Chapter 5

CHAPTER 5 Infrastructure Sector Development Status and Future Plans considering Regional Corridor Development

This chapter describes the relevant governmental institutions, the current infrastructure situation, the current usage of infrastructure, and development plan as basic information based on the collected data.

5.1. Transport Infrastructure

The objective sectors in transport infrastructure are road, maritime (seaport), railway, aviation (airport), river transport and dry port. In consideration of the survey objectives, intercity/inter-region transports are mainly described. The following Table 5.1.1 shows the major characteristics of each transport sector.
In the target region, the Djibouti port and the Port Sudan are the main international trade hubs[1]. The goods from/to the hinterland of the Djibouti port are mainly transported using road including expressway and the efforts to commence railway operation are underway. For transport from/to the hinterland of the Port Sudan, railway transport is available, but its transport volume is quite low due to aging infrastructure and the roads play the major role for land transport. Aviation is used in the target countries. In particular, the air network in Ethiopia has been developed and Ethiopia proactively takes the advantage. River transport used to be avaialble between Sudan and South Sudan, but it is out of service at the moment[2]. Ethiopia proactively develops dry ports and Sudan also possesses a dry port which is transshipment hub between road and river transports. The following sections presents the current situations of the respective sectors.

Table 5.1.1 Major Characteristics of Each Transport Sector

Sector	Major Characteristics	Target Countries
Road	Road is the major land transport mode. Basically no transshipment from origin and destination is required and route planning is flexible even if an accident occurs. The initial investment is lower than railway. Road includes various specifications from expressway to rural and access roads.	All
Maritime	Maritime transport is available only in the sea. The transport cost per weight-km is much inexpensive compared to other transport modes and it is suitable for mass volume and long distance hauling. The limitation in cargo size and weight is scarce. In comparison to other transport modes, delivery speed is relatively slow and cargos can be loaded and unloaded only at seaports. Major ports often become a hub for international trade.	Djibouti, Sudan
Railway	Railway is of the same importance as road in land transport. In comparison to road, mass transport is possible. However, railway development is viable in case long-distance and high transport demands are expected due to its large initial investment cost. The flexibility is low compared to road because cargos can be loaded and unloaded at stations and the operation should comply with the pre-determined time schedule in general.	All
Aviation (Airport)	The delivery speed is high while the transport cost is also high. Aviation is suitable for transport of light and high value goods. In principal, construction of an airport enables to establish another route. The route is limited between airports.	All
River Transport	River transport is applicable only in case a navigable river is available. The depth is usually shallow compared to sea route and only smaller ships service for river transport, of which capacity for one trip is limited. In the areas where river transport is available, road construction often faces difficulties and river transport can complement road transport.	Sudan, South Sudan
Dry Port	Dry port connects road/railway and seaport. It is a hub for inland area to transport cargos via transshipment. Dry port can complement the functions of seaport which include storage, workshop for vehicles and custom services.	Ethiopia, Sudan

Source: JICA Survey Team

[1] South Sudan mainly uses the Mombasa port which is located in Kenya, outside of the target countries.
[2] According to the interview with the Ministry of Transport in South Sudan

5.1.1. Road Sector

On land, road transport does not require any transshipment from origin to destination in principal, and the route setting is flexible even after accidents and the initial investment is smaller than railway. Thus, road transport is the most critical and general land transport mode. Road contains various specification levels from expressway and trunk roads to rural and access roads. In light of the objectives of this survey, this chapter describes expressway and trunk roads in the region.

(1) Road Sector in Djibouti

1) Outline

In Djibouti, Agence Djiboutienne des Routes (ADR) manages trunk roads and city streets. The total length is 1,806 km which consists of 38% (688 km) of paved roads and 62% (1,117 km) of unpaved roads as shown in the following Table 5.1.2.

Table 5.1.2 Road Network managed by ADR as of August 2015

Type	Length of Roads (km)			Ratio
	Trunk	City Streets	Amount	
Paved Road	519	169	688	38%
Unpaved Road	675	442	1,117	62%
Total	1,194	611	1,805	100%

Source: Final Report of Preparatory Survey on Road Maintenance Equipment (2016) JICA

2) The Current Road Network and Development Plan

The major road network in Djibouti is shown in Figure 5.1.1. There are four trunk roads in Djibouti. The most important route is RN1[3] of which length is approximately 240 km. The most cargos from/to Ethiopia use this road at the moment. At Semera in Ethiopia which is on the route after passing through the border named Galafi, a dry port is located and RN1 is the essential route for logistics. According to the interview with a freight forwarder, the pavement condition on the Dikhil – Galafi section is too poor to drive safely (Refer to Figure 5.1.2). JICA is assisting to procure equipment for road maintenance. Although the traffic demand is expected to change affected by commencement of the railway operation and the surrounding road development, this route remains the importance as a logistic route because this road has been utilized as the critical logistic route as dry ports are locates along the route, and this route can provide access to the Northern parts of Ethiopia.
RN5 and RN18 are the alternative routes to connect Djibouti and Ethiopia. In the current situation, traffic on the route is limited since the connecting route in Ethiopia is under development[4]. On completion, the route will function as an alternative route. RN2 connects to Somaliland of which length is 21.4 km. RN11 connects the Tadjourah port and the border with Ethiopia which is under construction. ADR mentioned that the route will be inaugurated shortly. An expressway between the Djibouti port and RN18 is planned although the finance has not been secured yet[5].

[3] RN refers National Route.
[4] A document clearly describing the detailed schedule was not obtained in this survey. RSDP V set the budget for this route in 2019/2020
[5] RSDP V does not include the budget for developing an expressway to connect with RN18

Source: JICA Survey Team based on Presentation, Aperçu Général sur le Transport Routier (2017) Ministry of Equipment and Transport, and Final Report of Preparatory Survey on Road Maintenance Equipment (2016) JICA

Figure 5.1.1 Trunk Road Network in Djibouti

Source: JICA Survey Team

Figure 5.1.2 Road Condition on RN1 (Dikhil –Garafi Section)

3) Traffic Volume

Traffic volume data was not obtained because ADR has not conduct regular traffic survey. However, ADR estimates the current traffic volume by using custom data at the border of Galafi. According to ADR and MET, the traffic volume at Galafi is 1,800 vehicles/day in total and approximately 1,200 vehicles/day are

fully loaded trucks. The volume is consistent with the projection by using traffic data as shown in Figure 5.1.11 (1,000 vehicles per day in 2012) and converted to the current traffic volume with the growth rate of 10%. ADR and MET stressed the high proportion of heavy vehicle which is also coincidence with the report for Ethiopia traffic volume (90% truck ratio).
The heavy traffic volume is considered to be one of the causes of deteriorated pavement condition as shown in Figure 5.1.2. The existing surface layer thickness of 5 cm[6] may be inadequate for this section referring the Japanese Pavement Design Standard[7].
As shown in Figure 5.1.3, truck queues are often observed near the border post. According to ADR, the queue is not due to traffic capacity, but due to inefficiency for border crossing procedures.
According to ADR, traffic volume on RN5 and RN 2 are low. This is because the current pavement condition on RN5 is poor to be rehabilitated in future as well as the service period of RN2 is short since the opening in 2015[8].

Source: JICA Djibouti Office

Figure 5.1.3 Truck Queue on RN1 (near Galafi border)

4) Design Standard

According to ADR, the French Design Standard is basically applied for road design in Djibouti9.

(2) Road Sector in Ethiopia

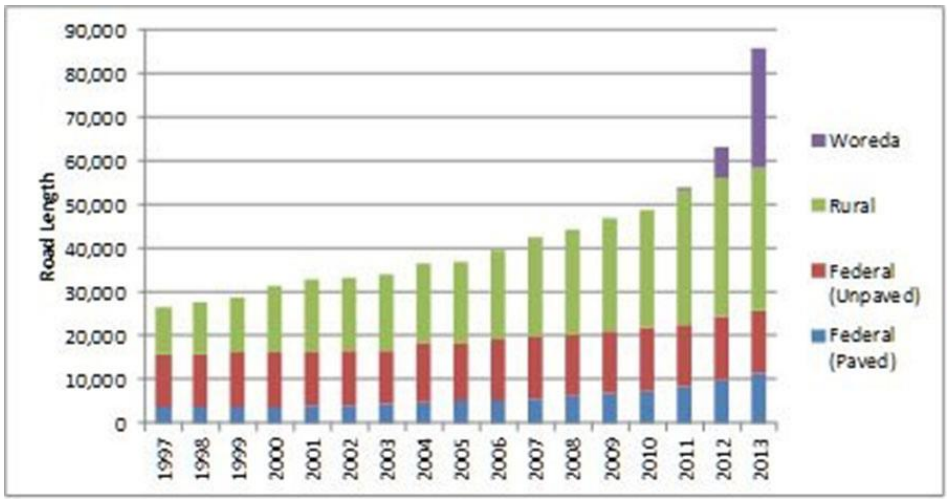
1) Outline

In Ethiopia both trunk road and expressway have been developed. The outlines of respective roads are described in this section.

a) Outline of Trunk Road

As shown in Figure 5.1.4 and Table 5.1.3, the road network in Ethiopia was approximately 86,000 km and the road density was 78.20 km/1,000 km^2 as of 2013. The total length has been increasing. The roads are categorized into 3 types, namely Federal, Rural and Woreda[10]. Federal roads are managed by Ethiopian Roads Authority (ERA) [11] and Rural and Woreda roads are by Regional Road Authority and Woreda Road Office, respectively[12].

[6] Final Report on Preparatory Survey for Road Maintenance Equipment in Djibouti (2016) JICA
[7] According to the Japanese Pavement Design Standard, the heavy traffic volume of 1,000 ~ 3,000 veh/day-direction is categorized in "N6" traffic. The heavy traffic on the corridor, on which many vehicles are for import to Ethiopia with cargo-loaded, seems to be categorized in N6. Under the assumption that CBR value is as high as 12, surface layer of 5 cm + base layer of 5 cm in addition to bitumen treated base course of 8 cm are required in accordance with the Japanese Standard.
[8] However, this might be due to low traffic demand.
[9] The document could not be obtained in this survey
[10] Administrative district in Ethiopia
[11] Referring "Road Sector Development Program 16 Years Performance Assessment (2013) ERA"
[12] Roads in Addis Ababa are managed by Addis Ababa City Roads Authority. Referring "Universal Rural Road Access Program (2011) ERA"



Note 1: The reason why Woreda roads were recorded since 2011 is unclear. In consideration of difficulties to develop road inventory for such roads, it is conjectured that the actual length of Woreda road is much longer.
Note 2: The proportion of paved and unpaved on Rural and Woreda roads could not be obtained in this survey.
Source: JICA Survey Team based on "Road Sector Development Program 16 Years Performance Assessment (2013) ERA"

Figure 5.1.4 The Length of Road Network in Ethiopia

Table 5.1.3 The Length of Road Network in Ethiopia

Year	Road Length (km)					Road Density (km/1000 km^2)
	Federal (Asphalt)	Federal (Gravel)	Rural	Woreda	Total	
1997	3,708	12,162	10,680		26,550	24.14
1998	3,760	12,240	11,737		27,737	25.22
1999	3,812	12,250	12,600		28,662	26.06
2000	3,824	12,250	15,480		31,554	28.69
2001	3,924	12,467	16,480		32,871	29.88
2002	4,053	12,564	16,680		33,297	30.27
2003	4,362	12,340	17,154		33,856	30.78
2004	4,635	13,905	17,956		36,496	33.18
2005	4,972	13,640	18,406		37,018	33.60
2006	5,002	14,311	20,164		39,477	35.89
2007	5,452	14,628	22,349		42,429	38.60
2008	6,066	14,363	23,930		44,359	40.30
2009	6,938	14,234	25,640		46,812	42.60
2010	7,476	14,373	26,944		48,793	44.39
2011	8,295	14,136	30,712	854	53,997	49.09
2112	9,875	14,675	31,550	6,983	63,083	57.30
2013	11,301	14,455	32,582	27,628	85,966	78.20

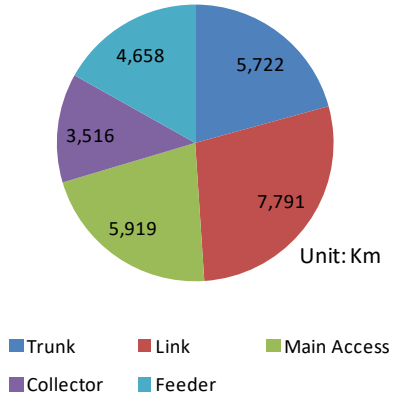
Source: "Road Sector Development Program 16 Years Performance Assessment (2013) ERA"

Federal Road is categorized in Trunk, Link, Main Access, Collector and Feeder by its function. The length of trunk road is about 5,700 km (see Figure 5.1.5). According to "Summary of 2015 Federal Road Class" issued by ERA, 49.1% of trunk roads are paved.
Maintenance for roads and bridges are managed by the Road Asset Management Department in ERA. The inventory is available in the department upon an official request letter[13].

[13] The data could not be obtained in this survey

b) Outline of Expressway

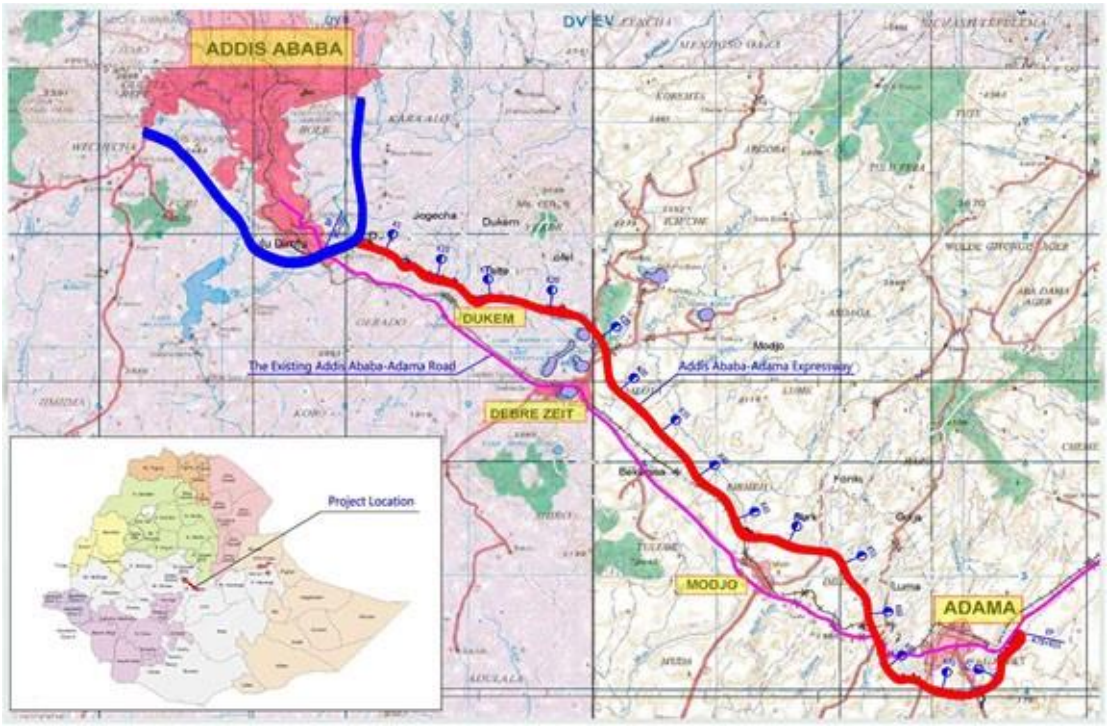
In this report, expressway is defined as the road with full access control and toll which enables users for high speed travel. Although expressway enables users to travel in short time, the initial investment is generally high. In the objective region, only Addis Ababa – Adama section is the expressway in service. This chapter describes the outline of Addis Ababa – Adaba Expressway (AAE) based on interview and obtained documents.



Source: JICA Survey Team based on "Summary of 2015 Federal Road Class, ERA"

Figure 5.1.5 Length of Federal Roads by Class

AAE connects from Addis Ababa to Dukem, Bishoftu, Modjo and reaches to Adama. AAE is managed by Ethiopian Toll Road Enterprise (ETRE). The alignment is parallel to the existing trunk road between Addis Ababa – Adama which is still in service. The length is 78 km and the expressway is fully access controlled. The background of development of the section is to ensure faster movement by avoiding the congestion on the existing two-lane trunk road between Addis Ababa – Adama, of which traffic volume exceeded 20,000 vehicles per day[14]. This section has the heaviest traffic in the country since many container cargos from the Djibouti pot are brought to the Modjo dry port and delivered to final destinations in Addis Ababa and the surrounding cities after custom clearance at the Modjo. AAE was constructed from 2010 to 2014 and financed by the China Exim Bank (57%) and the Government of Ethiopia (43%). The number of lanes is six lanes (three lanes for one direction), of which structure is that the width of one lane is 3.75 m, the width of median is 2 m and paved shoulder is 2.5 m.



Source: Overview of Addis Ababa – Adama Expressway and Ethiopian Toll Roads Enterprise (2016) ETRE

Figure 5.1.6 The Alignment of Addis Ababa-Adama Expressway

[14] http://www.roadtraffic-technology.com/projects/addis-adaba-adama-nazareth-expressway/

Toll Booth in Addis Ababa (CH 0+000)

Carriageway and Flyover

Source: JICA Survey Team

Figure 5.1.7 Addis Ababa-Adama Expressway

2) The Current Road Network and Development Plan

Ethiopia is a landlocked country surrounded by Djibouti, Sudan, South Sudan, Kenya, Eretria and Somalia. In the past several years, 95% of import cargos are shipped via the Djibouti port[15] and ERA officials mentioned that diversification of use of seaports is one of critical challenges. Ethiopia plays a role to provide logistic route to the surrounding landlocked country such as South Sudan.

The capital of Addis Ababa is located in the center of the country. Since it is prioritized to ensure access to the surrounding countries from the capital, the major trunk roads basically spread in a radial fashion.

The major trunk road network and border posts are shown in Figure 5.1.8. The most critical route for logistics and trade is Addis Ababa– Modjo – Awash – Galafi section[16] (#1 in Figure 5.1.8). Many freights between the Djibouti port and Addis Ababa pass through this route[17]. Container cargos delivered with Multi-modal transport system firstly arrive in the Modjo dry port which is located on this route. On Addis Ababa – Modjo – Adama section, which has the heaviest traffic in the country, an expressway was constructed in 2014 and the traffic capacity was strengthened.

According to an ERA official, the routes of Galafi – Mekele and Galafi – Gonder are also important to provide access for the Northern Ethiopia (#2 in Figure 5.1.8). The routes are the shortest access to the Northern area, however, the vertical alignment is steep due to large difference in altitude[18].

An alternative route to the Djibouti port is the section Awash – Dire Dawa – Dewele (#3 in Figure 5.1.8). The expressway is being extended to Dire Dawa and the section of Dire Dawa – Dewele will be upgraded to paved road[19]. On the completion, the route provides shorter access to the Djibouti port compared to the existing Awash – Galafi route[20].

As described in 5.1.2. (2) 3), development of the Tadjourah port is in progress. In line with it, the route up to Balho is under rehabilitation (#4 in Figure 5.1.8) in the Ethiopian side and Balho – Tadjourah section will be opened shortly in the Djiboutian side, according to the government hearing. On completion of these projects, Ethiopia will be accessible to the Tadjourah port.

In order to diversify the access to seaports, Dire Dawa – Togechane section is also under development which enables to access to the Berbera port in Somalia (#5 in Figure 5.1.8). The Berbera port is under rehabilitation[21] and re-opening is planned to be in 2019 (Refer to 5.1.2.(4) 3)).

Another seaport alternative for the Southern Ethiopia is the Lamu and/or Mombasa ports in Kenya via the LAPSSET corridor[22]. Modjo – Hawassa – Moyale section[23] is the major route to the LAPSSET corridor

[15] https://apnews.com/541fbd8c7bd041ecafeff0058ea25b97/ethiopias-new-coastal-rail-link-runs-through-restive-region
[16] The expressway between Adama and Awash is under construction
[17] According to ERA. Numerical data could not be obtained in this survey.
[18] The Google Earth shows that the section near Chifra (around 250 km west from the Galafi border) has 500 m of difference in altitude within the length of approximately 15 km.
[19] Road Sector Development Plan V (RSDP V) indicates that the budget for the extension is allocated until 2020.
[20] According to the interview with ERA
[21] According to the interview with ERA
[22] Refer to 5.1.2 (1) 2) Figure 5.1.17 for the LAPSSET corridor

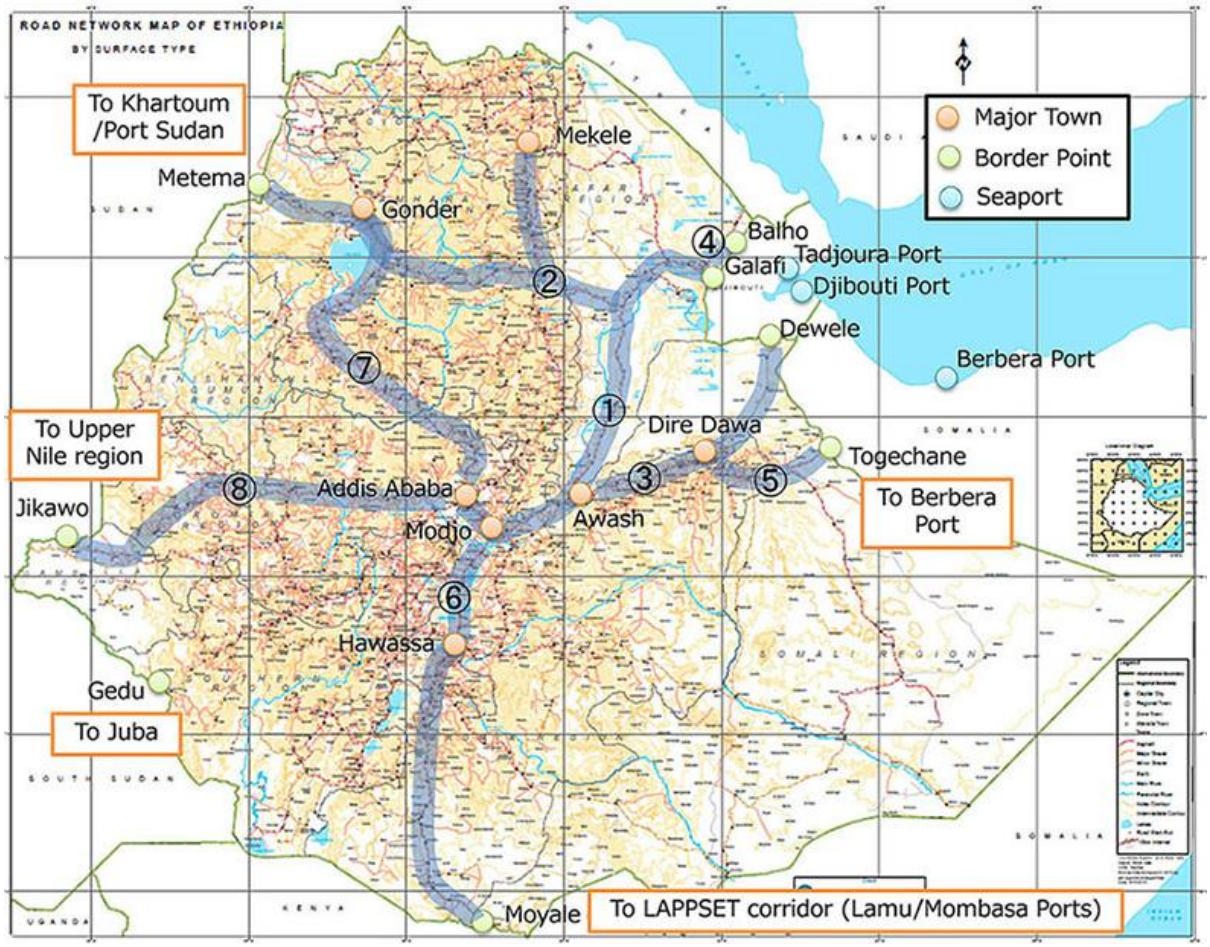
(#6 in Figure 5.1.8). In particular, a new industrial part has been operated in Hawassa and increase in logistic demand is expected. The traffic capacity on the section will be enhanced by developing expressway.

In the Northern Ethiopia, the Port Sudan is also an accessible seaport. On the route to the Port Sudan, Metema is the major border post (#7 in Figure 5.1.8). The route is expected to provide not only the access to the port, but also facilitation of trade between Ethiopia and Sudan.

Ethiopia road network provides an access to the Upper Nile region in South Sudan via Jikawo[24] (#8 in Figure 5.1.8). In the Upper Nile region, construction of road from Juba is difficult due to poor geological condition and flood damages, and an access from Ethiopia is crucial.

Road developments in Ethiopia are implemented based on Road Sector Development Plan (RSDP). RSDP is 5 years development plan[25]. RSDP I started in 1997 and the current RSDP V is for 2016 – 2020. In order to achieve the country vision that Ethiopia will reach the more developed country status by 2025, 16,746 km of Federal roads development is planned in RSDP V (The budget is described in Table 5.1.7).

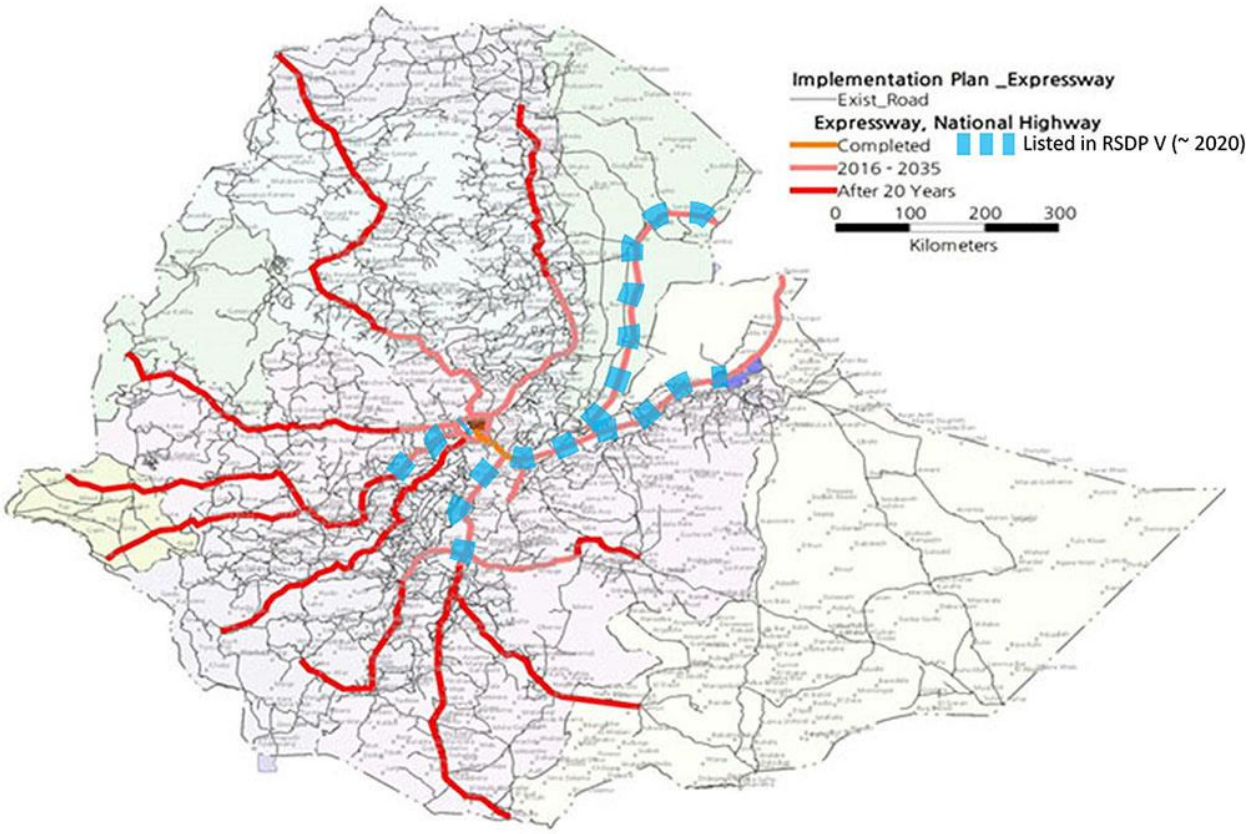
Figure 5.1.9 shows the development plan for trunk roads and expressway. The pink routes are planned to be constructed by 2035. RSDP V, which is the development plan up to 2020, includes the budget for the routes with blue-dot line.



Source: JICA Survey Team based on the map provided by ERA

Figure 5.1.8 Major Trunk Road Network and Border Posts in Ethiopia

[23] The expressway between Modjo – Hawassa is under construction
[24] According to the interview with Ministry of Roads and Bridges in South Sudan
[25] Only RSDP III is 3 years plan



Source: Overview of Addis Ababa – Adama Expressway and Ethiopian Toll Roads Enterprise (2016) ETRE added by JICA Survey Team referring RSDP V.

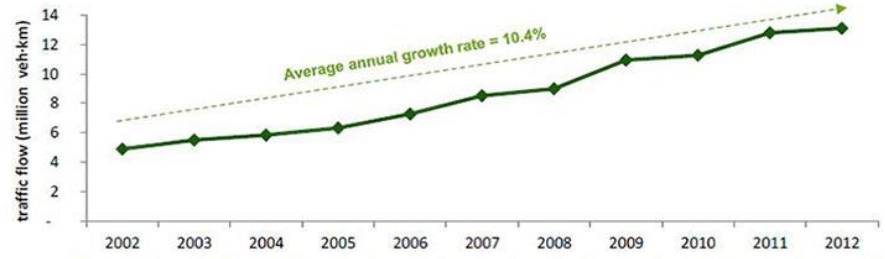
Figure 5.1.9 Trunk Road and Expressway Development Plan in Ethiopia

3) Traffic Volume

a) Traffic Volume on Trunk Roads

As shown in Figure 5.1.10 the traffic volume in the past 10 years had sharply increased. During 2002 ~ 2012, the traffic volume increased from 4.9 million veh-km to 13.1 million veh-km and the yearly average growth ratio was 10.4%. Increase in Bus is high rather than small vehicles and growth rate of heavy vehicles such as trucks and trailers were almost the same as the average growth. Registration of vehicles is managed by Federal Transport Authority (FTA), Addis Ababa City Transport Authority and Dire Dawa City Transport Authority. According to the interview with a FTA official, the number of registered vehicles has annually increased. However, actual data could not be obtained in this survey.

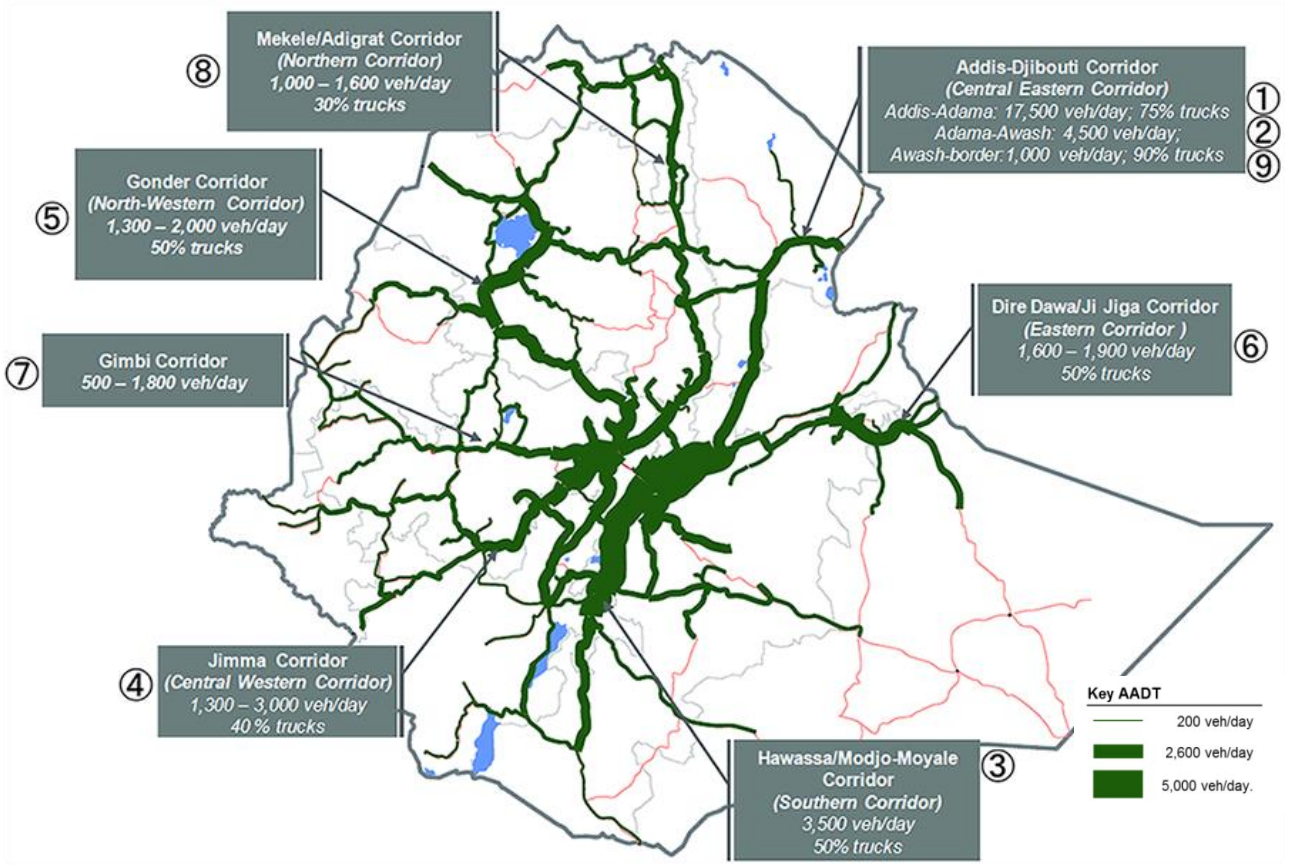
Figure 5.1.11 shows the traffic volume by section in 2012. Note that the traffic volume between Addis Ababa and Adama (#1 in the figure) is note expressed in the figure due to its significant high traffic volume of 17,500 vehicles per day. Other high traffic volume sections are; a) Adama-Awash (#2), b) Modjo – Hawassa (#3), Addis – Jimma (#4), Addis – Gonder (#5), the section towards Dire Dawa (#6), Addis – Gimbi (#7), Addis - Dessie (#8) and Awash – Galafi (#9). On these sections, the proportions of heavy vehicles are often high. In particular, the ratio of heavy vehicles on Awash – Galafi is as high as approximately 90%. On the other sections, the ratios are 30 ~ 50%. In consideration of pavement deterioration mechanism of which extent is determined by accumulated axle load, not just traffic volume, these high proportions of heavy vehicles seem to expedite pavement deterioration.



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Cars & Rovers	1,043	1,125	1,193	1,229	1,341	1,624	1,687	1,969	2,025	2,247	2,235	7.9%
Buses	1,013	1,142	1,328	1,441	1,741	2,093	2,357	2,822	3,093	3,555	3,619	13.6%
Trucks	2,052	2,336	2,479	2,639	3,062	3,461	3,580	4,482	4,574	5,119	5,264	9.9%
Trailers	785	901	844	1,024	1,137	1,338	1,375	1,677	1,575	1,881	1,983	9.7%
	'000 vehicles·km											Annual growth rate 2002- 2012

Source: Final Report on Analytical Work on Transport Sector in Ethiopia (2015) ALG

Figure 5.1.10 Traffic Volume in Ethiopia (veh-km, 2002 ~ 2012)



Note: The traffic volume of Addis Ababa-Adama section is not expressed in the figure since the value is far high compared to other sections.

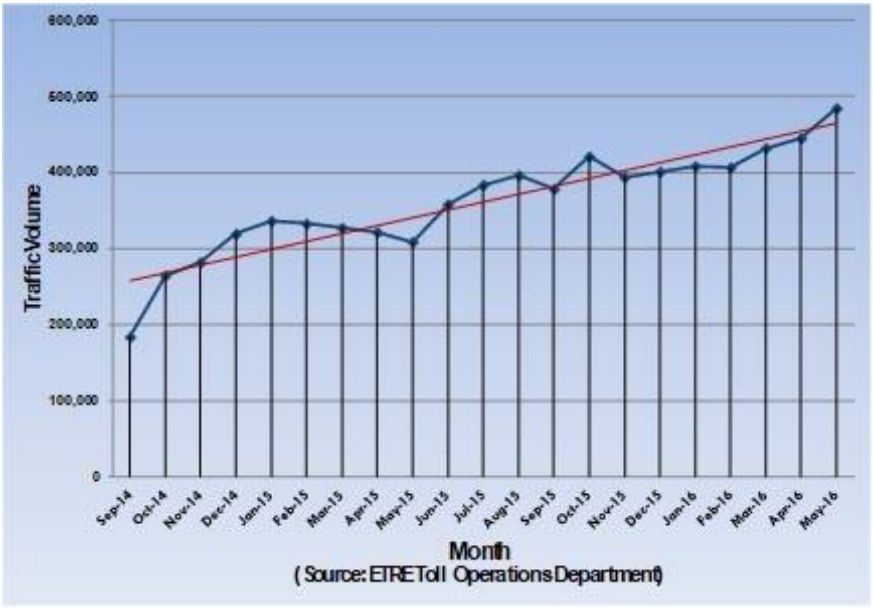
Source: Final Report on Analytical Work on Transport Sector in Ethiopia (2015) ALG

Figure 5.1.11 Traffic Volume in 2012 in Ethiopia

b) Traffic Volume on Expressway

Traffic volumes since commencement of the service are shown in Figure 5.1.12. In the past three years, traffic has steadily increased from 200,000 to 480,000 vehicles per month and the annual average daily traffic between June 2015 and May 2016 was 13,400 vehicles per day. Additional traffic data obtained in this survey are shown in Table 5.1.4. The average daily traffic from July 2016 to March 2017 was 17,900 vehicles per day. The traffic capacity of the expressway still has room for further increase since the

carriageway is six-lane road[26]. In terms of vehicle composition, the proportion of small/medium vehicles is the highest with 44.7% followed by mini-bus (19.5%) and Medium bus/light truck (18.0%). The ratios of large bus/medium truck and trailer with more than 6 axles are 7.5% and 7.6%, respectively. Finally, 4 axles and 5 axles vehicles are 1.6% and 1.1%. Traffic volumes at toll booths are automatically sent to the control center and such traffic data is available upon the assistance of ETRE.



Monthly	Traffic Flow Monthly	Daily
Sep-14	183,871	6,129
Oct-14	264,922	8,546
Nov-14	282,139	9,405
Dec-14	319,463	10,305
Jan-15	336,562	10,824
Feb-15	332,871	11,888
Mar-15	327,455	10,563
Apr-15	321,637	10,721
May-15	308,697	9,958
Jun-15	358,200	11,940
Jul-15	383,914	12,384
Aug-15	396,411	12,787
Sep-15	378,404	12,613
Oct-15	420,912	13,578
Nov-15	393,678	13,123
Dec-15	400,994	12,935
Jan-16	408,312	13,171
Feb-16	406,559	14,019
Mar-16	432,144	13,940
Apr-16	445,350	14,845
May-16	484,293	15,622
2016	7,586,788	

Source: Overview of Addis Ababa-Adama Expressway and Ethiopian Toll Roads Enterprise (2016), ETRE

Figure 5.1.12 Traffic Volume on the Addis Ababa-Adama Expressway (2014 ~ 2016)

Table 5.1.4 Daily Average Traffic Volume on Addis Ababa-Adama Expressway by Month from July 2016 to March 2017 (Vehicles/day)

Month	V1	V2	V3	V4	V5	V6	V7	計
Jul-2016	8,617	3,769	3,117	1,285	282	199	1,227	18,496
Aug-2016	7,840	3,662	3,287	1,534	321	239	1,371	18,254
Sep-2016	8,251	3,449	3,415	1,407	334	238	1,478	18,572
Oct-2016	6,600	2,976	3,406	1,473	324	228	1,429	16,436
Nov-2016	7,537	3,054	3,210	1,487	255	190	1,490	17,223
Dec-2016	7,933	3,271	3,159	1,287	267	184	1,308	17,409
Jan-2017	8,030	3,595	3,095	1,092	249	170	1,280	17,511
Feb-2017	8,865	3,974	3,211	1,223	256	192	1,325	19,046
Mar-2017	8,485	3,744	3,108	1,244	239	179	1,336	18,335

V1: Small/medium vehicle, V2: Mini bus, V3: Medium bus/light truck, V4: Large bus/medium truck, V5: 4 axles truck, V6: 5 axles truck, V7: More than 6 axles truck
Source: JICA Survey Team based on data provided by ETRE Toll Operations Department

4) Relevant Laws and Regulations

The relevant laws and regulations in road sector in Ethiopia are shown in Table 5.1.5.

[26]According to the Japanese Standard, design capacity for one lane on flat in rural area is specified as 12,000 vehicles per day. The actual traffic capacity is affected by several factors such as alignment, AAE is expected to have the capacity of 72,000 vehicles per day since the number of lanes is six.

Table 5.1.5 Relevant Laws and Regulations in Road Sector in Ethiopia

Proclamation No. 468/2005: Transport Proclamation
Part 1: General Part 2: Transport Authority Part 3: Public Commercial Road Transport Activities and Public Commercial Road Transport Associations Part 4: Miscellaneous Provisions
Regulation No.206/2011: Vehicles Identification, Inspection and Registration Fees Council of Ministers Regulation
Fees for 1) Title Certificate Book, 2) Identification Number Plates, 3) Annual Vehicle Inspection Certificate and Registration Sticker, and 4) Access to Registers, Records and Lists

Source: JICA Survey Team based on the obtained data

5) Design Standard

Design standards in road sector in Ethiopia are listed in Table 5.1.6. The standards were developed with the assistance by International Development Agency (IDA) referring AASHTO[27] and other European standards.

Table 5.1.6 Design Standards in Road Sector in Ethiopia

Design Standard	Year
Geometric Design Manual	2002
Pavement Design Manual (Vol. 1 & 2)	2002
Pavement Rehabilitation and Asphalt Overlay Manual	2002
Bridge Design Manual	2002
Drainage Design Manual	2002

Source: JICA Survey Team based on the obtained data.

6) Budget

According to Road Sector Development Program V (RSDP V), which is the development plan in road sector, investment in road sector is planned to be increased year by year. Table 5.1.7 shows the budget plan for trunk roads.

Table 5.1.7 Budget Plan for Trunk Roads according to RSDP V (Unit: USD million)

No.	Item	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
1	Rehabilitation of Trunk Roads	67.29	95.17	91.95	70.52	27.98
2	Upgrading of Trunk Roads	131.30	116.94	69.37	63.99	41.44
3	Upgrading of Link Roads	419.88	471.70	552.71	588.87	541.28
4	Construction of New Link Roads	627.29	840.95	1,052.55	1,360.92	1,693.53
5	Construction of Expressway Roads	94.99	107.40	260.46	603.66	550.38
6	Bridges and Structures	26.89	29.58	32.54	35.79	39.37
7	Feasibility Study	4.73	4.96	5.21	5.47	5.74
8	Maintenance	39.98	59.75	64.33	69.31	74.71
9	Policy and Capacity Building	38.09	40.00	42.00	44.10	46.30
10	Ordinary Budget	7.68	8.45	9.29	10.22	11.25
Total		1,458.12	1,774.90	2,180.42	2,852.83	3,031.99

Note: The currency is converted to US$ by using the exchange rate on 1st August 2017 by Commercial Bank of Ethiopia (USD 1 = ETB 23.4321)
Source: JICA Survey Team based on RSDP V

(3) Road Sector in Sudan

1) Outline

As shown in Table 5.1.8, the total road length in Sudan is approximately 32,300km and around 7,000km (20%) is paved in 2013. Trunk roads are managed by National Highway Authority (NHA) [28].

[27] American Association of State Highway and Transportation Officials
[28] Information on road administrators for other than trunk road could not be obtained in this survey.

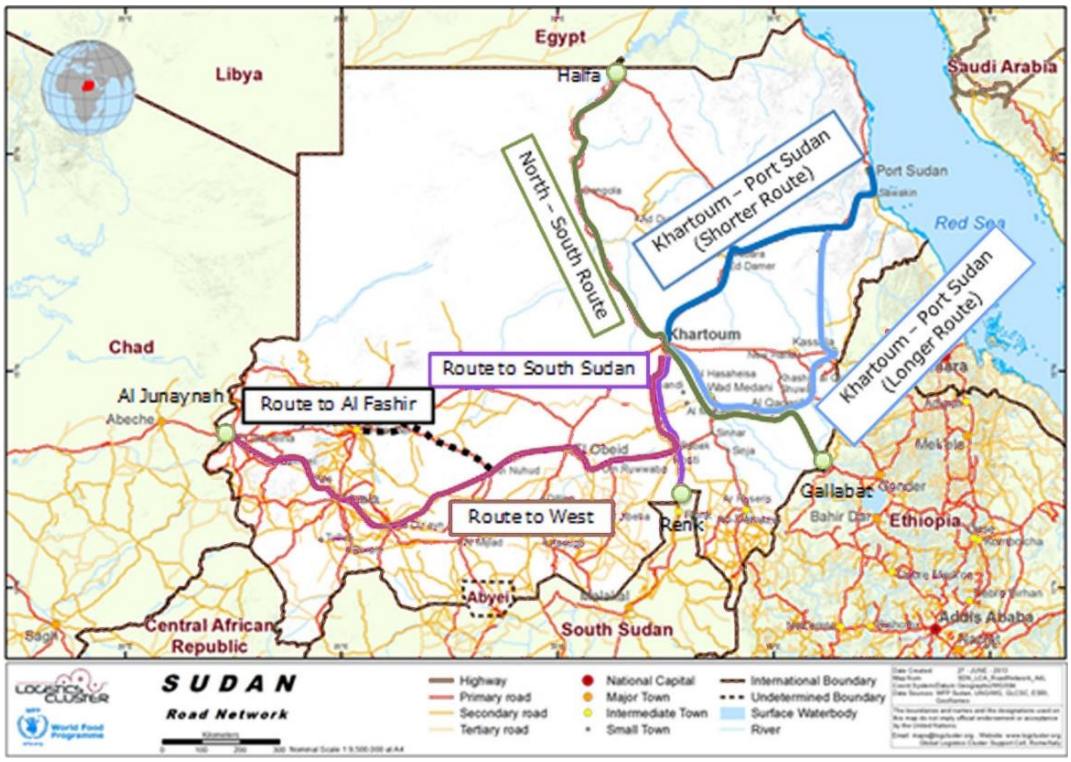
Table 5.1.8 Road Length in Sudan

Type	Length (km)
Highway/Primary (Asphalt)	7,000
Secondary (Gravel)	4,300
Tertiary/Trail (Gravel or Dirt)	20,000
Local/Urban	1,000
Total	32,300

Source: http://dlca.logcluster.org/display/public/DLCA/2.3+Sudan+Road+Assessment (Last update: May 2013)
Note: Data cannot be obtained from NHA in this survey. No data on road length by class

2) Road Network

Figure 5.1.13 shows the road network in Sudan. Through the interview with NHA, six major trunk roads were confirmed. This section summarizes the outlines on the respective routes based on the interview. The shape of road network is similar to railway network (see Figure 5.1.35) and it enables to share traffic demand[29]. No network has been formulated in the Northwest area where desert is spread.



Source: JICA Survey Team based on the map obtained from the link below and interview with NHA
http://dlca.logcluster.org/display/public/DLCA/2.3+Sudan+Road+Assessment

Figure 5.1.13 Road Network in Sudan

According to NHA, traffic surveys were conducted in 2012 and 2017. However, the data could not be obtained in this survey.

The busiest route in the country is Khartoum - Port Sudan route (Shorter Route in the figure). The route originates from the gateway of Port Sudan to the capital of Khartoum. Since trucks from Khartoum to Port Sudan are often empty, Khartoum – Port Sudan (Longer Route in the figure) is also used for the direction.

The next heaviest traffic is on North – South Route which connects to the surrounding countries such as Egypt and Ethiopia. This route is often used for international trade on land transportation.

According to NHA, the Route to South Sudan (Renk) was also a major trunk road before, but the route is not functional as a logistic route due to the deteriorated pavement. The Route to West provides the access to the Southwest area. The construction work on the Route to Al Fashir has recently been completed and its access has been improved.

[29] However, the current traffic volume by railway is very limited and most of the cargos are transported by road

3) Budget

2016 Annual Report provided by NHA describes the costs on projects by project stage. As budget information, the amounts of "under implementation/completed projects" and "contracted projects" are calculated as shown in Table 5.1.9.

Table 5.1.9 Outline of Project Costs in Road Sector in Sudan

Item	Cost (USD million)
Under implementation/completed projects	904.39
Contracted projects	731.66

Source: JICA Survey Team based on Annual Report (2016) NHA
Note: The currency is converted by using the exchange rate of Central Bank of Sudan as of 1 August 2017 (USD 1 = SDG 6.68335)

(4) Road Sector in South Sudan

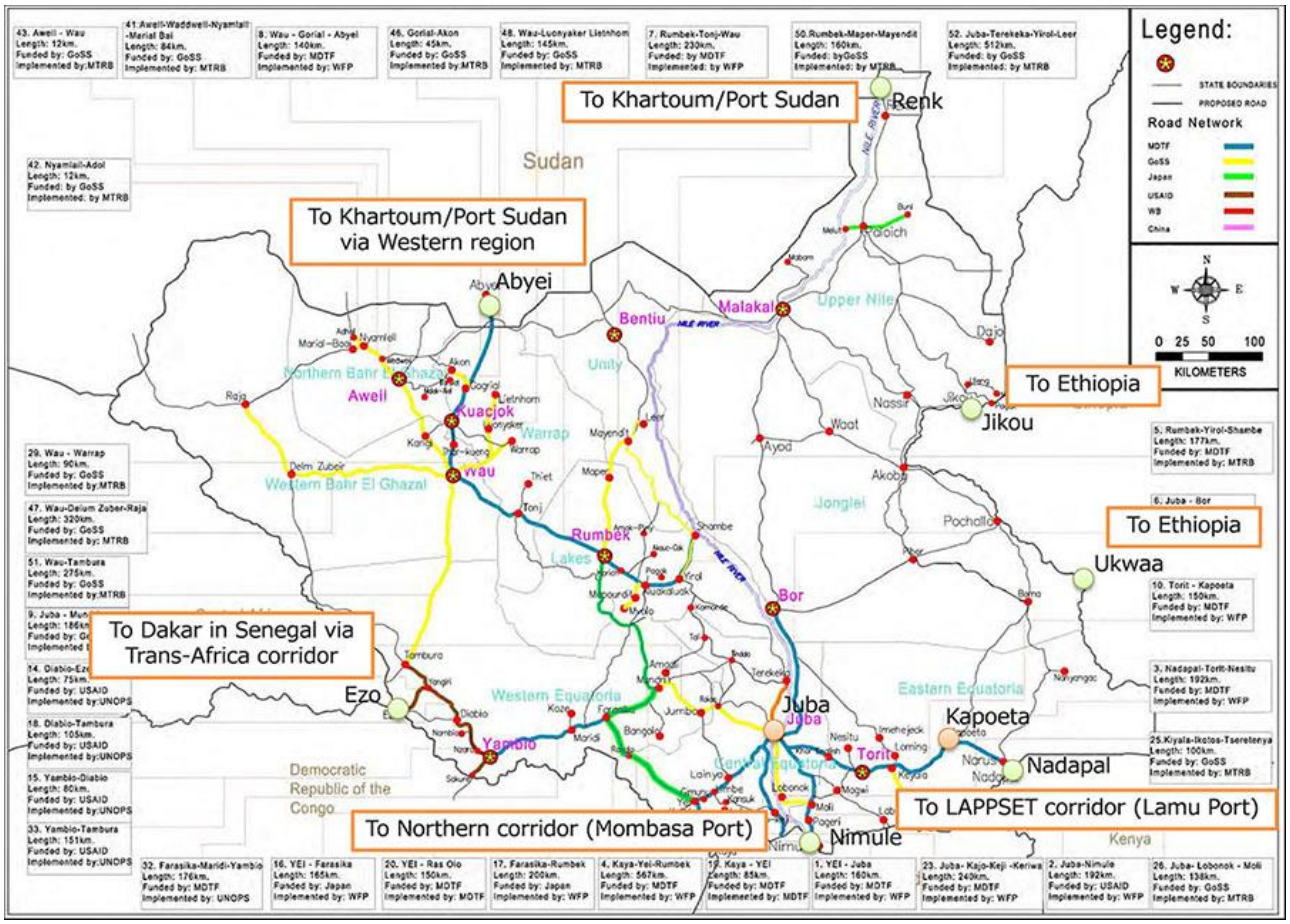
1) Outline

According to the Central Intelligence Agency[30], the total road length in South Sudan is approximately 7,000 km and most of them are unpaved. The route between the capital Juba and Nimule (border to Uganda) with the length of 192 km has been sealed[31] and the route became the first paved trunk road[32]. The roads are managed by South Sudan Roads Authority. According to "the Establishment of the Ministry of Roads and Bridges in the Republic of South Sudan (2012) MRB", establishment of State Roads Authority and Urban Roads Authority is under consideration to manage roads by state and city[33].

2) The Road Network and Development Plan

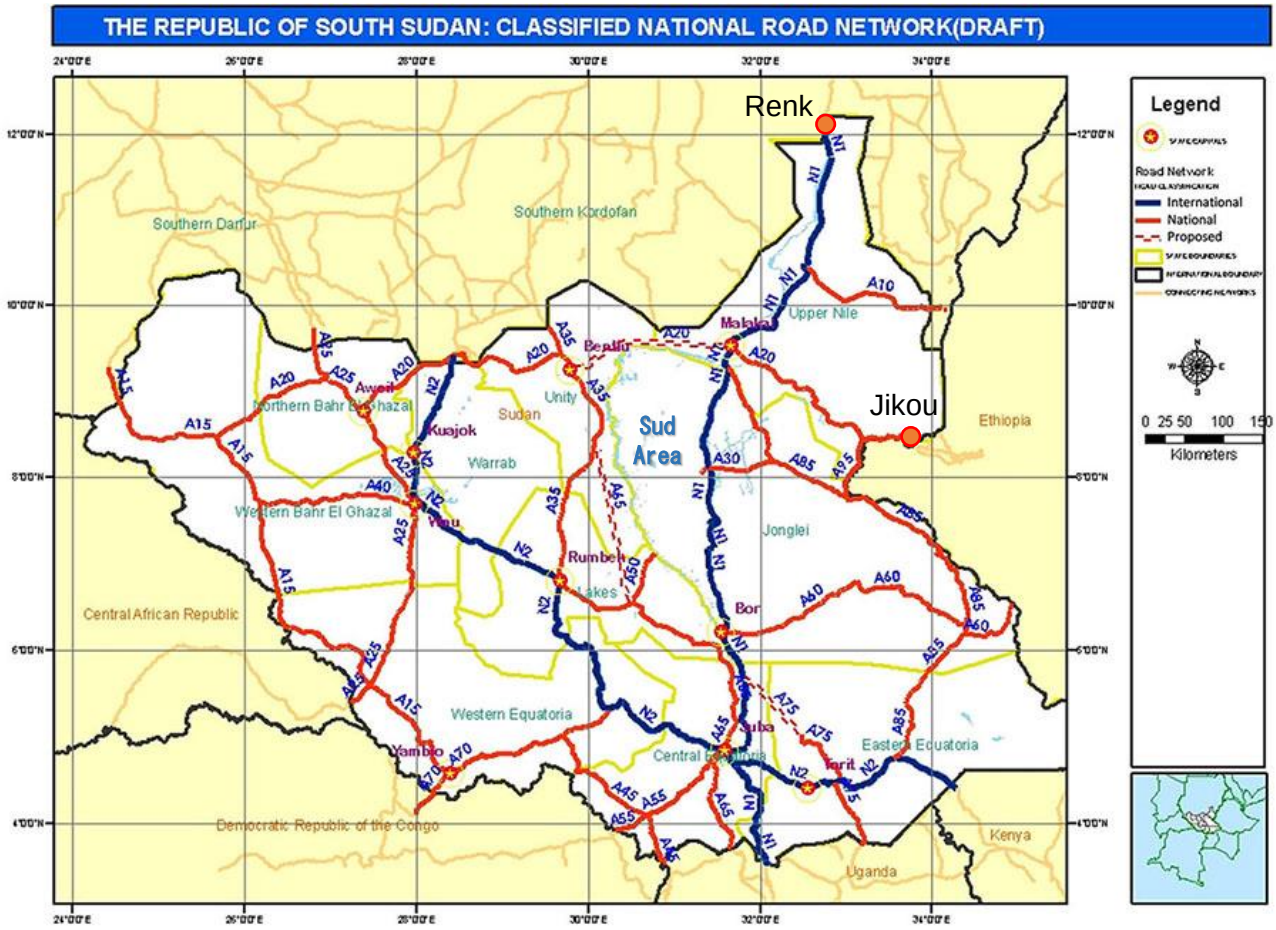
Figure 5.1.14 shows the road network in South Sudan and road development projects by development partner. Figure 5.1.15 presents the draft classified national road network. From the viewpoint of international trade, the most critical route is the section of Juba – Nimule which connects to the Northern corridor passing through Uganda and Kenya and reaching to the Mombasa port. According to the Ministry of Roads and Bridges (MRB), only this section functions as an international corridor. In the meantime, MRB prioritizes the road development toward the Northwest area where affluent mineral resources are available. As an alternative international corridor, Juba – Nadapal is under construction which connects to the Lamu port in Kenya via LAPSSET corridor. MRB recognizes that Kapoeta – Ukwaa is also an alternative international corridor in the country[34].
As shown in Figure 5.1.15, the section between Juba and the Upper Nile region as well as Renk is prioritized. However, the Sud area, where frequent flood occurs in rainy season, becomes an obstacle for road development. As an alternative, the Upper Nile region ensures the access to Ethiopia via Jikou.
In "South Sudan Development Plan (2011) Government of South Sudan (SSDP)," development of 7,252 km of road including 752 km of paved road is the target for the three years period (See Table 5.1.10). According to "Final Report on the preparatory survey for development small-scale bridges in the Juba city (2016) JICA," the period of SSDP was extended to 2016 and it plays significant role for development plan.

[30] https://www.cia.gov/library/publications/the-world-factbook/geos/od.html
[31] Double Bituminous Surface Treatment (DBST) was applied.
[32] Detailed information on road length could not be obtained in this survey.
https://www.usaid.gov/news-information/press-releases/first-paved-highway-south-sudan-constructed-usaid-officially-opened
[33] However, the concrete schedule is not described
[34] However, the section of Kapoeta – Ukwaa is not indicated in the figure.



Note 1: MDTF stands for "Multi Donor Trust Fund", GoSS stands for "Government of South Sudan"
Note 2: Some of the projects are suspended (Detailed information could not be obtained in this survey)
Source: Final Report on Preparatory Survey on Development of Small-scaled bridges in Juba City (2016) JICA

Figure 5.1.14 Road Network and Development Projects by Development Partner



Source: The Map provided by Ministry of Roads and Bridges

Figure 5.1.15 Future Classified National Road Network (Draft)

Table 5.1.10 Development Target set by SSDP (Accumulated) (unit: km)

Development Target	2011	2012	2013
Length of asphalted trunk road	150	500	752
Length of constructed engineered roads	363	1,065	2,000
Length of roads under maintenance with safety provision	500	2,000	4,500
Total	1,013	3,565	7,252

Source: South Sudan Development Plan (2011) Government of South Sudan

3) Traffic Volume

In "Preparatory Survey on Development of Small-scaled bridges in Juba City (2016) JICA", 12 hours traffic survey was conducted at several locations including Nimule (border to Uganda) in 2015. With the assumption that the day-night ratio is 1.2[35], the daily traffic at Nimule was 7,300 vehicles per day and around 800 vehicles (10%) are heavy vehicles.

Meanwhile, the recent traffic volume on the section is not as large as 1,000 ~ 2,000 vehicles per day. However, the ratio of heavy vehicles is as high as 75%. On the assumption that the daily traffic is 1,200 vehicles per day, the heavy traffic volume would be 900 vehicles per day which is almost coincident with the heavy traffic volume in 2015. Thus, it is considered that heavy vehicle traffic volume keeps the same level in recent years.

Other traffic data could not be obtained in this survey. For further understanding, implementation of traffic survey is required since no regular traffic survey is conducted by MRB.

[35] The report describes 12 hours traffic volume only.

4) Design Standard

According to the interview with MRB, the following three design manuals were developed with the assistance of USAID[36]. For the items which are not described in the manuals, AASHTO and design standards in Ethiopia are referred for road design.

- Geometric Design Manual (2006) MRB
- Bridge Design Manual (2006) MRB
- Drainage Design Manual (2006) MRB

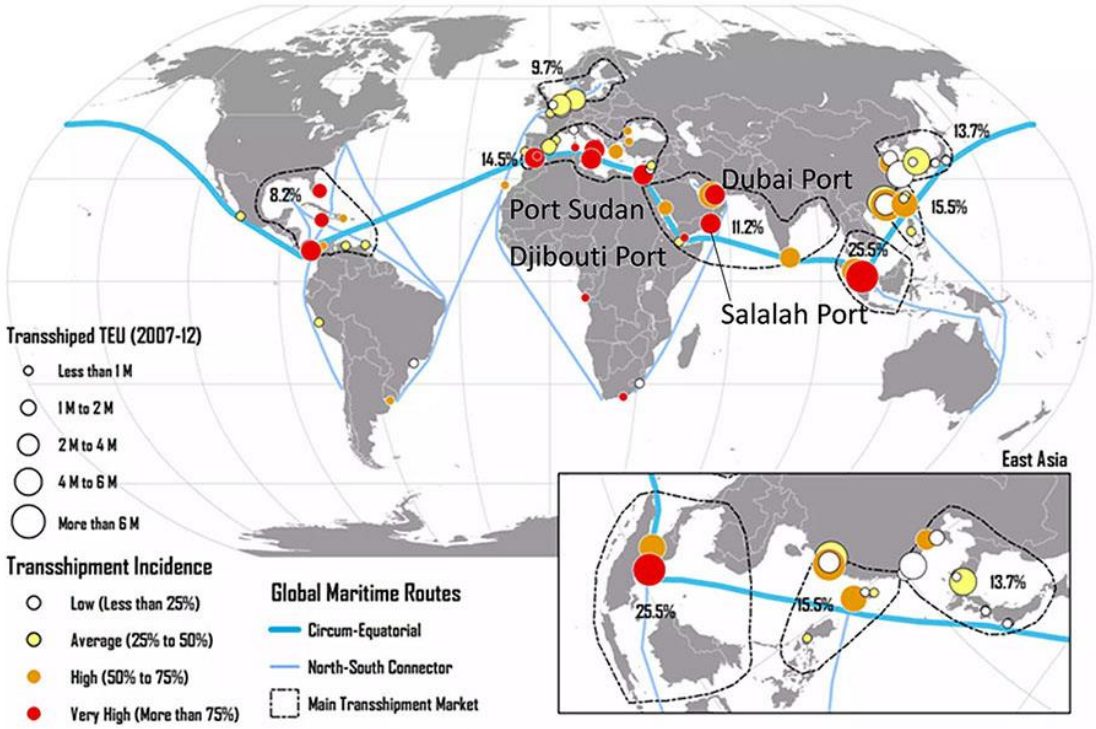
5.1.2. Maritime (Seaport) Sector

International trade is indispensable for economic growth under the globalization. Maritime transport plays key role for international trade due to its low transportation cost. In the African continent, there are many landlocked countries which have no coastal line. Thus, such landlocked countries should consider use of seaports in their neighboring countries.
In the target countries, Djibouti and Sudan have seaports while Ethiopia and South Sudan are landlocked countries. Maritime transport for Ethiopia heavily relies on the Djibouti port at the moment. South Sudan mainly uses the Mombasa port in Kenya via the Northern corridor and the Port Sudan is partially utilized in the Northern part of South Sudan. In addition, the Lumu port in Kenya and the Berbera port in Somalia which are under development/rehabilitation are expected to provide the services for the target countries. Thus, this chapter mainly presents the Djibouti port and the Port Sudan, and Mombasa, Lamu and Berbera are shown as relevant ports.

