Federal Democratic Republic of Ethiopia

MINISTRY OF TRANSPORT

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MINISTRY OF TRANSPORT

Consulting services for national integrated transport master plan study and enhance sector capacity in planning and research & development

TASK 4 – CONSOLIDATED NATIONAL TRANSPORT MASTER PLAN

"SECTOR REPORT 5 – LOGISTICS"

December 2021

DOCUMENT CODE

PROJECT CODE	COMPONENT SUBTASK	DESIGN PHASE	PROD. CENTER	DOC. TYPE	WBS & ACTIVITY	DOC. NUMBER	REV.
ETMP	0 0	F	01	RH	MD 00 0 0	013	A

REV.	DESCRIPTION	DRAWN	VERIFIED	APPROVED	AUTHORIZED
A	FIRST ISSUE	DESIGN TEAM	KEY EXPERTS	TEAM LEADER: Sergio Polizzotti	PROJECT DIRECTOR: Raffaele Lorusso

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ACRONYMS

Abbreviations	Meaning
3PL	third-party logistics
AU	African Union
C&F	Cost and Freight
CCTTFA	Central Corridor Transit Transport Facilitation Agency
CCTV	closed-circuit television
CDE	Chemin De Fer Djibouto-Éthiopien
CEO	Chief Executive Officer
CMA	Continuous Monitoring Approach
COFC	Containers on Flatcars
COMESA	Common Market for Eastern and Southern Africa
CTMS	Corridor Trip Monitoring System
CVTFS	COMESA Virtual Trading Facilitation System
DCT	Doraleh Container Terminal (DCT
DDID	Djibouti Damerjog Industries Development (DDID
DMP	Doraleh Multipurpose Port (DMP
DPFZA	Djibouti Ports and Free Zones Authority (DPFZA
DWT	dead weight tons (DWT
EAA	Ethiopian Aviation Academy
EAC	East African Community
EBM	Expenditure Budgeting Model
ECAA	Ethiopian Civil Aviation Authority
ECTS	Electronic Cargo Tracking System
ECWC	Ethiopian Construction Works Corporation
ECX	Ethiopian Commodity Exchange
EDCs	Economic Development Corridors
EDR	Ethio-Djibouti Railways
EFY	Ethiopian Financial Year
EGTE	Ethiopian Grain Trading Enterprise
EINDC	Intended Nationally Determined Contributions
EMAA	Ethiopian Maritime Affairs Administration Authority
EPE	Environmental Policy of Ethiopia
EPSE	Ethiopia Petroleum Supply Enterprise (EPSE
ERA	Ethiopian Road Authority
ERC	Ethiopian Railway Corporation
ERCA	Ethiopian Revenue and Customs Authority

Abbreviations	Meaning
KRC	Kenya Railways Corporation
LAPSSET	Lamu Port, South Sudan, Ethiopia Transport Corridor
LGE	European Guide Lines
LIC	Low-Income Countries
LLDCs	Landlocked Developing Countries
LNG	Liquid Natural Gas
LPI	Logistic Performance Index
m.a.s.l.	Meters above sea level
MCA	Multi Criteria Analysis
MHS	message-handling system
Mil	Million
M-LAT	multilateralisation system
MMT	Ethiopian Maritime and Transit Services Enterprise
MoF	Ministry of Finance
MOFEC	Ministry of Finance and Economic Cooperation
MoT	Ministry of Transport
MOTL	Ministry of Transport And Logistics
MSPs	Mobility Service Providers
MT	Metro
NCTTCA	Northern Corridor Transit and Transport Coordination Authority
NFLIP	National Freight and Logistic Information Portal
NISS	National Intelligence and Security Service
NLC	National Logistics Council
NLS	National Logistics Strategy
NRSP	National Road Safety Policy
NTBs	Non-Tariff Barriers
NTMP	National Transport Master Plan
NUDSP	National Urban Development Spatial Plan
NVOCC	Non-Vessel Operating Common Carrier
O/D	Origin/Destination
OJT	On-the-Job Training
OSBP	One-stop Border Post
PEHA	Public Enterprises Holding and Administration
PIDA	Programme For Infrastructure Development In Africa

Abbreviations	Meaning
ERTTP	Ethiopian Rural Travel and Transport Program
ESG	Environmental Social Governance
ESL	Ethiopian Shipping Line
ESLSE	Ethiopian Shipping and Logistic Service Enterprise
ESMM	Environmental And Social Management Manual
ETB	Ethiopian Birr
EMAA	Ethiopian Maritime Affairs Administration Authority
ETMP	Ethiopia Transport Master Plan
EU	European Union
FAA	Federal Aviation Administration
FCEV	Fuel Cell Electric Vehicle
FDI	Foreign Direct Investment
FDRE	Federal Democratic Republic of Ethiopia
FGDs	Focus Group Discussions
FMSs	Fleet Management Systems
FOB	Free on Board
FTA	Federal Transport Authority
FTM	Future Transport Model
FX	Foreign exchange
FYP	Five-Years Development
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
HDTL	Horizon Terminal
HoAI	Horn of Africa Initiative
HTL	Horizon Terminals Limited
IAIP	Integrated Agro-Industrial Parks
ICE	internal combustion vehicles
ICT	Information And Communication Technology
IFC	International Finance Corporation
IGAD	Intergovernmental Authority on Development
IMF	International Monetary Fund
IoT	Internet of Things
IRIMP	Regional Infrastructure Master Plan
IRR	Internal Rate of Return
ISS	Inception and Sector Situation

Abbreviations	Meaning
PPE	personal protective equipment
PPP	Public Private Partnership
RECTS	Regional Electronic Cargo Tracking System
RF	Road Fund
RoRo	Roll-on Roll-off
RVR	Rift Valley Railways Consortium
SADC	Southern African Development Community
SDGs	Sustainable Development Goals
SGR	Standard Gauge Railway
SIGMAT	Système Interconnectè de Gestion des Marchandises en Transit
SOEs	State-Owned Enterprises
SPM	Single Point Mooring
SPV	Special purpose vehicle
TAORT	Tripartite Agreement on Road Transport
TAZARA	Tanzania-Zambia Railway Authority
TEU	20-foot standard container
TMEA	TradeMark East Africa
TNCs	transnational corporations
TOFC	Trailers On Flatcars
TRL	Tanzania Railways Limited
TTTFP	Tripartite Transport and Transit Facilitation Programme
TYP	Long-Term Transport Planning
ULEVs	Ultra-Low Emission Vehicles
UN	United Nations
UNDP	United Nations Development Program
UNESCAP	United Nations for Economic and Social Commission for Asia and the Pacific
UNPO	Unrepresented Nations and Peoples Organization
USD	United States Dollar
VOCC	Vessel Operating Common Carrier
VoT	Value of Time
WAM	Wide Area Multilateration
WB	World Bank
WFP	World Food Program
WRAs	Woreda Road Authorities
WTO	World Trade Organisation

1 INTRODUCTION

1.1 THE LOGISTICS SECTOR REPORT

This Report is the Logistics Report, included in the list of different sectorial reports of the Ethiopia Transport Master Plan. Following is the list of sectorial reports that are presented in separate volumes:

Sector Report 1 – INTEGRATED TRANSPORT MODEL
Sector Report 2A – ROAD NETWORK
Sector Report 2B – RURAL ROADS
Sector Report 3 – RAILWAYS
Sector Report 4 – AVIATION
Sector Report 5 – LOGISTICS
Sector Report 6 – INLAND WATER TRANSPORT
Sector Report 7 – URBAN & PUBLIC TRANSPORT

The following paragraph explain the relations between the general transport master plan (ETMP50) and the sub-sectorial master plan (National Logistic Master Plan)

1.2 TRANSPORT MASTER PLAN & LOGISTIC MASTER PLAN

According with the terms of reference, "the Ethiopia Transport Master Plan should constitute a dynamic national long term transport plan that will guide transport planning, management and operations for all the different modes and spheres of government, developing intermodal/ multimodal transport network and integration with urban/rural & economic development of the country". The ETMP should also serve for enhancing the capacity of Ministry of Transport and other concerned agencies/institutions on the various transport planning tools and techniques, especially those employing new technology, through training activities and workshops.

To this scope, the Consultant has analysed the international best practices in conducting national transport planning and has acquired the main approach concepts to guide the ETMP as presented in the ISS Report. Major lessons learnt from best practices are: i) Need for a clear and straightforward planning framework (as shown in chapter 7 of the consolidated master plan), ii) Adoption of an Integrated multimodal transport approach (integrated multimodal model used); iii) Considering different evaluation scenarios (go ahead, next generation, limits to growth) and conduct iterative model assignments; iv) Integrate the national transport master plan with the regional transport system (rural road sector report); v) Make investment decision according with sustainable dimensions (use of economic analyses and MCA); vi) Promote diversified funding sources and sustainable private partnership (to be treated in the Policy & Strategy report); vii) Build technical capacity for institutions and local transport planners (to be finalised in the Policy & Strategy report).

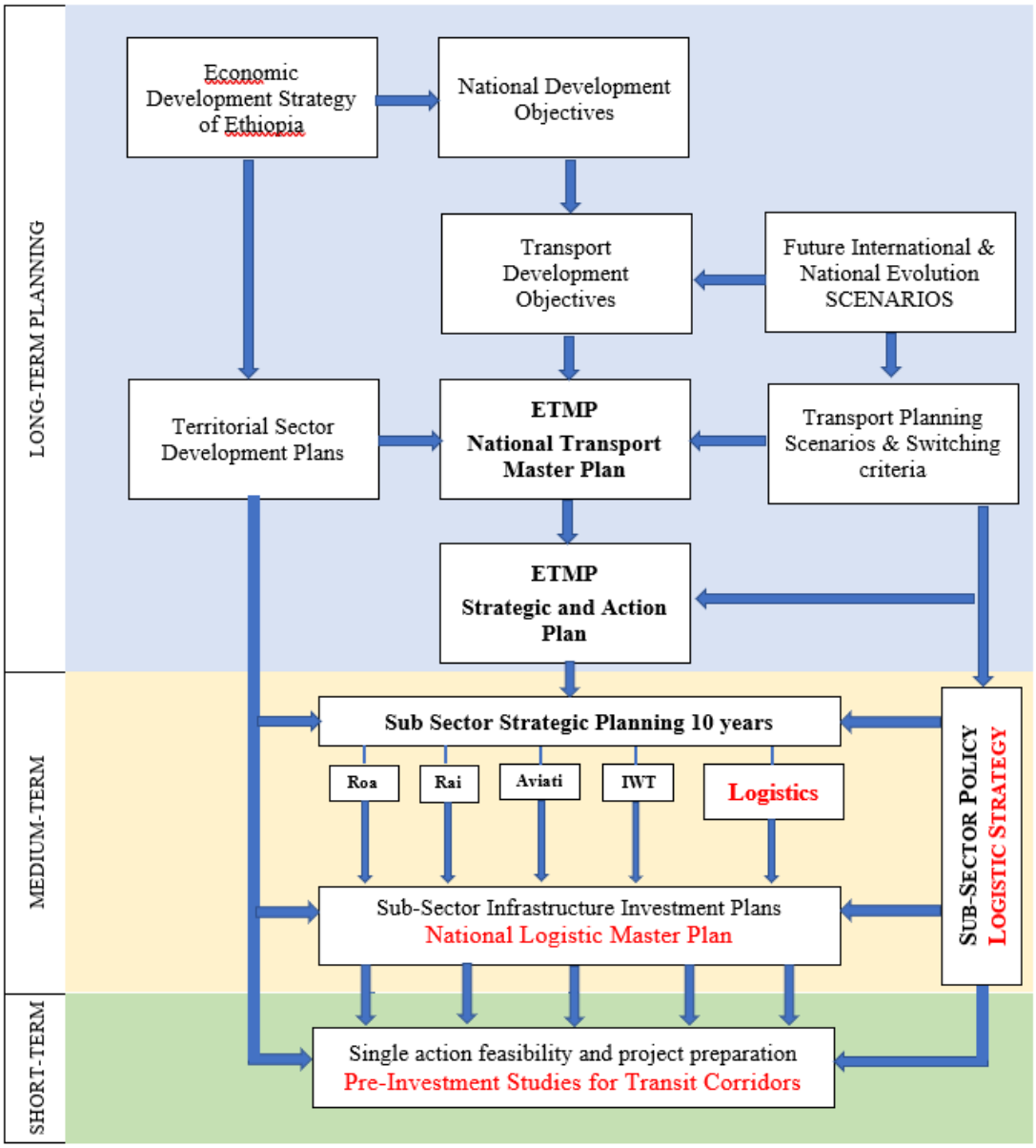
The scope of the Ethiopia Transport Master Plan is then to create the framework for development of each mode of transport (road, rail, aviation, logistics, inland water and urban mobility) for the next 30 years. The following figure represents the overall planning framework, from the long-term national multimodal transport plan, to the subsector medium term infrastructure plan and the specific short-term project preparation procedures, before implementation of the single road infrastructure investment. ETMP50 represent the multimodal long-term plan, while the ready-to-launch National Logistic Master Plan, will represent the medium-term plan for the logistics sub-sector.

On the basis of the main lines of the ETMP50, the National Logistic Master Plan should implement the desired logistic strategy, through a detailed:

- Diagnostic and Situational Analysis of the Ethiopian Logistics Sector, mapping origin/destination of agricultural, industrial, import/export freight movements, present logistic distribution/accumulation structures, transport resources, regulatory/operational procedures and identifying the gaps in the efficiency of the logistic sector provision.
- Drafting the Ethiopia Logistic Master Plan, with involvement of all main stakeholders and identifying the future short and medium-term freight transport demand, appropriate institutional and regulatory/procedural regulation reforms, introducing the most convenient logistic ICT innovations and the establishment of a permanent observatory of logistic performance in the various logistic activities.

Following is the scheme of the Overall Transport Planning Framework.

Figure 1: Overall Transport Planning Framework



1.3 LOGISTICS CONSTRAINTS IN ETHIOPIA

The logistic sector (as part of the supply chain trade) involves the management of freight movement and the integration of different disciplines like: production, packaging, materials handling, transportation, warehousing and security. In particular logistic transport involves international and multimodal transport: ports, railways, roads, aviation and dry ports. Trade logistics is not only goods transport and warehousing but in a wider sense is the base of a competitive industrial base, whose development is directly related to the capacity to reducing the costs of trade well beyond tariffs. Freight cost, both maritime and inland transport roles, are higher due to time-consuming port procedures and services, complexity of documentation and procedures, high vehicle operating cost and travel time because of bad road condition, etc.

1.3.1 Landlocked Ethiopia

All nations are involved in international trade to obtain inputs to improve production and productivity, because no country is self-sufficient. International trade is growing in terms of value and tonnage, and on average the value of world merchandise trade increased by 7% - 10% in the last years. Shipping carries 80% – 90% of global trade by volume and 60% – 70% of global trade by value. Shipping operations require access to the sea and adequate port facilities, but many countries around the world are landlocked, while 40% of the population of Africa lives in landlocked countries. The trade logistics sector is not only transport of goods and warehousing but also the tool for enhancing the competitiveness of the national industrial base. A recent study from the World Bank also shows that an increase in international transport costs of 10 per cent can reduce the volume of trade by as much as 20 per cent. In Africa, the reduction in trade volumes due to transport costs is even more severe, considered that this Continent hosts the largest number of **landlocked countries** in the world.

Although *the United Nations Convention on the Law of the Sea, Part X Article 125* gives landlocked states the right to pass through the territories of transit states to access the sea, but exercising this right requires bilateral, subregional or regional agreements between landlocked and transit states. Goods passing through transit corridors should not be subject to customs duty, but landlocked countries must pay for facilities such as railways, roads and port facilities, in line with negotiated agreements. Negotiations and agreements play a pivotal role in optimising the benefits of landlocked states' rights which should be applied in selecting optimal transit corridors and negotiating with transit neighbours.

As Ethiopia is a landlocked country, the importance of the logistic sector and maritime links for Ethiopian trade flows is enormous. Freight cost, both maritime and inland transport are higher due to time-consuming port procedures and services, complexity of documentation and procedures, high vehicle operating cost and travel time because of bad road condition. Today the logistic sector represents 30% of the national gross product (GDP) and it is estimated that prices of imports are around 30-40% higher than that of coastal country and exports volumes are reduced by 40% because of the major costs of Ethiopian goods.

Ethiopia became a landlocked country when its former province of Eritrea gained independence in 1992, but the port of Assab continued to handle more than 75% of Ethiopia's imports until the outbreak of war in 1998, after which the Ethiopian imports and exports shifted to Djibouti corridor. The Ethio-Djibouti transit corridor is now Ethiopia's main maritime gateway, handling over 93% of its trade cargo. The recent reconciliation (2020) between Ethiopia and Eritrea opens up for good opportunities for a renovated use of port of Assab and Massawa.

The recent two-digit growth of Ethiopia economy asks for ever increasing international trade and the logistic sector is becoming the focal point for accompanying and stimulating the national socio-

economic development. Ethiopia needs an efficient and competitive logistic system, that can be achieved through three lines of development: diversifying access to ports, improving cross-border transport regulations and improving logistic system performances.

1.3.2 Poor performance of the logistic sector

As explained by the EU Report: "Ethiopia's Regional Connectivity and Competitiveness", the high costs and poor performance of Ethiopia **logistics** hinder the country competitiveness in the global market, constraining its exports, and impeding a more sustainable and inclusive development. The main challenges are:

- Besides condition of road and railway corridors, the **quality of logistic infrastructures**: logistic centres, dry ports, border posts and ICT) **and its management** (e.g., axle load control) are key factors in transit time. Despite huge investment in infrastructure, inefficiencies in trade logistics are a major bottleneck to Ethiopia's growth. The new Ethiopia-Djibouti railway line is not operating at its full capacity and is, at the moment, not able to generate sufficient income to cover its costs (operating and financial).
- **Non-competitive environment**, impacting on effectiveness and costs of operations. Three State-Owned-Enterprises provide surface-freight logistics services: the Ethiopian Shipping and Logistics Enterprise (ESLSE) that has the multimodal monopoly; the Ethiopian Railways Corporation (with Ethiopia Djibouti Railways); and the Ethiopian Petroleum Supply Enterprise. Many logistic services (in Djibouti and Ethiopia) are provided by monopoly or exclusive service providers. The market would require a wide range of logistics and value-added logistics services providers to improve its performance. The lack of qualified logistics professionals (including in road transport – trucking industry – which is very fragmented and not effectively organised) has a negative effect on the performance of the sector.
- **Lack of coordination (including inter-modality):** There is no-coordination between Ethiopia and neighbouring countries. Corridor management authorities to remove bottlenecks, for instance, are not in place. Harmonisation (of vehicle specifications and equipment; training, testing of drivers and driving licences; etc.) to international standards would also improve coordination. Within Ethiopia, working on inter-modality will be needed for rail to provide a cost-effective door-to-door service.
- **Maintenance and asset preservation** of the main road corridors is crucial for decreasing the truck operating costs and also try to avoid the vehicle overloading. A maintenance management system with equipment-based road condition survey is crucial for a robust and realistic financial planning. Overloading on roads and the controlling mechanisms are areas of concern that are being addressed with the upgrading of the weigh bridges at various locations especially on the regional corridors. MoT is also working on the harmonisation of the vehicle loading control regulations to regional standards with the EU funded technical assistance of the Tripartite Transport and Transit Facilitation Programme (TTTFP).

1.4 AREAS FOR IMPROVEMENT

Areas for improvement will be: 1) Diversifying and improving the transport corridors to different regional port gateways; 2) Harmonisation of the current rules and regulation for transport such as vehicle size, axle load control, etc.3) Increasing operational efficiency and modernization of the logistic system.

1.4.1 Diversifying access to ports

Ethiopia is trying since long time to diversify access to ports, but up to now Djibouti port remains the almost obliged alternative.

In 1993, Ethiopia signed a port utilisation agreement with Djibouti, the right to use a duty-free plot at the port and the establishment of smooth flows of cargo and information and harmonised formalities for the movement of peoples, vehicles and aircrafts. Following the increase in Ethiopian cargo passing through the Port of Djibouti, the port authority invested substantially in expanding the terminals, the port utilisation for Ethiopian transit and multimodal services.

In August 2003, Somaliland and Ethiopia signed a bilateral agreement to improve truck road links and establish customs and ports (UNPO 2005). This allowed Ethiopia to use the port of Berbera, north-western Somalia.

An agreement was also signed between Ethiopia and Sudan for cooperation on transport and communication and to research the potential to build roads to connect their border cities. Ethiopia has been using Port Sudan for exports and has made efforts to use Sudanese ports for imports.

Ethiopia is part of the Lamu Port–South Sudan–Ethiopia Transport (LAPSSET) Corridor Project, an infrastructure project dedicated to providing sea access to several east African nations through Lamu. This port will consist of 32 deep-sea berths. The corridor comprises two elements: an infrastructure corridor involving the development of road, railway, pipelines and power transmission and a 50-km economic corridor on either side of the infrastructure corridor where industrial investments will be situated. Construction of three berths at Lamu Port was completed in July 2020 (Ochieng 2020).

Diversifying port access alternatives means to take advantage of the different corridor economic competition, lower transit costs and better serve particular areas of the country which are nearer to different ports. Diversifying import and export cargo through different transit corridors and seaports is essential to preserve the country's national interest and increase its bargaining power in bilateral and multilateral negotiations. The government of Ethiopia recognises this in its national logistics strategy to be implemented from 2018 to 2028 (Ministry of Transport and EMAA 2019).

1.4.2 Improving cross border transport regulations

Over 90% of the country's import and exported goods are transported by road. Improving regional road corridors utilisation and management is therefore key to ensure an effective and sustainable transit system.

The EU funded Tripartite Transport and Transit Facilitation Programme (TTTFP) programme is working on improved and harmonised standards for countries covered by the Common Market of Eastern and Southern Africa (COMESA), East African Community (EAC) and Southern Africa Development Community (SADC) –with the active participation of Ethiopia.

Ethiopia should work on the harmonisation of the custom and cross-border trucking regulations to regional standards with the EU funded technical assistance of the Tripartite Transport and Transit Facilitation Programme (TTTFP).

1.4.3 Improving logistic system performances

Present condition of Ethiopia logistic sector is characterised by following problems: inflexible trade and finance systems; excessive and cumbersome transit and custom procedures; poor quality and low competence of logistics service providers; monopolistic practice; logistic infrastructure deficit and management problem; institutional organisation and capacity gaps.

The Government of Ethiopia, recognising the extremely poor performances of its logistics sector and its impacts on export and global competitiveness, issued in 2018 a National Logistics Strategy (2018-2028), with specific objectives: refining the national trade and finance system, establishing a well-integrated and interfaced transit and custom system; improving logistics service provider's efficiency; reducing the monopolistic practices; developing logistics infrastructure and building up logistics sector institutional capacity.

In September 2018, the Ethiopia Investment Board announced the decision to allow foreign investment into the country's logistics sector. Non-Ethiopians are now allowed to own maximum 49% in joint venture arrangements to provide bonded warehouses and consolidation and de-consolidation. The opening up of the dry ports for private sector participation was also announced in November 2019.

In March 2020 a logistics policy has been approved with the main objectives of transforming the sector to increase efficiency, opening up the sector to the private sector and integrate it with other sectors to enhance job creation. To tackle the main challenges in the sector the policy aims at improving the leadership, accountability and enforcement of decision-making by establishing the National Logistics Council (NLC), re-organise the Ethiopian Shipping and Logistics Enterprise (ESLSE) and revise the existing regulations.

1.5 MODELLING LOGISTICS

The logistic network of the country has been simulated in the ETMP50 integrated transport model, which represents a tool for corridor planning and development model, integrated with the different modes of transport and the regional corridor identified by the Horn of Africa Initiative (HoAI).

The Integrated Model is using the freight transport demand O/D matrix at national and import/export level and the present and future road, rail and aviation mode for freight assignments at different years and different scenarios.

Import goods itineraries have been assigned in the future, varying the access to different ports and different dry ports as destination, in order to understand the appropriate capacity of the transport infrastructures (road/rail) and logistic structures (dry ports) at 2025-, 2035- and 2050-year horizons.

The import freight movements have been assigned in the present situation and in the future for different development scenarios and at different years 2025, 2035 and 2050, (see chapter 7).

1.6 CONTENTS OF THE LOGISTIC SECTOR REPORT

The present report analyses the logistics sector inside the other modes of transport and its desired evolution according with the need to reduce the logistic costs related to: presence of a quasi-monopolistic transit corridor, lack of appropriate regional and bilateral transport agreements and low performance of the logistic sector in operation.

The simulation of the present and future flow of import/export trade is made through an integrated transport (road, rail, aviation) model (ETMP50) at different years (2025, 2035, 2050) and different development scenarios (Go Ahead, Next Generation, Limits to Growth).

This logistics network sectorial report includes:

- Chapter 1 – A remind of the planning process adopted for the ETMP50 and its relation with the sub-sector medium-term plan (National Logistic Master Plan). Present logistic problems and desired solutions;

- Chapter 2 – Description of the institutional set-up for logistic sector: regulatory institutions and public enterprises;
- Chapter 3 – Ethiopia international trade, trade corridors used, present logistic system, ESLSE performances;
- Chapter 4 – Plans & strategies in the sector, like the Logistic strategy, the Ten-years perspective development and the launching of the National Logistic master Plan;
- Chapter 5 – Detailed analysis of import/export statistics from 2010 to 2021:
- Chapter 6 – Cost of being land-locked, analysis of present and possible alternative corridors;
- Chapter 7 – Model assignments of import/export freight at different time horizons and scenarios;
- Chapter 8 – Proposed actions in the logistic sector: diversifying port gateways, improving cross-border transport regulations, increasing efficiency of the logistic operations. Need for intermodal terminals and last innovations on logistic ICT.

2 INSTITUTIONAL FRAMEWORK

2.1 INTRODUCTION

Ministry of Transport & Logistics (MoTL) and Ethiopian Maritime Affairs Administration Authority (EMAA) are the two federal government institutions entrusted with powers and duties for regulating and administrating the maritime and logistics transport sector in Ethiopia. As per FDRE Constitution, regulating maritime and import-export logistics services are under the jurisdiction of the federal government; so that there is no regional institution established for the purpose of regulating such sector. Even though there are private operators engaging in freight forwarding, custom clearance, and shipping agent services, the state-owned Ethiopian Shipping and Logistics Services Enterprise has dominated Ethiopian marine and logistics services.

Table 1: Logistics Institutional Responsibility Matrix

Institution	Main Powers & Functions Areas	Financial Source	Legal Authority Sources
Ministry of Transport and Logistics	> Policy, Strategy, and Legal Frameworks; > Supervising EMAA, & FTA,	> Government Treasury	> FDRE Constitution > Proclamation No. ___/2021 (New) Definition of Powers and duties of executive organs
Ethiopian Maritime Affairs Authority (ECAA)	> Enforcing logistics and maritime laws; > Licensing & regulating logistics sector operators;	> Government Treasury	> Proclamation No. 549/2007;
Ethiopian Shipping and Logistics Service Enterprise (ESLSE)	> Providing sea freight transport services > Providing shipping agent, freight forwarding and land transport services; > Owning and operating dry ports > Providing multimodal transport services	> Revenues collected from service charges	> Regulation No. 255-2011 > Regulation No. 386-2016)
Ministry of Finance	> Allocating budget to MoT, EMAA,	> Domestic revenues; > Foreign loans;	> FDRE Constitution, > Proclamation No. ___/2021 (New) Definition of Powers and duties of executive organs
Public Enterprises Holding and Administration Agency	> Supervising ESLSE	> Government Treasury > Dividends from Public Enterprises	> Proclamation No. ___/2021 (New) Definition of Powers and duties of executive organs > Regulation No. 445/2019

Brief descriptions on the responsibilities and functions of each of the three federal institutions are provided below.

2.2 REGULATORY INSTITUTIONS

2.2.1 Ministry of Transport

The main responsibilities assigned to MoT regarding maritime and logistics are connected with to its responsibility it has for formulating transport policies and strategies and following up of their proper execution.

Prior to 2007, MoT was the sole federal institution that regulate the maritime and logistics services

in Ethiopia. Following the EMAA's establishment by the Maritime Sector Administration Proclamation No. 549/2007 as an independent federal institution for the sole purpose of regulating and administering maritime, logistics, and inland water transport services in 2007, the main responsibilities of MoT have been turned out to supervise and direct EMAA to the proper discharging of its responsibilities.

MoT, like other transport sectors, is responsible for the formulation and implementation of maritime and logistics sector polices and strategies as well as issuing Directives in line with maritime and logistics related Proclamations and Regulations.

MoT had a direct supervisory role over Ethiopian Shipping & Logistics Services Enterprises until the Public Enterprises Holding and Administration Agency took over the role in November 2018 following the enactment of Proc No. 1097/2018. However, MoT still has major responsibilities on maritime and logistics services by regulating them as well as by drafting and enforcing polices, strategies and long-term plans. As set out in detail under Article 21 of Proc No. 1097/2018, MoT has entrusted with a power ensuring the services provided by ESLSE are integrated, efficient and accessible as well as they are in line with strategies and plans of the government.

In addition to its responsibility for generating and implementing policies, strategies and medium- and long-term plans for transport infrastructures and services in general and to maritime and logistics sector in specific, MoT plays a major role in the regulatory functions by issuing directives as well as supervising and directing EMAA's functions.

Under its organizational structure, MoT has a State-Minister and Bureau Head dedicated to Shipping and Logistics as well as a Departmental called Maritime Logistics and Integration Coordination Directorate.

2.2.2 Ethiopian Maritime Affairs Authority (EMAA)

EMAA was established in August 2007 under Proclamation No.549/2007. EMAA is accountable to MoT and managed by the Director-General and a Deputy Director General who are nominated by MoT and appointed by the government. EMAA carries out its function through separate departments for the accreditation of training centers & seafarer certification, registration of Ethiopia's national fleet, and maritime security and safety.

As stated under Article 5 of Proc No. 549/200, the main purpose that EMAA was established for is transport operations and movement of goods in import and export are economical and planning, coordinating, and enforcing such operation. The other purposes that EMAA has established are reducing transit time of import export of goods by coordinating Government bodies to care for goods at port and promoting multimodal transport, marine transport, in-land water transport and ensuring the availability of uninterrupted resource of skilled man power in the maritime sector for the Country.

EMAA, as a Maritime Administration government agency, responsible for promotion of the development and maintenance of an adequate Shipping line sufficient to carry the Nation's domestic waterborne commerce and a substantial portion of its waterborne foreign commerce. It also seeks to ensure that Ethiopia maintains inland water transport safety and job creation on international sea transport for youth. EMAA has also a responsibility in the logistics sector to coordinate all stakeholders in foreign trade and set a mechanism to ensure smooth flow of import and export goods.

The detailed responsibilities of EMAA are stated under Article 6 of the Proclamation which includes mainly the following:

1. ensure that the import and export process and movement of goods is economical and efficient; supervise, coordinate and render timely solutions to problems arising in the course of these operations;
2. direct and coordinate efforts of the respective Government bodies to minimize the transit time of import and export goods; analyse and solve problems arising from the use of sea ports and negotiate on such matters;
3. ensure the availability of its own berth at sea ports; develop the construction and expansion of service of dry ports, develop skills in negotiation of cost of transit, shipping of goods and other freight services in the course of import and export operation;
4. strive for the strengthening of the national shipping carriers, supervising its activities, issue license and supervise bodies and persons engaged in sea and inland waterways transportation services;
5. regulate the manufacture, possession, use, sale and purchase of any vessel, license and control seafarers, pilots and other persons working on board a vessel;
6. recommend tariffs to be charged at dry ports, for the services they render; regulate the conditions under which passengers, goods and mail may be transported in vessels;
7. conduct research and prepare plans and programs for dry ports and other projects relating to maritime transport construction,
8. improve and maintain dry ports and other facilities for the use in accordance with the authorized programs;
9. ensure the availability of safe and adequate marine transport and dry port services; require the provision of necessary marine and surface transport insurance;
10. maintain port and vessel records; register all vessels and any rights relating thereto, issue registration marks to vessels; approve vessel christening; inspect and issue seaworthiness certificates; specify the type of services for which vessels are to be used; preserve and regulate condition as to the construction assignment, maintenance and repair of vessels; inspect, license and regulate all dry port and vessel services and facilities, the services at custom check points;
11. issue license to persons desiring to engage in multi modal transport business, renew such license and supervise their operation;
12. regulate and supervise dry ports, freight forwarders, ship agents, and the operation of customs clearing, to issue detailed directives, coordinate their tasks, and improve their capacity;
13. negotiate, with the approval of the Ministry, international maritime and transit services, issues implementation regulations and follow up their execution;
14. support the increased private organized participation in the organized manner in the maritime service sector, supervise the activities of associations organized in the maritime sector, disseminate properly analysed trade information regarding the maritime sector to end users.
15. designate and specify prohibited, danger and restricted areas for marine transport in inland waterways in cooperation with other concerned governmental agencies;
16. conduct and coordinate search and rescue operations for any vessel; investigate vessel accidents and prepare and issue accident reports;
17. cause the establishment of marine transport institution vessel construction, maintenance and repair centres and other facilities related to vessel operations; inspect and determine their standards and award' certificates of qualification;
18. prepare. and submit to the Ministry, draft Directives necessary for the implementation of this Proclamation and Regulations issued under this Proclamation; make such Directives known to concerned parties;

EMAA has 10 Directorates and two Offices with 155 positions under its Organizational structure;

however, it has abled to fill only 72 positions. Like any other regulatory institution of the federal government, EMAA carried out its responsibilities by using a budget allocated to it every year from government treasury.

Given the importance of the logistics sector for the country, the brief description of the institutional and regulatory framework must be completed with the National Logistics Council, an institution that gathers the major stakeholders that contribute to determining and managing the flows of goods and the related flows of currency.

The NLC is chaired by the MOTL and composed of some Ministers (in addition to Transport, Finance, Trade and Industry, Agriculture) the most important Authorities (EMAA, Investment Commission, Revenue and Customs), the National Bank of Ethiopia and the ELCoP, which includes members from service providers and users, logistics professionals, practitioners, transit operators and freight forward companies. The Council is supported by a dedicated office, the Logistics Transformation Office (LTO), within the EMAA.

The Council does not have the task of technical regulation or management of daily administrative processes, but to coordinate all the stakeholders active in the sector in order to develop intervention policies and strategies capable of rapidly advancing the national logistic sector.

2.3 PUBLIC ENTERPRISE - ETHIOPIAN SHIPPING AND LOGISTICS SERVICE ENTERPRISE (ESLSE)

ESLSE was established in 2011 by merging four state owned companies, namely, Ethiopian Shipping line Share Company, Maritime & Transit Services Enterprise, Dry Port Services Enterprise, and Comet Transport Share Company. The core services ESLSE provides are sea transport services, shipping agency services, freight forwarding and customs clearance services, inland transport services, and port & terminal services.

Currently ESLSE is under the supervision of the Public Enterprises Holdings and Administration Agency. ESLSE has a Board of Directors at top of its organizational structure and a CEO with four Deputies as its executive management team.

ESLSE is composed of four major Sectors called Shipping Service Sector, Freight Forwarding Service Sector, Port & Terminal Service sector, Corporate Services Sector. Each of these Sectors are led by a Deputy CEO and has respective focus areas.