(1) Overview on Maritime Sector in the Region

1) Transshipment Hub

As shown in Figure 5.1.16, the Djibouti port and the Port Sudan are located in strategically advantageous locations. Both ports are faced on the Red Sea which is on the route of the world busiest Europe – Asia Sea Line. The Dubai port in UAE and the Salalah port in Oman serve as transshipment hub for feeder shipping from/to the East and South Africa regions. The Djibouti port also complements its transshipment function.



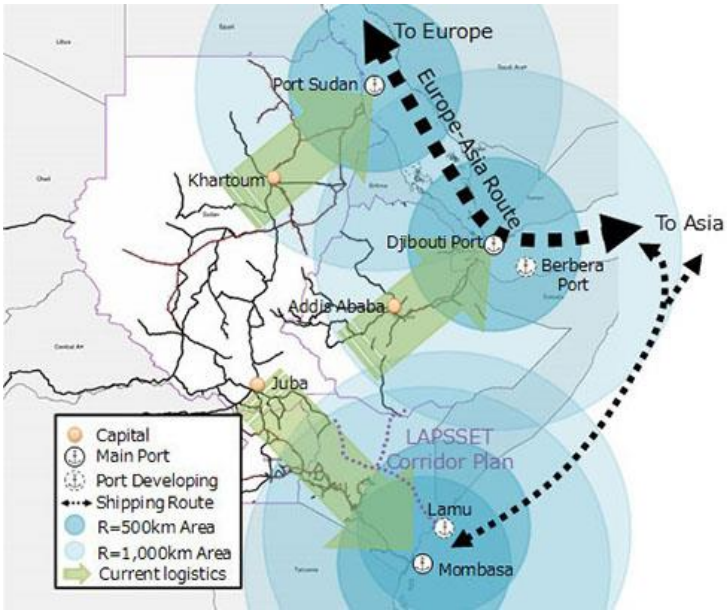
Source: http://www.porteconomics.eu/2015/09/17/transshipment-hubs-connecting-global-and-regional-maritime-shipping-networks/

Figure 5.1.16 Transshipment Hub Ports (2007-2012)

[36] However, the documents could not be obtained in this survey.

2) Hinterland

The Djibouti port, the Port Sudan and the Mombasa port have their different hinterland. Figure 5.1.17 reveals physical distance from the respective ports. The Djibouti port handles all the cargos for Djibouti and 95% of cargos for Ethiopia[37]. In order to cater for rapid increase for Ethiopian cargos, the possibility of the Berbera port in Somalia has been reviewed and the berth extension is being conducted at the moment. According to the interview with Sudan Port Corporation (SPC), the Port Sudan is the gateway for Sudan as well as seaports for the surrounding landlocked countries such as South Sudan, Central Africa and Chad. However, South Sudan mainly uses the Mombasa port in Kenya in consideration of the current situations and road condition as well as the long transport length of more than 1,000 km from South Sudan to the Port Sudan[38]. In addition, the Lamu port is under construction which is located 200 km north of the Mombasa port in Kenya. The Lamu port is expected to handle the cargos for North Kenya, South Ethiopia and South Sudan via the Lamu Port and Lamu-Southern Sudan-Ethiopia Transport (LAPSSET) corridor. From the viewpoints of the landlocked countries, such counties are considering to use alternative seaports other than the current Djibouti and Mombasa ports to ensure redundancy and diversification for the use of seaports[39].



Source: JICA Survey Team

Figure 5.1.17 Location of the Major Ports and Hinterland

(2) Djibouti Port

The Djibouti port is located in South of the Red Sea (See Figure 5.1.17). The Djibouti port handles many transshipment cargos due to its advantageous location. In addition, the port functions as the gateway for Ethiopia by handling 95% of Ethiopian cargo[40].

1) Outline of the Djibouti Port

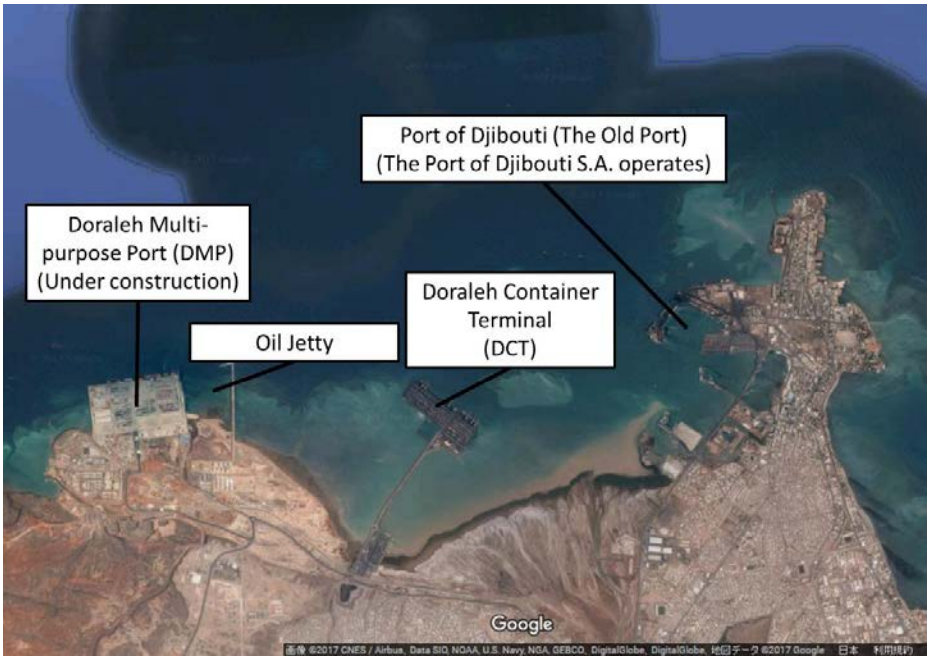
The Djibouti port consists of three major facilities such as the Port of Djibouti (the Old Port), Doraleh Container Terminal (DCT) and oil jetty. The locations are shown in Figure 5.1.18.
The Old Port is a multi-purpose port which handles break bulk[41], dry bulk[42], container cargo and RoRo[43]. The old port has 15 berths with the maximum draught is 12m. The port is managed by Port of Djibouti S.A. (PDSA). However, the government of Djibouti constructed a new multi-purpose port named Doraleh Multi-purpose Port (DMP) in consideration of the aged facilities in the Old port (See Figure 5.1.18). The

[37] http://bigstory.ap.org/article/541fbd8c7bd041ecafeff0058ea25b97/ethiopias-new-coastal-rail-link-runs-through-restive-region
[38] According to the interview with Ministry of Transport in South Sudan
[39] According to the interviews with Ethiopian Roads Authority (ERA) for Ethiopia and Ministry of Transport for South Sudan
[40] https://apnews.com/541fbd8c7bd041ecafeff0058ea25b97/ethiopias-new-coastal-rail-link-runs-through-restive-region
[41] Break bulk is large and/or heavy cargo which cannot be stored in a container
[42] Dry bulk is mass-transported cargo without wrapping such as coal, iron ore and grain
[43] Roll-on Roll-off (RoRo) is a passenger ferry or other method of transportation in which vehicles are driven directly on at the start of the voyage or journey and driven off at the end of it. (Source: Oxford Living Dictionaries)

DMP project consists of two phases. The phase one project for construction of 1,200 m-long berth (6 berths) with the maximum draught of 16 m was completed in May 2017[44]. All the port functions of the Old port are supposed to be transferred to DMP. Although the number of berth in DMP is smaller than the old port, the handling capacity of DMP is expected to be the same as the old port because of the latest cargo handling equipment and the deeper berth. In DMP, 2 berths are planned to be allocated for container, 1 berth for RoRo and 3 berths for bulk cargo[45]. According to the Djibouti Port and Free Zone Authority (DPFZA), the land for the old port is planned to be re-developed as a business district.

The Doraleh Container Terminal (DCT) has been operated since 2009 and handled most of the container cargos in Djibouti. DCT has 1,050 m long-berth with the maximum draught of 18 m. The handling capacity is 1.2 million Twenty-foot Equivalent Unit (TEU) [46]. The eight super-post panamax gantry cranes enable efficient cargo handling and 18m of draught enables the latest large ships to enter the port. In addition to a container yard behind the berth, additional container yard has been developed at the land side of the jetty. DCT is operated by the Joint Venture between the government of Djibouti and DP world, which is one of the leading port operators in the world.

The oil jetty has two berths; i) 80,000 DWT (Deadweight tonnages), the maximum draught of 18m, the length of 244 m and ii) 30,000 DWT, the maximum draught of 10m, the length of 180m. The 18m –depth berth can accommodate panamax-class ships. The total 31 tanks were constructed with the capacity of 399,304m^3. The oil jetty is operated by Horizon Djibouti Terminals Ltd.



Source: JICA Survey Team based on the interview with DPFZA and Google Earth

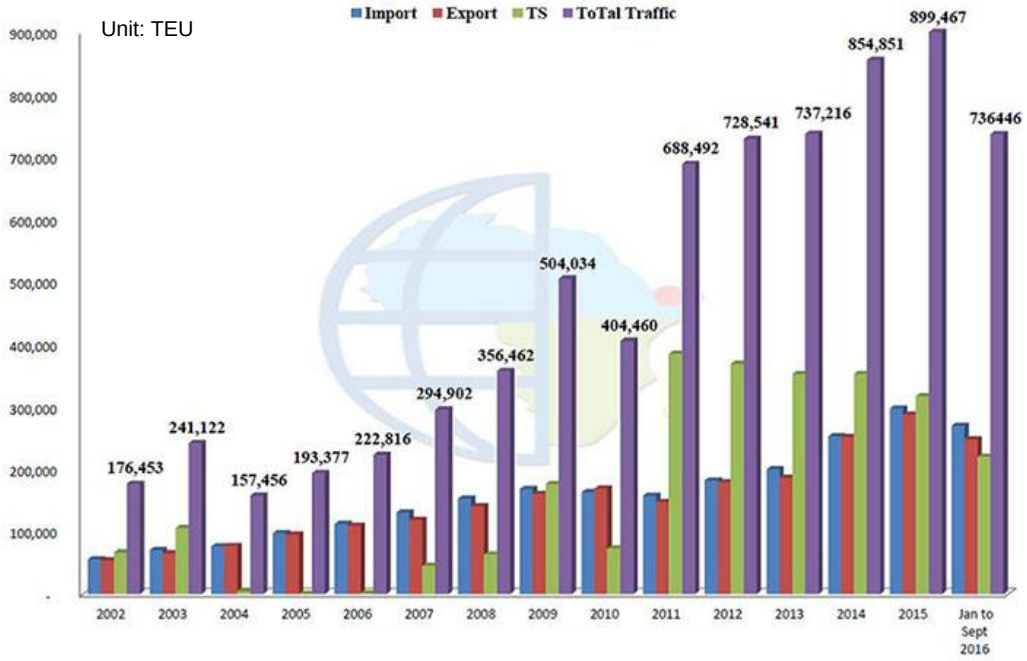
Figure 5.1.18 Location Map of the Djibouti Port

2) Cargo Throughput[47]

Figure 5.1.19 and Figure 5.1.20 reveal traffic volumes for container and non-containerized cargos, respectively. The volume of container cargo has rapidly increased since 2011 and reached to around 900,000 TEU in 2015. One of the reasons is the streamline of container handling after the DCT operation starting. Another reason is increase in import and export freights[48]. Currently Ethiopia has recorded high GDP growth of more than 8% and accordingly demand for freight has also increased. In the past 5 years, the volume of both import and export became 1.5 times. In the meantime, after large increase of transship

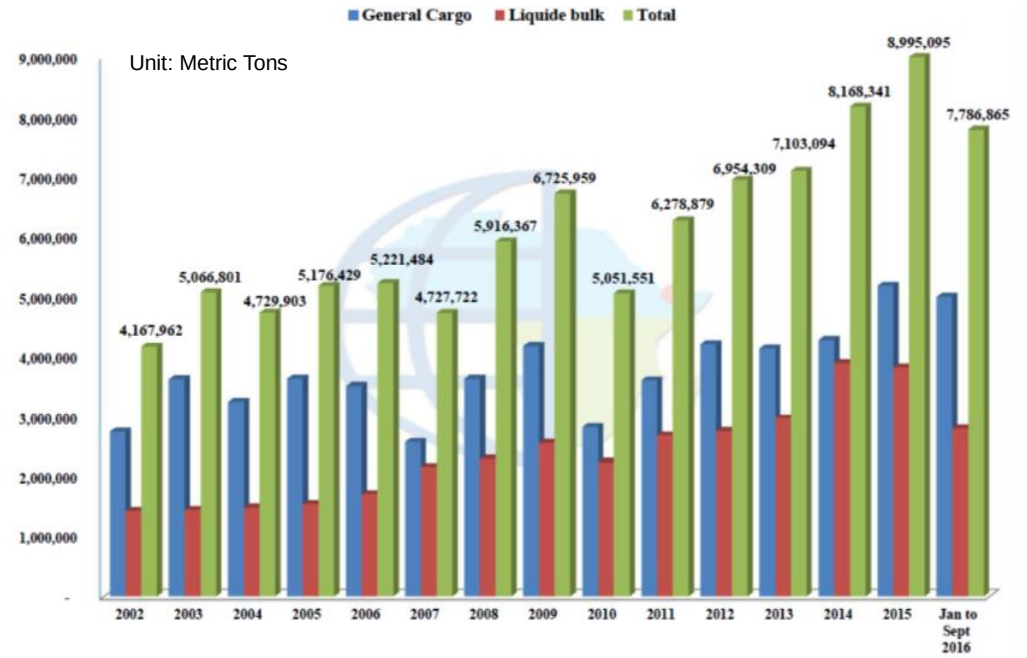
[44] As of 23rd March 2017 when the team visited, construction of the berths was completed and 12 harbor cranes were installed.
[45] According to the interview with PDSA
[46] http://dpfza.gov.dj/?q=facilities/dct
[47] Origin – Destination data of cargo could not be obtained in this survey.
[48] According to the statistical data issued by the Ministry of Equipment and Transport, cargo for Ethiopia is counted as import/export cargo, not transshipment cargo.

container in 2015, the volume gradually decreased in the past 5 years[49]. In light of the handling capacity of 1.2 million TEC in accordance with DPFZA, the capacity still has room for further increase in a short term. Most of the non-containerized cargos account for import cargo, of which share in 2015 was 96.2%[50]. The throughputs have gradually increased in the recent years. The total volume was around 6 million ton in 2011 and it hiked to approximately 9 million ton by 2015. Within the non-containerized cargo, 40% is liquid bulk of which majority is oil products. Other non-containerized cargos (noted as general cargo) are break and dry bulk including steel, agricultural and animal products.



Source: Unleashing the economic potential of Africa (2016) Djibouti Ports & Free Zones Authority

Figure 5.1.19 Traffic Volume for Container Cargo at the Djibouti port



Source: Unleashing the economic potential of Africa (2016) Djibouti Ports & Free Zones Authority

Figure 5.1.20 Traffic Volume for Non-containerized Cargo at the Djibouti Port

[49] The information on the reason could not be obtained in this survey.
[50] According to the statistical data issued by the Ministry of Equipment and Transport

3) Development Plan[51]

In order to make the most use of its geographically advantageous location, the government of Djibouti is implementing development projects as shown in Figure 5.1.21. This section presents the port projects. These projects are to diversify the use of port facilities other than DCT and DMP and mainly for developing port facilities to handle a specific cargo such as potassium, salt, livestock and LNG.

Table 5.1.11 Overview of Major Port Development Projects in Djibouti

Project	No.*	Overview
Doraleh Multi-purpose Port (DMP)	#4	All the functions of the old port are planned to be transferred to this DMP. 6 berths (1,200 m) and 16 m depth. 12 harbor cranes were installed in the phase 1 which was completed in May 2017.
Tadjourah Port	#2	The Tadjourah port is developed to export potassium from the Northern Ethiopia. Two quays are around 455 m with the draught of 12 ~ 15 m where up to 65,000 DWT ship can be accommodated. The RoRo terminal is 190 m long with the draught of 12 m. The phase 1 project was completed in June 2017[52].
Ghoubet Port	#3	The Ghoubet port is expected to export salt. The quay is 400 m long with the draught of 15 m where 100,000 DWT ship can be accommodated. The construction was completed in June 2017[53].
Damerjog Livestock Port	#7	The quay is 655 m long which can accommodate 5 livestock ships at the maximum. 50 hectors of livestock area will also be constructed. The operation is expected to be started in 2017[54].
LNG Terminal	#5	The construction of the terminal was commenced in March 2016 and the completion is expected to be in 2019. Annual LNG volume is planned to be 3 million tons which is transported from the Ogaden Basin in Ethiopia through 803 km of pipeline[55].
Ship Repair and Dry Dock	#1	The quay with 840 m long and 20 m depth and 80,000 DWT and 30,000 DWT floating docks are planned. The commencement of operation is expected to be in 2020 although the finance has not been secured yet[56].

Source: Unleashing the economic potential of Africa (2016) Djibouti Ports & Free Zones Authority, the Authority Website, etc.
* No. means the number in Figure 5.1.21

[51] Future throughput plans could not be obtained in this survey.
[52] http://www.portdedjibouti.com/port-of-tadjourah/, http://www.lanationdj.com/inauguration-port-de-tadjourah-jeudi-15-juin/#
[53] http://www.portdedjibouti.com/ghoubet-port/, http://www.portdedjibouti.com/wp-content/uploads/2017/07/Inauguration-of-the-ghoubet-port.pdf
[54] http://www.portdedjibouti.com/damerjog-livestock-port/
[55] http://www.lngworldnews.com/construction-starts-on-djibouti-lng-terminal/
[56] http://dpfza.gov.dj/?q=building-region/ship-repair-docks

Source: Unleashing the economic potential of Africa (2016) Djibouti Ports & Free Zones Authority

Figure 5.1.21 Major Port Development Projects in Djibouti

(3) Port Sudan

The Port Sudan is the gateway for Sudan and the hinterland includes the neighboring countries such as Ethiopia, South Sudan, Chad and Central Africa. This section presents the Port Sudan as well as the neighboring port facilities which complement the port functions.

1) Outline of Port Sudan and the Neighboring Port Facilities[57]

The Port Sudan mainly consists of 4 facilities such as North quay, Green terminal, South quay and Al-Khair oil terminal. In addition, the Osman Digna port is located 60 km South from the Port Sudan and operated as a multi-purpose port. The Oseif harbor is located in Fodikwan district, 260km North from the Port Sudan. The harbor mainly handles iron ore (See Figure 5.1.22). All the facilities except for the South quay are operated by Sea Ports Corporation (SPC).

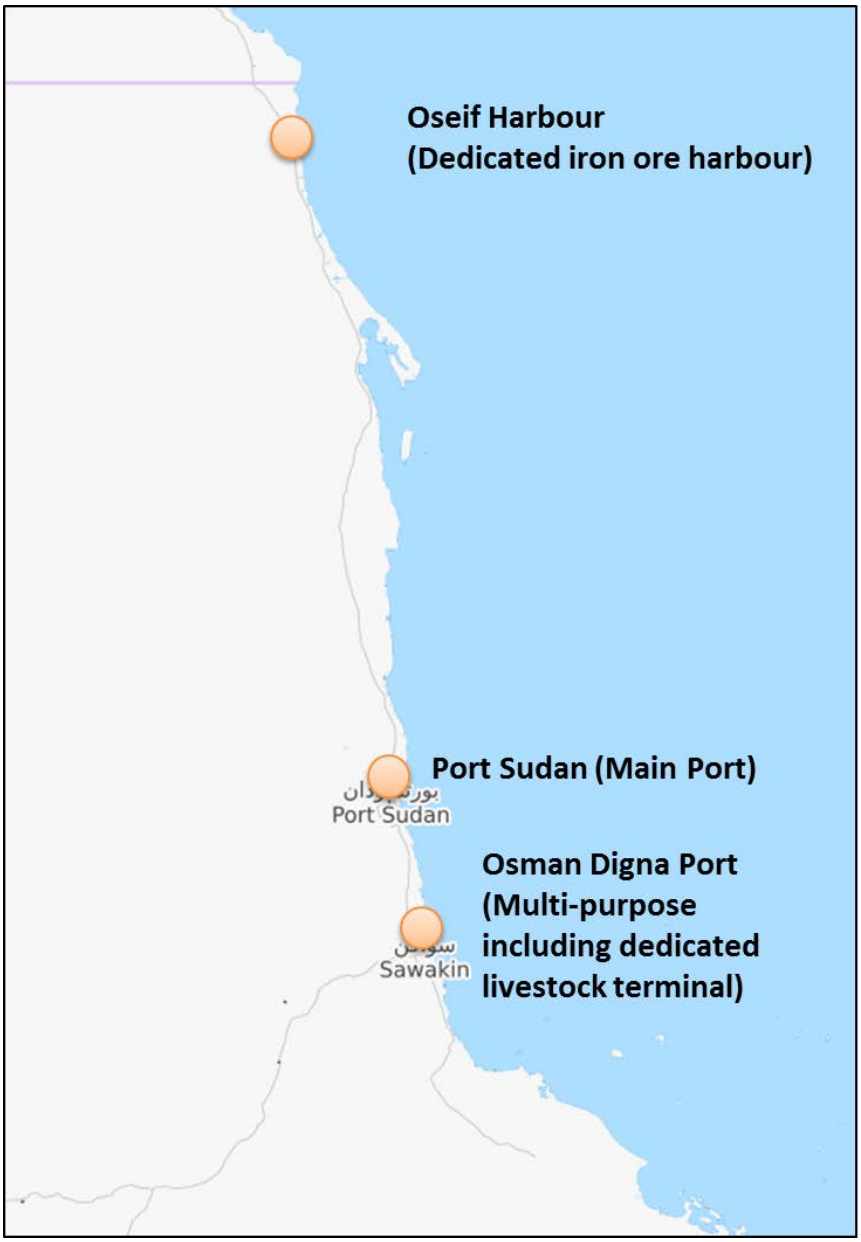
The North quay has 12 berths with the total length of 1,866m. The draught is 8.5 ~ 10.7m. Cranes with the capacity of 35 ~ 100 tons are installed in the all berths. The North quay is the oldest port facility in Port Sudan and commenced in 1905 ~ 1909 as the phase 1 project. The North quay mainly handles general cargo, edible oil and molasses. The annual capacity is 5 million tons which covers around 48 % of the total cargos in Port Sudan.

The Green terminal is a multi-purpose port which handles bulk, general and container cargos. The length is 1,228m with 4 berths. The draught is 14.7m which can accommodate up to 60,000 ships. The annual capacity is 4 million tons. The construction work is still in progress and grain silos and dry bulk warehouses will be constructed after the completion[58].

The South quay is a container terminal which is operated by SPC and International Container Terminal Service Inc. (ICTSI), Philippine based operator. It consists of 6 container berths, 1 grain berth and general cargo berths (total 15 berths) with the total length of 1,546m. The draught is 12.6 ~ 16 m and the annual capacity is 1.2 million TEU.

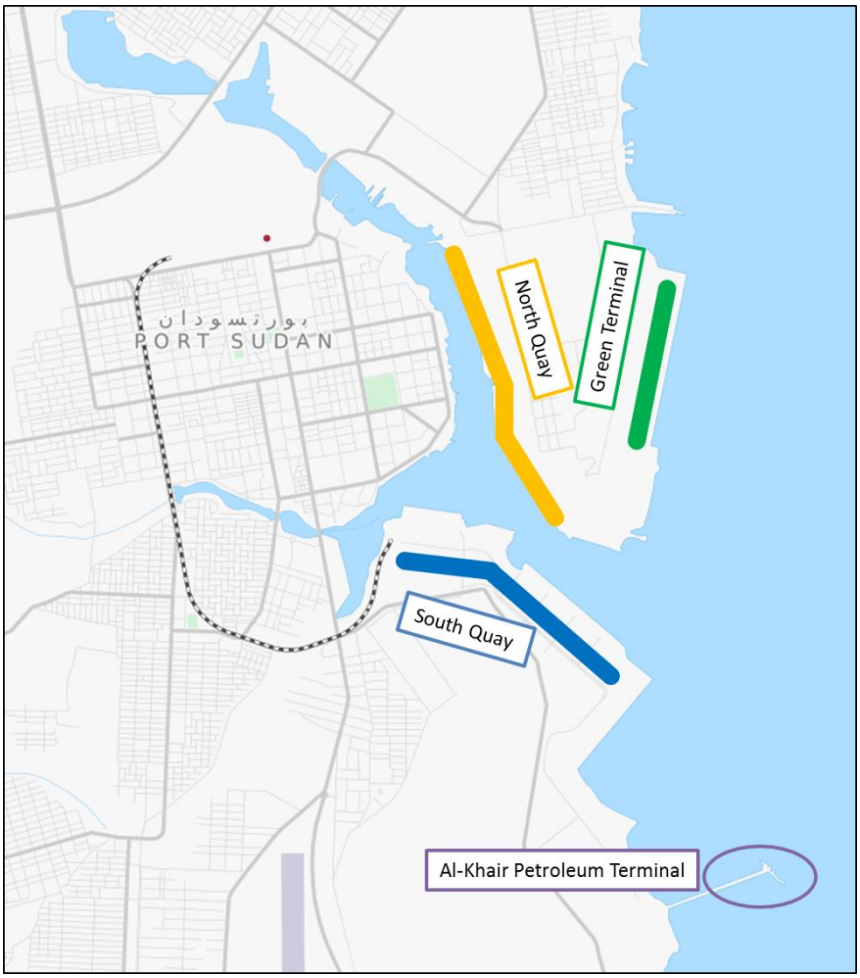
The Al-Khair oil terminal has a berth with 310m long. The draught is 14.6 m which can accommodate up to 50,000 DWT vessels. The annual handling capacity is 2.6 million tons.

[57] Refer to "Sudan Sea Ports Handbook 2016 – 2018"
[58] Further information on silo and warehouse could not be obtained in this survey.



Source: JICA Survey Team based on Open street map, Sudan Sea Ports Handbook 2016-18

Figure 5.1.22 Map of Port Sudan and its Surroundings



Source: JICA Survey Team Open street map, Sudan Sea Ports Handbook 2016-18

Figure 5.1.23 Layout of the Port Sudan

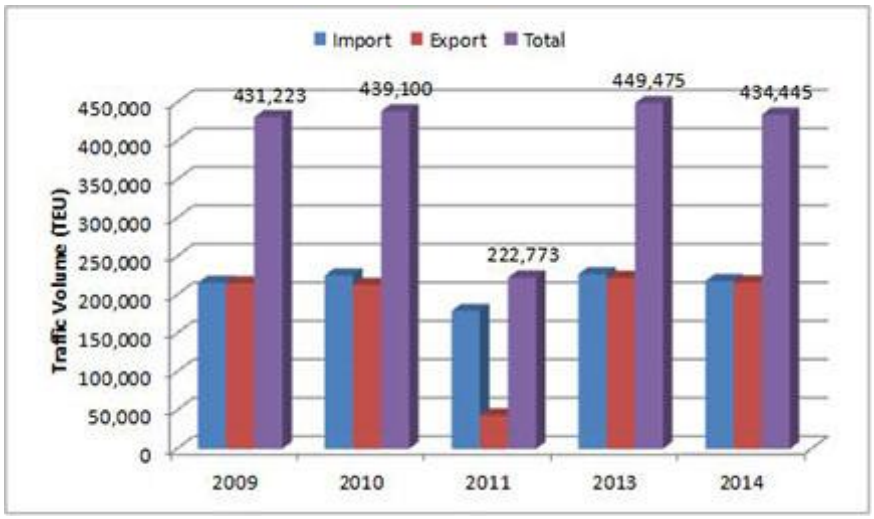
The Osman Digna port is located 60km South of the Port Sudan. The port has 9 berths which consist of 4 berths for passenger, RoRo and general cargo, 4 berths for livestock and general cargo and 1 berth for dry bulk, livestock and general cargo. The length of quay is 748 m and the draught is 8 ~ 12m. The annual capacity is 3 million tons.

2) Cargo Throughput[59]

Figure 5.1.24 and Figure 5.1.25 presents traffic volumes of container and non-containerized cargos, respectively. The annual container traffic is around 400,000 TEU in the past 5 years except for 2011 of which volume dropped to 200,000 TEU. Although the volumes of import and export are balanced, approximately 70 % of containers are exported without any cargo and excessive import was observed in Port Sudan. According to "Sudan Sea Ports Handbook 2016-18," the annual capacity of container terminal (South quay) is 1.2 million TEU and it still has room for further increase in container volume.

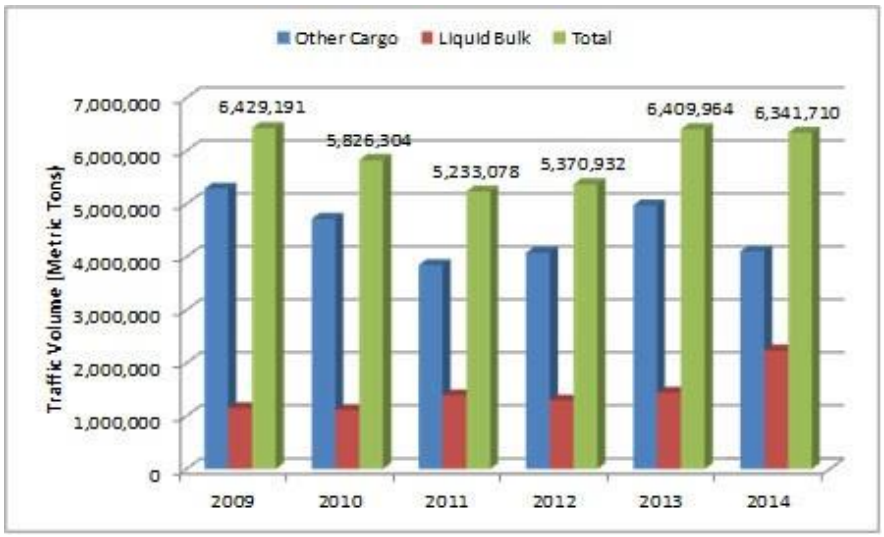
As with the Djibouti port, vast majority of non-containerized cargo in Port Sudan is import cargo of which proportion exceeds 90 % of the total non-containerized cargo volume. The volume was stable to be around 5.2 ~ 6.5 million tons per year. Compared to the Djibouti port, the share of liquid bulk is as low as 17 ~ 35 %. Alternatively, the proportions of wheat, cement and steel are higher in the Port Sudan.

[59] Origin-Destination data of the cargos could not be obtained in this survey



Note: The data in 2012 is published, but the file was broken.
Source: JICA Survey Team based on Statistical Report for the Year 2009 - 2014[60]

Figure 5.1.24 Container Throughput in Port Sudan



Source: JICA Survey Team based on Statistical Report for the Year 2009 – 2014

Figure 5.1.25 Non-containerized Cargo Throughput in Port Sudan

3) Development Plan[61]

Unlike the Djibouti port, major development in Port Sudan including the rehabilitation of the Osman Digna port has already been completed. The progressing/planned development project observed in this survey is the new livestock terminal development at 35 km South of the Osman Digna port. The phase 1 project is in progress and is developing 240 m long and 12.5 m depth quay. In phase 2 and 3, another 900 m (4 berths) quay with the draught of 12.5 m is planned[62].

(4) Relevant Ports

As possible competitive/complementary relationship ports to the Djibouti port and the Port Sudan, the Mombasa port and the Lamu port in Kenya and the Berbera port in Somalia are described in this section.

1) Mombasa Port[63]

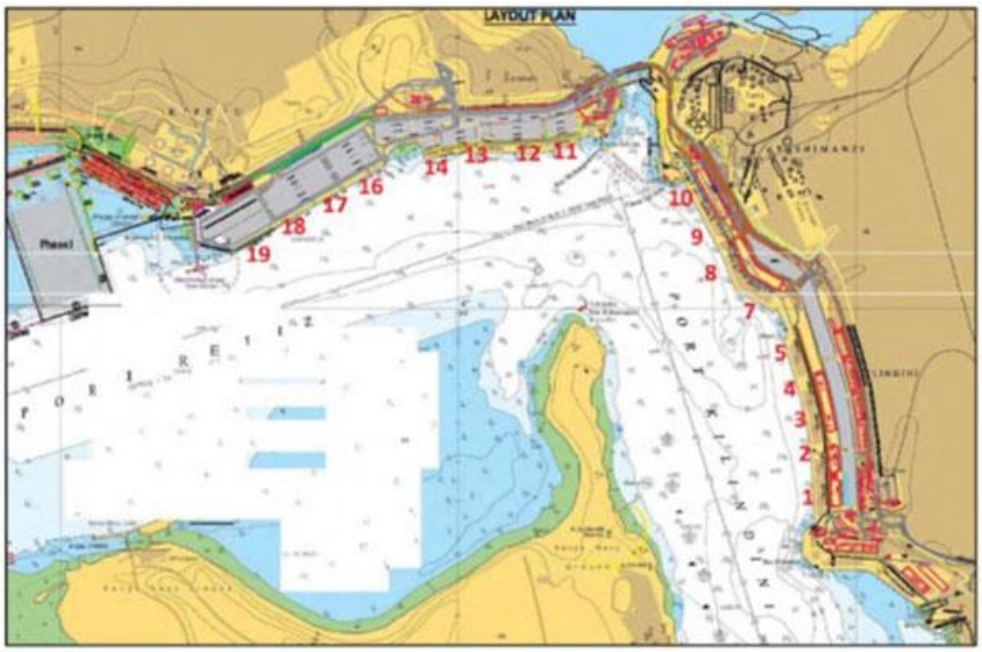
The Mombasa port is the largest seaport in the East Africa which is located in Mombasa, Kenya. The

[60] Only the report in 2013 was issued in English while the others are in Arabic
[61] The plan for future throughput could not be obtained in this survey.
[62] The materialized schedule is not described in the reference of "Sudan Sea Ports Handbook 2016-18"
[63] Referring the two documents; i) Final Report on Mombasa Port Master Plan including Dongo Kundu (2015) JICA, ii) Port Performance (2015) Kenya Port Authority (KPA)

hinterland includes not only Kenya, but also the neighboring landlocked countries such as Uganda, Rwanda and South Sudan. In order to cater for the booming demand, JICA has supported the development for the port masterplan.

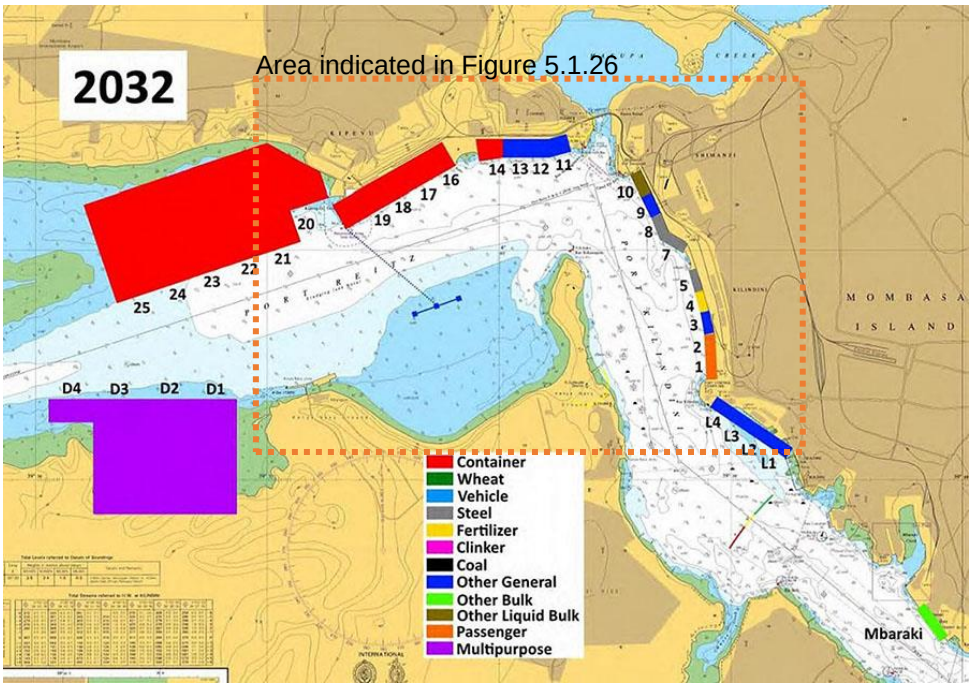
Compared to the Djibouti port and the Port Sudan, the Mombasa port handles larger volume of cargo. The annual container throughput in 2015 was 1,076,118 TEU. Container terminals are allocated to berth 11 ~ 19, of which the total length is 1,561.7m and the draught is 10.5 ~ 13.5 m. The traffic volume of non-containerized cargo was 16,456,000 tons which is equivalent to 1.8 times of the Djibouti port.

Development project is in progress. As the phase 1 project, additional container terminals (210m long x 10m depth and 300 m long x 15 m depth) are being constructed at the West side of the Terminal 19 (See Figure 5.1.26 and Figure 5.1.27). Further container terminal development is planned in the masterplan as well as multi-purpose port is also planned at the opposite shore.



Source: Final Report on Mombasa Port Master Plan including Dongo Kundu (2015) JICA

Figure 5.1.26 The Current Layout of the Mombasa Port



Source: Final Report on Mombasa Port Master Plan including Dongo Kundu (2015) JICA

Figure 5.1.27 Mombasa Port Development Plan (Target Year = 2032)

2) Lamu Port (Under Construction)[64]

In light of the recent congestion at the Mombasa port, the government of Kenya is developing a deep seaport with 32 berths in future. The Lamu port is located 340km North of the Mombasa which is expected to be the largest port in the East Africa. The first 1 berth is expected to be open in 2018 and the following 2 berths will be in 2020. By 2018 the government is considering to conclude the concession contract with a private operator and the remaining 29 berths are expected to be invested and constructed by the contracted operator. The hinterland will be North Kenya, South Ethiopia and South Sudan via the LAPSSET corridor.

Source: Nation Media Group (2015)

Figure 5.1.28 Image of the Lamu Port (Phase 1)

3) Berbera Port[65] (Under Rehabilitation)

The Berbera port is the gateway port for Somalia which is located in South shore of the Aden Gulf. In addition to an oil harbor, 650 m quay is installed in the port. The traffic volume in 2012 was 21,538 TEU for container, 521,300 tons for break bulk and 150,425 tons for other bulk[66]. The port is operated by Berbera Port Authority at the moment.

In consideration of its geographically advantageous location and booming economy in Ethiopia, the Berbera port is being recognized as an alternative gateway for Ethiopia. DP World, which is the world leading port operator, acquired a 30-year concession contract (including the right to extend 10 years of contract period). The rehabilitation project including 400 m quay, 250,000 m2 yard expansion[2] and procurement handling equipment is in progress and the project is expected to be completed by June 2019[67]. According to the article, 30% of Ethiopian cargo is expected to be diverted from the current Djibouti port to the Berbera port[68].

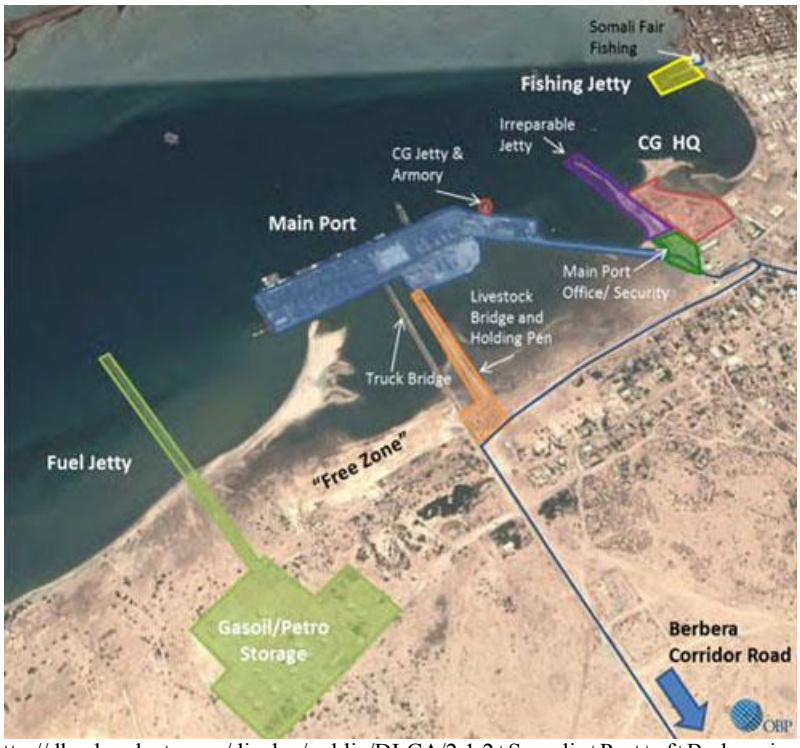
[64] http://www.lapsset.go.ke/projects/lamu-port/

[65] Main references are; http://www.berberaseaport.net/, https://asokoinsight.com/news/somaliland-and-dp-world-celebrate-30-year-concession-for-442-million-port-of-berbera-somalia --(a)

[66] http://dlca.logcluster.org/display/public/DLCA/2.1.2+Somalia+Port+of+Berbera

[67] This is inferred from the commencement date (March 2017 as shown in (a) above) and project period (16 months as shown in (b) below)

[68] https://www.tesfanews.net/berbera-port-ready-ethiopia-container-traffic-16-months/ ---(b)

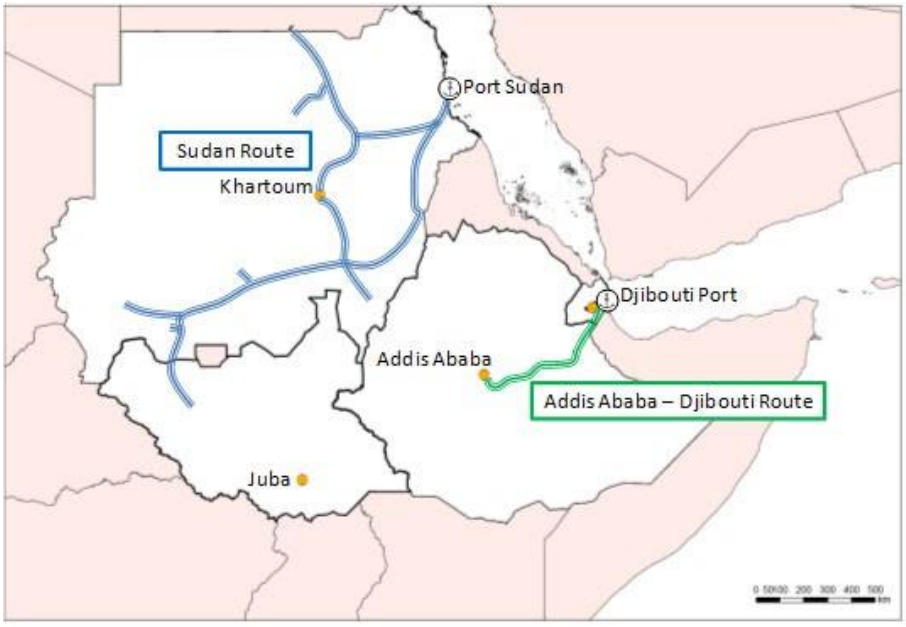


Source: http://dlca.logcluster.org/display/public/DLCA/2.1.2+Somalia+Port+of+Berbera;jsessionid=E45D379A0CE6A150116678565049B7D9

Figure 5.1.29 Layout of the Berbera Port

5.1.3. Railway Sector

Railway is an adequate transport mode for long-distance and mass demand for both passenger and freight. In the target countries as of 2017, the two routes such as i) Addis Ababa-Djibouti route (under preparation for operation) and ii) Sudan, South Sudan route (in operation) are available as shown in Figure 5.1.30.



Source: JICA Survey Team

Figure 5.1.30 The Current Major Railway Network in the Target Countries

(1) Railway Sector in Djibouti and Ethiopia

1) Outline

a) Background of New Railway Development

In the region, Ethio – Djibouti railway line was constructed in 1917 with the gauge width of 1,000mm and the line functioned as an artery connecting the gateway of the Djibouti port and Addis Ababa[69]. However, the operation had decreased due to destruction by war and lack of maintenance. A rehabilitation project had been planned for several time, the project had not been implemented yet. Thus, major transport mode between the Djibouti port and Addis Ababa became road transport for a while[70].
In order to connect the Djibouti port and Addis Ababa with standard gauge railway, the Ethiopian Railway Corporation launched a new Addis Ababa – Djibouti railway project. Alignments of the Addis – Ababa – Djibouti railway (Newly constructed standard gauge line) and the Ethio – Djibouti railway (former narrow gauge line) are shown in Figure 5.1.31. The alignment of the Addis Ababa – Djibouti railway is similar to the former narrow gauge line. However, the new line is a new construction project, not rehabilitation project, due to difference in gauge with and propulsion system. This chapter describes outline of the newly constructed Addis Ababa – Djibouti railway hereafter.

Source: https://en.wikipedia.org/wiki/File:Bahnstrecke_Addis_Abeba%E2%80%93Dschibuti.png

Figure 5.1.31 The Old and New Railway Alignment between the Djibouti port and Addis Ababa

b) Outline of the New Railway

The outline of Addis Ababa – Djibouti railway (newly constructed standard gauge line) is shown in Table 5.1.12. The route originates from the Djibouti port and passes through the border between Ethiopia and Djibouti, Dire Dawa, Awash, Adama, Modjo, Addis Ababa and finally reaches to Sebeta which is located in West side of Addis Ababa. The project cost was around US$ 3.4 billion (equivalent to JPY 388 billion) financed by the China Exim Bank[71] and the construction was completed in 2017[72]. The railway was constructed by two contractors, namely China Railway Engineering Corporation (CREC) and China Civil

[69] The first commercial service commenced in 1901.
[70] Detailed information could not be obtained in this survey.
[71] http://www.sankei.com/world/news/170511/wor1705110040-n1.html
[72] The completion ceremony was held on 10th January 2017

Engineering Construction Corporation (CCECC). The two contractors concluded 6-year railway operation contract with Djiboutian and Ethiopian Railway Corporation which includes technology transfer to Djiboutian and Ethiopian officials. The last two years in the contract period, the railway is expected to be operated only by Djiboutian and Ethiopian officials and only management person will stay from the Chinese companies. The new railway is the first electric railway in Africa. According to the Ethiopian official, the reason to introduce electric railway is the steep terrain. The railway starts from the Djibouti port of which altitude is near 0m and climbs to around 2,300m where Addis Ababa is located. Since it requires robust propulsion system, the introduction of electric railway was determined. On the section of Sebeta – Addis Ababa – Adama, double track was applied considering high traffic volume between the cities as shown in Figure 5.1.32, and the remaining sections are single track.
The section in Djibouti side was completed in January 2017 except for some section and it is a trial operation period as of March 2017. According to a Djibouti official, electrical problem was detected at some stations and it became an obstacle for full-fledged operation. The full operation is expected to be commenced by July 2017[73]. The Djibouti side considers starting its operation before the hottest season even by diesel vehicles if the electric problem is not addressed.

Table 5.1.12 Outline of the Addis Ababa-Djibouti Railway Line

Item	Outline
Country	Djibouti, Ethiopia
Length	756 km
Gauge width	1,435 mm (Standard gauge)
Number of track	Double (115 km), Single (641 km)
Axle load	25 tons at the maximum
Rail type	UIC[74] 54 or 60 kg rail, concrete sleepers
Propulsion system	Electricity (25 kV AC overhead line)
Construction Year	2017
Maximum speed (passenger)	120 km/h
Maximum speed (freight)	120 km/h
Rolling stocks (quantities are indicative only)	Passenger: 3 locomotives + 30 coaches Freight: 32 locomotives + 1,000 wagons
Operator	- Ethiopian Railway Cooperation - Société Djiboutienne De Chemin De Fer - Chinese railway companies (CREC & CCECC)

Source: Project Portfolio issued by Ethiopian Railway Corporation and the interview

Adama Station and Double Track (Sebeta – Adama)

Single Track between Adama and Djibouti

Source: JICA Survey Team

Figure 5.1.32 Addis Ababa-Djibouti Railway

[73] Another source indicates the commencement will be within 2017
[74] UIC stands for International Union of Railways

2) Operation Plan

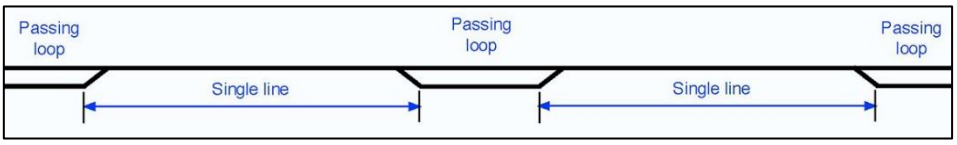
Both Djiboutian and Ethiopian officials mentioned that 30 ~ 40 % of freight between Djibouti and Ethiopia is expected to be transported by railway in short term. A Djiboutian official explained their freight operation plan as follows; 1 trip can carry 2,500 tons and 4 trips per day are planned. Thus, the planned transport volume is 10,000 tons per day. Assuming that 365-day per year operation is provided, the annual railway transport capacity reaches 3.6 million tons per year. According to the statistical data at the Djibouti port, the current traffic volume between the Djibouti port and Ethiopia is approximately 11.5 million tons per year. Therefore, 30% of freight can be transported with railway if the operation schedule is achieved.

According to the calculation by an Ethiopian official based on the quantity of owned rolling stock, the maximum transport capacity is much large. The Railway Corporation owns 32 locomotives and around 1,000 wagons which enable to formulate 16 train sets per day at the maximum. It is 4 times of the initial capacity estimate by the Djiboutian official. If it can operate 100% of the maximum capacity, the annual transport capacity is 14.4 million tons which exceeds the total traffic volume in 2015. The Djiboutian official mentioned that they expect 70% of the freight between Djibouti and Addis Ababa will be transported with railway. This prospect could be achievable by increasing the operation ratio of the owned rolling stocks.

The passenger operation plan is to formulate a locomotive and 10 coaches as one set in an initial stage. The capacity of one coach is around 100 ~ 120 passengers and one train set can accommodate 1,000 ~ 1,200 passengers. Since 3 train sets can be formulated at the maximum, the maximum passenger capacity is planned to be 3,000 ~ 3,600 passengers per day.

Travel time and cost are also expected to be reduced. In the current situation, travel time from the Djibouti port and Addis Ababa on road transport is around 3 days. The railway transport is expected to reduce to 10 hours and the cost is to be around 1/3[75]. Therefore, many logistics companies are considered to use railway for the transport as long as the operation goes well.

Since the logistic demand in Ethiopia is rapidly increasing, the Ethiopian Railway Corporation has already started to enhance the transport capacity. The major measures are as follows; i) additional procurement of rolling stocks, ii) system upgrade (i.e. signal, additional passing loop (See Figure 5.1.33), etc.), iii) upgrade from single track to double track on the section of Adama – Djibouti. On the current single track section, 3 km passing loops are installed every 30km. The transport capacity can be enhanced by applying adequate combination of the measures above.



Source: http://www.railway-technical.com/sigsing.shtml

Figure 5.1.33 Passing Loop

3) Development Plan

The Ethiopian government has prepared a railway development plan as shown in Figure 5.1.34. The center of the network is Addis Ababa and the network radiates toward East, North, South and West. In addition, the North Ethiopia directly connects with the Tadjourah port in Djibouti.

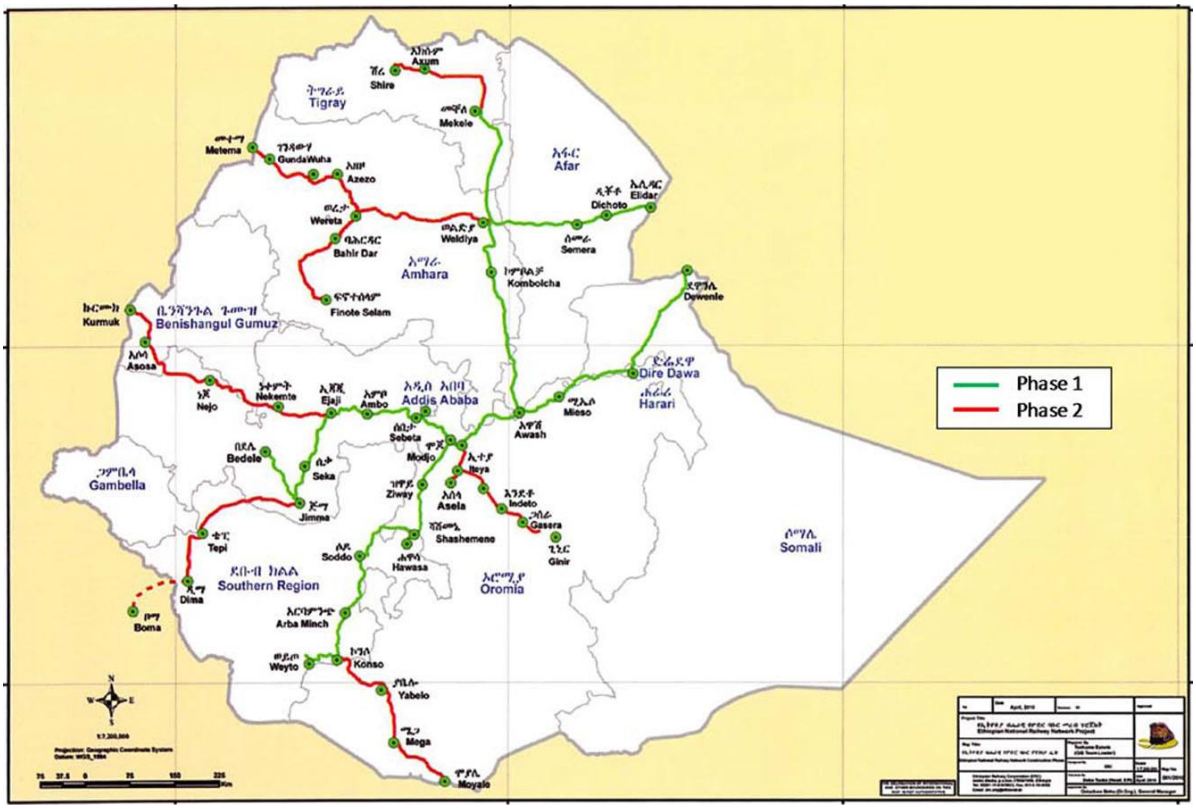
Following the development of Djibouti – Addis Ababa line, which is the most critical route for Ethiopia, North – South line connecting Awash and Mekele is under construction at the moment[76]. The specification of the route is the standard gauge, single track and electric propulsion system which are mostly the same as the Djibouti – Addis Ababa route. The length is 643 km connecting with the North Ethiopia with passenger and freight train.

As the next priority project, the section of Modjo – Hawassa – Konso – Moyale is under consideration. This route originates from the largest dry port of the Modjo dry port and passes through Hawassa where industrial park has opened, and it is planned to connect with railway network in Kenya as a part of the LAPPSET corridor. The length is 976 km and the route enables to access to the Lamu port which will start

[75] https://www.ft.com/content/42d7af2e-d95a-11e6-944b-e7eb37a6aa8e

[76] According to the article by "Horn Affairs", the contract was signed in June 2012 and the project period was 48 months. However, the construction was not completed as of May 2017 and the actual completion date is unclear. (http://hornaffairs.com/2017/05/13/ethiopia-mekelle-woldya-railway-project-standstill/)

its operation in 2020. The finance for this section has not been confirmed yet.
The next priority section is Woldiya /Haragebeya – Asayta (Djibouti border) –Tadjourah port. The length is 218 km in Ethiopia and around 100 km in Djibouti. The route can provide shorter seaport access for the North Ethiopia such as Mekele. This route is also expected to export potassium which was observed around Mekele, but the mining project is stagnant according to the Ministry of Mines and Natural Gas in Ethiopia. Feasibility study on Djibouti section has been conducted by the assistance of Indian government[77], but the finance has not been secured yet. The development of section in Ethiopia has no significant progress as well.



Source: Projects Portfolio issued by ERC

Figure 5.1.34 Railway Network Plan in Ethiopia

4) Relevant Laws and Regulations

The relevant laws and regulations in Railway sector in Ethiopia are shown in Table 5.1.13. According to the article of "The Reporter" on June 2017, a bill for railway operation license toward private sector has been submitted and it is deliberated.

Table 5.1.13 Relevant Laws and Regulations in Railway Sector in Ethiopia

Proclamation No. 468/2005: Transport Proclamation
Part 1: General Part 2: Transport Authority[78] Part 3: Public Commercial Road Transport Activities and Public Commercial Road Transport Associations Part 4: Miscellaneous Provisions
Regulation No.266/2012: Ethiopian Railway Corporation Establishment (Amendment) Council of Ministers Regulation[79]
1. Short Title, 2. Amendment[80], 3. Effective Date

Source: JICA Survey Team based on the obtained data

[77] The detailed information could not be obtained from Société Djiboutienne de Chemin de Fer(SDCF、Djibouti Railway Company)
[78] The responsibility of the Transport Authority includes the items related to railway such as issuance of railway operation license and rolling stock inspection
[79] The original regulation "Regulation 141/2007: Ethiopian Railway Corporation Establishment Council of Ministers Regulation" could not be obtained in this survey.
[80] Amendment includes authorization of L/A signing and increase in capital stock

(2) Railway Sector in Sudan and South Sudan

1) Outline

As shown in Figure 5.1.30, Sudan and South Sudan have the second longest railway network[81] in the African continent, of which length is 4,180km. The specifications are gauge width of 1,067mm (narrow gauge), single track and diesel propulsion system (See Table 5.1.14)
Table 5.1.15 indicates the aging railway infrastructure. 99% sections are more than 50 years old constructed prior to 1962 and 50% sections are more than 100 years old. The decrepit infrastructures are recognized as one of the critical issues in Sudan. In particular, some sections such as Haiya – Singa – Ed Damazin are no more operated at the moment. The aging problem is applied to rolling stocks as well. Only 44% of rolling stock can operate and the remaining is under repairing.
Unlike Addis Ababa – Djibouti railway, railway in Sudan is operated by private sector. According to Sudan Railway Corporation (SRC), 5 Sudanese operators made management contracts with SRC and provides railway services by using their own rolling stocks. 15% of fare revenue is paid t SRC as railway usage charge. The change is used for maintenance of railway infrastructure.

Table 5.1.14 Outline of Railway Network in Sudan and South Sudan

Item	Outline
Country	Sudan, South Sudan
Length	4,180 km in total
Gauge width	1,067 mm (narrow gauge)
Number of track	Single
Axle load	N/A
Rail type	N/A
Propulsion system	Diesel
Construction Year	1897 ~ 1995
Maximum Speed	40 km/h
Rolling Stocks	- Mainline locomotive: 111 - Shunting locomotive: 16 - Freight wagon: 2,800 - Tank wagon: 442 - Passenger coach: 50 Operation ratio: 44%
Operator	5 private operators (SRC is for management)

Source: Sudan Railways Strategic Plan (2016 – 2029),
https://en.wikipedia.org/wiki/Rail_transport_in_Sudan, interviews to SRC, etc.

Table 5.1.15 Construction Year of Each Section

Section	Construction Year	Length
Wadi Halfa- Abu Hamad	1897-1898	350 km
Abu Hamad – Atbara	1898	244 km
Atbara – Khartoum	1898-1900	313 km
Atbara – Port Sudan	1904-1906	474 km
Station No. 10 – Karima	1905	222 km
Khartoum –Kosti – El Obeid	1909-1911	689 km
Hayya – Kassala	1923-1924	347 km
Kassala – Gedarif	1924-1928	218 km
Gedarif – Sennar	1928-1929	237 km
Sennar- Damazin	1953-1954	227 km
Aradeiba Junction – Babanusa	1956-1957	354 km
Babanusa – Nyala	1957-1959	335 km
Babanusa – Wau	1959-1962	444 km
Girba – Digiam	1962	70 km
Muglad – Abu Gabra	1995	52 km

Source: http://www.sudanrailways.gov.sd/ar/pdf/facts_2007_en.pdf

[81] The longest railway network in the African continent is in South Africa

2) Operation

Although the railway network in Sudan and South Sudan is the second longest in Africa, the railway and rolling stocks are decrepit and the operation situation is not going well. According to "Sudan Railway Strategic Plan", the operation speed is as slow as 35km/h and it leads to long transit time. The aging infrastructure becomes a main cause for derailment and it decreases the reliability on railway transport.
Under the situation, the freight transport share of railway is low. Out of the total domestic freight transport of 26,006,773 tons, only 998,915 tons were transported by railway in 2011, of which proportion was 3.8%. As to passenger traffic, 11,000 passengers were transported by railway out of the total passengers of 37,433,218, of which proportion was less than 0.1%.
SRC and the government of Sudan are planning to rehabilitate the railway network to improve the situation. The targets for the rehabilitation project are freight transport of 22 million tons and 7.47 million passenger transport by 2029.

3) Development Plan

a) Objective and Specifications

In consideration of the aging railway infrastructure and compatibility with the railway in the surrounding countries, SRC and the government of Sudan plan to introduce standard gauge railway. The objectives to construct standard gauge railway are; i) provide modernized passenger traffic service, ii) meet the traffic demand which is projected to be triple in 5 years plan (2014 – 2019), ii) reduce transport cost by 30%, iv) contribute to reduction of traffic accidents of which number is the 16th largest in the world and v) connect the Sudanese railway network with the surrounding African countries and Arabic countries in future.
The major specifications on the standard gauge railway are shown in Table 5.1.16. In light of gauge width, axle load and rail type, the specifications are similar to the railway specifications in Djibouti and Ethiopia except for diesel propulsion system. It seems to be because of the relatively flat terrain in Sudan. The number of track is single or double corresponding to transport demand. On some sections, anomalistic double track might be introduced where one track for standard gauge and the other is for narrow gauge according to SRC. This is to utilize the existing rolling stocks for such sections.

Table 5.1.16 Major Specifications on Standard Gauge Railway in Sudan

Item	Outline
Gauge width	1,435 mm (Standard gauge)
Number of track	Single/Double
Axle load	25 tons at the maximum
Rail type	UIC 60 kg rail, concrete sleeper
Propulsion system	Diesel
Maximum operation speed (Passenger)	120 km/h (160 km/h in future)

Source: Sudan Railways Strategic Plan (2016 – 2029)

b) Priority Project and Cost

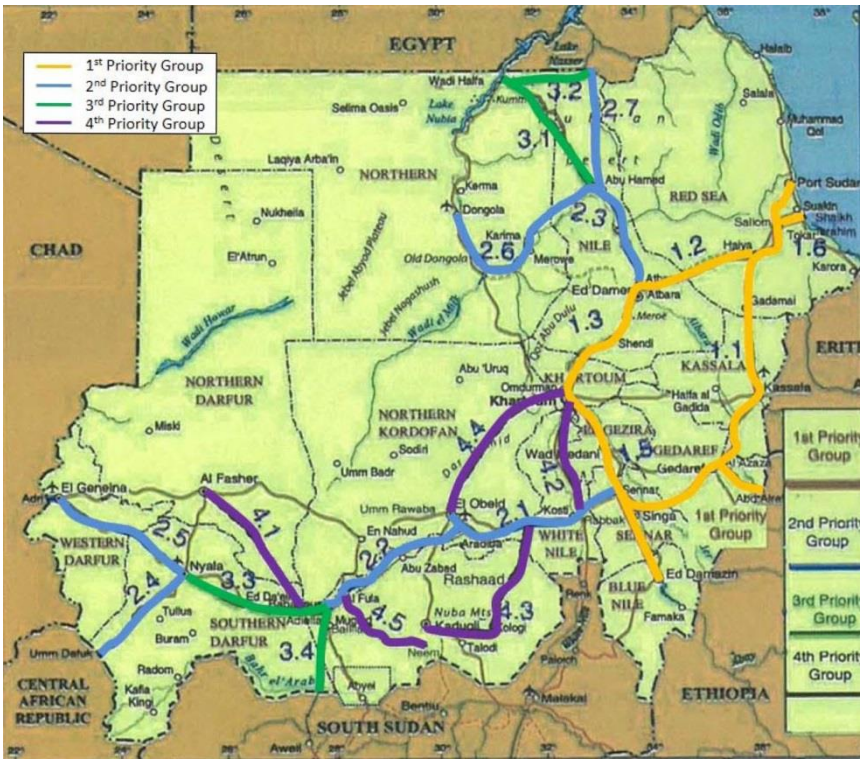
SRC has prepared a strategic plan for introducing standard gauge railway. As shown in Figure 5.1.35, the sections are categorized into 4 groups. The rough estimates for each group is shown in Table 5.1.17.
The first priority section is Khartoum – Port Sudan. The feasibility studies on Haiya – Kassala – El gadaref – Sennar – El damazin section (1,104km, section 1.1 in the Figure 5.1.35) and Port Sudan – Atbara section (598km, section 1.2 in the figure) have already been implemented. According to SRC, construction work on the former section has already been commenced by a Chinese contractor. According to the article of "The Ethiopian Herald" on 4 April 2017, the Prime Minister of Ethiopia and the President of Sudan agreed to connect Ethiopia and the Port Sudan with railway network. Thus, the projects in the 1st group are steadily in progress.
The second group projects extend the network toward West and North. The sections toward West (section 2.1 and 2.2 in the figure) are the route to enhance the transport including import and export facilitation. The sections toward North (section 2.3, 2.6 and 2.7) are to enhance the trade with the Northern region and Egypt. In particular, feasibility study on section Abuhamed – Egypt border (340 km, section 2.7 in the figure) has already been conducted.

The third group is to provide access to the surrounding countries such as Egypt and South Sudan. The fourth group is to enhance the access to major cities in Sudan. The railway development is in progress to achieve the objective railway transport share described in the above section.

Table 5.1.17 Rough Estimates for Railway Development in Sudan

No.	Project	Length (km)	F/S Cost (US$ million)	Construction (US$ million)	Rolling Stock (US$ million)
1	1st Group	2,672	2.4	4,227.6	595.3
2	2nd Group	2,606	5.4	5,407.3	384.9
3	3rd Group	1,130	2.7	1,821.2	228.5
4	4th Group	1,643	4.0	3,510.7	309.8
Total		8,051	14.5	14,966.8	1,518.5

Source: Sudan Railways Strategic Plan (2016 – 2029)



Source: Sudan Railways Strategic Plan (2016 – 2029) colored by JICA Survey Team

Figure 5.1.35 Railway Development Plan in Sudan

5.1.4. Aviation (Airport) Sector

Aviation transport has many advantages such as short transit time, no line construction and no physical obstacles on a route, while it has disadvantages such as high transport cost and small capacity for one trip. Thus, the aviation transport is suitable for light and high value cargos.

(1) Aviation Sector in Djibouti

1) Outline

The Djibouti-Ambouli International Airport is located in the Djibouti city and it establishes air access to the neighboring and Middle East countries. Aviation administration is managed by Autorité de l'aviation civile (Civil Aviation Authority).

2) Airport

a) Airport in Djibouti

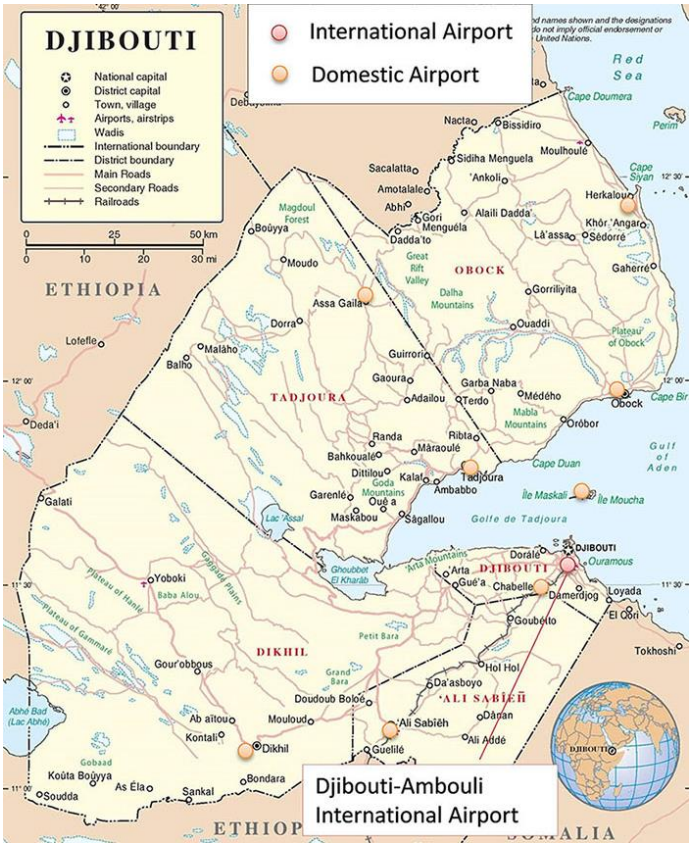
Airports in Djibouti are listed in Table 5.1.18 and the locations are shown in Figure 5.1.36. Nine airports are operated in the country. According to "List of international aerodromes as published in the regional air

navigation plans[82]" issued by ICAO[83], the Djibouti – Ambouli airport is an international airport.

Table 5.1.18 Airport in Djibouti

Airport	Location	ICAO Code[84]	IATA Code[85]
Ali-Sabieh Airport	Ali-Sabieh	HDAS	AII
Assa-Gueyla Airport	Assa-Gueyla	HDAG	
Chabelley Airport	Chabelley	HDCH	
Dikhil Airport	Dikhil	HDDK	
Djibouti-Ambouli International Airport	Djibouti City	HDAM	JIB
Herkale Airport	Herkale	HDHE	
Moucha Airport	Moucha Island	HDMO	MHI
Obock Airport	Obock	HDOB	OBC
Tadjoura Airport	Tadjoura	HDTJ	TDJ

Source: ICAO Location Indicators by State
Note: Underline is an international airport listed in "List of international aerodromes as published in the regional air navigation plans" ICAO (10 Aug 2017 access)



Source: JICA Survey Team

Figure 5.1.36 Airport Location in Djibouti

b) Djibouti-Ambouli International Airport

The outline of Djibouti – Ambouli International Airport is shown in Table 5.1.19. The airport is located in the Djibouti city and has one runway. The self-defense force of Japan and armies of the U.S., Italia, France and Djibouti also use the airport.

[82] https://www.icao.int/safety/iStars/Pages/API-Data-Service.aspx (10 August 2017 access)
[83] International Civil Aviation Organization
[84] ICAO Airport code is determined by each country following the allotment rule of International Civil Aviation Organization. Denote in 4 letters
[85] IATA Airport code is determined by the International Air Transport Association. 3 letters codes are allocated to more than 10,000 airports in the world.

Table 5.1.19 Outline of Djibouti-Ambouli International Airport

Item	Outline
Name	Djibouti-Ambouli International Airport
IATA code	JIB
ICAO code	HDAM
Type	Joint (civilian and military)
Location	Djibouti city
Major Airline	Djibouti Airlines
Altitude	15 m
Coordinates	11° 32’ 50.39” N, 43° 09’ 34.13” E
Runway	3,150 x 46 meters (part concrete, part asphalt, or part bitumen-bound macadam)

Source: Airports-Worldwide.com

3) Route

The airlines using the Djibouti-Ambouli International Airport and the destinations are summarized in Table 5.1.20. The major destinations are limited to the surrounding countries such as Ethiopia, Kenya and Somalia and the Middle East countries. The network of the Djibouti Airlines, which the flagship carrier in Djibouti, is likewise limited to Ethiopia, Somalia, Yemen and UAE.

Table 5.1.20 Airlines and Routes for the Djibouti International Airport

Airline	Route (Destination)
African Express Airways	Amman, Mombasa, Nairobi
Air France	Paris-Charles de Gaulle
Daallo Airlines	Addis Ababa, Bossaso, Burao, Dubai, Galcaio, Hargeisa, Mogadishu, Nairobi
Djibouti Airlines	Addis Ababa, Aden, Borama, Boosaaso, Dire Dawa, Dubai, Hargeisa
Ethiopian Airlines	Addis Ababa, Dubai, Sanaa
Felix Airways	Aden, Sana’a, Taiz
flydubai	Dubai
Inter-Somalia	Mogadishu
Jubba Airways	Mogadishu
Kenya Airways	Addis Ababa, Nairobi
Yemenia	Sana’a

Note: Underline means the flagship carrier
Source: Airports-Worldwide.com

(2) Aviation Sector in Ethiopia

1) Outline

Ethiopia has two international airports in the capital Addis Ababa and Dire Dawa. Development of the flagship carrier of the Ethiopian Airlines based in the Addis Ababa Bole International airport has established the air access to 96 cities in the world. Aviation administration is managed by the Civil Aviation Authority.

2) Airport

a) Airport in Ethiopia

Airports in Ethiopia are listed in Table 5.1.21 and the locations are shown in Figure 5.1.37. 45 airports are operated in the country. According to “List of international aerodromes as published in the regional air navigation plans[86]” issued by ICAO[87], the Addis Ababa Bole International Airport and Dire Dawa International Airport are international airports.

[86] https://www.icao.int/safety/iStars/Pages/API-Data-Service.aspx (10 August 2017 access)
[87] International Civil Aviation Organization

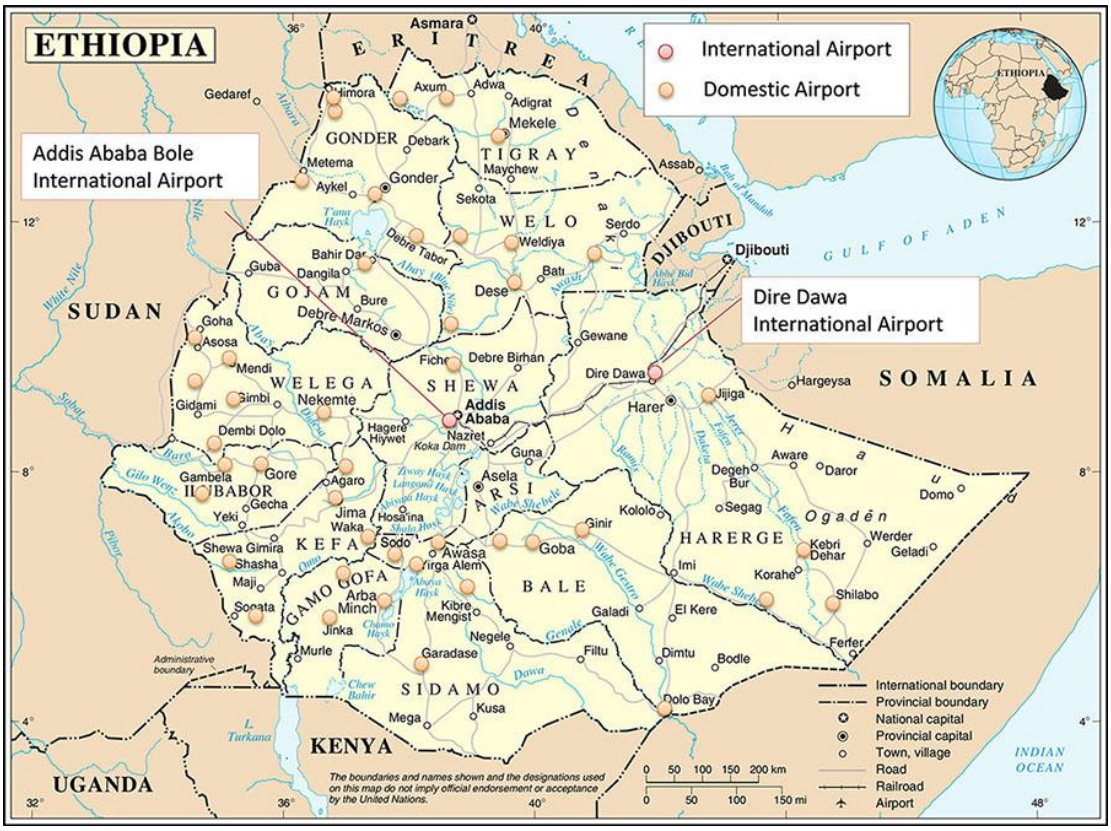
Table 5.1.21 Airports in Ethiopia

Airport	Location	ICAO Code[88]	IATA Code[89]
Adaba Airport	Adaba, Oromia	HAAD	
Addis Ababa Bole International Airport	Addis Ababa	HAAB	ADD
Arba Minch Airport	Arba Minch, SNNPR	HAAM	AMH
Asosa Airport	Asosa, Benishangul-Gumuz	HASO	ASO
Awasa Airport	Awasa, SNNPR	HALA	AWA
Axum Airport	Axum, Tigray	HAAX	AXU
Bahir Dar Airport	Bahir Dar, Amhara	HABD	BJR
Beica Airport	Beica, Oromia	HABE	BEI
Bulchi Airport	Bulchi, SNNPR	HABU	BCY
Combolcha Airport	Combolcha, Amhara	HADC	DSE
Dansha Airport	Dansha, Tigray	HADA	
Debre Marqos Airport	Debre Marqos, Amhara	HADM	DBM
Debre Tabor Airport	Debre Tabor, Amhara	HADT	DBT
Dembidolo Airport	Dembidolo, Oromia	HADD	DEM
Dire Dawa International Airport (Aba Tenna Dejazmach Yilma International Airport)	Dire Dawa	HADR	DIR
Dodola Airport	Dodola, Oromia	HADO	
Fincha Airport	Fincha (Finicha'a), Oromia	HAFN	FNH
Gambela Airport	Gambela	HAGM	GMB
Ghinnir Airport	Ghinnir, Oromia	HAGH	GNN
Robe Airport (Gobe Airport)	Robe / Goba, Oromia	HAGB	GOB
Gode Airport	Gode, Somali	HAGO	GDE
Gondar Airport	Gonda, Amhara	HAGN	GDQ
Gore Airport	Gore, Oromia	HAGR	GOR
Humera Airport	Humera, Tigray	HAHU	HUE
Garaad Wiil-Waal Airport	Jijiga, Somali	HAJJ	GWW
Aba Segud Airport (Jimma Airport)	Jimma, Oromia	HAJM	JIM
Baco Airport (Jinka Airport)	Jinka (formerly Baco), SNNPR	HABC	BCO
Kabri Dar Airport	Kabri Dar, Somali	HAKD	ABK
Lalibela Airport	Lalibela, Amhara	HALL	LLI
Tum Airport	Maji, SNNPR	HAMJ	TUJ
Alula Aba Nega Airport (Mekale Airport)	Mekele, Tigray	HAMK	MQX
Mekane Selam Airport	Mekane Selam, Amhara	HAMA	MKS
Mendi Airport	Mendi, Oromia	HAMN	NDM
Genda Wuha Airport	Metema, Amhara	HAMM	ETE
Mizan Teferi Airport	Mizan Teferi, SNNPR	HAMT	MTF
Mui Airport	Mui, SNNPR	HAMR	MUJ
Nejjo Airport	Nejjo, Oromia	HANJ	NEJ
Nekemte Airport	Nekemte, Oromia	HANK	NEK
Semera Airport	Semera, Afar		SZE
Shakiso Airport	Shakiso, Oromia	HASK	SKR
Shilavo Airport	Shilavo, Somali		HIL
Shire Airport	Shire, Tigray		SHC
Sodo Airport	Sodo, SNNPR	HASD	SXU
Tippi Airport	Tippi, SNNPR	HATP	TIE
Wacca Airport	Wacca, SNNPR	HAWC	WAC

Source: ICAO Location Indicators by State
Note: Underline is an international airport listed in "List of international aerodromes as published in the regional air navigation plans" ICAO (10 Aug 2017 access) .

[88] ICAO Airport code is determined by each country following the allotment rule of International Civil Aviation Organization. Denote in 4 letters

[89] IATA Airport code is determined by the International Air Transport Association. 3 letters codes are allocated to more than 10,000 airports in the world.



Source: JICA Survey Team

Figure 5.1.37 Airport Locations in Ethiopia

b) Addis Ababa Bole International Airport

The outline of the Addis Ababa Bole International Airport is shown in Table 5.1.22. The airport started its operation in 1992 as a public airport. The terminal is operated by the Ethiopian Airport Enterprise (EAE) at the moment. The airport possesses two runways with the lengths of 3,800 m and 3,700m. According to the interview with EAE, the terminal expansion project is in progress and will be completed in a few years[90], so that the congestion in the terminal will be alleviated on the completion of the expansion.

Table 5.1.22 Outline of the Addis Ababa Bole International Airport

Item	Outline
Name	Addis Ababa Bole International Airport
IATA code	ADD
ICAO code	HAAB
Type	Public
Location	Bole Addis Ababa
Main Airlines	Ethiopian Airlines
Altitude	2,334 m
Coordinates	08°58’40”N 38°47’58”E
Runway	3,800 x 45 meters (Asphalt Surface) 3,700 x 45 meters (Asphalt Surface)

Source: Airports-Worldwide.com

c) Dire Dawa International Airport

The outline of Dire Dawa (Aba Tenna Dejazmach Yilma) International Airport is shown in Table 5.1.23. The airport is located in Dire Dawa and it has one runway.

[90] Exact date could not be obtained in this survey.

Table 5.1.23 Outline of the Dire Dawa International Airport

Item	Outline
Name	Dire Dawa International Airport (Aba Tenna Dejazmach Yilma International Airport)
IATA code	DIR
ICAO code	HADR
Type	Joint (Civil and Military)
Location	Dire Dawa
Main Airlines	N/A
Altitude	1,167 m
Coordinate	09°37’25”N, 41°51’15”E
Runways	2,679 x 45 meters (Asphalt Surface)

Source: Airports-Worldwide.com

3) Route

The airlines and the destinations for the Addis Ababa Bole International Airport and Dire Dawa International Airport are shown in Table 5.1.24 and Table 5.1.25, respectively. The wide aviation network based on the Addis Ababa Bole International Airport includes Europe, Middle East as well as Asia. In particular, the flagship carrier of the Ethiopian Airlines (ET) contributes to the wide aviation network. ET provides 96 international destinations and 21 domestic destinations, and the routes (destinations) are being expanded. In addition to the main hub of the Bole International Airport, ET has established the second hub at Lomé in Togo and the third hub at Lilongwe in Malawi. Furthermore, Liège and Brussels in Belgium as well as Hong Kong and Dubai are set as international freight transport hubs for ET. In the meantime, the international routes from/to the Dire Dawa International Airport are limited to Djibouti and Somalia.

Table 5.1.24 Airlines and Routes for the Addis Ababa Bole International Airport

Airlines	Route (Destination)
BMI	Amman, London-Heathrow
Daallo Airlines	Djibouti, Hargeisa
Djibouti Airlines	Djibouti
Egypt Air	Cairo
Emirates	Dubai, Entebbe
Ethiopian Airlines	Abidjan, Abu Dhabi, Abuja, Accra, Aden, Ahmedabad, Al Hudaydah, Amsterdam, Antananarivo, Arba Minch, Asmara, Asosa, Assab, Athens, Axum, Awasa, Bahir Dar, Bamako, Bangalore, Bangkok-Suvarnabhumi, Bangui, Beica, Beijing-Capital, Beirut, Berbera, Berlin, Blantyre, Brazzaville, Brussels, Bujumbura, Bulchi, Buno Bedele, Cairo, Cape Town, Chengdu, Chennai, Conakry, Cotonou, Dakar, Dammam, Dar es Salaam, Debra Marcos, Debre Tabor, Delhi, Dembidolo, Dessie, Dhahran, Djibouti, Dire Dawa, Dodollo, Doha, Douala, Dubai, Dublin, Durban, Entebbe, Enugu, Frankfurt, Gaborone, Gambela, Ghimbi, Ginir, Goba, Gode, Goma, Gondar, Gore, Guangzhou, Hangzhou, Harare, Hargeisa, Hong Kong, Humera, Jeddah, Jijiga, Jimma, Jinka, Johannesburg, Juba, Kaduna, Kano, Karachi, Kabri Dar, Khartoum, Kigali, Kilimanjaro, Kinshasa, Kuala Lumpur, Kuwait City, Lagos, Lalibela, Larnaca, Lekempti, Libreville, Lilongwe, Liege, Lomé, London-Heathrow, Los Angeles, Luanda, Lubumbashi, Lusaka, Luxembourg City, Maastricht, Madrid, Mahe, Maji, Malabo, Malakal, Manama, Manila, Maputo, Masawa, Mekane Selam, Mek’ele, Mendi, Milan, Mizan Teferi, Mombasa, Monrovia, Moroni, Moscow, Mota, Mumbai, Muscat, Nairobi, Ndjamena, Ndola, Neghelli, Nejo, Newark, Niamey, Oslo, Ostend, Ouagadougu, Paris-Charles de Gaulle, Pointe-Noire, Port Sudan, Rio de Janeiro, Riyadh, Rome-Fiumicino, Sana'a, Semera, Seoul, Shanghai, Sheikh Hussein, Shilavo, Shire, Singapore, Soddu, Stockholm-Arlanda, Sao Paulo, Ta'izz,

Airlines	Route (Destination)
	Tel Aviv, Teseney, Tippi, Tokyo, Toronto, Tum, Victoria Falls, Vienna, Wacca, Wadi Halfa, Washington-Dulles, Windhoek, Yaounde, Zanzibar, Zaragoza
Gulf Air	Bahrain
Kenya Airways	Djibouti, Nairobi
KLM	Amsterdam, Khartoum
Lufthansa	Frankfurt
Saudi Arabian Airlines	Jeddah, Riyadh
Sudan Airways	Khartoum
Turkish Airlines	Istanbul-Ataturk
Yemenia	Sana'a
<< Cargo Airlines >>	
El Al Cargo	Tel Aviv
Royal Air Maroc Cargo	Casablanca, Cairo, Libreville

Note: Underline means the flagship carrier
Source: Airports-Worldwide.com

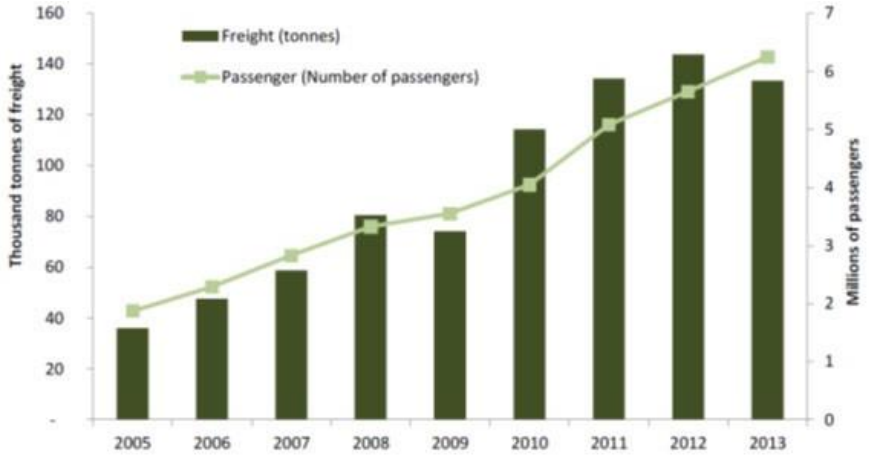
Table 5.1.25 Airlines and Routes for the Dire Dawa International Airport

Airlines	Route (Destination)
Djibouti Airlines	Djibouti
Ethiopian Airlines	Addis Ababa, Hargeisa, Jijiga, Kabri Dar, Shillavo, Djibouti

Note: Underline means the flagship carrier
Source: Airports-Worldwide.com

4) Traffic Volume

As shown in Figure 5.1.38, the aviation traffic volume for freight and passenger are increasing. The assumed volumes in 2015/2016 are 7.6 million passengers per year and 346,120 tons per year for freight traffic. Compared to the data 10 years ago, the passenger volume became approximately 4 times and the freight traffic became 9 times. However, the proportion of air traffic volume out of the whole international trade volume is not high. According to the statistical data in the Djibouti port, the freight cargo for Ethiopia was 11.2 million tons. Thus, the proportion of air transport is around 3% out of the whole trade volume on weight-basis. "The Ethiopian Cargo Vision & Strategic Objectives" sets the objective that the handling cargo will be 820,000 tons per year by 2025.
According to ET, the main export items for air cargo are flower for Europe (the largest), followed by meat for Middle East, garment, leather product, and horticulture. The main import items are electric devices and medical products.



Source: Final Report on Analytical Work on Transport Sector in Ethiopia (2015) ALG

Figure 5.1.38 Passenger and Freight Traffic at the Bole International Airport in 2005 ~ 2013

5) Relevant Laws and Regulations

The relevant laws and regulations in aviation sector in Ethiopia is shown in Table 5.1.26. "Civil Aviation

Rules and Standards (2013)" describes the rules and standards related to activities in aviation sector.

Table 5.1.26 Relevant Laws and Regulations in Aviation Sector in Ethiopia

Proclamation No. 616/2008: Civil Aviation Proclamation
Part 1: General Provisions, Part 2: Administration of Civil Aviation, Part 3: Registration of Aircraft, Part 4: Safety Tegulation of Civil Aviation, Part 5: Licensing of Air Services, Part 6: Liability, Part 7: Criminal Offences and Penalties, Part 8: Administrative Sanctions, Part 9: Miscellaneous Provisions
Civil Aviation Rules and Standards (2013) Federal Democratic Republic of Ethiopia
Policies and procedures, personnel licensing, approved training organizations, aircraft registration and marking, airworthiness, approved maintenance organizations, instruments and equipment, aircraft operations, air operator certification, commercial air transport by foreign air operators within Ethiopia, aerial work, and aerodromes

Source: JICA Survey Team based on the obtained data

(3) Aviation Sector in Sudan

1) Outline

Sudan has two international airports in Khartoum and Port Sudan which provide access to Ethiopia and Middle East. Kassala, operates domestic services. Aviation administration is managed by Sudan Civil Aviation Authority.

2) Airport

a) Airports in Sudan

Airports in Sudan are listed in Table 5.1.27 and the locations are shown in Figure 5.1.39. 27 airports are operated in the country. According to "List of international aerodromes as published in the regional air navigation plans[91]" issued by ICAO[92], the Kassala Airport, the Khartoum International Airport and Port Sudan New International Airport are international airports.

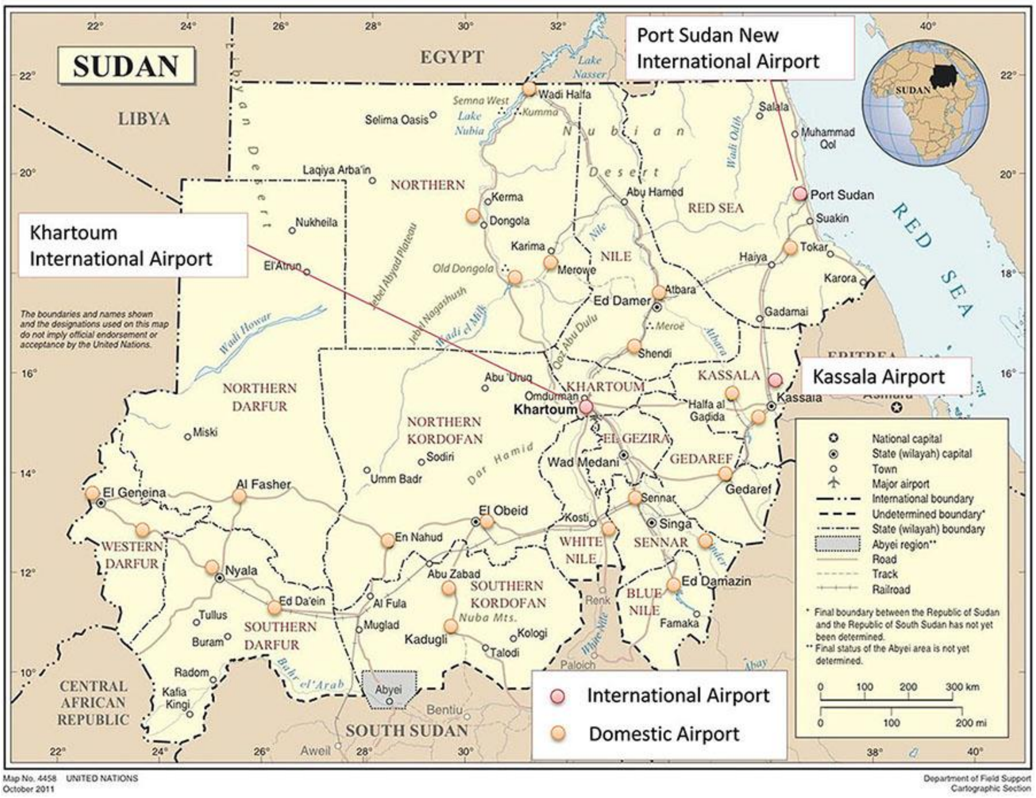
Table 5.1.27 Airports in Sudan

Airport	Location	ICAO Code[93]	IATA Code[94]
Atbara Airport	Atbara, River Nile	HSAT	ATB
Carthago Airport	Carthago, Red Sea	HSCG	
Damazin Airport	Damazin, Blue Nile	HSDZ	RSS
Dilling Airport	Dilling, South Kurdufan	HSDL	
Galegu Airport	Dinder, Sennar	HSGG	DNX
Dongola Airport	Dongola, Northern	HSDN	DOG
Ed Daein Airport	Ed Daein, East Darfur		ADV
El Debba Airport	El Debba, Northern	HSDB	EDB
El Fasher Airport	El Fasher, North Darfur	HSFS	ELF
El Obeid Airport	El Obeid, North Kurdufan	HSOB	EBD
En Nahud Airport	En Nahud, North Kurdufan	HSNH	NUD
Azaza Airport	Gedaref, Al Qadarif	HSGF	GSU
Geneina Airport	Geneina, West Darfur	HSGN	EGN
Kadugli Airport	Kadugli, South Kurdufan	HSLI	KDX
Kassala Airport	Kassala	HSKA	KSL
Khartoum International Airport	Khartoum	HSSS	KRT
Khashm el Girba Airport	Khashm el Girba, Kassala	HSKG	GBU
Merowe Airport	Merowe, Northern	HSMR	MWE
New Halfa Airport	New Halfa, Kassala	HSNW	NHF
Nyala Airport	Nyala South Darfur	HSNN	UYL

[91] https://www.icao.int/safety/iStars/Pages/API-Data-Service.aspx (10 August 2017 access)
[92] International Civil Aviation Organization
[93] ICAO Airport code is determined by each country following the allotment rule of International Civil Aviation Organization. Denote in 4 letters
[94] IATA Airport code is determined by the International Air Transport Association. 3 letters codes are allocated to more than 10,000 airports in the world.

Airport	Location	ICAO Code[93]	IATA Code[94]
<u>Port Sudan New International Airport</u>	Port Sudan, Red Sea	HSPN	PZU
Sennar Airport	Sennar, Blue Nile	HSNR	
Shendi Airport	Shendi, River Nile	HSND	
Kenana Airport	Sifeiya / Rabak, White Nile	HSKN	
Wad Medani Airport	Wad Medani, Al Jazirah	HSWD	DNI
Wadi Halfa Airport	Wadi Halfa, Northern	HSSW	WHF
Zalingei Airport	Zalingei, Central Darfur	HSZA	

Source: ICAO Location Indicators by State
Note: Underline is an international airport listed in "List of international aerodromes as published in the regional air navigation plans" ICAO (10 Aug 2017 access)



Source: JICA Survey Team

Figure 5.1.39 Airport Locations in Sudan

b) Kassala Airport

The outline of the Kassala Airport is shown in Table 5.1.28. The airport is located in Kassala and it has one runway.

Table 5.1.28 Outline of the Kassala Airport

Item	Outline
Name	Kassala Airport
IATA code	KSL
ICAO code	HSKA
Type	No Information
Location	Kassala
Main Airlines	N/A
Altitude	509 m
Coordinate	15°23'15"N, 36°19'44"E
Runways	2,500 x 45 meters (Asphalt Surface)

Source: Airports-Worldwide.com

c) Khartoum International Airport

The outline of the Khartoum International Airport is shown in Table 5.1.29. The airport is located in Khartoum and it has one runway which is the longest among the three international airports.

Table 5.1.29 Outline of the Khartoum International Airport

Item	Outline
Name	Khartoum International Airport
IATA code	KRT
ICAO code	HSSS
Type	Joint (Civil and Military)
Location	Khartoum
Main Airlines	Sudan Airways, Marsland Aviation
Altitude	386 m
Coordinate	15°35’22.19”N, 32°33’11.38”E
Runways	2,980 x 45 meters (Asphalt Surface)

Source: Airports-Worldwide.com

d) Port Sudan New International Airport

The outline of the Port Sudan New International Airport is shown in Table 5.1.30. The airport is located in Port Sudan and it has one runway. The airport joined in the International Air Transport Association (IATA) in 2014.

Table 5.1.30 Outline of the Port Sudan New International Airport

Item	Outline
Name	Port Sudan New International Airport
IATA code	PZU
ICAO code	HSPN
Type	Public
Location	Port Sudan
Main Airlines	N/A
Altitude	41 m
Coordinate	19°26’01.10”N, 37°14’02.67”E
Runways	2,460 x 45 meters (Asphalt Surface)

Source: Airports-Worldwide.com

3) Route

The airlines and the routes for the Khartoum International Airport and the Port Sudan New International Airport are shown in Table 5.1.31 and Table 5.1.32, respectively. The data on the Kassala Airport could not be obtained in this survey. Many Middle Eastern airlines provide services. The Sudan Airways, which is the flagship carrier in Sudan, establishes aviation network to South Sudan, Ethiopia and Middle East countries. Since the Sudan Airways is in the EU restriction list, the coverage of the network is limited.

Table 5.1.31 Airlines and Routes for the Khartoum International Airport

Airlines	Route (Destination)
AirTaxi (cargo charter)	Cairo, Dubai, El Geneina, El Obied, ElFasher, Juba, Kampala, Kenya, Malakal, Nyala, Rumbek, Sharjah, Wau
Air Arabia	Sharjah
Air Arabia Egypt	Alexandria-Borg El Arab
Air West	El Geneina, El Fasher, El Obeid, Juba, Nyala, Port Sudan, Sharjah
Afriqiyah Airways	Tripoli
Bahrain Air	Bahrain
bmi	Beirut
EgyptAir	Alexandria-El Nouzha, Cairo
Emirates	Dubai
Etihad Airways	Abu Dhabi

Airlines	Route (Destination)
Ethiopian Airlines	Addis Ababa
Flydubai	Dubai
Flying Carpet	Beirut
Gulf Air	Bahrain
Hainan Airlines	Beijing-Capital, Dubai
JetLink Express	Nairobi
Kenya Airways	Cairo, Nairobi
KLM	Amsterdam
Marsland Aviation	El Daein, El Fasher, El Geneina, El Obeid, Juba, Malakal, Nairobi, Nyala, Rumbek
Nas Air	Jeddah, Riyadh
Nasair	Asmara, Nairobi
Nova Airlines	El Fasher, Nyala, Port Sudan
Qatar Airways	Doha
Royal Jordanian	Amman-Queen Alia
Saudi Arabian Airlines	Jeddah, Riyadh
Sudan Airways	Abu Dhabi, Addis Ababa, Amman, Asmara, Cairo, Damascus, Doha, Dongola, Dubai, El Fasher, El Obeid, Jeddah, Juba, Kano, Kassala, Malakal, Nyala, Port Sudan, Riyadh, Tripoli, Wadi Halfa
Sun Air	Cairo, Damascus, Entebbe, Juba, Port Sudan, Nyala
Syrian Air	Damascus
Turkish Airlines	Istanbul-Atatürk
Yemenia	Sana'a

Note: Underline means the flagship carrier
Source: Airports-Worldwide.com

Table 5.1.32 Airlines and Routes for the Port Sudan New International Airport

Airlines	Route (Destination)
Badr Airlines	Khartoum
flydubai	Dubai-International, Khartoum
Nile Air	Cairo
Nova Airways	Khartoum
Saudia	Jeddah
Sudan Airways	Cairo, Jeddah, Khartoum

Note: Underline means the flagship carrier
Source: Airports-Worldwide.com

(4) Aviation Sector in South Sudan

1) Outline

South Sudan has an international airport in the capital of Juba which enables to access to the surrounding countries. The aviation administration is managed by the South Sudan Civil Aviation Authority.

2) Airport

a) Airports in South Sudan

Airports in South Sudan are listed in Table 5.1.33 and the locations are shown in Figure 5.1.40. 24 airports are operated in the country. According to "List of international aerodromes as published in the regional air navigation plans[95]" issued by ICAO[96], the Juba International Airport is an international airport.

[95] https://www.icao.int/safety/iStars/Pages/API-Data-Service.aspx (10 August 2017 access)
[96] International Civil Aviation Organization

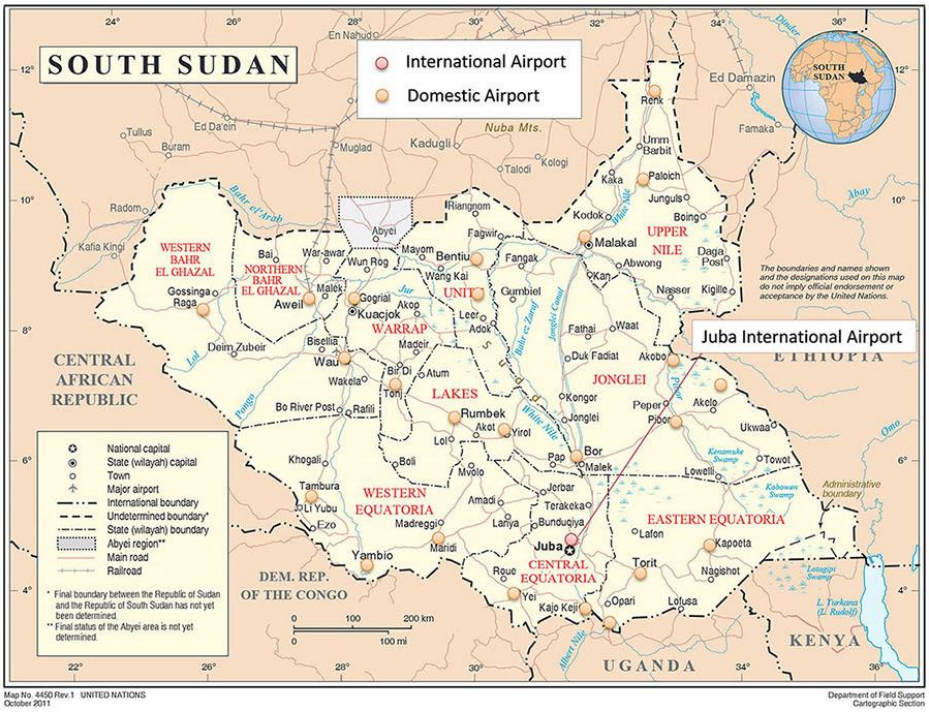
Table 5.1.33 Airports in South Sudan

Airport	Location	ICAO Code[97]	IATA Code[98]
Akobo Airport	Akobo, Eastern Bieh	HSAK	
Aweil Airport	Aweil, Aweil State	HSAW	
Bentiu Airport	Bentiu, Northern Liech	HSBT	
Bor Airport	Bor, Jonglei	HSBR	
Gogrial Airport	Gogrial, Gogrial State	HSGO	
Juba International Airport	Juba, Jubek State	HSSJ	JUB
Kajo Keji Airstrip	Kajo Keji, Yei River State	HSKJ	
Kapoeta Airport	Kapoeta, Namorunyang	HSKP	
Malakal Airport	Malakal, Eastern Nile	HSSM	MAK
Maridi Airport	Maridi, Maridi State	HSMD	
Nimule Airport	Nimule, Imatong State	HSNM	
Paloich Airport	Paloich, Eastern Nile	HSFA	
Pochalla Airport	Pochalla, Boma State	HSPA	
Pibor Airport	Pibor, Boma State	HSPI	
Raga Airport	Raga, Lol State	HSRJ	
Renk Airport	Renk, Eastern Nile	HSRN	
Rumbek Airport	Rumbek, Western Lakes	HSMK	RBX
Tonj Airport	Tonj, Tonj State	HSTO	
Torit Airport	Torit, Imatong State	HSTR	
Tumbura Airport	Tumbura, Gbudwe	HSTU	
Wau Airport	Wau, Wau State	HSWW	WUU
Yambio Airport	Yambio, Gbudwe	HSYA	
Yei Airport	Yei, Yei River State	HSYE	
Yirol Airport	Yirol, Eastern Lakes	HSYL	

Source: ICAO Location Indicators by State
Note: Underline is an international airport listed in "List of international aerodromes as published in the regional air navigation plans" ICAO (10 Aug 2017 access)

[97] ICAO Airport code is determined by each country following the allotment rule of International Civil Aviation Organization. Denote in 4 letters

[98] IATA Airport code is determined by the International Air Transport Association. 3 letters codes are allocated to more than 10,000 airports in the world.



Source: JICA Survey Team

Figure 5.1.40 Airports in South Sudan

b) Juba International Airport

The outline of the Juba International Airport is shown in Table 5.1.34. The airport is located in Juba and it has one runway

Table 5.1.34 Outline of the Juba International Airport

Item	Outline
Name	Juba International Airport
IATA code	JUB
ICAO code	HSSJ
Type	Joint (Civil and Military)
Location	Juba
Main Airlines	N/A
Altitude	461 m
Coordinate	04°52’19.22”N, 31°36’04.02”E
Runways	2,400 x 45 meters (Asphalt Surface)

Source: Airports-Worldwide.com

3) Route

The airlines and routes for the Juba International Airport are shown in Table 5.1.35. The aviation network is limited to the surrounding countries.

Table 5.1.35 Airline and Route for the Juba International Airport

Airline	Route (Destination)
Badr Airlines operated by Mid Africa Aviation	Khartoum
EgyptAir	Cairo
Ethiopian Airlines	Addis Ababa, Entebbe, Bujumbura
Fly540	Nairobi
Flydubai	Dubai
Kenya Airways	Nairobi
Nova Airways	Khartoum

Airline	Route (Destination)
RwandAir	Entebbe, Kigali
Sudan Airways operated by Yanair	Khartoum
Astral Aviation	Nairobi
Safe Air	Nairobi

Source: Airports-Worldwide.com

5.1.5. Inland River Transport

(1) River Transport in the Nile Basin

In the target region, the Nile River runs from South to North as shown in Figure 5.1.41. The While Nile originates from the Victoria Lake in the East African Community (EAC) region, passes through the South Sudan, and joins the Blue Nile at Khartoum. The Blue Nile originates from the Tana Lake in the Northwest Ethiopia and reaches Khartoum. The joined Nile River goes further to the North, passes Egypt, and finally reaches the Mediterranean Sea via Cairo.

The Nile River provides affluent water resources while the river may cause negative impacts on land transport such as flood and weak geology for road construction. On the river route where adequate depth for shipping is available, river transport can be applied. In particular, "cataract" makes it difficult to provide river transport as shown in Figure 5.1.41. Cataract is shallow and/or wild water section on a river of which river bed is often covered with bolds and rocks.

According to the River Transport Corporation (RTC) in Sudan, the major river transport route is from Kosti in Sudan to Juba in South Sudan. However, the operation is scarce at the moment. Since the section between Khartoum and Kosti has several swampy areas, the river use is limited to sightseeing around Khartoum. RTC plans to extend the river route until Ethiopia with the Blue Nile and the feasibility study is in progress. A South Sudanese official mentioned that the route from Juba towards the South is not navigable. Therefore, this chapter describes on the Route Kosti - Juba.

Source: State of the River Nile Basin (2012) NBIS

Figure 5.1.41 River Transport in the Nile Basin

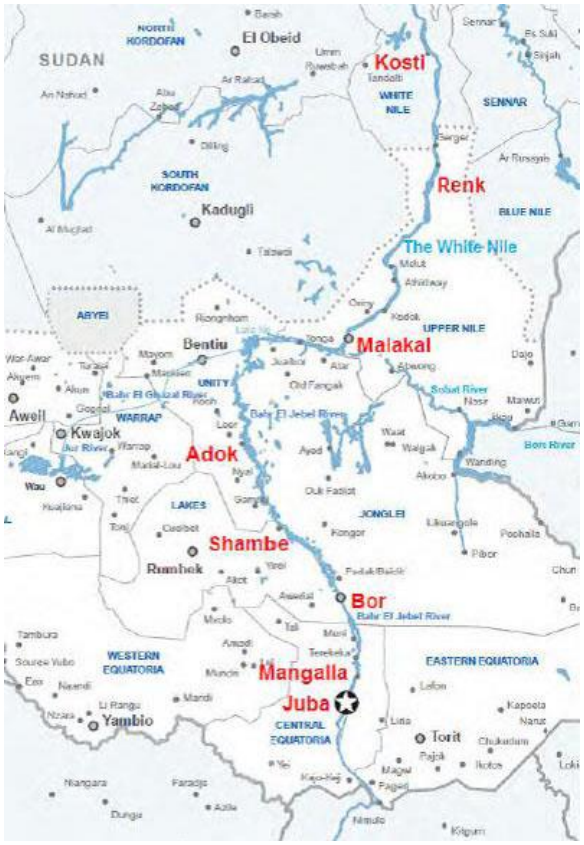
(2) River Transport between Kosti - Juba

1) Outline

In the target region, the all-year navigable section is Kosti – Juba and the East – West route such as Kwajok – Bentiu – Malakal – Border with Ethiopia is navigable almost 6 months during rainy reason. The cargos unloaded at the Port Sudan are transported to the Kosti dry port with land transport and they are transshipped to ships. As shown in Figure 5.1.43, 8 river ports[99] are on the route.

2) River Port

Based on "Juba River Port Magazine Vol. 2 (2013) Juba River Transport Administration", situation on river port as of 2013 is described in this section. The Kosti river port is adjacent to the Kosti dry port and it functions as a transshipment hub. The Renk port is located near the border. Container cargo can be handled if a shipper arranges handling equipment. The Malakal port is located at the middle between Kosti and Juba and a container crane is available. The Adok port is a small port mainly for passenger. The Shambe port is located in Rumbek, the capital of the Lake region. Since the river near the port is shallow, the port is accessible only during rainy season and container cannot be handled. The Bor port is located in the Bor city and container can be handled if a shipper arranges handling equipment. The Mongalla port is located 40 km North of Juba. The port is a private port constructed by an Indian firm in 2010. The Juba port is located in the Juba city which possesses 35m quay. Containers can be handled if a shipper arranges handling equipment.



Source : Juba River Port Magazine Vol. 2 (2013) Juba River Transport Administration (JRPA)
Note: Red colored names indicate the locations of ports.

Figure 5.1.42 Major River Ports on the Route

Source: Port Magazine Vol. 2 (2013) JRPA

Figure 5.1.43 Juba Port Expansion Project

3) Traffic Volume

According to RTC in Sudan, the current traffic on the river transport is scarce. However, 253 ships per year and 111,139 tons of freight were transported on Kosti – Malakal – Juba when the route was utilized[100]. The services were provided by several private firms and passenger service was also available.

4) Development Plan

The Juba port is planned to be expanded with the assistance by JICA. On completion, a quay with 205 m long and 2.5m depth, a mobile crane with 150 tons capacity, a warehouse of 1,700 m^2, and a management office will be developed in 5.4 hectares area. Although the construction contract was concluded with a Japanese contractor, the work was suspended based on the clause of force majeure[101].

Other development plan is under preparation. A feasibility study on the While Nile was commenced in April

[99] Unless stated, descriptions on ports are referred to "Juba River Port Magazine Vol. 2 (2013) Juba River Port Administration". According to the Ministry of Transport in South Sudan, most river ports are not operated at the moment. This report provides information when they operated.

[100] Year of the data is not clear

[101] According to "Progress Reports on Implementation of Adopted Transport Sector Policies, Projects and Decisions (2017) Ministry of Transport in South Sudan"

2017 with the assistance of UN so that the possibility of navigation on the While Nile in South Sudan is studied. The study includes; i) study to determine navigability of major rivers, promote their use for transport services and increase their safety, ii) regular dredging to ensure adequate water depth and safe rivers bends for sailing, and iii) strategy for dredging in order to make the river navigable developed[102]. In addition, the government of South Sudan is developing the Ten Year River Transport Masterplan (2018 – 2028) with the assistance of AfDB. The components include; i) port development master plan, ii) strategy for installation of navigational aids, iii) strategy for capacity development for relevant institutions, iv) strategy for dredging management plan, and v) strategy for investment in river transport[103].

5.1.6. Dry Port

Dry port can contribute to alleviate congestion in seaports. In landlocked countries, dry port is often developed as a logistic hub to facilitate trade and custom clearance. This section describes the current situation on dry ports in the target countries.

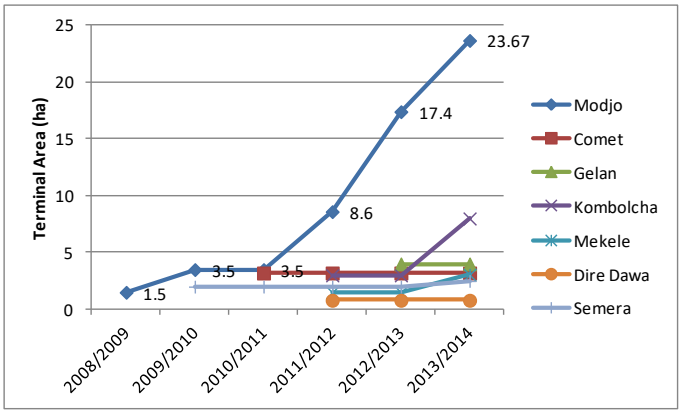
(1) Dry Port in Ethiopia

1) Outline

The dry ports in Ethiopia mainly handle container cargos and bulk cargos such as fuel and fertilizer are not handled in dry port. As of 2017, 7 dry ports have been developed and the ports are managed jointly by Ethiopian Shipping and Logistics Services Enterprise (ESLSE) and Ethiopian Customs and Revenue Authority (ERCA).

2) The Current Situation on Dry Ports

Figure 5.1.45 shows locations of the existing and planned dry ports in Ethiopia and Figure 5.1.44 shows the terminal areas of each dry port, respectively. The first dry port in Ethiopia was constructed in Modjo followed by Semera and Comet. Currently seven dry ports including 4 temporary ports have been operated since 2012. In particular, the area of the Modjo dry port has significantly expanded from 3.5 ha in 2011 to 23.7 ha in 2014. According to the interview with ESLSE, the area in 2017 reached 62 ha.



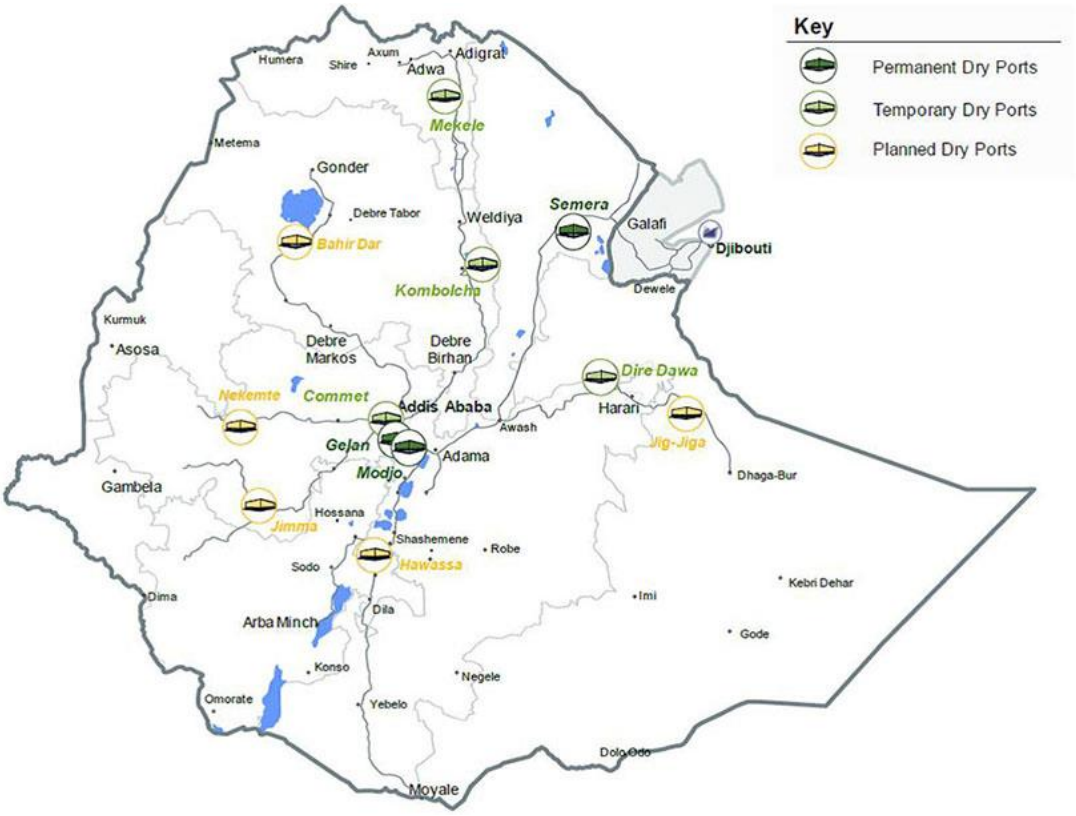
Source: JICA Survey Team based on Statistical Bulletin (EFY2000-2007) ESLSE

Figure 5.1.44 Terminal Area of Each Dry Port

The Modjo dry port is located on the major logistic route. As shown in Figure 5.1.46, the facility is adjacent to the new railway, the Addis Ababa – Adama expressway and the existing trunk road of Addis Ababa – Adama – Awash. The work to directly connect with the new railway is in progress at the moment. Figure 5.1.47 shows photos on the Modjo dry port.

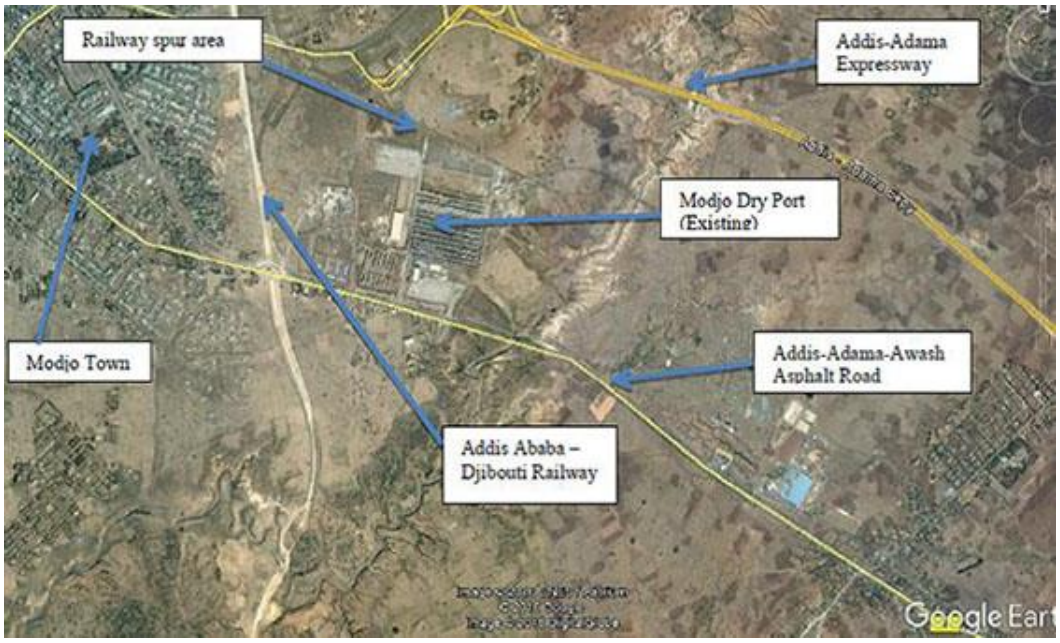
[102] Progress Reports on Implementation of Adopted Transport Sector Policies, Projects and Decisions by Ministry of Transport (2017) Ministry of Transport in South Sudan

[103] Progress Reports on Implementation of Adopted Transport Sector Policies, Projects and Decisions by Ministry of Transport (2017) Ministry of Transport in South Sudan



Source: Final Report on Analytical Work on Transport Sector in Ethiopia (2015) ALG

Figure 5.1.45 The Existing and Planned Dry Ports in Ethiopia



Source: An Environmental and Social Impact Assessment (ESIA) of a Proposed Trade Logistics Hub at Modjo (2016) MOT

Figure 5.1.46 Location of the Modjo Dry Port

Container Yard

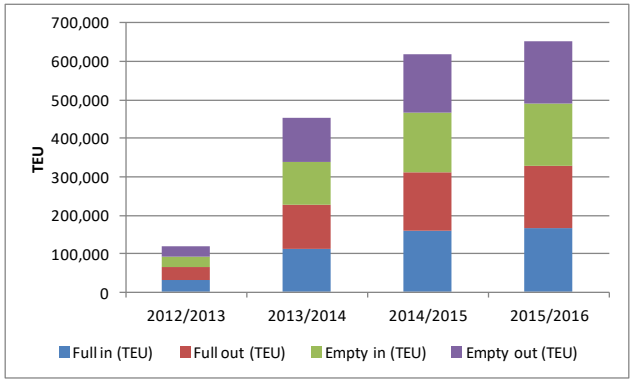
Custom Warehouse

Source: JICA Survey Team

Figure 5.1.47 Photographs on the Modjo Dry Port

3) Throughput and Transit Time

As shown in Figure 5.1.48, container throughput in dry ports has sharply increased in the past few years. The throughput in 2012/2013 was 100,000 TEU, and it became four time of 400,000 TEU in the next year and it reached to 600,000 TEU in 2014/2015. The rapid increase causes the congestion in dry ports.
Figure 5.1.49 reveals the throughput share of each dry port. The throughput at the Modjo is as large as 78.8% out of the total throughput and the Comet and Gelan, which are located in Southern Addis Ababa called Kaliti district, follow at 11.9%. Thus, approximately 90% of containers handled in dry ports are concentrated near Addis Ababa. The shares of Dire Dawa and the Mekele dry ports are 4.2% and those of Kombolcha and Semera are as low as 2.0% and 0.6%, respectively.



Source: Data provided by ESLSE

Figure 5.1.48 Container Throughputs at the Dry Ports

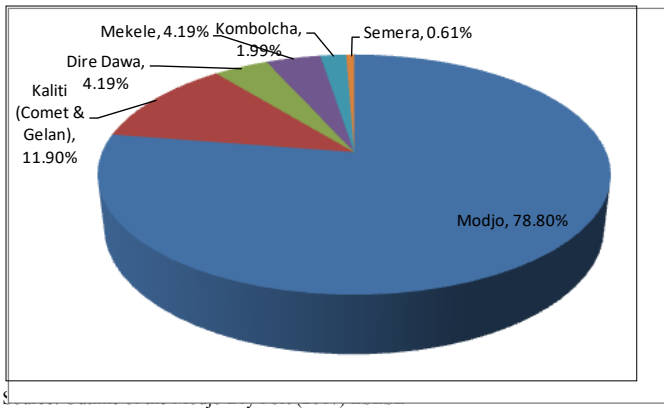


Figure 5.1.49 Throughput Share of Each Dry Port

Table 5.1.36 presents the average dwell time at the Djibouti port and dry port with multi-modal transport. From 2010 to 2014, the dwell time at the Djibouti port decreased from 23 days to 8.7 days. In the meantime, dwell time at dry ports in 2010 – 2012 was around 15 – 20 days, however, the dwell time was worsened to 71 days in 2012/2013 due to congestion derived from the booming logistic demand. According to ESLSE, the congestion still continues so far and the current dwell time is around 30 – 60 days.

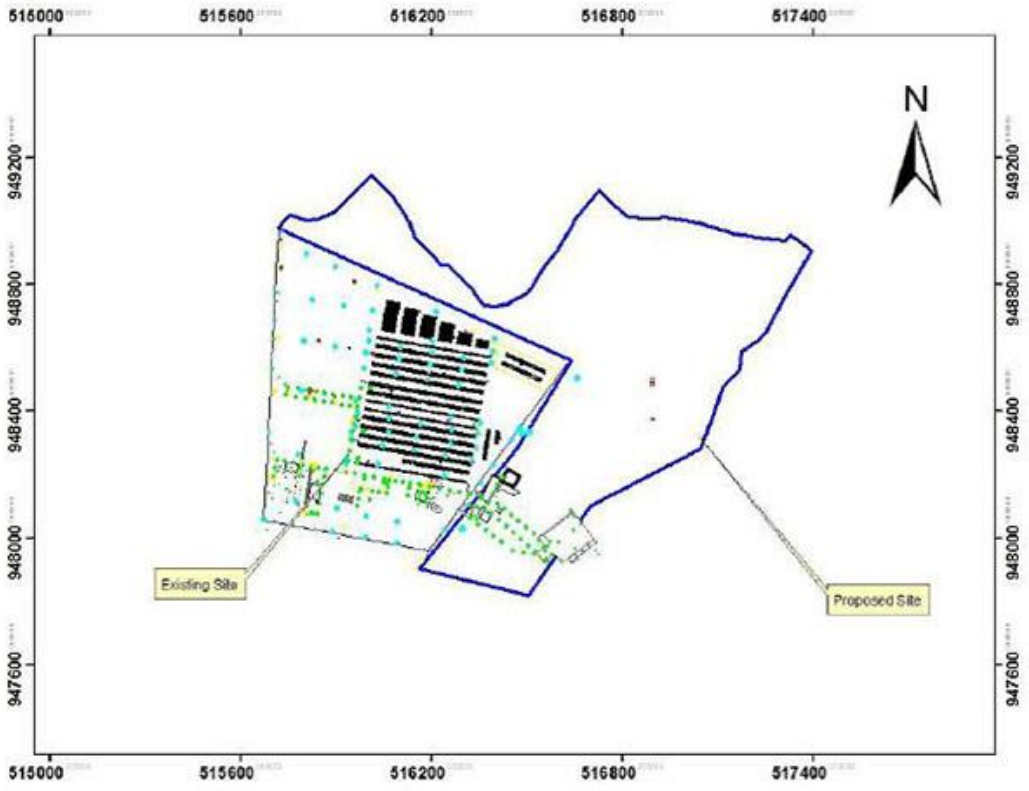
Table 5.1.36 Average Dwell Time at Djibouti Port and Dry Port with Multi-modal Transport (Unit: Day)

Location	2007 /2008	2008 /2009	2009 /2010	2010 /2011	2011 /2012	2012 /2013	2013 /2014
Djibouti Port (with Multi-modal Transport)	-	-	-	23	32	9.7	8.7
Dry Port	-	20	15.5	17	16	71	67

Source: Statistical Bulletin (EFY 2000 – 2007) ESLSE

4) Development Plan

The government of Ethiopia plans to develop further 5 dry ports in the country (See Figure 5.1.45). The priority is one in Hawassa where an industrial park has recently opened and increase in logistic demand is expected. Other candidates are in the major cities such as Bahir Dar, Jimma, Nekemte and Jig-Jiga.
In addition, further expansion of the Modjo dry port is in progress. Figure 5.1.50 presents a plan view on the project. In phase 1 project, the area will be expanded from the current 62 ha to 90 ha and finally the terminal area is planned to be 150 ha in futher phrases. In line with the terminal expansion, the number of custom warehouse will be from the current 2 houses to 6 houses, and container handling equipment will be procured with the assistance of the World Bank[104].



Source: An Environmental and Social Impact Assessment (ESIA) of a Proposed Trade Logistics Hub at Modjo (2016) MOT

Figure 5.1.50 The Expansion Project on the Modjo Dry Port

5) Relevant Laws and Regulations

The relevant laws and regulations for dry port in Ethiopia is listed in Table 5.1.37.

[104] The detailed schedule could not be obtained in this survey

Table 5.1.37 Relevant Laws and Regulations for Dry Port in Ethiopia

Proclamation No. 549/2007: Maritime Sector Administration Proclamation
Part 1: General, Part 2: Maritime Affairs Authority, Part 3: Organization and Management, Part 4: Miscellaneous Provision
Council of Ministers Regulations No 136/2007: Dry Port Administration Enterprise Establishment Council of Ministers Regulations
1. Short Title, 2. Establishment, 3. Supervising Authority, 4. Head Office, 5. Purposes, 6. Capital, 7. Liability, 8. Duration, 9. Effective Date
Proclamation No. 588/2008: A Proclamation to Define the Liability of the Dry Port to the Consignee
Part 1: General, Part 2: Dry Port's Basis of Liability, Part 3: Miscellaneous Provisions

Source: JICA Survey Team based on the obtained data

(2) Dry Port in Sudan

1) Outline

In order to alleviate congestion at the Port Sudan and to share the functions, two dry ports are operated in Sudan. The dry ports are operated by Sudan Port Corporation (SPC).

2) The Current Situation

As shown in Figure 5.1.51, two dry ports are operated in Salloum and Kosti. The Salloum dry port is located 18km Southwest of the Port Sudan to alleviate the congestion at the Port Sudan. The operation has recently started[105].

The Kosti Dry Port (KDP) is an important logistic hub for Sudan and South Sudan. The dry port has been operated since 2006. KDP is located 400km South of Khartoum and adjacent to the Kosti river port. The terminal area is 200 ha and the handling capacity is 150,000 TEU per year[106]. The cargos unloaded at the Port Sudan are transported to KDP and custom clearance is processed at the dry port. The cleared cargos are delivered to the central /West Sudan by railway or road transport, or delivered to South Sudan via river or road transport. Thus, KDP functions as a logistic hub in the region.