The Shipping Service Sector is responsible to provide coastal and international marine transport services to and from Djibouti port. It provides uninterrupted sea transport services between ports with own ships and slot chartering of major carrier ships. According to a latest Statistical bulletin of ESLSE, the shipping services sector currently provides in three major trade routes (Indian and Gulf, Europe and Africa, and Far East routes) dependable shipping services for cargoes from more than 311 ports.

The Freight Forwarding Sector is mainly concerned with clearing and forwarding of import and export using two business modalities namely multimodal and unimodal transport services. It is also responsible for freight forwarding and custom clearance services. It provides inland transport services to multimodal and unimodal cargos by using its own trucks and by sub-contracting other truck operators.

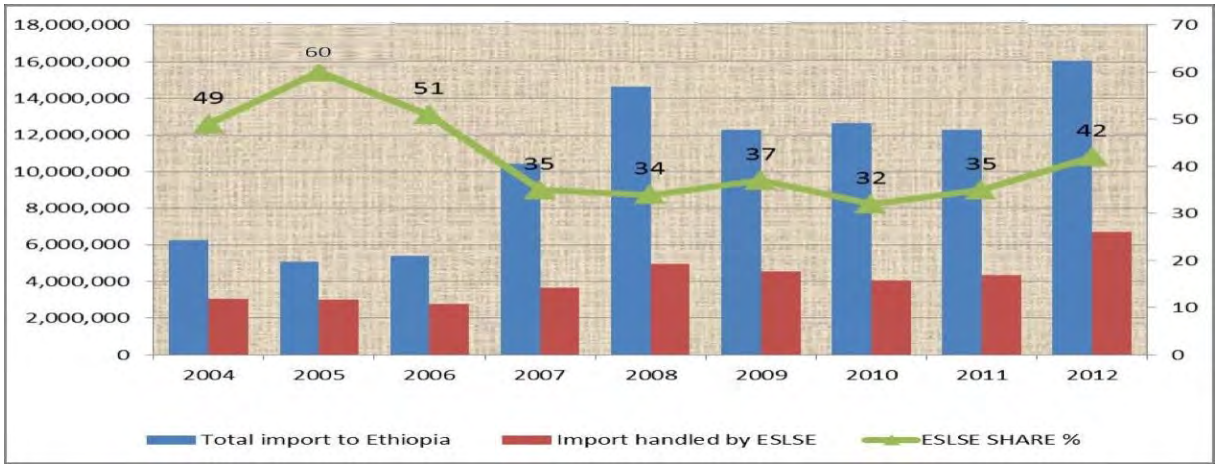
The Port and Terminal Sector is served as the point of destination to Ethiopia's import and export trade where goods are unloaded, customs formalities are completed; goods are temporarily stored; stuffing and un-stuffing activities take place and made ready for transport; and dispatched to their final destinations. The Corporate Service Sector is, as its name indicates, it provides support

services to the other three service sectors as well as other departments of the ESLSE.

In addition to its four Service-centered Sectors, ESLSE own and managed a Maritime and Logistics Training Academy. The Academy mainly provides short term trainings on safety for ratings and on logistics, leadership and related subjects for the off-shore industry. Besides, under its organizational structure, ESLSE has 24 Departments and 7 Branches which are directly accountable either to the CEO or one of the Deputy CEOs.

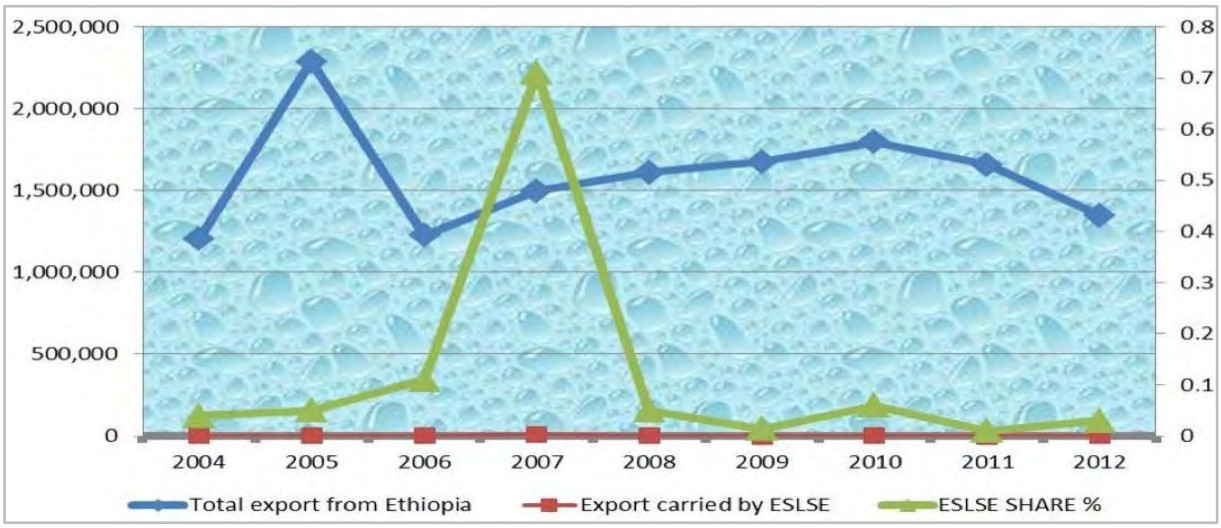
ESLSE currently owns and operates 11 Vessels, 9 of which are dry cargo ships with a total dead weight of 246,185 tons while the other two are product tankers, with total dead weight of 83,000 tons.

Figure 2: ESLSE Share on Imported Cargoes (Et. Years)



Source: ESLSE *Note: Years are in Ethiopian Calendar*

Figure 3: ESLSE Share on Exported Cargoes (Source ESLSE)



Source: ESLSE *Note: Years are in Ethiopian Calendar*

3 PRESENT SITUATION

3.1 ETHIOPIA INTERNATIONAL TRADE

In the last five years the Ethiopian trade has increased in quantity from 12.8 million tons (2015) to 16.3 million tons (2019) and in value from 25.6 billion USD (2015) to 27.6 billion USD (2019). There is a net prevalence of imports: In facts: in 2019 there were 14.2 million tons of import and 2.1 million tons of export, while 20.0 million USD value of import and 7.6 million values of export. In 2020 there is the same prevalence of imports as in previous years. The 2020-dollar amounts are defined on a USD ETB exchange rate of 35.5 (2020 average value) as shown in the following table:

Table 2: Value and tons of Imports and Exports of Ethiopia from 2015 to 2020

Year	Unit	Import	Export	Total
2014/15	Million ETB	393,189	121,532	514,721
	Million USD	19,566	6,048	25,614
	Tons	11,402,752	1,465,762	12,868,514
2015/16	Million ETB	424,750	122,501	547,251
	Million USD	20,125	5,804	25,929
	Tons	14,776,656	1,664,477	16,441,133
2016/17	Million ETB	430,233	139,830	570,063
	Million USD	19,195	6,239	25,434
	Tons	12,126,182	1,767,963	13,894,145
2017/18	Million ETB	502,215	184,209	686,424
	Million USD	19,236	7,056	26,292
	Tons	13,553,528	1,909,400	15,462,928
2018/19	Million ETB	561,512	213,437	774,949
	Million USD	20,015	7,608	27,623
	Tons	14,266,322	2,062,152	16,328,474
2019/20	Million ETB	571,230	239,229	810,459
	Million USD	16,091	6,739	22,830
	Tons	-	-	-

Source: National Bank of Ethiopia Annual Report 2019/20; WB/Trade International Statistics

3.1.1 International trade by kind and origin/destination

The analysis of Ethiopia trade by kind and origin/destination is based on 2017 import/export data, year for which the complete ERCA data have been obtained by the Consultant.

Ethiopia imports are mainly manufacturing products like chemicals, machinery and transport equipment, pharmaceutical products, vehicles and accessories, refined petroleum, palm oil, iron and steel, mixed minerals and chemical fertilizers, while **Ethiopia export** goods comprise low-value unprocessed and semi-processed agricultural products like coffee (which currently represents 16,5 percent of the total export of the country), cut flowers (11 percent), dried legumes, fruit & vegetables, oil seeds (mainly sesame), pulses, spices, natural gum, livestock, leather and tanned sheep hides, mineral products (gold, tantalum, opal and marble products), khat (with huge quantities exported mainly in Somalia), Notably, the share of manufactured products remains minimal.

Table 3: Main destinations of Ethiopian exports (ETB millions) 2014/15 – 2019/20

Country of destination	2014/15	2015/16	2016/17	017/18	2018/19	2019/20
China, People Rep.	7.378	6.431	5.111	6.302	4.035	2.635
Germany	4.206	3.375	3.943	4.730	3.118	5.027
Saudi Arabia	4.039	3.643	4.400	4.971	5.073	6.485
Netherlands	3.591	3.705	4.178	5.001	5.843	9.671
U.S.A.	3.517	3.285	4.317	6.650	5.358	6.784
U.A.R	1.968	1.663	2.695	2.890	3.660	3.936

Country of destination	2014/15	2015/16	2016/17	017/18	2018/19	2019/20
Japan	1.966	1.213	2.233	2.378	3.386	3.566
Sudan	1.650	1.334	983	2.691	1.946	2.168
Djibouti	1.594	2.206	2.283	3.313	3.572	3.703
Italy	1.089	966	1.348	1.486	1.196	1.401
France	721	680	828	815	556	890
U.K.	702	807	1.290	1.159	1.159	1.052
Kenya	586	619	1.186	1.058	566	440
Russia	306	333	386	472	345	370
Yugoslavia	0	46	0	0	0	0
Rest of the World	26.547	29.422	28.504	28.799	33.761	46.113
Total Export (Value of Goods)	**59.860**	**59.726**	**63.686**	**72.713**	**73.574**	**94.240**

Data can be disaggregated for office of presentation of customs declarations, transit routes, origin and destination of international trade, types, value and quantity of goods. The data indicate that Ethiopia trade is characterized by a general unbalance in terms of tons (8/1) and values (6/1). Customs offices where goods are declared for import, with their points of entry, are listed in alphabetic order in the following table,

Table 4: List of Customs Offices with points of entry of imported goods

Office Code	Office Name	Point of entry
AAA	A,A Air Port Customs	Air shipment
AAAPE	A,A Airport Personal Effect Office	Air shipment
AAGC	Addis Ababa Gerji Cargo	Djibouti port
AAHQ	Headquarter	Djibouti port
AAK	Aa Kality (Aak)	Djibouti port
AAL	Aa Lagar (Aal)	Djibouti port
AAP	A,A, Parcel Post Customs	Djibouti port
AAPE	Aa Airport Personal Effects (Aaape)	Air shipment
AAPX	ADDIS ABABA Airport Passenger Section	Air transport
ALX	Aa Lagar Export & Others (Alx)	Djibouti port
GLN	A,A Kality Gelan Sub-Branch	Djibouti port
EIP	Eastern Industrial Park (Eip)	Djibouti port
NAZ	Nazareth Customs Office	Djibouti port
MOJ	Mojo Dry Port (Moj)	Djibouti port
BLP	Bole Lemy Industrial Park (Blp)	Djibouti port
AWA	Awash Customs Office	Djibouti port
DDA	D,D Airport Customs	Air transport
DDL	D,D La Gare Customs Office	Djibouti port
JIJ	Jijiga Customs Office	Berbera port
TWECH	Togowechale Customs Office	Berbera port
DEW	Dewele Customs Office	Djibouti port
GAL	Galafi (Gal)	Djibouti port
MIL	Mile Customs Check Point Office	Djibouti port
SEM	Semera Dry Port	Djibouti port
COM	Combolcha Customs Office	Djibouti port
MEK	Mekele Customs Office	Port Sudan
MET	Metema Customs Office	Djibouti port
METY	Metema Yohannes Branch	Djibouti port
HUM	Humera (Hum)	Port Sudan
GON	Gonder Customs Office	Djibouti port
BAH	Bahirdar Customs Office	Djibouti port
BHA	Bahirdar Airport Customs	Air transport
GAM	Gambella (Gam)	Djibouti port
HAW	Awassa Erca Branch	Djibouti port
MOY	Moyale Customs Office	Mombasa port

The analysis on where customs declarations are submitted, allows the identification of the following border crossings points, with the countries where goods have passed in transit,

Table 5: Transit Country

Border Crossing point	Transit Country
Buuhoodle	Somalia
Khatumo State	Somalia
Togo Wuchalle	Somalia
Dewele	Djibouti
Galafi	Djibouti
Gallabat	Sudan
MetEMAA	Sudan
Humera	Eritrea
Qaysān, QēssanKormuk	Sudan
Moyale	Kenya
Doolow	Somalia

Main origins and destinations of Ethiopian trade are shown in the following table. China, Kuwait, Djibouti and South Africa are the main countries of origin, and China, Somalia, United States and Saudi Arabia the main destinations:

Table 6: Main Origin & Destination

countries of DESTINATION	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020
China, People Rep.	5.111	6.302	4.035	2.635
Germany	3.943	4.730	3.118	5.027
Saudi Arabia	4.400	4.971	5.073	6.485
Netherlands	4.178	5.001	5.843	9.671
U.S.A.	4.317	6.650	5.358	6.784
U.A.R	2.695	2.890	3.660	3.936
Japan	2.233	2.378	3.386	3.566
Sudan	983	2.691	1.946	2.168
Djibouti	2.283	3.313	3.572	3.703
Italy	1.348	1.486	1.196	1.401
France	828	815	556	890
U.K.	1.290	1.159	1.159	1.052
Kenya	1.186	1.058	566	440
Russia	386	472	345	370
Yugoslavia	0	0	0	0
Rest of the World	28.504	28.799	33.761	46.113
Total Export	**63.686**	**72.713**	**73.574**	**94.240**

Countries of ORIGIN	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020
China, P. Rep.	1.149.322	1.008.648	1.097.904	1.123.535
Germany	57.117	72.560	90.189	92.082
Saudi Arabia	107.286	90.891	68.545	142.502
Netherlands	45.408	61.721	52.031	46.790
U.S.A.	228.941	312.444	381.619	331.147
U.A.E	82.837	142.839	154.369	172.828
Japan	155.450	135.466	105.230	54.903
Sudan	26.975	25.008	23.039	22.959
Djibouti	1	75	2.695	12.263
Italy	155.183	133.706	95.855	81.912
France	45.051	47.568	43.555	82.578
U.K.	37.503	59.818	91.148	92.163
Kenya	7.750	8.839	11.391	26.822
Russia	9.477	24.729	34.226	21.164
Yugoslavia	0	0	0	0
Rest of the World	1.434.409	1.846.841	1.982.145	2.018.246
Total Import	**3.542.711**	**3.971.155**	**4.233.942**	**4.321.894**

According with the location of customs offices and Border crossings, as shown in Table 37, the main points of entry/exit of Ethiopian imports and exports, are:

Table 7: Main Import/Export Transit Corridors

Point of entry/exit	Total Trade 2017-2020 (Mil, ETB)
Djibouti port	12.607.914
Port Sudan	491.217
Berbera port	293.373
Air transport	2.783.565
Moyale	198.124
Total 2017-2020	**16.374.194**

3.2 INTERNATIONAL TRADE CORRIDORS

As a landlocked country, maintaining high performing trade corridors is critical to Ethiopia's trade competitiveness. Protections provided by such legal instruments as the African Maritime Transport Charter of 2010 are essential in protecting the right to use ports and land corridors in other countries, including multimodal transit systems. In keeping with this Charter Ethiopia has signed Port Utilization Agreements with Djibouti, Sudan, Somaliland and Kenya. In addition to guaranteeing right of access, these agreements stipulate operating procedures and sets performance targets. Ethiopian shippers can choose among 4 alternative ports.

DJIBOUTI CORRIDOR

Presently, 91% of Ethiopia's traffic uses the Port of Djibouti. Between 2008 and 2012, Ethiopian traffic doubled to 791,363 TEUs. The Port Authority of Djibouti has currently embarked on port expansion through a series of specialized terminals now planned or under construction. The two countries have also made a major investment in a new, standard gauge railway between the port and Addis Ababa. After completion of the railway line, it has transformed the transport and logistics system of the country and further strengthen the mutual dependence of the two countries. The inland terminal will generate a logistics park to handle transfer of goods between the train and road transporters. Later regional rail lines will connect regional centres to Addis Ababa and thereafter to the port. A bilateral customs agreement seeks to reduce time and cost in releasing cargo from the port and in the transit across Djibouti.

PORT SUDAN CORRIDOR:

The closest port to Northern Ethiopia is Port Sudan. It handles primarily exports such as sesame, which are grown and processed in northern cities, such as Gondar. Goods are transshipped at Gedaref in Sudan and carried by Sudanese trucks to the Port.

ADDIS ABABA – NAIROBI – KENYA PORTS CORRIDOR:

Kenya ports of Mombasa or Lamu are the closest ports for Southern Ethiopia. They are thw gateways of the two Kenyan Corridors.

Mombasa – Nairobi - Uganda transport corridor that passes through much of the Northern Rift. In Mombasa port, a new container terminal and other construction is underway to add capacity to Mombasa. Once the road construction in Kenya is complete, Ethiopian shippers will readily access the East African Community for trade as well as access to another major port with new terminal coming on line. It will also host Ethiopia's first One Stop Border Post.

Lamu - South Sudan-Ethiopia-Transport (LAPSSET) Corridor project, also known as Lamu corridor is a transport and infrastructure project that will be the country's second transport corridor. Basic LAPSSET infrastructure has been built (also police station and harbor office in Lamu and lengthening of the Lamu airport runway). The construction of LAPSSET's main components (ports, pipelines, roads, railways) is currently ongoing with construction of the first berth at Lamu Port completed in October 2019.

BERBERA CORRIDOR:

This port is about the same distance as Djibouti, which makes it attractive to some shippers. The road on the Ethiopian side is in reasonable condition. The port is shallow and requires ships use "own gear". A new container terminal has been recently built by the ownership (DP world-UAE 51%, 30% by Somaliland and 19% (not yet confirmed) Ethiopia share-holders). DP world and Ethiopia signed agreement to improve the road condition of the corridor.

3.3 PRESENT LOGISTIC SYSTEM

Ethiopia is putting efforts to increase the quality of its logistic system, implementing the National Logistic Policy & Strategy. In the last years Ethiopia has developed its logistic system, improving the main export/import corridors, building several dry ports, three cold logistic centres and having a fleet of 11 national ships. Presently the share of multimodal transport is 45%, with 52% rate of containerization and 95% use of road transport, but logistic performance of the country is rather low: average ship waiting time is 24 days, logistic costs represent 25% of GDP and the Logistic Performance Index (LPI) is 2.36, putting Ethiopia at the 126th place in the ranking of nations (2016).

Dry Ports

With the recent building of Woreta dry port, Ethiopia can count on 8 working dry ports:

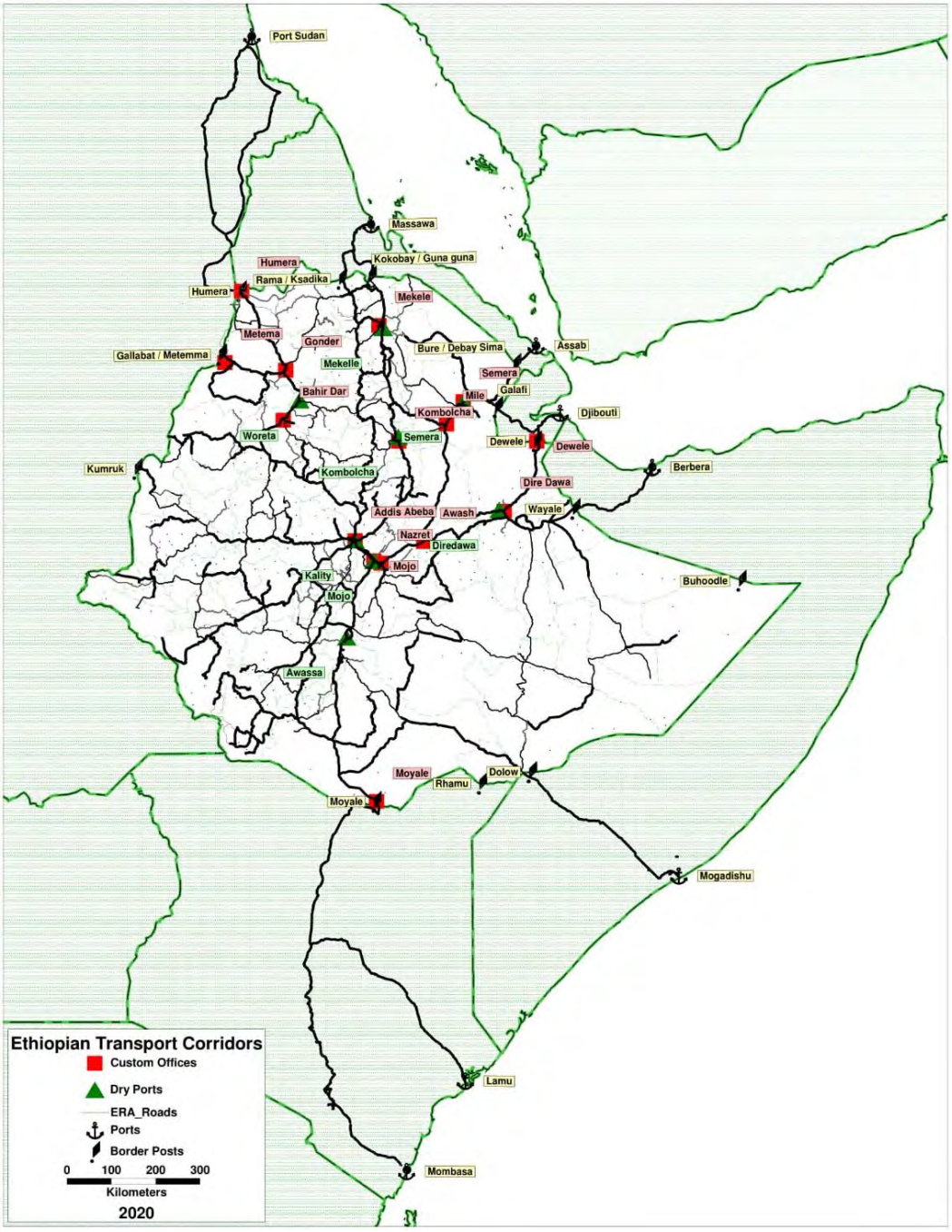
1) **Modjo** – Modjo dry port is the largest operational inland dry ports in the country, established in 2009. The dry port is located in Oromia National Regional State Lome woreda at Modjo town. The port occupies a total area of 150 hectare while 31.7-hectare land area is used for container terminal services. Modjo dry port is located 73 km from the capital and it is connected to the new Ethio – Djibouti Rail way line. As the largest port in the country, Modjo Dry Port handles more than 78 % of the nation's imports and has the capacity to accommodate 17,539 TEU containers at a time and its annual container handling capacity has reached up to 136,038 TEU. A 150 million USD project financed by the World Bank is transforming Modjo dry port into a full fledge green logistics hub.
2) **Kality** - Kality dry port was established in 2014. The port is located in Addis Ababa at Kality Sub City. The port occupies a total area of 37 hectare while 3-hectare land area is used for container terminal services. The port has the capacity to accommodate 1241 TEU containers at a time and its annual container handling capacity has reached over 23,131 TEU.
3) **Gelan** - Gelan RoRo vehicles terminal was established in 2014. The dry port is located in Oromia National Regional State, 25 km from the capital. The port occupies a total area of 23 hectare while 4.5-hectare land area is used for Ro Ro/ Vehicles terminal services.
4) **Semara** - Semara dry port was established in 2010 and is located in Afar National Regional State at Semara city. Semara is located approximately 592 km from Addis Ababa and 270 km from Djibouti, which is the main import and export gate of Ethiopia. The port occupies a total area of 160 hectare while 2.5 hector land area is used for container terminal services. The port has the capacity to handle 1180 TEU containers at a time and its annual container handling capacity has reached up to 2378 TEU.
5) **Dire Dawa** - Dire Dawa dry port was established in 2013 and is located in Dire Dawa city administration. Dire Dawa city is located approximately 550 km from Addis Ababa. The port occupies a total area of 0.78 hectare used for container terminal services. The port has the capacity to accommodate 368 TEU containers at a time and its annual container handling capacity has reached up to 3852 TEU.
6) **Kombolcha** - Kombolcha dry port was established in 2013 and is located in Amhara National Regional State at Kombolcha town, which is approximately 380 km from Addis Ababa. The port occupies a total area of 15 hectare while 4-hectare land area used for container terminal services. The port has the capacity to handle 1888 TEU containers at a time and its annual handling capacity has reached up to 4891 TEU.
7) **Mekelle** - Mekelle dry port was established in 2013 and is located in Tigray National Regional State at Mekelle city, which is approximately 783 km from Addis Ababa. The port occupies a total area of 3 hectare used for container terminal services. The port has the capacity to handle

1440 TEU containers at a time and its annual container handling capacity has reached up to 7789 TEU.

8) **Woreta** - Woreta dry port was established in 2019 and is located in Amhara National Regional State at Woreta town, which is approximately 620 km from Addis Ababa. The port occupies a total area of 20 hectare while 3-hectare land area is used for container terminal services. The port has the capacity to handle 900 TEU containers at a time.

In the following figure the Ethiopia import/export corridors, dry ports and borders are shown:

Figure 4: Ethiopia import/export corridors



3.4 ETHIOPIAN SHIPPING & LOGISTIC SERVICES ENTERPRISE (ESLSE)

ESLSE is a fully state-owned enterprise--established by the Council of Ministers Regulation No 255/2011-- to provide end-to-end logistics services including costal and maritime transport services, freight forwarding, multimodal transport, warehousing and container terminal services. ESLSE was created through a merger of four defunct public enterprises, namely, Ethiopian Shipping Line (ESL) S.C, Ethiopian Maritime and Transit Services Enterprise (MMT), Ethiopian Dry Port Services Enterprise and Comet Transport S.C. The Enterprise is supervised by the PEHAA and has a board of directors comprised of eight senior officials from various ministries.

For many types of good that are shipped into Ethiopia, ESLSE participate with either organized logistics or has physically performed the transportation. The quota of ESLSE in handling Ethiopian import trade is a function of regulatory choice. Under the so-called FOB Directive, the government requires all importers to use the ESLSE Bill of Lading, ensuring nearly all imported cargo to be booked through ESLSE. However, a waiver could be provided under exceptional circumstances to allow shippers to book on outside the ESLSE Bill of Lading. Currently the FOB Directive requires the use of ESLSE Bill of Lading on containerized import and roll on-roll off cargo (RoRo) up to 3000 tons.

The majority of ESLSE cargo (about 60 percent) is loaded on slot carriers while the remaining 40 percent is on own vessel. With a service feature that is heavily reliant on slot carriers such as MAERSK and CMA-CGM, the organization of ESLSE's shipping services is a Vessel Operating Common Carrier (VOCC). Recently, ESLSE is also involved in the import of bulk cargo such as fertilizer, grain and sugar but not fuel. The purchase is mostly transacted on cost and freight (C&F) basis and shipping is arranged by the sellers.

With more than five decades (since the 1950s as ESL) of dedicated maritime and logistics transport services, ESLSE is the most important logistics service provider in Ethiopia with regard to capital, physical facilities and equipment in Ethiopia. ESLSE has organized itself in four different departments: shipping service Sector, freight forwarding sector, port and terminal sector and corporate service sector with their own responsibilities. There are about 18 sub -departments and 7 branches under the 4 departments. ESLSE currently has about 3,134 employees. The enterprise envisages being a reputable and preferred logistics company in Africa in 2020 by providing competitive shipping and logistics services in the export and import trade.

Services Provided by ESLSE are:

- **Shipping Service Sector**. Sea transport services deploying own eleven vessels, nine of which are dry cargo ships with a total carrying capacity of about 400,000 tons at a time (that is, an average of 300 containers by each vessel), and the other two are oil tankers, each capable of transporting 42,000 metric tons of oil. Nine of these vessels are newly built. ESLSE also provides stevedoring, shore handling, and agency services at the Port of Djibouti.
- **Freight Forwarding Sector:** Multimodal and uni-modal transport, customs and port clearing, and trucking service with a total of 265 fleets. The fleet size is planned to grow to 480 trucks soon. Apart from operating its trucks, ESLSE leases the necessary trucks for direct or consolidated cargo delivery from private and public transport operators.
- **Port and Terminal Sector**: Receiving and delivering cargoes, cargo loading and unloading, stuffing and unstuffing of container goods, temporary storage for import and export cargo, container cleaning and maintaining, and weight bridge services.
- **Corporate Service Sector**: The Corporate Services Department combines various supporting functions such as Finance, human resource management, Procurement, Marketing and ICT.

ESLSE IMPORT/EXPORT CARGO

According to ESLSE Bulletin 2019, following is the import activity carried out by ESLSE in years 2011 – 2019 (EFY 2004-2012):

Table 8: Total Import cargo and ESLSE share

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total import	**6,264,168**	**5,066,832**	**5,391,234**	**10,444,594**	**14,643,341**	**12,307,133**	**12,665,579**	**12,272,904**	**16,052,400**
Import by ESLSE	4,929,119	4,394,336	4,412,338	3,690,335	4,966,265	4,538,722	4,065,569	4,338,437	6,698,200
ESLSE Share %	79	87	82	35	34	37	32	35	42

Source ERCA and ESLSE

The cargo imported by the enterprise from 2011 to 2019 shows an average of 6.7 million tons per year while the share passes from 79% in 2011 to 42% in 2019.

Ethiopian's main import goods include petroleum products, vehicles, spare parts, construction equipment, medical pharmaceutical products, industrial equipment and machinery, both agricultural and industrial chemicals, agricultural machinery, hybrid seed, fertilizers, irrigation equipment, and durable and non-durability consumer goods.

Table 9: Cargo type of ESLSE Imported Tonnes

Cargo Type	2011	2012	2013	2014	2015	2016	2017	2018	2019
Break bulk	449,206	347,129	295,259	576,675	441,792	485,272	273,045	328,664	373,287
Steel in tons	626,303	490,942	553,971	374,509	814,141	317,635	246,000	649,758	694,641
Vehicles	75,409	102,412	96,021	91,047	82,443	84,568	58,252	22,337	25,654
Container	2,113,849	2,078,615	1,821,801	2,297,856	2,855,300	2,899,445	2,347,290	2,564,904	2,436,393
Bulk Cargo	1,664,352	1,375,238	1,645,287	350,247	772,589	751,802	1,140,892	772,774	3,159,206
TOTAL	**4,929,119**	**4,394,336**	**4,412,339**	**3,690,334**	**4,966,265**	**4,538,722**	**4,065,479**	**4,338,437**	**6,689,181**

Table 10: Cargoes type of ESLSE share

Cargo Type	Average 2011 - 2019
Break bulk	8,5%
Steel in tons	10,8%
Vehicles	1,5%
Container	**51,0%**
Bulk Cargo	27,7%

About 51% percent of the total imported cargoes handled by ESLSE during the last eight years is containerized cargo, 28 % Bulk Cargo, 8.5% Break Bulk, and 10,8 % steel while vehicles account only 1,5 % which shows that containerized cargo had a bigger share of the imported cargoes followed by break bulk, steel and vehicles,

Regarding export trade, the volume of ESLSE export has decreased from 49,200 tons and a share of 4% with respect the total volumes exported in the year 2011 (1.2 Mil. of tons), to 33,860 tons and a share of 2% in the year 2019 (1.7 Mil. of tons).

Table 11: Exported Cargo at country level & ESLSE share (Tons)

Years	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total export	**1,205,502**	**2,285,934**	**1,227,796**	**1,498,206**	**1,608,902**	**1,673,827**	**1,796,967**	**1,658,400**	**1,693,100**
Exported by ESLSE	49,200	108,200	135,100	1,070,600	73,400	23,600	1097,00	15,200	33,860
ESLSE Share %	0.04	0.05	0.11	0.71	0.05	0.014	0.06	0.01	0.02

Source ERCA and ESLSE

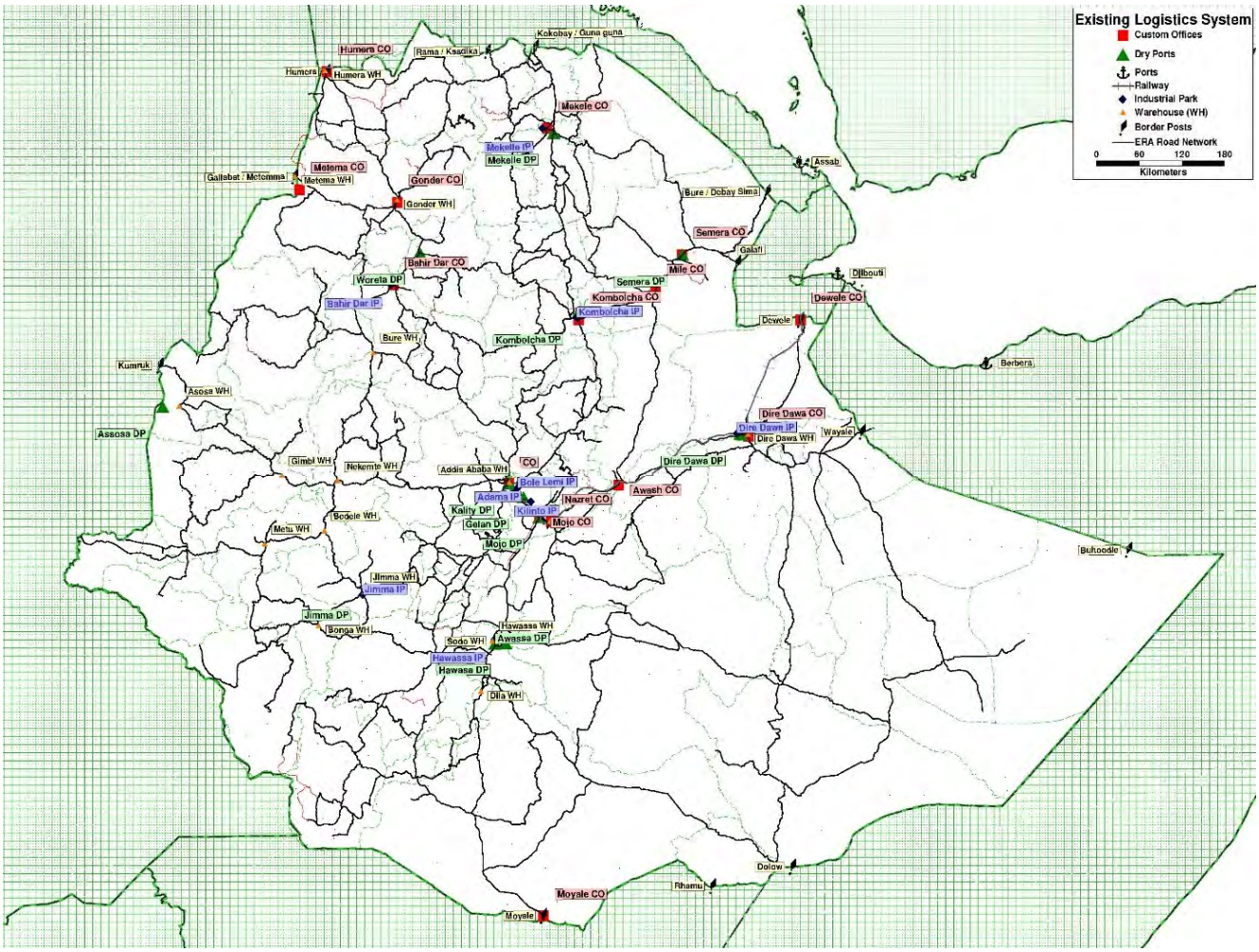
The main exported products consist of: Coffee, Flowers, Food, Textiles Material, Leather products and Live animals, Seed and Cement.