Source: JICA Survey Team, base map from http://dlca.logcluster.org/display/public/DLCA/2.3+Sudan+Road+Assessment

Figure 5.1.51 Dry Port Locations in Sudan

[105] According to "Sudan Sea Ports Handbook 2016 – 2018, Sudan Port Corporation" it was constructed in the past ten years. But information on the detailed date could not be obtained in this survey.

[106] Sudan Sea Ports Handbook 2016 – 2018, Sudan Port Corporation

3) Development Plan

A development plan on dry port in Sudan could not be obtained in this survey.

5.1.7. Governmental Institutions relevant to Transport Sector

The governmental institutions relevant to transport sector in the target countries are tabulated as follows.
In each country, Ministry of Transport is responsible for policy making, and implementation is done by Road Authority in road sector. In maritime sector, Ministry of Transport makes policy and implementation is conducted by the Djibouti Ports & Free Zone Authority in Djibouti, Ethiopian Maritime Affairs Authority in Ethiopia and Sudan Port Corporation in Sudan. In railway sector, Ministry of Transport is responsible for policy making and each Railway Corporation implements. In aviation sector, policy making is conducted by Ministry of Transport and implementation is done by Civil Aviation Authority. In river transport sector, of which the target countries are Sudan and South Sudan, Ministry of Transport is responsible for policy making while River Transport Corporation is for implementation.

Table 5.1.38 Relevant Organizations in Transport Sector

Sub-sector	Djibouti	Ethiopia	Sudan	South Sudan
Highway	Ministry of Transports and Equipment, Agence Djiboutienne des Routes (ADR)	Ministry of Transport, Ethiopian Roads Authority (ERA), Ethiopian Toll Roads Enterprise Road Fund	Ministry of Transportation, Road and Bridge, National Highway Authority (NHA)	Ministry of Roads and Bridges, South Sudan Road Authority
Maritime	Ministry of Transports and Equipment, Djibouti Ports& Free Zones Authority	Ministry of Transport, Ethiopian Maritime Affairs Authority, Ethiopian Shipping and Logistics Services Enterprise (ESLSE)	Ministry of Transportation, Road and Bridge, Sea Ports Corporation (Authority)	Ministry of Transport
Railway	Ministry of Transports and Equipment, Djibouti Railways	Ministry of Transport, Ethiopian Railway Corporation (ERC)	Ministry of Transportation, Road and Bridge, Sudan Railways Corporation	Ministry of Transport, Sudan Railways Corporation
Aviation	Ministry of Transports and Equipment, Direction de L'aviation Civile et de la Meteorologie	Ministry of Transport, Ethiopian Civil Aviation Authority Ethiopian Airports Enterprise	Ministry of Transportation, Road and Bridge, Civil Aviation Authority	Ministry of Transport, Civil Aviation Authority
River Transport	N/A	N/A	Ministry of Transportation, Road and Bridge, River Transport Corporation	Ministry of Transport, Juba River Port Administration (JRPA), River Transport Corporation

Source: JICA Survey Team

5.2. Soft Infrastructure

This section explains the current status of implementation of regional and international trade, transport and transit facilitation instruments and best practices by the four countries that use the Djibouti Corridor. Furthermore, the chapter highlights the current challenges and future opportunities available for potential development of these instruments and best practices in line with the objective of the survey.
It should be noted however that it was not possible to obtain adequate information from the governments of Sudan and South Sudan due to reasons beyond our control.

All four countries are Members of IGAD, World Customs Organization (WCO), and World Trade Organization (WTO), and are Members of COMESA with the exception of South Sudan. Trade and transport facilitation instruments are based on the premises of standardization, harmonization and simplification of procedures and documentation with the view to promoting regional economic integration. The underlying principles of promoting regional economic integration by IGAD and COMESA are provided for in the Abuja Treaty (1991) of the Africa Union Commission (AU) and underscored in the Protocol on

Transit Trade and Transit Facilities in the COMESA Treaty. IGAD has signed a MoU with COMESA and promotes the COMESA programmes on trade. Integration can only be realized with an enabling trading environment.

The COMESA trade facilitation agenda seeks to establish a transparent and predictable environment for cross border trade transactions based on simple standardized customs procedures and practices, documentation requirements, cargo and transit operations and an efficient transport and logistics system. This environment is essential in promoting transparency, streamlining cargo clearance, simplifying regulatory requirements, and smoothening the exchange of information between parties involved in a trade transaction, thus ensuring reduction in time and cost of doing business.

5.2.1. Customs

The COMESA customs procedures and documentation are based on the WCO Revised Kyoto Convention (RKC)[107] which provides a blueprint for modern and efficient customs procedures. The WTO Trade Facilitation Agreement (ATF) improved on the provisions of the RKC. All COMESA Member States were required to domesticate the Common Tariff Nomenclature (CTN); the Common External Tariff (CET); and the Common Market Customs Management Regulations (CMRs) by 2012. To date not a single Member State has domesticated this Common Market legislation for the Customs Union with the result that the process of operationalizing the customs union has not commenced. East African Community (EAC), of which South Sudan is a member, implements the EAC Customs Management Act (EACCMA) which is RKC compliant and similar in principle to the COMESA CMR.
The WTO Trade Facilitation Agreement (ATF), which clarifies and improves on the provisions of the General Agreement on Tariff and Trade (GATT) 1994, with specific focus on the Articles related to trade facilitation.[108] This agreement imposes specific legal obligations on it signatories to implement these provisions.

(1) Djibouti

1) Relevant Organization

Djibouti Customs Authority: Responsible for the collection of taxes, controlling of borders, combating smuggling, dissemination of tax information and trade statistics and examining of all goods and vehicles entering and leaving the country.

2) Current Status

The customs law is 100% ATF compliant and 98% RKC and COMESA CMR compliant. Efforts are underway to review the remaining 2% to make them compliant. A bilateral cooperation agreement was signed in 2002 between Djibouti and Ethiopia, allowing Ethiopia permanent access to the sea, for goods to move inland without escort or transit fees and for the Ethiopian Customs to conduct inspections at the port. It also provides for a forum to be conducted for regular exchange of information and dialogue. Clearance from the port takes 2-8 days while other border crossings take about 30 minutes. 98% of goods cleared use multi- modal transport. Djibouti customs uses ASYCUDA World[109] and is connected at all stations and to all logistics companies.
Galaffi, the main border with Ethiopia where more than 90% of cargo from Ethiopia is cleared has a customs office, a barrier and an in-lane booth. Documentary check of trucks, including the Ethiopian customs documents and COMESA Yellow Card (3rd party Vehicle Insurance Certificate), and a brief physical check are done on existing trucks in Ethiopia.

3) Issues

The cargo is cleared in a short time unless there are problems with the customs documentation. Being a one lane booth, once the documents are rejected, there is no room for the driver to move out of the lane and this

[107] The World Customs Organisation 's International Convention on the Simplification and Harmonisation of Customs Procedures
[108] GATT 1994 Article V Freedom of Transit, Article VII Fees & Formalities connected with importation and exportation , and Article Article X Publication and administration of Trade Regulations
[109] Automated System for Customs Data (ASYCUDA) is a computerized customs management system that handles manifest and customs declarations, accounting procedures, warehousing and import and export licenses, developed by UNCTAD which is used by Ethiopia, Sudan and Uganda in the Northern Corridor. .

causes a lot of delays at the border, given that most drivers arrive by 6.00am and wait for the border to open. Djibouti customs have a good working relationship with the relevant private sector stakeholders, i.e. the logistics, freight forwarding and transporting community. Although there is an official annual forum for dialogue between customs and the private sector stakeholders, it is not effectively operated. However, the chairpersons of the private sector associations have access to the senior management of customs on a case to case basis. Informal forums have proved more effective, where the private sector meets with the relevant customs departments. The Djibouti private sector umbrella association, the Djibouti Chamber of Commerce acts as an interface between the representative of the private sector and the public sector, and also has the duty to provide advice to the public authorities. The Chamber does not have any formal links with a certain counterpart in Ethiopia because in Ethiopia, each region has its own chamber and this makes it very difficult for dialogue and consultations.

(2) Ethiopia

1) Relevant Organization

Ethiopian Revenue and Customs Authority (ERCA): Responsible for establishing and implementing modern revenue assessment and collection system. It is empowered to examine goods and means of transport entering into or departing from Ethiopia through customs ports, frontier posts and other customs stations, and to ensure that customs formalities are complied with. It is also given prosecution and investigative powers over tax and customs offenses.

2) Current Status

ERCA was established by a proclamation that is reviewed every five years to ensure compliance with the RKC and the COMESA CMR. Efforts are underway to ensure 100% compliance. The 10% non-compliance is based on the fact that Ethiopian transit logistics companies have the monopoly over foreign companies for transit trades.

Cleared goods have to go through two check points at Mille and Awash before getting to the Modjo Dry Port. Ethiopia has 7 dry ports with the Modjo Dry Port, being the biggest in the region and Modjo and Kaliti being the busiest. It is located 553 km from the Djibouti Port and 56 km east of Addis Ababa. It is operated 24 hours with three eight hour shifts and clears 80% of the cargo in the country. It has a daily throughput of 2,000 TEUs. In 2009, the port cleared 12,337 TEUs, which increased to 1,024,949 TEUs in 2016.

Quarterly formal meetings are held with private sector stakeholders and meetings on a case to case basis. Close discussions and regular dialogue is held with chairs of the private sector associations.

Under the World Bank Group Ethiopia Investment Programme, an Ethiopian Customs Guide (March 2017) has been published with the view to provide adequate import/export information to the general public in order to improve compliance through a better understanding of the rules and regulations affecting trade. This will go a long way in facilitating trade and reducing the cost of doing business. This is also in line with the AFT provision on the publication and administration of trade regulations.

3) Issues

Customs operates a manual system and ASYCUDA++, which does not interface with Djibouti's ASYCUDA World. Efforts are underway to install the Ethiopian Customs Management System, which will replace ASYCUDA and can interface with ASYCUDA World. ERCA is working with relevant agencies to establish a Single Window System which will facilitate trade where all relevant trade documents will be cleared under one window. This is a key priority and is expected to be finalized in the next fifteen months. The first pilot project will commence 20 government agencies and will be finalized in the second phase with an additional 20 government agencies. All relevant stakeholders of the Ethiopian-Djibouti railway have set up a committee to develop procedures for the envisaged opening of the railway in June 2017.

The Ethiopian side of the Galaffi border has better facilities than the Djibouti side, with a customs yard with entry and exit gates, two scanners, two weighbridges, offices, staff accommodation, warehouses, a staff canteen and generators. However, most of the facilities are not well maintained and are in need of repair. It is a 24 hour border, but does not have proper lighting. The control zone is very dusty and not paved, and there is no rubbish disposal facility or public toilets. The weighbridges do not function because they have not been commissioned. The computerized systems at the entry and exit gate, the scanner and the customs offices are not interconnected. The two generators are sometimes not functional so when there is a power

outage, no clearing can be done and this increases congestion at the border.

(3) Sudan

1) Relevant Organization

Sudan Customs Authority (CA): The main role is collection of customs revenue. Furthermore, the authority: (i) facilitates and secures global trade, (ii) provides information on foreign trade and implements all legislation concerned with foreign trade, (iii) combats smuggling, (iv) protects the society and borders, (v) facilitates application of all trade agreements, (vi) implements economic, fiscal, monetary, and commercial government policies, (vii) contributes to the country's macro-economic policies, and (viii) executes strategic plans for the finance and the interior ministries.

2) Current Status

CA of the Republic of Sudan is comprised of military officers and men at larger ratio. CA implements a customs law that is in line with WTO, RKC and COMESA customs best practices. However it also contains provisions from the Sharia (Islamic Law)[110] with regard to prohibitions of alcohol and others. Sudan utilizes ASYCUDA world and operates from 6.00am to 6.00pm. CA meets with relevant stakeholders on a needs basis. A bilateral agreement of cooperation will be signed in the near future with Ethiopia.

3) Issues

Since the bilateral agreement with Ethiopia has not been signed yet, the custom systems of the two countries do not have interchangeability and it causes inefficiencies in the custom operations. In order to achieve efficient custom operations, it is necessary to secure the interchangeability with Ethiopia.

(4) South Sudan

1) Relevant Organization

South Sudan Customs Service (SSCS): Main objective is collection of revenue and facilitation of legitimate trade. The agency is also responsible for combating smuggling and disseminating information regarding customs procedures to the public.

2) Current Status

SSCS is comprised of commissioned and non–commissioned military officers. A forum of heads of sections develops and monitors the strategic plans of SCCS.

3) Issues

SSCS is currently waiting for the domestication of the EACCMA and is operating under the RKC. All systems are currently operated manually. There is no formal forum for meeting with relevant stakeholders and no mechanism for dissemination of information to the general public.

5.2.2. Immigration

Under the IGAD Agreement of Cooperation Article 13 provides for freedom of movement and the right of residence of persons in the region among other things. However free movement of in the IGAD region is agreed on a bilateral basis. Ethiopia and Djibouti have a bilateral agreement where Djiboutian enter Ethiopia without paying visa fees while Ethiopians pay visa fees on entry in Djibouti. Other corridor states nationals are required to comply with restrictive travel and visa requirements.

(1) Djibouti

1) Relevant Organization

Djibouti Immigration Authority: Responsible for the processing of visa applications, collection of visa fees and the clearance of passengers into and out of Djibouti.

[110] A regulation set on Islamic own accord

2) Current Status

The Immigration department is affiliated to the National Police and immigration officers are trained police officers. The department provides: (i) biometric passports, (ii) resident permits, (iii) work permits, and (iv) visas for free movement in Djibouti. The department has received software with the support of the International Organization for Migration (IOM) for the management and surveillance of movement of persons which enables them to maintain a database of people entering and leaving Djibouti. The same software is being utilized by Somaliland.

3) Issues

No information has been obtained from the Djibouti government regarding immigration, and it is necessary to obtain the information during the next study stage.

(2) Ethiopia

1) Relevant Organization

Ethiopian Department of Immigration and Nationality Affairs: Responsible for the processing of visas, collection of visa fees and clearance of passengers in and out of Ethiopia. They provide online applications and processing of visa on arrival.

2) Current Status

Ethiopian Immigration and Nationality Affairs have a similar mandate with the Djibouti Immigration department. Djibouti and Kenya nationals does not need visa, nationals of 37 counties get visas on arrival and all others have to process visa proceedings. All relevant stakeholders of the Ethiopian-Djibouti railway have set up a committee to develop procedures for the envisaged opening of the railway in June, 2017.

3) Issues

No information has been obtained from the Ethiopia government regarding immigration, and it is necessary to obtain the information during the next study stage.

(3) Sudan

1) Relevant Organization

Ministry of Interior: Divided into two departments: (i) border passports department; and (ii) expatriate affairs department. The role of the border passport department is to manage movement of persons into and out of the country, whilst the expatriate affairs department issues entry visas in accordance with rules and regulations.

2) Current Status

No information has been obtained from the Sudan government regarding immigration, and it is necessary to obtain the information during the next study stage.

3) Issues

No information has been obtained from the Sudan government regarding immigration, and it is necessary to obtain the information during the next study stage.

(4) South Sudan

1) Relevant Organization

Ministry of Interior (Directorate of Migration, Passports and Nationality): Responsible for processing of visas, collection of visa fees and clearance of passengers in and out of South Sudan. The Directorate also processes nationality certificates and passports for nationals.

2) Current Status

No information has been obtained from the South Sudan government regarding immigration, and it is necessary to obtain the information during the next study stage.

3) Issues

No information has been obtained from the South Sudan government regarding immigration, and it is necessary to obtain the information during the next study stage.

5.2.3. Quarantine

Currently each country has their own quarantine centers and implements national standards. IGAD is developing a regional quarantine policy that will be implemented by all the countries once it's adopted, targeting 2018.

(1) Djibouti

1) Relevant Organization

Ministry of Agriculture, Livestock and Fisheries: Responsible for the implementation of sectoral policies in the areas of food security, rural development and water. One of its mandates is to supervise inspections of all plant and livestock entering and leaving Djibouti and ensuring that the standards set by CODEX, OIE and IPPE are adhered.

2) Current Status

The Djibouti Regional Livestock Quarantine Centre is owned under a public-private arrangement with the private sector managing the centre and the government supervising, regulating and providing certification of good health for livestock. The centre has a state of the art laboratory and certification is recognized in all the countries where livestock is exported. It is the largest quarantine centre in the IGAD region. The centre's main objectives are to (1) apply sanitary requirements for export of disease free livestock, (2) conduct research on livestock diseases and trade in the horn of Africa, (3) promote livestock production in the region by opening market opportunities–a partnership with Ethiopian, Djibouti and Somali 'traders of Livestock, (4) serve as a source of livestock market information centre in East Africa, (5) maintain sustainable livestock trade by applying strict sanitary measures in international livestock trade, (6) act as a market source for fodder and concentrate feed for traders in the region, and (7) provide short term training for veterinarians and laboratory technicians.[111]

3) Issues

No information has been obtained from the Djibouti government regarding quarantine, and it is necessary to obtain the information during the next study stage.

(2) Ethiopia

1) Relevant Organization

Ministry of Trade for goods, Food and Drug Authority, Health and Medicine Controlling Authority, Ministry of Livestock and Fisheries for livestock and fish (ML&F)

2) Current Status

Ethiopia is in the process of developing a national standards policy while it currently implements CODEX, ISO international standards, and COMESA and EAC regional standards. The former Ethiopian Standards and Quality Authority was split into four autonomous agencies, namely: (a) The Ethiopian Standards Agency- mandated with developing standards, training and capacity building of standards officers and creating awareness among the general public; (b) The Conformity and Assessment Enterprise- mandated with testing, certification, and inspection; (c) The National Metrology Institute-which conducts calibration and other related activities; and (d) The National Accreditation Office accredits laboratories certified by the Conformity and Assessment Enterprise.

Regulation of standards is under the docket of the Ministry of Trade for goods and enforcement under the Food and Drug Authority, Health and Medicine Controlling Authority, and the Ministry of Livestock and Fisheries for livestock and fish. The ML&F conducts quarantine checks, laboratory testing and also works with accredited private laboratories.

[111] www.au-ibar.org/component/jdownloads/finish/10/2783

3) Issues

No information has been obtained from the Ethiopia government regarding quarantine, and it is necessary to obtain the information during the next study stage.

(3) Sudan

1) Relevant Organization

No information has been obtained from the Sudan government regarding immigration, and it is necessary to obtain the information during the next study stage.

2) Current Status

No information has been obtained from the Sudan government regarding quarantine, and it is necessary to obtain the information during the next study stage.

3) Issues

No information has been obtained from the Sudan government regarding quarantine, and it is necessary to obtain the information during the next study stage.

(4) South Sudan

1) Relevant Organization

The South Sudan National Bureau of Standards (SSNBS): Established in 2012, and responsible for the setting and enforcement of standards. SSNBS currently implements EAC Standards.

2) Current Status

The mandate of the SSBS is (i) Consumer protection, (ii) Promotion of trade, (iii) Environmental protection, and (iv) Enforcement of Sanitary and Phytosanitary (SPS) controls. SSNBS has conducted a number of awareness campaigns and works very closely with the South Sudan Chamber of Commerce for the dissemination for information to the general public.

3) Issues

No information has been obtained from the South Sudan government regarding quarantine, and it is necessary to obtain the information during the next study stage.

5.2.4. Regional Trade Facilitation Instruments

(1) Current Status

]Regional Trade facilitation instruments include axle load control regulations, harmonized road charges, establishment of One Stop Border Posts (OSBP's), among other things. Table 5.2.1 below illustrates which Member States are implementing these instruments.

Table 5.2.1 Implementation Status of COMESA Transport Facilitation Programmes

	Djibouti	Eritrea	Ethiopia	Kenya	Sudan	Uganda
Harmonized Road transit charges	○	―	―	○	○	○
COMESA Carriers License		○	○	○		○
Harmonized Axle Loading and Maximum Vehicle Dimensions	―	○	○	○	○	○
Regional Vehicle Insurance Scheme	○	○	○	○	―	○
Regional Customs Bond Guarantee Scheme	―	―	○	○	―	○
Single Customs Document	―	―	○	○	○	○
ASYCUDA	―	―	○	―	○	○
EuroTrace	―	―	○	○	○	○

Source: *Report for the Formation of the Truckers Association in the IGAD Region,* Gerald.W. Mbuthia, July 2016.

(2) Issues

Roads transit charges in Ethiopia are determined by the Ethiopian Road Authority based on competitive rates and applied for one year. In Djibouti the COMESA transit charges are applied. The objective of Harmonized Road Transit Charges is to standardize road user charges and to reduce divergences in transit costs among member states. The COMESA Harmonized Road Transit Charges are set at: US $ 10 per 100 km for Heavy Goods Vehicles with more than 3axles axles; US $ 6 per 100 km for Heavy Goods Vehicles with up to 3 axles; and US $ 5 per 100 km for buses with a capacity of more than 25 passengers

Ethiopia's main mode of transport is the 6 axle truck/ trailer combination which is not designed to carry heavy bulk and that large number of old and damaged truck/trailers along the Ethiopia-Djibouti highway. Unlike Djibouti, Ethiopia doesn't apply the COMESA axle load[112]. COMESA member states have agreed on common harmonized axle load limits and dimensions for Heavy Goods Vehicles (HGVs), ensuring a fair balance between pavement protection and an economical and competitive road freight transport operations. The COMESA and IGAD harmonized axle load limits are presented in Table 5.2.2 below.

Table 5.2.2 COMESA Harmonised Axle Load Limits

Item	Axle Configuration	COMESA	IGAD
1	Single Steering Axle	8 tons	8 tons
2	Drive Axle	10 tons	10 tons
3	Tandem Axle Group	16 tons	16-17 tons
4	Triple Axle Group	24 tons	10-24 tons
5	Gross Vehicle Weight (Maximum 7 Axles)	53 tons	46-56 tons
6	Maximum Vehicle Length	22 metres	18-22 metres

Source: Vision: Towards a Single Market; Theme: Deepening COMESA-EAC-SADC Integration, 2008 and member country reports

It is mandatory in Ethiopia and Djibouti to use the regional cross-border third party vehicle insurance scheme; the COMESA Yellow Card. The card is a third party liability insurance scheme that is valid in all the participating countries. The scheme covers third party liabilities and medical expenses for the driver and passengers should they suffer any bodily injury as a result of an accident. However the COMESA Yellow Card is not fully recognized in both countries and truckers have to have both Ethiopian and Djiboutian insurance which creates additional time and cost in doing business. Furthermore, the offices that issue the Yellow Card are few and situated in the capitals. In some instances borders aren't aware of the Yellow Card and therefore do not recognize it and impose fines or even imprison truck drivers.

Goods in transit to Ethiopia from Djibouti are not required to take out a customs bond Ethiopia currently piloting a national cargo tracking system[113]. The biggest challenge in that the four countries don't have harmonized standards of weighbridge management (laws and regulations for weighbridge equipment, equipment calibration, manuals for use of the equipment and certification). Secondly they all don't apply harmonized roads transit charges and customs carrier licenses. All these are meant to ease and facilitate trade.

(3) One Stop Border Posts (OSBPs) in the region

1) General

Ethiopia does not implement the COMESA axle load of the OSBP concept referring to the legal and institutional framework, facilities and associated procedures that enable goods, people and vehicles to stop in a single facility, in which they undergo necessary controls following applicable regional and national laws to exit one state and enter the adjoining state.

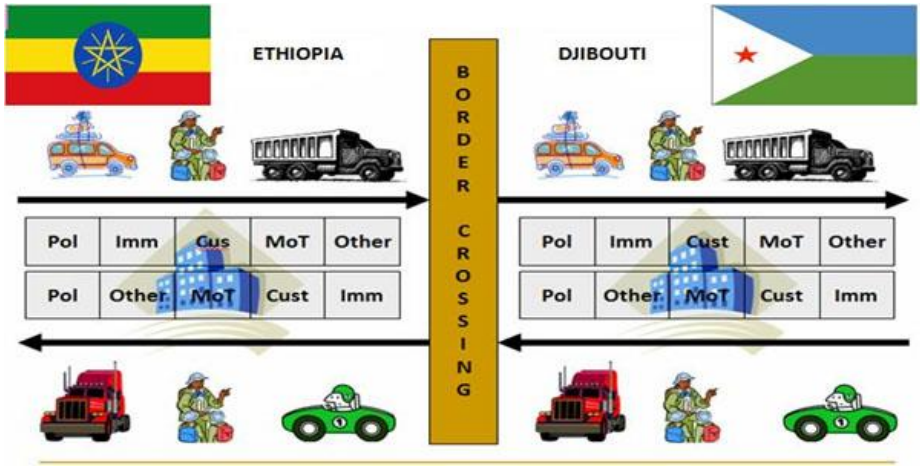
The establishment of OSBPs is considered top priority under the AU program for infrastructure development and trade facilitation. This is evidenced by the recent launch of the 2nd edition of the OSBP Sourcebook, which provides the current best practices and a blueprint for the operationalization of OSBPs. This was developed under the auspices of IGAD, AU, COMESA, EAC, and NEPAD with support from JICA.

[112] Ethiopia applies own axle load limits. It applies same standard as COMESA for main items, such as Single Steering Axle, Drive Axle, etc., but does not show limits for some items which is shown in COMESA. Furthermore, there is a difference in Gross Vehicle Weight (COMESA: 53 tons, Ethiopia: 58 tons).

[113] The system recognizes the status of all cargos in the nation by obtaining data inputs at the each process between pickup and delivery and aims to upgrade cargo-handling processes, to improve timely delivery and to avoid the theft of goods

2) Issues under Current Status

Currently there is no operational OSBP in the region. Traders are delayed by duplication of checks and procedures from the country of exit repeated in the country of entry. This together with lack of facilities and manual processing of customs documents encourages corruption. Traders are also hampered by insecurity and checks by different security agencies along the transit corridor. Currently, for example, crossing the Sudan border to Ethiopia, at Gallabat, a person needs to go through five different offices. On the Sudanese side, the person goes through: 1) the immigration office to register to get out of the country, 2) the customs offices to clears the vehicle and luggage, 3) the passport office to stamp the passport. After crossing a small bridge into Ethiopia, the person would have to: 4) get the passport stamped again, 5) move to customs offices at Shehedi in Metemma, and about 40 km further on, the vehicle and luggage will be cleared. All the procedures are lengthy and multi-stepped. It is usual to find offices closed as early as 4.00 pm, so ther person would have to spend at least one night at the border. Actually, movement of indigenous traders through this border point is quite limited. It is mainly used by tourists/expatriates. Several other informal routes are used for the vibrant cross-border trade in livestock, legumes, cereals and *khat* (legal herbal drug in north eastern Africa). The figure below illustrates the replication of checks and controls at a two stop border post (example of Ethiopia-Djibouti process).

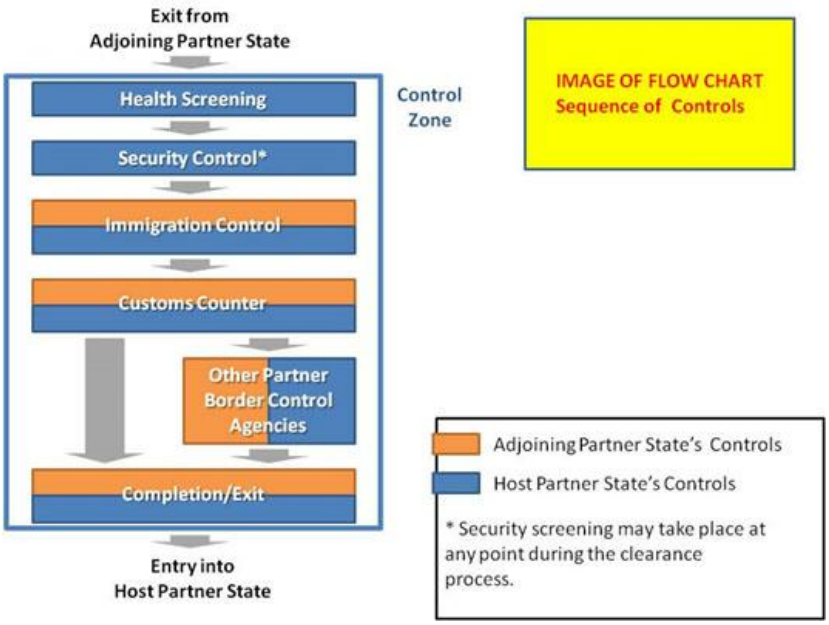


Source: Report on Legal Framework and Modalities for the establishment of One Stop Border Posts in the IGAD Region, John Baptist Walugembe, March 2017

Figure 5.2.1 Replication of Checks and Controls at a Two Stop Border Post.

With the establishment and operationalization of OSBPs all border government and private agencies are expected to work together taking cognizance of each states sovereignty, harmonization of procedures, development of procedural manuals, interconnectivity of IT systems, sharing of facilities and equipment and mutual recognition of Authorized Economic Operators (AEOs). Mutual recognition of AEOs will facilitate faster clearance of their cargo. This calls for the design of common regional customs procedures and manuals, provision of regional transit bond guarantee, harmonizing rules of origin, promotion of customs best practices, creating awareness among the users of the OSBP, and, capacity building and training of OSBP staff, among others.

There is need to set up legal and regulatory frameworks to establish inter and intra agency/ country cooperation and coordination. This has proved successful in EAC where it was done through bilateral agreements prior to the enactment of the EAC OSBP Act 2015. The case studies highlighted in the OSBP Sourcebook 2nd Edition underscore the importance of proper planning before operationalization to ensure that (i) both the users and the government agencies fully understand the concept, (ii) the institutional frameworks for inter and intra agency / country are in place and functional, (iii) equipment including IT systems is integrated, (iv) there is a clear understanding of how the facilities are going to be shared and managed, and(v) there is availability and accessibility of information for all stakeholders.



Source: Prepared by JICA Survey Team according to OSBP Sourcebook Information

Figure 5.2.2 OSBP Flow Chart

The above figure shows a flow chart with the sequence of controls in an OSBP. Controls and checks are done once at the exit point by government officers from both the exit and host country. There are numerous border points between the four countries, however many of them have been engaged in armed conflict which has adversely affected their economic and social development. The Moulhole (Djibouti)-Rahaita (Eritrea) border, and the border between Kassala (Sudan) and Tesseny (Eritrea) which are the official border crossings remain closed due to armed conflict. There are informal border crossings as between Eritrea and Ethiopia, but the official ones are Bedme (Eritrea) and Hemera (Ethiopia). This border is connected to the rest of the country by a very good tarmac road, an airport, electricity, water and telephone networks. The Eritrean side has poor roads and has been engaged in armed conflict with Ethiopia for a long time. If this insecurity could be sorted out this would be a potential OSBP given its proximity to Assab the port in Eritrea.

3) Curent Status of OSBP Border Point

Table 5.2.3 below shows the current status of potential OSBP border points in the four countries

Table 5.2.3 Current Status of Planned OSBPs[114]

STATUS OF MAJOR INTRA-IGAD BORDER POSTS WITH PLANNED OSBPS						
Border	Roads	Traffic	Security	Offices	OSBP	Other Infrastructure
Djibouti/Ethiopia Galile - Dewele, Galafi Guestir Balho	Bitumen roads at Galile and Galafi Murrum at Guestir and Balho. Upgrading road at Balho.	Buses, cargo and other traffic at the border points. High demand on border facilities. Frequent traffic congestion. Traffic includes vehicles, cargo and	Peaceful borders, normal trade.	All have police, immigration, customs, security offices and personnel.	Two planned OS BPs (Galafi, Galile-Dewele) under COMESA-UNECA.	At Balho: Addis Ababa – Djibouti Railway to Sea Port, but the existing railway is not functioning, being repaired; Dire-Dawa 230KV power line

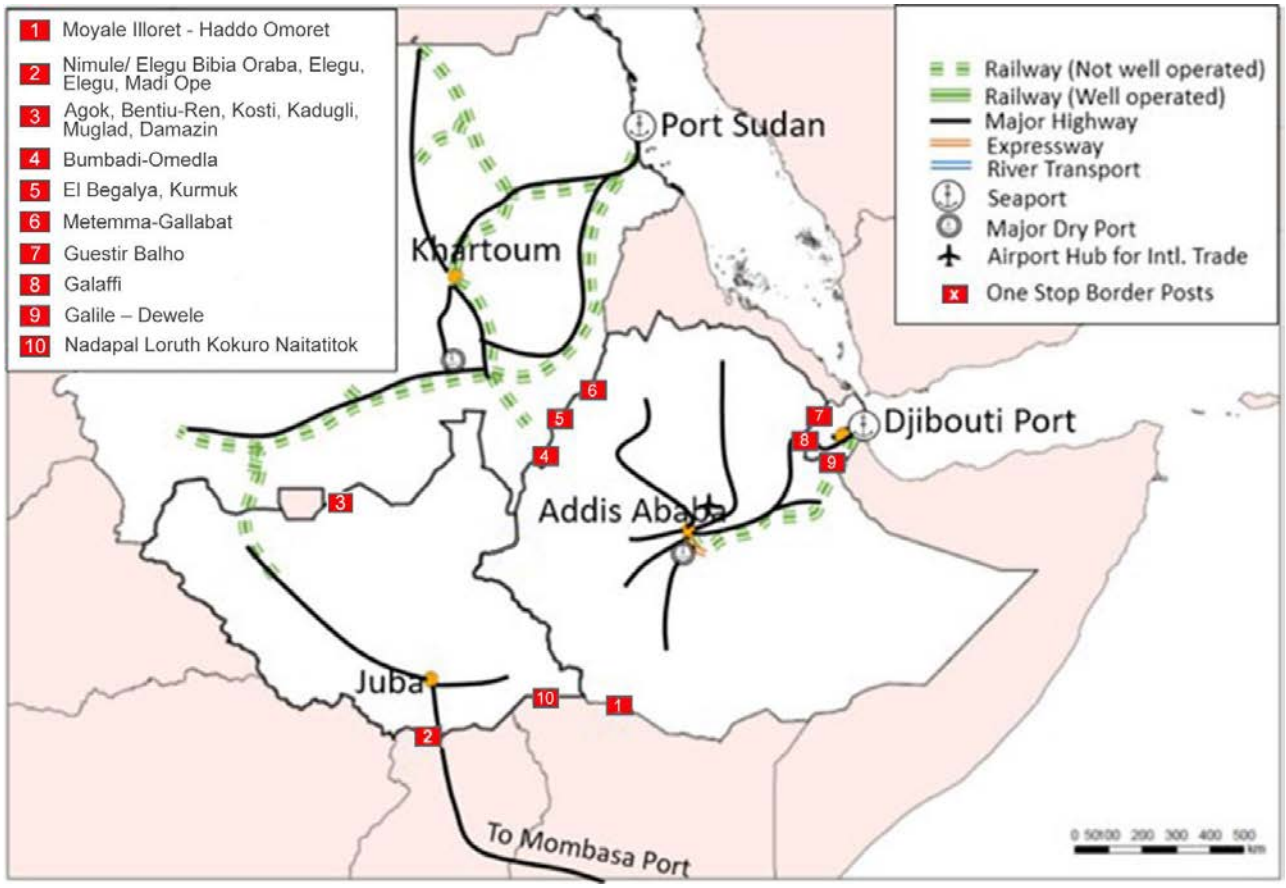
[114] *Report on Legal Framework and Modalities for the establishment of One Stop Border Posts in the IGAD Region*, John Baptist Walugembe, March 2017.

STATUS OF MAJOR INTRA-IGAD BORDER POSTS WITH PLANNED OSBPS						
Border	Roads	Traffic	Security	Offices	OSBP	Other Infrastructure
		livestock.				
Ethiopia – Kenya Moyale Illoret - Haddo Omoret	Tarmac road from Moyale to Addis Ababa. Poor road (work in process) from Moyale to Isiolo. Poor roads and tracks in case of Illoret/Haddo and	Much traffic on Ethiopia side Moyale (buses,cargo, etc) but little on Kenya side (mainly live animal trade and essential commodities) . Displaced refugees.	Insecure. Some disputed parts of Moyale district and other parts of the border have led to violence and ethnic clashes. Tensions areescalated by	Established ,police, immigration and customs at Moyale. Poor offices at other border points. Refugee offices	OSBP planned at Moyale under COMESA.	Planned Ethiopian railway to Moyale
Ethiopia - Sudan Metemma-Gallabat Bumbadi-Omedla, El Begalya, Kurmuk	Tarmac Gallabat-Khartoum road.	Little traffic. Mainly petty informal trade between people living near the borders.	Insecure	Multiple checks; Ill equipped offices. Limited controls.	Planned OSBP at Metemma-Gallabat. None for other border points.	Metemma bridge
South Sudan - Sudan Agok, Bentiu-Ren, Kosti, Kadugli, Muglad,Damazin	Poor murrum roads, impassable during rainy seasons.		Insecure: Tensions fuelled by divisions over religion, oil, ethnicity and ideology. Sudanese traders reported to be ambushed and killed in South Sudan.			Oil pipeline crossing the border.
Uganda-South Sudan Nimule/ Bibia Oraba, Elegu, Madi Ope	Nimule-Elgu tarmac road from Juba to Kampala. Oraba and Madi Opei roads being upgraded to tarmac on Uganda side.	Heavy trucks carrying goods from Uganda to landlocked South Sudan.	Insecure: Ugandan traders often attacked and killed in South Sudan.	Full border control offices. Several road checks.	Nimule OSBP planned under TMEA. No OSBP at Oraba and Madi Opei.	A small civilian and military Nimule Airport.Planned railway link passing through Nimule
Kenya – South Sudan Nadapal Loruth	Very poor roads, tracks.	Only informal trade currently.	Has been insecure with banditry.	Limited controls, military road	None	LAPSSET : ports, railway, transport

STATUS OF MAJOR INTRA-IGAD BORDER POSTS WITH PLANNED OSBPS						
Border	Roads	Traffic	Security	Offices	OSBP	Other Infrastructure
Kokuro Naitatitok			Territorial conflicts are getting resolved	checks.		corridors, pipelines.

Source: JICA Survey Team

The Figure below shows the locations of planned OSBPs with current infrastructure layout.



Source: JICA Survey Team

Figure 5.2.3 Locations of Planned OSBPs with current Transport Infrastructure Layout

4) Agreed Action Plans

Under the auspices of the IGAD project[115] modalities are being developed to establish OSBPs in the region, which include the legal and regulatory frameworks. The IGAD member states have agreed to the Action Plan in Table 5.2.4 below:

Table 5.2.4 Action Plan for IGAD OSBPs

Objectives	**Results / Targets**	**Activities**	**Roles and Responsibilities**	**Timeframes**
Objective1: Promote the establishment of IGAD OSBPs.	An IGAD OSBP institution established IGAD national committee/ comprising MOT ,Customs, Federal police etc	Conduct conferences and meetings at regional and national levels. Provide a Focal Person/Point in each GAD member state. Train and sensitize	IGAD: Mobilize resources, Lobby governments and enhance IGAD's role for public awareness. Donors and international partners, development agencies.	*Short Term*

[115] IGAD project under the 2nd Regional Integration Support Programme (RISP 2) under the10th European Development Fund

Objectives	Results / Targets	Activities	Roles and Responsibilities	Timeframes
	Private Sector and informal trade sensitized on OSBP and other trade facilitation measures	private sector and public sector actors, including all agencies on OSBP issues and procedures. Exchange best practice through visits, forums, and networking	*Members States*: Give technical and financial support *Private Sector:* Form public-private sector partnerships to promote OSBPs; Engage government and other key stakeholders	
Objective 2: Establish new OSBPs at critical border points not yet covered	9 new OSBPs in IGAD region: South Sudan-Uganda South Sudan- Kenya Somalia-Ethiopia Djibouti –Somalia Somalia-Kenya Sudan –South Sudan (2 borders) Ethiopia-Kenya Madera	Mobilize resources for establishing OSBPs. Design and construct the OSBPs. Provide adequate physical and human resources for the OSBPs	*IGAD:* Mobilize resources; Lobby governments and development agencies; Contract designers and constructors of OBSPs. *Member States:* Give technical and financial support to construct and operate the OSBPs; Promote local content in infrastructure development. *Private sector:* Form public-private sector partnerships to invest in OSBPs.	*Medium Term*
Objective 3: Simplify and harmonize laws, policies, procedures and other trade regulations for cross- border trade among IGAD member states.	IGAD OSBP Bill drafted and passed. Common IGAD cargo export, import and transit documents. Informal trade sector incorporated into formal sector.	Establish IGAD OSBP laws, procedures in line with EAC, COMESA, GAFTA, World Customs organization, WTO, World Bank, World Customs Organization, etc. Sensitize informal sector on trade facilitation measures.	*IGAD:* Mobilize resources; Lobby governments and development agencies; Contract designers and constructors of OBSPs, Capacity Building *Member States:* Align bilateral agreements to IGAD OSBP legal framework. *Private Sector:* Form public-private	*Medium Term*
Objective 4: Improve infrastructure and facilities at key border points in IGAD region.	IGAD OSBP Bill drafted and passed. Common IGAD cargo export, import and transit documents. Informal trade sector incorporated into formal sector.	Construct roads to selected border points. Provide electricity, water, and ICT to important marginalized border points. Establish a one-stop data centre for IGAD trade documentation, customs payments, online transactions and business information	*IGAD:* Mobilize resources; Lobby governments and development agencies; Contract designers and constructors of OBSPs. *Member States:* Give technical and financial support to improve trade infrastructure *Private Sector:* Form public-private sector partnerships in infrastructure	*Medium Term*

Objectives	Results / Targets	Activities	Roles and Responsibilities	Timeframes
			development	
Objective 5: Regularly monitor and evaluate OSBPs and other major border point in the IGAD region	An M&E system for IGAD OSBPs established. Data collected on human and cargo traffic volumes and other trade flows at major IGAD border points	Coordinate agencies and systems for data collection. Extend data collection systems to major border points not yet covered. Conduct regional and national-level forums for reviews and forward planning on national	*IGAD:* Coordinate and provide technical support for M&E. *Member States:* Link national customs data systems to IGAD M&E system; Improve data collection at border points. *Private Sector:* Provide information and participate in M&E, planning and reviews	*Long term*

Source: Report on Legal] Framework and Modalities for the establishment of One Stop Border Posts in the IGAD region John Baptist Walugembe March 2017 (May 2017-validated)

5.2.5. Institutional Structure of Soft-Infrastructure Sector

Under the auspices of COMESA, the Djibouti Corridor Authority (DCA) is under preparation for establishment of a logistics authority concerned of Djibouti Corridor region, and a One Stop Border Post (OSBP) development project. The DCA will accelerate economic activity in the region and facilitate the transit of goods and passengers between countries, while the establishment of OSBPs will improve customs transit procedures through the implementation of joint border controls. In the meantime each country has government agencies managing one or several of the aspects pertinent to the operations of the future Djibouti Corridor.

Table 5.2.5 Institutional Structure of Soft-Infrastructure Sector in each Target Country

	Organization	Responsibility and Activities
Djibouti	Djibouti Customs Authority	Refer to section 5.2.1
	Djibouti Ports & Free Zones Authority (DPFZA)	The governing authority that sets the rules and directives for the managing of ports and free zones. It's responsible for the enforcement and implementation of these rules and directives. The Authority also has the mandate to promote the ports and free zone as a commercial and logistics platform.
	Djibouti Immigration Authority	Refer to section 5.2.2
	Ministry of Equipment & Transport	Responsible for the implementation and coordination of road, rail, sea and air transport policy as well as national meteorology. It is also responsible for the management, operation, maintenance and renovation of public facilities. It is responsible for designing and implementing government policy on road, port and airport infrastructure. In this capacity, it coordinates the policies of opening up and developing the national territory. The Djibouti-Ethiopian Railway, the Ports of Djibouti and the Secondary Ports, the Djibouti International Airport, the Civil Aviation and the Roads Agency are under the supervision of the Ministry.
	Ministry of Agriculture, Livestock and Fisheries	Refer to section 5.2.3
Ethiopia	Organization	Responsibility and Activities
	Ethiopian Revenue and Customs Authority	Refer to section 5.2.1
	Ethiopian department of Immigration and Nationality Affairs	Refer to section 5.2.2
	Ministry of Transport	Responsible for the expansion of transport services, development and implementation of regulatory frameworks for reliable and safe transport

		services, regulating maritime and transit services, construction and maintenance of transport infrastructure, and ensuring the provision of transport services is in line with the country's development strategy.
	The Ethiopian Maritime Affairs Authority (EMAA)	Mandated with planning, coordinating and enforcing requirements to ensure that the transport operations and movement of goods in the import and export sectors become more economical. It is also responsible for implementing the rights and obligations of Ethiopia under international maritime conventions.
	Ethiopian Standards Agency	The national standard body that develops and implements the national standardization strategy, which is in line with the country's rights and obligations under regional and international obligations. The Agency works closely with other standard bodies in the region in formulation, adoption, and harmonization of standards.
Sudan	Organization	Responsibility and Activities
	Sudan Customs Authority	Refer to section 5.2.1
	Ministry of Interior	Refer to section 5.2.2
	Ministry of Transport, Roads and Bridges	Responsible for supervising, coordinating and planning the transportations in Sudan and developing the different policies ruling this sector.
	Sudanese Standards and Metrology Organization (SSMO)	Responsible for the development and enforcement of standards in line with the regional and international rights and obligations of Sudan. Its role is the control and assurance of quality. Furthermore the agency is mandated with research and development in the area of metrology.
	Sudan Ports Authority	A state governed agency that manages, constructs and maintains the operations at the port of Sudan.
South Sudan	Organization	Responsibility and Activities
	South Sudan Customs Service	Refer to section 5.2.1
	Ministry of Interior (Directorate of Migration, Passports and Nationality)	Refer to section 5.2.2
	South Sudan Bureau of Standards	Responsible for developing a safe, secure and efficient transportation system. The Ministry is mandated with establishing and overseeing the implementation of the legal framework and regulations for the development of the transport network in Southern Sudan.

Source: JICA Survey Team

5.3. Energy Infrastructure

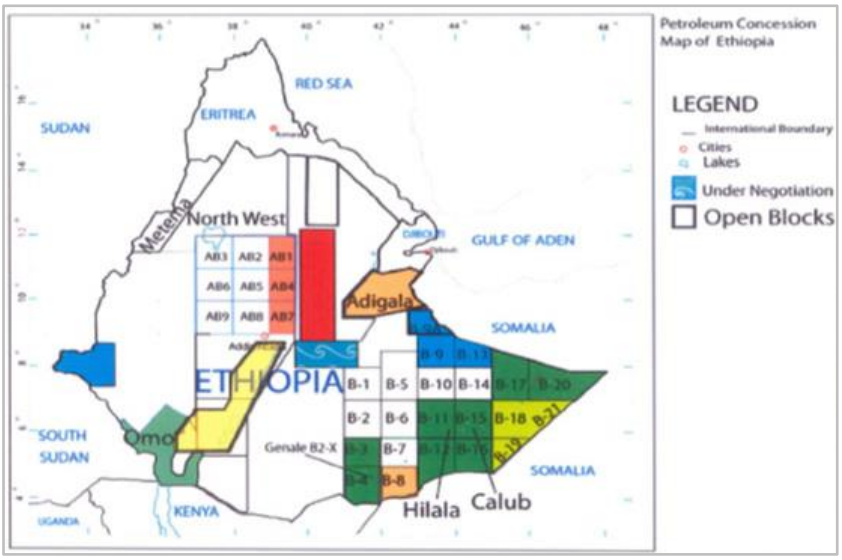
5.3.1. Djibouti

No primary energy potential such as oil and gas is observed in Djibouti. There is a plan to transport oil products (diesel oil, gasoline and kerosene) from Djibouti to Ethiopia by pipeline instead of tank trucks but no progress has been made so far.

5.3.2. Ethiopia

Petroleum resource exploration is ongoing in Ethiopia by concluding twelve numbers of development contracts with six companies. POLY-GCL of China has acquired five concession licenses and conducting petroleum exploration in eight blocks. Of which, natural gas reserve was discovered in Hilala (B-11 block, 4.7 Tcf[116]) and Calub (B-15 block, 2.5 Tcf) with the total amount of 7.2Tcf. The government of Ethiopia and POLY-GCL concluded a contract to construct a gas transport pipeline within the territory of Ethiopia up to the border with Djibouti. Detailed schedule will be proposed by POLY-GCL.
There is no progress on the pipeline construction within the territory of Djibouti. Produced gas will be exported as LNG (Liquefied Natural Gas) by constructing LNG terminal in the territory of Djibouti (Damerjog) by POLY-GCL.

[116] Trillion Cubic Feet



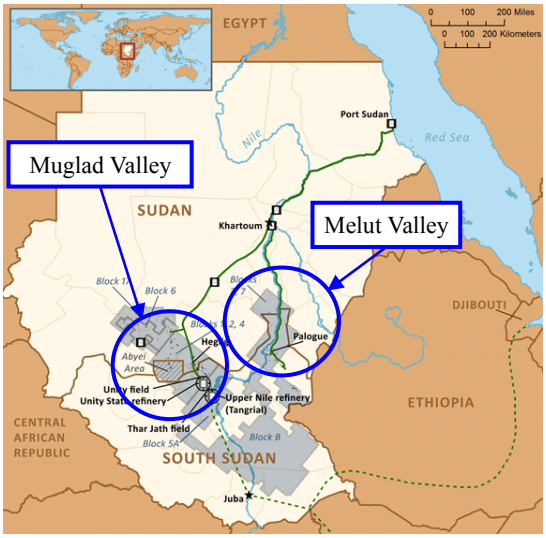
Source：Ministry of Mines, Petroleum and Natural Gas, Ethiopia

Figure 5.3.1 Petroleum concession map in Ethiopia

5.3.3. Sudan

(1) Oil reserve

According to BP Statistical Review（2016）[117], proven oil reserve is 1.5 billion barrels and R/P ratio is about 39 years in Sudan as of the end of 2015. Most of the oil reserves in Sudan and South Sudan are located at Muglad and Melut valleys which lay between the border of two countries. Figure 5.3.2 shows the oil development blocks in the two countries.



Source：Japan Petroleum Energy Center (Jun. 2015) "Oil and gas trends in north African countries (1)"

Figure 5.3.2 Oil development blocks in Sudan and South Sudan

(2) Oil refineries

There are two oil refineries and three topping plants currently in operation in Sudan. Total refining capacity of the plant is 143,700 Barrels/day. Table 5.3.1 shows the list of oil refining plants and Figure 5.3.3 shows the geographical location of the plant. There are plans to expand Khartoum oil refinery and to construct a new refinery at Port Sudan.

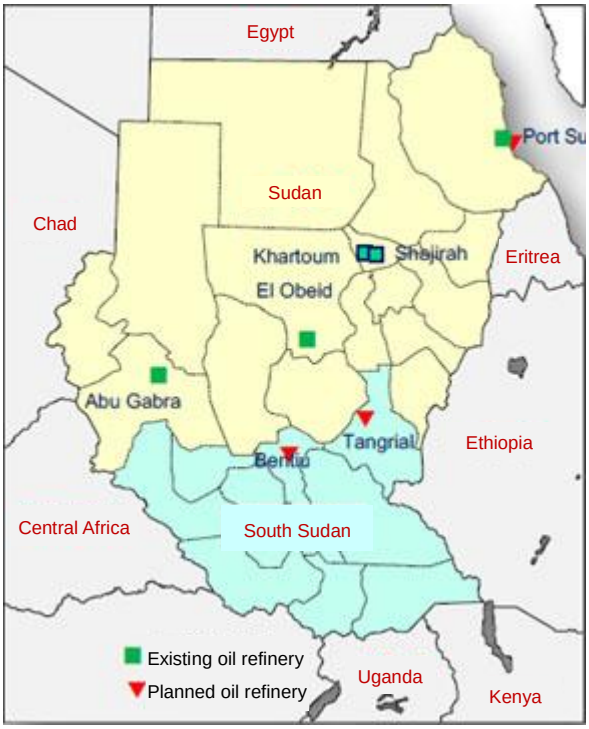
[117] BP Statistical Review of World Energy, June 2016

Table 5.3.1 Oil refining plants in Sudan

Name of plant	Location	Type	Capacity	Operator
Khartoum (al Jaili)	Khartoum	Oil refinery	100,000 Barrel/day	CNPC/Sudapet
Port Sudan	Read sea	Oil refinery	21,700Barrel/day	Sudapet
El Obeid	Northern Kordofan	Topping plant	10,000 Barrel/day	Sudapet
Shajirah	Khartoum	Topping plant	10,000 Barrel/day	Concorp
Abu Gabra	Southern Darfur	Topping plant	2,000 Barrel/day	Sudapet
Total			143,700 Barrel/day	

Source：Japan Petroleum Energy Center (Oct. 2014) "Latest information on world oil refineries (monthly report)"

Remarks：Oil refinery produces oil products such as gasoline, kerosene, etc. by distilling crude oil and with some additional processes such as cracking, reforming, chemical treatment, mixing etc. Topping plant uses atmospheric distillation method to extract gas, gasoline, kerosene, light oil, residual oil, etc. by heating (300～360 ℃) crude oil under atmospheric pressure (0.5 ～ 1.0 kg/cm^2). Topping plant is also called as an atmospheric distillation plant. (Source: Japan Oil, Gas and Metals National Corporation (JOGMEC) "Oil and gas terms dictionary")



Source : Japan Petroleum Energy Center (Oct. 2014) "Latest information on world oil refineries (monthly report)"

Figure 5.3.3 Location of oil refineries in Sudan

5.3.4. South Sudan

(1) Oil reserve

According to BP Statistical Review (2016)[3], proven oil reserve is 3.5 billion barrels and R/P ratio is about 65 years in South Sudan as of the end of 2015.

(2) Crude oil export pipeline

Sudan owns two crude oil export pipelines which connect southern area and Bashayer Marine Terminal which is located at 24km south of Port Sudan. These pipelines are indicated in green lines in Figure 5.3.2. The first one is Petrodar Pipeline which transports Dar Blend[118] crude oil produced in South Sudan. It has the length of 1,370km and transport capacity of 0.5 million barrels/day. The pipeline is equipped with heating system to increase the fluidity of the oil which contains a lot of wax content.

[118] Dar blend is the low quality crude oil found in the Melut Basin east of the White Nile, mostly in South Sudan but extending into Sudan. On the other hand, Nile blend is a light and sweet waxy crude located mostly in the Muglad Basin. (refer to Figure 5.3.2)

Another one is GNPOC Pipeline which transports Nile Blend crude oil from Heglig treatment facility to Bashayer Marine Terminal having the length of 1,610km and transport capacity of 0.45 million barrels/day. South Sudan is considering an alternative crude oil pipeline route other than the current route via Sudan in order to reduce the dependency on Sudan. The government of South Sudan signed MOUs with Kenya, Ethiopia and Djibouti to construct pipelines going to Lamu port through Kenya or another pipeline going to Djibouti port. A Japanese trading company conducted a feasibility study for the construction of a pipeline going to Lamu port, Kenya and found it feasible. However, the plan has been suspended due to worsening security situation in South Sudan.

(3) Oil products depots

South Sudan plans to construct strategic oil storage depots at four sites as shown in Table 5.3.2. Oil products will be transported by ships using rivers except Wau in which railway transportation is planned. A feasibility study for the plan was completed but construction was suspended due to worsening security situation.

Table 5.3.2 Strategic oil products depots

Location	Products	Capacity (m^3)
Juba	Diesel oil	50,000
	Gasoline	25,000
	LPG	5,000
Bor	Diesel oil	5,000
	Gasoline	2,500
	LPG	150
Malakal	Diesel oil	5,000
	Gasoline	2,500
	LPG	150
Wau	Diesel oil	10,000
	Gasoline	5,000
	LPG	200

Source：Ministry of Petroleum (MoP), South Sudan

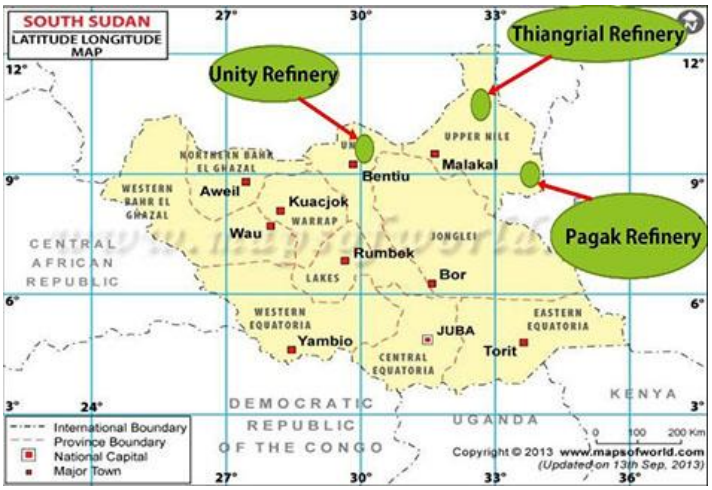
(4) Construction plan of oil refineries

South Sudan plans to construct oil refineries at three sites. The refineries will be connected by pipelines when the constructions are completed.

Table 5.3.3 Construction plans of oil refineries

Location	Operational capacity	Remarks
Unity	5,000Barrel/day	4km apart from an oil field At the stage of pre-commissioning
Thiangrial	20,000Barrel/day	Under construction
Pagak	50,000Barrel/day	F/S completed 15km apart from Ethiopian border Aiming at exporting oil products to Ethiopia

Source：Ministry of Petroleum (MoP), South Sudan



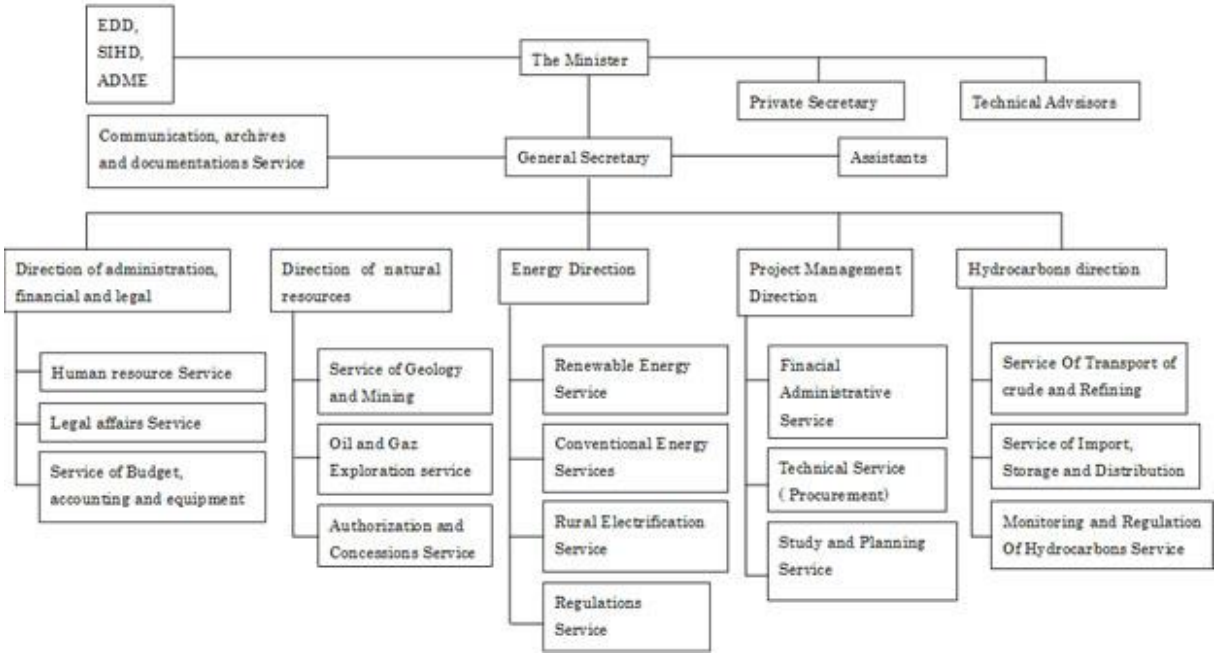
Source：Ministry of Petroleum (MoP), South Sudan

Figure 5.3.4 Planned locations of oil refineries

5.3.5. Institutional Structure of Energy Infrastructure

(1) Djibouti

Ministry of Energy and Natural Resources is in charge of the formulation and implementation power sector policy and regulation of power sector. Figure 5.3.5 shows the organization structures of Ministry of Energy and Natural Resources.



Source: Ministry of Energy and Natural Resources

Figure 5.3.5 Organization Structure of Ministry of Energy and Natural Resources

(2) Ethiopia

Ministry of Mines, Petroleum and Natural Gas is in charge of policy making, planning, implementation and control of energy infrastructure. Ethiopian Petroleum Enterprise is only one company importing oil products, and imported products are gasoline, gas oil, kerosene, diesel and heavy oil. Ethiopian Petroleum Enterprise wholesales to retailers.

(3) Sudan

The Ministry of Oil and Gas should be in charge of primary energy resource development, however detailed information has not been obtained. Thus, further study of the sector information is necessary in the future study stage.

(4) South Sudan

Any detailed information has not been obtained from the concerned government agency(s). Thus, further study of the sector information is necessary in the next study stage.

5.4. Power Supply Infrastructure

5.4.1. Power Demand

(1) Djibouti

Peak demand and electricity supply in Djibouti has grown by 9.7% and 6.5% per year respectively in the past five years from 2011 to 2015. Peak demand in Djibouti reached 99MW in 2015 which has grown as high as 17.3% compared to the previous year. This high growth of peak demand is caused by the stable economic growth and increase of bulk consumers such as large scale development projects. It is forecasted that this growth trend will continue for the time being. Table 5.4.1 shows the trend of peak demand and electricity supply in Djibouti from 2011 to 2015.

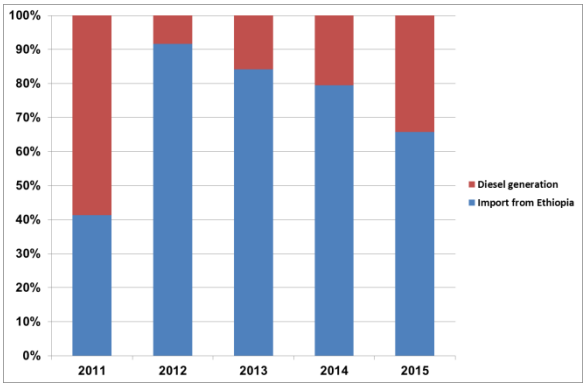
According to the Power System Master Plan 2015 (Tractebel Engineering), power demand in Djibouti is expected to grow by 17.9% per year from 2015 to 2020. This indicates that power demand in 2018 will be twice as high as that of 2015.

Table 5.4.1 Trend of peak demand and electricity supply (Djibouti)

	2011	2012	2013	2014	2015	2015/11
Peak Demand (MW)	68	75	77	84	99	-
Growth (%)	-	10.3%	2.5%	8.7%	17.8%	9.7%
Electricity supply (GWh)	372	387	422	434	479	-
Growth (%)	-	4.0%	8.9%	3.0%	10.4%	6.5%

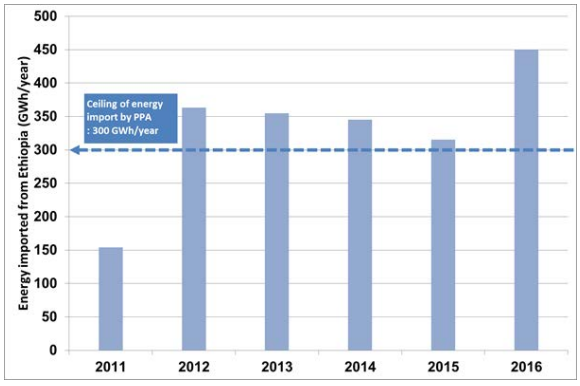
Source：Electricite de Djibouti

Power import from Ethiopia commenced in Djibouti from 2011. Since then, major power supply source was shifted from diesel power generation to import. Figure 5.4.1 shows the share of diesel generation and import in total electricity supply. According to the PPA (Power Purchase Agreement) between Djibouti and Ethiopia, the ceiling of annual power import is 300GWh. However, 450GWh which is 50% higher than the ceiling was imported in 2016. Figure 5.4.2 shows the trend of energy imported from Ethiopia.