With respect to dry-port services, ESLSE manages 8 dry-ports located in different parts of the country, which are Modjo, Gelan, Mekelle, Kombolcha, Semera, Diredawa, Kality and Woreta dry Ports, with the following area and capacity.

Table 12: Dry Port Terminal Area and Carrying Capacity

Dry port	Year 2019	
	Area in hectares	Terminal Capacity (TEU)
Modjo	31.5	20,227
Gelan	4.5	1,697
Mekelle	3.5	1,440
Kombolcha	4	1,888
Semera	2.5	1,180
Diredawa	0.78	368
Kality/Comet	1.97	1,241
Woreta	3	900

Figure 5: Border posts, Custom offices & Dry ports



4 PLANNED DEVELOPMENT

4.1 NATIONAL LOGISTIC STRATEGY

A few years ago, the Ethiopian government has approved the **National Logistics Strategy** (2018 – 2028) to modernize the sector and stimulate economic activities and soon after the National Logistics Policy document, to indicate the way to implement the set strategies.

The National Logistics Strategy has been prepared by the MoT and EMAA, with the purpose of:

- Enable National Development, avoiding logistic bottlenecks and hindrances;
- Reduce logistic costs, due to inefficiency and waste of time;
- Provide systemic logistic solutions, coordinating the different players (regulatory, operators, importers/exporters, customs clearing agents, freight forwarders, non-government organizations, and other logistics service providers);
- Provide Direction and Leadership, with effective coordination of different stakeholders and systems.

The Logistic Policy document clearly sets policy issues and direction in order to modernize the Ethiopia logistics sector so that the sector provides efficient service and contribute to the growth of the national economy.

The bases for drafting the logistic policy have been:

- **The general national transport strategy**, prepared by the Ministry of Transport. Beyond the provision of transport services, logistics service system embraces warehousing, freight forwarding, dry port services, customs service, finance system, trade system, etc.
- **The National Economic Reform,** transforming the country's economy, opening various economic sectors to competition and involvement of the private sector and other economic operator.
- **The Industrial Development Policy**, with the aim to deliver the required number of industrial inputs and products on the right time and proper and efficient handling of products in warehousing.
- **The Agriculture and Rural Development Policy,** taking into account the supply of agriculture inputs, warehousing, forwarding, port services and the agriculture- market and agriculture-industry linkage.
- **The Pastoralist and Semi-Pastoralist Development Policy**, to facilitate product supplies, fosters economic gain and ensure that these areas equally benefit from the overall economic growth of the country.
- **The National Information Technology Policy**, recently approved by the government, in order to modernize and organize the logistics sector with information technology and strong organizational setup, human resource, information exchange and technology.
- **The Logistics Service Operators enhancement**, like the Ethiopian Shipping and Logistics Service Enterprise- ESLSE – and possible new private operators.
- **Private Investor's attraction**, in order to make the logistics sector effective and competitive, through competent work force and technology.

The **Five-Years Plan** foresees to study new OSBPs implementations and increase the number of dry ports from 9 to 13, and:

- Carry out dry port construction on Jimma, Hawassa and Assosa;
- Complete the remaining 62% of the construction work to transform the Modjo dry port into a Logistics hub;
- Carry out an IT center development to improve the logistics system;
- Build a Cold Store in 2 locations;
- Increasing multimodal transport performance from 45% to 90%

- Reducing the shipment time to 43 days (from 123), from requesting a bank license for shipment to the country;
- Reduce the time it takes to ship within 23 days (from 46) from the date of shipment of import cargo
- Reduce Port Dwell time by 17 days (from 37)
- Reduce freight cargo ships by 15 days (from 35) at port

The objectives of the Strategy are:

- Implement the National Logistics Strategy measures;
- Implement a Seaport Corridor Strategy;
- Increase One-Stop Border Posts from 2 to 6;
- Increase number of Dry ports from 12 to 20
- Upgrading from 3 to 7 Cold Stores
- Number of Freight Terminals from 1 to 23;
- Building 925 km of refined oil pipeline from Djibouti to Addis
- Increase logistic efficiency by increasing service control stations;
- Facilitate the movement of trucks with 100% fleet management system.

4.2 TEN YEARS PERSPECTIVE DEVELOPMENT PLAN

The first five-year plan focusses on modernization of lake Tana, Baro, Hidasse and Hawassa inland water. Successful planning for the establishment of an internationally recognized training center has enhanced the level of the Ethiopian Maritime Academy and has also provided training to foreign shipping companies in addition to domestic demand.

In this context, the *Transport sector's 10 Years Perspective Development Plan (2013-2022)* introduce the opening of a transport systems in 8 major lakes and rivers. A river-based transport system will commence in Lake Tana, GERD Dam, Abaya, Chamo, Ashenge and riverslike Baro and Tekeze.

MARITIME SECTOR

The **10 Years Perspective Plan (2020-2030)** includes the following projects in the Maritime Sector:

- **On-going Projects:**
  - The project of developing the Mojo dry port to logistics centre (Ethiopian commercial logistics project) in Mojo Town;
- **New Projects to start:**
  - Cool Chain facility development project in Ethio-Djibouty corridor;
- **Projects on research and designing stage:**
  - One Stop Boarder Post facility project in Ethio-Djibouti border, Ethio-Sudan border, Ethio-Somaliland and Ethio-Eritrea border;
  - Sea port development project in Berbera and Djibouti;
  - Cross – docking centre construction project at loading and unloading sites of the country;
  - Capacity building projects of logistics sector in Addis Ababa;
  - Building liquid load logistics facilities in Ethio-Djibouti corridor.

Figure 6: Ten-Years Plan (2020-2030): *Maritime Project Map*

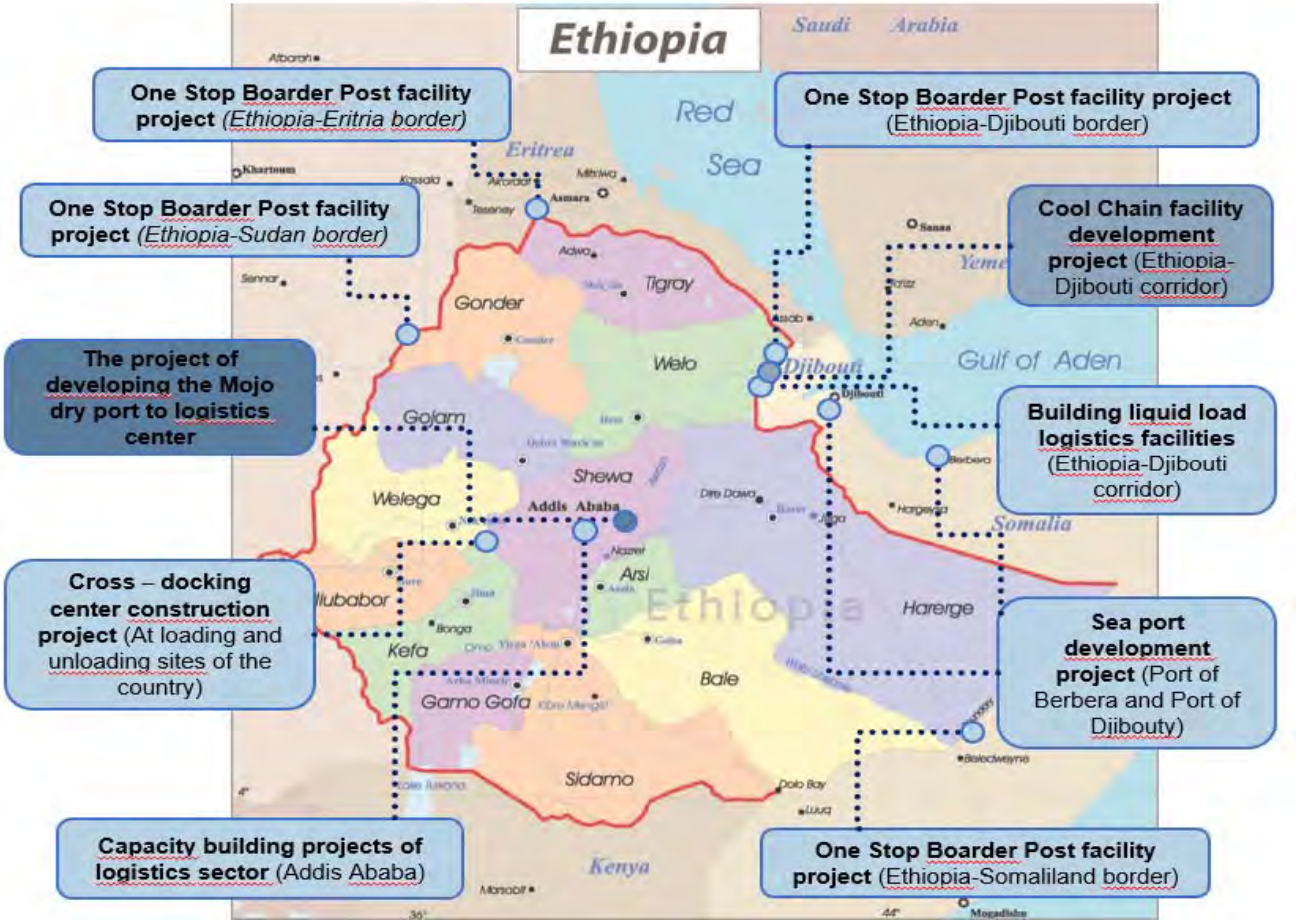


Table 13: Ten-Years Plan (2020-2030): *List of Maritime Project*

N.		Project owner	Project site	Year it started	Year it ends	Budget (million birr)
ON-GOING PROJECTS						
1	The project of developing the Mojo dry port to logistics centre (Ethiopian commercial logistics project)	Maritime Authority	Mojo town	August 2017	2022	150.000.000
					Subtotal budget	**150.000.000**
NEW PROJECTS TO START						
1	Cool Chain facility development project	Maritime Authority	Ethio-Djibouti corridor	2019	2025	44.115.684,66
					Subtotal budget	**44.115.684,66**
PROJECTS ON RESEARCH AND DESIGNING STAGE						
1	One stop boarder post facility project	Maritime Authority	Ethio-Djibouti border Ethio-Sudan border Ethio-Somaliland border Ethio-Eritrea border	2020	2025	92.441.764,66
2	Sea port development project	Maritime Authority	Berbera, Djibouti	2020	2023	489.862.964,66
3	Cross- docking centre construction project	Maritime Authority	At loading and unloading sites of the country	2020	2022	37.972.799,14
4	Capacity building projects of logistics sector	Maritime Authority	Addis Ababa	2020	2027	77.113.692,08
5	Building liquid load logistics facilities	Ethiopian fuel supply agency	Ethio-Djibouti corridors	2020	2023	55.041.764,66
					Subtotal budget	**752.432.985,20**

4.3 TECHNICAL ASSISTANCE TO TRANSPORT & LOGISTIC SECTORS

In the framework of the Ethiopia's Regional Connectivity and Competitiveness Sector Reform Performance Contract, EuropAid has launched a technical assistance project for Ethiopia with the following objectives:to **support the policy dialogue in transport and logistics and the achievement of objectives and targets** through:

- ***Transfer of knowledge on logistics and transport best practices:*** provide technical assistance to the responsible government body/ies to implement the logistics strategy, to improve the existing logistics system to international standards and modernize the transport services to better facilitate logistics (including for instance mode share to rail, intermodality, axle overloading control, vehicle standards, road safety, time, etc.).
- ***Technical Support on defining and implementing the logistics reforms:*** provide data evidence, best practices examples and contributing to bringing the reform of the logistics sector higher in the political agenda, ensuring the participation of CSOs in the policy making process and accelerate its pace
- ***Support on defining and monitoring relevant corridors' performance indicators and standards:*** to improve the monitoring and data collection (including environmental/climate performances and road safety), contribute to improving environmental and safety standards.

4.4 LAUNCHING THE NATIONAL LOGISTICS MASTER PLAN

Presently EMAA is launching the National Logistic Master Plan. The **General Objectives** of the Masterplan is to analyse the logistics sector in detail, depict the future logistics functions of Ethiopia through mapping and, from this analysis, draw up a set of policies, regulations and actions that will provide solutions to logistical constrains and allow the logistics sector to meet the requirements of NLS goals as well as the nation's Homegrown Economic Reform Agenda.

The **Specific Objectives** are:

- To establish Supply (sourcing) and Production Network based logistics service including the preparation of a production and logistics supply master plan;
- To establish modern import trade distribution network including the development of master plan for modern import trade system;
- To develop logistics centres (assembly, parking, maintenance, depot, warehouse) and facilities, including a masterplan for the country's logistics freight centres;
- To develop transport infrastructure plan including designing a master plan for transport infrastructure development and management;
- To develop transport infrastructure including developing and implementing a master plan for liquid bulk cargo logistics; and
- To set-up effective and efficient trade facilitation and financial system related to logistics system.

The Study will be undertaken in two Phases and each phase will be contracted out separately. It will be the case that each Phase of the Study will be undertaken by two different Contractors or Consultancy Teams.

Phase I of the Study involves undertaking a Diagnostic and Situational Analysis of the Ethiopian Logistics Sector and will involve the following:

- A review of existing national and regional studies, policies, rules, regulations, strategies, proclamations, procedures, masterplans (such as existing road, rail and air transport masterplans and strategies) and performance reviews, and other relevant documents, and use them, where

appropriate, as background and reference material for the Masterplan.

- A mapping of existing monthly freight movements, by volume, over the last 10 years, and an estimate of the volumes, by month, of freight volumes, for the following:
- Domestic agricultural products, geographical production and consumption zones
- Domestic Industrial Products production and consumption zones
- Source of Export Products with crop seasonality and export destinations for agricultural export products; mineral products; and industrial Products.
- Mapping import products and origins, distribution channels with all the required detail identification of population definition, population size determination for each geographic location, sample size determination, sampling technique determination, etc (see Nathan Diagnostics study of NLS).
- Assessing the existing Business Processes, work flows of the various direct logistics service providers and other stake holders.
- Assessing importers and exporters, stakeholders and collaborators' needs and challenges.
- Assessing the existing ICT systems and infrastructures in the logistics sector.
- Surveying or visiting, as necessary, all infrastructure and prospective logistics provision locations.
- A thorough depiction of Trade and Logistics Operational chain particularly sea port and dry port operations taking into consideration that Ethiopia is a land-locked country.
- Review other relevant data available related to logistics inside and outside Ethiopia, including service providers and other stake holders.
- Focus on gap and comparative analysis and benchmarking with other successful and world class trade logistics systems.
- Consider national and international standards, rules and regulation.
- Conduct interviews and Focus Group Discussions (FGDs), and consultations from appropriate EMAA's and LTO's national and international experts and the management.

Phase II of the Study will involve the preparation and presentation of the Ethiopian National Logistics Masterplan.

5 ANALYSIS OF IMPORT TRADE

5.1 IMPORT/EXPORT STATISTICS

5.1.1 The ECA Database

Following is the analysis of the Import statistics in the years 2012 – 2020 received from ECA – Ethiopian Custom Authority. No statistics have been received for the export trade. The database received is composed by over one million records and contains 20 fields, regarding the period of reference (Year, Month, Day), type of product (CPC, HS e HS Code), Country of Origin, Country of Consignment, Destination, Gross Wt (kg) and Net Wt, Supply Quantity, transport document (uni- or multi-modal), CIF/FoB value, invoice and total tax paid. There is no indication of ports or boarding crosses.

Figure 7: Import Data Base Fields

Year	Month	DATE	IMPEX	CPC	HS Code	HS Description	Country (Origin)	Country (Consignment)	Destination	Gross Wt. (Kg)	Net Wt. (Kg)	Suppl. Quantity	Unit	MoT Code	MoT Description	CIF/FOB Value (ETB)	INVOICE VALUE	INVOICE CURR CODE	Total tax (ETB)

The database has been processed and analysed mostly regarding: Year, Gross Wt., Value CIF /FOB, MoT Code. The results obtained can differ slightly from other available data due to the type of selection made for the analysis.

5.1.2 Database Analysis

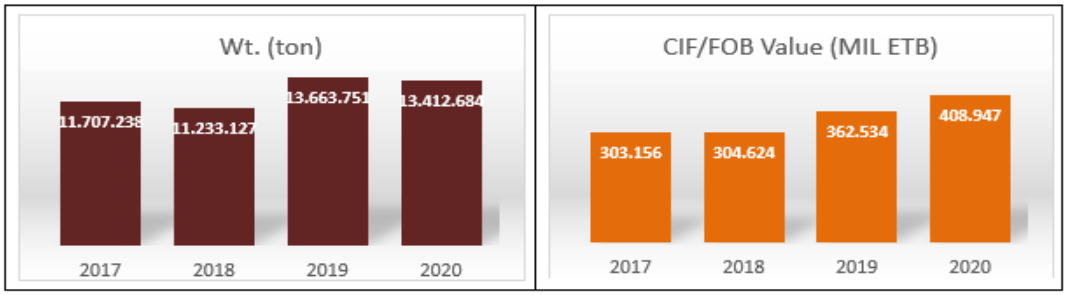
Following are the synthesis tables by year, gross weight, value, country of origin, type of transport document, for the last 4 years (2017, 2018, 2019 and 2020.

Table 14: Total Import (Ton/ETB) 2017 - 2020

Year	Gross Wt. (ton)	CIF/FOB Value (MIL ETB)
2017	11,707,238	303,156
2018	11,233,127	304,624
2019	13,663,751	362,534
2020	13,412,684	408,947

Import volumes have slightly increased in the last years, with tonnage decrease in year 2020, due to starting of covid pandemic.

Figure 8: Total Import 2017-2020

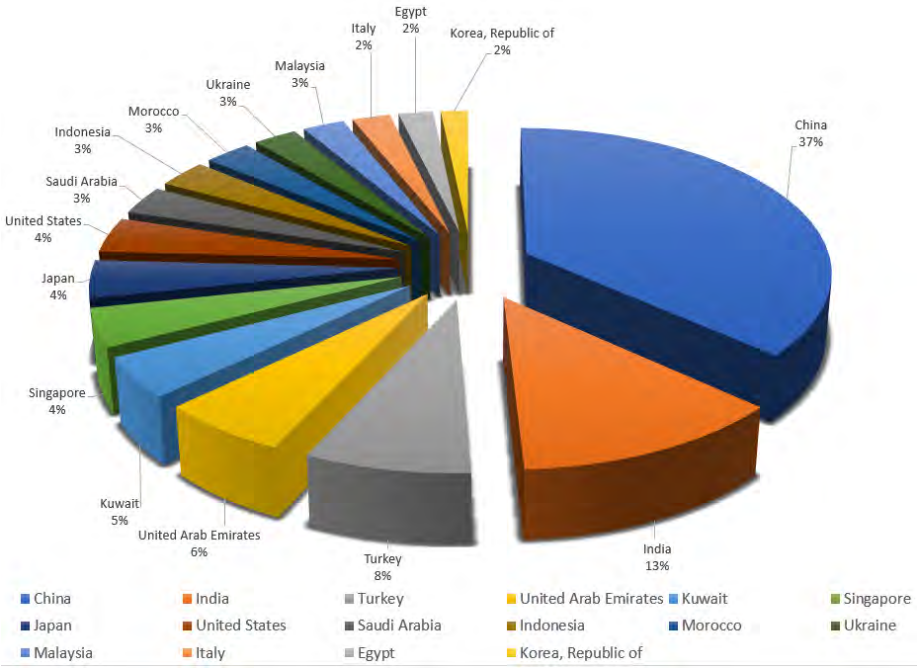


China, India, Turkey, UAE and Kuwait are the major exporter to Ethiopia. India has recently overcome China as the leading exporter.

Table 15: Total Import by Country (Tons) 2017 - 2020

ORIGIN	2017 Gross Wt. ton	2018 Gross Wt. ton	2019 Gross Wt. ton	2020 Gross Wt. ton
China	2,053,882	1,738,737	2,448,280	1,608,889
India	920,818	1,268,021	1,302,751	2,166,306
Turkey	456,626	550,294	872,483	1,200,213
UAE	214,669	536,396	500,904	929,617
Kuwait	1,701,033	1,203,831	1,727,904	756,582
Singapore	4,432	3,380	13,613	867,168
Japan	201,121	69,037	84,459	68,127
United States	573,692	447,662	495,101	631,273
Saudi Arabia	854,371	295,144	713,503	474,041
Indonesia	257,148	311,773	265,032	316,043
Morocco	776,946	600,741	724,217	883,806
Ukraine	277,783	301,135	1,201,100	486,642
Malaysia	342,927	415,747	232,802	347,258
Italy	278,495	107,759	69,416	68,090
Egypt	103,684	326,794	218,796	413,762
Korea	63,366	92,322	65,399	88,983
Germany	46,654	267,933	74,373	34,010
South Africa	961,993	934,364	865,065	629,000
Thailand	124,837	151,715	56,311	48,702
Argentina	5,523	11,274	10,101	402,187
France	36,456	77,795	61,573	38,662
Spain	34,510	20,297	27,616	25,447
Netherlands	37,395	39,800	34,650	33,733
Belgium	33,379	61,864	53,843	43,736
Taiwan (China)	46,565	33,253	72,953	61,518
Djibouti	57	595	61,748	70,932
Russian Fed.	131,435	393,441	291,071	102,404
United Kingdom	15,678	9,454	8,387	6,516
Canada	1,000	931	4,327	17,320
Pakistan	44,098	130,186	41,852	144,863
Kenya	3,031	4,218	20,371	18,717
Brazil	133,281	45,633	8,716	62,580
Romania	352,281	354,544	199,636	55,182
Poland	9,281	15,040	10,251	8,080
Austria	60,506	27,874	57,920	29,882
Ireland	1,687	1,259	1,731	1,023
Sudan	46	64,022	103,730	64,285
Viet Nam	20,258	25,063	19,591	19,281
Sweden	8,222	4,878	7,762	7,030
Bahrain	133,806	58,037	101,701	32,824
Rest of the Word	**382,251**	**228,866**	**530,691**	**145,950**
Total Import	**11,707,238**	**11,233,127**	**13,663,751**	**13,412,684**

Figure 9: Total Import 2020 (top 15 countries)



China remains the leading exporter to Ethiopia in terms of value of trade

Table 16: Total Import by MoT Code (Ton/ETB) 2017 - 2020

Year	MULTIMODAL TRANSPORT Mil. ETB	UNIMODAL TRANSPORT Mil. ETB	CIF/FOB Value (Mil. ETB)	MULTIMODAL TRANSPORT Mil. ETB	UNIMODAL TRANSPORT Mil. ETB
2017	117,156	186,001	303,156	39%	61%
2018	114,091	190,534	304,624	37%	63%
2019	140,928	221,606	362,534	39%	61%
2020	156,651	252,303	408,953	38%	62%

The relative quotas of Multimodal – Unimodal system has remained unchanged in the last years.

5.2 PRESENT USE OF ACCESS PORTS

According with the information and recent literature the use of access ports of Ethiopian imports is distributed: 95% Djibouti port, 2% Port Sudan, 2% Berbera, 1% Kenyan and Somali ports, while for export 83% Djibouti port, 7 % Port Sudan, 7% Berbera and 3% distributed to other ports.

6 DIVERSIFYING PORT CORRIDORS

6.1 THE COST OF BEING LANDLOCKED

Landlocked countries need to cross through transit states to increase their participation in global trade. Several challenges arise from their lack of direct access to the sea. They have higher trading costs as a consequence of higher land transport costs for imports and exports, owing both to the distance to sea ports and the passage across transit countries' borders. However, effective assessment of actual and potential transit corridors may promote the efficiency of transit businesses and improve regional and interregional connectivity. In addition, efficient ports promote trade growth by empowering greater quantities of imports and exports recommended that efficient combinations of intermodal transport systems should also be considered in assessing optimal transit corridors for landlocked states. The quality of the transport infrastructure and organisational restructuring may determine the performance of cross-border corridors. The challenges faced by landlocked countries include socio-economic, political and infrastructural aspects.

6.2 IGAD REGIONAL INFRASTRUCTURAL MASTER PLAN

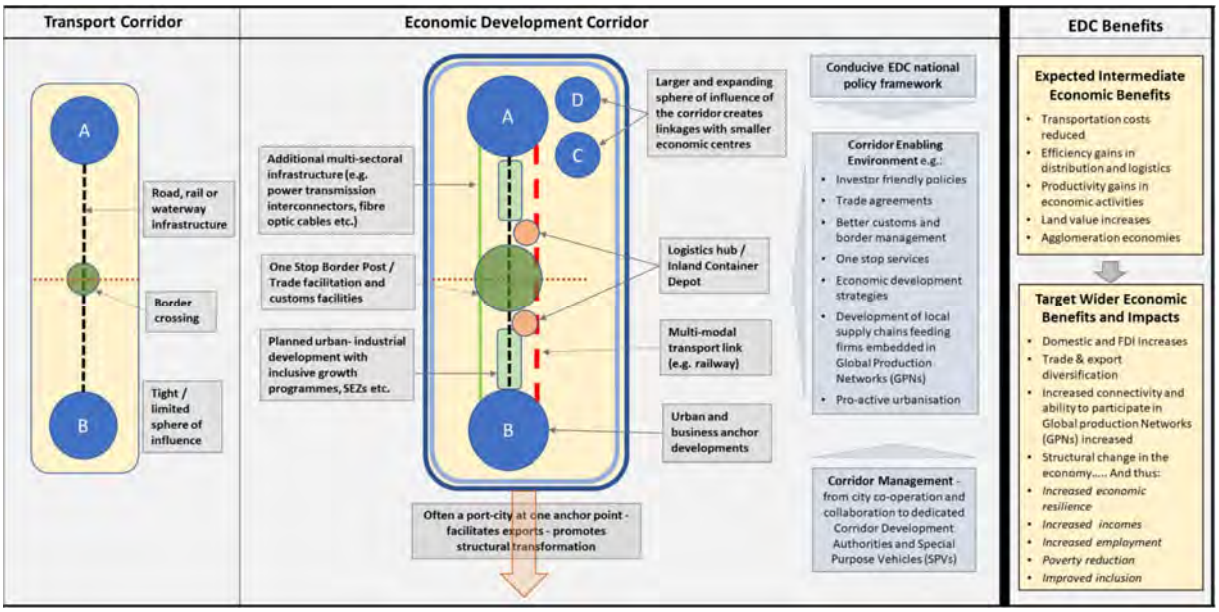
Recently (May 2020), IGAD produced an ambitious Regional Infrastructure Master Plan (IRIMP). This plan is aligned with AU Agenda 2063 and aims to accelerate the region's growth and structural transformation. The Plan consists of policy initiatives and infrastructure investments which will significantly strengthen the process of regional economic cooperation and integration.

The IRIMP plan covers infrastructure in Transport, ICT, Energy and Transboundary Water Resources. The IGAD region is unfortunately characterized by the low stock of infrastructure, particularly in transport and energy, and the inadequate development of the ICT sector and digital economy. Studies have shown that inadequate infrastructure shaves off at least 2% of Africa's annual economic growth. Adequate infrastructure would lead to productivity gains by African firms of up to 40%.

The objectives of the plan are 4, i.e., to: a) Develop a strategic framework for infrastructure development in the Transport; Energy; ICT and Water sectors. B) Facilitate intra-regional and inter-continental trade, and the flow of goods, services, and the movement of people across borders of the region. c) Support regional economic growth that is inclusive, resilient, and sustainable; and d) Reduce isolation and promote regional integration and stability.

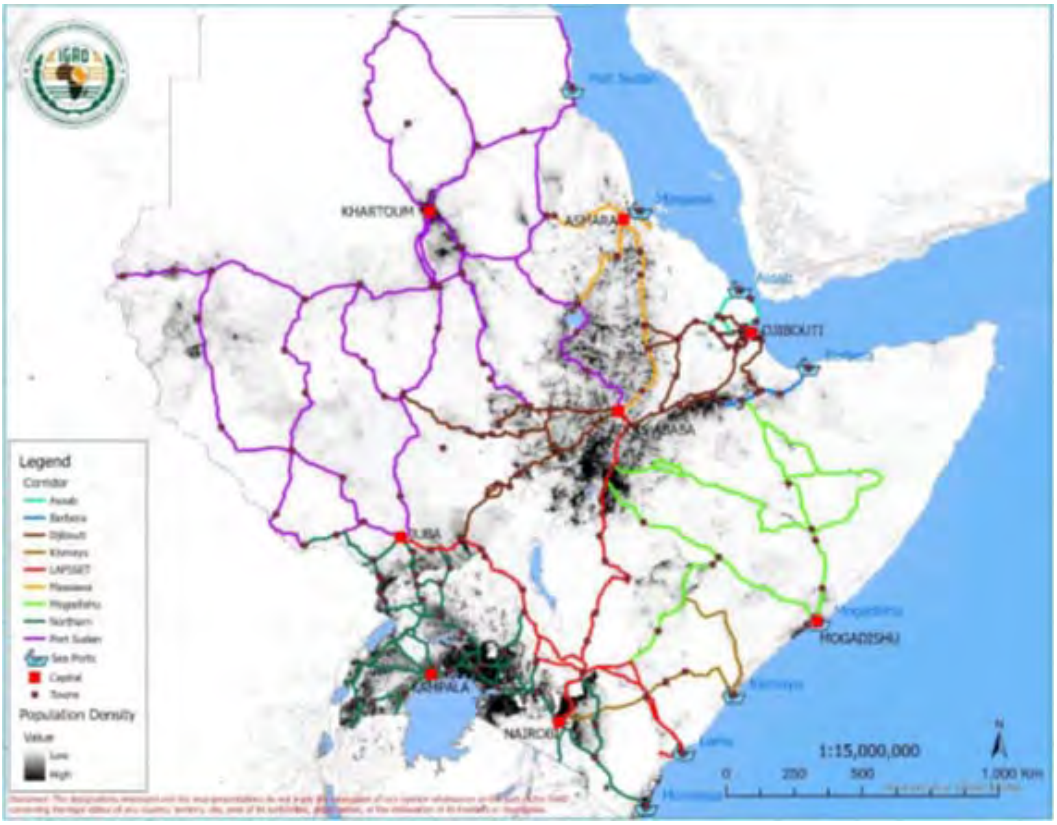
The primary principle guiding the regional plan is to transition the present transport corridors into economic development corridors (EDCs) that maximize job creation, are resilient to climate change, are people-driven and strengthen the role of women through gender-sensitive infrastructure development. Corridors develop is conceived through four stages: 1) basic transport corridor; 2) multi-modal/multi-sectoral corridor; 3) logistics corridor; 4) EDC, as illustrated in following figure.

The EDC framework is widely used by international development organizations and national governments to direct resources to promote economic growth. An EDC most commonly contains a transportation corridor (generally a road, railway or waterway) but is much more than a linear area connecting two countries, regions or cities through which goods and people pass. An EDC is an instrument of development that is used to ensure that the transportation hard infrastructure generates important economic and social development impacts. Transforming a transport corridor into an EDC, however, is often not a straight-forward task. It demands political commitment and stakeholder involvement from all levels of government and can often require the establishment of a special purpose vehicle (SPV) to co-ordinate, direct and manage the infrastructure and policy-type initiatives required for the success of an EDC.



There are nine potential EDCs in the IGAD region (see following figure). At present, however, just three are functioning effectively as regional transport corridors, and these have not yet become clear drivers of economic development and structural transformation. The Northern Corridor is the most developed (Corridor Authority and Observatory is in place) and is a functioning logistics corridor, while the Djibouti Corridor and Port Sudan Corridor are multi-modal/multi-sectoral corridors.

Figure 10: Igad Economic Corridors



It is recommended that the IGAD region follows a Phased Corridor Development pathway, with emphasis on the following:

1. Transform the Northern, Djibouti and Port Sudan Corridors into EDCs by 2030 that are important drivers of growth, regional integration, and prosperity in the IGAD region.
2. Develop the LAPSSET, Berbera and Massawa Corridors into functional logistics corridors by 2030 that have the potential to integrate the region and serve as conduits for intra-regional and international trade;
3. Complete missing links on the Mogadishu, Kismayo and Assab Corridors to ensure functional transport corridors by 2030.

Following the present and potential corridors for Ethiopia international trade, are analysed in details:

6.3 PRESENT & POTENTIAL CORRIDORS

Present Corridors are represented by Djibouti, Port Sudan and Berbera corridors, while potential new corridors are: Massawa, Assab, Mogadishu, Lamu and Mombasa.

6.3.1 Djibouti corridor

The dominance of the Djibouti port is due to several factors, including: the advantageous geographical proximity of the Djibouti port, the poor quality of the port infrastructure available in other neighbouring countries, the poor quality of the road infrastructure to alternative ports and the instability of (or the political relationship with) other Horn of Africa countries.

Land infrastructures

The Djibouti corridor consists of two major road connections: the Djibouti-Galafi-Mojo and Djibouti – Dewele – DireDawa – Addis roads and a possible third alternative via Balho, as shown in the following figure.

Option 1/via Galafi | **Option 2/via Dewele** | **Option 3/via Balho**

Mid 2018, a 756-km electrified railway connecting Ethiopia to Djibouti (from Addis Ababa to Negad) officially started commercial operations. The new railway, that is supposed to greatly improve transportation logistics from Djibouti to Addis Ababa (and vice versa), by shifting about 50 percent of the current import-export freight being transported on the Djibouti corridor, is expected to cut transport time for cargoes to 12 hours, from two days on trucks.

Figure 11: Ethiopia - Djibouti Railway

The Government of Djibouti considers as a priority: a) the upgrade of the Djibouti-Addis Ababa corridor and b) the establishment of a One Stop Border Post (OSBP) in Galafi (and possibly, in other border posts with Ethiopia). Currently, Djibouti has operationalized an Electronic Cargo Tracking System for monitoring trucks in transit along the Djibouti-Addis Ababa corridor, although not mandatory. The system however is little used by transport operators as it is deemed by them too costly.

The Port

Djibouti port can count on different structures:

- **Port Autonome International de Djibouti**, which is the oldest surviving port facility in Djibouti. It handles containers, bulk cargo, and cargo which can be offloaded by gear carried on ships gear rather than by cranes or gantries on the pier. The Port Autonome International de Djibouti is due to be closed, and all of its operations moved to the Doraleh Multipurpose Port.
- The **Doraleh Container Terminal** (DCT) is a joint venture between DP World and the Djiboutian Government, based on an agreement signed in 2006. The DCT was inaugurated in 2009. DP World has a 30- year concession to manage the port. DCT has capacity designed to handle 1.6 million twenty-foot-equivalent units (TEU), or standardized shipping containers. It has 1,050 meters of quay length, eight Super Post Panamax quay cranes (with twin lift capacity), and 18 meters of draft at the quay.
- The **Doraleh Multipurpose Port** (DMP) opened in May 2017. The multipurpose port has been built for the Djiboutian Government by a Chinese construction firm at a cost of about $590 million for Phase 1 and Phase 2 of the project, with Phase 2 still to be completed. When completed, the facility will have the capacity to handle 8.8 million tons of goods per year. The port will have 15 berths that are 1,200 m long with a depth of 16-18 m at quayside, so that they will be able to accommodate "Cape Size" (100,000 dead weight ton) vessels. The port includes a container storage yard.
- The **Horizon Djibouti Terminals** Ltd is an oil terminal. Horizon Djibouti Terminals Ltd is part of Horizon Terminals Limited (HTL), which is wholly owned by Emirates National Oil Company of the United Arab Emirates. The terminal handles petroleum products, liquified petroleum gas, chemicals, and edible oils. It has 31 tanks with a total capacity of 399,300 m³. It has two berths, one able to accommodate ships of 80,000 dead weight tons (DWT), 18 m draft, and 244 m in length, and the other able to accommodate ships of 30,000 DWT, 10 m draft and 180 m in length. The facility has 12 truck loading bays (top and bottom loading) for petroleum products and one truck loading bay (top loading) for chemicals and edible oil.

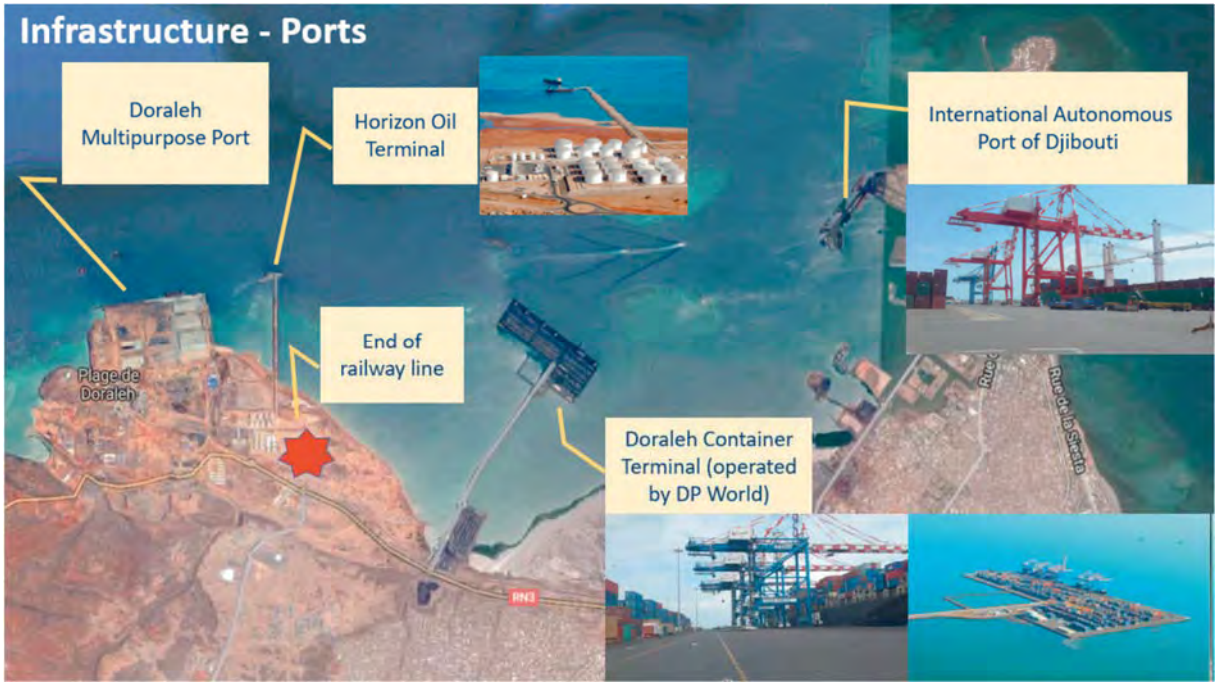
  Djibouti Ports and Free Zones Authority (DPFZA) have recently announced that they will be

expanding their ports with the development of the new Djibouti International Container Terminal (to boost the capacity of DCT by 2.5 million TEU in the first phase) to be located between DCT and DMP where the water depth is 18.5m; ship repair and drydocks; and the development of Djibouti Damerjog Industries Development (DDID) that is planned to be a multipurpose port, livestock terminal, a refinery, storage tanks, dry dock, gas complex and its jetty, and jetty for refined and crude oil.

The port of Djibouti offers the most reliable and advanced line docks and modular floating systems with maximum lift capacity (one 1750 Tons Floating Dock). Furthermore, it disposes a slipway of 500 tones capacity for flat bottom vessel and 400 T for V-shape vessel.

Figure 12: Djibouti Port

Figure 13: Map showing ports and ports under construction in Djibouti



Within the Port of Djibouti there are three main areas where Ethiopian trade is handled: 1) the Doraleh Container Terminal, which handles most of the containerized traffic; 2) the general cargo area, which handles predominantly break-bulk, but also some containerized traffic; and 3) the bulk terminal, which handles bulk imports mostly of fertilizer, grains, and coal, as well as livestock exports. A petroleum terminal (Horizon Terminal - HDTL) offers deep-water draft dedicated jetties, as well as large tank capacities. HDTL has a global storage capacity of 371,000 cubic meters with two berths of 30,000 and 80,000 DWT (Dead Weight Tonnages); 12 truck loading bays, 1 Ethiopia Petroleum Supply Enterprise (EPSE) bulk truck loading. The Ethiopia Petroleum Supply Enterprise (EPSE), the sole government body tasked in Ethiopia with the import of fuel, receives the petroleum products (benzene, diesel kerosene and jet fuel) from oil tanker vessel, and stores them in the oil terminal until they are loaded on fuel tanker trucks and transported to the mainland Ethiopia. EPSE currently pays 2 million dollars to the Horizon Terminal for the storage facility. However, as the Ethiopian economy is growing fast (and the amount of fuel import is increasing proportionally), the Horizon Terminal is not yet able to accommodate Ethiopia's upward fuel demand, which grows at a yearly rate of 10 percent and reached 3.8 million tons in 2017. However, the governments of Ethiopia and Djibouti recently agreed on the joint development and expansion of the fuel terminal, as well as on the upgrade of the Ethio-Djibouti corridor[1].

About 90 percent of inbound containers imported via the Djibouti port are currently processed at the Modjo Dry Port, a key transportation hub nearly 75 km East of Addis Ababa, which started operations in the first half of 2009 and that handles about 95% of Ethiopia's total trade. There are six additional dry ports operating in Ethiopia to handle shipment from ports. These are Semera, Gelan, Dire Dawa, Kombolcha, Mekele, and Kaliti. All these ports are connected to Djibouti and have been built with the purpose of receiving and delivering cargoes, by offering additional services like: loading/unloading, stuffing/unstuffing of containers, temporary storage for import and export cargoes, container cleaning and maintaining, weighbridge, customs control and clearance, banking and insurance, container depot service. However, most of users complain about the efficiency and effectiveness of the Ethiopian dry ports. Some of the complaints include poor trade logistics, reduced free time for imported cargo, and unavailability of empty containers and enough storage facilities. In addition, customs clearance delay affects the performance of dry ports in Ethiopia, and contributes to exacerbating the congestion in the Djibouti port[2].

Concerning Modjo, this facility reaches its terminal capacity very quickly and stays crowded thereafter. Other operational constraints at the Modjo Dry Port include: (a) insufficient cargo handling equipment; (b) lack of facilities for stuffing of export containers and unstuffing of import containers; (c) lack of proper systems for the management of the facility, leading to delays in locating containers and increased handling cost (the port is operating without a proper Terminal Operating System and gate system); (d) increased congestion around the facility due to poor traffic flow patterns and lack of parking spaces for trucks; (e) poor dry port security as evidenced by the absence of closed-circuit television (CCTV); and (f) lack of facilities and readiness to handle inbound and outbound railway traffic. Underinvestment in facilities and equipment, poor operational procedures and control, and lack of a yard management system are responsible for the excess time for truck turnarounds and for 35–40 percent of the container dwell time[3]. For bulk imports, the key weakness is the lack of storage and handling facilities in Ethiopia.

Regional Corridor

The Djibouti Corridor links the ports in Djibouti to the hinterland of Ethiopia and has the potential to

1 "Ethiopia, Djibouti agree to expand fuel port, upgrade road", The Reporter, 11 November 2017

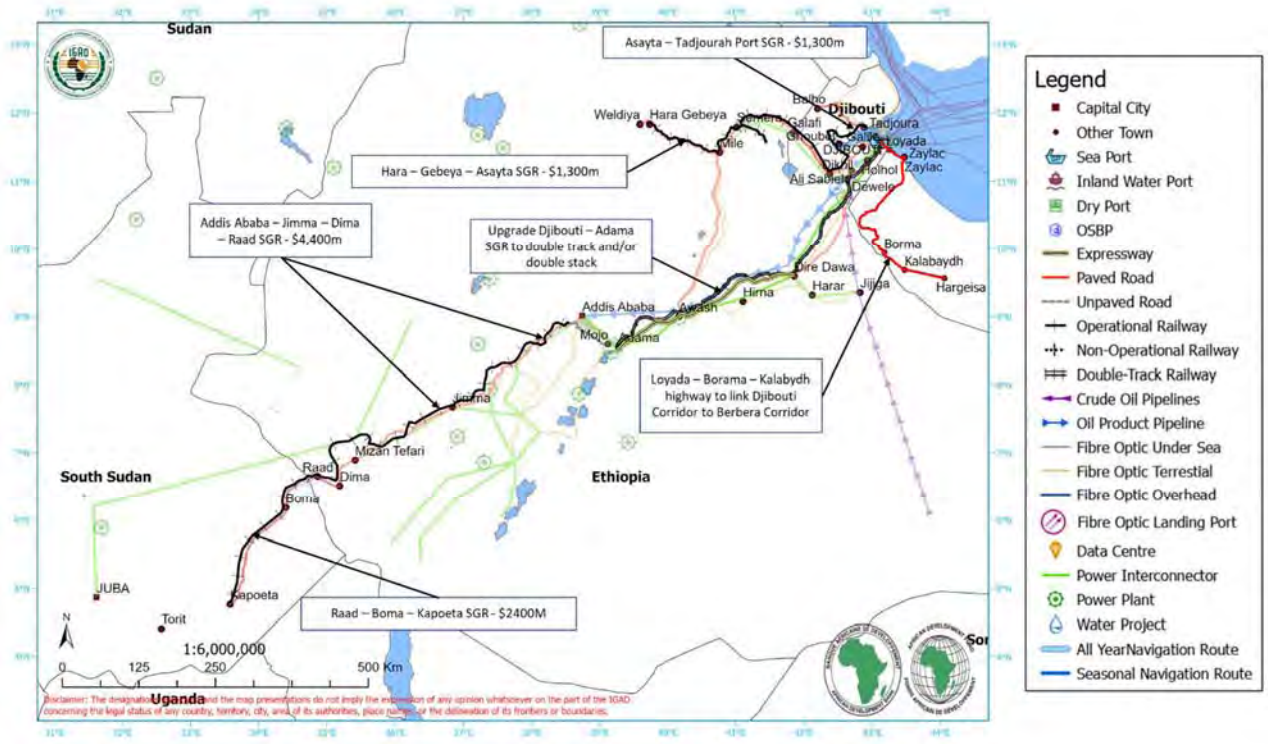
2 Hiwot Tadesse, Exploratory Study on Dry Port Service in Ethiopian Context: Case of Addis Ababa Kality Dry Port Branch, Addis Ababa University, School of Commerce, Department of Logistics and Supply Chain Management Graduate Studies (2016).

3 Nathan Associates. 2014. Development of a National Logistics Strategy for Ethiopia, 2:177.

be extended to Sudan and till Juba, South Sudan. The Corridor is multi-sectoral encompassing multi-modal transport links (road and SGR), as well as a power transmission interconnector (230KV), fibre optic cables and a water The corridor has benefited from also a pipeline completed in recent years.

At year 2050 (see following figure) besides the highway connection, a complete railway connection is foreseen down to South Sudan crossing the border at Raad.

Figure 14: Djibouti Corridor Infrastructure (2031-2050)



6.3.2 *Port Sudan Corridor*

Port Sudan is the closest port to Northern Ethiopia. Located 1781 km from Addis Ababa, Port Sudan is used so far mainly for exports, in particular from northern Ethiopia to the Middle East and Europe, primarily for agricultural commodities such as sesame, which are grown and processed in northern cities, such as Gondar. The port is occasionally used for the import of wheat destined to Ethiopian Grain Trading Enterprise (EGTE) and for imports of crude oil and chemical fertilizers, two commodities whose demand in Ethiopia has been continuously rising through time (currently, the country's annual fertilizer demand is about 17 million quintals).

Land infrastructures

The road connecting Port Sudan to Addis Ababa is 1781 Km. long, passing via Gedaref in eastern Sudan, Metemma (at the border between the two countries), Gondar and Bahir Dar.

The Port

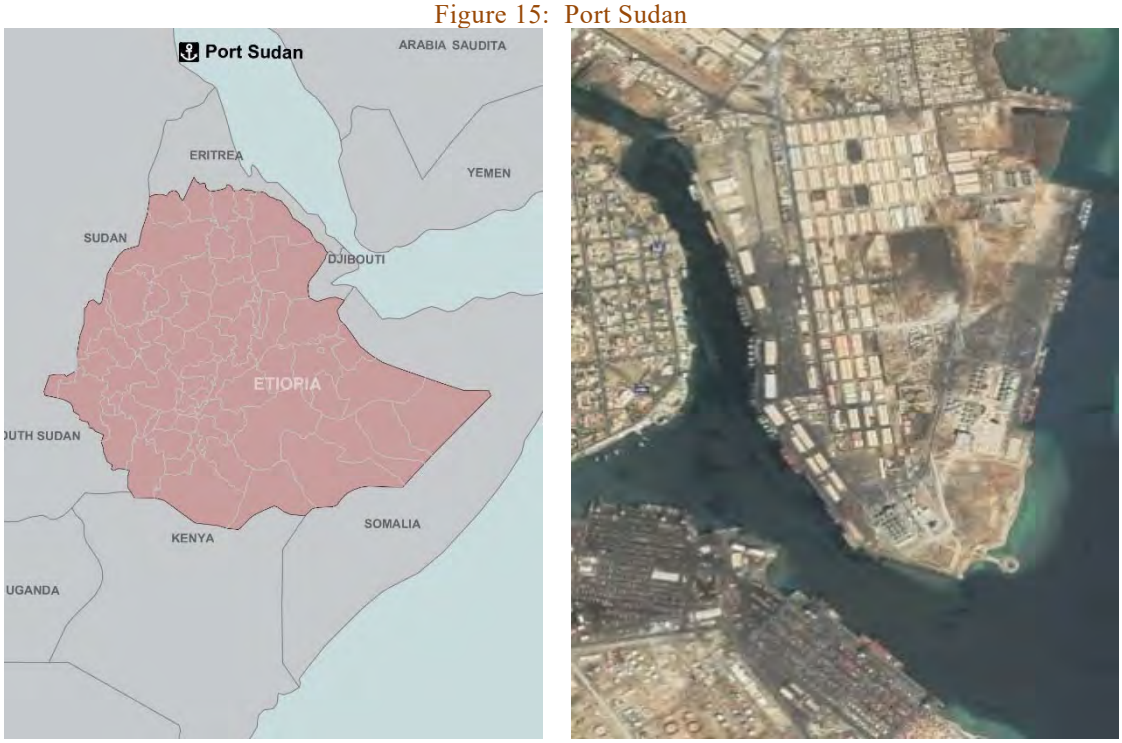
Port Sudan's Berth 16, handles roll-on/roll-off cargoes and tankers with a 128-metre-long berthing position with alongside depth of 10.7 metres. The South quay has two container and a tanker berth of 426.8 metres with the alongside depth of 12.6 metre. The port of Port of Sudan is linked by road to Khartoum, El Obied, the Darfur states, Kasala, Kosti and main cities in Sudan (see section 3.3 Road Assessment). The rail link from the links the Port to El Obeid, Khartoum, Kasala and Nyala

are some of the strategic distribution hubs. A rail line links the port to the river Nile at Rabak and to various destinations through to Juba in the South using the Nile River barges (see section 3.5 Railway assessment). The harbour is in the mouth of a gulf continuing seawards through a coral free channel, depth between 18 and 26 metres.

The Capacity of the port areas are:

- Containers: 1.200.000 Metric Tons;
- Break bulk: 5.000.000 Metric Tons;
- Dry bulk: 4.000.000 Metric Tons;
- Liquid bulk: 3.000.000 Metric Tons.

Figure 15: Port Sudan



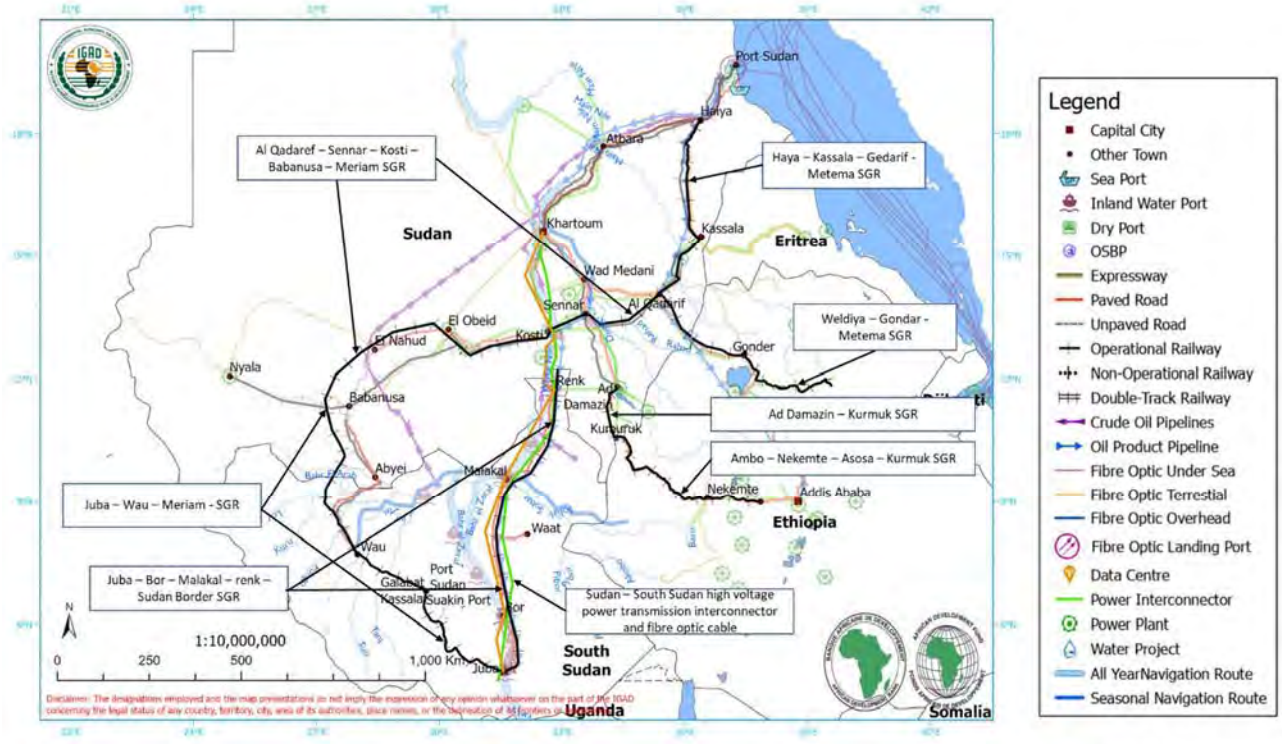
Port Sudan is connected to the Red Sea by an 18-26-meter-deep coral-free channel. In addition to modern dock facilities, Port Sudan hosts an oil refinery and an international airport. Petroleum comes to the Port Sudan refinery from on-shore wells and an 850-kilometer pipeline to Khartoum that was finished in 1977.

Regional Corridor

The Port Sudan Corridor is the most extensive in the IGAD region, reaching inland Sudan, Ethiopia and South Sudan. Port Sudan serves as the primary port of Sudan and handles a small share of Ethiopia's trade. The corridor has two crude oil pipelines that connect oil fields in Sudan and South Sudan with the refinery and the export port.

The corridor is multi-modal with road, rail, crude oil and petroleum product pipelines, as well as inland container depots. Much rehabilitation, in particular the railway which is narrow gauge and road of the infrastructure, however, is in need of upgrading and / or links to South Sudan and Ethiopia which have received little maintenance. Recently a feasibility study for the construction of a standard gauge railway connection between Ethiopia and Port Sudan has been launched. A pipeline is also foreseen

Figure 16: Port Sudan Corridor Transport (2031-2050)



6.3.3 *Berbera Corridor*

The port of Berbera handles bulk and containerised imports, mostly arriving via Dubai. Imports are dominated by petrol, vehicles, building materials, textiles, electronics, sugar, rice, wheat and other foodstuffs, including food aid for the region imported by the UN's World Food Program (WFP). In addition, Berbera exports around three million head of livestock to the Arabian Peninsula every year. Ethiopia began using the Port of Berbera in February 2015 after the self-declared independent Republic of Somaliland and Ethiopia signed a deal one-month prior. Currently, Ethiopia's cargo imported via the Berbera Port is largely composed of food aid shipments arranged by organizations like the World Food Program (WFP).

Land infrastructures

The **Berbera port** is located 854km from Addis Ababa: about the same distance as Djibouti, which makes it attractive to some shippers. The road on the Ethiopian side is in reasonable condition and the section Berbera-Tog Wajaale in Somaliland is under rehabilitation.

The Port

Berbera Port is on the Northern coast of Somalia and is located on the Gulf of Aden. The Port is owned and operated by the Somaliland authorities. In addition to an oil terminal the facilities can accommodate containers, general cargo, and bulk cargo. The port foundation is traced back more than a hundred years, and the current place, a linear wharf of 300 meters, was established in 1968 by Soviet Union and expanded to a 350 meters linear wharf in 1984 by United States of America. Since then, the port has developed numerous properties as well as constructions. The Port's task hasn't changed over the years but its scope of services has expanded considerably. The port contributed significantly in the development of the Somaliland community.

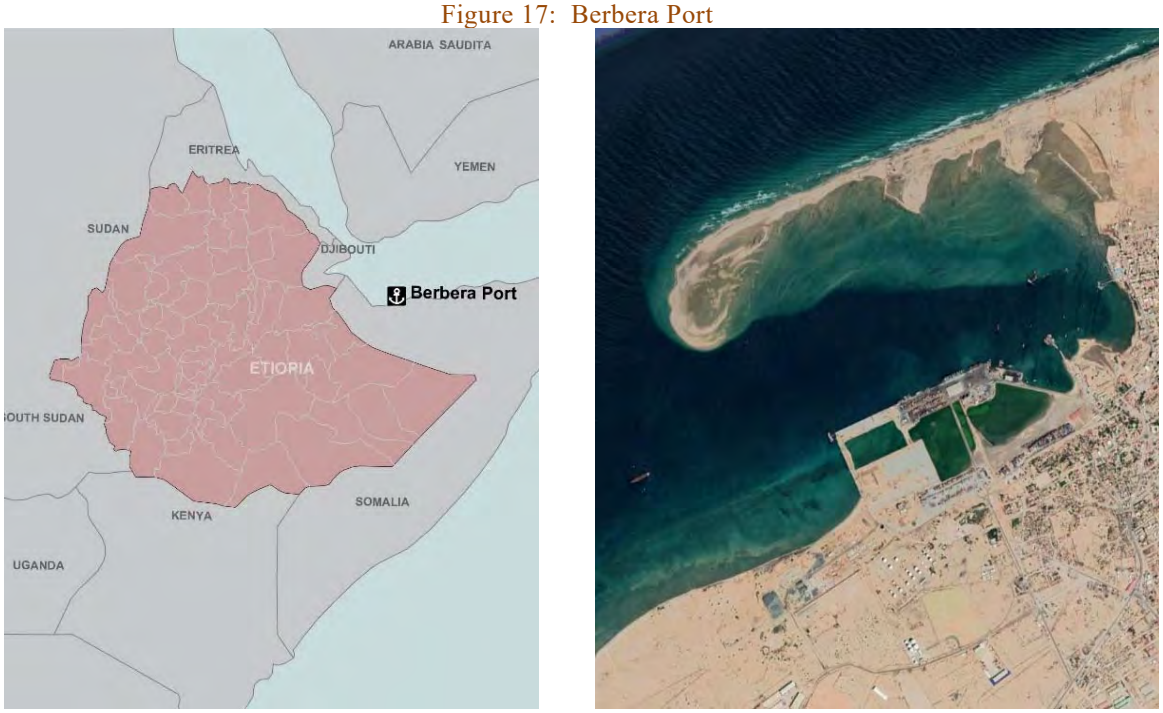
Berth Characteristics and Equipment of Berbera Port are**:**

- N° 6 conventional berth with length of 650 meters and maximum draft of 9 meters at low tide and 13 meters at high tide;
- N°10 Mobile Cranes with maximum capacity of 10-70 meters;
- N°2 Forklift with maximum capacity of 32 meters.

General Cargo Handling Performance of Berbera Port are:

- Bulk Cargo**:** 2,000 to 2,500 mt per ship/day;
- Bagged Cargo: 1,000 mt per ship/day;
- General Cargo: 1,000 to 1,800 mt per ship/day;
- Container Cargo: Approx. 6 containers per hour.

Figure 17: Berbera Port

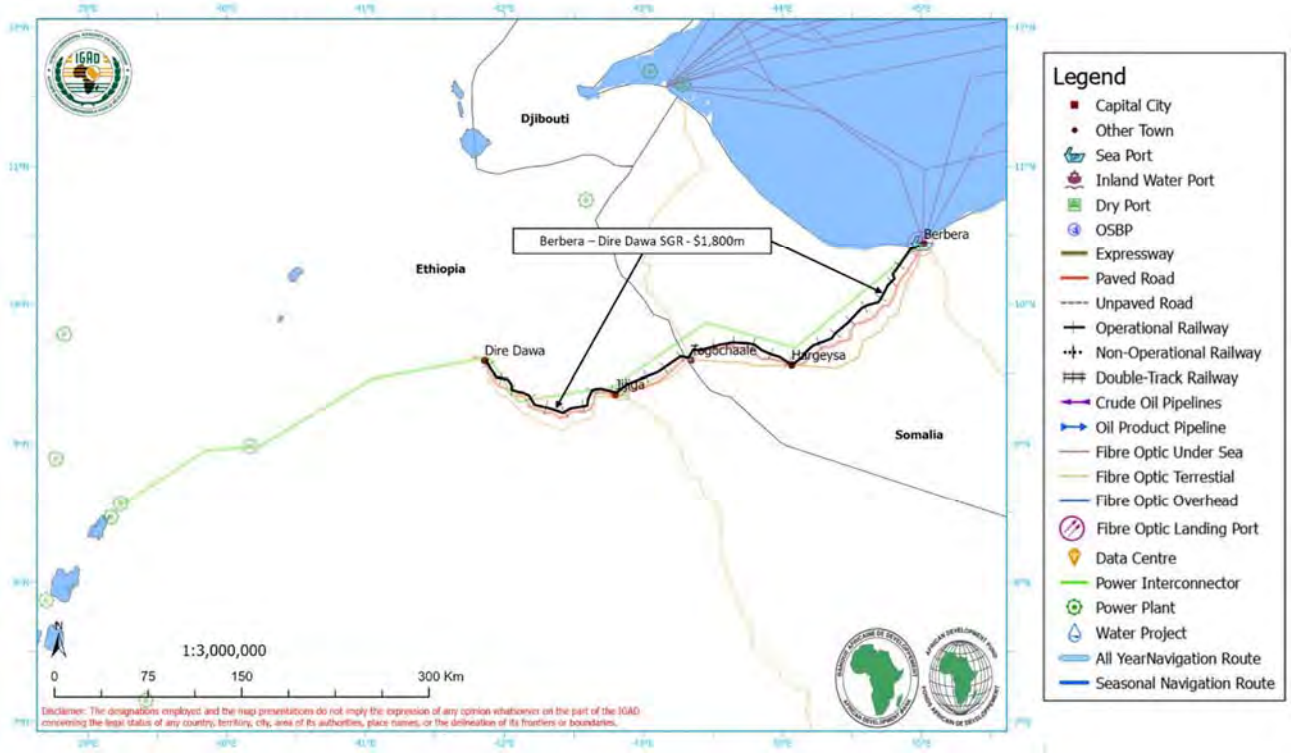


An investment of up to US$442 million will include a first phase of a 400-metre quay and 250,000 square metre yard extension. Equipment includes 3 new ships to shore post Panamax gantry cranes and 7 new rubber tire gantry (RTG) cranes and reach stackers. On completion, the port will have a container throughput capacity of 450,000 TEU per annum and an increase in its capacity to handle general cargo, bulk and break bulk cargo from 1,500,000 MT to 2,000,000 MT.

Regional Corridor

The Berbera Corridor links the port in Berbera in Somalia to Ethiopia via Gijjiga and Dire Dawa, where it connects to the Djibouti Corridor and on to Addis Ababa. The development of the corridor has been designated a high Corridor, and was named as a priority by the government in Ethiopia as an alternative to the Djibouti corridor. It is a priority also for Horn of Africa Initiative for Infrastructure Development in Africa (PIDA) endorsed by World Bank.

Figure 18: Berbera Corridor Infrascture (2031-2050)



6.3.4 *Massawa Corridor*

The peace agreement with Eritrea signed in July 2018 has potentially opened another economically interesting access to the sea. The road corridor in the Ethiopian territory is being refurbished. While the border is still formally closed, the Massawa (mainly for the Tigray Region) and Assab corridors represent a very competitive alternative to the Djibouti one.

Land infrastructures

To date, four roads connect Addis Ababa to the port of Massawa through Asmara:

1) Addis Ababa-Adigrat-Zalam-Asmara (933 Km). This road is currently functional;
2) Addis Ababa-Mekele-Adawa-Rama-Mereb-Asmara (1.005 Km). The road is currently under maintenance;
3) Addis Ababa-Gonder-Humera-Asmara (991 Km);
4) Addis Ababa Awash-Bedeche-Bure-Assebe (876 Km).

From Asmara to Massawa, the only available road (passing through Nefasit-Ginda-Dogali) is 123 Km. long.

The Port

Massawa port is home to a naval base and large dhow docks. It also has a station on the railway line to Asmara. Ferries sail to the Dahlak Islands and the nearby Sheikh Saeed Island, aka Green Island. The port has six cargo berths with a total length of 1007 metres, with four of these berths forming a continuous length and a newly developed container terminal. The port has three rail mounted shore cranes, three mobile harbour cranes and other cranes, fork lift trucks, reach stackers and tractors and trailers. One of the main physical challenges of using Massawa as a port for Ethiopia is the road link between Massawa and Ethiopia which goes through the capital Asmara. The distance

between Massawa and Asmara is 110km but the difference in altitude is 2,000 metres, meaning that the gradients on the roads are very steep, translating into the need for trucks to be in good condition and an expensive journey in terms of fuel used per ton/kilometre.

Regional Corridor

The Massawa Corridor links the port of Massawa to the hinterland of Eritrea, northern Ethiopia, and eastern Sudan via road. A standard gauge railway link from Mekele to Awash is under construction. This corridor, as the Assab corridor, was closed to trade with Ethiopia from the commencement of the war in 1998. As a consequence, Ethiopian trade shifted primarily to the Djbouti port and the infrastructure on the Massawa Corridor has deteriorated.

Ethiopia is planning to build the Awash HaraGebeya railway and the Italian Government has financed the feasibility study of the railway extension to Massawa. In the immediate future priority is the rehabilitation of the primary road till the border crossing of Zalambessa.

Figure 19: Massawa Corridor Infrastructure (2030-2050)

6.3.5 Assab Corridor

As a consequence of the signature, in July 2018, of the Asmara Declaration to end the state-of-war with Eritrea by virtue of the acceptance of the Algiers Agreement (2000) on the demarcation of borders between the two countries, Ethiopia agreed to strengthen diplomatic and economic ties with Eritrea in the transport, trade and telecommunication fields. It is therefore expected that peace negotiations with Eritrea will soon lead to the restoration of the Ethiopia's access to the two Eritrean ports, capitalizing on the relative closeness of the Assab port to the capital Addis Ababa.

Land infrastructures

From Addis Ababa to Assab, there are two main roads:

1) Addis Ababa-Adama-Awash-Bure, 884 Km. long.
2) Addis Ababa-Debre Birhan-Kombolcha-Bure, 861 Km. long.

The re-opening of the roads connecting Ethiopia to the two Eritrea's Read Sea ports was announced as a priority in the two nations' reconciliation program and a task force has been drawn from the Ministry of Transport, the Ethiopian Maritime Affairs Authority and the ESLSE to follow the implementation of the project for restoring the roads to the port of Assab.

The Port

The Port of Assab is located in southern Eritrea along the Red Sea. The port of Assab can only provide berthing space for seven ships and its draft is limited to a maximum of 10 meters. Furthermore, the overall length of ships that Assab can handle is limited to 200 meters.

The port of Assab presently handle 2.5 million tons of goods through thirteen commercial and nine specialised berths with a joint capacity of 480,000 cubic metres of space.

The port can accommodate 6 vessels at one time.

Jetty Characteristics:

- North Jetty is 490 meters long, berths depths between 9,1 meters and 10 meters;
- South Jetty is 530 meters long, berths depths between 5,6 meters and 9,7 meters.

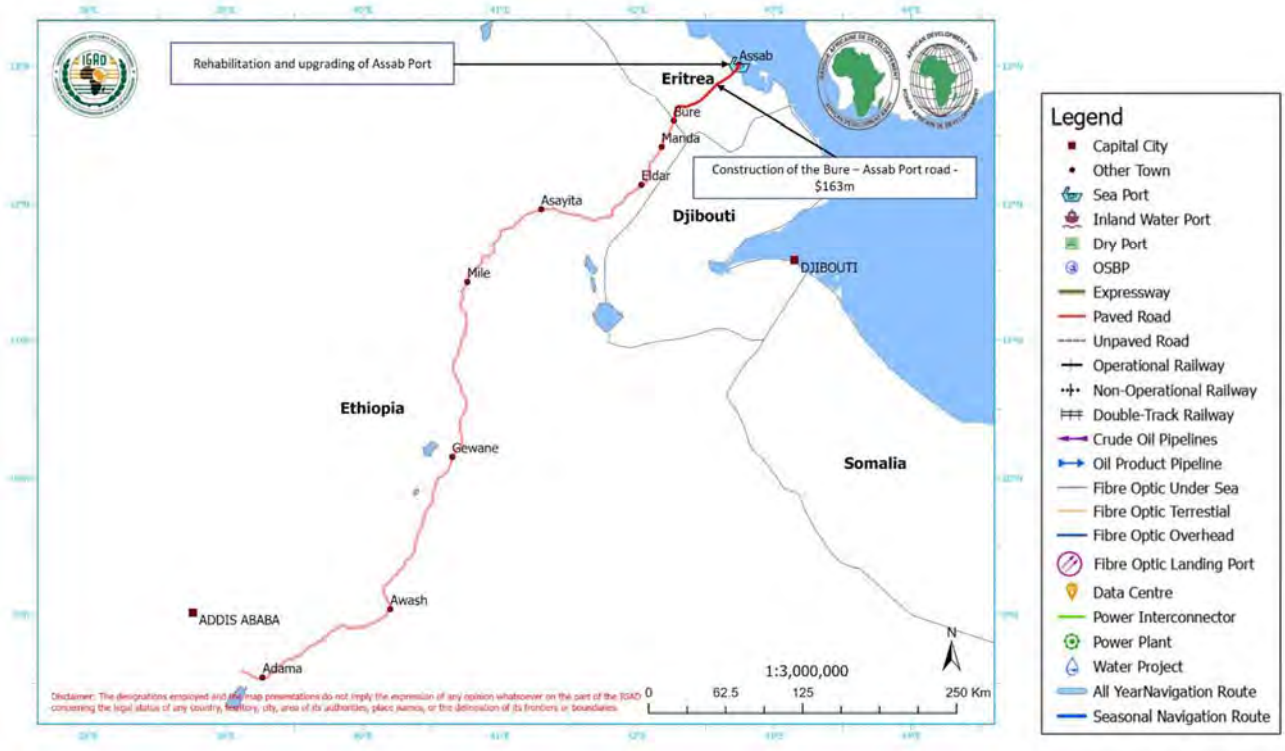
Port of Assab Equipment are n°8 mobile crane and n°29 forklifts with capacity between 3-10 tones.