Source：Electricite de Djibouti

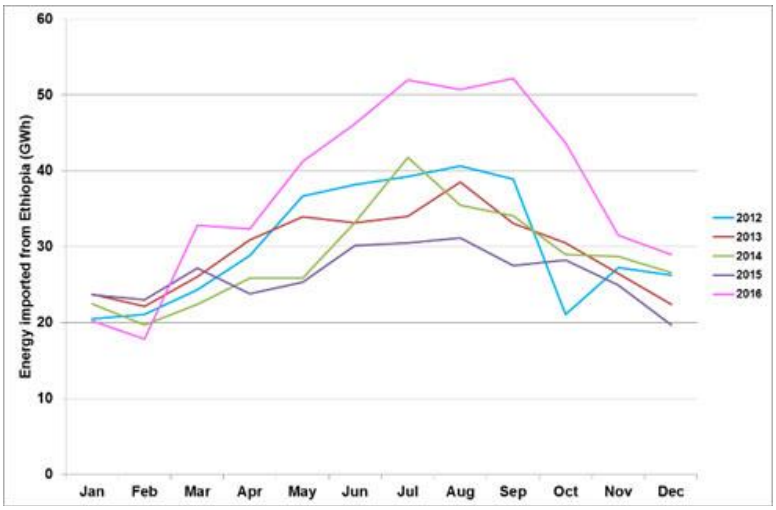
Figure 5.4.1 Share of diesel generation and import in total electricity supply



Source：Electricite de Djibouti

Figure 5.4.2 Trend of energy imported from Ethiopia

Figure 5.4.3 shows the trend of monthly energy import in Djibouti. Amount of energy import increases from June to September which falls in the hottest season in Djibouti. Monthly energy import during the hottest season dropped in 2015 but it increased further in 2016. This is attributed to the increase of reserve margin in power generation in Ethiopia due to the commissioning of Gibe-III (1,870MW).



Source：Electricite de Djibouti

Figure 5.4.3 Monthly energy import from Ethiopia

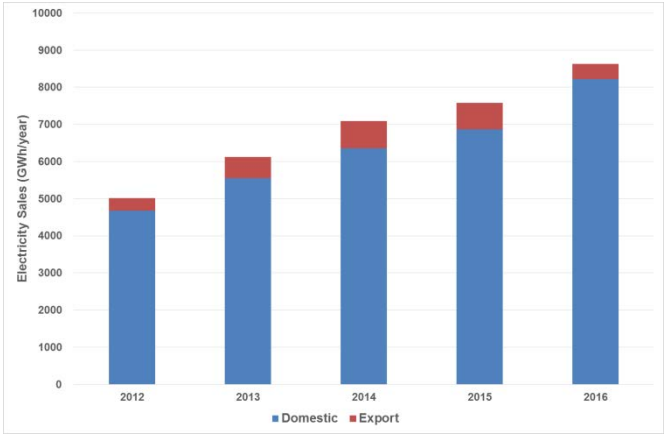
(2) Ethiopia

Peak demand and electricity supply in Ethiopia has grown at the high rate of 15.1% and 13.6% per year respectively in the past five years from 2012 to 2016. Figure 5.4.4 shows the share of domestic consumption and export in total electricity sales. As shown in the figure, power export accounts for only 5 to 10% in total electricity sales. Thus, the high growth of power demand in Ethiopia is derived from increase in domestic demand.

Table 5.4.2 Trend of peak demand and electricity supply (Ethiopia)

	2012	2013	2014	2015	2016	2016/12
Peak Demand (MW)	1,125	1,378	1,440	1,643	1,974	-
Growth (%)	-	22.5%	4.5%	14.1%	20.2%	15.1%
Electricity supply (GWh)	6,291	7,588	8,701	9,521	10,465	-
Growth (%)	-	20.6%	14.7%	9.4%	9.9%	13.6%

Source：Ethiopian Electric Power



Source：Ethiopian Electric Power

Figure 5.4.4 Share of domestic consumption and export in total electricity sales

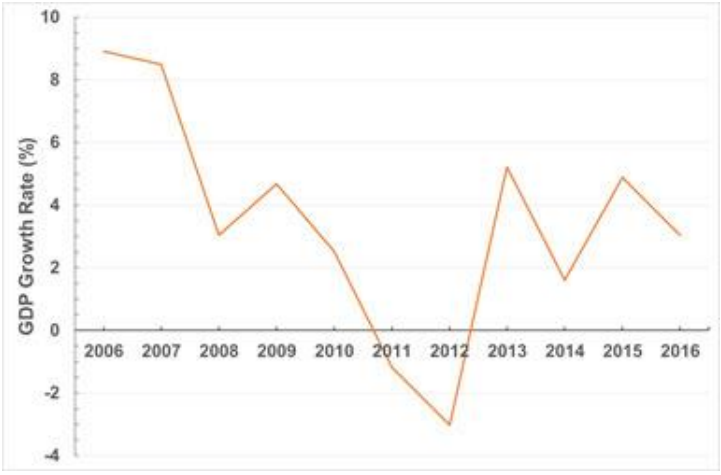
(3) Sudan

Peak demand and electricity supply in Ethiopia has grown at the high rate of 13.8% and 11.7% per year respectively in the past five years from 2011 to 2015. However, the growth rate of both peak demand and electricity supply dropped after 2013. As shown in Figure 5.4.5, GDP growth of Sudan has largely dropped after the independence of South Sudan (2011). Such stagnated economic growth could be the cause of recent low growth rate of power demand.

Table 5.4.3 Trend of peak demand and electricity supply (Sudan)

	2011	2012	2013	2014	2015	2015/11
Peak Demand (MW)	1,525	1,727	2,011	2,296	2,562	-
Growth (%)	-	13.2%	16.4%	14.2%	11.6%	13.8%
Electricity supply (GWh)	8,443	9,417	10,783	11,834	13,142	-
Growth (%)	-	11.5%	14.5%	9.7%	11.1%	11.7%

Source：Ministry of Water Resources and Electricity, Republic of Sudan



Source：IMF (April 2017) "World Economic Outlook Database"

Figure 5.4.5 GDP growth rate of Sudan

(4) South Sudan

Since South Sudan became independent in July 2011, power demand data of the country only exists after 2012. Table 5.4.4 shows the trend of electricity supply in South Sudan.

SSEC (South Sudan Electricity Corporation) was not able to generate and supply electricity in the past two years because the financial difficulty of the corporation forced it unable to buy fuel for diesel generation. Therefore, citizens of South Sudan depend of private generators for their electricity. According to the survey of the United Nations, electricity access rate in South Sudan is estimated to be 1%. SSEC assumed it to be the level of 5%.

Table 5.4.4 Trend of electricity supply (South Sudan)

	2011	2012	2013	2014	2015
Electricity supply (GWh)	-	445	472	488	-
Growth (%)	-	-	6.1%	3.4%	-

Source：International Energy Agency

5.4.2. Power Supply Facilities

(1) Djibouti

1) Power plants

There are two power plants in Djibouti, namely, Boulaos and Marabout. Installed generation capacity of the power plants is 139MW in total while available capacity is 103MW. Power import from Ethiopia accounts for 92% in 2012, 84% in 2014, 79% in 2014 and 66% in 2016 in total electricity supply. Power import from Ethiopia is not guaranteed by the PPA during the peak hours of dry season in Ethiopia. Therefore, Djibouti needs to secure its own power generation capacity to cope with an emergency situation.

Table 5.4.5 Generators at Boulaos power station

No	Year Commissioned	Type	Fuel	Installed Capacity (MW)	Available Capacity (MW)	Operation mode
G1	1976	Alstom Pielstick 18PC2-2	HFO	6,0	4,0	Peak
G12	2004	Caterpillar	HFO	7,25	6,5	Base
G13	2001	Wartsila GMT 16VA32	HFO	6,0	4,5	Base

No	Year Commissioned	Type	Fuel	Installed Capacity (MW)	Available Capacity (MW)	Operation mode
G14	2001	Wartsila GMT 16VA32	HFO	6,0	4,5	Base
G15	2001	Wartsila GMT 16VA32	HFO	6,0	4,5	Base
G16	2001	Wartsila GMT 16VA32	HFO	6,0	4,5	Base
G17	2003	Caterpillar	HFO	7,25	6,5	Base
G18	2004	Caterpillar	HFO	7,25	6,5	Base
G21	1984	FINCANTIERI B550/18	HFO	15,2	―	Decommissioned
G22	2007	Wartsila Vassa 18V46	HFO	17,0	14,0	Base
G23	2011	MAN 9L52/55A	HFO	8,5	6,9	Base
G24	1988	MAN 9L52/55A	HFO	5,5	4,5	Base
G25	2000	Wartsila GMT 18V46	HFO	14,4	13,4	Base
G31	2010	SEMT PIELSTICK PA6	light	4,5	4,0	Peak
G32	2010	SEMT PIELSTICK PA6	light	4,5	4,0	Peak
Total				121,35	88,3	―

Source：Electricite de Djibouti

Table 5.4.6 Generators at Marabout power station

No	Year Commissioned	Type	Fuel	Installed Capacity (MW)	Available Capacity (MW)	Operation mode
M1	1999	Wartsila GMT 16V25	light	3,0	2,4	Peak
M2	1999	Wartsila GMT 16V25	light	3,0	2,4	Peak
M3	1999	Wartsila GMT 16V25	light	3,0	2,4	Peak
M4	1999	Wartsila GMT 16V25	light	3,0	2,4	Peak
M5	1999	Wartsila GMT 16V25	light	3,0	2,4	Peak
M6	1999	Wartsila GMT 16V25	light	3,0	2,4	Peak
Total				18,0	14,4	―

Source：Electricite de Djibouti

Construction of a diesel power plant with the capacity of 56MW was planned in Jaban'as area where Jaban'as interconnection substation is located with the finance from Islamic Development Bank[119]. However, the plan was canceled due to a new plan to construct an LNG terminal and gas fired power plant in Damerjog, the eastern part of Djibouti. However, the site was relocated to Damerjog, the capacity was increased to 100MW with dual firing of gas and oil due to a new plan to construct an LNG terminal in Damerjog, the eastern part of Djibouti. Djibouti is located in the Lift Valley of eastern Africa and has a potential of geothermal generation. Development of a geothermal power plant is planned in Fiale Valley.

2) Transmission and substation facilities

Transmission network in Djibouti is consisted of 230kV and 63kV in terms of voltage. Table 5.4.7 shows the list transmission lines with voltage classes and Table 5.4.8 shows the list of substation equipment.

Table 5.4.7 List of transmission lines

Path	Voltage	Length	Conductor	Capacity
(a) Hurso – Jaban As	230 kV	290 km	Overhead Ash (180 mm^2) × 2	168 MVA × 2
(b) Jaban As – Palmeraie	63 kV	9,3 km	Overhead Aster (366 mm^2) × 2	65 MVA × 2
(c) Palmeraie – Boulaos	63 kV	3,8 km	Underground 800 mm^2 × 1	72 MVA × 1
(d) Palmeraie – Marabout	63 kV	5 km	Underground	72 MVA × 1

[119] Tender opening for the project in 2016 was not successful because the lowest bidding price exceeded the ceiling price of the bid. Re-tender was planned supplementing the shortage of fund by utilizing a loan from China Exim Bank and increasing the capacity to 100MW.

Path	Voltage	Length	Conductor	Capacity
			800 mm² × 1	
(e) Boulaos – Marabout	63 kV	4,8 km	Underground 400 mm² × 1	36 MVA × 1
(f) Jaban As – Ali Sabieh	63 kV	72 km	Overhead Ash (150 mm²) × 2	40 MVA × 2
(g) Dire Dawa – Nagad (For railway, from Nagad to border)	230 kV	72 km	Overhead Ash (180 mm²) x 2	168 MVA x 2
(h) Djaban'As – Nagad	230 kV	11 km	Overhead Ash (180 mm²) x 2	168 MVA x 1

Source：Electricite de Djibouti

Table 5.4.8 List of substation equipment

Name of substation	Voltage	Transformer capacity
Jaban As	230/63 kV	63 MVA × 2
	63/20 kV	40 MVA × 1
Marabout	63/20 kV	36 MVA × 1
Boulaos	63/20 kV	36 MVA × 2
Ali-Sabieh	63/20 kV	12 MVA × 1
Palmeraie	63/20 kV	40 MVA x 1

Source：Electricite de Djibouti

(2) Ethiopia

1) Power plants

Existing power plants in Ethiopia has total installed capacity of 4,303MW in which hydro power accounts for 89%. Table 5.4.11 shows the list of hydro power plants under construction. Total installed generation capacity of Ethiopia will reach 10,558MW, 2.5 times larger than present, in 2018 after the completion of Grand Ethiopian Renaissance Dam.

Table 5.4.9 List of existing hydro power stations

No.	Name of power plant	Installed Capacity (MW)	Dependable Capacity (MW)	Ave. energy (GWh)	Firm energy (GWh)
1	Tis Abay I	11.3	0	1.8	0.0
2	Tis Abay II	73	0	10.7	0.0
3	Beles	460	460	2,823.3	1,815.4
4	Koka	43.2	18.7	134.9	119.8
5	Awash II	32	12	184.4	177.1
6	Awash III	32	24	185.3	177.9
7	Finchaa including IVth Unit	134	128	618.9	587.3
8	Melka Wakena	153	114.5	555.9	579.2
9	Finchaa Amerti Neshe	98	98	247.3	233.8
10	Sor	5	0	30.1	28.8
11	Gilgel Gibe-I	192	184	895.2	742.8
12	Gelgel Gibe 2	420	420	2,060.6	1,709.8
13	Tekeze	300	300	1,431.3	1,029.2
14	Gibe III	1,870	1,870	5,370.7	3,383.0
Hydro total		**3,823.5**	**3,629.2**	**14,550.4**	**10,584.1**

Source：Ethiopian Electric Power

Table 5.4.10 List of existing power plants other than hydro

No.	Name of power plant	Type	Installed Capacity (MW)	Dependable Capacity (MW)	Ave. energy (GWh)
1	Aluto Langano	Geothermal	7.3	5	0
Geothermal total			**7.3**	**5**	**0**
1	Adama I	Wind	51	17.85	156
2	Ashegoda	Wind	120	30	263
3	Adama II	Wind	153	45.9	402
Wind total			**324**	**93.75**	**821**
1	Wonji Sugar	Bagasse	30	16	77
2	Finchaa Sugar	Bagasse	30	10	48
Bagasse total			**60**	**26**	**125**
1	Awash 7kilo Diesel	Diesel	35	30	197
2	Kaliti I Diesel (Container type)	Diesel	14	10	66
3	Dire Dawa Diesel	Diesel	40	30	197
Diesel total			**89**	**70**	**460**
Others total			***480.3***	***194.75***	***1406***

Source：Ethiopian Electric Power

Table 5.4.11 Hydro power plants under construction

Name of power plant	Installed Capacity (MW)	Firm energy (GWh)	Ave. energy (GWh)	Expected year of operation
GD3	254	1,633	1,694.7	2017
Grand Renaissance Phase 1	750	5,585	5,585	2017
Grand Renaissance Phase 2	5,250	4,777	9,177	2018
Total	6,254	11,995	16,456	

Source：Ethiopian Electric Power

Table 5.4.12 Committed generation project (Other than hydro)

Name of power plant	Type	Installed Capacity (MW)	Dependable Capacity (MW)	Average Energy (GWh)	Expected year of operation
Tendaue / Ende	Bagasse	120	70	337	2017
Beles 1	Bagasse	30	20	96	2017
Beles 2	Bagasse	30	20	96	2017
Beles 3	Bagasse	30	20	96	2017
Wolkayit	Bagasse	133	82	395	2017
Omo Kuraz 1	Bagasse	60	20	96	2018
Omo Kuraz 2	Bagasse	60	40	193	2018
Omo Kuraz 3	Bagasse	60	40	193	2018
Omo Kuraz 4	Bagasse	60	40	193	2018
Omo Kuraz 5	Bagasse	60	40	193	2018
Omo Kuraz 6	Bagasse	60	40	193	2019
Kessem	Bagasse	26	16	77	2017
Bio - committed – “120MW”	Biomass	120	60	289	2019
Addis Ababa EFW	Waste	25	25	186	2017
Aluto Langano II	Geothermal	70	70	521	2020
Total		**1,014**	**673**	**3,675**	

Source：Ethiopian Electric Power

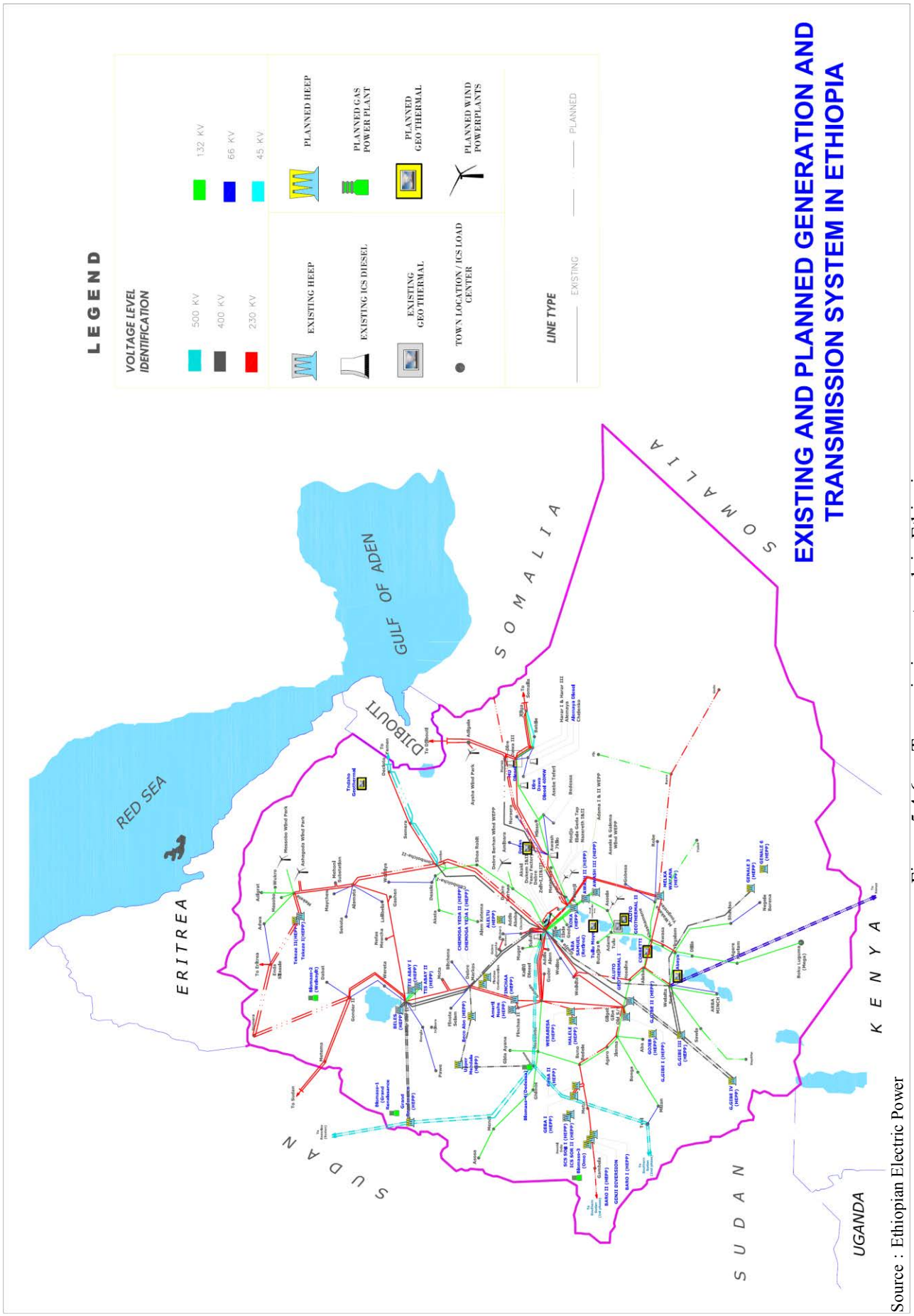
2) Transmission and substation facilities

Transmission network in Ethiopia is consisted of 400kV, 230kV, 132kV, 66kV and 45kV in terms of voltage. 500kVtransmission lines are under construction and they will be completed in 2017. Table 5.4.13 shows the length of transmission lines in Ethiopia with voltage classes including the ones under construction. Figure 5.4.6 shows the transmission network in Ethiopia including facilities under construction. Ethiopia and Djibouti are currently interconnected with a 230kV line via Dire Dawa and the second interconnection line via Semera is planned. Feasibility study for the second interconnection line was conducted by the Tractebel Engineering (Belgium) and the draft final report of the study was completed as of May 2017. Ethiopia and Sudan are currently interconnected with a 230kV line via Metema and 500kV line (double circuits) from Grand Ethiopian Renaissance Dam to Sudan is planned. Feasibility study for the 500kV interconnection line was completed and African Development Bank expresses its interest to finance the project.

Table 5.4.13 Length of transmission lines in Ethiopia with voltage classes

Voltage	Length（km）	Remarks
500kV	1,672.02	
400kV	2,729.30	Including lines under construction
230kV	5,851.53	Including lines under construction
132kV	6,426.00	Including lines under construction
66kV	2,419.51	
45kV	249.05	
Total	19,596.45	

Source：Ethiopian Electric Power



Source : Ethiopian Electric Power

Figure 5.4.6 Transmission network in Ethiopia

(3) Sudan

1) Power plants

Table 5.4.14 shows the list and information of power plants in Sudan which is obtained from the websites of Sudanese Thermal Generation Co., Sudanese Hydro Generation Co., and Merawi Dam Electricity. According to the information from Ministry of Water Resources and Electricity in Sudan[120], total generation capacity in 2015 is 3,227MW of which 1,593MW (49%) derives from hydro and 1,634MW (51%) derives from thermal. Total energy generated in 2015 is 13,133GWh with the share of hydro: 64%, thermal: 35% and import: 1%.

Table 5.4.14 List of power plants in Sudan

Name of power plant	Year commissioned	Type	Fuel	Installed Capacity (MW)	Unit capacity×number of units
Jabal Aulia	1933	Hydro	―	30.4	6.08MW×5units
Sennar	1959	Hydro	―	15	7.5MW×2units
Khashme el Qirba	1964	Hydro	―	10.6	5.3MW×2units
Er Roseires	1971	Hydro	―	280	40MW×7units
Merowe	2009	Hydro	―	1,250	125MW×15units
Garri(1)	2001	Combined cycle	unknown	100	ST 30MW+GT10MW ×6units
Garri(2)	2002	Combined cycle	unknown	220	(ST30MW+GT15MW ×5units)×2
Garri(4)	2006	Steam	Oil/ Coke	110	55MW×2units
Kosti	2006	Steam	Crude oil	500	125MW×4units
Bur Sudan	NA	Diesel engine	Diesel oil Crude oil	17.35	10.51MW+5.62MW +1.253MW
Bur Sudan	NA	Diesel engine	Diesel oil Crude oil	20.3	5.7MW×3units 1.6MW×2units
Bur Sudan	NA	Diesel engine	Diesel oil Crude oil	6.9	2.3MW×3units
El Obeid	1979	Gas turbine	Diesel oil	33.3	15.7MW&17.6MW
Ed Daein	2002	Thermal	Diesel oil Crude oil	5.4	2.7MW×2units
Kadugli	2004	Thermal	Gasoline Diesel oil	16	2MW×8units
Total				2,615.25	―

Source: Website of Sudanese Thermal Generation Co., Sudanese Hydro Generation Co., and Merawi Dam Electricity

2) Transmission and substation facilities

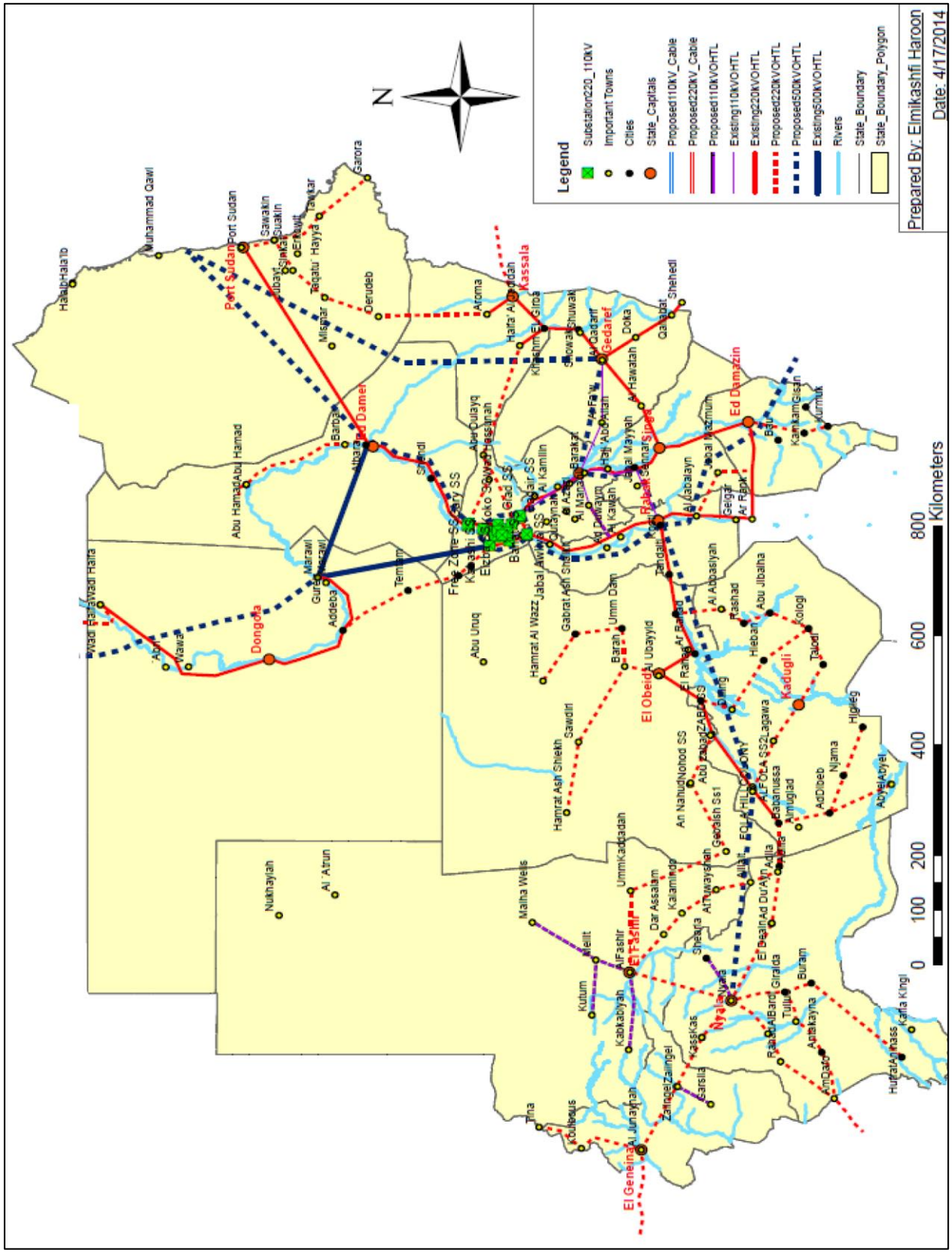
Transmission network in Sudan is consisted of 500kV, 220kV, 110kV and 66kV in terms of voltage. Table 5.4.15 shows the length of transmission lines with voltage classes. Figure 5.4.7 shows the transmission network in Sudan.

Table 5.4.15 Length of transmission lines with voltage classes

Voltage	Length（km）
500kV	965.5
220kV	7,692.9
110kV	1,128.7
66kV	233
Total	10,010.1

Source : Sudanese Ministry of Water Resources and Electricity (Apr. 2016) "Sudan Potentials, Opportunities and Challenges in Energy Fields"

[120] Ministry of Water Resources and Electricity "Sudan Potentials, Opportunities and Challenges in Energy Fields" presented at 10th German-African Energy Forum-Hamburg, April 26-27th 2016



Source: Sudanese Ministry of Water Resources and Electricity (Apr. 2016) "Sudan Potentials, Opportunities and Challenges in Energy Fields

Figure 5.4.7 Transmission network in Sudan

(4) South Sudan

Since nation-wide transmission network does not exists in South Sudan, electricity is supplied through independent grids in Juba and Malakal. Installed generation capacity is approximately 64MW but available capacity is only 29MW. Potential demand is assumed to be around 200MW and load shedding is implemented all the time.

Table 5.4.16 List of power plants in South Sudan

Name of power plant	Year commissioned	Type	Fuel	Installed Capacity (MW)	Available Capacity (MW)	Remarks
Juba	2009	Diesel engine	Diesel oil	17	10	1.5MW×13
Malakal	2008	Diesel engine	Diesel oil	4.8	2.4	1.6MW×3
Wau	2010	Diesel engine	Diesel oil	3.8	3.0	1.5MW×3
Bar	2010	Diesel engine	Diesel oil	3.0	2.0	1.5MW×2
Rumbek	2013	Diesel engine	Diesel oil	3.0	2.0	1.5MW×2
Renk （Sudan）	2010	Hydro	―	32.0	10.0	Import from Sudan
Total				63.6	29.4	

Source：South Sudan Electricity Corporation

Table 5.4.17 List of distribution lines in South Sudan

Path	Voltage	Length	Conductor	Capacity
Juba－Gudele	11kV	15km	95mm^2	5MVA
Juba－Giada	11kV	14km	95mm^2	5MVA
Juba－Munuki	11kV	15km	95mm^2	5MVA

Source：South Sudan Electricity Corporation

According to the information from South Sudanese government, the following power development projects are planned or under implementation.

I. Northern Corridor Transmission Line（NCTL）

NCTL is an interconnection line which connects Karoma in Uganda and Juba in South Sudan with the transmission capacity of 300MW. A feasibility study for the line is under preparation.

II. Interconnection line with Sudan

The interconnection line will connect the existing line of Sudanese side which was extended up to the border and the South Sudanese cities of Melut (Paloj) and Malakal. A feasibility study for the line was completed but it needs to be updated.

III. Interconnection line with Ethiopia

MOU was signed for the construction of an interconnection transmission line and railway which will connect Ethiopia and South Sudan.

IV. Fulla Rapids Hydro Development

There is a plant to construct a hydro power plant with generating capacity of 40MW near the border of South Sudan and Uganda (around Nimule). Norway expressed an interest on the project but it was suspended due to worsening security situation. Project cost is estimated to be around 150 million USD.

V. Reinforcement of Juba distribution network

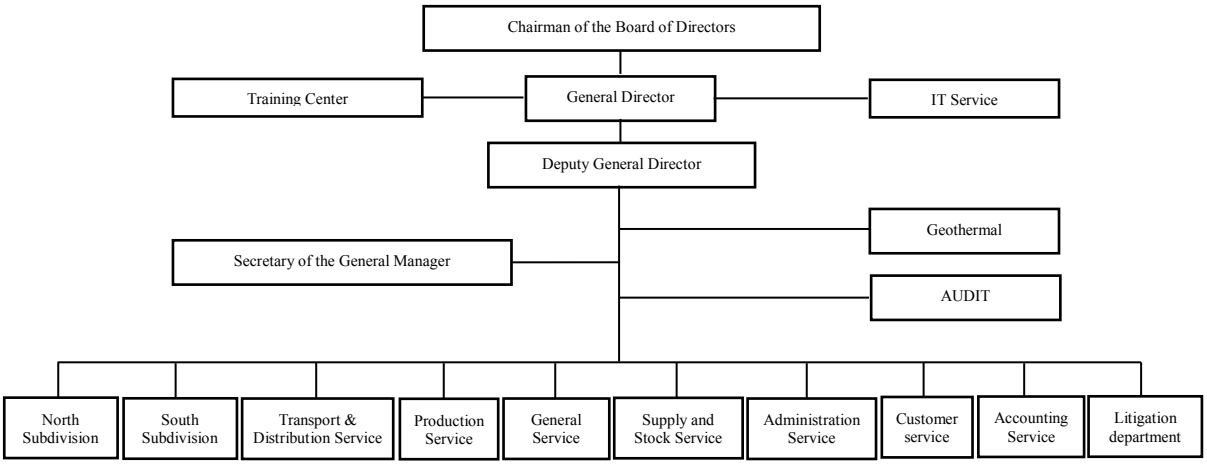
A project to boost up distribution voltage in Juba area from 11kV to 33kV is ongoing with the financial assistance of African Development Bank (25 million USD).

5.4.3. Institutional Structure of Power Infrastructure

(1) Djibouti

Ministry of Energy and Natural Resources (see earlier Figure 5.3.5) is in charge of the formulation and implementation power sector policy and regulation of power sector while Electricite de Djibouti is a

vertically integrated electric utility which generates, transmits and distributes electricity to customers. Figure 5.4.8 shows the organization structures of Electricite de Djibouti, respectively.

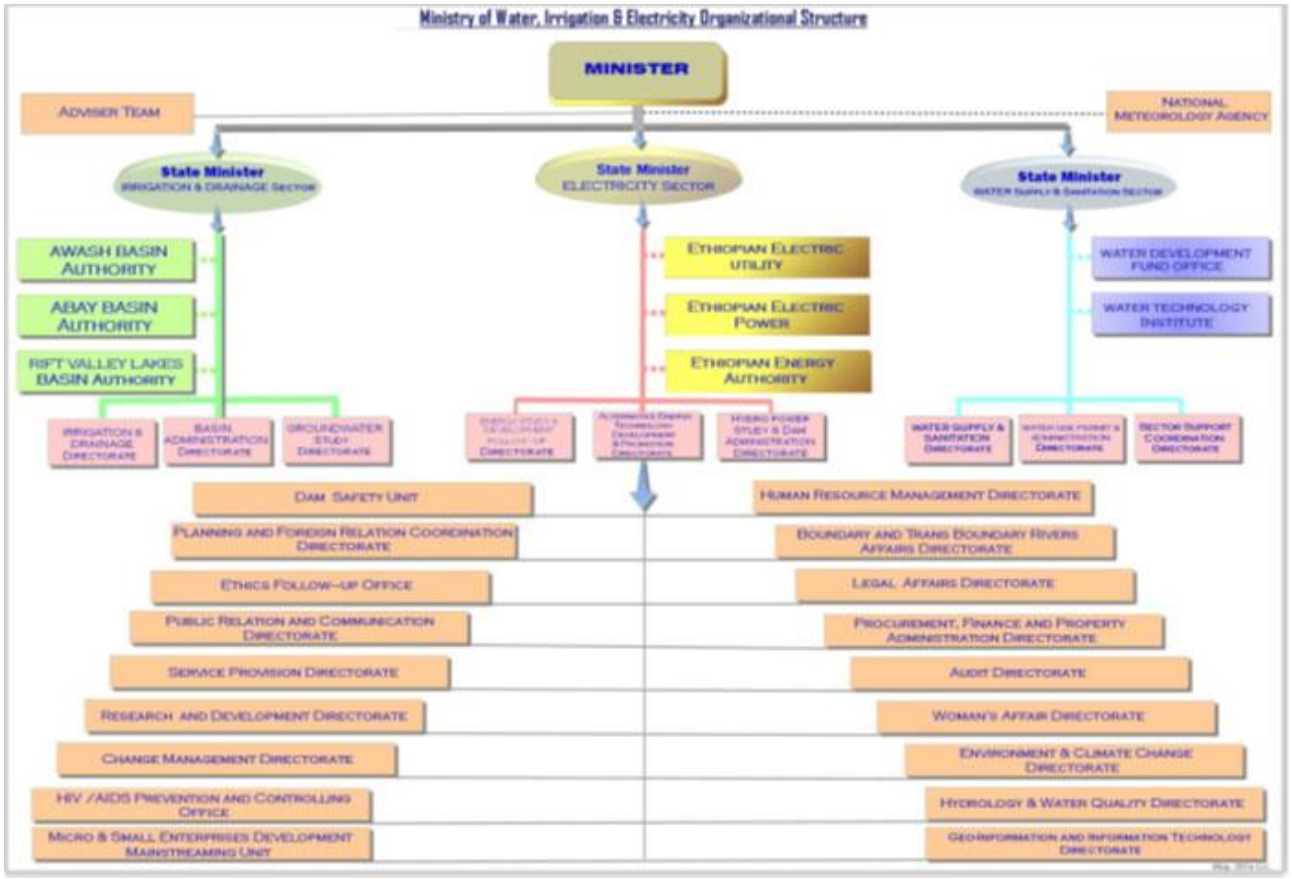


Source: Electricite de Djibouti

Figure 5.4.8 Organization Structure of Electricite de Djibouti

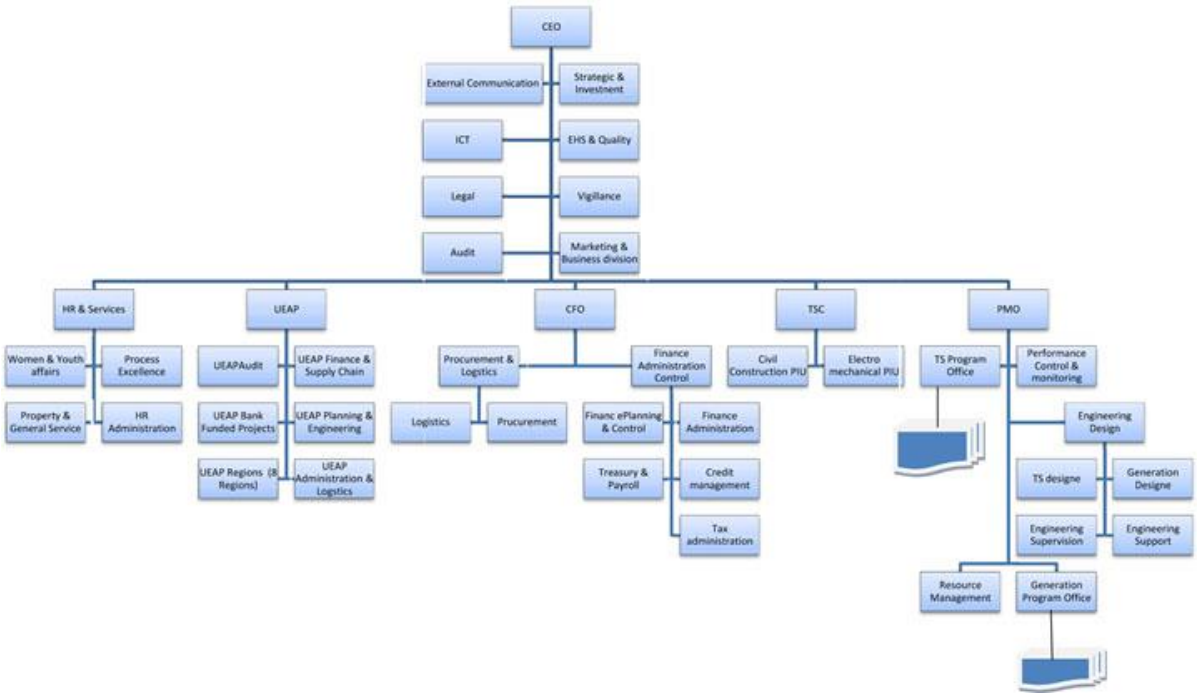
(2) Ethiopia

Ministry of Water, Irrigation and Electricity is in charge of the formulation and implementation power sector policy and regulation of power sector. Electricity supply is undertaken by Ethiopian Electric Power (EEP) which is in charge of power generation and transmission and Ethiopian Electric Utility (EEU) which is responsible for electricity distribution. Figure 5.4.9 and Figure 5.4.10 show the organization of Ministry of Water, Irrigation and Electricity and EEP, respectively.



Source: Ministry of Water, Irrigation and Electricity, Ethiopia

Figure 5.4.9 Organization Structure of Ministry of Water, Irrigation and Electricity (Ethiopia)



Source: Ethiopian Electric Power

Figure 5.4.10 Organization Structure of Ethiopian Electric Power

(3) Sudan

Ministry of Water Resources, Irrigation and Electricity is in charge of the formulation and implementation power sector policy and regulation of power sector. Since electric utility in Sudan is unbundled, electricity supply is undertaken by generation, transmission and distribution companies as shown in the following Table 5.4.18.

Table 5.4.18 Electric utility companies in Sudan

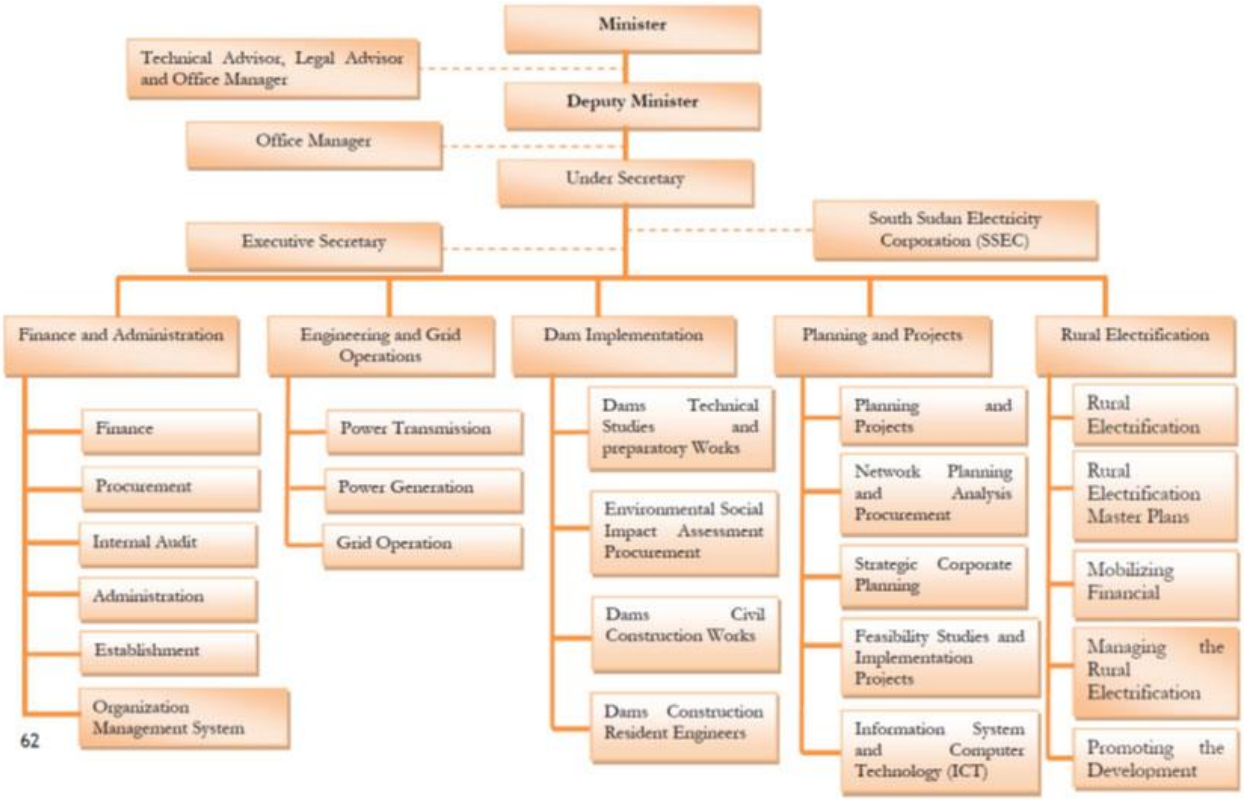
Subsector	Name of companies
1) Generation	Sudanese Thermal Generation Co. Sudanese Hydro Generation Co. Merawi Dam Electricity
2) Transmission	Sudanese Electricity Transmission Co.
3) Distribution	Sudanese Electricity Distribution Company (SEDC) Ltd.

Source: Sudanese Electricity Distribution Company's website

(4) South Sudan

Ministry of Energy and Dams is in charge of the formulation and implementation power sector policy and regulation of power sector while South Sudan Electricity Corporation (SSEC) is in charge of electricity supply.

Figure 5.4.11 shows the organization structure of Ministry of Energy and Dams.



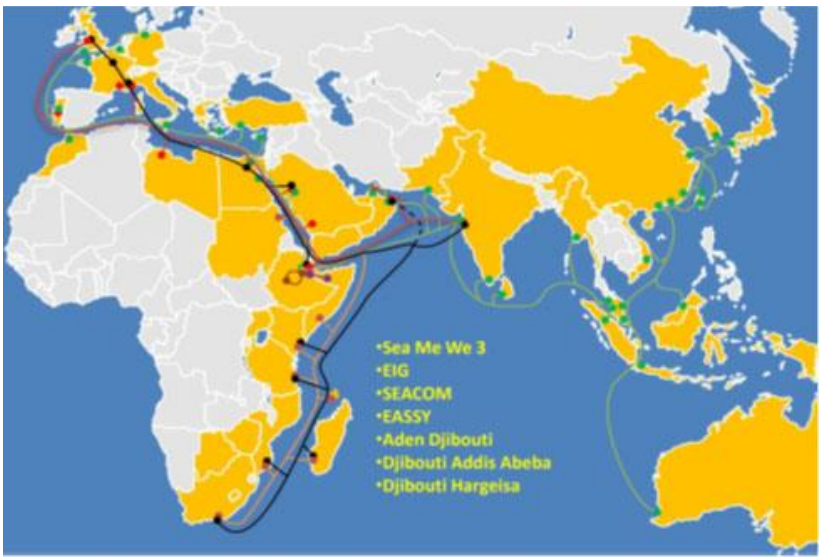
Source: Ministry of Energy and Dams

Figure 5.4.11 Organization Structure of Ministry of Energy and Dams (South Sudan)

5.5. Telecommunication

5.5.1. Djibouti

Djibouti is a gateway of submarine optical fiber cables for internet communication from Asia to Europe. Djibouti is relaying internet connections for twenty two east African countries. Also, Djibouti provides telecommunication services through microwave for South Sudan which has no link with optical fiber network. Figure 5.5.1 and Table 5.5.1 show submarine optical fiber network and the details of submarine optical fiber cables connected to Djibouti, respectively. Table 5.5.2 shows the details of domestic optical fiber cables in Djibouti. State owned Djibouti Telecom is the monopoly to provide internet services in Djibouti.



Source：Djibouti Telecom

Figure 5.5.1 Submarine optical fiber network

Table 5.5.1 Submarine optical fiber cables connected to Djibouti

Name of cable		Capacity	Year of service
SEA-ME-WE 3	South East Asia -Middle East-Western Europe 3	560Gb	1999
EASSy	East African Submarine System	4.72 Tb	July 2010
EIG	Europe India Gateway	3.84 Tb	March 2011
SEACOM		1.28 Tb	July 2009
Aden-Djibouti		160Gb	April 2014
SEA-ME-WE 5	South East Asia -Middle East-Western Europe 5	24TB	December 2016

Source：Djibouti Telecom

Table 5.5.2 Domestic optical fiber cables for internet in Djibouti

Route	Year of service	Type	Number of cores	Length (km)	Capacity (Gbit/s)
Djibouti - Guellileh	2010	Overhead＋ Underground	18 cores	76	100 G
Djibouti - Guellileh	2011	OPGW	48 cores	―	Over 100G
Djibouti – Ali Sabieh	2011	OPGW	48 cores	73	100 G
Djibouti – Ali Sabieh	2017	Underground along railway	2 cores	70	Unknown
Djibouti – Ali Sabieh	2017	OPGW for railway	―	70	Unknown
Plan					
Tadjourah - Balho	Unknown			112	

Source：Djibouti Teleco

5.5.2. Ethiopia

The construction of 100G Backbone optical fiber network named DWDM/OTM (Dense Wavelength Division Multiplexing Optical Transport Network) is in progress since 2016. It is contracted to ZTE China. For the time being, obsolete existing optical fiber network will be maintained concurrently with the ongoing backbone project but it will be replaced by DWDM/OTM after the completion. Data transfer capacity at gateway level will be sufficient enough once DWDM/OTM is fully operational.
State owned Ethio telecom is the monopoly to provide internet services in Ethiopia. Figure 5.5.2 shows the development plan of backbone optical fiber network at the time of 2012. The latest plan is prepared by Ehio telecom but it is not disclosed due to the confidentiality of the information.

Source：Ministry of Communication and Information Technology (MCIT), Ethiopia

Figure 5.5.2 Development plan of backbone optical fiber network (2012)

5.5.3. Sudan

(1) Status of optical fiber network

Total length of optical fiber network in Sudan is 12,000km and it is connected with Egypt and Ethiopia. Sudatel Telecom Group provides internet connection services through the optical fiber network. Sudan is connected with submarine optical fiber cables such as EASSy (Eastern Africa Submarine System), Africa-1, FALCON, Saudi Arabia-Sudan (1 and 2), etc. at Port Sudan.

5.5.4. South Sudan

(1) Status of optical fiber network

There are optical fiber cables within the territory of South Sudan installed before its independent but they are not functional presently. They are;

1) Khartoum (Sudan)～El Obeia (Sudan)～En Nuhud (Sudan)～Muglad (Sudan)～Border～Bentiu(South Sudan) having the length of 200km and
2) Khartoum (Sudan)～Kosti (Sudan)～Border～Renk (South Sudan) having the length of 100km.

Both 1) and 2) are owned by Sudatel.

(2) Development plan of optical fiber network

1) Interconnection with Uganda

There are plans to construct optical fiber interconnection with Uganda (192km) and mesh shaped network in Juba through PPP. Three companies, namely, ZTE (China) Huwaei (China) and Liquid Telecom (Africa) are competing in a bid.

2) Interconnection with Kenya

Installation of optical fiber cable to connect Kenya and South Sudan having the length of 340km along roads is planned with the assistance of the World Bank.

3) National Backbone

Construction of backbone optical fiber network connecting South Sudan with neighboring countries with the total length of 6,000km is planned. This will be implemented through PPP but bidding for the project has not been announced.

(3) Internet providers

There are three companies which proved mobile phone and internet services, namely, Viva Cell, Zain (Middle East), MTN (South Africa). There are twelve internet providers and they use satellite and microwave for telecommunication.

5.5.5. Organization Structure of Telecommunication Infrastructure

(1) Djibouti

Ministry of Communication, Posts and Telecommunication is in charge of policy making, planning, implementation and control of the sector. Djibouti Telecom besides is the only a company that manages and operates actual services in the country.

(2) Ethiopia

Ministry of Communication and Information Technology is in charge of policy making, planning, implementation and control of the sector. Ethio Telecom is an only national company to manage and operate actual services in the country.

(3) Sudan

Sudatel Telecom Group provides optical fiber based internet services in the country, and three foreign companies (from South Africa and middle east, etc.) provide mobile network based internet services.

(4) South Sudan

Ministry of Information, Telecommunication and Postal Services is in charge of policy making, planning, implementation and control of the sector. There are three companies provides mobile communication and internet communication services, and there are twelve internet service providers.

Chapter 6

CHAPTER 6 Current Condition and Challenges of the Survey Target Region

This chapter presents the challenges on the regional and industrial development as well as objective infrastructures by sector and country extracted through interviews with governmental officials and data study.

6.1. Current Situation of Regional and Industrial Development and Challenges

6.1.1. Djibouti

(1) Challenges regarding Industrial Development

The following points are identified as challenges for industrial development in Djibouti through the hearings to the government agencies and data analysis.

- Although Djibouti is developing the free zone at the port premise to expand industrial capacity, large FDIs are necessary and investment environment should be established for manufacturing sector development promotion at a large scale.
- One Stop Border Post and related facility have not been developed, and logistics and transportation are not effectively implemented, although these are also important for industrial development promotion. Djibouti Port also has cargo handling and customs related processes taking much greater time, thus this reflects over as higher transport cost.

Based on the above noted points, the survey team has identified the following challenges.

- Although it is necessary avoid Djibouti's manufacturing industry being isolated from the corridor countries' market, roles of Djibouti's manufacturing industry in collaboration with Ethiopian industry and its needs are not clearly identified.

(2) Industrial and Regional Development Potential

1) Primary Industry Development

Based on the collected data study, the survey team has identified the following potentials.

- Fishery sector is at small scale production today due to limited fishermen population and primitive fishing method, however the sea resource in the surrounding area is rich, and there is higher potential in this sector.
- Livestock export is at higher volume, however most livestock and meat products are transported from Ethiopia and Somaliland for final quarantine inspection and export. Djibouti has a quarantine facility and standard as high as CODEX[1], thus the food processing sector in line with livestock industry could be a possible field of development.

2) Port and Logistics Service Development

According to the hearings to the government officials, the port service related industry is the leading industry of the country as it is located at the most strategic location of the Red Sea, and the government will further develop the logistics service industry with port expansion together with industrial development promotion. Currently the Port and Free Zone Authority and Port of Djibouti are working closely to develop new port facilities with "Free Zone," as well as railway and road network are under development plan by the government, and One Stop Border Post development is also undergo.
Accordingly, the survey team considers that logistics service development together with port expansion has a development potential.

3) Manufacturing Sector Development with Port Free Zone

Based on the collected data study, the survey team has identified the following potentials.

Limited availability of local materials and resources is the weakness of Djibouti. Djibouti is located at the international trading strategic location of the Red Sea, and there are potentials to grow manufacturing industry with utilization of Free Zone at the Port premises. Not only regional local materials and products from Ethiopia and Sudan but also those from other oversea countries could be utilized for

[1] CODEX Alimentarius Commission's (CAC) food quality management standard set under FAO and WHO coordination.

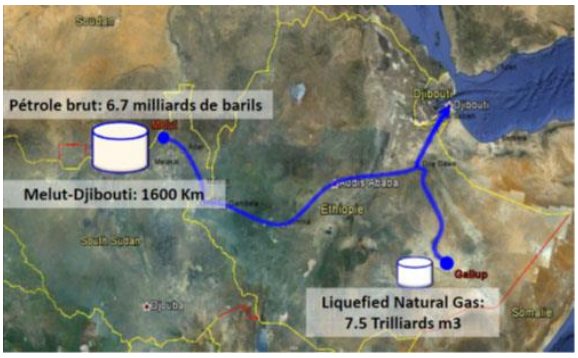
processing and manufacturing industry. However, there is further need of data collection to identify potential materials and resources for manufacturing industry that Djibouti could achieve.

4) Regional Development and Djibouti's Role in the Region

Based on the collected data study, the survey team has identified the following potentials.
It is important to identify the regional and international (closer region such as Middle-East countries) market demands as well as to identify manufacturing and processing roles that Djibouti industry should take. Djibouti may expect its development potential with selecting productions that supports manufacturing or processing sectors that Ethiopia has not started to manage or Djibouti to work together with Ethiopian industry. However, there is further need of data collection to identify potential sectors that Djibouti could achieve.

5) Natural Gas and Petrol Shipping

According to the hearings to the government officials, it is highly dependent on the national or bilateral development agreement which normally stated as the national development plans of each. In the study of the survey target country, there are potentials of natural gas from Ethiopia and petrol from South Sudan already taken into account of the Djibouti industrial development.
The Figure 6.1.1 illustrates global concept of pipeline development among three countries, and the survey team believes that this could be considered in the regional corridor development.



Source: Djibouti Ports and Free Zones Authority
Figure 6.1.1 Potential Transport Route of Natural Gas and Petrol in the Target Countries

(3) Current Status and Potential of Investment

According to the hearings to the government officials, National Investment Promotion Agency of Djibouti under the Investment Code (Law No.58/AN/94 3-rd L and Amending the Law No.88/AN/1e L Feb. 13 1894) has prepared guidelines to support investors to set up businesses in the country. This action has made with close coordination with Free Zone development to invite investors.
It is obvious that investments have been put mostly in transportation and logistics service industry and its development so far, and investment to the manufacturing sector should be upcoming activities that the government foreseen. Under the SCAPE and Vision 2035 implementation, the government has been working in coordination with concerned agencies to develop Free Zone together with port facility, and this aims FDIs with the investment promotion considering regional and international marketing in manufacturing industry. Major logistic corridor between Ethiopia and Djibouti has been developing and sector development foundation is coming close to be ready.
Based on the above situation, the survey team considers that OSBP service is another key to facilitate the sector development with effective investment promotion.

6.1.2. Ethiopia

(1) Challenges regarding Industrial Development

The following points are identified as challenges for industrial development in Ethiopia through the hearings to the government agencies and data analysis.

- According to the hearings to the government officials, workers in Ethiopia do not have enough skills and knowledges of manufacturing industries, although labor cost is considerably low among other neighboring countries.

According to collected data study, the survey team has identified the following challenges.

- The share of agriculture production based population is very large (85%), and sudden shift of working population from agriculture to manufacturing sector concerns risk in accepting new technologies and skills with quality management.

- Industrial parks with One Stop Shop (OSS) services[2] are in development under IPDC and the Ministry of Industry for value chain establishment as well as inviting FDIs in more desirable business environment, and more effective business environment preparation is on-going. However the OSS service is only for the industrial park business and manufacturing activities, and wider supporting services for SMEs to value chain[3] development is not effectively developed to provide better business environment for SMEs.
- The government has not established foreign investor friendly business administration environment not only at the policy level but also at the actual processing line official levels to facilitate smooth service delivery to all foreign investors and companies.
- Although value chain establishment is highly expected to elevate integrated effects among sectors, such as agro-production, livestock and fertilizer industries, both public and private sectors do not have enough experience of such system establishment for development level.

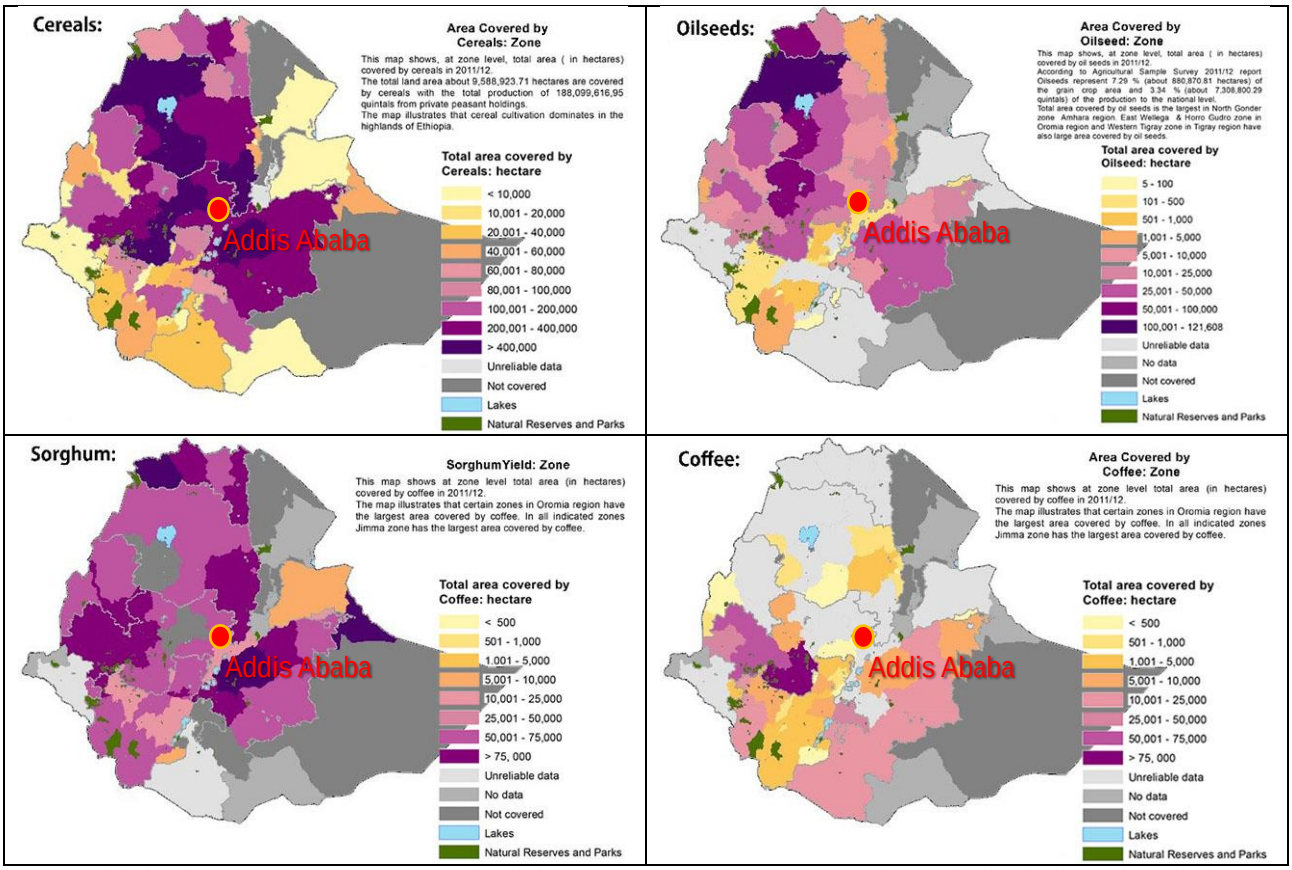
(2) Industrial and Regional Development Potentials

1) Agriculture and Livestock Industry

Based on the collected data study, the survey team has identified the following potentials.
Agriculture is Ethiopia's main production sector of all as over 85% of population is still involved in this industry. Products, such as coffee and sesame, are cultivated for export to especially Arab countries, such as Saudi Arabia, and Asia. The productivity and quality have more space to expand with mechanization and better production techniques including fertilizer use, although the potential of agro-industry development is higher. The government has initiated value addition program with agro-production to strengthen value chain between farm production and food processing sectors as the government is developing four Integrated Agro-Industrial Parks and more. The production may be increased with the use of future domestically manufactured fertilizer, and cereal productions share almost 80% of local agro-production, and the integration of increased production and food processing industry should even elevate national food security as well as enhance export to the neighboring countries. It is also expected that better production and quality control technologies should also strengthen competitiveness of, for instance horticulture and sesame export in the broad market. As shown in the maps below (Figure 6.1.2), large areas in north and west of the territory are the major agro-production. These areas should be effectively connected by stronger infrastructure for industrial enhancement considering agro-food processing sector.

[2] OSS is the support service packaging all necessary processes and registration for new business establishment and company as well as investment for manufacturing industry introduced with each industrial park development in Ethiopia.

[3] Value Chain is the term describes the total chain of a product from its origin to final sales activities including logistics considering total value of the product. Business activity flow can be divided into all necessary parts of processes from material production, processing, manufacturing, transport and service to deliver to consumers in order to establish comparative flow data analyzing competitiveness and level of value addition of the products.

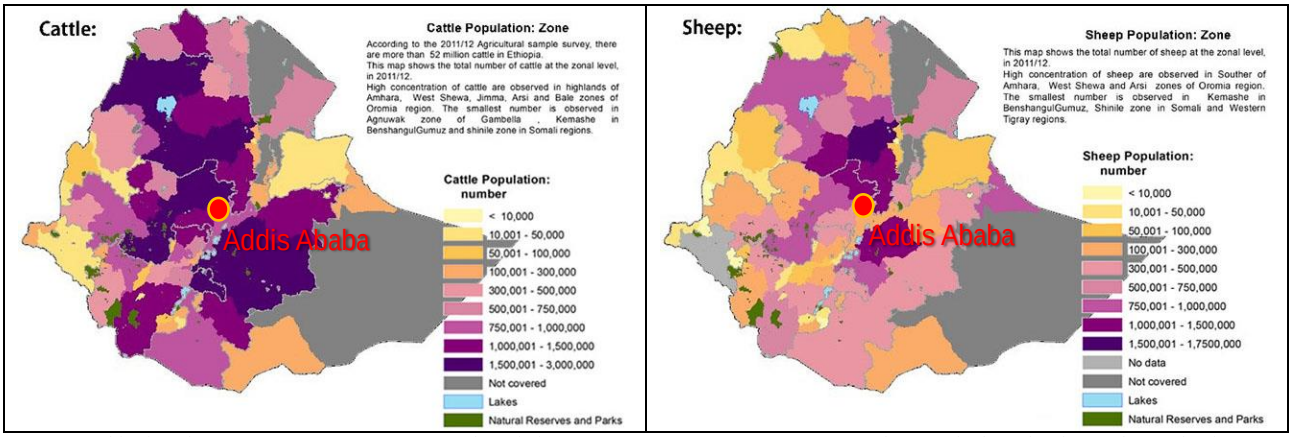


Source: Ethiopia Atlas AgroMaps 2011-2012 (Central Statistics Agency) Note: Darker purple the color, larger the production.

Figure 6.1.2 Major Agricultural Production

The survey team has identified the following development potentials.

Export of livestock also shares at large in Ethiopia, and the quality of leather production has been identified at considerably high competitiveness in the world market. Both animal meat and skin could be byproduct in Ethiopia, and further quality upgrade should be necessary to expand the sector utilizing system and facility of Ethiopian Leather Industry Development Institute and other related agencies. As capacity of animal feed production in agriculture sector increases, there should be a good integration with the livestock sector for more stable production. Livestock breeding and pasture land are also spreading in large areas of the country. Animal meat and leather production are important development target under the GTP-II, and these sector oriented areas should be treated with effective transportation network. The Figure 6.1.3 illustrates areas of cattle and sheep breeding.