Figure 20 - Port of Assab

Regional Corridor

Assab Corridor is currently not functional as a trade route between Ethiopia and Eritrea due to the dilapidated state of infrastructure in Assab as the main highway leading to Assab in Eritrea was destroyed during the Ethio-Eritrean war. With the advent of peace between Ethiopia and Eritrea, it is expected that Assab Corridor will be a crucial corridor that serves Ethiopia in addition to Djibouti Corridor thereby promoting trade, interconnectivity, and integration between the two countries. It is recommended that bilateral agreements be signed between Ethiopia and Eritrea to support the development of infrastructure to facilitate trade between the two countries.

Figure 21: Assab Corridor Infrastructure (2025-2030)



6.3.6 *Mogadishu Corridor*

Somalia has one of the longest coastlines in Africa with three main ports (Mogadishu, Kismayo and Bossaso). Mogadishu port handles 80% of Somalia trade and 70% of its value.

Land infrastructures

The Mogadishu corridor links different parts of Somalia and also south-eastern neighbouring Ethiopia. The corridor between Addis Ababa and Mogadishu through Beled Weyne and Mandera in North Eastern Kenya played important roles in the past. Priorities for the immediate future include rapid upgrading and rapid rehabilitation of infrastructure. of Africa is the Berbera Currently, the only established corridor connecting Somalia with the rest -Addis Ababa corridor, which offers an alternative route to Djibouti for Ethiopian imports and exports.

The Port

The port is managed, since 2014 by the Turkish construction and logistics corporation Albayrak Group, that has recently renewed its concession to operate the Port of Mogadishu for another 14 years, during which physical and operational changes will be made. !

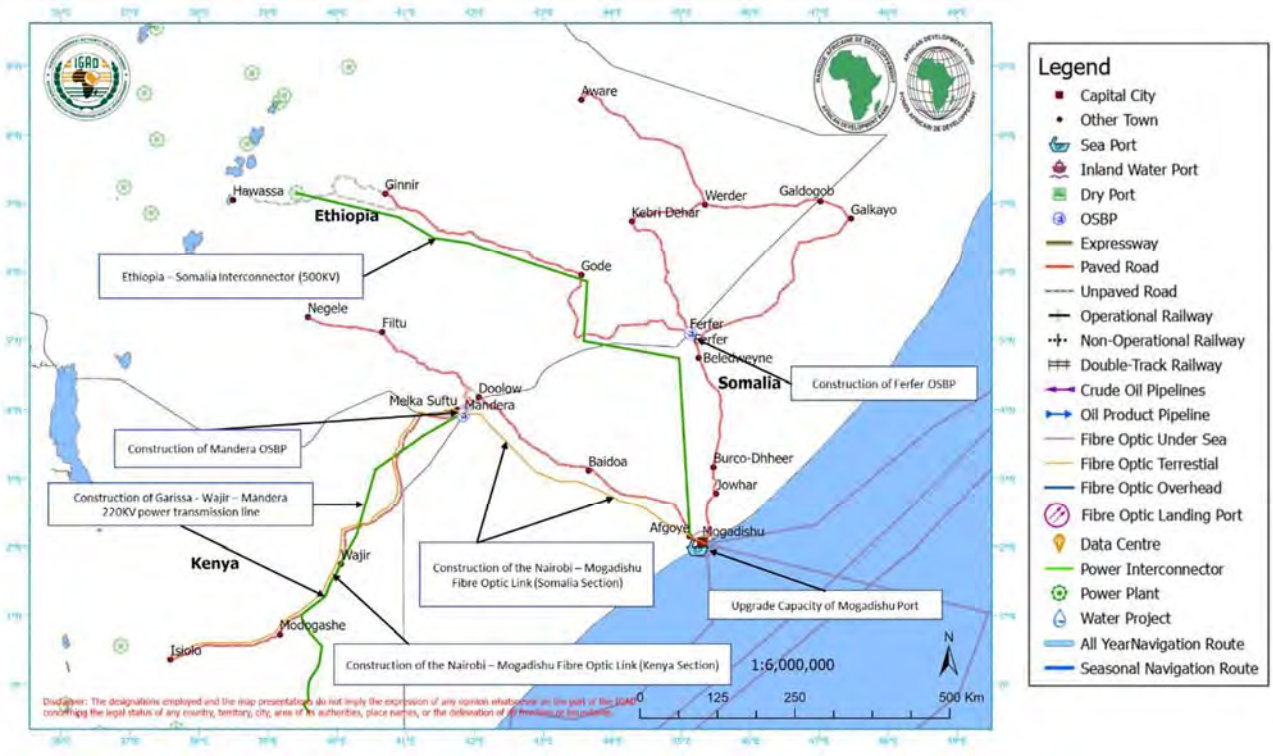
Facilities available in Mogadishu port are:

- 2 General cargo Berths from break bulk, RORO and dry bulk.
- 2 Container Terminal Berths,
- Grain Terminal facility (silos with storage capacity of 30,000 tons). Container Yard with the capacity of (14,500 TEUs) and CFs with the capacity of holding 2,000 vehicles at once).
- 80,000 MT Single Point Mooring (SPM) – for handling refined and oil.

Regional Corridor

The IRIMP programme foresee connections of Mogadishu port with Ethiopia in two itineraries with border posts in Dolow and Ferfer and connection to Kenya at Mandera.

Figure 22: Mogadishu Corridor Infrastructure (2031-2050)



6.3.7 Lamu Corridor

Lamu port is an ambitious project launched by the Government of Kenya in 2012 under the "Vision 2030" strategy. The port is part of the "**Lamu Port-Southern Sudan-Ethiopia" (LAPSSET)** transport corridor, one of Africa's largest infrastructure projects, aimed at improving transport linkages between Kenya, Ethiopia and South Sudan. This project also comprises rail lines, highways, an oil pipeline, resort cities and airports (in Lamu).

Land infrastructures

Although construction works of the **Lamu Port** and of the Lamu corridor are still in early stages, once completed, this project will cut by about 300 km the distance between Addis Ababa and the Kenyan ports, by putting at disposal of Southern Ethiopia a second transport and economic corridor connected to a seaport in Kenya. The Lamu corridor will intersect the Addis Ababa-Nairobi road in Isiolo. During its official visit to Kenya on 7th May, 2018, the Prime Minister of the Federal Democratic Republic of Ethiopia Dr. Abiy Ahmed reached an agreement with the President of the Republic of Kenya for the acquisition of a portion of land in Lamu for the settlement of a logistics facility. In the same date, the leaders of the two countries released a joint communique in which they committed to jointly supervise the construction works of the Lamu-Garissa-Isiolo-Moyale and Moyale-Hawassa-Addis Ababa road networks.

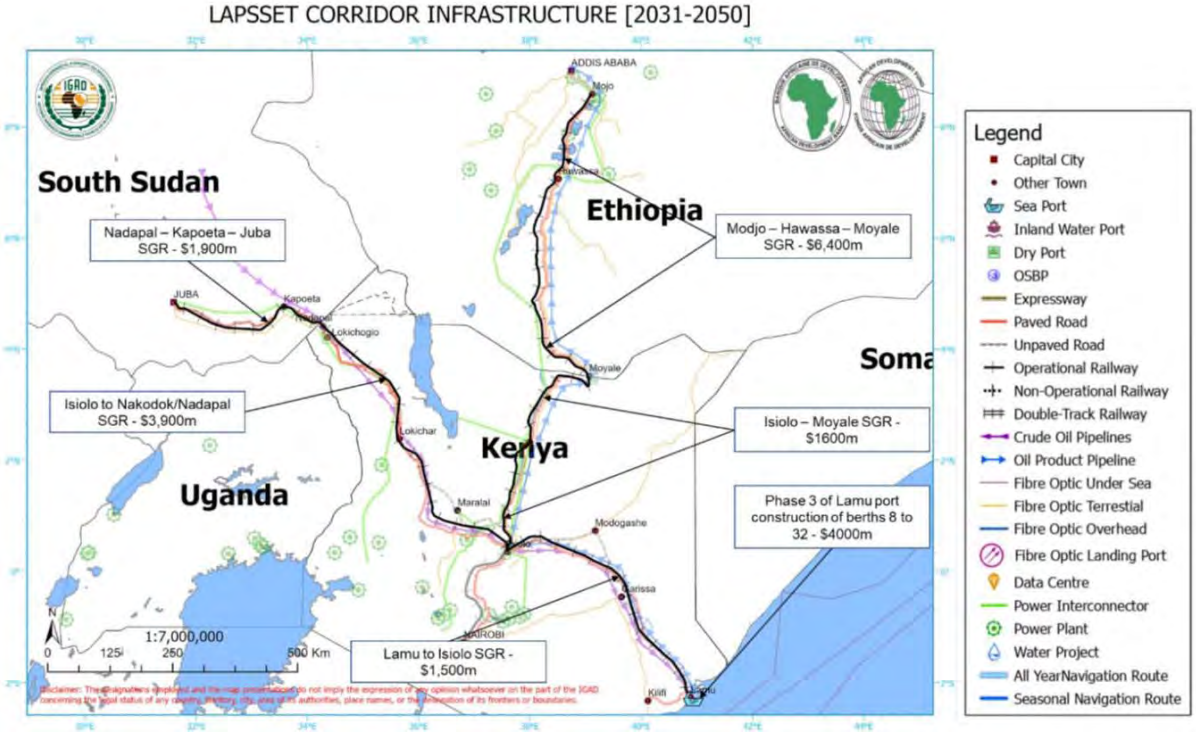
The Port

The Lamu port will have a total of 32 berths, with the first 3 fully financed by the Government of

Kenya and the remaining 29 berths to be financed by private Investors under a Public-Private Partnership (PPP) scheme, in order to avoid burdening the country with debts[4]. The first three berths of Lamu Port will be able to handle 1.2 million TEUs and when fully operational, the Port will handle a total of 20 million TEUs. The construction of the first of the three government-funded berths was commissioned to China Construction Company in August 2014, with the relevant works still ongoing and expected to be completed before the end of 2018. In October 2016 also dredging operations of the seabed began, so to allow larger ships access to the first berth. Concerning the Lamu corridor, the construction works of the first section of the Lamu-Garissa-Isiolo Highway (530km), were set to start in June 2018, but the project is being delayed

Regional Corridor

At year 2050, it is foreseen the construction of a complete SG railway connection between Isiolo – Moyale – Modjo.



6.3.8 Mombasa Corridor

Mombasa is a closer port for Southern Ethiopia. Located about 2.060 Km. from Addis Ababa, Mombasa currently handles a minimal volume of Ethiopian import/export trade (about 0,1%), with most of goods comprising transit cargo: mainly sugar (imported from India, UAE and Brazil), palm oil (from Malaysia and Indonesia), rice (India), which are transported to Ethiopia via Nairobi-Moyale.

The capacity of the Mombasa port is 1.1 million TEUs. However, a new container terminal (Kipevu Container Terminal) was recently built on an area of 100 hectares, thereby adding a further capacity of 550 000 TEUs to the port. A "Phase II", commenced on January 2018 and is expected to provide additional 450 000 TEUs, while an envisaged third phase will further increase the port

4 For governments seeking to expand infrastructure, the public-private partnership offers an option that lies somewhere between public procurement and privatization. Ideally, it brings private sector competencies, efficiencies, and capital to improving public assets or services when governments lack the upfront cash. Companies agree to take on risk and management responsibility in exchange for profits linked to performance.

capacity by other 500 000 TEUs/y. The expansion works of the port are expected to be completed in 2023.

Land infrastructures

Mombasa Corridor is conceived as the connection of Ethiopia (from Moyale to Isiolo where it connects to the Northern Corridor reaching the port of Mombasa.

The Port

The port of Mombasa is the Principal Kenyan seaport and comprises of Kilindini Harbour and Port Reitz on the Eastern side of the Mombasa Island and the Old Port and Port Tudor north of the Mombasa Island. Kilindini is naturally deep and well sheltered and is the main harbour where most of the shipping activities take place. It has 16 deep water berths, two oil terminals and safe anchorages and mooring buoys for sea-going ships. The Port of Mombasa not only serves Kenya but is also the main gateway to the Eastern African hinterland countries of Uganda, Rwanda, Burundi, DRC and Southern Sudan.

The Port of Mombasa has a length of 7 nautical miles, a width of 300 m and a maximum depth of 15 m. The inner harbour has a tidal range of 3.5 m. The main port currently has 19 berths, comprising of 1 bulk grain terminal, 2 oil terminals/jetties, 4 container berths and 12 general cargo berths.

Berthing specifications of Mombasa Port are:

- Container Berth: n. 6, length 1204 m, max. draft 10-13,5 m;
- Water Barges: privatized;
- Conventional Berth: n.11, length 2080 m, max draft 10-13,5 m;
- Berthing Tugs: n.4;
- Silo Berth: n.2, max draft 10 m.

The container berths are backed up by a container terminal stacking yard of 197,000 m².

The existing container terminal was designed to handle throughput of 250,000TEU's per annum but its capacity has since been surpassed 200,000 TEU's per annum.

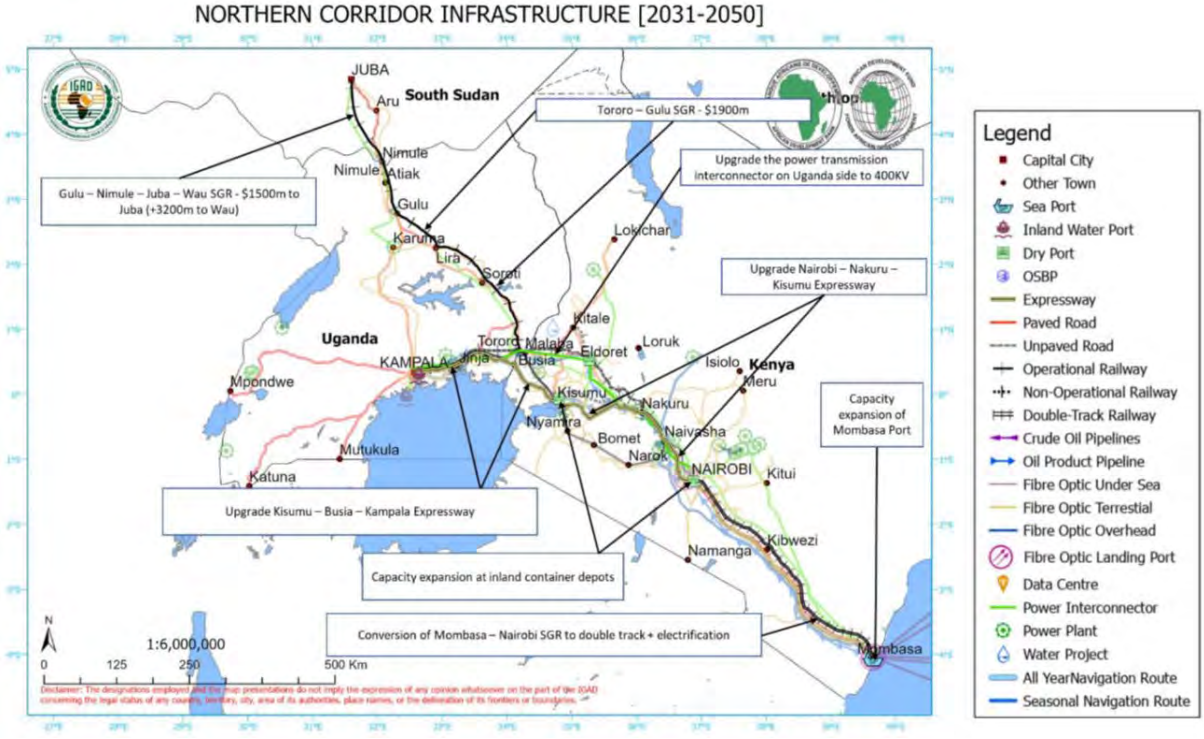
Figure 23 - Mombasa Port

The Shipping Line Operators of bulk carriers, car carriers, container ships, Roll-on/roll-off (for freight), and tankers operating in the ports servicing Ethiopia are the following:

- Bollore;
- Maersk;
- Green International Logistics;
- DP World;
- Italferr;
- MSC Mediterranean Shipping Company;
- Ignazio Messina &C.;
- J.J. Kothari & Co.

Regional Corridor

Apart from the complete road connection Moyale – Isiolo – Nairobi – Mombasa, the IGAD Infrastructure Master Plan foresee at year 2050 (LAPPSET) the construction of a SG Railway from Isiolo to Modjo via Moyale. The Mombasa corridor will be then composed by two separated railway sections: Modjo . Isiolo and Nairobi – Mombasa, with no railway between Isiolo and Nairobi.



7 ASSIGNMENT AT DIFFERENT HORIZONS

7.1 DEVELOPMENT SCENARIOS CONSIDERED

The adoption of a dynamic planning and possible switching between different scenarios, is particularly important for the road transport infrastructures. Following the three-scenario adopted are described and the "switching" conditions.

7.1.1 The "Go-Ahead" Scenario

This is to be considered as a "base scenario" and is characterized by the continuity with the policies and the planning expressed by the government of Ethiopia in recent times. The macro-economic conditions hypothesized are the ones of the Base Scenario described in the paragraph 6.1.4. of the Consolidated Report.

International Conditions. There will be a smooth recovery from pandemic of the most developed countries, that recuperate the pre-Covid levels in two-three years, also thanks to a strong injection of public-funded investments in the economies. The trend toward globalisation will take new strength, with new records of world trade and progressive improvement of the LIC (Low Income Countries), that start experimenting autonomous growth, ignited by the Foreign Direct Investments (FDI).

National Conditions. In this frame the "*Homegrown Economic Reform Plan*" of Ethiopia keeps its objectives, even though the objectives are reached with years of delay. The International Organizations like FMI and WB express a strong support to the national objectives. Ethiopia is able to leverage on its points of strength, as to be the logistic hub of the Continent for the air transport, and becomes a preferred destination of the Foreign direct investments, with significant injection of know-how and new technologies.

Transport sector Conditions. The railway reform is implemented and the commercial performance substantially improved. As a logical consequence, international investors and operators show interest in entering the sector and position themselves through their investments. In a mix of PPP initiatives and of direct investments by the public rail operator, the reformed Railway is able to integrate and implement the Ethiopian Railway National Network.

This scenario can, in principle, fully incorporate the "Ten years Perspective Plan" of the transport sector. In road sector a substantial number of infrastructures are built, in order to avoid the bottlenecks and to improve the service ratios.

International corridors are opened for the logistic integration of the horn of Africa, to connect Ethiopia to the ports of Berbera and Lamu via road, and to the ports of Port Sudan, Assab and again Lamu via rail.

7.1.2 The "Next Generation" Scenario

International conditions. The guiding idea under this scenario is that the technologies and the energy sources used in motorizing the transport means have shown in the last months an astonishing acceleration, thanks to the political actions in response of the global warming, and the major economies will invest unprecedented amounts of money in the re-conversion of their transport systems in order to reduce emissions. The Recovery plan of EU, financed with 1.800 billion Euro, will support many of these re-conversions in view of the new challenging objectives of EU and this will give momentum to the new technologies to evolve from the research and development phase to the mass production phase. It is now clearer which technologies will dominate the next phase: electric and hybrid engines for the small and medium land vehicles and Hydrogen fuel cell engines for the large vehicles and for the sea vessels.

National Conditions. The production of the hydrogen as fuel will require high amounts of electricity, and the nations with relative abundant electric generation through green sources will have a comparative advantage in competition. Ethiopia, thanks to its hydroelectric massive investments, will be in that position.

Transport Sector Conditions. The Ethiopian approach to the de-carbonisation, declared in Paris in occasion of the COP 21- Hydroelectric generation and electrified railway- has also the road alternative of zero emission via the use of coaches and trucks with fuel cell engines. This can reduce the risk of the start-up of new railways lines and better capitalize the recent and future investments in roads. This scenario is based on a policy that is anyway coherent with previous initiatives of the government: the always declared approach to zero emissions policy and the start of the production in the Ethiopian transplant that produces electric cars as a initiative in cooperation between the Ethiopian Government and the Korean corporation Hyundai. In these conditions, the investment plan will be much more focused on the road infrastructures, that become more efficient and far more environmentally friend. The railways investment is reduced and focused on the strategic lines, like the ones for the main international corridors.

7.1.3 The "Limits to Growth" scenario

International Conditions. This scenario could materialize if the economic effect of the pandemic will be much worse than the ones assumed in the World economic Outlook of October 2020 by IMF. This would reflect in a deep economic, fiscal and employment crisis in the most developed western countries –particularly EU and USA – that would take years to recuperate the pre-Covid levels. In turn, the necessary measures to reduce the fast-growing public debt would resolve in cutting resourced for the bilateral cooperation and in reluctance to grant growing financial resourced to the international Development banks. The world trade growth rates would be hit by the reduction both of consumptions and of investments, and, in general, the interaction between developed and developing countries would decrease. In this situation, the crisis would be quickly transferred to the Low-Income Countries (LIC).

National Conditions. For what concerns Ethiopia, the "*Homegrown Economic Reform Plan*" that continued to be vulnerable to external shocks, would see these vulnerabilities materialize. In particular, it was already declared that potential shocks due to rising protectionism and weaker-than-expected global growth would negatively affect exports further exacerbating FX and debt vulnerabilities. Also, international air transport market, that brings relevant amounts of FX to Ethiopia, would see its perspectives worsening. Under this scenario, the PPP attractiveness for international investors would be much reduced, and at the same time the public-owned transport and infrastructure Companies would have limited resources to be invested, in a general situation of shortage of FX and consequent difficulty to introduce foreign technologies to improve the national infrastructures and transport services.

Transport Sector Conditions. In this situation, it would be perfectly logic for the central Government to abandon the Go-Ahead scenario Master Plan and to recur to a Contingency Plan, coherent with the present Scenario. The rational strategic approach to this Contingency Plan is to concentrate the investment spending to the ongoing projects, in order to complete them and avoid that the relevant investment expenses already borne would remain without benefits. The new investment projects would be limited to the ones that can really make a strong difference and open a new business perspective. To finance these projects, the central Government should be able to provide the sovereign guaranties. A stronger investment activity can be borne in the second decade and third decade, when the conditions for a new growth phase will have been restored. Furthermore, the investments less impacting in the short run on the FX need would have more possibility to be approved and carried on not incurring in the typical stop-and-go situation. The Investment Plan accelerates after the first ten years, in parallel with the recovery.

7.1.4 The key Uncertainties and their timing

The first key uncertainty to face in the time scale will be about the depth of the global economic crisis deriving from the pandemic and the recovery times at international and national level.
Within year 2023 it will be already time to ask the following question:

- will economic growth recover and Homegrown economic reform plan can be respected?

As a matter of fact, if the national GDP growth has not restored and reached a yearly rate of at least 3-4%, the transport infrastructure investment planned in the go-ahead Scenario will hardly be financially sustainable by the State Treasury, and will be necessary to reduce the investment plan, or, in other words, to switch to the Limits-to-growth Scenario. In that scenario the stagnation will last about seven years, probably coupled with general instability, and then the path of growth will be restored and a more significant amount of infrastructure investments can be performed.

In the hopefully case that the *Homegrown economic reform plan* can be respected, then the next key uncertainty will materialize around the year 2025, a time span sufficient to understand if the complex process of railway reform, at present under study by the MOT, will have started having encouraging results, both in terms of institutional capacity and in terms of commercial and production performance of the operating railway lines, particularly the Addis- Djibouti one.
So, the question to be answered around year 2025 is the following:

- will Ethiopian railway reform be successful and its commercial performance accelerates?

If the answer will be positive, then the Go-Ahead Scenario will still be on and its policies and investment plan, with a huge part dedicated to railway lines, can continue. If the answer, at the opposite, will be negative, to invest very relevant resources in a modality that still has institutional, organization and technical problems unresolved will be a hazard. In this case it will be logical to bet more on the road modality, and, in order to mitigate the environmental impact of this policy, it will be opportune to structure a policy of incentives and of direct intervention by the SOE to anticipate the introduction of less impacting vehicles. In other words, it will be the case to switch to the Next Generation Scenario.

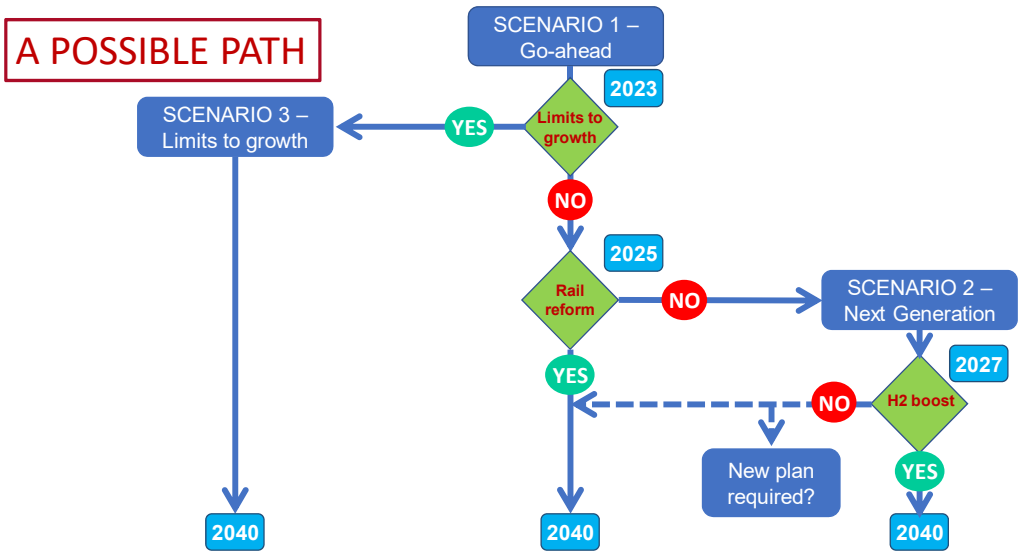
Also, in this scenario a key uncertainty will be faced, presumably around the year 2027. At that period, it will be much easier to answer the question about the third key uncertainty:

- is the "energy transition" and the Hydrogen technologic shift materializing?

In case of positive answer, the relevant road investments can be effectively complemented with the incentives policy, and the effect in the medium-long term will be a significant development of the road transport in a framework of economic and environmental sustainability. In case of negative answer, it will be necessary to make a technology assessment and coherently define a "road vehicles strategy", that can assume as "bridge policy" an intermediate stage of promotion of more mature and low impacting technologies, as hybrid motorization and/or LNG engines.

At the same time the status of the railway sector can be re-evaluated. At that point an "extraordinary maintenance" of the NTMP can be recommended.

Figure 24: A possible path for the Scenarios Shifting



In general, to find the right path, and to make the right shift between scenarios, a monitoring procedure of the plan projections and implementation. It will be proposed by the Consultant within the capacity-building part of the assignment. As anticipated, a five-years revision of the hypotheses underlying the Plan is opportune. The results of this revision should guide any decision to switch to another scenario as baseline, or eventually to reformulate the Scenario and to have a new run of the Master Plan Model with different value of the variables exogenous to the model itself.

7.1.5 The key Uncertainties Indicators

In order to anticipate the understanding of the phenomenon about the key uncertainties, it is hypothesized here a number of indicators to be monitored for each key uncertainty. A precise list, together with the guiding values, will be supplied within the procedure for the ETMP five-years revision. It will be preferred to select a main indicator, in order to have precise threshold values and minor ambiguities in the data interpretation. A number of ancillary indicators can complete the picture.

Indicators for Key Uncertainty 1: will economic growth recover and *Homegrown economic reform plan* can be respected? The grow rate of GDP should be the principal indicator. Ancillary positive indicators can be a good FX availability, the export of goods increase, the balance of trade improvement, the foreign exchange stability.

Indicators for Key Uncertainty 2: will Ethiopian railway reform be successful and its commercial performance accelerates? The main indicator should be the percentage of increase in Tonnes-km transported on the Addis-Djibouti line, that nowadays is below the expected results and needs to be almost doubled to allow a better profitability of the line.

Ancillary variable as positive indicators can be:

- Good organization integration and clear command-and-control-line-between the former ERC, EDR and CDE;
- Full institutional implementation of the Railway Safety Regulatory Body;
- Start of private investments in railway sector in accordance of approved schemes of PPP.
- Indicators for Key Uncertainty 3: is the "energy transition" and the Hydrogen technologic shift materializing?

The main indicator should be the Hydrogen Fuel cell engines as percentage of the delivery of new

heavy trucks in Developed countries. Ancillary variable as positive indicators can be:

- delivery of new electric cars (battery electric + Hydrogen fuel cell) in the Developed countries become more than the 50% of the total in the period.
- GOE officialises its own "Hydrogen Strategy"
- Ethiopia start using part of the surplus of hydroelectric energy to produce "green hydrogen

7.2 FREIGHT TRANSPORT ZONING AND DEMAND MATRICES

To represent the future freight transport demand in the country and their relations to the access ports, a specific model has been built taking into consideration all internal fright movements concentrated mostly in 9 areas of major logistic potentiality, where there is freight production/attraction and also considering the connection with 7 possible ocean ports.

The major areas of freight production/attraction are the industrial and agro-industrial areas of: Addis Ababa, DireDawa, Semera, Kombolcha, Mekele, Bahir Dar, Asosa, Jimma, Hawasa. The ports considered are: Djibouti, Assab, Port Sudan, Berbera, Mombasa/Lamu, Mogadishu.

The table below shows the logistic ID nodes used by the model.

Table 17: Logistic ID Nodes

ID Nodes	Logistic Sites
1	Addis Ababa Zone
2	DireDawa Zone
3	Semera Zone
4	Kombolcha Zone
5	Mekelle Zone
6	Bahir Dar Zone
7	Asosa Zone
8	Jimma Zone
9	Hawassa Zone
2897	Assab Port
2899	Massawa Port
2900	Djibouti
2901	Berbera
2902	Mogadishu
2904	Mombasa Lamu
2906	Port Sudan

An assignment of the import volumes has been done at different years:

- Year 2020, representing the present situation;
- Years 2025, 2035 and 2050 under different scenario growth.

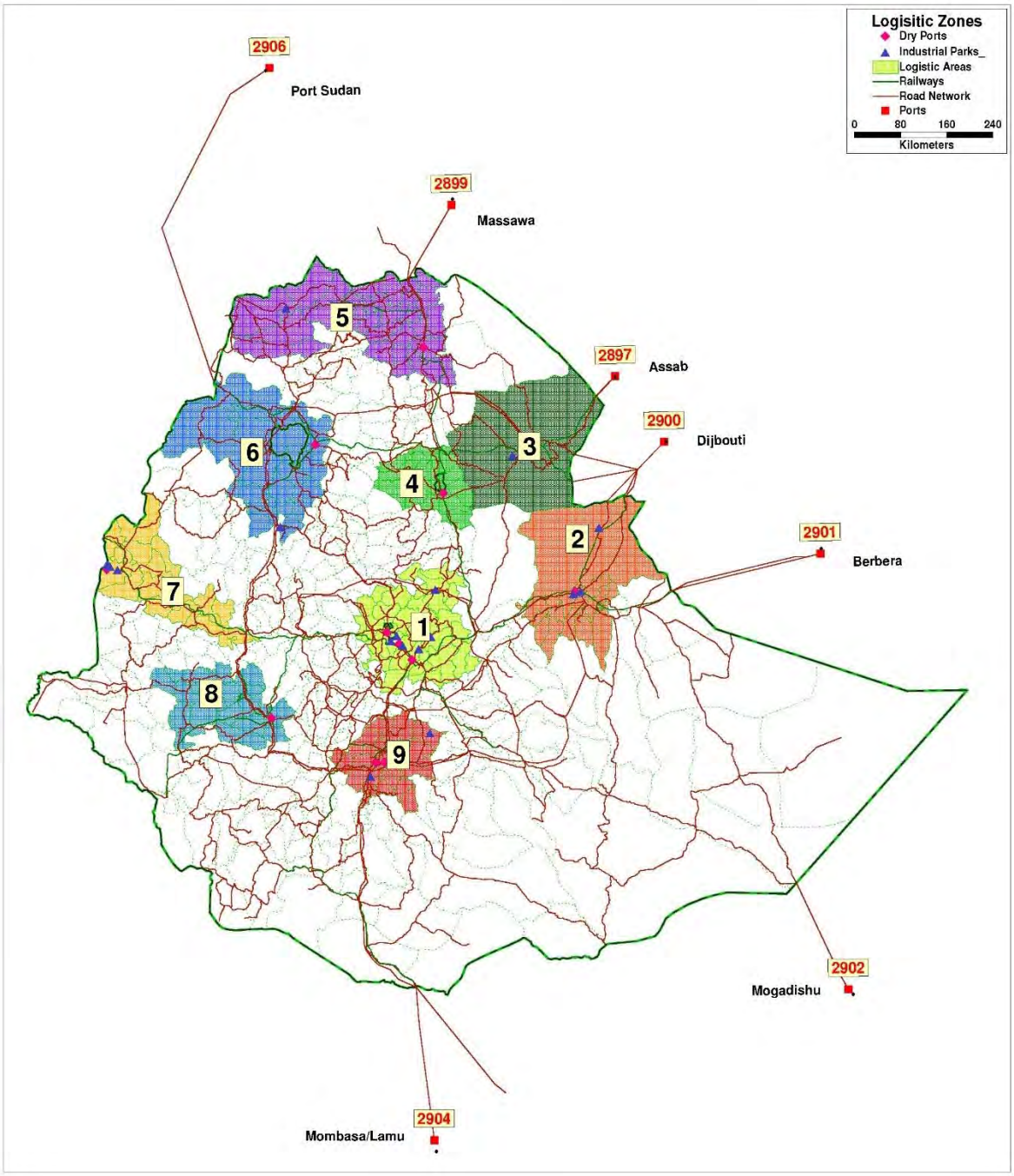
The distribution of import volumes among the various access ports has been assumed as shown in the following table:

Table 18: Import /Export Freight Traffic Distribution

Ports	2020	2025	2035	2050
Djibouti	92%	85%	60%	50%
Port Sudan	4%	7%	13%	10%
Berbera	3%	5%	10%	15%
Assab			12%	15%
Mombasa/Lamu	1%	3%	5%	10%

The following figure shows the location of the logistic zones and access ports considered in the model-

Figure 25: Logistic Zones



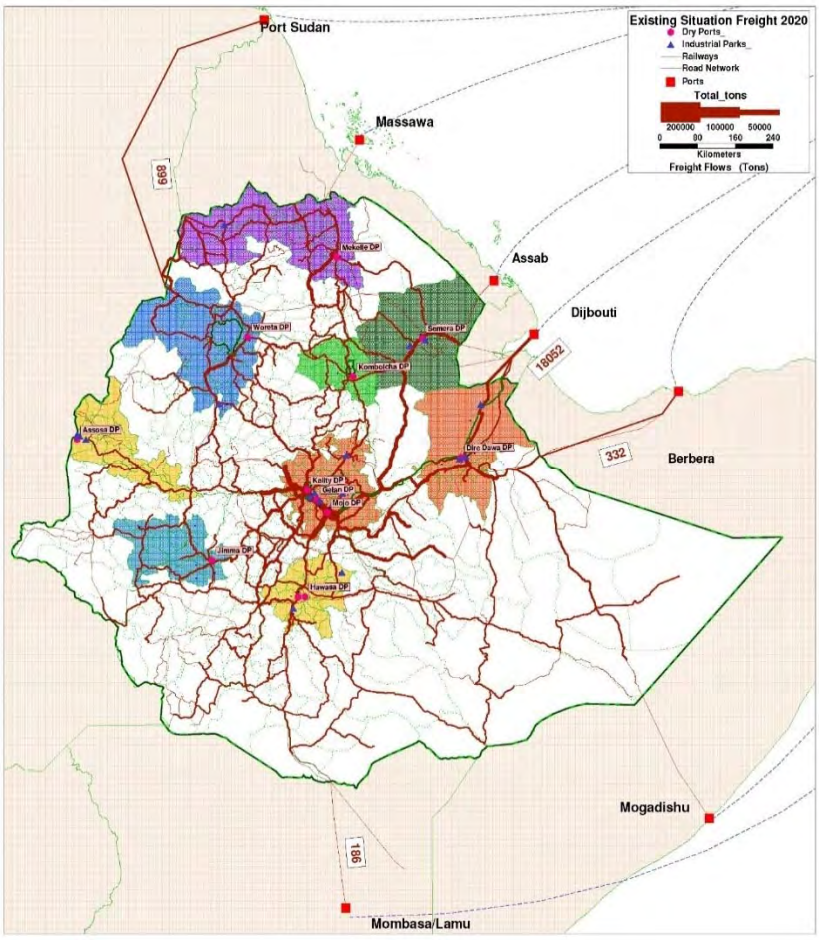
Following are the freight demand matrices and the assignments of freight flows at different years (2020, 2025, 2035 and 2050) for the three scenarios considered.

7.3 ASSIGNMENTS AT YEAR 2020

Table 19: Freight Matrix Present year 2020

LOGISITC Zones	Addis Ababa	Dire Dawa	Semera	Kombolsha	Mekelle	Bahar Dar	Asosa	Jimma	Hawassa	Assab Port	Djibouti Port	Berbera Port	Mombasa Port	Port Sudan	Tot (tons)
Addis Ababa		100	673	525	356	943	156	1,091	2,084	0	8,911	291	97	387	**15,613**
Dire Dawa	100		9	8	28	6	4	33	29	0	136	4	1	6	**364**
Semera	673	9		132	65	166	2	42	49	0	124	4	1	5	**1,271**
Kombolsha	525	8	132		42	45	3	112	28	0	26	1	0	1	**922**
Mekelle	356	28	65	42		5,013	5	33	22	0	298	10	3	13	**5,888**
Bahar Dar	943	6	166	45	5,013		12	37	9	0	197	6	2	9	**6,444**
Asosa	156	4	2	3	5	12		476	7	0	9	0	0	0	**676**
Jimma	1,091	33	42	112	33	37	476		450	0	63	2	1	3	**2,343**
Hawassa	2,084	29	49	28	22	9	7	450		0	110	4	1	5	**2,796**
Assab port	0	0	0	0	0	0	0	0	0		0	0	0	0	**0**
Djibouti Port	8,911	136	124	26	298	197	9	63	110	0		0	0	0	**9,873**
Berbera Port	291	4	4	1	10	6	0	2	4	0	0		0	0	**322**
Mombasa Lamu Port	97	1	1	0	3	2	0	1	1	0	0	0		0	**107**
Port Sudan	387	6	5	1	13	9	0	3	5	0	0	0	0		**429**
Tot (tons)	**15,613**	**364**	**1,271**	**922**	**5,888**	**6,444**	**676**	**2,343**	**2,796**	**0**	**9,873**	**322**	**107**	**429**	**47,050**

Figure 26: Freight assignment at year 2020



7.4 ASSIGNMENTS FOR THE GO-AHEAD SCENARIO

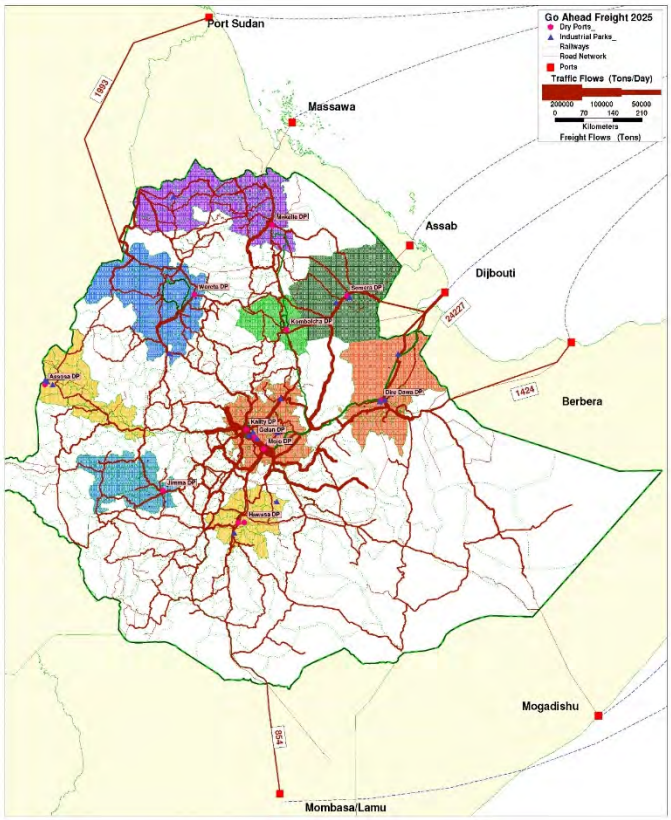
To be considered that matrices of the Go Ahead and Next Generation scenarios are the same. The difference is in the modal split of flows between road and rail transport.

7.4.1 Go Ahead scenario at year 2025

Table 20: Go Ahead Scenario 2025 (Freight)

LOGISITC Zones	Addis Ababa	Dire Dawa	Semera	Kombolsha	Mekelle	Bahar Dar	Asosa	Jimma	Hawassa	Assab Port	Djibouti Port	Berbera Port	Mombasa Port	Port Sudan	Tot (tons)
Addis Ababa		139	813	650	446	1,116	186	1,360	2,434	0	9,562	562	337	787	**18,393**
Dire Dawa	139		12	10	4,629	9	5	41	34	0	167	10	6	14	**5,075**
Semera	814	12		155	76	197	2	50	57	0	124	7	4	10	**1,510**
Kombolsha	650	10	155		50	52	4	141	33	0	27	2	1	2	**1,126**
Mekelle	447	4,623	77	50		6,041	6	41	26	0	285	17	10	23	**11,646**
Bahar Dar	1,120	9	199	52	6,043		13	47	10	0	195	12	7	16	**7,723**
Asosa	186	5	2	4	6	13		565	8	0	8	0	0	1	**799**
Jimma	1,360	41	50	141	41	47	565		537	0	65	4	2	5	**2,858**
Hawassa	2,433	34	56	33	26	10	8	537		0	111	7	4	9	**3,268**
Assab port	0	0	0	0	0	0	0	0	0		0	0	0	0	**0**
Djibouti Port	9,562	167	124	27	284	194	8	65	111	0		0	0	0	**10,541**
Berbera Port	562	10	7	2	17	11	0	4	7	0	0		0	0	**620**
Mombasa Lamu Port	337	6	4	1	10	7	0	2	4	0	0	0		0	**372**
Port Sudan	787	14	10	2	23	16	1	5	9	0	0	0	0		**868**
Tot (tons)	**18,398**	**5,069**	**1,510**	**1,126**	**11,651**	**7,714**	**799**	**2,859**	**3,270**	**0**	**10,544**	**620**	**372**	**868**	**64,800**

Figure 27: Freight Traffic Volumes Go Ahead 2025

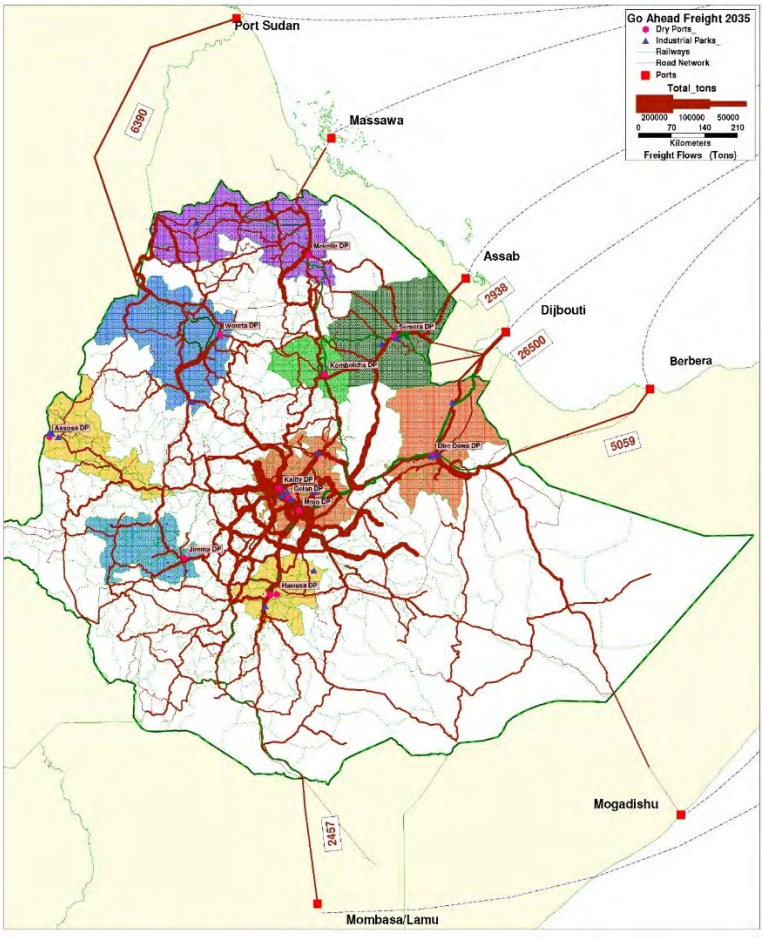


7.4.2 Go Ahead scenario at year 2035

Table 21: Freight Matrix Go Ahead 2035

LOGISITC Zones	Addis Ababa	Dire Dawa	Semera	Kombolsha	Mekelle	Bahar Dar	Asosa	Jimma	Hawassa	Assab Port	Djibouti Port	Berbera Port	Mombasa Port	Port Sudan	Tot (tons)
Addis Ababa	0	369	1,822	1,534	1,344	2,323	387	3,298	4,700	2,449	12,246	2,041	1,021	2,653	**36,188**
Dire Dawa	371	0	26	20	9,114	16	8	94	72	43	217	36	18	47	**10,081**
Semera	1,833	26	0	314	188	453	3	108	105	25	123	20	10	27	**3,234**
Kombolsha	1,541	20	313	0	103	96	7	341	68	6	29	5	2	6	**2,537**
Mekelle	1,365	9,023	191	104	0	12,692	10	116	59	72	361	60	30	78	**24,161**
Bahar Dar	2,359	17	467	98	12,693	0	19	142	17	43	217	36	18	47	**16,175**
Asosa	387	8	3	7	10	19	0	1,138	15	1	7	1	1	2	**1,598**
Jimma	3,297	93	107	341	113	136	1,133	0	1,106	14	69	12	6	15	**6,442**
Hawassa	4,687	71	104	68	57	16	15	1,100	0	23	114	19	9	25	**6,307**
Assab port	2,449	43	25	6	71	42	2	14	23	0	0	0	0	0	**2,674**
Djibouti Port	12,246	216	123	29	354	210	8	70	115	0	0	0	0	0	**13,370**
Berbera Port	2,041	36	20	5	59	35	1	12	19	0	0	0	0	0	**2,228**
Mombasa Lamu Port	1,021	18	10	2	30	18	1	6	10	0	0	0	0	0	**1,114**
Port Sudan	2,653	47	27	6	77	45	2	15	25	0	0	0	0	0	**2,897**
Tot (tons)	**36,250**	**9,984**	**3,238**	**2,534**	**24,212**	**16,102**	**1,594**	**6,452**	**6,334**	**2,677**	**13,384**	**2,231**	**1,115**	**2,900**	**129,006**

Figure 28: Freight Traffic Volumes Go Ahead 2035

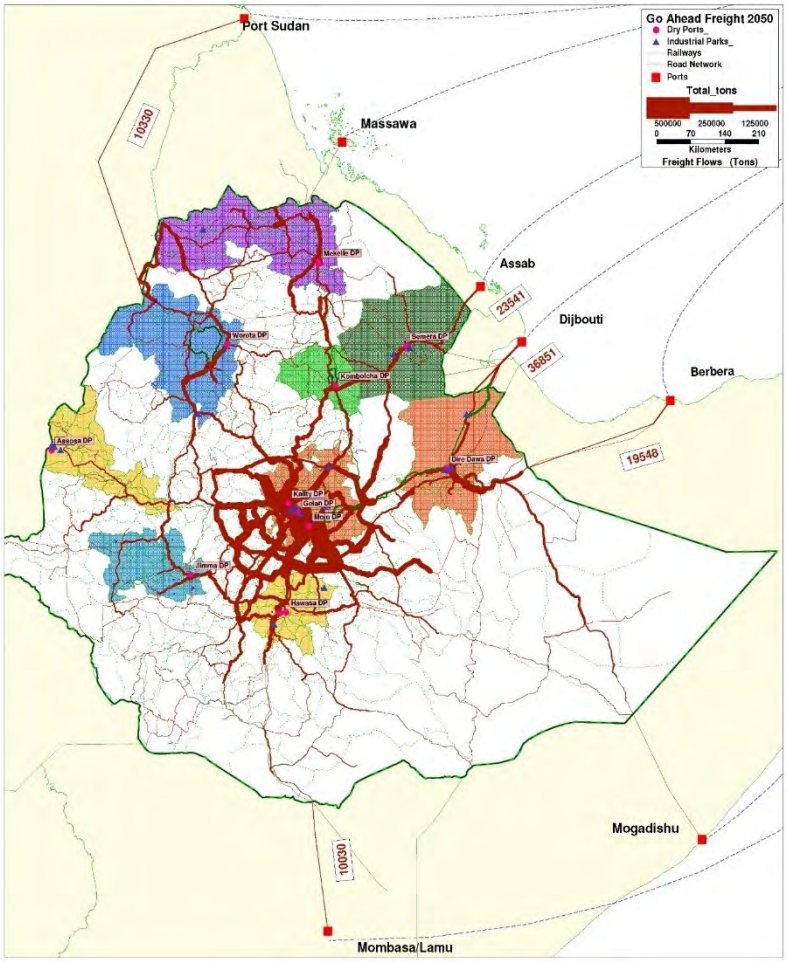


7.4.3 Go Ahead scenario at year 2050

Table 22: Freight Matrix Go Ahead 2050

LOGISITC Zones	Addis Ababa	Dire Dawa	Semera	Kombolsha	Mekelle	Bahar Dar	Asosa	Jimma	Hawassa	Assab Port	Djibouti Port	Berbera Port	Mombasa Port	Port Sudan	Tot (tons)
Addis Ababa	0	2,185	7,848	6,154	10,186	9,024	1,452	14,378	15,873	8,332	27,772	8,332	5,554	5,554	**122,644**
Dire Dawa	2,223	0	102	68	30,563	51	19	435	306	164	546	164	109	109	**34,860**
Semera	7,943	101	0	1,114	1,182	2,281	10	408	347	63	209	63	42	42	**13,805**
Kombolsha	6,202	68	1,107	0	365	276	22	1,418	228	15	50	15	10	10	**9,784**
Mekelle	10,555	29,779	1,224	377	0	41,360	35	776	291	348	1,161	348	232	232	**86,720**
Bahar Dar	9,270	52	2,381	287	41,533	0	37	866	47	151	502	151	100	100	**55,478**
Asosa	1,455	19	10	22	33	35	0	3,873	44	3	11	3	2	2	**5,513**
Jimma	14,398	426	402	1,418	740	818	3,846	0	3,873	36	120	36	24	24	**26,161**
Hawassa	15,764	296	338	223	275	45	43	3,824	0	57	191	57	38	38	**21,192**
Assab port	8,353	161	63	15	336	144	3	37	59	0	0	0	0	0	**9,171**
Djibouti Port	27,845	537	209	50	1,119	479	11	122	197	0	0	0	0	0	**30,569**
Berbera Port	8,353	161	63	15	336	144	3	37	59	0	0	0	0	0	**9,171**
Mombasa Lamu Port	5,560	100	40	8	220	90	2	20	38	0	0	0	0	0	**6,114**
Port Sudan	5,571	114	44	12	226	102	2	28	40	0	0	0	0	0	**6,139**
Tot (tons)	**123,500**	**34,001**	**13,832**	**9,763**	**87,116**	**54,848**	**5,485**	**26,223**	**21,403**	**9,169**	**30,563**	**9,169**	**6,113**	**6,113**	**437,295**

Figure 29: Freight Traffic Volumes Go Ahead 2050

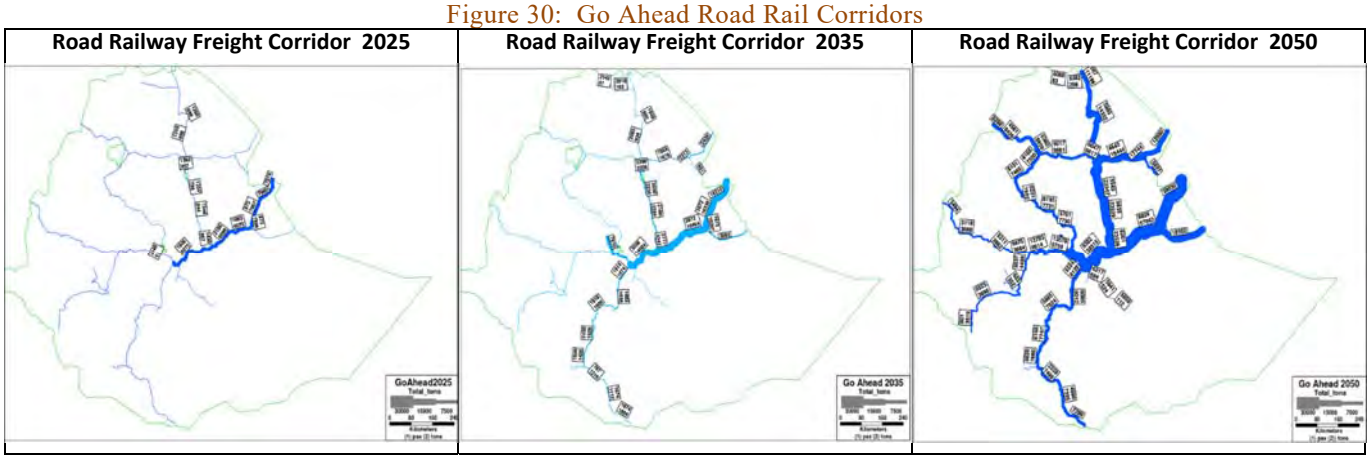


7.4.4 Go Ahead Scenario Freight Modal Split

Table 23: Go Ahead Scenario - Road Rail Freight Corridors (Modal Split)

	Next Generation				Next Generation	
	Corridor Fright By Road		Corridor Fright By Railway		Freight By Road	Freight By Railway
	Ton*Km	Average tons	Ton*Km	Average Tons	%	%
2025	27,062,073	14,980	6,822,226	5,538	73%	27%
2035	74,504,537	20,085	18,603,327	6,097	77%	23%
2050	398,309,057	63,531	74,857,751	13,215	83%	17%

Figure 30: Go Ahead Road Rail Corridors



7.5 ASSIGNMENTS FOR NEXT GENERATION SCENARIO

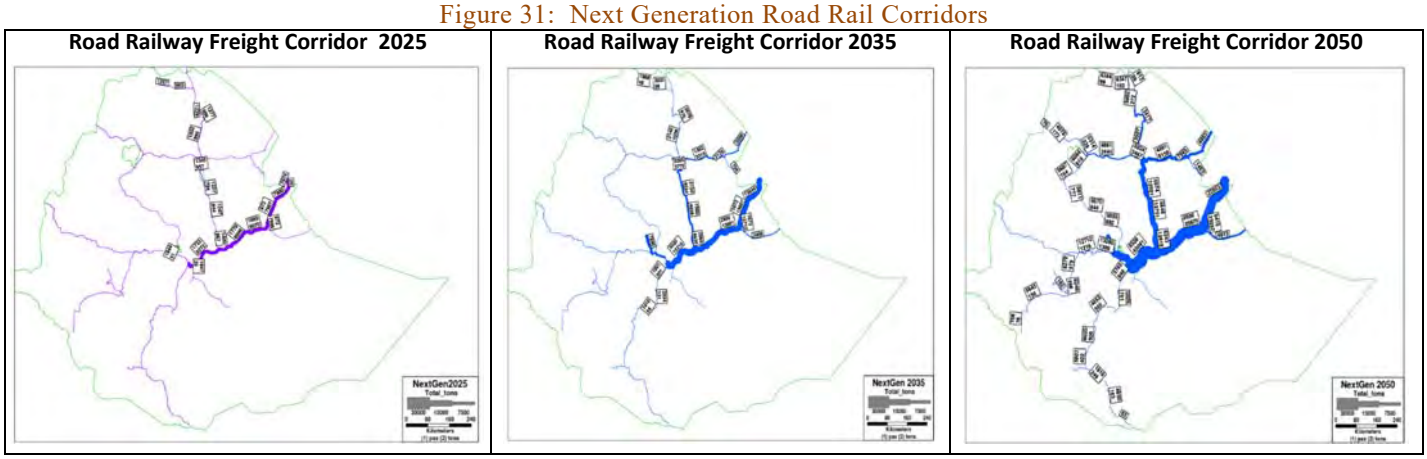
As it has already mentioned, the Go Ahead and Next Generation scenarios Matrices are the same. The difference is in the modal split of flows between road and rail transport.

7.5.1 Next Generation Scenario Freight Modal Split

Table 24: Next Generation Scenario - Road Rail Freight Corridors (Modal Split)

	Next Generation				Next Generation	
	Corridor Fright By Road		Corridor Fright By Railway		Freight By Road	Freight By Railway
	Ton*Km	Average tons	Ton*Km	Average Tons	%	%
2025	29,400,777	13,755	5,069,660	4,971	73%	27%
2035	71,790,257	19,545	11,594,668	5,546	78%	22%
2050	365,820,185	64,805	29,233,995	6,126	91%	9%

Figure 31: Next Generation Road Rail Corridors



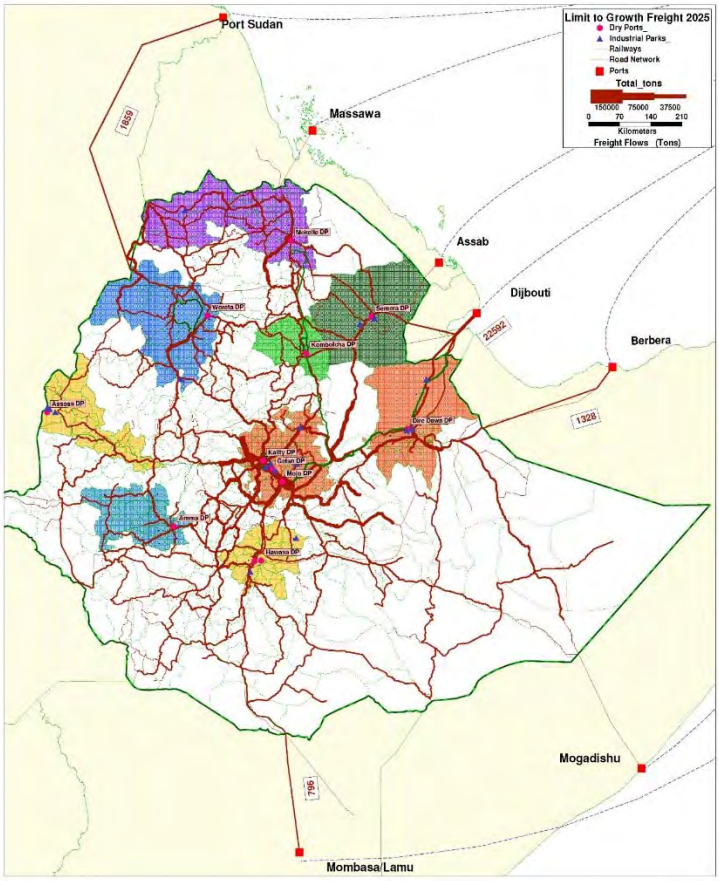
7.6 ASSIGNMENTS FOR LIMITS TO GROWTH SCENARIO

7.6.1 Limits to Growth scenario at year 2025

Table 25: Matrix Limit to Growth Scenario 2025 (Freight)

LOGISITC Zones	Addis Ababa	Dire Dawa	Semera	Kombolsha	Mekelle	Bahar Dar	Asosa	Jimma	Hawassa	Assab Port	Djibouti Port	Berbera Port	Mombasa Port	Port Sudan	Tot (tons)
Addis Ababa		111	734	578	400	1,020	170	1,206	2,205	0	8,841	520	312	728	**16,824**
Dire Dawa	111		10	9	31	6	5	36	31	0	134	8	5	11	**396**
Semera	737	10		143	70	179	2	46	52	0	118	7	4	10	**1,378**
Kombolsha	579	9	143		46	48	3	124	30	0	25	1	1	2	**1,012**
Mekelle	403	31	71	46		5,471	6	37	24	0	287	17	10	24	**6,425**
Bahar Dar	1,025	6	180	48	5,471		13	41	9	0	187	11	7	15	**7,013**
Asosa	170	5	2	3	6	13		517	8	0	8	0	0	1	**732**
Jimma	1,208	36	45	124	37	41	516		486	0	61	4	2	5	**2,565**
Hawassa	2,206	31	52	30	24	9	8	485		0	105	6	4	9	**2,968**
Assab port	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Djibouti Port	8,844	133	118	25	285	185	8	61	105	0	0	0	0	0	**9,764**
Berbera Port	520	8	7	1	17	11	0	4	6	0	0	0	0	0	**574**
Mombasa Lamu Port	312	5	4	1	10	7	0	2	4	0	0	0	0	0	**345**
Port Sudan	728	11	10	2	23	15	1	5	9	0	0	0	0	0	**804**
Tot (tons)	**3,573**	**394**	**1,375**	**1,012**	**6,419**	**7,005**	**731**	**2,564**	**2,968**	**0**	**9,765**	**574**	**345**	**804**	**50,799**

Figure 32: Freight Traffic Volumes Limit to Growth 2025

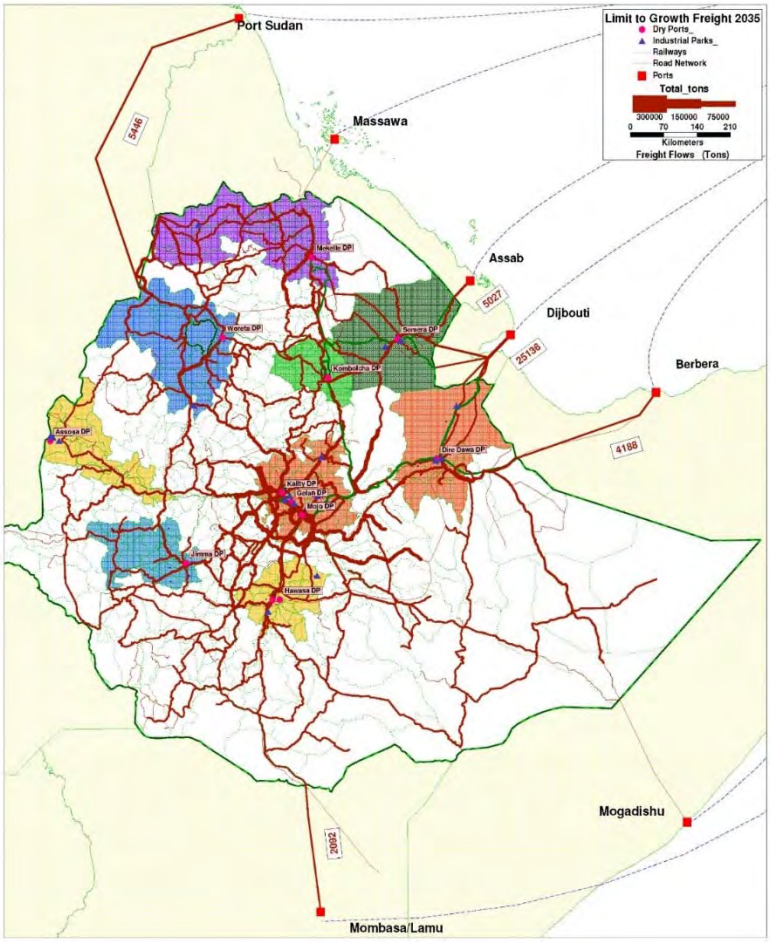


7.6.2 Limits to Growth scenario at year 2035

Table 26: Matrix Limit to Growth Scenario 2035 (Freight)

LOGISITC Zones	Addis Ababa	Dire Dawa	Semera	Kombolsha	Mekelle	Bahar Dar	Asosa	Jimma	Hawassa	Assab Port	Djibouti Port	Berbera Port	Mombasa Port	Port Sudan	Tot (tons)
Addis Ababa		245	1,433	1,197	994	1,868	312	2,546	3,832	2,066	10,330	1,722	861	2,238	**29,643**
Dire Dawa	246		17	15	65	9	7	71	56	32	160	27	13	35	**754**
Semera	1,444	17		257	145	350	3	86	87	22	110	18	9	24	**2,571**
Kombolsha	1,203	15	256		84	80	6	264	55	5	25	4	2	5	**2,006**
Mekelle	1,011	66	147	86		10,282	9	86	47	63	316	53	26	69	**12,260**
Bahar Dar	1,895	10	359	82	10,285		17	103	14	37	186	31	15	40	**13,076**
Asosa	313	7	3	6	8	17		930	13	1	7	1	1	2	**1,307**
Jimma	2,549	70	85	264	84	99	927		893	12	61	10	5	13	**5,073**
Hawassa	3,826	55	86	55	46	14	13	889		20	101	17	8	22	**5,152**
Assab port	2,066	32	22	5	62	36	1	12	20	0	0	0	0	0	**2,257**
Djibouti Port	10,332	159	110	25	311	180	7	61	102	0	0	0	0	0	**11,286**
Berbera Port	1,722	26	18	4	52	30	1	10	17	0	0	0	0	0	**1,881**
Mombasa Lamu Port	861	13	9	2	26	15	1	5	9	0	0	0	0	0	**941**
Port Sudan	2,239	34	24	6	67	39	2	13	22	0	0	0	0	0	**2,445**
Tot (tons)	**29,705**	**749**	**2,569**	**2,004**	**12,229**	**13,020**	**1,304**	**5,077**	**5,168**	**2,259**	**11,296**	**1,883**	**941**	**2,447**	**90,651**

Figure 33: Freight Traffic Volumes Limit to Growth 2035

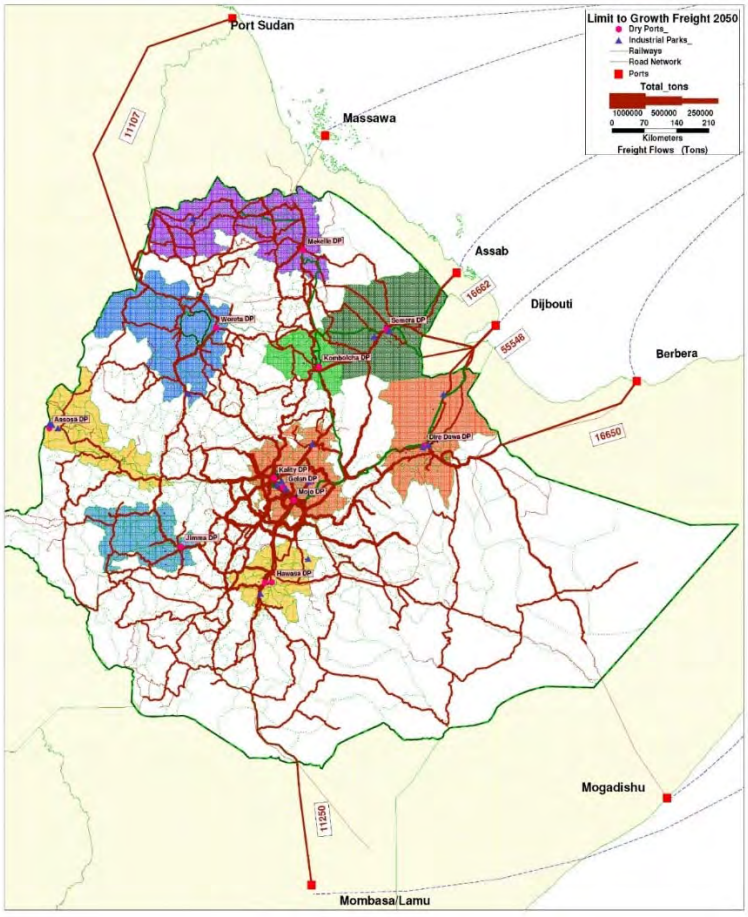


7.6.3 Limits to Growth scenario at year 2050

Table 27: Matrix Limit to Growth Scenario 2050 (Freight)

LOGISITC Zones	Addis Ababa	Dire Dawa	Semera	Kombolsha	Mekelle	Bahar Dar	Asosa	Jimma	Hawassa	Assab Port	Djibouti Port	Berbera Port	Mombasa Port	Port Sudan	Tot (tons)
Addis Ababa		1,437	6,202	4,964	7,638	7,216	1,175	11,347	12,938	7,093	23,645	7,093	4,729	4,729	**100,208**
Dire Dawa	1,459		64	53	405	28	17	329	235	121	404	121	81	81	**3,399**
Semera	6,282	64		913	902	1,759	8	328	284	55	184	55	37	37	**10,907**
Kombolsha	5,007	53	906		301	231	18	1,126	188	13	44	13	9	9	**7,918**
Mekelle	7,929	419	936	311		34,360	28	590	230	297	988	297	198	198	**46,780**
Bahar Dar	7,416	29	1,840	241	34,451		33	658	40	127	425	127	85	85	**45,558**
Asosa	1,178	17	8	18	27	31		3,178	37	3	10	3	2	2	**4,513**
Jimma	11,367	322	323	1,125	561	619	3,156		3,154	32	106	32	21	21	**20,838**
Hawassa	12,863	227	277	185	218	37	36	3,117		51	169	51	34	34	**17,297**
Assab port	7,110	119	55	13	285	121	3	32	52	0	0	0	0	0	**7,791**
Djibouti Port	23,701	398	184	44	950	404	10	107	173	0	0	0	0	0	**25,971**
Berbera Port	7,110	119	55	13	285	121	3	32	52	0	0	0	0	0	**7,791**
Mombasa Lamu Port	4,740	80	37	9	190	81	2	21	35	0	0	0	0	0	**5,194**
Port Sudan	4,740	90	35	13	200	90	25	65	20	1	20	1	1	1	**5,302**
Tot (tons)	**100,905**	**3,374**	**10,922**	**7,902**	**46,413**	**45,100**	**4,513**	**20,930**	**17,437**	**7,793**	**25,994**	**7,793**	**5,196**	**5,196**	**309,468**

Figure 34: Freight Traffic Volumes Limit to Growth 2050

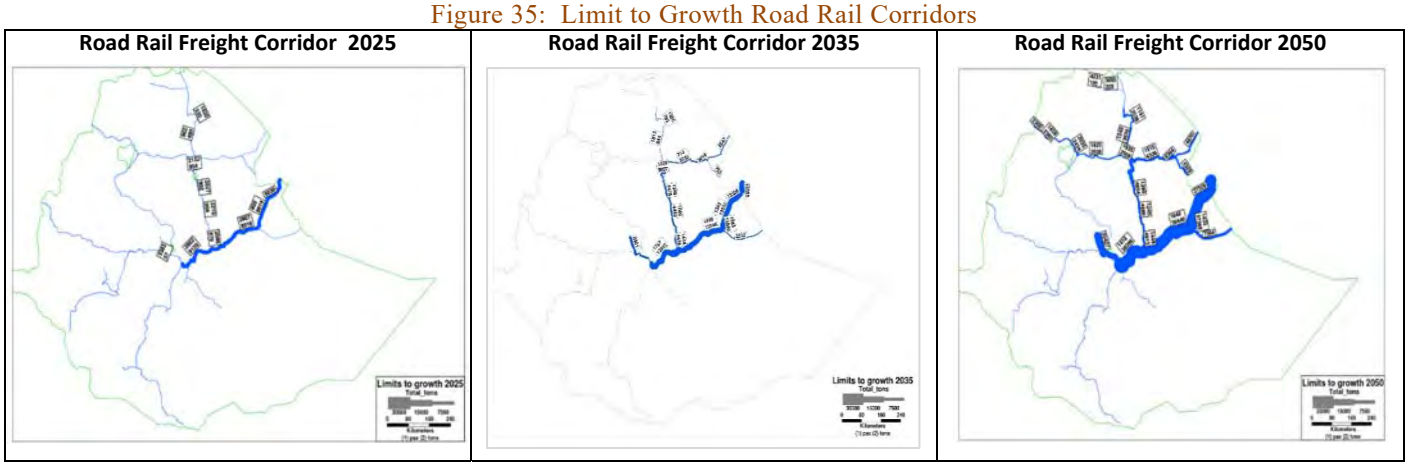


7.6.4 Limit to Growth Scenario Freight Modal Split

Table 28: Table 26: Growth Limit Scenario - Road Rail Corridor Freight Modal Split

	Limit to Growth				Limit to Growth	
	Corridor Fright By Road		Corridor Fright By Railway		Freight By Road	Freight By Railway
	Ton*Km	Average Tons	Ton*Km	Average Tons	%	%
2025	24,814,321	13,736	5,613,094	4,553	75%	25%
2035	48,559,438	18,727	11,751,262	6,073	76%	24%
2050	205,699,086	58,911	30,628,370	11,626	84%	16%

Figure 35: Limit to Growth Road Rail Corridors



8 LOGISTICS DEVELOPMENT

Ethiopia's economic development will heavily depend in future upon the capability to build efficient hard and soft trade-related infrastructure, whose costs are currently unacceptably high. While hard infrastructure refers to physical assets like transport corridors (roads, railways, ports and other transport facilities), soft infrastructure refers to the legal and regulatory frameworks, institutions and good policies supporting their effective exploitation, including the technological applications needed to operate them efficiently.