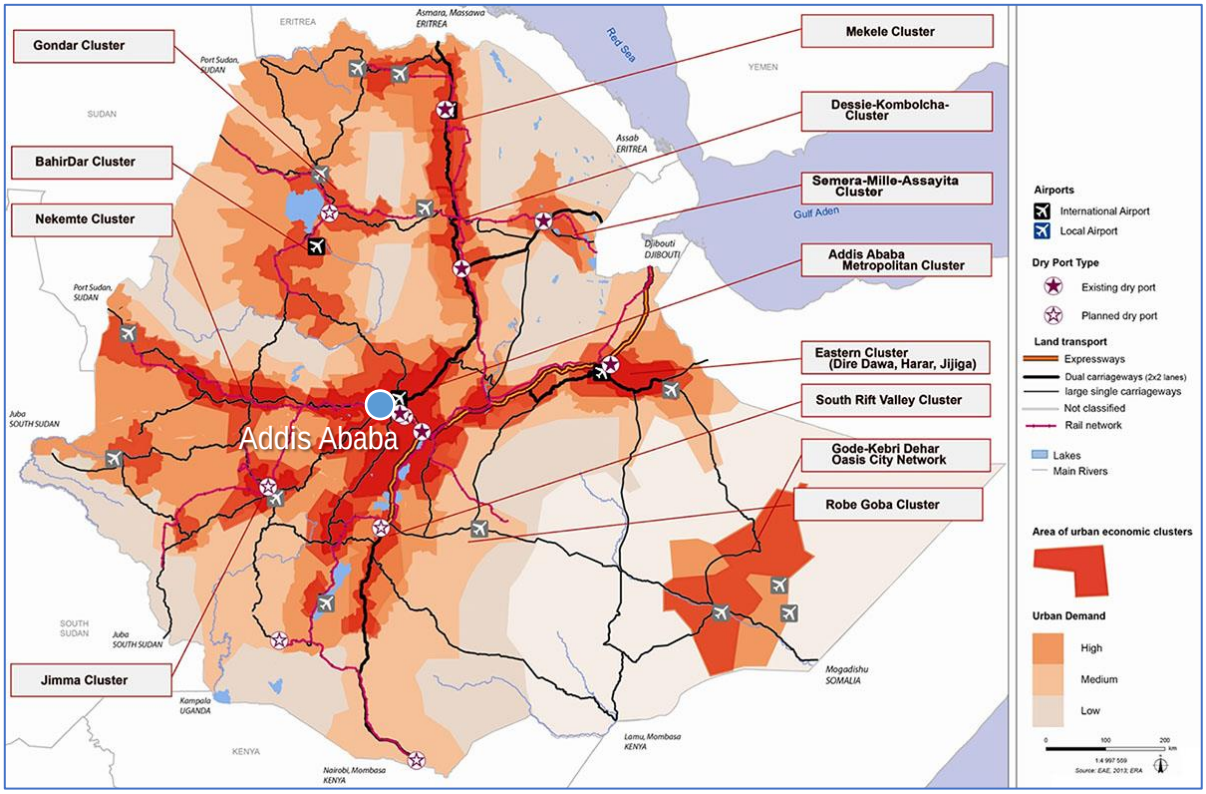


Source: Ethiopia Atlas AgroMaps 2011-2012 (Central Statistics Agency) Note: Darker purple the color, larger the production.

Figure 6.1.3 Livestock Distribution Map (Cattle and Sheep)

2) Manufacturing Sector

Based on the collected data study, the survey team has identified the following potentials.
Ethiopia's international trade statistics clearly identifies that the import expense is much larger than export revenue, and it is important to consider utilizing locally procurable materials to expand manufacturing industry. In this regard, leather industry, agro-processing industry, chemical industry and meat industry should be more straight forward choices for investment and development. Leather and leather product industry in Ethiopia should be an immediate target to make value-added production. To facilitate smooth flow within the value chain, effective integration among IAIP and industrial parks needs to be well established so as to utilize all marketable byproducts together with main leather products.
The following Figure 6.1.4 illustrates urban cluster and development corridor designated under the national urban development spatial plans, and the industrial development should take place where these highlighted urban developments are projected so that transportation and logistics effectiveness could also be expected through the development.



Source: National Urban Development Spatial Plan 2016 (Ministry of Urban Development and Housing)
Note: Red colored areas are the target of industrial cluster establishment corresponding with the IPDC's development Plan

Figure 6.1.4 Consolidated Scenario for 2035 (Urban Clusters and Development Corridors)

Agro-products and food processing industry should be another potential for development. GTP-II also takes value addition and importance of value chain into account for industrial development as most products are exported in raw materials without processing. Some agro-products should be selected for value added manufacturing utilizing cluster industrial park system which is underway of development. As examples, fruit and vegetable products are target for food processing as well, such as to make juice and drink as well as snacks. In order to complete food processing value chain, there should be additional systems and technologies to be invested and setup, such as plastic package/container manufacturing facility and refrigeration/freezer facility which complete cold chain as well. The investment to setup certain facilities with equipment should be costly, however such investments may also be acceptable level considering larger market within the region around Ethiopia in long term development.
Other manufacturing sectors including textile and daily consumables should be more carefully examined as these still require material imports. Textile industry in particular, the level of manufacturing is low, and labor cost is still relatively low in Ethiopia. However, the government has put effort to setup the institutes for production management and quality improvement, so that further development progress in this sector should be expected.

There is further data collection required to identify potential of value addition manufacturing industry in Ethiopia.

3) Mining and Mineral Resource Utilization

According to the hearings to the government officials, there will be more mineral resource production in the future being expected besides already exported or marketed products, such as opal (gemstone) and marble. Natural gas and potassium are the ones that the government already has development plans for transportation and export through Djibouti.
The Ethiopian government has prepared mineral resource map, however the lastest map data should be obtained during the next study stage since the mining exploitations for several resources are underway.

(3) Current Status and Potential of Investment

According to Ethiopian Investment Commission (EIC), the investment environment[4] with One Stop Shop service mechanism has been gradually established for 29 service sectors, and Ethiopian Investment Commission (EIC) is in charge of overall control. Top investing countries are China, India and Turkey mainly investing in garment manufacturing sector. EIC is preparing for the first oversea office establishment in China. The following Table 6.1.1 shows companies made investment to setup manufacturing facilities in operating industrial parks in Ethiopia.

Table 6.1.1 Company Name List in Operating Industrial Parks

Name of Park	Company Directory
Bole Lemi	New Wide Garment Ethiopia Branch Company (India), Goerge Shoe Ethiopia Plc. (China), Shints ETP Garments PLC. (S. Korea), KEI Industrial Engineering Consultancy PLC. (S. Korea), Vestis Garment Production PLC (India), Jay Jay Garment PLC. (India), C & H Garments PLC. (China), Ashton Apparel Manufacturing PLC. (India), Lyu Shoutao Fact Ory Plc. (China), ARVIND Lifestyle Apparel Africa PLC. (ANFGULF) (India), Evertop (Korea)
Hawassa	PVH Corporation (US), JP Textile (Ethiopia) Co., Ltd. (China), ARVIND (India), Quadrant (Hongkong), 5.1 Chargeurs (French), Isabella (Sri Lanka), Hirdaramani (Sri Lanka), Rayond (Silver Spark Apparel) (India), TAL Apparel (Hongkong), Century Garment (Indonesia), Everest Textile (Taiwan), Epic Apparel (Hongkong), PNTEX (Belgium), Hela Indochine Apparel (India/China/Sri Lanka), Indochine Apparel Ltd. (India/China)

Source: Ethiopia Industrial Park Development Corporation

There are 11 industrial parks under construction or planning in the country and these are all projected with full service One Stop Shop as well as other facilities (depending on site) together with common infrastructure services, and each has slight different target of manufacturing sectors to invite especially FDIs. Most of them will be operational in 2018, so that there should be more open and wide opportunities for the investors.

6.1.3. Sudan

(1) Challenges regarding Industrial Development

The survey team has identified the following challenges for industrial development in Sudan through the hearings to the government agencies and data analysis.

- As far as current investments made to Sudan are concerned, the country's development is highly depending on China, Saudi Arabia and some Arab countries. However, such investments focus on very independently targeted development that may not be well integrated with other development programs.

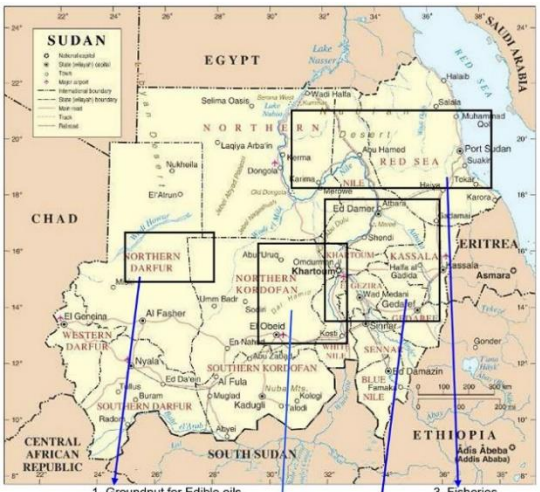
[4] Ethiopian investment environment is regulated and controlled under the Investment Law (Proclamation No.37/1996, No.116/1998, No.168/1999, No.280/2002 and No.375/2003) and Proclamation No.769/2012 as well as Investors Incentives and Investment Area Reserved for Investors Council of Ministers Regulation No.270/2012

- There are several agro-products, for instance sorghum and maize, produced in Sudan, Ethiopia and South Sudan, and these available resources should be best utilized to maximize the potential instead of competing each other. However, understanding the effective roles of each country in manufacturing industry have not been identified well.
- There are products and materials transported between Sudan and Ethiopia as bilateral trading activities, however the cross border process is not as smooth as expected since the OSBP facility and program are not completed and in effect.

(2) Industrial and Regional Development Potentials

Based on the collected data study, the survey team has identified the following potentials.
The government expects the national economy to change on the basis of value-added manufacturing industry as the Free Zones are ready or under development (Figure 6.1.5). Though, Sudan has not widely achieved to invite FDIs. Therefore, agricultural raw products as well as priority mineral resources may be exported for foreign currency earning to invest for next development target which is manufacturing sector development and its supporting infrastructure in Sudan's short term development.
The following Table 6.1.2 on the right illustrates Sudan's potential industrial development based on the production location.

- Dura (Sorghum)
  There are large demands of sorghum within neighboring countries as well as for domestic consumption. Achieving production increase could help marketing and export as sorghum has already been exported in gulf and Arab region countries.
- Oilseeds (Sesame and Sunflower)
  Oilseed demand in general is high in the global market in Asia, especially China, and Sudan may be able to depend on Chinese market for export of sesame seed especially. Sustainable production and quality control should be achieved to stabilize the export.
- Cotton (Baraka Cotton)
  Sudanese cotton is a very high quality product similar to Egyptian cotton, and the market demand is high as well. Since Ethiopia has higher manufacturing techniques in textile sector, cooperative production and technical transfer could be considered. Sudan in a medium-long term development can take over processing work for independent manufacturing.
- Livestock
  Traditionally demand of livestock and animal meat is quite high in the region, and export of livestock and animal meat as well as skins and leather products has



1. **Groundnut produce:** Northern Darfur (concept)
1 **Edible Oil Products:** Khartoum, Gezira, North Kordofan (concept)
2. **Fisheries:** Recovery of Coastal livelihoods in Red Sea State (ongoing)
2 **Fisheries:** Merow River and Lake Nubia (pipeline)
3. **Leather sector:** White Nile, Gedaref, Sennar (to be decided) (pipeline)
4. **Fresh Fruit and vegatables/Food Processing sectors**: Shendi, Nahr Elnil State, Kasala (concept)
5. **Spinning/textile/ cotton lint:** South Kordofan and Khartoum (concept)
6. **Animal feed/ Fertilizers**: Al Gezira and White Nile (concept)
7. **Agriculture Machinery,** Khartoum (concept)

Source: INDUSTRIAL MODERNIZATION PROGRAMME OF THE REPUBLIC OF THE SUDAN (UNIDO Report)

Figure 6.1.5 Geographical Location of the Projects and Concepts Envisaged

Table 6.1.2 Agro-Production Location

No	Product	Production area name
1	Cows	• Animals parks in Khartoum • Some private sector • Other states especially Darfur& Kordofan
2	Sheep	
3	Camels	
4	Mango	All of Sudan
5	Limon	
6	Orange	
7	Grapefruit	
8	Dates	Northern
9	Alfalfa	• River Nile • Khartoum
10	Onion	• Northern • Darfur • Al Gazire
11	Sorghum	• Gedaref • Al Gazire
12	Cotton	Al Gazire
13	sesame	Gedaref
14	Gum Arabic	Kordofan & part of Darfur
15	Sugar	Factories • Guneid • Kenana • Sennar • Assalaya • New Halafa
16	Sunflower	Dal (Private company)
17	groundnut	• New Halafa • Suky • Rahad • Al Gazira

Source: JICA Survey Team based on the Information provided by the government officials

Note: Further data collection is necessary for detailed analysis.

large and possibly stable demand in the global market. The leather processing technology and skills are developed in the region, especially in Ethiopia, and processed leather product demand will become larger, so that exporting animal skin to Ethiopia will also secure stable revenue. It may be appropriate choice to ask Ethiopia's manufacturing technique at earlier stage. There is further data collection required to identify more effective leather manufacturing sector development.

- Gold
  Current gold mining is at a low in technology producing small amount, and there should be minimum technology and equipment applied to improve mining condition to increase production. The global gold market is stable, thus production expansion is the key to increase revenue from the sector.
- Nile Blend crude oil
  Although the production of crude oil has drastically reduced after South Sudan's secession, the revenue by the crude oil shares at large, and production and export increase is the key to maintain foreign currency earning. Thus, for the short term the development vision should allow the increase of crude oil production and export, however the government shall draw roadmap to shift the industrial structure to diversified industry as oil based revenue is not eternal. There is further data collection and study required for oil industry development in Sudan.

(3) Current Status and Potential of Investment

The Ministry of Investment states that the "laws (in particular Investment Law 2013) and regulations encourage investment to achieve the objectives of development and investment, in the different field regardless local or foreign investments." The government has prepared investment guide in line with the law and regulations to invite the investors to provide open and supporting environment to both foreign investors and local SMEs. There should be a potential for investment from the laws and regulation as well as support program points of views. Some major points to support investors are summarized as Appendix 10.

6.1.4. South Sudan

(1) Challenges regarding Industrial Development

Based on the collected data study, the survey team has identified the following challenges.

- From the regional corridor development point of view, stabilizing internal condition is highly important for any development in the country.
- The country needs to earn foreign currency to invest immediate possible sectors to improve economy instead of pursuing a large step of industrial progress. The government investment has not effectively made to develop basic infrastructure to improve general livelihood of the country utilizing revenue from crude oil sales.
- Agricultural production is very traditional and need major change in technology and mechanization to expand production. Although the government identifies the necessity of industrial diversification and value-addition to the agro-production sector integrating with food processing industry, it may not be easy to achieve such level of change in a short development period. Therefore, the government needs to identify priority development sectors, however it has not progressed much due to internal conflicts.
- Mineral resource industry is very primitive and very young stage in development except oil sector, and technology change for mining sector improvement has not been made.

(2) Industrial and Regional Development Potentials

1) Oil Industry and Resource Management

According to the hearings to the government officials, oil industry is an important sector for the country to maintain stable revenue, although industrial diversification is necessary for income generation by departing from the oil-based economic development framework. Current development of three national refinery facilities, when the development is completed, will change the marketing strategy of crude oil industry in South Sudan. The refinery facility is designed to Diesel, Kerosene, Naphtha and Heavy Fuel Oil in case of Thiangrial Refinery as an example. The government also identified the locations for four oil depot development for transporting products in nationwide network even considering exports.

2) Agriculture and Livestock Industry

In South Sudan, some products has potential for export, such as sorghum, sesame, sunflower, Gum Arabic, Teak wood, and these production should be expanded. Though, road network upgrade or development to rural production sites are necessary to strengthen the sector, according to the hearings to the government officials.
Based on the above point, the survey team has identified the following potentials.
Livestock is also potential sector to expand. In addition, JICA's Comprehensive Agricultural Development Master Plan has been approved by the parliament lately so that the agricultural development sector will be developed accordingly. The products listed in Table 6.1.3 could have potentials for expansion in production volumes.

Table 6.1.3 Major Products and Production Areas in South Sudan

Products	Area/Location of Production	Remarks
Rice	Western Bahr el Ghazal (north-west)	With irrigation
All kinds of crops	Al Wahdah (Malakal) and Warrap (Wad-Kona)	Irrigation and Rain-fed
All kinds of crops (grain, vegetables and fruit, etc.)	Upper Nile (north area: Renk)	1.5 million Faddans in area with large irrigated farm land
All kinds of crops (cereal)	Jonglei (Maban)	New development area
All kinds of crops (cereal)	Jonglei (Bor)	
All kinds of crops (cereal)	Eastern Equatoria (Torit)	Agricultural Road Side Center at Palataka
Timber Wood	Southern region of Central Equatoria (Yei) and Western Equatoria (Yambio)	
Fish	Along the Nile	
Livestock	Upper Nile and Bahr el Ghazal	Exported to neighboring areas

Source: JICA Survey Team prepared based on the information provided by the Ministry of Agriculture and Food Security.

3) Other Mineral Resources

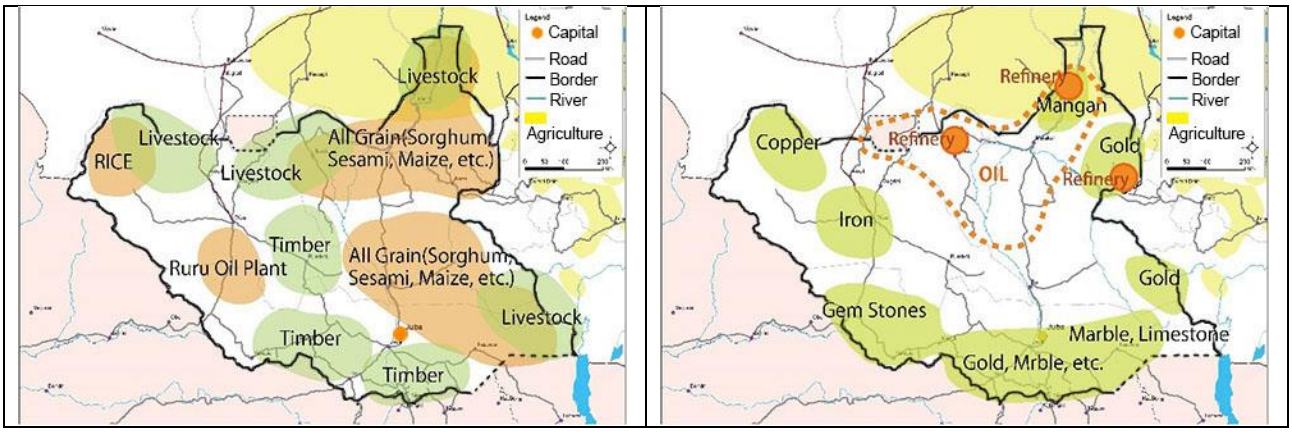
Based on the above point, the survey team has identified the following potentials.
Exploitation has been made to identify potential mineral resources in the country, however the productions are very limited or not started in many minerals. Major investment will be necessary, and there is a need of effective selection and concentration for the development of certain resource(s). There is further data collection in the next study stage to understand the last exploitation data and development plan. The following Table 6.1.4 illustrates available mineral resources and regions.

Table 6.1.4 Potential Mineral Resources and Location

Products	Area/Location of Production	Remarks
Bauxite (for Aluminum), Copper	Western Bahr el Ghazal (Raja), West Equatoria, Central Equatria	
Iron	Western Bahr el Ghazal (Wau)	
Manganese	Upper Nile (north area)	
Gold and many other minerals	Upper Nile (Mout)	
Gem stones (Diamond)	Western Equatoria (Izo)	Not in production
Gold	Southern region of Central Equatoria and Eastern Equatoria, (also Booma)	Started in Kopeta area
Marble and Limestone, Cement	Southern region of Central Equatoria and Eastern Equatoria (Kojokedi and Kopeta)	
Uranium	Between Jonglei and Eastern Equatoria	Vein is identified
Crude Oil	Central South Sudan (Um-Ruobe Basin) and spine between Jonglei and Upper Nile	

Source: Hearing to Ministry of Mining
Note: Exporting plan for mineral resources is possible from Mombasa to Asian countries for their use in production, however the government considers Djibouti Port and connecting corridor for future export because of its shorter distance.

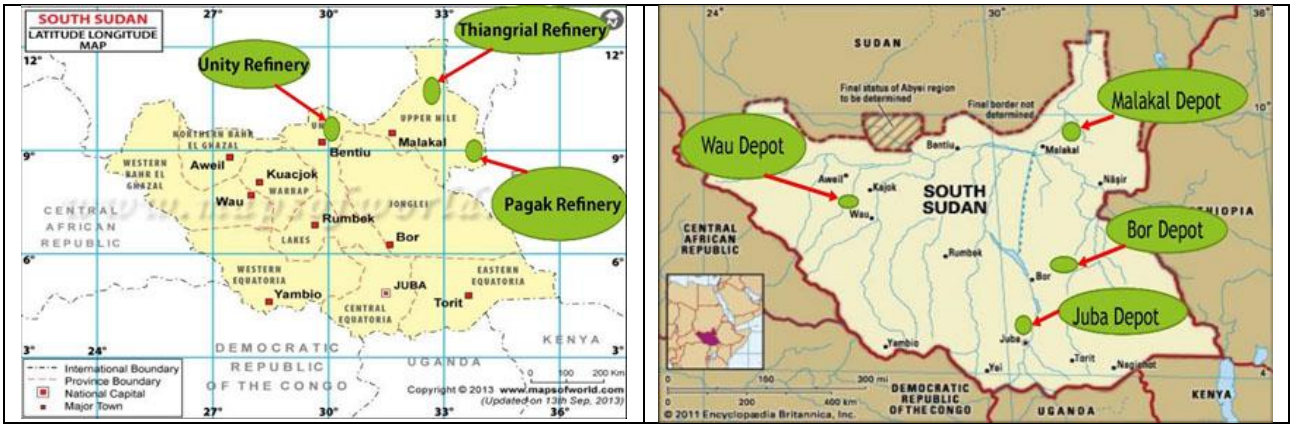
Following Figure 6.1.6 illustrates agro-production, livestock and mineral resource distribution in South Sudan.



Agriculture and Livestock Productions Map　　Mineral Resources Map
Source: Prepared by JICA Survey Team based on the Information provided by the government officials

Figure 6.1.6　Potential Agro-Production (left) and Mineral Resource (right) Map

The following Figure 6.1.7 illustrates where the government proposed refinery facilities and fuel depots are located. The survey team considers that these locations need to be linked for effective regional resource utilization.



Source: Ministry of Petroleum (Left: Projected Refinery facility locations, Right: Projected Oil depot locations)

Figure 6.1.7　Planned Refinery (left) and Fuel Depot (right) Locations

(3) Current Status and Potential of Investment

South Sudan's trading activities today is mainly going through Uganda and Kenya due to limited transport network to other seaports. The country in such circumstance still manage international trades with several countries in variety of products as shown in the following Table 6.1.5, although volume of import highly exceeds export volume same as other countries in the region.

Table 6.1.5　Major International Trade Items and Destinations of South Sudan

Products (Imports)	from which country	Products (Exports)	to which country
Sugar	Brazil	Oil	China
Rice	Pakistan, India	Timber (Mahogany, Teak)	India
Spare parts of machines, etc.	China	Honey	Kenya, Uganda
Chicken	Turkey	Livestock	Kenya, Uganda
Vehicles (second hand)	Asian Countries	Note: Mahogany is strictly controlled for export and very limited.	
Apparel, cloths	China, Kenya, Dubai		
Electricals	China		

Source: Prepared based on the information provided by the government official (Ministry of Trade and Industry)

Based on the above point, the survey team has identified the following potentials.
As discussed above, the survey team concerns that South Sudan is still immature in economic and industrial

development, and SMEs should be more attended with financial support programs and investment promotion instead of supporting large companies.
According to the hearings to the government officials, South Sudan is also not ready with much of laws and regulations since secession from Sudan, preparation of institutional framework is also very important to achieve together with government capacity development.
For SME support, the government has Private Sector Development Directorate to execute support for SMEs and others, as SMEs are protected under the Constitution Article37, Page2-2C. There were over 17,300 SMEs in the country during 2013, and 70% of them operate wholesale and retailers and only 2.2% are in the manufacturing sector. According to the government officials, the investment promotion is specifically governed by Investment Promotion Act 2009 in line with the government's industrial development plan.

(4) Inhibitory Factors regarding Regional Corridor Development

Through mainly government official hearings, the following inhibitory factors against the regional corridor development are identified in addition to the above described challenges in the target countries.

- Increase in illegal trade and refuges (All target countries)
- Risk of pirates activities around the Gulf of Aden (Djibouti)
- Continuous internal conflict as nationwide issue (South Sudan)

6.2. Current Condition of Infrastructure Development and Challenges

6.2.1. Transport Infrastructure

(1) Major Challenges on Road Sector

1) Djibouti

Major challenges on road sector in DJibouti are shown as follows;

- There is a lack of road maintenance capacity[5].
- The pavement condition of Dikhil – Galafi section on RN1, which is one of the major trunk roads, is poor.
- While road is designed in accordance with the French design standards and manuals, harmonization of the design standards with Ethiopia has not been established. In addition, countermeasures to flow rutting has not been well developed against high average temperature and high traffic of heavy vehicle.
- According to ADR, weighbridges have not been introduced in Djibouti, while overloading vehicles are considered as one of the major causes for rapid pavement deterioration.

2) Ethiopia

Major challenges on road sector in Ethiopia are shown as follows;

- While the road transport accounts for the most of land transport at the moment, it is expected to share it between road and railway upon commencement of railway operation. In addition, other factors such as industrial development the Ethiopian government initiates, development of the Berbera port, pipeline also influence traffic pattern. Though, road development plan has not been made and harmonized with the relevant development plan.
- Since the pavement conditions of parts of Addis Ababa – Galaffi section, which is one of the major trunk roads, are poor, freight forwarders in both Djibouti and Ethiopia strongly request to improve the condition[6].
- Many sections, such as Addis Ababa – Galaffi section, have large heavy traffic volume in Ethiopia. Furthermore, the existing design method cannot fully reflect the difference in climate conditions such as temperature and rainfall into the pavement design[7]. Because of this and other factors, pavement deteriorations as shown in Figure 6.2.1 were observed on a major trunk road and it indicates the necessity of high-quality pavement design and construction. In addition, harmonization of the design standards/manuals with the method in Djibouti has not been made.

[5] In order to address the challenge, the government requested to JICA for road maintenance equipment.
[6] According to the hearing to Ethiopian Roads Authority, Road of Addis Ababa – Adama indicates faster road deterioration due to larger traffic volume.
[7] According to the interview with the Ethiopian Roads Authority

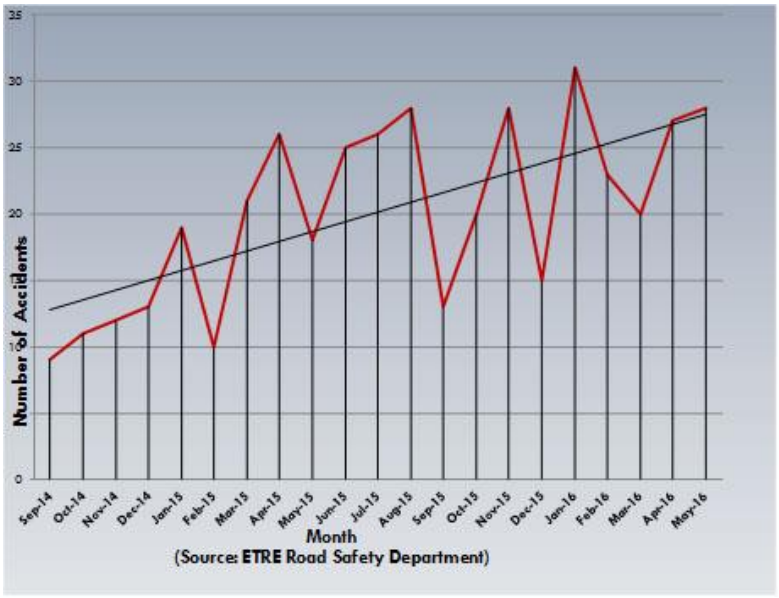
Surface Deterioration

Flow Rutting

Source: JICA Survey Team

Figure 6.2.1 Photos on Road Condition on the Djibouti Corridor near Addis Ababa

- Ethiopian Toll Roads Enterprise (ETRE) mentioned the traffic accident[8] is increasing as shown in Figure 6.2.2. Since the section is the first expressway in Addis Ababa, ETRE identifies the possibility of insufficient dissemination of traffic rules for expressway and recognizes the necessity of traffic safety education.



Source: ETRE Road Safety Department

Figure 6.2.2 Number of Accidents on Addis Ababa – Adama Expressway

3) Sudan

Major challenges on road sector in Sudan are shown as follows;

- While the road transport accounts for the most of land transport at the moment, it is expected to share it between road and railway upon completion of railway re-development. Harmonization of road development plan with the relevant development plan has not been achieved yet.

4) South Sudan

Major challenges on road sector in South Sudan are shown as follows;

- On Juba – Nimule section which is the first paved trunk road in South Sudan, Double Bituminous Surface Dressing (DBST) was applied at the surface layer. However, Ministry of Roads and Bridges

[8] However, traffic volume has also increased and further investigation is required to understand the causes of accidents.

(MRB) concerns on the durability. The pavement design standards in consideration of conditions in South Sudan is not ready.

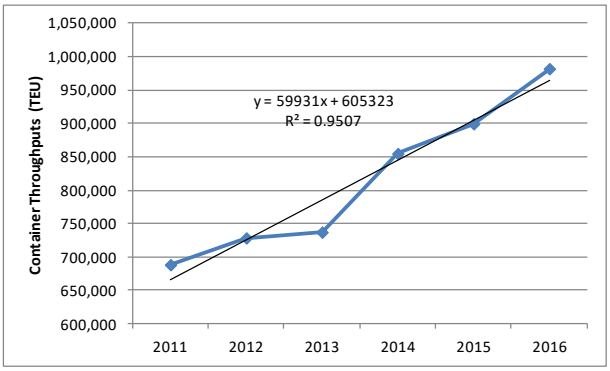
- Since the total length of paved roads is short, many areas face difficulty in land accessibility. In particular, many bridges are required to formulate a road in Nile basin due to large number of rivers to be crossed and it leads to higher construction cost. Implementation of road development has not been progressing.

(2) Major Challenges on Maritime (Seaport) Sector

1) Djibouti

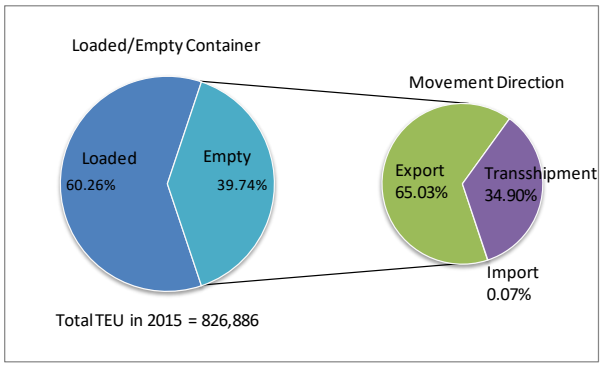
Major challenges on maritime sector in Djibouti are shown as follows:

- At the Djibouti port, the container demand sharply hiked in the past five years as shown in Figure 6.2.3 and approximately 60,000 TEU increases per year. Since the capacity of the Doraleh Container Terminal (DCT) is 1,200,000 TEU per year, the container throughput is expected to reach the capacity in 4 years by keeping this pace. However, the calculation above does not reflect the effect of container throughput at the newly-opened Doraleh Multi-purpose port as well as the Berbera port which is under rehabilitation. A comprehensive port development plan has not been prepared in light of logistic demand in the hinterland and throughput allocations among the neighboring ports.
- As shown in Figure 6.2.4, the ratio of empty container accounts for 40% of the total containers. The ratio is higher than the international standard of 20.5%[9]. Within the empty containers, 65% is for export, 35% is for transshipment and less than 0.1% is for import.
- According to the analysis on transit time for bulk cargo import as shown in Figure 6.2.6, the dwell time at the port accounts for 912 hours (approximately 95%) out of the total transit time of 956 hours. Dwell time at the ports has increased, and the efficiency of entire logistic system has degraded.



Source: JICA Survey Team based on data provided by Djibouti

Figure 6.2.3 Container Throughputs at the Djibouti Port



Source: JICA Survey Team based on data provided by Djibouti

Figure 6.2.4 Ratio of Empty Container at the Djibouti Port

2) Sudan

Major challenges on maritime sector in Sudan are shown as follows;

- According to the Sudan Port Corporation (SPC), SPC is considering to increase transshipment container to make the most use of the container terminal of which capacity still has room for further throughput[10]. As the volume of transshipment container is expected to increase, operation capacity should be lower based on the current port capacity.

[9] http://www.greenport.com/news101/Products-and-Services/reducing-empty-container-costs

[10] "Sudan Sea Ports Handbook 2016 – 2018" shows that the container throughput in 2014 was 0.43 million TEU while the capacity of the container terminal named South Quay is 1.2 million TEU/year.

(3) Major Challenges on Railway Sector

1) Djibouti and Ethiopia

Major challenges on railway sector in Djibouti and Ethiopia are shown as follows;

- In general, the transport capacity is kept by proper maintenance of railway and rolling stocks. The previous narrow gauge railway network became out of service due to inadequate maintenance. Thus, sustainable maintenance and operation is one of the major challenges. In the current plan, the Chinese railway company who constructed the railway operates it in the first place, the operation skill and knowledge is transferred to railway corporations of Djibouti and Ethiopia and the two corporations will be in charge of maintenance and operation in future. In Ethiopia, a bill for enabling private sector to participate in railway operation[11] is being discussed.
- According to the interview with the Ethiopian Railway Corporation (ERC), although the railway development plan has been prepared, transport demands on some sections are unclear since the plan is not harmonized with other sectors such as road, port and industrial developments.
- The standard-gauged railway has been introduced in surrounding countries such as Sudan and Kenya and connection with the surrounding countries is under consideration,[12] however the harmonization to the specification of the standard gauge is in delay for railway development.

2) Sudan and South Sudan

Major challenges on railway sector in Sudan and South Sudan are shown as follows;

- The transport share of the current narrow gauge railway in 2011 is 3.8% in freight and 0.1% in passenger and the low reliability in railway transport due to derailment caused by aged infrastructure and rolling stocks is the major problem.
- Since the financial requirement is huge, the railway development with standard gauge cannot be fully implemented in a short term and use of the current network with maintenance is also prioritized. Currently, the levy (15% of the fare) is collected from private operators and the levy is utilized for railway infrastructure maintenance. However, the amount is not sufficient to keep it in good condition according to SRC[13].

(4) Major Challenges on Aviation Sector

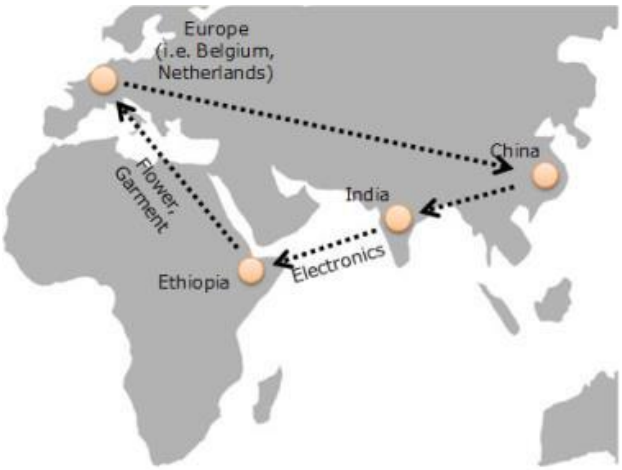
1) Djibouti

Since interviews regarding aviation sector in Djibouti have not been conducted in this survey, interviews, data collection and analysis are required in the following study.

2) Ethiopia

Major challenges on aviation sector in Ethiopia are shown as follows;

- Aviation traffic volumes in recent years have rapidly increased and further enhancement of the capacity is required. The Ethiopian government sets the target volume of air cargo to be doubled in GTP-II, therefore the handling capacity could be lower than required.
- In order to compete with the major aviation companies such as the Emirates Airlines, the Quarter Airways and the Turkish Airlines, the flagship carrier of the Ethiopian Airlines (ET)



Source: JICA Survey Team based on the interview with ET

Figure 6.2.5 The Triangle Operation by the Ethiopian Airlines

[11] http://www.thereporterethiopia.com/content/bill-proposes-liberalization-rail-transport

[12] Referring to the article of "the Ethiopian Herald" on 5th April 2017 shown in 5.1.3 (2) 3) and https://qz.com/996255/kenyas-3-2-billion-nairobi -mombasa-rail-line-opens-with-help-from-china/

[13] The implementation structure in Sudan is described in 5.1.3 (2) 1)

recognizes the necessity to streamline the operation. Imbalance import and export are also a challenge in the Ethiopian aviation. As a measure to streamline, ET introduced the triangle operation as shown in above Figure 6.2.5. Export goods from Ethiopia are transported to Europe and cargos for Asian markets are loaded in the Europe. Then, the aircraft directly goes to Asia and import goods to Ethiopia such as electric products are loaded in Asia and the aircraft comes back to Ethiopia. The triangle operation improved efficiency of the operation of ET. Introduction of cargo tracking system and other ICT is considered for further streamlining.

3) Sudan

Since interviews regarding aviation sector in Sudan have not been conducted in this survey, interviews, data collection and analysis are required in the following study.

4) South Sudan

Since interviews regarding aviation sector in South Sudan have not been conducted in this survey, interviews, data collection and analysis are required in the following study.

(5) Major Challenges in River Transport Sector

1) Sudan and South Sudan

Major challenges on river transport sector in Sudan and South Sudan are shown as follows;

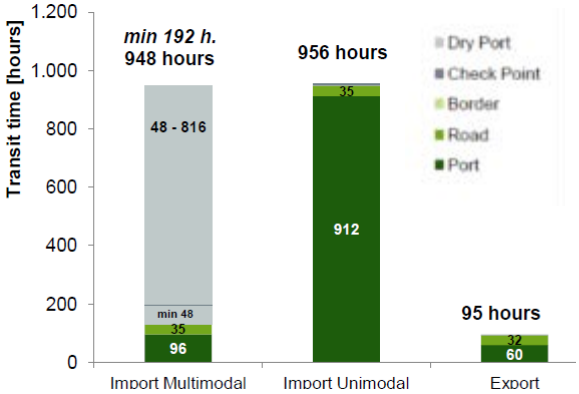
- In order to ensure financial and human resources based on the legal ground, a bill for establishment of South Sudan Inland Water Navigation Authority (SSIWNA)[14] has been submitted to the Diet in South Sudan. However, the bill has not been enacted yet[15].
- According to the interview with the Ministry of Transport in South Sudan, some port facilities are out of service due to destruction.
- Regular maintenance including dredging has not been made to keep the essential depth on the river route[16]. Therefore, financial resource and training for private sector who can conduct dredging is not enough.

(6) Major Challenges on Dry Port Sector

1) Ethiopia

Major challenges on dry port sector in Ethiopia are shown as follows;

- As shown in Figure 6.2.6, while the transit time of bulk cargo (the center in the figure) which does not use a dry port is 956 hours per trip, the minimum transit time of container cargo (the left in the figure) which uses a dry port is as short as 192 hours per trip. However, the maximum dwell time at the dry port is 816 hours due to the congestion caused by rapid increase in throughput and long storage time by forwarders. Such long dwell time is a major problem.
- Currently, the Modjo dry port deals with 78.8% out of the total dry port cargo and the neighboring dry ports such as Comet and Gelan account for 11.9%. The throughputs in the dry ports near Addis Ababa reaches 91% and the dry port cargos are concentrated in these dry ports. In addition to expansion of the Modjo dry port, dispersion of dry



Source: Final Report on Analytical Work on Transport Sector in Ethiopia (2015) ALG

Figure 6.2.6 Transit Time of Container and Bulk Cargos on Addis Ababa-Djibouti section

[14] According to the interview with the Ministry of Transport in South Sudan, the roles of SSIWNA are to development of river transport and river ports.
[15] According to the interview with the Ministry of Transport in South Sudan
[16] The feasibility study on the White Nile by UN and 10 years river transport masterplan (2018~2028) by AfDB also include dredging plans.

port function in other area is required to ease the congestion, however the development progress is slow.

- According to the interview with Ethiopian Shipping and Logistics Services Enterprise (ESLSE), one of the causes of long dwell time at a dry port is that forwarders do not pick up their cargos on time after custom clearance.

2) Sudan

Major challenges on dry port sector in Sudan are shown as follows;

- The major dry port in Sudan, Kosti functioned as a transit node for cargos imported at the Port Sudan to river transport toward South Sudan. Thus, the Kosti dry port and the Kosti river port are adjoined. The dry port demand is influenced by demand for river transport from/to South Sudan and development plan shall be prepared in collaboration of both relevant organizations, however this has not been achieved.

6.2.2. Cross-border Facilities and Soft Infrastructure

(1) Customs

1) Djibouti

The following items are identified as challenges for Djibouti customs.

- Although the customs law is ATF compliant, the regulation has not been internationally standardized and compliant to RKC and COMESA CMR. Furthermore, through the collaboration with the United Nations Office for Project Services (UNOPS)[17], establishing a modernized legal framework and customs operation has not been made.
- The Djibouti Customs Authority intends to set an official annual forum for dialogue between the customs and the private sector stakeholders, but the forum is not effective so far. In addition, although the Joint Commission of Ethiopia and Djibouti plan to address the corridor challenges, concrete improvements, such as improvement of connection to the Ethiopia system, have not been implemented yet.

2) Ethiopia

The following items are identified as challenges for Ethiopia customs.

- Although Ethiopia equips better facilities than facilities of neighboring countries, there are some equipment and facilities that needs to be fixed. For more efficient border operation, improvement of the inefficient facilities, equipment and system is not enough.
- For efficient operation of custom procedures, constant training and capacity development of customs officers are essential and facilities for the training and capacity development need to be installed. Furthermore, with the establishment of the Djibouti Corridor Authority, it is envisaged that the members harmonize their customs procedures, ensure connection of all borders, install adequate facilities, and standardize the training for all customs officers, however it has not been achieved.

3) Sudan

The following items are identified as a challenge for Sudan customs.

- As a bilateral agreement with Ethiopia has not been signed yet, customs systems of the two countries are not interchangeable, causing inefficiencies in custom operations. To achieve efficient customs operations, establishing a customs management system compatible to the system is not enough in Ethiopia.

4) South Sudan

The following items are identified as a challenge for South Sudan customs.

[17] This program aims at upgrading ASYCUDA, designing, constructing and providing equipment to critical customs and transit facilities at Loyada (Djibouti / Somaliland) and designing and constructing a dedicated headquarters to improve operational efficiency of customs officers.

- As South Sudan became a member of EAC, it is required to introduce EACCMA. In addition, for a more efficient customs operation, the customs system need to be automated. However, these have not been ready.

(2) Immigration

As the Survey Team could not collect enough information regarding immigration of each country, the following items are identified as challenges in regards to immigration in the whole target area.

- It is necessary to make the immigration works of each country efficient, by the introduction of a regionally common immigration management system in EAC.
- For the implementation of efficient immigration procedures, constant training and capacity development of immigration officers are essential, however facilities for training and capacity development are not enough. Furthermore, with the establishment of the Djibouti Corridor Authority, it is envisaged that the members harmonize their immigration procedures, ensure connection of all borders, install adequate facilities and standardize the training for all immigration officers, however these have not been made.

(3) Quarantine

As each country has not developed enough facilities for quarantine and as the Survey Team could not collect enough information regarding quarantine of each country, following items are identified as challenges in regards to quarantine in the whole target area.

- Although the development stage of facilities for quarantine is different by country in the region, it can be said that all countries do not have adequate facilities to conduct necessary quarantine operations. Therefore, it is necessary to promote further development of quarantine facilities for essential operations.
- For the implementation of efficient quarantine procedures, constant training and capacity development of quarantine officers are not enough and facilities for the training and capacity development need to be installed. Furthermore, with the establishment of the Djibouti Corridor Authority, it is envisaged that the members harmonize their quarantine procedures, ensure connection of all borders, install adequate facilities and standardize the training for all quarantine officers, however these have not been made.

(4) Challenges for regional trade facilitation

The following items are identified as common challenges for regional trade facilitation in the target area.

- By the support of COMESA, issues for the regional trade facilitation is identified and necessary actions to improve the issues are being taken. The identified issues include; harmonized road transit charges, harmonized axle loading and maximum vehicle dimensions, regional vehicle insurance scheme, etc. However, these developments are not proceeding well.
- OSBP is an effective tool to promote regional trade facilitation. JICA is providing technical assistance for OSBP implementation, however OSBP, utilizing the output of the assistance, such as the second Edition of the OSBP Sourcebook, is not progressing well.

6.2.3. Power, Energy and Telecommunication

(1) Power Supply Infrastructure

The target countries of the survey are compared in terms of power demand and supply facilities. As shown in Table 6.2.1, Ethiopia owns the largest generation capacity in the four countries and it will become 2.5 times larger in coming two years. Thus, its generation capability is dominant compared to the others. In addition, Ethiopia already exports power to Djibouti and Sudan. With these facts, it is undoubted that Ethiopia will play an important role in power supply for the development Djibouti corridor.
EAPP (Eastern Africa Power Pool) prepares rules and regulations to ensure safety and security of the network and system operation as well as guidelines for international power trade in the eastern Africa region. Therefore, infrastructure development and trade regarding electricity which is related to Djibouti corridor should be implemented in conformity with the framework of EAPP. Demand and supply in electricity

network must be balanced at any time in order to maintain the frequency and voltage of the network. Otherwise, the system will be collapsed and it results in total blackout in the worst case. In this sense, central load dispatch centers of all the countries involved in power export and import need to operate and control the regional electricity network in an integrated manner.

Although EAPP was established in 2005, EAPP Coordination Center has not been operational. With the full operation of the center which is responsible for coordinating central dispatch centers of each country, power trade among the member countries will become possible.

Electricity supply infrastructure will support the development of corridor itself and accompanied industrial development. Associated power demand and its location needs to be clarified and integrated into power development plans of each country.

Table 6.2.1 Comparison of power demand and supply facilities among the target countries

	Djibouti	Ethiopia	Sudan	South Sudan
Peak demand	99MW (2015)	1,974MW (2016)	2,562MW (2015)	29MW (2014)
Installed generation capacity	139MW (2015)	4,304MW (2016)	3,227MW (2015)	64MW (2016)
Transmission voltage	230kV 63kV	500kV (in progress) 400kV 230kV 132kV 66kV 45kV	500kV 220kV 110kV 66kV	11kV distribution only
Interconnection	Interconnected with Ethiopia at 230kV	Interconnected with Djibouti and Sudan	Interconnected with Ethiopia at 230kV To be interconnected with Ethiopia and Egypt at 500kV	
Status of power trade	Import from Ethiopia	Export to Djibouti and Sudan	Import from Ethiopia	Import from Sudan

Source：Government organizations and agencies of each country（Results of the first field survey）

EAPP's Strategic Plan 2016-2026 indicates priority interconnection projects to be implemented by 2020 as shown in Table 6.2.2. However, securing financial sources is the most critical challenge[18] to materialize the projects.

Table 6.2.2 Priority projects in EAPP's Strategic Plan 2016-2026

No.	Countries	Length (km)	Voltage	Capacity (MW)	Cost (million US$)
1	Sudan – Ethiopia	550	500kV	1,600	373
2	Egypt – Sudan	775	500kV	500	233
3	Rwanda – Tanzania	115	220kV	200	30
4	Uganda – South Soudan	200	400kV	600	77
5	Libya – Egypt	163	220kV	200	38
6	Kenya – Uganda	254	400/220kV	300	44
	Total	**2,057**		**3,400**	**795**

Source：Eastern Africa Power Pool Website, http://eappool.org/strategic-and-coporate-plans/

[18] Interview with EAPP on 27th May 2017

1) Djibouti

There are two major challenges in power sector. The first one is the management of various projects concurrently ongoing, including IPP projects. The second one is to secure own generation assets. Regarding the second one, Djibouti can enjoy economic benefit by importing cheap electricity from Ethiopia but diplomatic relations of the two countries might be changed.
Fuel cost of the unit electricity sales dropped by 20% in Djibouti after the commencement of power import from Ethiopia in May 2011. Unit cost of power purchased from Ethiopia is 6 to 7 US cents/kWh while fuel cost of unit electricity sales of EdD is DJF 34.52 /kWh (Approx. 19cents/kWh). This means that imported power costs one third compared to diesel generation.
For the time being, diplomatic relation of Djibouti and Ethiopia has been maintained in favorable status but in order to cope with unforeseeable situation, the government of Djibouti considers it necessary to secure generation capacity which will fully satisfy the demand of the country from the view point of energy security.

2) Ethiopia

Thanks to the progress of power plant construction in Ethiopia, generation capacity is sufficient but transmission and substation capacity becomes a bottleneck to evacuate power. Although planning and construction of interconnection lines related to power export seems to move forward, expansion/ reinforcement of domestic transmission networks lags behind schedule. Also, low electricity tariff which is not cost reflective makes it difficult for electric utility to invest on its own finance. This is the main cause of delay in various projects. Electricity access is still as low as 25% and coverage of nation-wide transmission and distribution network remains the level of 60%.

3) Sudan

Major energy resources are available in Sudan, such as oil, water as well as renewable energy (solar and wind), and the government is seeking options to balance the use of these energy resources to meet growing power demand. However, securing development fund is the major challenge to the country.

4) South Sudan

Electricity access in South Sudan is still limited to a mere 1% and load shedding is in place as a daily basis, according to the hearing to the government officials. Furthermore deteriorated financial situation of SSEC forced the corporation to suspend its electricity supply for the last two years. Development of least cost generation plants as well as nation-wide transmission and distribution network is highly needed.

(2) Energy

The role of energy infrastructure in corridor development is to efficiently and safely transport primary energy products from landlocked countries such as Ethiopia and South Sudan rather than supporting the development of main corridor infrastructure. Economic correlation between Ethiopia and Djibouti is tight and interdependent. Also, they maintain preferable diplomatic relation. Therefore, there is no specific challenges in developing interrelated infrastructure. On the other hand, South Sudan needs an alternative route for crude oil export due to deteriorated relation with Sudan.
Development of energy related infrastructure should not be only targeting the development of primary energy transport infrastructure. Development of oil refineries and supply and consumption of oil products within the region should also be taken into consideration.

(3) Telecommunication

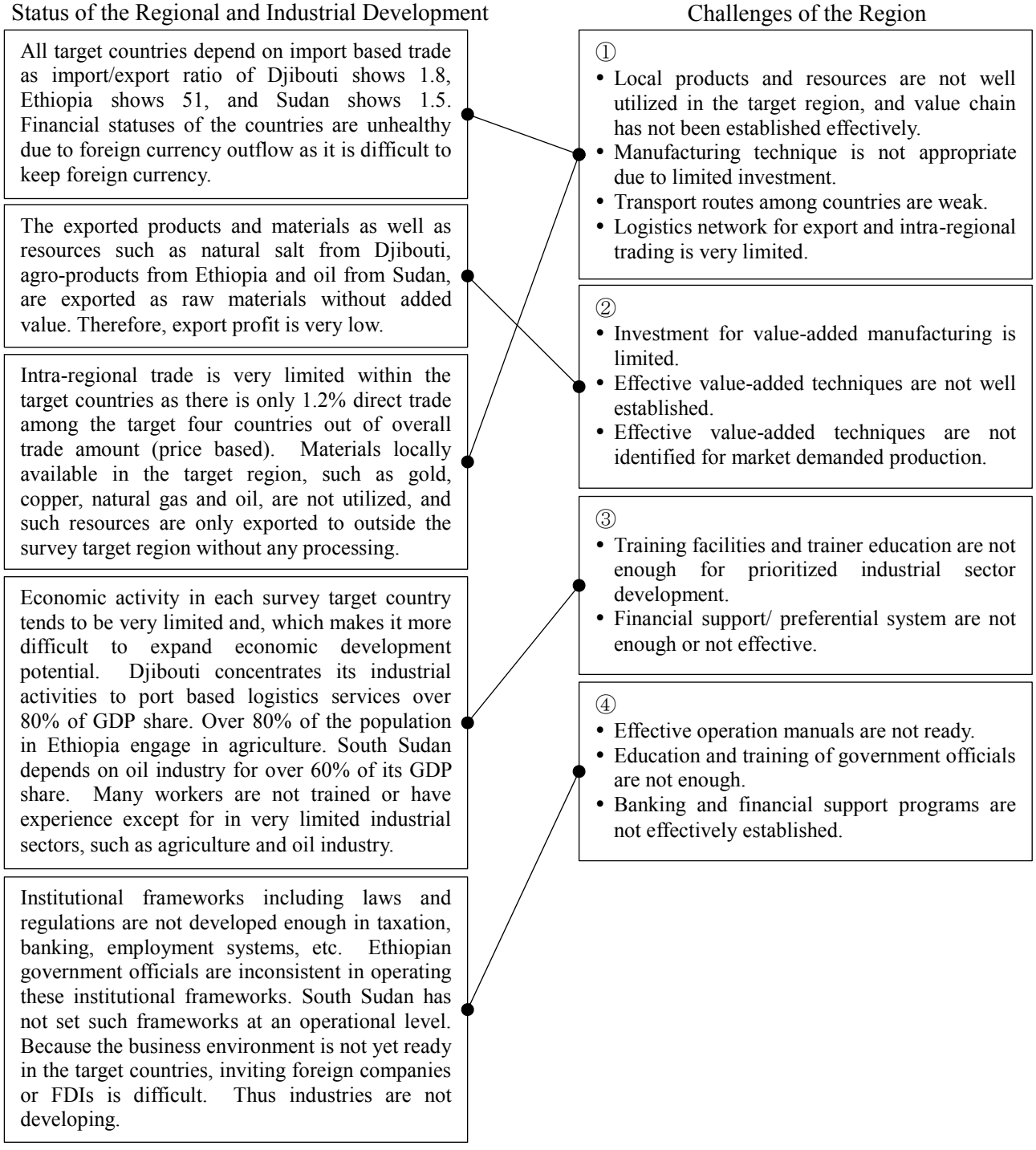
Since development of optical fiber network has two aspects, namely, public infrastructure and profitable business, there is a difficulty to collect information on present status and future plans. Djibouti is a gateway of submarine optical fiber cable and Sudan also has a link with EASSy (Eastern Africa Submarine System). Development of interconnection connecting gateway countries along the coast which have links with submarine cables and inland countries at backbone level is one of the challenges in corridor development. Another challenge is to develop domestic backbone network in each country.

6.3. "Challenges in the Target Countries" towards Regional Corridor Development

Based on the study on collected baseline data of each sector in the survey target countries described above, regional level development challenges towards the regional corridor development are summarized.

(1) Current status and challenges regarding regional and industrial development

Current status and challenges regarding regional and industrial development of the survey target countries are summarized.

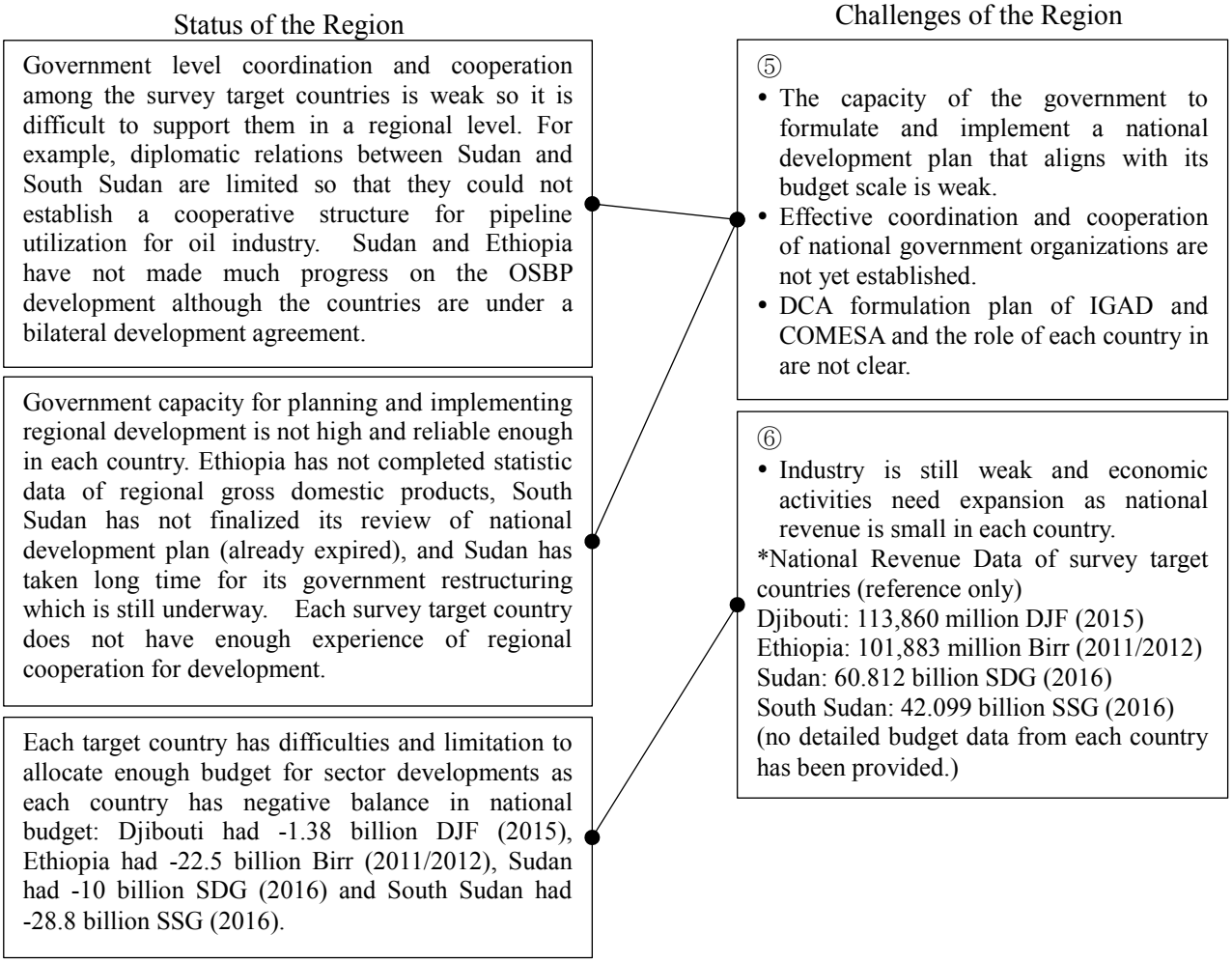


Source: JICA Survey Team

Figure 6.3.1 Current Status and Challenges regarding Regional and Industrial Development

(2) Current status and challenges regarding development implementation organization

Based on the condition of each country's budget management and development implementation organization structure described in the previous chapter 3 (section 3.5 and 3.6), current status and challenges regarding the regional development implementation organization of the survey target countries are summarized.

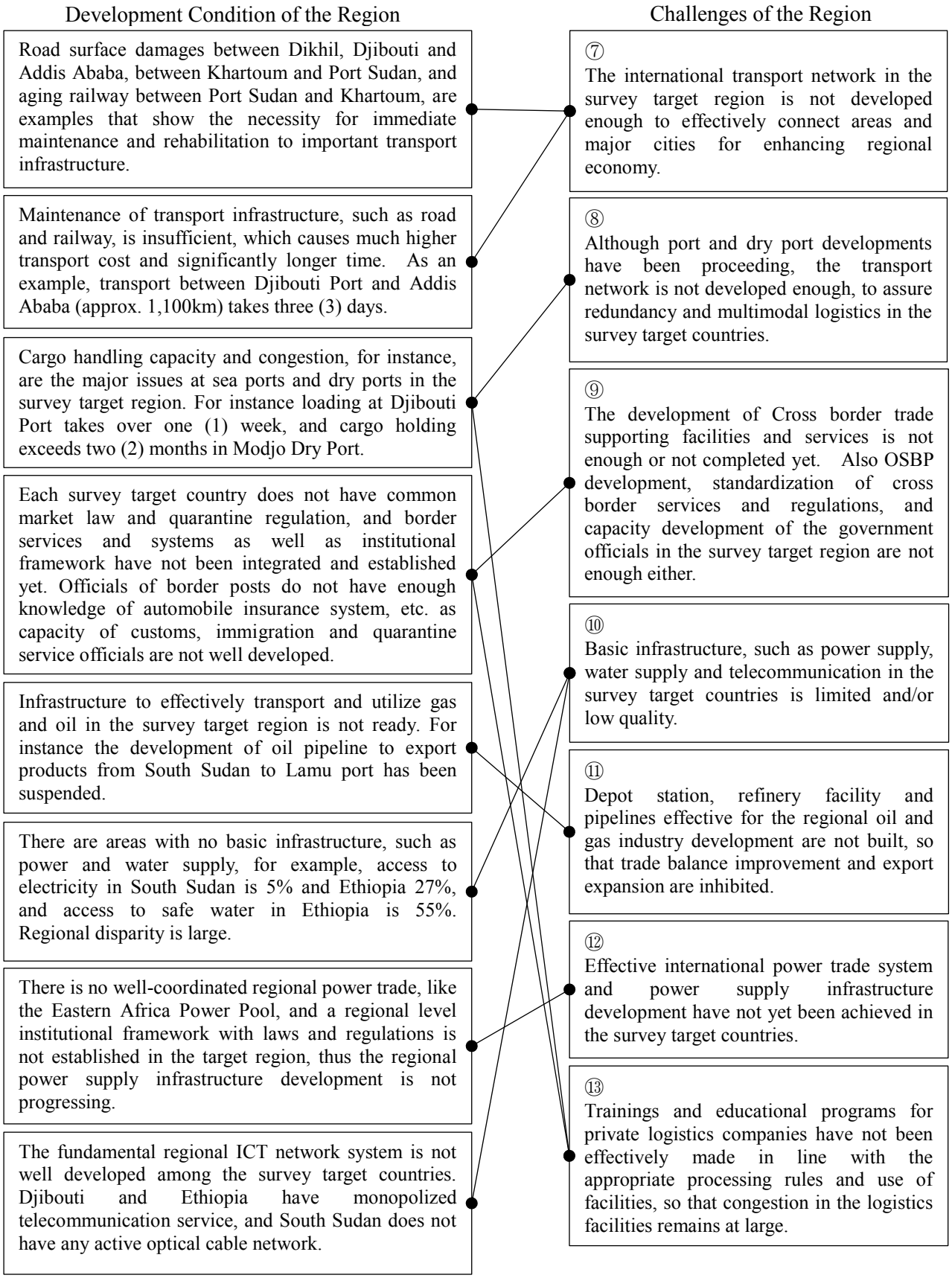


Source: JICA Survey Team (Djibouti: Annuaire Statistique 2016 (DISED), Ethiopia: 2014Abstract (ECSA), Sudan and South Sudan: IMF database)

Figure 6.3.2 Current Status and Challenges regarding Development Implementation Organization Structure

(3) Current status and challenges regarding infrastructure development

Current status and challenges regarding infrastructure development of the survey target countries are summarized.



Source: JICA Survey Team

Figure 6.3.3 Current Status and Challenges regarding Infrastructure Development

Chapter 7

CHAPTER 7 Recommendation to the Future Master Plan Formulation for the Regional Corridor Development

Based on the baseline data as well as development condition, challenges and potentials of the survey target region and countries discussed in the previous chapters, comprehensive development issues for the target region were studied. In order to realize such regional corridor development to support economic development, further study needs to be implemented for the master plan formulation. Recommendation from the survey result are then described in this chapter to clearly recognizes what needs to be studied during the next stage during the master plan formulation based on the important points concerned: Purpose of the study, master plan target area, scope of works, and points taken into account for study implementation.