Following are the actions needed for the good development of the logistic sector of Ethiopia, concerning the hard infrastructures (diversifying access to seaports) and the soft infrastructures (improving the regulatory framework and the logistic operational performances)

8.1 DIVERSIFYING ACCESS TO SEAPORTS

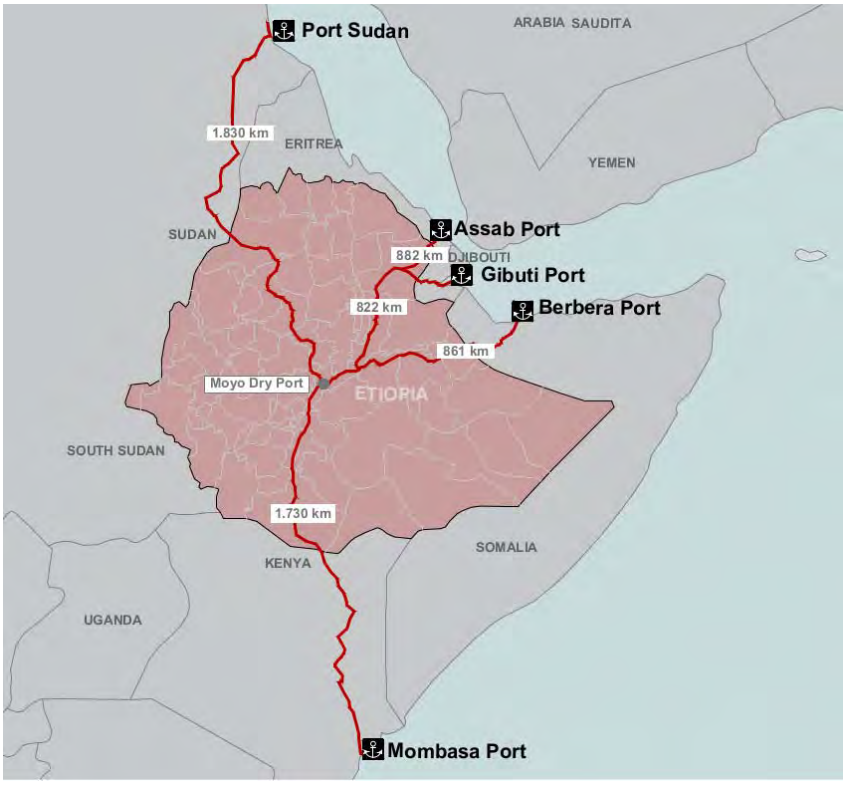
8.1.1 Dominance of the North-Eastern corridors (Trident)

The dependence on one port, in a foreign country, makes Ethiopia very vulnerable to any unexpected interruptions in supply. A recent publication on the *Journal of Transport and Supply Chain Management* "Optimal transit corridors for Ethiopia", analysed the logistic costs of three ports: Port of Djibouti, Mombasa Port and Port Sudan with Ethiopia's containerised and dry bulk cargo imports and calculated that the total logistics costs, including sea freight, port charges and land transport, of importing a TEU from Shanghai to Modjo dry port are around $3663 through Djibouti, $5032 through Mombasa Port and $8235 through Port Sudan. In particular Djibouti port has higher liner shipping connectivity, which is associated with lower freight rates. In addition, geographical proximity and railway connections to Modjo make the Port of Djibouti optimal for container shipping to Ethiopia.

Djibouti ports have invested a lot in the last years and continue to improve port services and access roads (RN1, RN18, etc.) so the Djibouti corridor is the predominant corridor and will remain in the future for Ethiopia import/export trade. Moreover, an extension of road and rail infrastructure from Addis south-west till Raad border will enlarge the area served by this corridor to the landlocked South Sudan, transforming Ethiopia also in a transit country.

With appropriate investments also the ports of Berbera and Assab can participate in this north-east south-west important **Trident axis**, diversifying the possible Ethiopian trade gateways, with partial new infrastructure investment and profiting of Addis – Adama – Modjo expressway/railway and the dominant dry port of Modjo. The Trident will assure the access at three different ports (the nearest ones) which belong to three different nations (Djibouti, Eritrea, Somaliland), stimulating the competitiveness between them and ensuring Ethiopian trade against possible future emergency in one or two of the transit countries.

Figure 36 : Distance of the Modjo dry ports from ocean ports



8.1.2 *Serving different areas of the country*

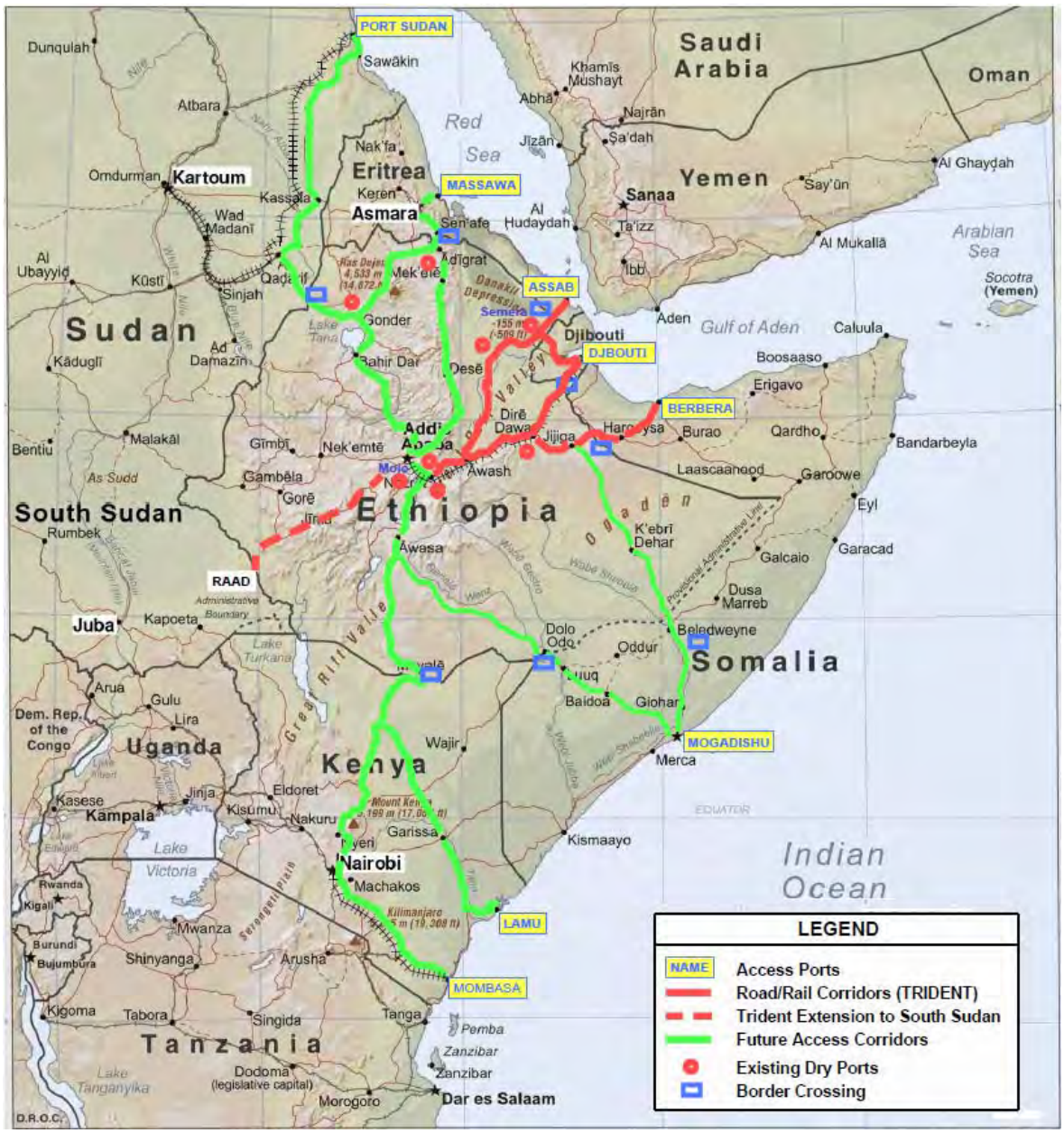
On another side, considering the large geographical size of Ethiopia other transit corridors and seaports can be utilised for different regions of the country and for handling dry bulk and liquid bulk cargos. For example, soil fertiliser might be imported through Port Sudan to Wereta for northern Ethiopia, through Lamu Port (Kenya) to Hawassa for southern Ethiopia and through the Port of Djibouti to Adama for east and central parts of the country.

In addition, further efforts should be made to ensure sustainable access to the seaports of several neighbouring countries, with particular emphasis on seaports within a short geographical distance from the country's economic centre. These ports are Djibouti, Berbera in Somaliland and Assab and Massawa in Eritrea.

In a longer perspective, the Ethiopia areas that are farer from the Trident, could have alternatives abbesses to other regional ports.

- Northern areas of Ethiopia, namely Tigray and Gonder area could be connected to Massawa port and Port Sudan with road and a new railway. Existing dry ports in Woreta and Mekelle.
- Southern part of Southern regions could be connected to Kenya ports Lamu & Mombasa. New dry port foreseen in Hawassa.
- South-eastern area of Ogaden could be finally in the long term connected to Mogadishu port, via Dolow or Ferfer border posts. Dry ports should be created inland Ethiopia along these routes.

Figure 37: Diversifying Port Access for Ethiopia trade

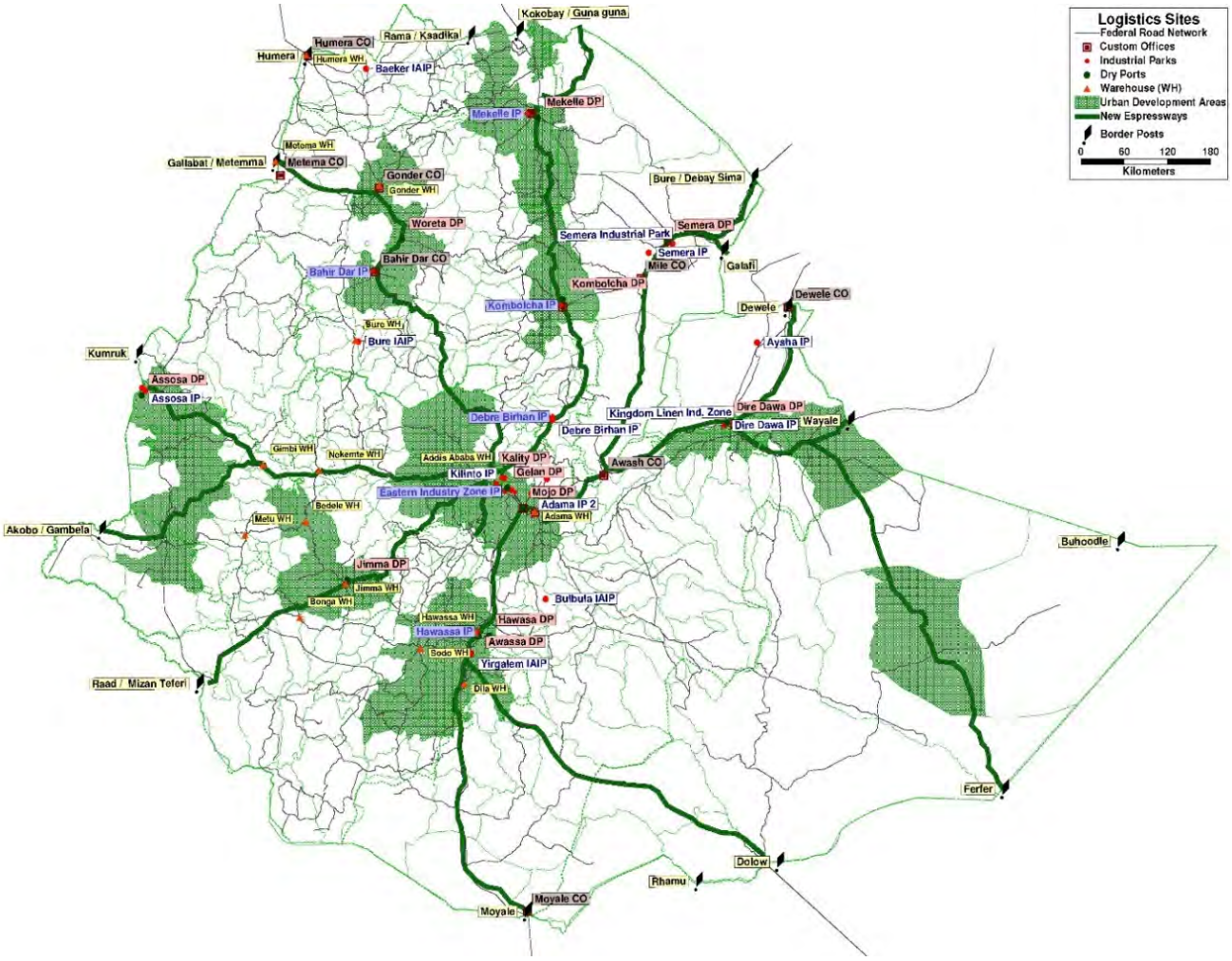


8.1.3 *New Dry Ports location*

The MoT FYP and TYP ask for the construction of 3 additional dry ports in Assosa, Jimma, Awassa and others to reach up to 20 dry ports. The new dry ports should be connected with the regional trade corridors, the Ethiopia spatial planning areas and the existing and future industrial and agro-industrial parks. A specific study should then be carried out analysing the main trade commodities production, collection and import/export and distribution, in order to identify the best location for complementary freight terminals, warehouses, cold stores.

In paragraph 2.2.3 are listed the present boarder post and custom offices. In paragraph 2.2.5 the location of the 8 existing dry ports already active and in in paragraph 4.5.1 and 4.5.2 the location of present industrial and agro-industrial parks.

Figure 38: Dry Ports and Border Posts



Future Logistic sites (Dry Port and Industrial parks)

Other Logistic poles (Dry Ports) and industrial, agricultural and manufacturing sites have been planned to support economic and social growth along the corridor development areas.

In particular, in the short term (2025) the realization of 3 Dry Port and 3 Industrial Park:

- Hawassa Dry Port
- Assosa Dry Port
- Jimma Dry Port
- Bole Lemi Industrial Park 2
- Kilinto Industrial Park
- Dire Dawa Industrial park.

In the medium and long term (2035/2050) the following Agro-Industrial and Industrial Parks are planned:

Year 2035:

- Baeker IAIP (Integrated Agro Industrial Park)
- Yirgalem IAIP (Integrated Agro Industrial Park)

- Bure IAIP (Integrated Agro Industrial Park)
- Bulbula IAIP (Integrated Agro Industrial Park)

Year 2050:

- Adama Industrial Park 2
- Semera Industrial Park
- Assosa Industrial Park
- Aysha Industrial Park
- Kingdom Linen Industrial Zone.

Border Crossing and Custom Offices

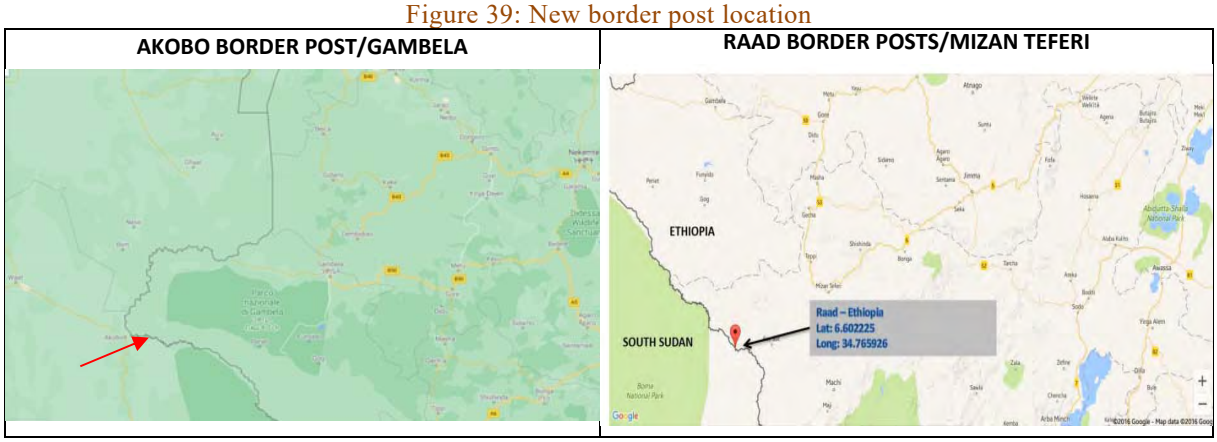
Customs offices where goods are declared for import, with their points of entry, are listed in paragraph 2.5.3, but other four additional Border Crossings points are to be added.

Table 29: Border Crossing & Transit Country

Border Crossing point	Transit Country
Buuhoodle	Somalia
Khatumo State	Somalia
Togo Wayaale	Somalia
Dewele	Djibouti
Galafi	Djibouti
Gallabat	Sudan
Metemma	Sudan
Humera	Eritrea
Qaysān, QēssanKormuk	Sudan
Moyale	Kenya
Doolow	Somalia
Ferfer	Somalia
Dolow	Somalia
Akobo/Gambela	**South Sudan**
Raad /Mizan Teferi	**South Sudan**

With reference to the new expressways proposed by the consultant, two additional Border posts should be established at the border with South Sudan.

Figure 39: New border post location



NEW border Post – South Sudan/Ethiopia according to the FINAL FEASIBILITY REPORT- RAAD ONE STOP BORDER POSTS (TRADE AND TRANSPORT FACILITATION STUDY OF THE KAMPALA-JUBAADDIS ABABA-DJIBOUTI CORRIDOR – 2015)

Besides the infrastructural and physical improvements also the **policy measures** have to be recalled.

The main concern of the logistics sector's policy is that of market liberalization in order to make

private operators to inject their money and entrepreneurial skills in the sector's development. The most important issues to be faced under this topic are: i) an effective process of multimodal licenses issuing and, ii) a clear positioning about the dry port's development and management model. This latter issue calls for a choice between an approach based on some vertical integrated operators and another based on different operators using the same network of freely accessible dry ports. Both points also require a review of the mission of the public company in the sector, ESLSE, in order to allow it to act with a clearer and conflict-free mandate in the various fields of action (land transport, maritime transport, intermodal transport).

8.1.4 Pre-investment Studies for Transit Corridor Development

Each of the actions identified in the preceding paragraphs for port access diversification, need to undergo a specific detailed technical, economic, social and environmental study focusing on the following areas:

a) Examine volume and cost of overseas transportation (air, land, ocean and by cargo type)
b) Review transport infrastructure endowment survey (truck terminals, road & rail facilities to ports, connectivity with Djibouti and other ports, transhipment facilities, etc.), including organization, location of port, port facilities, cargo handling equipment/ appliances, transhipment facilities, customs office, inland container depot and warehousing facilities, parking/loading/unloading areas and banking services
c) Examine road and rail connections to major ports in the region of Africa and points of entry/exit in the country
d) Examine the need for warehouse facilities to cater for container packing and unpacking operation and for storage of bonded cargo prior to custom clearance for both import and export.
e) Propose arrangements for registration and licensing of freight forwarders, customs clearing agents and shipping agents, facilitating the inland movement of sea borne containers from gateway ports to inland cities
f) Propose an inland distribution system for sea borne containers and improve service quality of the container inland distribution market
g) Examine alternatives far concessioning of land port operation to private sector
h) identify areas for knowledge sharing, networking and dissemination of good practices
i) evaluate the management structure for existing and future investments, such as the potential for private sector financing and management, and public-private partnerships

8.1.5 Capacity building

The implementation of the Transport Logistic Strategy & Policy needs to be assisted by a technical assistance and capacity development to the relevant institution(s) of the Government of Ethiopia dealing with transport and logistics, with the aim of;

- ***Transfer of knowledge on logistics and transport best practices:*** provide technical assistance to the responsible government body/ies to implement the logistics strategy, to improve the existing logistics system to international standards and modernize the transport services to better facilitate logistics (including for instance mode share to rail, inter-modality, axle overloading control, vehicle standards, road safety, time, etc.).
- ***Technical Support on defining and implementing the logistics reforms:*** provide data evidence and contributing to bringing the reform of the logistics sector higher in the political agenda, ensuring the participation of CSOs in the policy making process and accelerate its pace

Support on defining and monitoring relevant corridors' performance indicators and standards: to improve the monitoring and data collection (including environmental/climate performances and road safety), contribute to improving environmental and safety standards.

8.2 IMPROVING CROSS-BORDER TRANSPORT REGULATION

8.2.1 Logistic Performance of Ethiopia

Apart from the dependence from one unique trade corridor, Ethiopia logistic system presents many non-physical barriers (regulatory, financial, information flows, etc.). The poor performance of the Ethiopian logistics sector is evidenced by the World Bank indexes: Logistic Performance Index (LPI) and Doing Business which are quite low also in comparison with other East Africa countries.

Table 30: Logistics Performance Index 2018 ranks for Eastern African countries

Country	LPI Overall Score	LPI 2018 Rank	Customs Rank	Infrastructure Rank	International Shipment Rank	Logistic Rank	Tracking & Tracing Rank	Timeliness Rank
Sudan	2,43	121	136	125	102	96	115	139
Ethiopia	2,38	126	80	133	102	117	133	149
Eritrea	2,09	155	137	152	154	146	145	159
Djibouti	2,63	90	113	60	118	135	72	85
Somalia	2,21	144	145	157	100	121	140	157
Kenya	2,81	68	67	79	99	64	56	79
Uganda	2,58	102	76	124	78	99	123	110
Rwanda	2,97	57	64	65	29	60	86	61
Burundi	2,06	158	159	146	139	117	156	158
Tanzania (*)	2,99	61	60	60	63	58	60	64

Source: LPI, 2018

Table 31: EDB, Trading across Borders component rank for Eastern African countries

COUNTRY	Trading across Borders		EXPORT					IMPORT				
				Border compliance		Documentary compliance			Border compliance		Documentary compliance	
	Rank	Score	Type	Time (hours)	Cost (USD)	Time (hours)	Cost (USD)	Type	Time (hours)	Cost (USD)	Time (hours)	Cost (USD)
Sudan	185	19.0	port	180	967	190	428	port	144	1093	132	420
Ethiopia	159	56.0	land	51	172	76	175	land	72	120	194	750
Eritrea	188	0.0	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Djibouti	147	59.4	port	72	605	60	95	port	118	1055	50	100
Somalia	166	51.6	port	44	495	73	350	port	85	952	76	300
Kenya	117	67.4	land	16	143	19	191	port	194	833	60	115
Uganda	121	66.7	land	59	209	24	102	land	145	447	96	296
Rwanda	88	75.0	land	83	183	30	110	land	74	282	48	121
Burundi	169	47.3	land	59	109	120	150	land	154	444	180	1025
Tanzania	182	20.2	port	96	1175	96	275	port	402	1350	240	375

Source: World Bank, Ease of Doing Business 2020

At the same time Ethiopia is ranked as the least integrated nation on the productive side in the COMESA Region and the country with the worst trade complementarity, despite being considered as the best macroeconomically integrated nation in the HoA Region (see next Table).

Table 32: Integration status in the HoA countries

County	Kenya	Djibouti	Ethiopia	Somalia	Eritrea
Regional Integration	0,674	0,537	0,413	0,404	0,205
Rank	2	3	4	5	8
Trade Integration	0,566	0,549	0,475	0,297	0,317
Rank	2	3	4	7	6
Productlye Integration	0,813	0,200	0,043	0,175	0,166
tank	2	3	8	4	5
Macroeconomic Integration	0,377	0,309	0,853	0,352	0,249
Rank	4	7	1	5	8
Infrastructural Integration	1,000	0,718	0,539	0,279	0,157
Rank	1	2	4	6	7
Free movement of people	0,654	1,000	0,061	1,000	0,117
Rank	4	1	8	1	7

Source: Africa Regional Integration index

One of the barriers to trade in Africa and in particular in the Horn of Africa, besides the transport connectivity, are the **Non-Tariff Barriers (NTBs),** i.e., any barrier to trade other than import and export duties, like import bans, government monopolies, cumbersome documentation requirements and restrictions resulting from prohibitions, conditions or specific market requirements that make the importation or exportation of products difficult and/or costly.

According with Danilo Desiderio (*Trade Integration & Facilitation Reforms in the Horn of Africa 2020),* the existence in the HoA of many administrative hurdles, lengthy border crossing processes, restrictions to the movement of vehicles and persons and the overreliance on manual processing of paper forms at borders are a consequence of: 1) the lack of harmonization between the policies and regulatory frameworks of HoA countries in the areas of customs, trade and transport, as well as of 2) the lack of collaborative mechanisms for identification, monitoring and resolution of such barriers.

8.2.2 The National Logistics Strategy

In 2019 the Federal Government demonstrated a clear awareness of the above problems, issuing a focused paper, the **National Logistics Strategy** (NLS) which carried out a detailed assessment of the operational / administrative conditions of the sector and identified the main strategies to be pursued as follows:

1. Transform logistics service delivery and operator's efficiency
2. Develop and strengthen logistics sector policies and legal frameworks
3. Institute an efficient and reliable transit and customs system
4. Implement reliable trade and finance system to enhance logistics facilitation role
5. Develop logistics infrastructures
6. Strengthen regulators institutional capacity, qualifications of human capital and create efficient government.

In order to implement the NLS, the Federal Government recently issued the National Logistics Policy (March 2020) which stated the following policy objectives:

- Transform the logistics sector in order to have efficient leadership, organizational set up and procedures.
- Open the logistics sector for competition and enhance the involvement of the private sector.
- Integrate the logistics sector with other sectors and avail job creation opportunities.

The principles underlying the policy objectives are to ground the logistics sector on a competitive basis and to adopt the suitable information technologies to enhance reliability and efficiency of services. This means, for instance, to set up favourable conditions for private operators' investments or service providing also involving potential investors in railways, dry ports, port terminals, logistics services. In the National Logistics Policy, the issues of logistics policy concern the organization of the sector, the set of services provided, the procedural aspects of services' provision.

The establishment of the National Logistics Council (chaired by the Ministry of Transport) is the main **organizational measure** to be implemented, in order to cope with the statement of the National Logistics Policy of leading the logistics sector in an integrated manner. As **services** are concerned, each different phase of the logistics chain is involved.

For maritime services, the focus is to support ESLSE to restructure its organizational set up and service delivery by designing different approaches and strategies. The interest of the government is to have a National Carrier and become a service provider under the NVOCC (Non-Vessel Owner Common Carrier) arrangement.

For dry ports services (and development) the policy measures will focus on:

- Opening up Dry Port Development and Services to Private Investors. (Currently all dry ports in Ethiopia are constructed by the Government (ESLSE), all services are exclusively rendered by ESLSE);
- Putting down Common Use Facility Arrangement in Dry Ports. (Under the ownership of ESLSE, common use facility will be applied in dry ports);
- Join investments on Dry Ports (ESLSE will work with private investors with either joint investment arrangements or partnership arrangements).

For Multimodal services, face to the 'de-facto' monopoly of ESLSE, the Government has a belief to create additional multi-modal operators. The obstacle here is not purely legal, as it concerns a real implementation commitment. As the services' provision are concerned, the crucial policy measures involve, again, the role of ESLSE because its monopolistic status hampers the ability of private operators to operate under FOB Procedures and, moreover, to act in an efficient way in providing services. This field of action concerns mainly the **procedural aspects** of the process of services' provision, which are clearly described in the National Logistics Policy (Logistics Sector Procedure).

Ethiopia's logistics sector has recently been opened up to international logistics service providers by allowing joint ventures for freight forwarding and shipping agency services between Ethiopian and foreign investors, where the foreign investor owns a maximum of 49% (FDRE 2020; Investment Commission 2018). Furthermore, as stipulated in the country's national logistics strategy and policy, the government of Ethiopia has promised step-by-step liberalisation of the maritime sector and multimodal transport to admit international logistics operators (Ministry of Transport and EMAA 2019, 2020).

8.2.3 Non-tariff barriers in Ethiopia

The Ethiopian government has planned the establishment of a National Trade Facilitation Committee that is expected to conduct an assessment of existing NTBs and bottlenecks hampering Ethiopian trade, including analysis on divergences in axle load regulations, vehicle configuration standards and quality and security standard with neighboring countries that are common members of COMESA and other Regional Economic Communities. This Committee is also expected to offer support to the government in the acceleration of the accession to the World Trade Organization (WTO). In this respect, it was also pointed out that this Committee will need financial and technical support, with particular regard to the alignment of the national legislation and regulation with the provisions of the WTO Trade Facilitation Agreement and especially of the "Category C" ones (provisions requiring, in order to be implemented, the acquisition of technical assistance and support for capacity building).

Anyway, main challenges remain: i) need to improve quality and management of logistic infrastructures, like border posts, dry ports, ICT, railway services, etc. ii) non-competitive environment for shipping, multimodal service, road transport, packaging, warehousing, freight-forwarding and other logistics areas that are so far exclusively reserved for Ethiopian nationals.

8.2.4 Regulatory Issues to be solved

Regulatory issues, present in Ethiopia, but common also in other Africa countries, to be resolved, are:

UNHARMONIZED AXLE LOAD LIMITS

Unharmonized axle load limits, gross vehicle weights and/or maximum vehicle dimensions represent a significant regulatory burden for transport operators, as they encourage transhipment at borders. When these limits in the territory of a neighbouring country are lower, trucks cannot continue their trip and have to offload cargo at the border or in its proximity, so that it can be

transferred on other vehicles of the destination country for delivery at destination. In some cases, it may be necessary to split cargo in two or more consignments that are thereafter picked up by two or more trucks. As transhipment operations at border posts are in most cases manually conducted, transhipment cost further escalates transport costs, acting as a deterrent to trade. At regional level, many RECs in Africa have harmonised such limits, but they still significantly differ among different RECs. An example is the case of Ethiopia, which has implemented its own axle load limits that are not fully harmonized with COMESA, as shown in the following table6. Another example is the Somaliland State, where maximum allowable load is up to 30 tonnes, much less than the maximum permissible weight allowed in COMESA

Table 33: Comparison of Ethiopia and COMESA Vehicle Axle Load Limits

Vehicle Configuration	Vehicle Axle Load Limits (Tons)	
	Ethiopia	COMESA
Single steering axle	8 Tons	8 Tons
Single load or drive axle	10 Tons	10 Tons
Tandem	17 Tons	16 Tons
Tridem (Triple Axle Group)	Up to 10 tons each (30 Tons)	24 Tons
Maximum permissible Gross Vehicle Weight	58 Tons	56 Tons

CROSS-BORDER TRUCKING

In the East African Community (EAC), a Regional Agreement governing trucking operations in the Region is in force since 1998. Originally concluded by Kenya, Tanzania, and Uganda with the name of "Tripartite Agreement on Road Transport" (abbreviated with the acronym "TAORT"), the agreement has subsequently become applicable to Burundi, Rwanda and South Sudan too, as a consequence of their accession to the EAC. Renamed "EAC Agreement on Road Transport", this instrument facilitates traffic through transit routes connecting the EAC partner States' territories, urging them to harmonize technical standards on safety, fitness and dimensions of vehicles and vehicle combinations; as well as of loads on vehicles. The Agreement also establishes the mutual recognition of roadworthiness certificates and engages the EAC partner States to implement a harmonized cross-border road charging system or road transit charges to be reviewed as the need arises in a framework acceptable to all partner states. Currently, in the EAC, transporters can move freely from a country to another without any restriction. For cross-border transport of goods in transit, a transit license must be obtained by the Revenue Authorities of each EAC Partner State which is valid within the entire Region. To this end, revenue authorities issue different types of licenses: some of them allows trucks to transport exclusively transit goods (in this case, they include a prohibition to carry local goods, as shown in the next figure), while others allow the transport of both transit goods and local goods, on condition that these two categories of cargo are kept separated in the vehicle. Ethiopia is not a signatory of this Regional Agreement.