7.1. Lessons Learned from Other Corridor Development Projects

JICA has been supporting several corridor development projects in Africa, and experiences and knowhow from those JICA projects should be applied for Djibouti corridor development master plan formulation.
There could be a possible combination for development in the Djibouti Corridor region, such as corridor infrastructure development together with manufacturing industrial promotions, such as food processing and leather manufacturing, in Ethiopia, since Ethiopia has higher potentials with low cost quality labor, industrial park development, government led foreign company attraction, and promised European Market through Djibouti Port. However, high cost of transport and logistics as well as immature business environment delay Ethiopia's industrialization. Learning from the Nacala Corridor Development Master Plan, both hard and soft infrastructure development, continuous "Kaizen" project implementation, and integration of tax and foreign currency related regulations has identified possible development synergy effect to the Djibouti Corridor development. Triangular cooperation with the countries, such as India, Thailand and Vietnam involved in major industrialization experiences should also be another possible method to the master plan formulation.
The following Table 7.1.1 summarizes three JICA projects focusing on the corridor development.

Table 7.1.1 Study on Other Corridor Development Projects

Corridor	Project Brief	Points to be considered under Djibouti Corridor Study
West Africa Growth Ring	The objective of the project is to identify bottleneck against development potential and corridor transport, and to setup the regional development strategy and corridor development plan to balance inland and coastal area for the economic growth. It focuses on the corridor development utilizing regional economic integration (customs union) between UEMOA and ECOWAS, and on the intra-regional market based industrial development.	The M/P formulation starts with visualizing the regional and spatial development image in 2040, in which the intra-regional trade expansion, and industries focusing on such intra-regional market are important aspects. Nigerian market will be expanded as the regional market. The philosophy is to seek domestic intra-regional market expansion to compete with foreign products from import. In order to achieve such intra-regional domestic market development and expansion, more "quick" and accelerated transport/logistic corridor infrastructure development strategy is necessary for better intra-region investment promotion to the region. Focusing on more localized development strategy in this project should be more appreciated in the target countries considering also the nature of the local industries and market trend seeking maximum effect and benefit from minimum development expenses.

Corridor	Project Brief	Points to be considered under Djibouti Corridor Study
Northern Corridor	The project is to organize logistics and transport in Kenya, Uganda and toward Burundi by 2030 including capacity development and technology transfer regarding regional development and strategy to the counterpart agencies. The region faces issues on preparation of foreign cash holdings, unbalanced regional development and weak industrial integration without value addition to the industries.	The Study clearly identified development vision with regional, industrial and transport strategies together with institutional and financial strategies as foundation. It strategies to make certain industries to bring Growth Driver into the regional development, such as agro-products, processed, and regional growth hub will be formulated for effective regional integration enhancement. The PPP related laws and regulations will be set in the target countries, and the development methods are planned for well integrated possible options with PPP considering appropriate private sector involvement in multi programs. The project identified the Flagship Project to lead overall regional development establishing Mombasa Port area including SEZ which should be investment promotion trigger. In market integration point, OSBP setup is highly expected, however it is evaluated that operational issues still remains. It is important to identify the solutions to overcome the OSBP issues.
Nacala Corridor	The objective of the project is to formulate strategy to achieve appropriate development and to promote investment to the Nacala corridor with development of Tete coal transport, railway utilization for regional industry, and development of wide industrial sectors in larger region. This also includes utilization of potential resources: Tete Coal and LNG. Investment to SEZ is another key for regional development.	The development scenario focuses on wider area development with corridor network base in order to achieve large regional development. Then, seven key development strategies to realize the scenario were identified: strengthening transportation, developing basic infrastructure, sustainable agriculture, land and environmental management, securing basic education and human resource development, enhance organization structure, and considerations on social issues, on remote areas and on socially vulnerable people. Actions are also set in line with those strategies, and 12 programs with 48 priority projects are identified to tackle. Besides, *Kaizen* program as well as triangular cooperation with third countries are considered in the M/P formulation process to maximize potential of the region.

Source: JICA reports of the above noted corridor projects as well as seminar handout documents for "Corridor Development Strategic Master Plan in Africa" Seminar held on Jan. 18, 2017 are referred for summary preparation.

Above described and concerned JICA reports as well as the seminar handout documents for "Corridor Development Strategic Master Plan in Africa" Seminar held on Jan. 18, 2017 are referred, and the points listed below are considered important.

- When many countries or concerned RECs become a development target, coordination among stakeholders becomes more complicated and difficult as the executing or implanting organization expands very large. Therefore, it is important to have a clear vision for corridor development and to identify each country's as well as organization's role and responsibility among others. *(Growth Ring)*
- When target area is large together with number of countries, it is important to study not only global market but also local market in the region for economic and market development efficiency, and local products, materials and resources should be effectively utilized for regional development. *(Growth Ring)*
- In order to support landlocked countries, it is important to secure regional network, to utilize local resource and products, and to strengthen infrastructure including OSBP for trade promotion giving more benefit to the inland countries through the regional corridor development. *(Northern Corridor)*

- If the local private sector is not strongly active, it is important to exercise to promote more foreign investment, international borrowing, public-private partnership, etc. for industrial development option study together with capacity development of the government organizations. *(Northern Corridor)*
- Where very strong and effective local resources for industrial development activation in the target region, it is necessary to effectively plan the integration of infrastructure development and utilization of the local resources. *(Nacala Corridor)*
- It is recommendable to ask emerging countries for cooperation and or regional support enhancement, such as triangular cooperation and South-South Cooperation for the regional development, and through such cooperation a synergy effect on development could be drawn to strengthen and enhance regional industrial development and integration to the international markets. *(Nacala Corridor)*

7.2. Issues toward Regional Corridor Development for the Target Region and Necessity of Regional Corridor Development

Based on the previously discussed baseline data and information survey regarding the status of the target countries as well as sector development plans and policies in the earlier chapters, the development conditions and related challenges as well as potentials are summarized in chapter-6. Regional development issues then are summarized based on the current development conditions and challenges. Further, the relationship between the development issues and the necessity of regional corridor development have been examined as described hereafter in this section.

7.2.1. Development Issues of the Target Region

Issues in the Target Countries

Based on the current condition and challenges of the region discussed in Chapter 6, development issues in the target countries are summarized. The numbers in circle corresponds to the same numbers in the Figures 6.3.1 through 6.3.3 in chapter 6, and (1) ~ (5) corresponds to the listed comprehensive regional development issues in the following section 7.2.2.

1) Issues regarding Industrial Development

① Achieve regional value-added production utilizing locally available resources, products and materials, start manufacturing of processed products, and initiate active intra-regional trading. (1)
② Achieve and/or strengthen manufacturing of value-added products, and start exporting the products. (1)
③ Implement job training and education in order to achieve industrial expansion and diversification. (1)
④ Establish effective and appropriate institutional framework and improve services for investment and entrepreneur. (5)

2) Issues regarding Executing Organization for Future Master Plan Formulation

⑤ Develop effective institutional framework for capacity development and regional development cooperation among countries. (5)
⑥ Secure development fund in each country for regional development. (5)

3) Issues regarding Improvement of Infrastructure Development and Logistics

⑦ Improve and strengthen the international transport network in the survey target region in order to effectively connect areas and major cities for enhancing regional economy. (1) (2)
⑧ Develop transport network with redundancy and multimodal logistics together with port and dry port developments in the survey target countries in order to improve transport efficiency. (2)
⑨ Improve cross border trade supporting facilities and services including OSBP facilities in order for efficiency and standardization of cross border services and regulations, and develop capacity of the government officials in the survey target region. (2)
⑩ Improve livelihood in the society through developing and/or improving basic infrastructures (power supply, water supply and telecommunication). (3)
⑪ Develop refinery facilities, stock depots and transport pipelines for oil and gas in order to expand export and improve trade balance. (4)

⑫ Establish international power trade system and framework in order to further promote power supply infrastructure development. (4) (5)
⑬ Establish strict application and compliance system of regulation in order to reduce congestion in the logistics facilities. (5)

7.2.2. Necessity of Regional Corridor Development

Through the review of the above noted issues t, cooperation among target countries is recognized necessary to solved the regional issues. Based on the above consideration, comprehensive regional development issues could be summarized in the following six points.

(1) Collaboration among Agriculture, Livestock and Manufacturing Industries

Agriculture, livestock, and manufacturing sectors are considered having higher development potential in Ethiopia and Sudan in the region, and especially, food processing and leather production are at the top in Ethiopia, because of larger agro-production (sorghum, maize, etc.) for export as well as the foundation of livestock industry has been established. As byproduct of animal meat, leather could become major material for leather manufacturing sector. Ethiopia also plans to establish fertilizer manufacturing industry in a few years, so that the productivities in agricultural sector should be increased. Accordingly, local agro-products and livestock products in Ethiopia and Sudan could have higher potential for value-added industrial development. Establishing value-added production with each country's role set-up in the region could contribute all integrated countries' development utilizing their potentials of materials, industries and transport for value addition. In this sense, enhancing transport network and strengthen logistics through the regional corridor development is necessary.

(2) Transport Cost and Time Reduction through the smooth Trade and Transport Facilitation in the Region

Transport infrastructure development in the region is not progressing much and integration between countries is weak. Cross border facilities and services are not designed as a unified system and all necessary processes take too much time because of complication, thus transport cost becomes very high. Planning transport infrastructure development in order to enhance value-chain for intra-regional trading expansion is important for both resource providing and manufacturing countries. Infrastructure development plan for the value-chain establishment support based on the regional industrial potential is necessary. Business environment improvement is also important, and both soft and hard infrastructure development need to be prepared in cooperation for regional industrial development.

(3) Cooperation for Livelihood Improvement in the Region

Target region and countries are vulnerable against severe environmental change caused by climate change and natural disaster partly because of the lack of basic infrastructure preparedness. After experiencing major draught and famine, fragile food security was acknowledged in the region. Recognition of necessary measures from everyday life as well as stronger regional cooperation came into the concern to the countries, and preparation toward basic social security and safety assurance became more important as a tool for regional development cooperation.

1) Livelihood Improvement through Basic Infrastructure Development in the Rural Areas

Infrastructure development in rural areas of the target countries is especially weak and undeveloped. Basic but minimum life infrastructure including local power and water supply development is necessary to improve livelihood in rural areas within the infrastructure development in order to reduce disparity while enhancing network to the rural production areas, particularly to farmers and livestock breeders to support them for productions.

2) Infrastructure Strengthening to Secure Food Security in the Region

Rural areas of the target countries are not well connected by road network and vulnerable to the natural disaster and famine easily loosing access to food supply. South Sudan in this sense is very weak as their transport network is undeveloped in rural areas, and WFP for instance deploy air-drop food supply to those remote areas when necessary. Such situation should be improved within the reginal transport infrastructure development, so that the regional support activities could also be assisted through the

corridor development. Lifeline improvement and development needs regional cooperation, and the purpose of the corridor development also becomes important in this regard.

(4) Coordination for Regional natural Resource Utilization

There are several natural resources existing in the target countries and some are already utilized. Ethiopia's Potassium use for fertilizer, future chemical production, and packaging production, as well as Sudan's and South Sudan's oil processing and utilization could be considered potential. Realizing such regional resource utilization plans, resource production area and processing areas needs to be effectively connected through the regional corridor development.

(5) Capacity Development of Operating Bodies and Establishment of Institutional Cooperation

The target countries may need to depend on foreign direct investment in the future in order to achieve value-added production and export utilizing local resources and materials. Furthermore, strengthening the implementing organizations of each country and effective setup of institutional framework is necessary to facilitate development and operation of corridor infrastructure among countries and expand intra-regional trading. It is important to establish integrated regional operation system and its actual use should be well achieved through technical capacity development in the regional corridor soft component development and enhancement.

7.3. Recommendation to the Regional Corridor Development Master Plan Formulation (hereinafter referred to as "the Master Plan Study")

During the master plan study, the latest data of the target countries should be further collected and analyzed in addition to the data obtained during the data collection survey to understand issues and conditions during the master plan formulation period. Major objective of the regional corridor development is to strengthen the regional industry and enhancing mutual complement among countries through the development assuring consistency among existing plans and projects of each country. The sector development projects then become necessary to support general regional security assurance and to expand intra-regional trade, thus proposed. The recommendation to the master plan formulation is described hereafter.

(1) Necessity of Role Analysis of Ports in Regional Corridor Development

The function of port in the region should be recognized as the gateway to landlocked countries, and the most effective way for the corridor is to improve the efficiency of port service sector. The role of Djibouti Port should focus on the service improvement to meet the demand of Ethiopia and its trade and the further connection to South Sudan. The role of Port Sudan on the other hand is mainly to fulfill Sudan's own trade demand. As industrial development concerned of value-chain and intra-trade expansion with Ethiopia[1], Sudan may need to take another role for industrial integration.

(2) Understanding Roles of the Target Countries to the Regional Corridor Development

Ethiopia's high economic growth behind its large population will continue, inducing structural changes in economy. There are a large number of transport infrastructure projects as well as industrial projects such as Industrial Parks. They should be considered as a whole so that components complement each other. Besides, Sudan and South Sudan, where output of oil production is and will be the main driver of economic growth, have been affected by armed conflicts. Therefore, it could be more effective to work together with Ethiopia for regional industrial development.

(3) Investment Promotion necessary to the Economic Development for Regional Integration

The target countries face large trade deficit due to increase of import, and it is important to effectively promote Foreign Direct Investments (FDIs) to achieve smooth development. Although political stability is necessary for enabling such external capital inflow, improving connectivity among the countries is necessary not only for lowering transaction cost, which in turn should induce economic growth but for the purpose of bolstering the exchange of goods and people which should contribute to develop industry for regional integration, therefore enhancement of FDI promotion is important.

[1] Regarding analysis of Input-Output Table, additional note is shown as Appendix 11.

(4) Importance of Choice and Focused Infrastructure Development

It is important to identify priority in infrastructure development. Especially in Djibouti and Ethiopia many infrastructure projects are underway for new ports, new railways, highway improvements, and new processing facilities in the corridor. Upon completion physical means of transport in the Djibouti-Addis Ababa corridor will be significantly improved. Such Djibouti-Ethiopia corridor development could be a backbone of regional network development of spine to Sudan and South Sudan that should strengthen to achieve wider regional network. Integral analysis of target products for transport through/by ports, railway and highway services in relation to the development target industries is important.

(5) Development Effort to be made in order to eliminate Institutional Barriers among countries

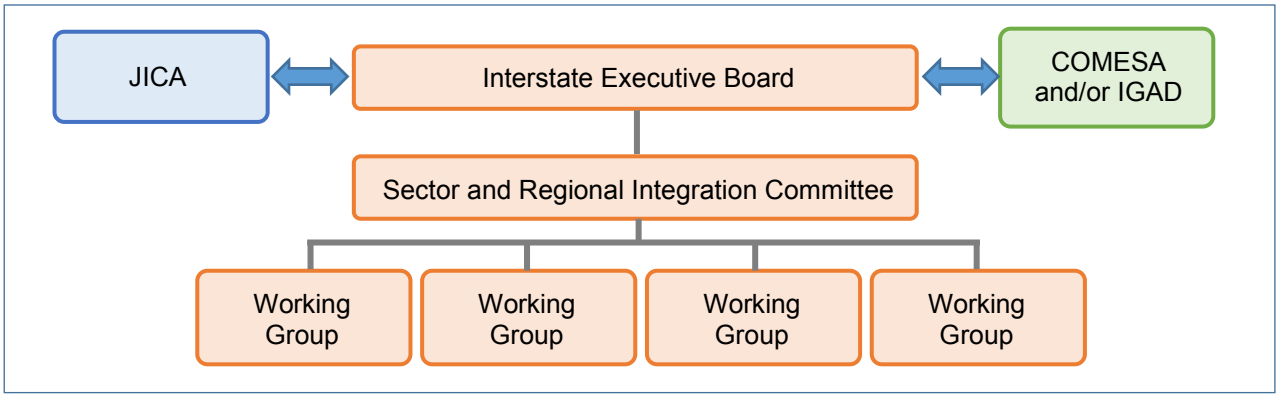
Non-physical barriers against efficient transport in the corridor seem to be quite high, even in African standards. Abolishing non-physical trade barriers is always a difficult task as a loss of national revenue would entail and a large number of people maintained to operate procedures that are in effect barriers. Effort must be made in a painstaking process of proving to reduce inefficient time and cost use, and it is also necessary to design good facilitation mechanism with proper policy for cross border facility, customs and cross border management[2].

(6) Potential through Regional Market Competitiveness

The developments of Djibouti port and Berbera port of Somalia could trigger a good regional competitiveness as those countries in the hinterland of those ports needs options. Where options increase, transport network and value-chain formulation could enhance positive competitiveness in the region as if there are possible selections and choices.

(7) Setting-Up Master Plan Formulation Executing Organization Structure (Counterpart) among Four Country

It is important to establish a joint executing body among four countries and implementation structure in each country in order to maximize target four countries' cooperation and active relationship for the master plan formulation for regional integration and corridor development. In order for the effective active organization setup, Interstate Executive Board (IEB) with representatives from each country and Working Group (WG) for each country could be established as expected effective. IEB will function as facilitator among countries for overall master plan formulation as well as JICA coordination. IEB will also coordinate with DCA if set by COMESA or IGAD. Each country's development plans may need to be integrated by sector based package, and such action should be well facilitated by higher entity, and Sector and Regional Integration Committee (SRIC) would be considered effective to be set for such coordination function between WGs and IEB within the regional cooperation.



Source: JICA Survey Team

Figure 7.3.1 Master Plan Formulation Executing Organization Structure (tentative)

- Interstate Executive Board (IEB)

  IEB may be formulated by selected representatives from each target country (such as general secretary level of government agencies), and this could make various coordination and facilitation at the highest

[2] The agreement reached by Ethiopia and Djibouti for streamlining customs procedures last March indicates the right direction, however there are number of issues concerned for actual operation.

level related to planning among countries. Besides, IEB should confirm the master plan submitted by the Sector / Regional Integration Committee through a consensus development.

- Sector Region Integrated Committee (SRIC)
  The committee is comprised of officials from key agencies elected from the group of competent ministries and agencies in each country. The committee is, especially, for coordinating plans between sectors and regions and make adjustments so that the whole plan will be integrated at this level, and it plays a role of verification / confirmation and required modification / adjustment to assure the plan from the WG is consistent with the strategy of regional development as well as each national level development plans and policies. Regarding the development of border facilities etc., SRIC will coordinate and manage particularly.

- Working Group (WG)
  It is an organization for formulating an elaborated development plan segmented into national level from the whole integrated strategy of regional corridor development, comprised of representative technical officials etc. from competent ministries of targeted development sector in each country. In formulating the plan, it works closely with survey team, having in charge of P/C (public consultation) activities etc. conducted in each country basis and plays a central role in technical adjustment and confirmation.

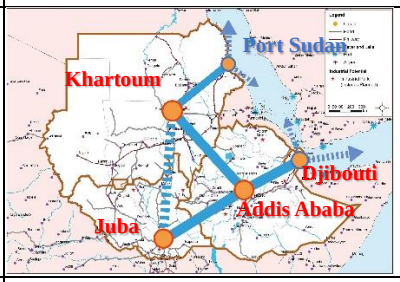
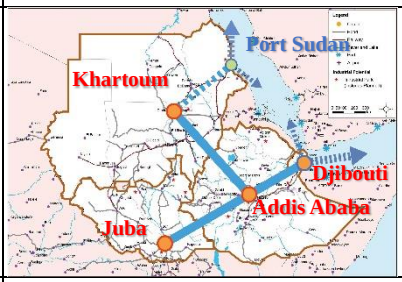
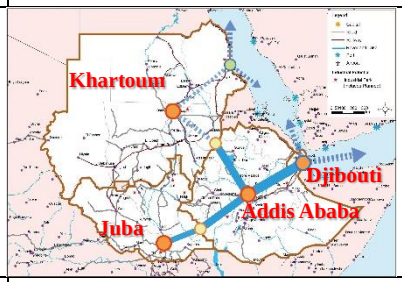
(8) Timing for the Master Plan Study

The master plan study needs to be implemented during the best suitable period considering target countries' upper level national plan periods and other development plans by COMESA and IGAD, for instance expecting effective cooperation and coordination with these RECs. All concerned national development plans have time frame and target before 2019, and the master plan study should be conducted taking into account of these timing and synergy effect.

(9) Scale and option of target area in the master plan formulation

Recommendations are summarized in this chapter on the basis of formulating a master plan for the four target countries in the master plan study. There are several issues in the region, such as difficulty to enter the country and conduct the survey due to internal political unrest and conflict, thus it is assumed that the target area of the study will be partially reduced as shown in the following table with scale reduced study options.

Table 7.3.1 Options of regional corridor development

	Idea-1	Idea-2	Idea-3
Map for target area			
Outline of plan	Corridor that connects all four countries and intra-regional collaboration between Sudan and South Sudan could focus on collaboration for food trade, for instance. It intends to revitalize intra-regional trade by strengthening cooperation from Ethiopia to the other three countries. Connections to Djibouti Port and Port Sudan are included in the plan. It aims to maximize industrial development in each country.	This option develops radial corridors to Sudan, South Sudan and Djibouti from Ethiopia. Industrial development and intra-regional trade also add value to regional products from the resources and materials use utilizing on Ethiopia's manufacturing development. It could strengthen connection to landlocked country considering the Djibouti port centered.	This option establishes a basic network of intra-regional trade collaboration by mainly Ethiopia connecting to Djibouti port. Also connections to the Sudan border and the inland part of South Sudan could be achieved. South Sudan could relieve the weaknesses of inland situation by connecting to Djibouti and may support industrial development.
Advantage	This connects all four target countries and use resources and materials of each country to achieve value added manufacturing throughout the region. This maximizes regional trade activities and overseas trade as well.	This could reduce development costs by focusing on strengthening industrial development utilizing resources and materials between targeted two countries and investment targets. It could be possible to take measures against local political unrest.	Avoiding the complicated problems of each target country, it focuses on strengthening collaboration between Ethiopia and Djibouti, and concentrate regional cooperation on specific areas by developing small areas, thereby reducing costs and development period.
Difficulty of plan	The plan is a tool to comprehensively solve the problems each target country has, with high difficulty of development coordination among four countries. The development executing period would be longer due to political unrest or problems in the area.	It may be difficult to coordinate opinions among the target countries in order to promote regional collaboration while limiting target development sectors to both industries and infrastructure. It may be difficult to develop some infrastructure due to individual budget issue of each country.	It could be difficult to establish regional trade and value-chain between target countries and value-added development due to limited resource use and infrastructure utilization of each country by limit the development scale and area.

Source: JICA Survey Team

Appendix

Appendix 1 List of Official Government Interviewees

Djibouti	
Mr. Said Nouh Hassan	Secretary General, Ministry of Equipment and Transport
Ms. Mariam Hamadou Ali	Director of Economy, Ministry of Economy and Finance
Mr. Yasin Housein Douale	Director for Bilateral Relations, Ministry of Foreign Affairs
Mr. Tabarek Mohamed Ismael	Technical Advisor to the Minister, Ministry of Agriculture, Livestock, Fishery and Water Resources
Mr. Houssein Rirache	Director Planning, Ministry of Housing, Urban and Town Planning and Environment
Mr. Simon Mibrathu	Secretary General, Ministry of Budget
Mr. Abdallah Ali Mohamed	Ministry of Labor
Mr. Abeli Abdillahi	Ministry of National Education and Vocational Training
Mr. Mohamed Hamonler	Advisor, Djibouti Railway Company
Mr. Sema Birara	Head, Maritime Transit Services Agency
Mr. Mahamoud Houssein	Operations Director, Ports & Free Zones Authority
Mr. Aquad Izzi	Director General, Djibouti Customs and Indirect Tax
Colonel Abdillahi Abdi Farah	Director General, Immigration Police, Djibouti Police
Mr. Osman Houssein Bouraleh	Director Financial Officer, Djiboutian Road Agency (ADR)
Mr. Djama Ibrahim Darar	The Port of Djibouti S.A. (PDSA)
Mr. Mohamed Ali Farah	Operation Manager, Electricite de Djibouti (EdD)
Mr. Houmed-Gaba Omar	Director of Project and Acting Secretary General, Ministry of Energy and Natural Resources
Mr. Kassim Mahmoud Waiss	Djibouti Telecom
Mr. M. Ahmed Youssouf Elmi	Secretary General, Ministry of Communication, Posts and Telecommunication
Ethiopia	
Mr. Kokeb Misrak	Director Bilateral Cooperation, Ministry of Finance and Economic Cooperation
Mr. Abiyot Dagne	Coordinator, Perspective Plan Preparation & Research Directorate, National Planning Commission
Mr. Ahmed Nuru	Director of Policy and Program Study and M&E and Special Advisor, Ministry of Industry
Mr. Assefa Mulugeta	Director General, Export Promotion Directorate, Ministry of Trade
Mr. Seifu Assefa	Director, Agricultural Input Marketing Directorate, Ministry of Agriculture and Natural Resources
Dr. Legese Lemma	Bureau Head, Urban Planning, Ministry of Urban Development and Housing
Mr. Astawesgn Mulatu	Team Leader, Human Resource Study & Labour Market Information, Ministry of Labor and Social Affairs
Mr. Teka Gebreyesus	Deputy Commissioner, Ethiopian Investment Commission
H.E. Mrs. Ayelech Eshet	State Minister, Ministry of Public Enterprises and Human Resource Development
Ms. Roman Kassahun	Director, Environment Assessment, Ministry of Forest, Environment and Climate Change
H.E. Tewodros G. Egziabher	State Minister, Ministry of Mines, Pertoleun and Natural Gas
Mr. Asfaw Abebe Eregnaw	Director General, Federal Small & Medium Manufacturing Industry Development Agency
Mr. Mekonnen Yaie	Director General, Kaizen Institute
Ms. Birknesh Gonfa Yado	Director, Marketing Support Directorate, Ethiopian Leather Industry Development Institute
Mr. Minyahel Terefe	Director, Ginning & Spinning Directorate, Ethiopian Textile Industry

	Development Institute
Ms. Likyelesh Abay	Director, Promotion Directorate, Industrial Park Development Corporation
Mr. Tadesse Tefera Yimamu	Director, Transport Policy & Legal Affairs Directorate, Ministry of Transport
Mr. Alemayehu Woldie	Freight Transport Competent Directorate Director, Federal Transport Authority
Mr. Daniel Mengestie	Deputy General Director of Planning & ICT, Ethiopian Roads Authority
Mr. Temeszen Yihunie	Director Logistics Coordination Directorate, Ethiopian Maritime Affairs Authority
Mr. Berhanu Kassa	Director Global Cargo Sales & Service, Ethiopian Airlines (ET), Ethiopian Airport Enterprise (EAE)
Mr. Tilahun Sarka	Deputy CEO, Trail Transport Division, Ethiopian Railways Corporation
Mr.Ato Zelalem	Deputy Director, Ethiopian Immigration and Nationality Affairs
Mr. Abiy Woretaw	Deputy General Manager, Ethiopian Toll Roads Enterprise
Mr. Tesema Fote	Head of CEO office, Ethiopian Shipping & Logistics Service Enterprise
Mr.Ahmed Yasin	Deputy Director Valuation and Tariff Classification, Ethiopian Revenue and Customs Authority
Mr. Teclehaimanof Areya	Modjo Port Terminal Acting Director, Ethiopian Shipping & Logistics Service Enterprise (ESLSE) Modjo Dry Port
Mr. Sahele Tamiru Fekede	Director, Directorate of Energy Study, Ministry of Water, Irrigation and Electricity
Mr. Balcha Reba	Director, ICT Standardization and Regulation, Ministry of Communication and Information Technology
Mr. Daniel Mulatu	Manager, Generation Strategy & Investment, Ethiopian Electric Power
Mr. Ketsela Tadesse Hategebreal	Director of Petroleum Licensing and Administration Directorate, Ministry of Mines, Petroleum and Natural Gas
Sudan	
Dr. Siddig Elobaid	Ministry of Finance & Economic Planning
Ms. Batoul Abasa Awnd	Director General, External Relation, Ministry of Industry
Ms. Omsalama Osman	Director, Bilateral Department, Ministry of Trade
Dr. Nabeel A. Saad	General Director, Statistics and Planning Dept., Ministry of Agriculture and Forest
Mr. Suliman Elboni	Deputy General Director, Environment, Ministry of Environment, Natural Resources and Urban Development
Dr. Nagmeldin Hassan Ibrahim	Undersecretary, Ministry of Investment
Mr. Tarig Mohamed Ichiar	Planning, National Highway Authority
Mr. Hassab Alkarim Adam Alnour	Head of Customs, Sudan Customs
Eng. Maghrabi Elmaj Yassin Ali	Deputy General Manager for Project and Planning, Sudan Railway Corporation
Mr. Yassin Mohamed	General Manager, River Transport Corporation
Mr. Abdelsalam Elawad	Khartoum Office Manager, Sudan Port Corporation
Ms. Zohaira Mohame	Planning Officer, Ministry of Water Resources, Irrigation and Electricity, Water Resource Management
South Sudan	
Mr. Bida Emmanuel Francis	Acting Director Macroplanning, Ministry of Finance and Planning
Mr. Kout Madhor Mout	Director, External Trade, Ministry of Trade and Industry
Mr. Daniel Atem Awuol Apet	General Director, National Projects and Donor Coordination, Ministry of Agriculture and Food Security
Mr. Nicola Ireneo Voci Kenyi	Mining Cadastre Officer, Ministry of Mining

Mr. Manyok. S. Chol Kok	Policy and Research Officer, Ministry of Transport
Mr. Otim Bong Mike	Director, Ministry of Roads & Bridges
Mr. Edwin Rokani Uliamete Ikudri	Director of Road Maintenance, South Sudan Roads Authorit
Mr. Kon Atem Ajak	Director General, Administration and Finance, Ministry of Energy and Dams
Mr. Thomas Gatkouth Nyak	Director General, Telecommunication, Ministry of Information, Telecommunication and Postal Services
Mr. Saber Ojak Chol Kwet	Acting Director General for Supply and Investment, Ministry of Petroleu
Mr. Michael Wani Kenyi	Deputy Director, Power Distribution, South Sudan Electricity Corporation
Ms Juliet William Wani Duk	Head Customs in Juba, South Sudan Customs Service
Mr. Alex Sabah Nelson Noah	Acting Deputy Director, South Sudan Bureau of Standards
Others	
Mr. Joseph Rwanshote	Programme Manager: Trade, Industry and Tourism, IGAD
Mr. Sindiso Ngwenya Mr. Mutabzi Jean Bapliste	Secretary General, COMESA Director, COMESA
Mr. Ken Fujie	JICA Advisor to EAC, EAC
Mr. Eisuke Tachibana	Infrastructure Advisor, NEPAD
Mr. John Aylieff	Representative and Country Director, World Food Programme

Appendix 2 Concerned Organizations for Economic Development and Investment and their Roles

Country	Government Organizations (core and/or potential)	Roles and Field of Services (expected)
Djibouti	Ministry of Economy and Finance,	• National level economic development planning • Financing and budget administration and monitoring • Industrial development and investment planning
	Ministry of Agriculture, Water, Fisheries, Livestock and Fisheries Resources	• Sector development planning • Sector budget distribution and Monitoring • Statistic data collection and analysis
	Ministry of Labour	• Labor and employment strategy • Sector budget distribution and Monitoring • Statistic data collection and analysis
Ethiopia	Ministry of Finance and Economic Cooperation	• National level economic development planning • Financing and budget administration and monitoring
	Ministry of Trade	• Sector development planning • Sector budget distribution and Monitoring • Statistic data collection and analysis
	Ministry of Mines and Energy	• Sector development planning • Sector budget distribution and Monitoring • Statistic data collection and analysis
	Ministry of Agriculture	• Sector development planning • Sector budget distribution and Monitoring • Statistic data collection and analysis
	Ethiopian Investment Commission	• Investment planning
	Ministry of Industry	• Sector development planning • Organize different organization to promote export (TIDI, LIDI, MIDI)
Sudan	Ministry of Finance and Economic Planning	• National level economic development planning • Financing and budget administration and monitoring

Country	Government Organizations (core and/or potential)	Roles and Field of Services (expected)
	Ministry of Agriculture and Forestry	• Sector development planning • Sector budget distribution and Monitoring • Statistic data collection and analysis
	Ministry of Trade	• Trade planning • Statistic data collection and analysis
	Ministry of Industry	• Industrial development planning • Statistic data collection and analysis
	Ministry of Oil and Gas	• Sector development planning • Sector budget distribution and Monitoring • Statistic data collection and analysis
	Ministry of Foreign Trade	• Foreign trade planning • Statistic data collection and analysis
	Ministry of Investment	• Industrial and investment planning
South Sudan	Ministry of Finance and Economic Planning	• National level economic development planning • Financing and budget administration and monitoring
	Ministry of Petroleum	• Sector development planning • Statistic data collection and analysis
	Ministry of Mining	• Sector development planning • Statistic data collection and analysis
	Ministry of Agriculture and Food Security	• Sector development planning • Sector budget distribution and Monitoring • Statistic data collection and analysis
	Ministry of Trade and Industry, Ministry of Livestock and Fisheries	• Sector and Industrial development and investment planning • Sector budget distribution and Monitoring • Statistic data collection and analysis

Source: JICA Survey Team

Appendix 3 Policies and National Plans for Regional and Urban Development

Country	Government Organizations (Core and/or Potential)	Policies and National Plans
Djibouti	Ministry of Housing, Urban Planning and Environment	-Vision Djibouti 2035 -SCAPE 2015-2019 (Strategy of Accelerated Growth and Promotion of Employment) -Millennium Development Goals in Djibouti
Ethiopia	Ministry of Urban Development and Housing	-Growth and Transformation Plan II -Growth and Transformation Plan I (2010/11-2014/15) -Millennium Development Goals 2012 -Plan for Accelerated and Sustained Development to End Poverty (PASDEP-by 2010) -Second Urban Local Government Development Program (2015-2019)
Sudan	Ministry of Environment, Natural Resources and Urban Development	-25-Year Economic Strategy 2007-2031 -Five Year Programme for Economic Reform 2015-2019 -Country Programme Action Plan (2013-2016)
South Sudan	Ministry of Housing and Physical Planning	-South Sudan Development Plan 2011-2013 -South Sudan Infrastructure Action Plan

Source: JICA Survey Team

Appendix 4 Policies and National Plans for Economic Development and Investment

Country	Government Organizations (core and/or potential)	Policies and National Plans
Djibouti	Ministry of Economy and Finance, Ministry of Agriculture, Water, Fisheries, Livestock and Fisheries Resources Ministry of Labour	-Vision Djibouti 2035 - Strategy of Accelerated Growth and Promotion of Employment (2015-2019)
Ethiopia	Ministry of Finance and Economic Cooperation Ministry of Trade, Ministry of Mines, Fuel & Natural Gas Ministry of Agriculture, Ethiopian Investment Commission Ethiopian Industrial Parks Development Corporation Ministry of Industry Ministry of Mines, Fuel, and Natural Gas	-Growth and Transformation Plan II -Millennium Development Goals 2012
Sudan	Ministry of Finance and Economic Planning Ministry of Agriculture and Forestry, Ministry of Trade Ministry of Industry, Ministry of Oil and Gas Ministry of Foreign Trade, Ministry of Investment	-25-Year Economic Strategy 2007-2031 -Five Year Programme for Economic Reform 2015-2019
South Sudan	Ministry of Finance and Economic Planning Ministry of Petroleum, Ministry of Mining Ministry of Agriculture and Food Security Ministry of Trade and Industry, Ministry of Livestock and Fisheries	-South Sudan Development Plan 2011-2013

Source: JICA Survey Team

Appendix 5 Ministries for Land Use and Urban Development

Country	Responsible Agency	Acts, Regulations and others
Djibouti	Ministry of Housing, Urban and Town Planning	Acts of Urban Planning Land Law No.177
Ethiopia	Ministry of Urban Development and Housing	Building Regulations, The Construction Industry Development Council Reinvestment Act, Urban Land Lease Holding Proclamation No.721/2011 Urban Planning Proclamation No.574/2008 Federal Urban Planning Institute Establishment Proclamation No.455/2005 Micro and Small Business Development Agency mek'wak'waye Council Regulation, The Construction Project Management Institute cope with Council Regulation
Sudan	Ministry of Environment, Natural Resources and Urban Development	Land Act, 1970 Unregistered Land Act Land Allocation and Distribution Law 1994 1984 Civil Transaction Act 1925 Land Settlement and Registration Law 1994 Urban Planning and Disposition Law
South Sudan	Ministry of Housing and Physical Planning Land Commission	Land Act of 2009 (from Sudan administration) Local Government Act of 2009 Mining Act 2012 and Mining Regulation 2015

Source: JICA Survey Team

Appendix 6 Organization Structure and Roles of Concerned Government Entities

<table>
<tr><td colspan="4">Djibouti</td></tr>
<tr><td colspan="4">Ministry of Economy and Finance</td></tr>
<tr><td>Roles</td><td>• Implementation and coordination of the economic and financial policy
• Management of the assets, resources and the State debt of the financial control of the monetary institutions and of the credit
• Prepares and implements the fiscal and fiscal policy of the government
• Monitors with the Minister responsible for the budget, the prevention of fraud and respect of budgetary discipline
• Develops and implements, in conjunction with the Ministry in charge of the Budget, the government's policy on the mobilization of internal resources, external finance and revenues, and relations with development partners
• Develops and implements, in conjunction with the Ministry in charge of the Budget, the government's policy on the mobilization of internal resources, external finance and revenues, and relations with development partners
• Responsible for the development of the private sector
• Designs and implements the policy and strategic orientations of industrial development as well as policy of competitiveness and regional economic integration</td><td>Structure</td><td>◊ Secretary General
◊ Directorate of Human and Material Resources
◊ Directorate of Legal Affairs
◊ the IT Department.
Central Technical Directorates are:
◊ Department of Economy, Planning and Portfolio
◊ Directorate of Statistics
◊ Directorate of Industry
◊ Budget Directorate
◊ Directorate of Budget Execution
◊ Directorate of Taxes
◊ Directorate of Customs and Indirect Duties
◊ Department of Lands and Conservation
◊ External Financing Department
◊ Directorate of Public Accounting and Auditing
◊ General Treasury Department
◊ Directorate for Trade, Competition and Regional Integration
◊ Department of SMEs, Handicrafts and Formalization.</td></tr>
<tr><td colspan="4">Ministry of Housing, Urban Planning and Environment</td></tr>
<tr><td>Roles</td><td>• Planning and urban planning
• Administration of approval and development control
• Management of Planning and law/regulation
• Manage land occupancy plans and land use
• Asset management and real estate promotion
• Housing development and improvement
• Manage seismic engineering design
• Manage construction administration and procurement
• Technical control of construction
• City development and activity monitoring</td><td>Structure</td><td>◊ The Offices of Promotion and Real Estate Management (OPGI)
◊ The National Agency for the Improvement and Development of Housing (AADL)
◊ The National Housing Fund (CNL)
◊ Mutual Guarantee and Guarantee Fund for Real Estate Promotion (FGCMPI)
◊ National Center for Studies and Research in the Building Industry (CNERIB)
◊ The Center for Seismic Engineering (CGS)
◊ The National Agency for Urban Planning (ANURB)
National Center for Studies and Animation of the Building, Public Works and Hydraulic Enterprise (CNAT)
◊ National Center of Construction Engineering (CNIC)
◊ National Organization for the Technical Control of Construction (CTC)
◊ National Laboratory of Housing & Construction (LNHC)
◊ The National Observatory of the City (ONV)</td></tr>
</table>

Ethiopia

Ministry of Economy and Finance,

Roles

Mission

Make real a prosperous Ethiopia by formulating development policies, preparing development plan and budget, mobilizing and administering external resources, installing modern, efficient, effective & accountable public finance and property administration and controlling system.

Strategic Pillars

- Public finance administration and control
- Resource mobilization and effective utilization
- Economic leadership and management

Strategic Objectives

1. **National perspective**

- Ensure faster, sustainable and equitable economic growth
- Improve the macro-economic administration
- Scale up the supply of resource for development
- Harmonize population issues with economic growth
- Enhance the delivery and distribution of information and communication
- Boost developmental partnership and cooperation

2. **Resource Perspective**

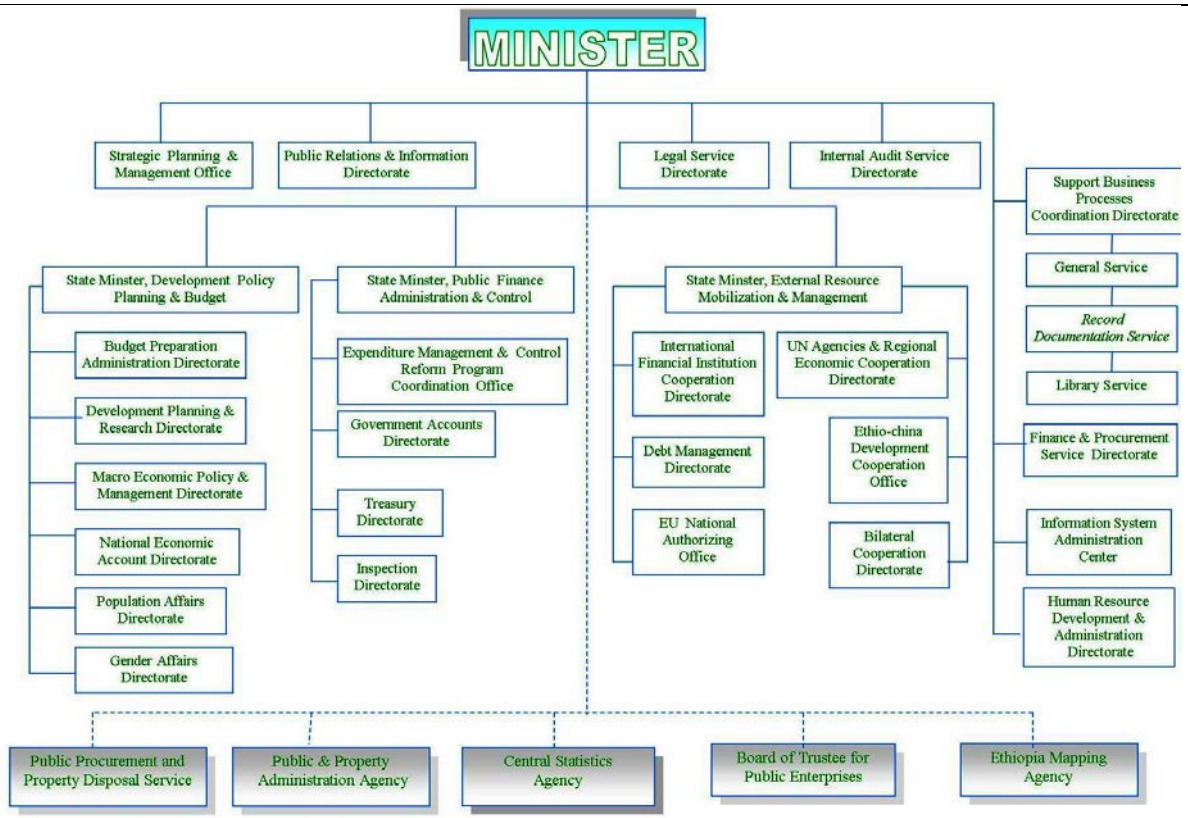
- Improve the effectiveness of resource utilization
- To better resource flow

3. **Operational system perspective**

- Improve public finance and internal audit operation systems
- Strengthen monitoring and evaluation systems
- Improve development planning and budget preparation system
- Improve information communication system

Structure

Structure



Ministry of Housing, Urban Planning and Environment			
Roles	**Mission-** To make residents beneficiaries by making urban centers to become development and good governance centers by supplying standardized services through integration and coordination of customers and stakeholders.	Structure	◊Capacity Building and Reforms Management Bureau ◊Urban Land Development and Management Bureau ◊Housing Development and Government Building Construction Bureau ◊Urban Good Governance and Capacity Building Bureau ◊Urban Planning, Sanitation and Beautification Bureau ◊Policy and Program Bureau ◊Information Technology and Database Development Bureau ◊Minister Office and Mini Cabine Affairs ◊Resource Management Coordinating Bureau ◊Public Relation and Communication Office ◊Audit Department ◊Ministry Advisory Office
Sudan			
Ministry of Finance and Economic Planning			
Roles	• Prepare financial and economic development plans and policies • Administrate and control financial plan of the country • Monitor the budget use	Structure	◊ unclear
South Sudan			
Ministry of Finance and Planning			
Roles	• Prepare financial and economic development plans and policies • Administrate and control financial plan of the country • Monitor the budget use	Structure	◊ unclear

Source: JICA Survey Team

Appendix 7 Trade Statistics

7-1 Ethiopia Trade Statistics

Total Value of Imports, Domestic Exports and Re-Exports and Visible Balance of Trade (Million Birr)

YEAR	Ethiopia Year	IMPORTS	DOMESTIC EXPORTS AND RE-EXPORTS	VISIBLE BALANCE OF TRADE
2005	1997/98	35,365.9	8,028.3	27,337.6
2006	1998/99	46,141.9	9,082.2	-37,059.7
2007	1999/00	52,007.4	11,474.8	-40,532.6
2008	2000/01	79,453.0	14,946.0	-64,507.0
2009	2001/02	90,310.2	17,732.3	-72,577.9
2010	2002/03	123,270.8	32,259.9	-91,010.9
2011	2003/04	152,456.4	61,932.4	-90,524.0
2012	2004/05	253,020.4	71,742.2	-181,278.2
2013	2005/06	275,331.2	75,278.6	-200,052.6

Source: Central Statistics Agency, Ethiopia

7-2 Ethiopia Commodity Export Quantity and Value

Quantity and Value of Exports by Commodity Group

SECTION I	**2011**		**2012**		**2013**	
LIVE ANIMALS; ANIMAL PRODUCTS						
1. Live animals	247,864.3	5,636,171.5	211,171.1	5,702,715.9	195,175.5	6,293,781.4
2. Meat and edible meat offal	18,275.0	1,301,291.1	15,414.5	1,300,828.6	14,607.2	1,365,574.0
3. Fish and crustaceans, mollusks and other aquatic invertebrates	933.8	8,076.0	938.9	8,524.6	798.0	7,559.9
4. Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	5,146.4	57,685.5	5,360.7	66,594.2	5,697.5	74,495.4
5. Products of animal origin, not elsewhere specified or included	660.4	34,343.3	478.2	45,419.1	377.4	41,052.7
SECTION II	**2011**		**2012**		**2013**	
VEGETABLE PRODUCTS						
6. Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	102,756.4	8,152,050.8	131,118.4	10,631,354.9	136,888.0	10,890,319.5
7. Edible vegetables and certain roots and tubers	462,285.7	11,382,730.6	563,531.1	13,559,949.2	655,081.8	16,020,183.1
8. Edible fruits and nuts; peel of citrus fruit or melons	13,618.1	70,241.4	13,357.9	83,462.2	21,488.6	113,346.1
9. Coffee, tea, mate and spices	221,677.3	19,117,567.2	293,701.1	21,451,914.0	245,399.0	14,823,013.4
10. Cereals	148,601.7	649,702.2	25,353.5	748,806.1	11,458.2	99,700.8
11. Products of the milling industry; malt; starches; insulin; wheat gluten	1,036.3	39,838.5	481.2	13,533.9	526.0	17,278.9
12. Oil seeds and oleaginous fruits, miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	297,900.3	6,687,882.8	409,024.2	9,339,933.4	336,689.3	10,446,582.7
13. Lac; gums' resins and other vegetable saps and extracts	4,054.4	212,211.5	3,105.0	190,787.8	3,711.6	237,582.7
14. Vegetable plaiting materials; vegetable products not elsewhere specified or included	1,474.4	2,216.1	7,796.6	19,240.2	9,092.7	22,565.6
SECTION III	**2011**		**2012**		**2013**	
ANIMAL OR VEGETABLE FATS AND OILS AND THEIR CLEAVAGE PRODUCTS; PREPARED EDIBLE PATS; ANIMAL OR VEGETABLE WAXES						
15. Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	411.5	35,838.3	407.4	42,570.1	342.1	47,760.9
SECTION IV	**2011**		**2012**		**2013**	
PREPARED FOODSTUFFS; BEVERAGES SPIRITS AND VINEGAR; TOBACCO AND MANUFACTURED TOBACCO SUBSTITUTES						
16. Preparations of meat, of fish or crustaceans mollusks or other aquatic invertebrates	528.3	19,625.8	360.8	15,955.7	6.8	778.8
17. Sugars and sugar confectionery	13.2	657.4	1.2	38.7	2.4	472.4
18. Cocoa and Cocoa preparations	-	-	-	-	1.1	68.4
19. Preparations of cereals, flour, starch or milk; pasterycooks' products	2,691.8	70,267.8	2,722.4	86,190.0	3,786.1	125,728.5
20. Preparations of vegetables; fruit, nuts or other parts of plants	1,697.7	97,741.9	1,313.1	117,781.5	981.9	120,748.4
21. Miscellaneous edible preparations	90.0	3,678.6	113.8	7,190.9	1.7	68.8
22. Beverages, spirits and vinegar.	3,850.3	64,097.3	3,848.1	87,668.4	3,468.2	90,343.7
23. Residues and waste from the industries; prepared animal fodder	13,297.1	51,622.4	8,478.1	37,781.0	37,955.2	193,243.7
24. Tobacco and manufactured tobacco substitutes	51.6	9,077.1	10.1	1,836.3	24.0	4,903.8
SECTION V	**2011**		**2012**		**2013**	
MINERAL PRODUCTS						
25. Salt; sulfur; earth's and stone; plastering materials, lime and cement	458.8	4,573.6	2,141.0	8,524.0	39,015.5	77,458.3
26. Ores, slag and ash	361.6	435,092.6	241.1	275,722.3	249.0	37,529.7
27. Mineral fuels, mineral oils and products of their distillation;	0.1	4.2	63.9	1,658.8	232,402.6	4,810,096.6

bituminous substances; mineral waxes						
SECTION IV	**2011**		**2012**		**2013**	
PRODUCTS OF THE CHEMICAL OR ALLIED INDUSTRIES						
28. Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	161.2	988.0	213.3	6,802.9	127.8	1,780.9
29. Organic chemicals.	0.9	168.1	-	-	1.4	52.7
30. Pharmaceutical products	55.7	25,573.9	23.8	18,294.5	24.3	12,306.8
31. Fertilizers.	0.2	14.5	0.6	218.8	4.9	195.5
32. Tanning or dyeing extracts; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	9.2	3,136.3	13.1	2,114.8	9.1	1,203.9
33. Essential oils and resinoids; perfumery, cosmetic or toilet preparations	1,603.0	70,863.1	1,151.2	61,757.5	886.8	47,509.4
34. Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial waxes, prepared waxes, polishing or scouring preparations, candles and similar articles, modeling pastes, "dental waxes" and dental preparations with a basis of plaster	103.6	2,856.1	184.2	4,730.2	129.5	5,151.2
35. Albuminoidal substance; modified starches; glues; enzymes	0.1	0.7	0.4	14.2	0.0	19.5
36. Explosives; pyrotechnic products; matches; pyrophoric alloys; certain combustible preparations.	-	-	72.9	2,074.2	15.4	422.4
37. Photographic or cinematographic goods	2.0	638.4	0.3	26.5	0.4	54.1
38. Miscellaneous chemical products	437.4	2,516.6	298.6	277.2	144.5	75.2
SECTION VII	**2011**		**2012**		**2013**	
PLASTICS AND ARTICLES THEREOF; RUBBER AND ARTICLES THEREOF						
39. Plastics and articles thereof	564.3	10,501.9	532.7	8,890.5	948.0	14,128.7
40. Rubber and articles thereof	1,722.6	31,102.5	1,572.2	18,486.8	1,536.0	23,296.1
SECTION VIII	**2011**		**2012**		**2013**	
RAW HIDES AND SKINS, LEATHER, FURSKINS AND ARTICLES THEREOF; SADDLERY AND HARNESS; TRAVEL GOODS, HANDBAGS AND SIMILAR CONTAINERS; ARTICLES OF ANIMAL GUT (OTHER THAN SILK-WORM GUT)						
41. Raw hides and skins (other than furskins) and leather	5,590.2	2,068,186.6	2,643.4	1,509,595.6	3,657.4	1,909,642.1
42. Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut)	18.1	11,438.9	116.2	53,086.1	140.4	60,671.8
43. Furskins and artificial fur; manufactures thereof.	0.0	1.7	-	-	45.7	845.8
SECTION IX	**2011**		**2012**		**2013**	
WOOD AND ARTICLES OF WOOD; WOOD CHARCOAL; CORK AND ARTICLES OF CORK; MANUFACTURES OF STRAW, OF ESPARTO OR OF OTHER PLAITING MATERIALS; BASKET WARE AND WICKERWORK						
44. Wood and articles of wood; wood charcoal.	53,080.4	152,067.3	44,605.3	114,135.8	49,464.6	126,168.7
45. Cork and articles of cork.	0.0	0.3	-	-	-	-
46. Manufactures of straw, of esparto or of other plaiting materials; basket ware and wickerwork	22.8	1,034.1	506.8	3,007.9	260.4	2,370.5
SECTION X	**2011**		**2012**		**2013**	
PULP OF WOOD OR OF OTHER FIBROUS CELLULOSE MATERIAL; WASTE AND SCRAP OF PAPER OR PAPERBOARD; PAPER AND PAPERBOARD AND ARTICLES THEREOF						
47. Pulp of wood or of other fibrous cellulose material; waste and scrap of paper or paperboard	-	-	1.0	5.2	-	-
48. Paper and paperboard ; articles of paper pulp, of paper or of paperboard	15.5	452.9	16.1	375.8	32.5	1,354.4
49. Printed books, newspapers, pictures and other products of the	58.0	7,616.3	55.5	7,903.6	55.1	8,881.7

printing industry; manuscripts, typescripts and plans						
SECTION XI	**2011**		**2012**		**2013**	
TEXTILES AND TEXTILE ARTICLES						
50. Silk	0.0	11.9	0.0	11.8	0.0	0.1
51. Wool, fine or coarse animal hair; horsehair yarn and woven fabric	-	-	0.0	0.3	1.1	82.8
52. Cotton.	5,174.3	411,711.5	10,132.7	432,948.0	15,098.8	738,171.7
53. Other vegetable textile fibers; paper yarn and woven fabrics of paper yarn	33.4	2,133.5	0.6	59.6	12.3	881.6
54. Man-made filaments	468.9	63,218.8	218.6	26,129.0	334.6	33,466.8
55. Man-made staple fibers	183.2	14,545.7	419.7	32,874.6	339.7	28,420.7
56. Wadding, felt and non wovens; special yarns, twine, cordage, ropes and cables and articles thereof	3.2	812.7	3.0	391.8	16.6	1,457.2
57. Carpets and other textile floor coverings	14.0	1,733.0	23.7	2,938.2	63.6	5,485.7
58. Special Woven fabrics; tufted textile fabrics; lace; tapestries; trimmings; embroidery	34.2	5,429.8	12.6	2,050.6	1.5	323.0
59. Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use.	0.2	194.6	0.7	80.2	7.2	1,557.2
60. Knitted or crocheted fabrics	86.7	5,949.9	0.2	20.8	89.8	10,807.7
61. Articles of apparel and clothing accessories, not knitted or crocheted.	1,570.9	318,397.2	1,637.2	323,621.1	2,410.6	526,895.9
62. Articles of apparel and clothing accessories, not knitted or crocheted	1,222.4	254,414.2	1,515.8	331,645.1	775.7	216,527.6
63. Other made up textile articles; sets; worn clothing and worn textile articles; rags	1,419.1	202,197.5	1,409.0	142,908.0	1,485.0	174,859.3
SECTION XII	**2011**		**2012**		**2013**	
FOOTWEAR; HEADGEAR, UMBRELLAS, SUN UMBRELLAS, WALKING-STICKS, SEAT-STICKS, WHIPS, RIDING-CROPS AND PARTS THEREOF; PREPARED FEATHERS AND ARTICLES MADE THEREWITH; ARTIFICIAL FLOWERS; ARTICLES OF HUMAN HAIR						
64. Footwear, garters and the like; parts of such articles	481.9	145,573.6	805.6	253,963.7	1,548.4	523,330.5
65. Headgear and parts thereof	1.3	1,290.5	4.2	1,509.4	0.7	109.8
66. Umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips, riding-crops and parts thereof	0.6	123.1	0.5	50.9	0.3	46.3
67. Prepared feathers and down and articles made of feathers or of down; artificial flowers; articles of human hair	0.6	61.2	1.1	260.2	0.2	33.9
SECTION XIII	**2011**		**2012**		**2013**	
ARTICLES OF STONE, PLASTER, CEMENT, ASBESTOS MICA OR SIMILAR MATERIALS, CERAMIC PRODUCTS; GLASS AND GLASSWARE						
68. Articles of stone, plaster, cement, asbestos, mica or similar materials	1,012.6	15,388.9	991.1	17,048.3	874.8	17,393.8
69. Ceramic products	109.1	8,828.8	106.2	4,558.9	95.0	4,676.6
70. Glass and glassware	15.2	2,696.9	12.1	1,462.1	13.0	1,561.4
SECTION XIV	**2011**		**2012**		**2013**	
NATURAL OR CULTURED PEARLS, PRECIOUS OR SEMI-PRECIOUS STONES, PRECIOUS METALS, METALS CLAD WITH PRECIOUS METAL AND ARTICLES THEREOF; IMITATION JEWELRY; COIN						
71.Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal and articles thereof; imitation jewelry; coin	27.3	2,233,357.3	27.5	3,258,864.5	26.6	3,124,260.5
SECTION XV	**2011**		**2012**		**2013**	
BASE METALS AND ARTICLES OF BASE METAL						
72. Iron and steel	47.6	1,247.2	149.3	13,153.8	1,054.8	19,172.6
73. Articles of iron or steel	269.9	13,122.6	427.2	27,302.0	672.3	53,518.0
74. Copper and articles thereof	94.1	11,402.4	30.1	4,029.5	0.5	17.9
75. Nickel and articles thereof	7.0	1,167.2	5.2	939.6	8.0	1,391.4
76. Aluminum and articles thereof	30.0	1,101.2	152.7	5,572.5	45.4	1,953.7

78. Lead and articles thereof	1,369.5	26,935.9	209.0	1,445.2	0.0	12.5
79. Zinc and articles thereof	750.0	7,991.4	821.1	8,031.6	-	-
80. Tine and articles thereof	0.2	24.3	-	-	-	-
81. Other base metals; ceremets; articles thereof.	13.0	4,529.2	-	-	2.1	3,053.3
82. Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal	61.9	9,574.0	98.4	44,456.0	109.2	48,907.2
83. Miscellaneous articles of base metal	119.1	6,376.2	18.5	1,789.0	18.9	1,958.1
SECTION XVI	**2011**		**2012**		**2013**	
MACHINERY AND MECHANICAL APPLIANCES; ELECTRICAL EQUIPMENT; PARTS THEREOF; SOUND RECORDERS AND TELEVISION IMAGE AND SOUND RECORDERS AND REPRODUCERS, AND PARTS AND ACCESSORIES OF SUCH ARTICLES						
84. Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	6,241.7	1,030,749.9	1,969.7	294,548.1	1,597.0	527,425.6
85. Electrical machinery and equipment and parts thereof; and recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	315.5	75,146.7	667.1	185,730.3	825.1	134,195.0
SECTION XVII	**2011**		**2012**		**2013**	
VEHICLES, AIRCRAFT, VESSELS AND ASSOCIATED TRANSPORT EQUIPMENT						
86. Railway or tramway locomotives, rolling-stock and parts thereof; railway of tramway track fixtures and fittings and parts thereof; mechanical (including electro-mechanical) traffic signaling equipment of all kinds	160.7	27,018.2	41.5	4,570.6	71.2	11,468.1
87. Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof	2,866.1	291,717.8	3,152.1	388,656.9	1,096.8	342,225.9
88. Aircraft, spacecraft, and parts thereof	4.1	58,861.0	193.4	97,013.0	460.6	320,673.0
89. Ships, boats and floating structures	0.1	83.6	0.4	63.9	9.6	1,753.1
SECTION XVIII	**2011**		**2012**		**2013**	
OPTICAL, PHOTOGRAPHIC, CINEMATOGRAPHIC, MEASURING, CHECKING, PRECISION, MEDICAL OR SURGICAL INSTRUMENTS AND APPARATUS; CLOCKS AND WATCHES; MUSICAL INSTRUMENTS; PARTS AND ACCESSORIES THEREOF						
90. Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof	59.5	85,011.5	94.1	111,772.6	144.2	119,629.6
91. Clocks and watches and parts thereof	0.2	15.4	0.3	327.1	0.1	90.9
92. Musical instruments; parts and accessories of such articles	8.5	1,583.8	5.0	893.1	22.8	32,672.5
SECTION XIX	**2011**		**2012**		**2013**	
ARMS AND AMMUNITION; PARTS AND ACCESSORIES THEREOF						
93. Arms and ammunition; parts and accessories thereof	0.6	8.5	0.0	33.9	0.7	428.9
SECTION XX	**2011**		**2012**		**2013**	
MISCELLANEOUS MANUFACTURED ARTICLES						
94. Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere specified or included; illuminated signs, illuminated name-plates and the like; prefabricated buildings	351.0	42,310.9	401.3	41,745.1	429.7	49,949.0
95. Toys, games and sports requisites; parts and accessories thereof	32.2	2,984.8	15.3	1,502.4	39.3	4,546.6
96. Miscellaneous manufactured articles	80.3	14,183.0	67.4	14,617.0	52.4	12,459.8
SECTION XXI	**2011**		**2012**		**2013**	
WORKS OF ART, COLLECTORS' PIECES AND ANTIQUES						
97. Works of art, collectors' pieces and antiques	14.3	4,291.1	16.5	2,917.6	17.7	2,475.2

Total Exports	**1,637,937.6**	**61,938,952.1**	**1,778,398.7**	**1,742,287.7**	**2,043,920.1**	**75,278,697.3**
	Quantity	Value	Quantity	Value	Quantity	Value
COMMODITY	in Tons	in '000 Birr	in Tons	in '000 Birr	in Tons	in '000 Birr
	2011		**2012**		**2013**	

Source: Central Statistics Agency, Ethiopia

7-3.1 Sudan Trade Statistics

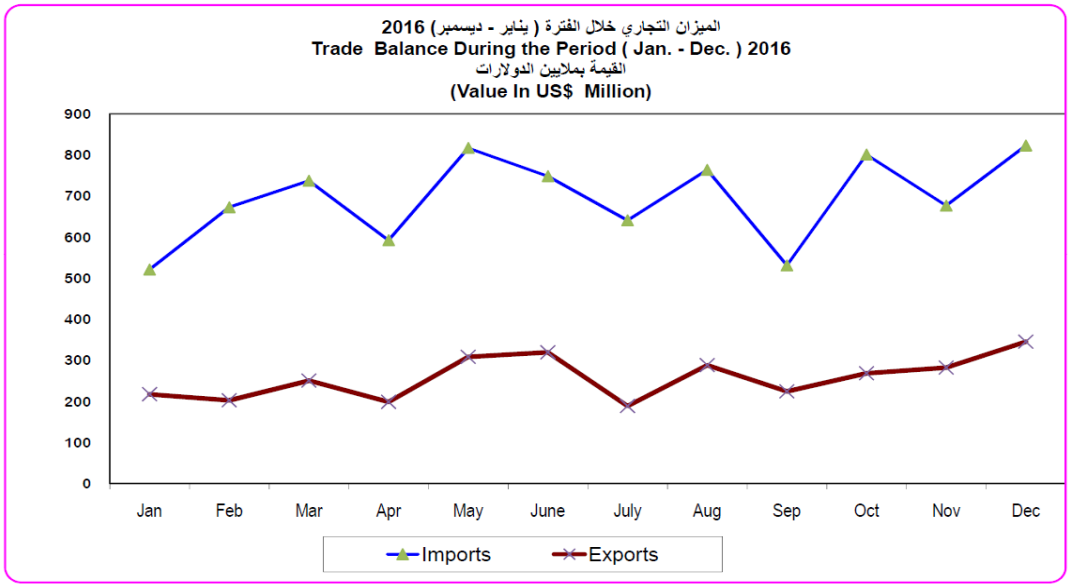
الميزان التجارى خلال الفترة 2006 -2016
Trade Balance During The Period 2006 - 2016
(القيمة بآلاف الدولارات)
(Value In US.$000'S)

Period	الميزان التجارى Trade Balance	الواردات Imports	الصادرات Exports	الصادرات غيرالبترولية Non Petroleum Exports	الصادرات البترولية Petroleum Exports	الفترة
2006	(2,416,930)	8,073,498	5,656,568	569,357	5,087,211	2006
2007	103,793	8,775,457	8,879,250	460,722	8,418,528	2007
2008	2,318,964	9,351,540	11,670,504	576,393	11,094,111	2008
2009	(1,433,813)	9,690,918	8,257,105	1,020,318	7,236,787	2009
2010	1,359,510	10,044,770	11,404,280	1,712,018	9,692,262	2010
2011	957,572	9,235,860	10,193,432	2,294,239	7,899,193	2011
2012	(5,163,819)	9,230,318	4,066,499	3,111,511	954,988	2012
2013	(5,128,336)	9,918,068	4,789,732	3,073,187	1,716,545	2013
2014	(4,861,090)	9,211,300	4,350,210	3,096,140	1,254,070	2014
2015	(6,339,642)	9,508,653	3,169,011	2,541,829	627,182	2015
2016*	(5,229,756)	8,323,395	3,093,639	2,757,926	335,713	2016*
January	(303,692)	521,077	217,385	168,445	48,940	يناير
February	(470,053)	672,610	202,557	178,967	23,590	فبراير
March	(486,602)	736,961	250,359	214,635	35,724	مارس
April	(393,535)	592,276	198,741	198,741	-	ابريل
May	(508,439)	816,919	308,480	248,858	59,622	مايو
June	(428,913)	748,226	319,313	310,777	8,536	يونيو
July	(452,001)	640,660	188,659	155,424	33,235	يوليو
August	(475,315)	763,498	288,183	240,026	48,157	اغسطس
September	(306,668)	530,944	224,276	220,642	3,634	سبتمبر
October	(532,598)	800,918	268,320	227,877	40,443	اكتوبر
November	(394,418)	676,583	282,165	276,748	5,417	نوفمبر
December	(477,522)	822,723	345,201	316,786	28,415	ديسمبر

*Provisional * بيانات اولية

Source: Sudan Foreign Trade Statistical Digest (Jan – Dec 2016), Central Bank of Sudan

7-3.2 Sudan Trade Balance



Source: Sudan Foreign Trade Statistical Digest (Jan – Dec 2016), Central Bank of Sudan

7-3.3 Sudan Commodity Export

Table No. (4) جدول رقم
الصادرات حسب السلع خلال الفترة (يناير - ديسمبر) 2015 - 2016 *
Exports By Commodities During (Jan. - Dec.) 2015 - 2016 *
(القيمة بالالف الدولارات)
(Value in US.$000'S)

Commodities	Unit	2015 (يناير - ديسمبر)** **(Jan. -Dec) 2015		2016 (يناير - ديسمبر)* *(Jan. -Dec) 2016		الوحدة	السلـــــــــــع
		الكمية Quantity	القيمة Value	الكمية Quantity	القيمة Value		
Crude Oil	Barrel	12,115,647	573,906	6,898,396	271,062	برميل	بترول خام
Benzene	M.T.	79,571	50,995	146,601	64,651	طن متري	بنزين
Kerosene	"	4,416	2,070	-	-	" "	كيروسين
Light Gas	"	-	-	-	-	" "	غاز طبيعي
F/O& HCGO	"	-	-	-	-	" "	الوقود الحبيبي
Furnace	"	-	-	-	-	" "	فيرنس
Mixbutagas	"	100	110	-	-	" "	غاز مخلوط
Diesel	"	-	-	-	-	" "	ديزل
Others Petroleium Produts	Value	-	101	-	-	قيمة	منتجات بترولية اخري
Cotton	Bales	29,644	39,365	67,958	80,001	بالة	قطن
Gum Arabic	M.T.	90,920	111,687	61,782	98,293	طن متري	صمغ عربي
Sesame	"	307,363	453,478	467,629	379,347	" "	سمسم
Groundnuts	"	3,296	2,994	32,686	26,693	" "	فول سوداني
Hibiscus Flower	"	14,253	18,740	15,584	16,491	" "	كركدي
Melon Seeds	"	56,302	30,650	35,926	20,670	" "	حب بطيخ
Senna Pods	"	2,303	2,013	1,934	1,576	" "	سنمكة
Henna	"	4,835	2,803	1,837	933	" "	حنه
Dura (Sorghum)	"	107,341	28,169	108,191	28,180	" "	ذرة
Sunflower Seeds	"	120	102	-	-	" "	بذور زهرة الشمس
Crude Groundnuts Oil	"	560	945	21,534	25,953	" "	زيت فول سوداني
Sugar	"	181,173	58,580	105,187	40,520	" "	سكر
Molasses	"	25,500	2,805	57,280	6,672	" "	مولاس
Cake& Meal	"	143,287	24,211	118,197	28,704	" "	امباز
Sheep	Head	5,476,356	492,794	3,967,143	363,699	راس	ضان
Goats	"	452,062	30,409	275,650	18,391	" "	ماعز
Camels	"	194,834	260,009	225,459	271,898	" "	جمال
Other livestock	M.T.	-	21,088	-	57,153	قيمة	حيوانات حية اخرى
Meat	"	17,954	70,081	8,874	37,074	"	لحوم
Vegetables& Fruits	"	102,407	29,446	142,647	60,627	"	فواكه وخضروات
Gold	K.G.	19,389	725,697	26,973	1,043,838	كيلو جرام	ذهب
Iron & Copper Scraps	M.T.	13,750	21,555	13,553	22,410	طن متري	خردة
Chromium	"	13,800	2,982	1,093	156	"	كروم
Hides & Skins	Value	-	34,197	-	14,719	قيمة	جلود
Others	"	-	77,029	-	113,928	"	اخرى
Total			3,169,011		3,093,639		المجموع

* Provisional Data
** Adjusted data

* بيانات اولية
** بيانات معدلة

Source: Sudan Foreign Trade Statistical Digest (Jan – Dec 2016), Central Bank of Sudan

7-3.4 Sudan Commodity Import Summary

جدول رقم (1) TABLE NO. (1)

ملخص الواردات خلال الفترة (يناير -ديسمبر) 2016*

Summary Of Imports By Commodity During (Jan. - Dec.) 2016*

(القيمة بآلاف الدولارات)

(Value In US.$000'S)

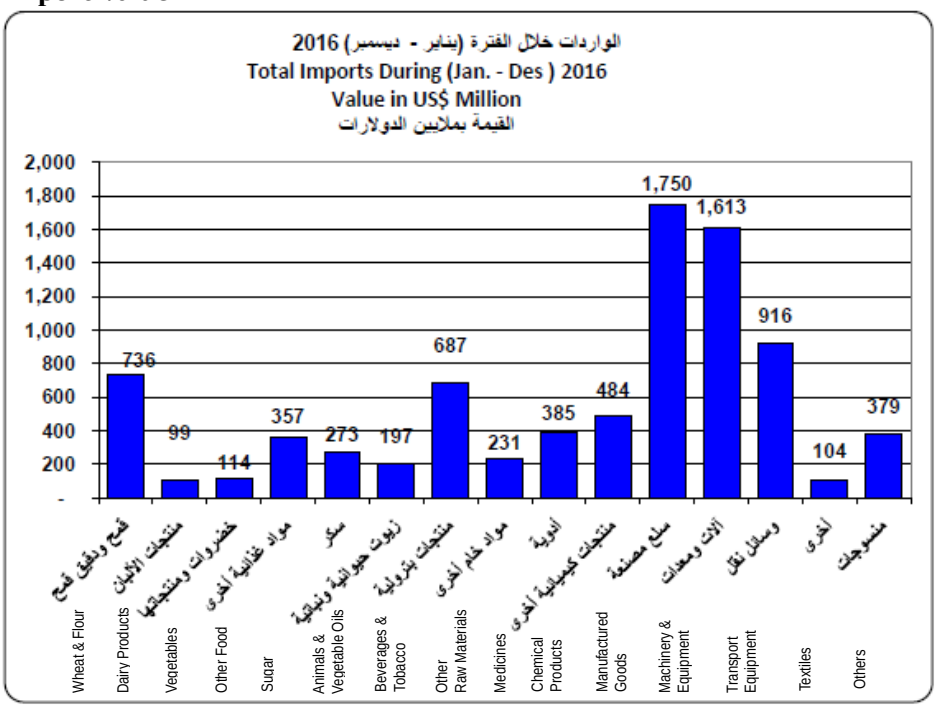
Commodity	Unit	الكمية Quantity	القيمة Value	الوحدة	السلـــــــع
Wheat & Wheat Flour	M.T	1,952,179	736,334	طن متري	قمح ودقيق قمح
Sugar	"	611,984	272,597	" "	سكر
Dairy Products	"	39,312	98,940	" "	منتجات الألبان
Vegetables & Veget. Products	"	138,718	113,580	" "	خضروات ومنتجاتها
Other Foodsutfs	Value	-	356,772	قيمة	مواد غذائية أخرى
Animal & Vegetable Oils	M.T	244,689	197,248	طن متري	زيوت حيوانية ونباتية
Beverages & Tobacco	"	-	80,241	" "	المشروبات والتبغ
Petroleum Products	"	1,456,178	687,462	" "	منتجات بترولية
Other Raw Materials	"	146,173	230,661	" "	مواد خام أخرى
Medicines	Value	-	385,356	قيمة	أدوية
Other Chemical Products	"	-	483,706	" "	منتجات كيماوية أخرى
Manufactured Goods	"	-	1,749,631	" "	سلع مصنعة
Machinery and Equipments	"	-	1,613,303	" "	آلات ومعدات
Transport Equipments	"	-	915,504	" "	وسائل نقل
Textiles	"	-	378,529	" "	منسوجات
Others	"	-	23,531	" "	أخرى
Total			8,323,395		المجموع الكلى

*Provisional Data

* بيانات اولية

Source: Sudan Foreign Trade Statistical Digest (Jan – Dec 2016), Central Bank of Sudan

7-3.5 Sudan Import Value



Source: Sudan Foreign Trade Statistical Digest (Jan – Dec 2016), Central Bank of Sudan

7-3.6 Sudan Commodity Import Value

جدول رقم(4).Table No
الواردات حسب السلع خلال الفترة (يناير - ديسمبر) 2015 - 2016 *
Impotrs by Commodity During (Jan. - Dec.) 2015 - 2016 *
(القيمة بآلاف الدولارات)
(Value in US.000's)

Commodity	UNIT	2015 (يناير - ديسمبر)** **(Jan - Dec) 2015		2016 (يناير - ديسمبر)* *(Jan - Dec) 2016		الوحدة	السلع
		الكمية Qty.	القيمة Value	الكمية Qty.	القيمة Value		
Foodstuffs:							مواد غذائية:-
Wheat	M.T	1,522,731	532,167	1,343,681	448,990	طن متري	قمح
Wheat Flour	"	441,389	223,584	608,497	287,344	"	دقيق قمح
Sugar	"	1,299,255	550,127	611,984	272,597	"	سكر
Tea	"	30,235	52,424	31,406	54,904	"	شاى
Coffee	"	38,016	46,409	37,014	44,699	"	بن
Dairy Products	"	34,529	89,051	39,312	98,940	"	منتجات الألبان
Fish & Canned Fish	"	3,073	5,322	3,118	5,977	"	أسماك ومعلبات الأسماك
Meat & Meat Products	"	345	928	164	396	"	لحوم ومنتجاتها
Fruits & Fruit Products	"	98,506	41,837	62,418	33,160	"	فواكه ومنتجاتها
Vegetable & Vegetables Products	"	123,834	96,458	138,718	113,580	"	خضروات ومنتجاتها
Confectionery, Sweets & Buiscuits	"	34,074	29,540	34,120	32,493	"	حلويات وبسكويت
Lentils	"	49,809	52,973	13,202	13,393	"	عدس
Animal & Vegetable Oils	"	273,946	243,193	244,689	197,248	"	زيوت حيوانية ونباتية
Spices	"	10,617	16,651	9,229	13,193	"	بهارات
Rice	"	137,898	31,989	69,863	35,980	"	ارز
Others	VALUE	-	120,214	-	122,577	قيمة	أخرى
Total			**2,132,867**		**1,775,471**		**المجموع**
Beverages & Tobacco:					-		المشروبات والتبغ :-
Soft Drinks	VALUE	-	37,797	-	32,792	قيمة	مشروبات معدنية
Cigarettes	"	-	1,442	-	328	"	سجائر
Tobacco	"	-	40,075	-	47,121	"	تبغ
Others	"	-	-	-	-	"	أخرى
Total			**79,314**		**80,241**		**المجموع**

Commodity	UNIT	2015 (يناير - ديسمبر)** **(Jan - Dec) 2015		2016 (يناير - ديسمبر)* *(Jan - Dec) 2016		الوحدة	السلع
		الكمية Qty.	القيمة Value	الكمية Qty.	القيمة Value		
Raw Materials:							مواد خام:-
Petroleum Products	M.T	1,110,465	1,189,426	1,456,178	687,462	طن متري	منتجات بترولية
Raw Plastic	"	140,595	224,352	146,173	199,975	"	خام البلاستيك
Raw Rubber	"	2,731	1,136	2,318	901	"	خام المطاط
Tallow	"	16,519	22,485	15,743	21,021	"	شحوم
Seeds For Sowing	"	746	9,366	924	8,540	"	بذور وتقاوى
Packing Paper	"	-	-	-	-	"	ورق تغليف
Other	VALUE	-	131	-	224	قيمة	أخرى
Total			**1,446,896**		**918,123**		**المجموع**
Chemicals:							مواد كيماوية:-
Medical& Pharmaceutical Products	VALUE	-	460,979	-	385,356	قيمة	أدوية
Chemicals Products	"	86,285	122,128	-	122,787	"	عناصر كيماوية ومركباتها
Fertilizers	M.T	199,270	87,034	299,458	98,572	طن متري	إسمدة
Tanning & Dyeing Materials	"	127,630	74,190	42,530	85,456	"	مواد للدباغة والصباغة والتلوين
Perfumes & Cosmetics	"	52,981	104,245	55,585	107,172	"	عطور ومستحضرات تجميل
Explosives	"	6,649	21,174	11,108	12,576	"	مفرقعات
Insecticides	"	1	38	501	255	"	مبيدات حشرية
Others	VALUE	-	59,178	-	56,888	قيمة	أخرى
Total			**928,966**		**869,062**		**المجموع**
Manufactured Goods:							مصنوعات:-
Medical&Pharmaceutical Equipments	VALUE	-	89,223	-	85,254	قيمة	معدات طبية وصيدلية
Leather Products.	M.T	7,827	12,273	7,923	11,876	طن متري	مصنوعات الجلود
Manufactured Rubber	"	6,761	20,746	6,787	20,523	"	مصنوعات المطاط
Manufactured Plastic	"	137,142	205,735	79,849	176,489	"	مصنوعات البلاستيك
Manufactured Wood & Cork	"	152,817	61,951	142,820	68,804	"	مصنوعات خشب والفلين
Glass & Classware	"	94,055	71,174	170,193	73,172	"	مصنوعات الزجاج
Iron & Steel	"	997,776	803,269	937,584	696,899	"	حديد وصلب
Manufactured Metal	"	57,962	127,743	70,955	120,901	"	مصنوعات المعادن
Footwear	VALUE	-	91,453	-	76,660	قيمة	أحذية
Jute & Sacks	NO.	73,172	106,822	49,260	79,375	عدد	خيش وجوالات
Books,Magazines,And Newspapers	M.T	2,785	11,709	4,900	31,181	طن متري	كتب ومجلات وجرائد
Cement & stony products	"	309,558	11,805	84,323	17,187	"	أسمنت ومنتجات حجرية
Scientific Equipments	VALUE	-	83,903	-	73,508	قيمة	اجهزة علمية
Paper Products	M.T	139,761	147,889	127,182	123,420	طن متري	مصنوعات الورق
Ceramic Products	"	117,085	61,141	117,275	56,913	"	مصنوعات الخزف
Toys & Sport Goods	VALUE	-	6,877	-	7,109	قيمة	لعب اطفال وادوات رياضية
Other	"	-	27,604	-	30,360	"	أخرى
Total			**1,941,317**		**1,749,631**		**المجموع**

Commodity	UNIT	2015 (يناير - ديسمبر)** **(Jan - Dec) 2015		2016 (يناير - ديسمبر)* *(Jan - Dec) 2016		الوحدة	السلـــــع
		الكمية Qty.	القيمة Value	الكمية Qty.	القيمة Value		
Machinery & Equipment:							الآت ومعدات:-
Non-Electrical Appliances	M.T	104,967	460,842	102,823	418,997	طن متري	الات غير كهربائية
Electrical Appliances	VALUE	-	297,987	-	345,862	قيمة	الات كهربائية
Refrigerators	NO.	8,059	28,908	9,577	34,115	عدد	ثلاجات
Air Conditioners	"	4,911	29,134	5,464	29,864	"	مكيفات هواء
Machinery Spare Parts	VALUE	-	301,964	-	320,353	قيمة	قطع غيار الات
T.V., Radios, Recorders & Tapes, etc.	"	2,728	75,879	-	82,436	"	تلفزيونات وراديوهات واشرطة ومسجلات واجهزة اتصال
Dry Batteries	NO.	3,606	7,387	1,771	4,338	عدد	بطاريات جافه
Accumulators	"	11,250	33,063	12,516	38,032	"	بطاريات
Tractors	"	23,134	185,726	16,430	153,212	"	جرارات
Ovens	"	952	2,503	1,265	3,339	"	افران
Other	VALUE	-	226,303	-	182,755	قيمة	أخرى
Total			1,649,696		1,613,303		المجموع
Transport Equipment:							-:وسائل نقل
Railway Locomotives	NO.	1,544	40,457	-	-	عدد	قاطرات
Railway Wagons	"	2,431	7,856	929	811	"	عربات قطارات
Motor Cars	"	18,373	204,730	25,144	255,590	"	عربات صوالين
Trucks & Lorries	"	41,425	275,992	42,639	249,666	"	شاحنات و لواري
Buses	"	2,191	19,709	1,176	12,634	"	بصمات
Tyres & Tubes	"	83,141	140,609	64,796	142,588	"	انابيب واطارات
Auto-Spare Parts	VALUE	-	151,561	-	155,510	قيمة	قطع غيار عربات
Motor-Cycles	NO.	3,698	20,121	10,619	49,010	عدد	دراجات بخارية
Bicycles	"	1,105	3,741	1,774	3,814	"	دراجات
Aircrafts	"	-	-	-	-	"	طائرات
Aircraft Spare Parts	VALUE	-	34,880	-	30,573	قيمة	قطع غيار طائرات
Locomotive Spare Parts	"	-	5,740	273	12,392	"	قطع غيار قاطرات
Ferries & Steamers	NO.	183	5,173	715	2,916	عدد	مراكب بخارية ومعديات
Other	VALUE	-	-	-	-	قيمة	أخرى
Total			910,569		915,504		المجموع
Textiles:							-:منسوجات
Yarn	M.T	4,648	6,201	4,619	6,299	طن متري	غزل
Sewing Threads	"	1,041	3,199	886	2,659	"	خيوط حياكه
Woven Synthetic Fabric	"	21,939	96,537	26,955	115,839	"	اقمشة من حرير صناعي
Woven Cotton Fabrics	"	70	164	149	215	"	اقمشة من قطن
Woven Flax Fabrics	"	785	103	73	70	"	اقمشة من كتان
Man-Made Filament & Staple	"	114	630	42	125	"	منسوجات من شعيرات تركيبية
Waddig Of Textile Materials	"	3,168	6,773	4,176	9,079	"	حشو من مواد نسيجية
Carpets	VALUE	-	4,082	-	4,526	قيمة	سجاد
Special Woven Fabrics	M.T	5,877	36,651	7,273	35,047	طن متري	منسوجات بصفات خاصة
Knitted Or Crocheted Fabrics	"	-	5	3	27	"	اقمشة مصنرة
Ready Made Clothes	VALUE	-	240,442	-	204,193	قيمة	ملبوسات جاهزة
Other	"	-	530	-	450	"	أخرى
Total			395,317		378,529		المجموع
Other	"	0	24,173		23,531	"	اخرى
Grand Total			9,509,115		8,323,395		المجموع الكلي

*Provisional Data — *بيانات اولية
**Adjusted Data — **بيانات معدلة

Source: Sudan Foreign Trade Statistical Digest (Jan – Dec 2016), Central Bank of Sudan

Appendix 8 Production Statistics

8-1 Sudan Agriculture Production Statistics

السمات العامة للموسم 2016/2015 — إدارة الإحصاء الزراعي

محصول الذرة Sorghum : المساحات المزروعة والمحصودة والإنتاج والإنتاجية لموسم 2016/2015م مقارنة مع 2015/2014 ومتوسط الفترة (2009/2008 – 2013/2012)

المساحة : بالألف فدان Area (000fed) — الإنتاج : بالألف طن متري Production (000MT) — الإنتاجية : بالكيلو جرام/فدان Yield Kg/fed

موسم season 2016/2015				موسم Season 2015/2014				(2013/2012 - 2009/08)					
الإنتاجية Yield	الإنتاج Prod.	المحصودة Harv.	المزروعة Plan.	الإنتاجية Yield	الإنتاج Prod.	المحصودة Harv.	المزروعة Plan.	الانتاجية Yield	الانتاج Prod.	المحصودة Harv.	المزروعة Plan.	مراكز الانتاج Centre of Production	الولاية state
القطاع المروي Irrigated Sector													
860	2	2	4	1150	7	6	8	1000	12	12	13	الشمالية Northern	الشمالية Northern
720	14	20	21	1100	58.3	53	53	855	36	43	44	نهر النيل River Nile	نهر النيل River Nile
0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	الخرطوم Khartoum	الخرطوم Khartoum
850	325	382	412	800	375	469	495	878	414	471	558	مشروع الجزيرة Gezira Scheme	الجزيرة Gezira
-	-	-	-	-	-	-	-	675	1	2	2	خارج الدورة Outside Rotation	الجزيرة Gezira
900	30	33	40	700	25	35	40	975	31	31	37	السوكي Suki	سنار Sennar
635	47	74	79	708	46	65	86	781	55	71	82	سنار Sennar	سنار Sennar
650	61	94	107	900	112	124	130	815	83	102	105	النيل الأبيض White Nile	النيل الأبيض White Nile
-	-	-	-	-	-	-	-	-	-	-	-	النيل الأزرق Blue Nile	النيل الأزرق Blue Nile
990	89	90	95	850	70	82	86	886	80	91	96	الرهد Rahad	القضارف Gedaref
900	63	70	72	900	70	78	81	929	69	74	78	حلفا الجديدة New Halfa	كسلا Kassala
400	14	35	40	1000	100	100	104	965	60	62	64	القاش Gash	كسلا Kassala
-	-	-	-	-	-	-	-	600	1	1	1	كسلا Kassala	كسلا Kassala
630	3	5	5	630	30	48	52	430	5	13	14	طوكر Tokar	البحر الأحمر Red Sea
560	1	2	3	500	1	2	3	528	2	4	6	شمال كردفان North Kordofan	شمال كردفان N. K.
804	649	807	878	842	894	1062	1138	870	850	976	1099	جملة القطاع المروي Total Irrigated Sector	
القطاع المطري الآلي Mechanized Rainfed Sector													
228	357	1563	2106	281	555	1975	2323	145	246	1423	2362	سنار Sennar	سنار Sennar
156	95	610	1005	250	196	783	1044	185	143	802	1042	النيل الأبيض White Nile	النيل الأبيض White Nile
300	288	961	1117	200	157	785	1100	294	119	622	859	النيل الأزرق Blue Nile	النيل الأزرق Blue Nile
119	352	2961	5568	300	1952	6505	7228	166	694	3549	5717	القضارف Gedaref	القضارف Gedaref
37	1	27	900	315	369	1170	1300	154	114	638	1241	كسلا Kassala	كسلا Kassala
	(...)	(...)	(...)	300	3	10	12	167	3	19	26	شمال كردفان N. K.	شمال كردفان N. K.
-	-	-	-	300	3	10	12	-	-	-	-	غرب كردفان West Kordofan	غرب كردفان W. K.
191	310	1619	1889	250	249	996	1423	213	118	683	961	جنوب كردفان South Kordofan	جنوب كردفان S. K.
-	-	-	-	-	-	-	-	-	-	-	-	شمال دارفور North Darfur	شمال دارفور N. D.
-	-	-	-	-	-	-	-	-	-	-	-	غرب دار فور West Darfur	غرب دار فور W. D.
-	-	-	-	-	-	-	-	-	-	-	-	جنوب دار فور South Darfor	جنوب دار فور S. D.
181	1403	7741	12585	285	3484	12234	14442	178	1438	7736	12208	جملة المطري الآلي Total Mechanized Rainfed	

الإدارة العامة للتخطيط والاقتصاد الزراعي

السمات العامة للموسم 2016/2015 — إدارة الإحصاء الزراعي

القطاع التقليدي Rainfed Sector Traditional													
270	5	17	21	450	108	241	347	204	13	64	81	نهر النيل River Nile	نهر النيل River Nile
0	0	0	0	240	47.52	198	226	60	(...)	(...)	(...)	الخرطوم Khartoum	الخرطوم Khartoum
135	1	4	39	234	234	1000	1381	149	90	604	984	الجزيرة Gezira	الجزيرة Gezira
230	64	280	550	281	166	592.5	696.9	192	68	355	543	سنار Sennar	سنار Sennar
45	5	119	265	180	65	364	485	201	77	382	543	النيل الأبيض White Nile	النيل الأبيض White Nile
307	63	205	245	-	-	-	-	261	34	132	188	النيل الأزرق Blue Nile	النيل الأزرق Blue Nile
-	-	-	-	-	-	-	-	-	-	-	-	القضارف Gedaref	القضارف Gedaref
40	0	3	100	360	68	190	200	173	41	238	398	كسلا Kassala	كسلا Kassala
75	1	18	60	90	1	10	60	200	5	23	30	البحر الأحمر Red Sea	البحر الأحمر Red Sea
91	37	405	804	135	78	580	684	86.8	84	965	1342	شمال كردفان North Kordofan	شمال كردفان N. K.
135	65	480	800	135	93	690	863	-	-	-	-	غرب كردفان West Kordofan	غرب كردفان W. K.
253	183	721	799	270	270	1000	1436	245	182	743	894	جنوب كردفان South Kordofan	جنوب كردفان S. K.
120	17	144	240	200	59	296	400	127	24	191	326	شمال دارفور North Darfur	شمال دارفور N. D.
270	56	206	258	383	163	426	532	359	101	280	457	غرب دار فور West Darfur	غرب دار فور W. D.
180	108	600	1000	270	229	849	1213	238	212	891	1378	جنوب دار فور South Darfor	جنوب دار فور S. D.
160	29	180	300	540	208	386	429	99	35	353	543	وسط دارفور Central Darfur	وسط دارفور C. D.
130	58	444	888	234	39	167	275	90	27	300	500	شرق دارفور Eastern Darfur	شرق دارفور E. D.
181	692	3826	6369	262	1830	6990	9228	180	993	5521.3	8207	جملة القطاع التقليدي Total Traditional Rainfed	
222	2744	12374	19832	306	6208	20286	24808	230	3281	14233	21514	جملة السودان Sudan Total	

الإدارة العامة للتخطيط والاقتصاد الزراعي

السمات العامة للموسم 2016/2015 | إدارة الإحصاء الزراعي

القمـــح(Wheat) : المساحات المزروعة والمحصودة والإنتاج والإنتاجية لموسم 2016/2015م مقارنة مع 2015/2014 ومتوسط الفترة (2009/2008 – 2013/2012)

المساحة : بالألف فدان Area (000fed) الإنتاج : بالألف طن متري Production (000MT) الإنتاجية : بالكيلو جرام/فدان Yield Kg/fed

الولاية state	مناطق الإنتاج Centre of Production	(2013/2012 - 2009/2008)				Season 2015/2014 موسم				season 2016/2015 موسم			
		المزروعة Plan.	المحصودة Harv.	الانتاج Prod.	الانتاجية Yield	المزروعة Plan.	المحصودة Harv.	الإنتاج Prod.	الإنتاجية Yield	المزروعة Plan.	المحصودة Harv.	الإنتاج Prod.	الإنتاجية Yield
القطاع المروى Irrigated Sector													
الشمالية Northern	الشمالية Northern	136	129	116	900	100	96	86	900	106	100	90	900
نهر النيل River Nile	نهر النيل River Nile	55	52	38	736	40	38	30	800	40	38	32	850
	الخرطوم Khartoum	6	6	4	700	-	-	-	-	-	-	-	-
الخرطوم Khartoum	دال DAL	7	7	5	677	10	8	6	750	-	-	-	-
الجزيرة Gezira	الجزيرة والمناقل M &.G	279	263	167	634	315	300	270	900	325	315	284	900
الجزيرة Gezira	أخرى Other	19	18	13	762	-	-	-	-	-	-	-	-
النيل الأبيض White Nile	النيل الأبيض White Nile	29	28	18	667	45	41	37	900	-	-	-	-
النيل الأبيض White Nile	خاص Private	-	-	-	-	-	-	-	-	-	-	-	-
النيل الأزرق Blue Nile	النيل الأزرق Blue Nile	-	-	-	-	-	-	-	-	-	-	-	-
سنار Sennar	سنار Sennar	3	3	2	572	-	-	-	-	-	-	-	-
سنار Sennar	السوكي Suki	4	3	2	588	-	-	-	-	-	-	-	-
القضارف Gedaref	الرهد Rahad	4	3	2	588	-	-	-	-	-	-	1	700
كسلا Kassala	حلفا الجديدة New Halfa	15	14	8	603	42	41	37	902	50	49	44	900
كسلا Kassala	الخاص Private	-	-	-	-	-	-	-	-	-	-	-	-
جملة القطاع المروي Total Irrigated Sector		556	526	376	715	552	524	467	891	522	503	451	897
القطاع المطرى Sector Rainfed													
ج. دار فور S. Darfur	ج. دار فور S. Darfur	14	12	6	500	5	4	2	500	5	4	2	450
غ. دار فور W. Darfur	غ. دار فور W. Darfur	12	11	5	510	7	7	4	571	6	5	3	550
جملة المطري التقليدي Total Traditional Rainfedr		26	23	12	505	12	11	6	545	11	9	5	556
جملة السودان Sudan Total		582	549	388	707	564	535	473	884	533	512	456	891

- تقديرات أولية للقمح خلال شهر نوفمبر 2015م.

الإدارة العامة للتخطيط والاقتصاد الزراعي

السمات العامة للموسم 2016/2015 | إدارة الإحصاء الزراعي

السمسم(Sesame) : المساحات المزروعة والمحصودة والإنتاج والإنتاجية لموسم 2016/2015م مقارنة مع 2015/2014 ومتوسط الفترة (2009/2008 – 2013/2012)

المساحة : بالألف فدان Area (000fed) الإنتاج : بالألف طن متري Production (000MT) الإنتاجية : بالكيلو جرام/فدان Yield Kg/fed

الولاية state	مراكز الانتاج Centre of production	(2013/2012 - 2009/2008)				Season 2015/2014 موسم				season 2016/2015 موسم			
		المزروعة Plan.	المحصودة Harv.	الانتاج Prod.	الانتاجية Yield	المزروعة Plan.	المحصودة Harv.	الإنتاج Prod.	الإنتاجية Yield	المزروعة Plan.	المحصودة Harv.	الإنتاج Prod.	الإنتاجية Yield
القطاع المطري الآلي Mechanized Rainfed Sector													
سنار Sennar	سنار Sennar	532	326	23	72	677	535	78	135	440	235	39	167
النيل الأبيض White Nile	النيل الأبيض White Nile	328	275	26	93	355	302	41	135	238	143	13	90
النيل الأزرق Blue Nile	النيل الأزرق Blue Nile	361	247	20	79	370	300	40	135	255	195	31	158
القضارف Gedaref	القضارف Gedaref	920	756	77	102	1227	1118	145	130	785	687	62	90
كسلا Kassala	كسلا Kassala	57	47	5	101	200	200	27	135	10	1	(...)	(...)
شمال كردفان N. Kordofan	شمال كردفان N. Kordofan	-	-	-	-	-	-	-	-	-	-	-	-
جنوب كردفان S. Kordofan	جنوب كردفان S. Kordofan	505	430	35	81	640	512	46	90	600	360	32	90
جملة المطري الآلي Total Mechanized Rainfed		2702	2081	185	89	3469	2967	377	127	2328	1621	177	109
القطاع التقليدي Traditional Rainfed Sector													
الجزيرة Gezira	الجزيرة والمناقل M &.G	11	8	0	99	10	8	0	60	-	-	-	-
سنار Sennar	سنار Sennar	128	68	5	73	225	232	26	135	110	60	10	167
النيل الأبيض White Nile	النيل الأبيض White Nile	336	296	25	84	356	305	41	135	264	158	7	45
النيل الأزرق Blue Nile	النيل الأزرق Blue Nile	145	103	8	76	-	-	-	-	94	73	12	158
كسلا Kassala	كسلا Kassala	9	8	1	101	-	-	-	-	-	-	-	-
شمال كردفان N. Kordofan	شمال كردفان N. Kordofan	2164	1450	56	39	1533	1533	138	90	1800	810	52	65
جنوب كردفان S. Kordofan	جنوب كردفان S. Kordofan	516	355	25	72	890	712	80	112	400	240	28	115
غرب كردفان W. Kordofan	غرب كردفان W. Kordofan	-	-	-	-	180	145	13	90	170	119	10	85
شمال دار فور N. Darfur	شمال دار فور N. Darfur	89	54	6	112	100	85	5	60	60	36	2	60
جنوب دار فور S. Darfor	جنوب دار فور S. Darfor	72	54	6	115	160	112	13	117	150	100	13	125
غرب دار فور W. Darfur	غرب دار فور W. Darfur	283	193	18	95	89	71	11	155	144	115	9	75
شرق دارفور E. Darfur	شرق دارفور E. Darfur	-	-	-	-	145	94	8	85	185	90	6	70
وسط دارفور C. Darfur	وسط دارفور C.I Darfur	97	62	7	112	74	66	9	135	52	31	3	85
جملة القطاع التقليدي Total Traditional Rainfed		3849	2652	158	60	4295	3363	344	102	3429	1832	152	83
جملة السودان Sudan Total		6551	4733	343	72	7764	6330	721	114	5757	3453	329	95

الإدارة العامة للتخطيط والاقتصاد الزراعي

السمات العامة للموسم 2016/2015 — إدارة الإحصاء الزراعي

محصول القطن(Cotton) : المساحات المزروعة والمحصودة والإنتاج والإنتاجية لموسم 2016/2015م مقارنة مع 2015/2014 ومتوسط الفترة (2013/2012 – 2009/2008)

المساحة : بالألف فدان Area (000fed) الإنتاج : بالألف طن متري Production (000MT) الإنتاجية : بالكيلو جرام/فدان Yield Kg/fed

موسم season 2016/2015				Season 2015/2014 موسم				(2013/2012 - 2009/2008)				نوع القطن Type of Cotton	مراكز الإنتاج Centre of Production	الولاية state
الإنتاجية Yield	الإنتاج Prod.	المحصودة Harv.	المزروعة Plan.	الإنتاجية Yield	الإنتاج Prod.	المحصودة Harv.	المزروعة Plan.	الإنتاجية Yield	الإنتاج Prod.	المحصودة Harv.	المزروعة Plan.			
														القطاع المروي Sector Irrigated
-	-	-	-	-	-	-	-	-	-	-	-	أكالا Acala	الزيداب Zeidab	نهر النيل R. Nile
-	-	-	-	-	-	-	-	582	38	66	73	مصري Egy	الجزيرة والمناقل M &.G	
1130	62	55	59	1630	75	46	47	704	20	28	30	أكالا Acala	الجزيرة والمناقل M &.G	الجزيرة
-	-	-	-	-	-	-	-	939	1	1	1	أكالا Acala	الجنيد Genied	Gezira
-	-	-	-	-	-	-	-	-	-	-	-	مصري Egy	السوكي	
864	23	27	30	846	13	15	20	377	3	8	9	أكالا Acala	Suki	سنـــار
705	1	1	1	-	-	-	-	-	-	-	-	مصري Egy	سنـــار	
1100	4	4	4	583	7	12	13	446	9	20	22	أكالا Acala	Sennar	Sennar
-	-	-	-	-	-	-	-	-	-	-	-	مصري Egy	النيل الأبيض White Nile	النيل الأبيض
350	1	2	2	-	-	-	-	382	8	20	22	أكالا Acala	النيل الأبيض White Nile	White Nile
-	-	-	-	-	-	-	-	-	-	-	-	مصري Egy	النيل الأزرق Blue Nile	النيل الأزرق
-	-	-	-	-	-	-	-	-	-	-	-	أكالا Acala	النيل الأزرق Blue Nile	Blue Nile
-	-	-	-	-	-	-	-	-	-	-	-	مصري Egy	الرهـد	القضارف
1215	52	43	46	1100	26	24	25	478	14	30	33	أكالا Acala	Rahad	Gedaref
-	-	-	-	-	-	-	-	-	-	-	-	مصري Egy	حلفا الجديدة	
1215	41	34	38	1030	36	35	36	560	31	55	58	أكالا Acala	New Halfa	كســـلا
-	-	-	-	-	-	-	-	-	-	-	-	مصري Egy	القاش	
-	-	-	-	-	-	-	-	-	-	-	-	أكالا Acala	GASH	Kassala
-	-	-	-	350	0.7	2	2	302	1	4	4	مصري Egy	طوكر	البحر الأحمر
-	-	-	-	-	-	-	-	391	1	3	3	أكالا Acala	Tokar	Red Sea
-	-	-	-	-	-	-	-	-	-	-	-	مصري Egy	أبو حبل	كردفان
-	-	-	-	-	-	-	-	141	0.20	1	1	أكالا Acala	Abu Habil	Kordofan
1108	184	166	180	1180	158	134	143	535	127	237	255			جملة القطاع المروي Total Irrigated Sector

الإدارة العامة للتخطيط والاقتصاد الزراعي

Source: Ministry of Agriculture and Forest, Sudan

8-2 Ethiopia Production Statistics

Production of Major Manufactured Articles 2010/2011 - 2014/2015

NAME OF PRODUCT	UNIT	QUANTITY PRODUCED				
		2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
FOOD						
Meat	TONS	20,910	22,702	*15,426	20,596	19,388
Vegetable Soup	,,	1,987	2,569	-	-	-
Zigin and Shiro wet	,,	1,141	1,870	440	-	2,907
Orange Juice	,,	1,097	15,405	2,867	1,243	384
Marmalade	,,	2,795	593	-	61	6
Tomato Paste	,,	*4,301	1,630	21	209	1,075
Milk Pasturized	H.L.	220,350	243,995	111,925	261,573	310,042
Butter and Ghee	TONS	252	228	5,980	2,144	3,922
Cheese	,,	160	282	3,127	187	476
Edible Oil	,,	6,055	6,520	4,573	9,596	5,612
Oil Cakes	,,	5,839	13,671	13,481	20,800	17,973
Flour (Wheat)	,,	351,148	578,198	1,380,132	1,585,668	992,653
Flour (Others)	,,	14,134	127,290	146,875	116,675	59,981
Fafa, Dube, Edget, Meten etc	,,	21,058	32,166	21,194	26,371	3,732
Macaroni and Pasta	,,	50,060	42,629	63,792	75,940	123,852
Biscuits	,,	*23,267	64,672	153,389	48,848	31,326
Galetta	,,	1,707	1,403	1,403	-	-
Bread	,,	86,930	297,784	261,740	291,390	118,222
Coffee(milled)	,,	1,407	19,059	17,807	591	5,278
Sugar	,,	332,728	333,039	*274,621	284,848	336,866
Tea	,,	10,017	10,122	7,780	11,512	8,589
Molasses	,,	*20,502	29,172	1,615	534	19,770
Sweets	,,	25,531	9,690	10,667	32,681	6,162
Animal Feed	,,	19,563	25,632	35,277	245,362	413,211

NAME OF PRODUCT	UNIT	QUANTITY PRODUCED				
		2010/2011	**2011/2012**	**2012/2013**	**2013/2014**	**2014/2015**
Beer	H.L	4,015,584	4,553,138	6,378,884	7,462,238	5,793,116
Wine	,,	64,342	70,910	64,167	65,426	73,300
Liqours	,,	211,139	237,418	281,264	62,143	202,903
Alcohol	,,	18,752	4,965	1,053	25,988	35,592
Lemonade	,,	4,424,090	3,500,550	4,289,377	3,509,970	4,052,037
Mineral Water	,,	1,343,539	1,512,655	4,288,903	2,027,028	3,103,794
Malt	TONS	27,510	20,724	33,235	37,148	49,133
TOBACCO						
Cigarettes	('000 PCS)	6,217,148	6,217,148	4,111,970	4,111,970	4,545,540
TEXTILES						
Lint Cotton		8,852	8,104	20,723	13,162	559
Cotton Fabrics	('000Sq.m)	11,711	19,076	27,912	34,648	7,506
Nylon Fabrics	,,	722	732	883	4,394	21,940
Acrylic Yarn	TONS	7	2,786	11,855	31,357	5,827
Cotton Yarn	,,	9,845	7,585	9,814	14,136	6,044
Woolen Fabrics	SQ.M.	-	-	-	-	-
Blanket (Woolen)	('000Sq.m)	1,352	1,654	-	-	208
Blanket (Waste Cotton)	PCS	346,060	746,025	1,938,866	1,174,912	1,019,110
Blanket (Others)		695,431	746,324	746,324	460,034	899,899
Bed sheet	PCS	433,882	929,025	8,609,841	8,748,825	5,634,650
Shirts	DOZEN	200,409	385,713	378,831	385,122	662,463
Carpets	SQ.M.	1,452	3,209	51,713	46,529	358
Gunny Bags	TONS	5,825	16,193	3,149	2,041	699
Hosieries	DOZEN	121,769	139,793	*136,653	282,882	-
Wearing Apparel (Except Leather)	,,	10,823	152,068	16,877	214,554	1,008,690
Wearing Apparel (Leather)	PCS	*969	13	2,999	1,127,542	1,660,210
Sweater	DOZEN	3,825	3,058	125	456	723
Sewing Thread	TONS	14	2	791	791	3,238
Emroidery	,,	528	580	580	-	228
Jano Thread	,,	-	-	-	-	-
LEATHER AND FOOTWEAR						
Leather Shoes and Boots	PAIRS	2,127,862	1,966,008	2,473,274	3,371,753	4,610,435
Canvas and Rubber Shoes	,,	1,135,541	1,274,445	1,101,115	334,370	1,110,144
Plastic Footwear	,,	20,886,016	21,569,795	*20,879,303	18,545,442	28,711,002
Leather Upper and Linning	('000Sq.m)	2,680	6,436	34,424	29,812	15,377
Leather Sole	PAIRS	65,822	102,111	21,499	7,417,057	365,893
Semi Processed Skins	('000 PCS)	13,515	13,515	17,058	4,300	11,494
Leather Garment	('000 SqFt)	6,067	33,141	81,325	84,232	21,101
Plastic Sole	PAIRS	3,272,920	3,609,748	5,444,238	3,297,397	7,698,662
Crust Hides and Wet Blue Hides	('000 SqFt)	44,627	46,587	33,701	14,285	5,172
WOOD						
Timber	CUB. M	*78,782	155,556	214,260	293,560	916,867
Plywood	,,	5,817	49,074	5,350	5,384	88,521
Particle Board	,,	582,660	889,154	899,543	487,303	91,018
PAPER AND PRINTING						
Paper	TONS	12,490	10,699	117,544	118,793	11,200
Boxing Paper	TONS	10,241	10,176	*15,381	14,462	67,924
CHEMICAL						
Foam	CUB.M.	*215,441	235,341	352,262	294,954	823,884
Soap	TONS	*144,867	70,914	*84,900	90,959	117,453
Carbon Dioxide	,,	2,104	1,698	11	689	-
Oxygen	CUB.M	895,968	895,968	7,522	901,218	272,795
Plastic Crate	('000 PCS)	1,387	24,897	31,943	8,298	2,780
Paints	('000 LTR)	14,873	18,000	19,558	33,127	52,049
Vaseline	TONS	2,007	2,291	270	7,944	1,236
Parafffine	TONS	4,409	2,990	12,975	44,158	32,355
Varnihes and Lacquers	,,	459	462	5,596	848	2,203
Capsules	('000 PCS)	956,746	786,388	657,804	111,270	171,071
Tablets	,,	808,694	412,840	383,443	322,363	371,371
Antibiotics	,,	14,452	7,449	8,144	8,231	87
Syrup	('000 LTR)	408	1,463	22,069	19,100	1,844
Ointment	TONS	39	189	2,915	2,983	55,771

NAME OF PRODUCT	UNIT	QUANTITY PRODUCED				
		2010/2011	**2011/2012**	**2012/2013**	**2013/2014**	**2014/2015**
Injection of 100 A	('000 PCS)	8,371	1,676	5,644	5,644	7,548
Tyres	PCS	*136,692	175,958	*104,136	142,307	2,034
Tubes	,,	-	-	465,995	-	-
Electric Wires	('000 Mtrs)	2,101	2,101	-	-	43
Polyethylene Products	TONS	11,424	62,251	20,952	29,827	313,807
Candles	,,	436	875	43,537	2,933	2,183
Ball Pen	('000 PCS)	-	-	2,300	-	-
NON-METALLIC MINERAL PRODUCTS						
Cement	TONS	2,082,366	3,547,880	1,908,357	2,135,969	6,106,291
Cement Blocks	('000 PCS)	*26,116	25,899	33,548	171,552	72,115
Cement Tubes	('000 PCS)	148	8,479	6,678	4,146	224
Cement Floor Tiles	SQ.M	413,731	776,566	190,112	896,762	623,631
Bricks of Clay	('000 PCS)	18,408	13,976	1,441	12,223	1,053
Lime	TONS	2,481	5,621	*127,930	44,882	23,270
Glasses	('000 PCS)	1,394	93	-	-	-
Gravel	CUB.M	655,493	1,096,866	2,787,238	3,514,010	1,325,570
Marble	SQ.M	143,820	219,743	*269,021	414,759	660,308
Glass Bottles	('000 PCS)	26,089	32,081	18,785	-	33,886
METAL						
Iron Bars	TONS	30,279	39,216	19,173	6,252	11,044
Wires	,,	7,846	2,693	11,024	102,445	6,498
Nails	,,	10,663	26,544	47,817	31,272	65,482
Iron Sheets	,,	147,299	80,845	*240,744	185,345	39,709
Crown Cork	('OOO GROSS)	359	4,026	4,170	2,759	-
Motor Vehicle Spring	TONS	629	594	1,779	2,289	393
Metalic Door	SQ.M	29,674	30,217	75,142	*65,924	82,990
Metalic Window	SQ.M	*12,843	12,533	13,024	18,515	48,510

Source: Central Statistics Agency, Ethiopia (* indicates revised value)

Appendix 9 Selected GTP-II Macroeconomic, Social and Economic Development Targets

No.	Sector/ Indicator	Unit of measurement	Baseline year (2014/15)	Plan targets (2019/20)2
1.	Macroeconomic indicators			
1.1	The Macro Economy			
	Real GDP Growth Rate	percent	10.2	11.00
	Agriculture and Allied Sectors Growth rate	percent	6.4	8.0
	Industry Sector Growth rate	percent	23.5	20
	Manufacturing Growth rate	percent	21.4	21.9
	Service sector Growth rate	percent	10.2	10
	Per capita income @CMP	Us dollar	691	1,177
	Gross Domestic Investment as share of GDP	percent	39.3	41.3
	Gross Domestic Saving as share of GDP	percent	21.8	29.6
	Export of Goods and non-factor Services as share of GDP	percent	9.7	20.6
	Import of Goods and non-factor Services as share of GDP	percent	27.1	32.3
	Resource gap as a share of GDP	percent	-17.4	-11.7
1.2	public finance			
	Domestic Revenue as share of GDP @CMP	percent	15.0	19.1
	Tax Revenue as share of GDP @CMP	percent	13.3	17.2
	Total Expenditure as share of GDP @CMP	percent	18.5	22.6
	Capital Expenditure as share of GDP @CMP	percent	9.4	13.4
	Recurrent Expenditure as share of GDP @CMP	percent	9.1	8.7
	Total Poverty-oriented Expenditure as share of GDP	percent	12.3	15.4

No.	Sector/ Indicator	Unit of measurement	Baseline year (2014/15)	Plan targets (2019/20)2
	Budget Deficit as share of GDP (@Market Price)	percent	-2.5	-3.0
1.3	Poverty and Welfare			
	Total Poverty Head count	percent	23.43	16.7
1.4	Population and development			
	Total Unemployment Rate	percent	4.1	3.5
	Urban unemployment rate	percent	16.1	12.2
	Total Dependency Ratio	Per100	77	70
1.5	Financial Sector			
	Number of Bank Branches	Number	2868	5,736
	Share of Kebeles launching micro finance institutions from total rural kebeles	percent		50
1.6	Export			
	Manufacturing Export Revenue as share of GDP	percent	0.6	3.0
	Agricultural production Export Revenue as share of GDP	percent	3.6	6.5
	Manufacturing Export as share of Total Merchandise Export Value	percent	12.5	25.6
	Merchandise Export as Share of GDP @ CMP	percent	4.9	11.8
1.7	Productivity, quality and competitiveness			
	labor force employed in agriculture and allied sectors	Number	31,752,000	33,371,573
	Share of agriculture and allied sectors employment from total employment	percent	74	68
	Productivity per worker in the agricultural and allied sectors	GVA/ worker	8437	11771
	labor force employed in medium and manufacturing sector	Number	380,000	757,600
	Share of medium and manufacturing sector employment from total employment	percent	0.9	2
	Productivity per worker in medium and large scale manufacturing sectors	GVA/worke r	68,158	91,869
2.	Agriculture and Rural Transformation			
	Share of Agriculture and allied Sectors to GDP	percent	38.5	33.5
2.1	Crop Production and Productivity			
	Major Crops Production	Mln/qt	270.3	406
	Major Crops productivity	qt/ha	21.5	27.3
	Cane Productivity	qt/ha	29.0	42.64
	Cereals productivity	qt/ha	21.1	31
	Pulses productivity	qt/ha	17.2	23
	Oil seeds productivity	qt/ha	9	12.7
	Coffee productivity	qt/ha	7.48	11.0
	Coffee production	1000tons	420	1,045.05
2.2	Natural Resource Conservation and Utilization			
	Area of Land Rehabilitated	Mln/ha	10.86	22.5
	Area of Land developed with community based water shade development Program	Mln/ha	12.162	41.35
	Area of Land developed with modern small scale irrigation schemes	Mln/ha	2.3	4.1
2.3	Food Security, Disaster Prevention and Preparedness			
	Food Reserve to enhance disaster prevention capacity	Thnd/tons	405	1,500
	Farmers beneficiaries of productive safety net program	Mln/number	3.4	8.3

No.	Sector/ Indicator	Unit of measurement	Baseline year (2014/15)	Plan targets (2019/20)2
	Household headed farmers that graduated from productive safety net program	Mln/number	0.049	1.0
2.4	Agricultural Input Supply and Utilization			
	supply of Improved seeds	Millionquintal	1,873,778	3,559,924
	supply of Chemical Fertilizers	Metric/tons	1,223,309	2,062,106
2.5	Agriculture extension service			
	Total number of farmers receiving extension service	Thnd/number	10090	16776
	Male headed farming households received extension service	Thnd/number	7,854	9,674
	Female headed farming households received Extension service	Thnd/number	3,927	5,325
	Total number of pastoralists received extension service	Thnd/number	510	892
	Male headed pastoral households received extension service	Thnd/number	308	502
	Female headed pastoral households received Extension service	Thnd/number	153	267
	Proportion of Rural women farmers who benefited from extension service.	percent	20	30
2.6	Climate Resilient Green Economy Development			
	share of projects/programs that passes through social and environment impact assessment	percent	100	100
	Forest Coverage	percent	15.5	20
	Reduced GHG emission	Mln/Metric tons		147
3.	Industry			
	Share of Industry in GDP	percent	15.1	22.3
	Share of Manufacturing industry in GDP	percent	4.8	8.0
	Share of Medium and Large scale Manufacturing industry in GDP	percent	3.8	5.9
	Employment opportunities created by medium and large manufacturing industry	Number	380,000	758,000
4	Infrastructure Development			
4.1	Road			
	Length of all-weather roads	Km	110,414	220,000
	Average time taken to reach all- weather roads	hour	1.7	0.8
	Areas Further than 5 km from all-weather roads	percent	33.6	13.5
	Roads in acceptable (fair + good) condition	percent	70	80
	Ratio of Paved roads	percent	13	16
	Road density	km/1000km2	100.4	200
	Road density	km/1000 population	1.2	2.3
4.2	Energy			
	Electricity service coverage	percent	60	90
	Power generating capacity	MW	4,180	17,347
	Length of distribution lines construction	Km	16,018	21,728
	Customers with access to electric power service	Mln/number	2.31	6.955
	Annual per capita electricity consumption	GWS	86	1,269
4.3	Telecommunication			

No.	Sector/ Indicator	Unit of measurement	Baseline year (2014/15)	Plan targets (2019/20)2
	Telephone density (Fixed Lines)	percent	0.92	54.0
	Telephone subscribers (Fixed Lines)	Mln/number	0.837	10.4
	Mobile telephone subscribers	Mln/number	38.8	103.6
	Internet service subscribers	Mln/number	9.4	56.0
	Mobile telephone coverage	percent	43.9	100
	Broad band internet and data service subscribers	Mln/number	1.59	39.1
	Narrow band internet and data service subscribers	Mln/number	8	16.9
4.4	Water			
	Overall potable water supply coverage as per GTPII standards	percent	58	83
	Rural potable water supply coverage as per GTPII standards	percent	59	85
	Urban Potable water supply coverage as per GTPII standards	percent	51	75
	Area of land developed with large and medium irrigation schemes	ha	658,340	954,000
4.5	Transport and Logistics Service			
	Logistics performance index	Number	2.59	3.07
	Average time spent across borders for imported goods	Day	40	3
	Share of logistics expenditure in GDP	percent	30	22
	General cargo carried by multi-modal transport system coverage	percent	35	90
	Inland packed export goods freight vessels	percent	7	100
	Fatality rate per 10,000 vehicles	Number	60	27
5	Urban development, Housing and Construction			
	Jobs opportunity created through urban productive safety net program	Number		717,114
	Urban food insecure communities that get direct support	Number	1,017,056	
	Urban residential houses constructed	Number	174,190	750,000
	Green area development and public recreation land utilization coverage	percent	30	
	Industrial parks	Number	2	7
6	Construction industry			
	Improved and cost saving construction inputs and technologies	Number	30	
	Internationally competitive contractors	Number	41	100
	Internationally competitive consultants	Number	35	50
	Proportion of construction inputs supplied through domestic manufactures	percent	0	80
7.	Human Resource Development			
7.1	Education and Training			
	Pre-primary school gross enrollment rate	percent	39	80
	Net primary school(1-8) enrollment	percent	96.9	100

Source: Ethiopia GTP-II

Appendix 10 Tax Preferential Treatment Information of Sudan

Guarantees, Facilities, Exemptions and Concession

1) Exemption from Value Added Tax

The project imports of capital preparations shall be exempted from Value Added Tax according to the approved list of the National Investment Authority.

2) Exemption from customs duties

i. Grant the project exemptions from:
   - Customs duties on capital preparations, which are not, provided for in customs tariffs, provided that the exemption for the State investment project.
   - Customs duties on means of transportation, excluding administrative vehicles.

ii. Production inputs for investment projects, which is not provided for in the customs tariff, shall be subject to the same tariff rate imposed on the production inputs in custom such as may be specified by regulations.

iii. Guarantees
   - Non-nationalization, seizure, confiscation or expropriation of the project assets and estates in whole or in part, save as for public policy, and against a fair and immediate compensation.
   - Non seizure on the project funds, confiscation, expropriation, freezing, reservation or imposing custody thereof; save as by a judicial order, or order from the competent Bureau.
   - Remit the invested money in case of non-execution of the project, liquidation, or disposal thereof in any manner with the approval of the Authority and upon the fulfillment of all the legal obligations.
   - Re-export, sell, or waive machines, equipment, goods, apparatuses, means of conveyances and other requirements.
   - Transfer of profits and the cost of finance of foreign capital or loans in the currency dealt with at the Central Bank of Sudan or the loan at the due date, after the payment of the due legal obligations.
   - Bring raw materials necessary for the project and products thereof.

iv. Invested capital is to be calculated in foreign currency, and the corporeal capital elements shall be assessed by the ministry in coordination with the competent bodies.

v. The investor shall enjoy the followings:
   - Import of the licensed labors in accordance with the conditions and safeguards such as may be determined by laws and regulations regulating the same.
   - The foreign Investor may obtain work licenses, residence for himself and his family, throughout the term of execution and operation of the project in accordance with laws and regulations.
   - The wage and allowance of non-Sudanese workers shall not be subject to Social Insurance.

Appendix 11 Consideration in possibility of input-output table utilization for the master plan formulation

1) Preparation of input-output table in Ethiopia

In Ethiopia, sound data and appropriate analytical tools are identified necessary for reliable quantitative analysis of macroeconomic policy, and SAM (Ethiopia Social Accounting Matrix 2005-06) was summarized with US (University of Sussex) cooperation and issued by the Ethiopian Development Research Institute (EDRI) as "Input Output Table and Social Accounting Matrix" in 2009. It is the core of the analysis model and providing the database of Ethiopian economy etc.

2) Objectives and outline of input-output table

The objective is to construct a data system and overall economic modeling to support the policy analysis of the Ethiopia Institute for Development Studies (EDRI), and 1) to create an economic scale database and many other economic indicators as a comprehensive data system for regular updates, 2) construction of various structural, economic and empirical models, and 3) regional capacity building to ensure sustainability is subsequent goals as well. SAM is an essential tool for sector-specific and macro-microeconomic policy analysis and it organizes interdependence relationships between various productions and demands according to the Input-Output Table (IOT).

3) Possibility in utilization of input-output table

Where industrial input-output analysis would target the corridor neighboring countries, it could be possible to picture the flows of people, materials, money and interdependence within the regions, and it helps drawing an effective value-chain. Although Ethiopia's input-output table is not detailed to grasp the value-chain between industries, it is effective for formulating an industrial development plan from a macro perspective. Since there is no regional level input-output data including neighboring countries, it is necessary to verify the possibility of its utilization up for regional industry promotion policies and plans during the master plan study. In reality, the administrative capacity in each country is insufficient to create IOT except Ethiopia, thus it is necessary to verify the possibility of creating an industrial division network (inter-industrial relationship) from industrial and socioeconomic related statistical data etc.

Toward the future corridor development, utilizing local products, manufacturing final products in another country and delivering to others could be possible as if target countries will effectively cooperate and promote industrial integrated development together, thus expansion of intra-regional trading and logistics could be achievable. In this view, industrial input-output analysis could have certain level of positive impact. However, the IOT related data in the target countries is very limited, so that it is possible to schematically identify possibilities of cooperation among industries through hearings to the companies and draw the flow of inter-industrial relations. In turn, understanding the weaknesses of the value-chain and methods for value-chain enhancement together with a realistic industrial promotion strategy could be identified.

Appendix 12 Meeting Record of Interim Reporting to Djibouti Government

23 -05-2017

Informative Workshop
on the Data Collection Survey of Djibouti Corridor

ATTENDEES :

- General Secretary of the Ministry of Equipment and Transport
- Technical Advisor of the Ministry of Energy
- Technical Advisor of the Ministry of Equipment and Transport

Other Representatives from:

- Ministry of Housing, Urban Planning and Environment
- Ministry of Equipment and Transport
- Ministry of Foreign Affairs
- Djibouti Road Authority
- Djibouti Electricity Company
- Chamber of Commerce

JICA

- JICA Djibouti Office (Mr. Ohashi, Mr. Warsama)
- JICA Ethiopia Office (Mr. Iio)

There are several attendants left without providing their information in the list. Attendance list is attached herewith.

Discussion Contents:

The General Secretary has officially opened the workshop by first welcoming JICA Survey Team and slightly briefed the participants about the purpose of the informative workshop conducted by JICA Experts. He then invited to the JICA Ethiopia and Djibouti Representatives to the floor to make his remarks and explain the objectives of the on-going workshop as well.

Mr. Iio Akitoshi, JICA Ethiopia Representatives, thanked the General Secretary for his opening remarks and as well the participants to have come attend the workshop. He briefly explained to the participants the importance of such survey conducted the experts present in the room and assured that they will explain more in details the presentation regarding the survey. He, once more, thanked the Chair of the workshop as well as the participants.

The Chair of the workshop (General Secretary of Ministry of Equipment and Transport) has invited participants to introduce one and another before allowing JICA survey Team Leader Kudo to proceed for the survey presentation.

Participants has introduced each and another and shortly after Mr. Kudo took the floor to start the presentation regarding the survey and added that they were still in the process of data collection. In the same, other experts of the JICA survey Team explained parts of the presentation of the survey related to their expertise.

Just after the end of the presentation of the survey by the different experts, Mr. Kudo, invited participants to have their comments or questions regarding presentation and perhaps share any information as an input if they may have.

Questions and Remarks:

1- Mr. Dileyta, Head of Service of the Maritime Affairs, has emphasized the importance of such survey and added there are other similar survey of the corridor conducted by IGAD and COMESA. The Djibouti Corridor presents opportunities for the development and management of infrastructure, and management of international traffic arising from improved coordination, scope for standardization and harmonization, information sharing and opportunities for focused support from collaborating partners. He added that the Somaliland and Ethiopia corridor has not yet started. The Corridor aims to accelerate economic activity in the region and facilitate the transit of goods and passengers between the four countries.

2- Mr. Syad, Representative of the Ministry of Commerce outlined as the importance of such survey and added that it is a complete and clear presentation done by the experts and very good related to the Corridor.

3- Mr. Aden Arbahem, Representative of the Ministry of Environment, emphasized that Oil Tanker on the road seems to have less negative impact on environment than a pipeline considering the risk of explosion. Such environmental aspects should be taken into consideration in planning corridor infrastructure.

4- Ms. Rahma Omar, Representative of Custom has raised a question related to Customs and questioned whether there are Training in Customs. (The survey team replied that such training study should be considered during the master plan formulation when it comes.)

5- Mr. Ali, Director of Transport at the Ministry of Equipment and Transport, emphasized the important role played by transport in the economy, specifically promoting trade and regional competitiveness and addressing most of the major impediments to freight transportation and movement of people between and through the countries. He stressed the advantages of the corridor in improving trade flows and addressing transit challenges and noted the various corridor based initiatives at national, regional and global levels pursued with the objective of addressing trade, transport and transit facilitation challenges.

6- Mr. Mohamed Ali Farah, Operation Manager of Electricite de Djibouti asked the Team about the progress of constructing LNG terminal in Djibouti as well as natural gas development in Ethiopia.

There are other general comments made during the workshop as summarized hereafter.

1. Business promotion to European region should be well studied in the Djibouti corridor study considering expansion of regional resource potential.

2. Although it includes South Sudan as a partner country for the regional corridor development, the current situation of the internal conflicting matter should be considered. However, it is also understandable that South Sudan may consider alternative port access other than Mombasa, and Djibouti could discuss the potential.

3. Djibouti has already identified several mineral resources in the territory, and these should be considered for the corridor development expanding industrial potential.

4. While developing the capital and Djibouti Port area under the corridor development, it should also be considered for the rural area development in order to reduce disparity in the country. Tadjourah is one important area for the development expecting the network connection to the northern part of Ethiopia.

5. It is understood that the time consuming and transport cost between Djibouti and Ethiopia, considering OSBP type cooperative development, it seems important to develop effective system and institutional framework for trading including customs control and activities, for instance.

6. Even studied IGAD or COMESA corridor project may have financial problems, and it would be appreciated that JICA could bring good financial program for the corridor development.

7. Northern route from Tadjourah is important as Ethiopia's Potassium mining development and its transport have already been discussed with Ethiopia that the product would be exported from Djibouti. Therefore, Northern route development should be taken into account of the regional corridor development.

8. Livestock port is facing capacity issue, and there is a need of expansion to be considered within the corridor development.

The survey team has noted all the concerns with replying that the concerned points will be taken into consideration in this survey as well as future study. However, it was also noted that the concrete answers should be provided when JICA's further evaluation of this survey result was made.

Closing Remark

On its closing Remarks, the General Secretary of the Ministry of Transport has thanked the JICA Survey team for all the effort they have put and contributed for this important survey related to Corridor of four countries in the region namely Djibouti, Ethiopia, Sudan and South Sudan. He, as well, invited participants from various public and private entities to help and share with the team to have necessary and useful information regarding the corridor.

End of Workshop Record