COMESA CARRIER'S LICENSE

The COMESA Carrier's License allows transport companies with commercial vehicles registered in a COMESA country to operate in other COMESA member States on the basis of a regionally-recognised license, without the need to obtain a cross-border road permit for each country where they enter. Although both Ethiopia and Kenya have agreed to apply this measure, Ethiopian authorities do not allow Kenyan commercial vehicles to enter their territory for picking up or delivering cargo without a temporary cross-border road permit, whose validity is usually 15 days that must be shown to Customs at both arrival and exit from the Ethiopian border. The permit can be requested only in Addis Ababa, at the central headquarters of the Ministry of Transport of Ethiopia. The Ministry of Transport, on the other hand, accepts the relevant applications only from Ethiopian licensed importers, who therefore act as intermediaries of Kenyan transport companies in the request of the permit. Once issued, the Ethiopian importer has to deliver the original copy of

the permit to the Kenyan driver, which is usually done by engaging other transporters that travel from the Ethiopian capital to the border. According to Ethiopian authorities, this permit is asked to Kenyan drivers in order to avoid that the vehicles introduced in Ethiopia are sold after their entry in their territory, so evading customs duties, and also because import of right-handed vehicles is prohibited.

CARGO INSURANCE

Cargo insurance is reported as high in many African countries, like in Ethiopia or Zimbabwe, where it significantly contributes to increasing the cost of transport. Premiums for insurance of cargo are not only influenced by security conditions of the road, but also by regulation. In Ethiopia, for instance, the Licensing and Supervision of Insurance Business Proclamation N° 86/1994 (Article 8) and the Notice of the National Bank N° 1/1977 of 5 January 1977, establish that a cargo insurance can be given in Ethiopia only by a national insurance company, except in those cases where the capacity or the insurance cover required is not available locally. Because of this restriction, transporters from neighbouring countries entering in Ethiopia (where the insurance of cargo is mandatory), in addition to the insurance concluded in their country need to obtain a second, separate, insurance policy with an Ethiopian insurance company in order to have the transportation risks covered on the Ethiopian roads. On the other hand, in Ethiopia, most of insurance companies do not cover the risk of transport out of the country.

8.3 IMPROVING LOGISTICS PERFORMANCES

The logistics sector in Ethiopia is highly fragmented and less efficient than in other sub-Saharan African countries. This fragmentation is mainly due to the characteristics of the transport industry in the country: around 95% of the traffic volumes are carried by road where the services are managed by some larger logistics companies and a large number of small transport operators, which in turn manage fleets of vehicles that are old and inadequate by modern standards, expensive to run and with low payload and utilization rates. One of the consequences of this industry structure is truck overload, indicated by the National Logistics Strategy of the Government, with an average truck utilization rate of transport companies operating on the Djibouti corridor of 2.5 trips per month. In addition, Ethiopian transport companies offer in most cases only basic transport and customs clearance services which do not include other auxiliary value-added logistics services that are highly demanded by the import / export community, such as warehousing, consolidation and packaging services. Finally, very few logistics operators have invested in tracking, cargo and fleet management systems capable of optimizing routes and increasing vehicle utilization, thus reducing their overall operating costs.

8.3.1 Old vehicle fleet and low utilisation rate of trucks

An old vehicle fleet is known to have high operating costs due to increased fuel consumption and vehicles maintenance needs. Old trucks are also expensive to operate, slow to load/unload, and many studies have also shown that they have a higher frequency of accidents because of the lower vehicle safety standards. Consequently, they heavily contribute to congestion of roads and to road accidents[5]. Moreover, old vehicles lack equipment that could help expedite transit transport. For instance, in many cases these vehicles cannot be sealed or cannot be fitted with cargo-tracking devices.

A consequence of the long delays encountered by transport companies in Africa along road corridors, is that they can use their vehicles only for a limited number of cross-border trips. Low vehicle utilization erodes profit margins, because fixed operating costs can be spread over a small

5 Rechnitzer, G., Haworth N., Kowadlo, N. "The effect of vehicle roadworthiness on crash incidence and severity", Monash University Accidents Research Centre, Victoria (Australia), Report No. 164, 2000

number of trips[6]. This situation obviously pushes transporters to raise their fares to offset their low revenues, with the relevant costs that are passed to consumers, through their in the final price of goods on the destination market. The problem of underutilisation of trucks along African road corridors has been further exacerbated by the COVID-19 pandemic because of the many travel restrictions and border closures and increased mandatory health controls that have further slowed down the flow of goods between States.

The main reason for the reduced truck utilisation along most of African corridors is the high waiting times spent by truckers in navigating along such routes which, in turn, is due to the following reasons:

1) the non-immediate availability of cargo and the difficulty of finding return cargo once completed the trip on the first leg of a road corridor;
2) the need to complete lengthy and cumbersome port/border post procedures and related paperwork;
3) the high number of truck stops, e.g., for weighting trucks and scanning cargo at both the port exit gates and border posts or for controls at checkpoints mounted by multiple government agencies, such Customs and other security forces.

On the other hand, road corridors where truck turnaround time is higher are mainly those where:

a) OSBPs are established at border posts (as exit and entry procedures are jointly carried out by the border agencies of adjoining countries, a practice that significantly reduces border post processing time and accelerates clearance of goods);
   - ♦ where there are few trucks stops for completing control, weighting or cargo scanning procedures; and
   - ♦ where Electronic Cargo Tracking Systems (ECTSs) are implemented. ECTSs, as explained further on in this report, keep transit traffic moving along corridors as there is no necessity to stop trucks for inspection at every border post, saving a considerable amount of time[7].

On average, on the main road corridors linking two or more States or crossing the boundaries of one national territory, truck turnaround time ranges from 3 to 5 trips per month. Along the Northern Corridor, for instance, the truck utilisation rate (round trip) is of 3 trips per month for a transport along the Mombasa (Kenya)-Kampala (Uganda)-Mombasa section and along Mombasa-Kigali (Rwanda)-Mombasa, and 2 trips per month for a transport Mombasa-Bujumbura (Burundi)-Mombasa, Mombasa-Goma (DRC)-Mombasa and Mombasa-Juba (South Sudan)-Mombasa8. Another example is the Djibouti-Addis Ababa corridor, connecting Djibouti to Ethiopia via the Galafi border post, where the average truck turnaround time is 2,5/3 trips per month.

8.3.2 Imbalanced trade and empty truck trips

The problem of imbalanced trade flows and empty trips, which as indicated above is a consequence of the unbalanced nature of African trade, is common to all the African corridors. A recent study conducted by the Northern Corridor Transit and Transport Coordination Authority (NCTTCA), the Central Corridor Transit Transport Facilitation Agency (CCTTFA) and TradeMark East Africa

6 Fixed costs are those which must be borne by transport company irrespective of whether their trucks are used or not, or of their frequency of use. This category includes the drivers' salaries, general structural costs (administrative, commercial, IT, etc.), insurance costs, administrative costs (permits, road hauliers' registration or permits, etc.). Variable costs, on the other hand, are those that vary in proportion to the transport operation to be conducted (the more the vehicle operates, the higher these costs are: a typical example is fuel, the cost of tyres, motorway tolls, vehicle maintenance).

7 The European Union's European Development Fund (EDF) for ACP Group of States, "Technical Note on Intelligent Transport Systems Concepts and Gap Analysis Methodology for Smart Corridors in Africa", Addis Ababa, May 2016.

8 Source: Northern Corridor Transport Observatory Report, 11th Issue, November 2017.

(TMEA)[9], for instance, points out that on both corridors, exports represent only 14% of the total trade commercial vehicle movements, against the 86% of imports. As a consequence, nearly 70% of trucks moving to the seaports of Mombasa and Dar es Salaam to pick cargo, travel empty. In order to rebalance these traffic flows, the use of digital logistics solutions and truck aggregator models is recommended. To this purpose, the report invites member States to promote the use of web-based and/or uber-like apps capable to facilitate the matching supply and demand of transport services.

Conversely, if the transport from the seaport to the inland destination is arranged by a transport company in the neighbouring country (like in the case of Ethiopian logistics companies picking up cargo at the Djibouti port), the problem is the opposite: the transport company must find a shipment to deliver to the seaport, in order to avoid travelling empty on the first leg of the trip. This situation is particularly serious for landlocked countries, where usually transport companies cannot easily access to cargo arriving on vessels docking at ports of neighbouring coastal States for delivery in their territories. This difficulty for transport companies in landlocked countries to find cargo at seaports of neighbouring States often compels them to join transport cartels, or truckers' associations in their home country that usually have branches at the ports in coastal states that procure them back loads[10]. This practice, which is widespread especially in Western and Central Africa, is also common to some countries in regions where road transport is more liberalised, like in Tanzania[11] and Mozambique[12], where transporters in some cases operate as cartels, facilitating the access to loads, particularly at ports, to their members. Sometimes, such associations or groups also engage in unofficial practices that further impede foreign transport operators to directly access to loads at ports. For instance, it has been reported that Zambian transport companies delivering cargo at the Dar es Salaam port are not allowed to directly access to loads destined to Zambia (in order to find a return load), without passing through Tanzanian intermediaries, that charge commissions for this service that can reach up 20% of the value of cargo[13].

TRAILER-SWAP AND CONTAINER-SWAP

Two practices that are used in many areas of the world to avoid trucks to travel back with an empty container and, more generally, to avoid transhipment at borders, are the trailer-swap and container-swap. Basically, these operations consist in the use of articulated or container trucks that stop at the border so that the load is unhooked from the motive unit and hooked by another motive unit in the country of destination that delivers cargo at its final destination. Once the motive unit unhooks the trailer or container at the border, the driver can look for other cargo to transport back, which is usually easier, because of the widespread presence of commercial activities at borders.

Trailer-swap and container-swap are particularly cost-efficient as they avoid time-consuming, tedious and unproductive transhipment operations at borders, but are rarely used along African corridors. The study "Efficient Cross-Border Transport Models" published by the United Nations for Economic and Social Commission for Asia and the Pacific (UNESCAP) in 2015 analyses in detail these operations, concluding that they are very efficient and a more reliable choice compared to manual transloading, which is considered the most time-consuming freight transport arrangement. The main reason is that most of the trucks involved in cross-border transport in Africa are not adequate for these operations, as they imply, as mentioned above, the use of

9 NCTTCA, CCTTFA, TradeMark East Africa (TMEA), "Greenhouse Gas Inventory for the Northern and Central Corridors", 2021.

10 As Raballand and Teravaninthorn (2009) suggest, in regulated environments, as in West and Central Africa, companies and truckers predominantly join a trucking association knowing that without this membership getting a load would be much more difficult. On the other hand, in a deregulated environment, as in East Africa, membership is less important since sales depend on the individual professionalism of a company and not on being part of the existing system of cartels or truckers' associations.

11 Ncube, P., Roberts S., and Vilakazi T., 'Study of Competition in the Road Freight Sector in the SADC Region: Case Study of Fertilizer Transport and Trading in Zambia, Tanzania and Malawi'. Centre for Competition, Regulation and Economic Development (CCRED) Working Paper 2015/3.

12 Vilakazi T. and Paelo A., "Understanding intra-regional transport Competition in road transportation between Malawi, Mozambique, South Africa, Zambia, and Zimbabwe", United Nations University World Institute for Development Economics Research (UNU-WIDER), Working Paper 2017/46, March 2017.

13 Interview with the Chartered Institute of Logistics and Transport (CILT), Zambia, 2 November 2020.

articulated14 or of container trucks. To this end, specific incentives could be introduced by African governments to encourage transport companies to replace their trucks with articulated vehicles, including fiscal incentives on vehicle taxes, and specific reductions on road usage fees. Transit tolls could also be reduced on articulated vehicles consisting of a combination of both national head with foreign registered trailers and vice versa, in order to encourage the use of swapping operations.

8.3.3 Low use of digital solutions

According to Knight Frank Logistics Africa 2016 report[15], in Sub-Saharan Africa's the cost of transport takes up 50-75% of the retail price of goods. Apart from the poor infrastructure, inefficient procedures at border points and the high port and border crossing congestion, two factors that also indicated as significantly contributing to the high logistics cost in Africa are the lack of trucks and to an unpredictable lead time to deliver goods. Hence, the conclusion that in Africa there is an increasing need to utilize limited resource such as trucks more effectively, in particular by leveraging on new technologies. To this end, GPS devices, container and cargo tracking services and fleet management systems can be useful tools to optimize routes and vehicle utilization, so reducing overall operating costs of transport companies. These are however tools that are still little used.

FLEET MANAGEMENT SYSTEMS

The market research firm Berg Insight[16], in a recent research report points out that in Sub-Saharan Africa, the use of Fleet Management Systems (FMSs), with the exception of South Africa and – to a lesser extent - Northern Africa, is very limited. The report mainly analyses the use of FMSs in South Africa, where the fleet telematics market is far ahead of the rest of the continent in terms of adoption[17], but includes an outlook on the rest of the African market where, it concludes, these systems have generally a low penetration rate.

In East Africa FMSs are registering a progressive expansion as well. According to a 2016 UN-WIDER (United Nations World Institute for Development Economics Research) Working Paper[18], the level of utilization of FMSs by East African fleets is quite high, particularly in Kenya and Rwanda, where half of the transport companies with fewer than 10 trucks are equipped with such systems. The paper concludes that except in Tanzania, where fleets still lag behind in the use of such technology, East African countries are rapidly catching up South African companies in terms of productivity, fleet age, and use of GPS devices and tracking.

An FMS is a software system or IT platform that serves to track and manage commercial fleets of vehicles, such as cars, vans, trucks or even heavy equipment to ensure they are utilized safely, efficiently and professionally. FMSs collect, store and provide complete comprehensive information about the state of vehicles and cargo, the route history, as well as the driver driving habits (e.g. speed, mileage, fuel usage, truck utilization), so allowing transport companies to oversee fleet performance and maintenance needs, which in turn leads to increased fleet efficiency and reduced operational costs and transport time.

A recent report published by Allied Market Research, however warns that installation cost for a

14 Articulated trucks are made up of a motive unit plus a semi-trailer.

15 https://content.knightfrank.com/research/1114/documents/en/2016-4022.pdf

16 http://www.berginsight.com/ReportPDF/ProductSheet/bi-fmseries2019-ps.pdf

17 The number of active fleet management systems deployed in commercial vehicle fleets in South Africa was estimated at 1.6 million at the end of 2018 with a grow forecast of 15.0 percent per year. This number is expected to reach 3.2 million by 2023.

18 Charles Kunaka, Gaël Raballand, Mike Fitzmaurice, "How trucking services have improved and may contribute to economic development - The case of East Africa", United Nations University World Institute for Development Economics Research, WIDER Working Paper 2016/152, December 2016.

fleet management system can be high, reaching up to $100 for advanced tier system[19], which makes them unaffordable for small transport companies with a few trucks, considering that additional costs to be incurred for ensuring connectivity in terms of telecom service charges[20]. These costs, however, are in part mitigated by incentives that in many African countries insurance companies often provide for companies adopting such systems, in terms of reduced insurance premium costs that would otherwise be prohibitive without such systems.

DIGITAL LOGISTICS

Logistics in Africa has recently started a change path with the digitalization of logistics operations. In particular, the advent of marketplace solutions and the development of truck aggregation models aimed at facilitating connection between shippers and available drivers are contributing to decrease transport prices and to increase predictability in delivery of cargo. Such solutions also increase security and reliability in transporting goods as they allow cargo owners to track and monitor the status of their shipment all along their routes where it moves, which is notoriously difficult to control in Africa.

Digital logistics represents an important opportunity for improving and reducing transport costs in Africa, and can contribute to solve the problem of finding return cargo. According to a joint report published by the International Finance Corporation (IFC) and Google[21], poor infrastructure and logistics add between 40% and 60% to the cost of goods in Africa and e-logistics providers, which are spreading rapidly, can play a key role in reducing such cost. The main advantage they offer is due to the fact that cargo owners/shippers registered to the system can post an offer of available load to which truck operators can access without any brokers or intermediaries. Such a way all intermediation costs are completely eliminated. Another value-addition of digital operations is the efficient use of data analytics, as such data can suggest to both cargo owners and transporters ways for further improving the efficiency of transporting goods. For example, aggregated data produced by such systems can tell cargo owners which is the better routing or better time for departure of cargo, or can allow them to cope with port congestion more efficiently by deploying their fleet in a timely manner. Lastly, logistics platforms enable shippers and available drivers to conclude quickly a transport contract without the need of filling any paper form, phone calls or complex price negotiations, being the cost of the transport automatically determined by the system. Examples of e-logistics providers currently offering truck aggregation solutions are **TAI+**[22] and **Sendy**[23], which are active in Kenya**, Lori Systems**[24], a cloud-based platform launched in Kenya and Uganda that is now used in other 8 countries in Africa, **Truckr**[25] in Ghana and **Kobo360**, in Nigeria[26] and Cloud-Fret in North Africa[27]. All these e-logistics providers allow truck drivers use an app for taking charge of the transport requests, choosing cargoes according to their nature, volume, weight, and on the basis of pickup location and drop-off location. Once the load is accepted, drivers are bound to the price that is calculated by system.

Conversely, an example of web platform aggregating supply and demand of transport services is

19 FMS include both low-end tracking systems, such as Stolen Vehicle Recovery (SVR) with basic fleet management features, and most advanced solutions where an on-board computer is installed in the vehicle wirelessly collects and transmits important information, including vehicle location and status, driver identity, fuel usage, distances travelled, as well as trip start and end points..

20 Allied Market Research, "Smart Fleet Management Market by Mode of Transportation, Application, Connectivity, and Operation: Opportunity Analysis and Industry Forecast, 2020–2027", 2020.

21 IMF, Google, e-Conomy Africa 2020

22 https://www.tai-plus.com

23 https://www.sendyit.com

24 https://www.lorisystems.com/

25 http://www.truckrtech.com

26 https://www.kobo360.com

27 https://cloudfret.com

the NFLIP (National Freight and Logistic Information Portal) portal[28], online marketplace for freight and logistic stakeholders in Tanzania which was launched in December 2019 by the Tanzania Private Sector Foundation with the support of Trademark East Africa (TMEA). The portal allows cargo owners to publish their requests for transportation of cargo and to transport service providers to find cargo to transport.

CONTAINER AND CARGO TRACKING SYSTEMS FOR GOODS IN TRANSIT

Container and cargo tracking systems are widely spreading in Africa for the transport of goods in transit across the various regions. As many countries in the continent have no direct access to the sea, in many cases cargo needs to be imported through the seaports of other nations by transiting through one or more foreign countries before it reaches its final destination, where customs duties, VAT and other related taxes have to be paid.

In the transiting countries, on the other hand, the movement of cargo occurs under suspension of customs duties and other import levies. This gives rise to the risk that during this journey, the whole or part of cargo is diverted to irregular destinations, so evading the payment of all such taxes. This is why customs authorities in such countries must take precautions so that this does not happen, which is usually done by escorting the shipment from the point of entry in their territory up to the point of exit.

Electronic Cargo Tracking Systems (ECTS) are tools that allow Customs to monitor electronically the movement of transit cargo in their national territory without the need of arranging physical escorts. By avoiding risks of diversion of goods in not authorized places, ECTSs also reduce delays and transit time for these goods, with substantial cost savings for transport companies. Security is increased as well, as ECTSs facilitate real time responses from Customs and other authorities that often deploy field patrols or rapid response units along the transit routes to quickly intervene in the event of attempted highway thefts and accidents. However, although these systems in Africa have had a positive impact in terms of reduction of transport costs, they have not led to a complete elimination of customs escorts, that are still required in many countries and regions, especially for sensitive goods (i.e. goods attracting high duties or taxes, such as excises for instance). ECTSs should also eliminating the need for bonds or guarantees on transit cargo, due to reduced risk perception by Customs, as these technologies make real time enforcement of violations by transiting vehicles possible. This, however, is not the case in many African countries and Regions, where goods moving in transit still requires to be secured via a transit bond, despite they are armed with an electronic seal and monitored via an ECTS.

In the EAC Community, for instance, a **Regional Electronic Cargo Tracking System (RECTS)** is implemented along the Northern corridor since 2018 from the place of loading (departure) to destination within Kenya, Rwanda, and Uganda. Subsequently, the system has been extended to the road section connecting Nairobi to Moyale at the border between Kenya and Ethiopia and to the Central Corridor. Since the commissioning of the system, Kenya Revenue Authorities calculated an improvement in transit time from 11 days to 4 days and a drastic reduction in cases of diversion of goods which result in major loses in duty and tax[29].

Currently, a regional electronic **Corridor Trip Monitoring System (CTMS)** is being developed by the Tripartite that will in future be integrated with the RECTS, to allow Customs and other regulatory and law enforcement agencies to track the driver, crew and truck movements against pre-approved route plans and to record and monitor driver wellness data such as COVID-19 test results. The CTMS is being developed and deployed in a phased manner and is being piloted on a section of the Trans Kalahari Corridor between Botswana, Namibia and South Africa, a section of the

28 https://www.nflip.co.tz

29 https://www.kra.go.ke/en/media-center/blog/429-leveraging-on-the-regional-electronic-cargo-tracking-system-for-fair-trade-facilitation

Namibia-Ndola Zambia-Kasumbalesa DRC Corridor and a section of the North-South Corridor covering South Africa, Botswana, Zambia up to the Kasumbalesa border post. Thereafter, the CTMS will be rolled out to other corridors in the Tripartite region based on Member States preparedness. In the COMESA Region, the CTMS replaces a previous system called **COMESA Virtual Trading Facilitation System (CVTFS)**, which has been abandoned because embraced so far only by a few countries.

In the ECOWAS Region a project called ALISA, subsequently renamed "**SIGMAT**" (*Système Interconnectè de Gestion des Marchandises en Transit*) was launched in March 2019 and initially piloted in Cote d'Ivoire, Burkina Faso, Benin and Togo (and more recently, implemented along the Dakar-Bamako Corridor) for the electronic tracking of the movement of transit goods along some key regional corridors in West Africa. The system also allows ECOWAS customs administrations to dematerialize transit procedures, by replacing the paper-based transit documents exchanged between the customs offices of departure, arrival and transit with a system of electronic messages.

Ethiopia has implemented an ECTS system for goods in transit, although not mandatory, on the Ethiopian section of the Djibouti-Addis Ababa corridor, while more recently, after conclusion of a pilot phase launched in October 2019, the Republic of Congo has developed a new Electronic Cargo Tracking System (ECTS) called "**Ekengue**" (which means "vigilance" in the Lingala language), to ensure that goods moving from the port of Pointe-Noire in transit along Congolese road corridors for reaching other countries in Central Africa are not diverted to unauthorised places, so evading the payment of customs duties and other import taxes. The system, which led to the removal of Customs escorts along the Congolese transit corridors, is based on a GPS/GSM/GPRS tracker that is applied by Customs to containers or to the driver's cab (in case of vehicles transporting bulk cargo), once the truck enters into Congo, which is removed at the border of exit from the country[30].

8.4 TRANSPORT MODES INTEGRATION

The logistic sector needs to be fully integrated with all other modes of transport**. Intermodal freight transport** is the concept to be applied, involving the transportation of freight in an intermodal unit, container or vehicle, using multiple modes of transportation (e.g., rail, ship, aircraft, and truck), without any handling of the freight itself when changing modes. The organized intermodal method reduces cargo handling, and so improves security, reduces damage and loss, and allows freight to be transported faster. Reduced costs over road trucking are the key benefit for inter-continental use.

8.4.1 Containers

Containers are the basis of an organized multimodal transport. An intermodal container or ISO container has the dimensions defined by ISO standards. The three common sizes are:

- one TEU – 20-by-8-foot (6.1 m × 2.4 m) × 8-foot-6-inch (2.59 m)
- two TEU – 40-by-8-foot (12.2 m × 2.4 m) × 8-foot-6-inch (2.59 m)
- highcube−40-by-8-foot (−12.2 m × 2.4 m) × 9-foot-6-inch (2.90 m).

Handling equipment are specifically designed for container inter-modality, transferring containers between rail, road and sea. These equipment can include:

- Gantry crane for transferring containers from seagoing vessels onto either trucks or rail wagons. A spreader beam moves in several directions allowing accurate positioning of the cargo. A container crane is mounted on rails moving parallel to the ship's side, with a large boom spanning the distance between the ship's cargo hold and the quay.

30 The manual of use of the Ekengue system is available at https://douanes.gouv.cg/assets/downloads/Saisie%20en%20ligne%20des%20Bordereaux%20de%20Suivi%20Electronique.pdf

- Straddle carriers, and the larger rubber tyred gantry crane are able to straddle container stacks as well as rail and road vehicles, allowing for quick transfer of containers.
- Grappler lift, which is very similar to a straddle carrier except it grips the bottom of a container rather than the top.
- Reach stackers are fitted with lifting arms as well as spreader beams for lifting containers to truck or rail and can stack containers on top of each other.
- Side-lifters are a road-going truck or semi-trailer with cranes fitted at each end to hoist and transport containers in small yards or over longer distances.
- Forklift trucks in larger sizes are often used to load containers to/from truck and rail.
- Flatbed trucks with special chain assemblies such as QuickLoadz can pull containers onto or off of the bed using the corner castings.

8.4.2 Transportation modes

CONTAINER SHIPS

Container ships are used to transport containers by sea. These vessels are custom-built to hold containers. Some vessels can hold thousands of containers. Their capacity is often measured in TEU or FEU. These initials stand for "twenty-foot equivalent unit," and "forty-foot equivalent unit," respectively. For example, a vessel that can hold 1,000 40-foot containers or 2,000 20-foot containers can be said to have a capacity of 2,000 TEU. After the year 2006, the largest container ships in regular operation are capable of carrying in excess of 15,000 TEU. Onboard ships they are typically stacked up to seven units high.

A key consideration in the size of container ships is that larger ships exceed the capacity of important sea routes such as the Panama and Suez canals. The largest size of container ship able to traverse the Panama canal is referred to as Panamax, which is presently around 5,000 TEU. A third set of locks is planned as part of the Panama Canal expansion project to accommodate container ships up to 12,000 TEU in future, comparable to the present Suezmax. Very large container ships also require specialized deep-water terminals and handling facilities. The container fleet available, route constraints, and terminal capacity play a large role in shaping global container shipment logistics.

RAILWAYS

In North America, containers are often shipped by rail in container well cars. These cars resemble flatcars but the newer ones have a container-sized depression, or well, in the middle (between the bogies or "trucks") of the car. This depression allows for sufficient clearance to allow two containers to be loaded in the car in a "double stack" arrangement. The newer container cars also are specifically built as a small articulated "unit", most commonly in components of three or five, whereby two components are connected by a single bogie as opposed to two bogies, one on each car. Double stacking is also used in parts of Australia. On some older railways, particularly in the United Kingdom, the use of well cars is necessary to carry single stacked large containers within the loading gauge.

It is also common in North America to transport semi-trailers on railway flatcars or spine cars, an arrangement called "piggyback" or TOFC (trailer on flatcar) to distinguish it from container on flatcar (COFC). Some flatcars are designed with collapsible trailer hitches so they can be used for trailer or container service. Such designs allow trailers to be rolled on from one end, though lifting trailers on and off flatcars by specialized loaders is more common. TOFC terminals typically have large areas for storing trailers pending loading or pickup.

If the rail line has been built with sufficient vertical clearance, then double-stack rail transport can be used. Where lines are electrified with overhead electric wiring double stacking is normally not

possible. The mandatory requirement to fit under overhead wire for the traction engine electrical power supply sets the height limit for the railcars to allow for trailer transport. This requires a certain low building height which led to a minor size of wheels for the railcars. Hence increased degradation of bogeys by wheel wear-out is a cost disadvantage for the system.

When carried by rail, containers can be loaded on flatcars or in container well cars. In Europe, stricter railway height restrictions (smaller loading gauge and structure gauge) and overhead electrification prevent containers from being stacked two high, and containers are hauled one high either on standard flatcars or other railroad cars. Taller containers are often carried in well wagons (not stacked) on older European railway routes where the loading gauge (especially with the reduced gauge for UK lines) is particularly small.

Narrow gauge railways of 610 mm (2 ft) gauge have smaller wagons that do not readily carry ISO containers, nor do the 30-foot (9.14 m) long and 7-foot (2.13 m) wide wagons of the 762 mm (2 ft 6 in) gauge Kalka-Shimla Railway. Wider narrow gauge railways of e.g. 914 mm (3 ft) and 1,000 mm (3 ft 3+3⁄8 in) gauge can take ISO containers, provided that the loading gauge allows it.

TRUCKS

Trucking is frequently used to connect the "linehaul" ocean and rail segments of a global intermodal freight movement. This specialized trucking that runs between ocean ports, rail terminals, and inland shipping docks, is often called drayage, and is typically provided by dedicated drayage companies or by the railroads. As many rail lines in the United States terminate in or around Chicago, Illinois, the area serves as a common relay point for containerized freight moving across the country. Many of the motor carriers call this type of drayage "crosstown loads" that originate at one rail road and terminate at another. For example, a container destined for the east coast from the west will arrive in Chicago either via the Union Pacific or BNSF Railway and have to be relayed to one of the eastern railroads, either CSX or Norfolk Southern.

BARGES

Barges utilising ro-ro and container-stacking techniques transport freight on large inland waterways such as the Rhine/Danube in Europe and the Mississippi River in the U.S.

PLANES

Generally modern, bigger planes usually carry cargo in the containers. Sometimes even the checked luggage is first placed into containers, and then loaded onto the plane. Of course because of the requirement for the lowest weight possible (and very important, little difference in the viable mass point), and low space, specially designed containers made from lightweight material are often used. Due to price and size, this is rarely seen on the roads or in ports. However, large transport aircraft make it possible to even load standard container(s), or use standard sized containers made of much lighter materials like titanium or aluminium.

8.5 LOGISTIC INNOVATION

Innovation in the logistics focus essentially in the use of ICT. The logistic sector is very competitive so, it is essential keep up-to-date on the latest logistic innovations. Today's expectations of fast and affordable delivery are encouraging more research and development on logistics technology and automation. Logistic innovations represent changes and improvements in logistics services from warehousing to fulfilment, to last-mile delivery. Here is an overview of the top logistics innovations in 2021 that impact will impact the ecommerce supply chain.

8.5.1 On-demand warehousing

On-demand warehousing connects online brands that need to store inventory and fulfil orders on a temporary basis with warehouses that have excess space. On-demand warehousing is ideal for businesses that need warehousing storage but don't want to make an investment in managing a warehouse. It also is a cost-effective and flexible fulfilment solution. Though it's an affordable option, it sometimes lacks vetted fulfilment providers and doesn't provide the level of visibility into operations, with a tech-enabled third-party logistics provider.

8.5.2 Last-mile delivery

Last-mile delivery refers to the stage when a carrier picks up orders from a distribution hub or warehouse and delivers it to the final destination. The goal of last-mile delivery is to deliver orders to customer quickly and effectively. Faster delivery is no longer a thing of the past but expected from customers due to the standards set by names like Amazon and Walmart Marketplace. To ensure customer satisfaction, it is important to make sure that the company has a handle on its delivery process. The sooner a customer receives their package, the happier they will be. Cost is a big factor. 28% of an online brand's bottom line comes from last-mile delivery costs.

8.5.3 Warehouse management systems

With so many processes happening simultaneously in any single warehouse, a warehouse management system (WMS) is important for efficient supply chain management in 2021 and beyond. Warehouse management refers to the overall observation of operations in a warehouse. Keeping track of things such as receiving, tracking, and storing inventory, as well as training staff, managing shipping, workload planning, and monitoring the movement of goods is very important for success. A WMS is designed to improve supply chain efficiency and provide complete visibility into operations.

8.5.4 Automation potential

Automating in-house operations processes reduces manual work and saves on logistics costs by automating time-consuming tasks. Automation also frees up time for the logistics team, so they can focus on how to improve workflows with automation in mind.

Every part of the supply chain offers automation of some sort. For instance, automated fulfilment can streamline the order fulfilment process. This logistics innovation is the implementation of technology and resources that can be used to manage the fulfilment process, which helps to speed up processes, save time, and reduce human error.

Logistics automation is using technology and equipment to help with warehouse operations and fulfilment processes. It can help improve and speed up these processes in a more efficient way. Lastly, inventory automation is the process of making generally very time-consuming tasks automated allowing more time for other work.

8.5.5 Blockchain transactions

Blockchain is more than just an industry buzzword as it continues to be one of the most talked about innovations in logistics. However, it can be a hard concept to grasp. In layman's terms, blockchain refers to an open ledger of transactions distributed among systems within a single network. This process offers further transparency into an entire supply chain network with quick approvals and processing checkpoints. It also consists of automatically recorded data that makes it challenging to change, hack, or cheat the framework. This provides more security for brands that are expanding their distribution network.

For ecommerce, blockchain transactions make it easier for retailers to share and access the same data as their third-parties that manage different parts of their supply chain.

8.5.6 Geolocation technologies

Geolocation technology has been used in various industries, including ecommerce, for a while now. One example, order tracking, is essential to send to customers, so they can stay up to date on deliveries and lower the amount customer service inquiries. However, geolocation technology continues to improve to optimize the supply chain and enhance the customer experience.

Geolocation technology can also track inventory throughout the supply chain in real time, such as how much inventory will be received and when, what's in transit, and what's been stored. Another example of geolocation technology is the ability to view inventory levels across different fulfilment locations, which provides real-time insights to help maintain and optimize an ideal product allocation strategy.

8.5.7 Drones

Drones are now being used for faster delivery all over the world, no matter how remote a location might be. Drone delivery is incredibly efficient for certain types of deliveries and can be used to replace traditional transportation methods. Drones also have the capability to reach remote areas, which reduces the delivery time and cost. For instance, some company offers drone delivery as a service to restaurant chains with its latest delivery drones' innovation, and can fly at an altitude of 80 meters with a speed of 80 km/hour. This provides a promising benefit to the logistics industry. The process not only eases the coordination from shipment to delivery but also has a great impact on effective product delivery and can reach both rural, urban, and more remote regions.

8.5.8 Crowd shipping technology

Crowd shipping technology (also known as crowdsourced delivery) makes the most of bulk supply and delivers orders at a faster rate. Today, this technology is used mostly for food delivery, but it's also making its way into ecommerce. Crowd shipping technology works by using a network of local couriers to deliver packages to customers' doors in a timely fashion. Crowdsourced delivery offers benefits for both online stores and customers as it makes it easier to get orders to their customers faster. For customers specifically, crowd shipping provides more control over the shopping experience as it's not only a faster option but it provides more visibility using GPS tracking, so customers know exactly when their order will arrive.

8.5.9 Big data analytics

Data runs through every process within the supply chain and one can use this data to improve the performance and productivity. Using inventory and fulfilment data, one can better manage SKUs (Stock Keeping Units), replenish inventory on time, forecast demand, and make better decisions on how to optimize operations.