Data Collection Survey on Impact Measurement of Corridors - Northern Corridor, Nacala Corridor and West Africa Growth Ring in Africa

Final Report

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Deloitte Tohmatsu Financial Advisory LLC

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Abbreviation

Acronym	Explanation
AFD	Agence française de développement
AfDB	African Development Bank
AIIB	Asian Infrastructure Investment Bank
BOAD	West African Development Bank
CFS	Container Freight Station
CY	Container Yard
DBSA	Development Bank of Southern Africa
DRC	Democratic Republic of the Congo
ECOWAS	Economic Community of West African States
EIB	European Investment Bank
EPZ	Export Processing Zone
EU	European Union
FDI	Foreign Direct Investment
F/S	Feasibility Study
FTZ	Free Trade Zone
GDP	Gross Domestic Product
GRDP	Gross regional domestic product
ICD	Inland Container Depot
ICT	Information and Communication Technology
IFC	International Finance Corporation
IMF	International Monetary Fund
IsDB	Islamic Development Bank
JICA	Japan International Cooperation Agency
LNG	Liquefied Natural Gas
MP	Master Plan
NEDO	New Energy and Industrial Technology Development Organization
NEPAD	New Partnership for Africa's Development
PEDEC- Nacala	The Project for Nacala Corridor Economic Development Strategies
PPP	Public Private Partnership
REE	Rare Earth Elements
SADC	Southern African Development Community
SDGs	Sustainable Development Goals
SEZ	Special Economic Zone
SGR	Standard Gauge Railway
TEU	Twenty-foot Equivalent Unit
TICAD	Tokyo International Conference on African Development
UNDP	United Nations Development Programme
USD	United States Dollar
VC	Value Chain
WAGRIC	West Africa Growth Ring Corridor

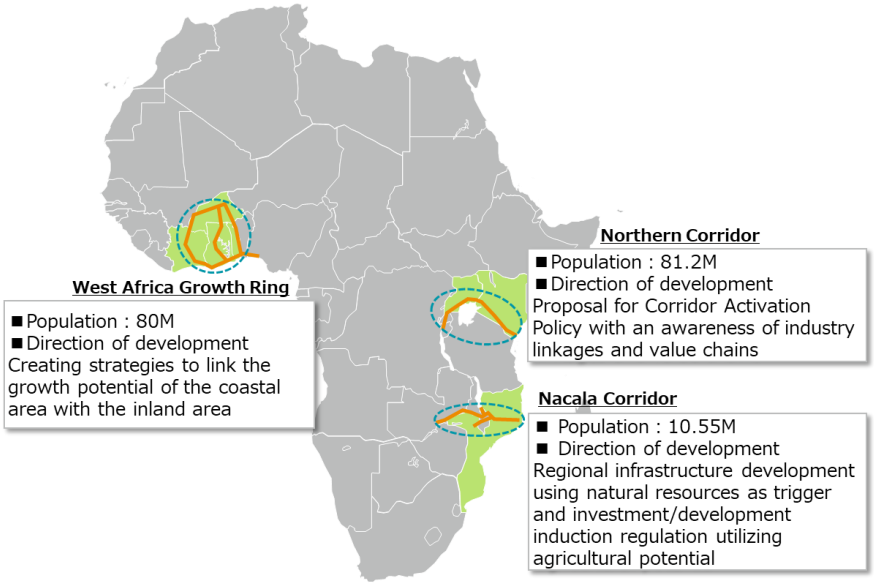
CHAPTER 1 Implementation Policy of the Research

1.1 Objective and background of the study

Japan International Cooperation Agency (JICA) has promoted the development of strategic master plans in Africa's economic corridor development and priority corridors based on the Africa support policy adopted at the fifth Tokyo International Conference on African Development (TICAD V). The Strategic Master Plan is a wide-area plan that includes medium- and long-term business plans, which aims to improve the business environment by strengthening the economic foundation, and to promote private investment and wide-spread development required for sustainable growth in Africa.

JICA has formulated the following three corridor master plans: the Master Plan on Logistics in Northern Economic Corridor, the Nacala Corridor Economic Development Strategies in the Republic of Mozambique, and the Corridor Development for West Africa Growth Ring Master Plan. These corridor master plans are expected to be spread and implemented to other African corridors in the future.

Detailed information, such as implementation status, impact on the development, etc. about the corridor master plans are planned to be shared at the TICAD VII scheduled on August 2019 and other related side events. The aim is to enhance the development of the three corridors and spread them to other corridors by integrating the corridor master plans into each country's policies, as well as gather interest from development partners. These information are also planned to be shared at other related side events.



Source: JICA Study Team

Figure 1.1.1 Location of Corridors

This study was conducted to spread the current situation on target countries and the importance of corridor development in Africa during TICAD VII. In order to provide appropriate information, it is necessary to sort out the issues encountered during project delivery, and analyze the impacts of these corridor developments.

In this study, the study team reviewed the outline of the action plans and priority projects set in the corridor master plans, investigated the current status and issues such as the implementation status of priority projects, and compared the results with preceding corridor cases as a reference. The purpose was to consider what would be the appropriate indicators for corridor development and to establish a baseline that allow the evaluation of the impact of the corridor master plans at present (2019) and in 2030.

1.2 Objective of the Study

This study focused on the three corridor strategies: the Northern Corridor Development (Kenya and Uganda), the Nacala Corridor Development (Mozambique), and the West Africa Growth Ring (Burkina Faso, Côte d'Ivoire, Ghana, and Togo,) as shown in the table below.

Table 1.2.1 The List of Target Corridors of the Study

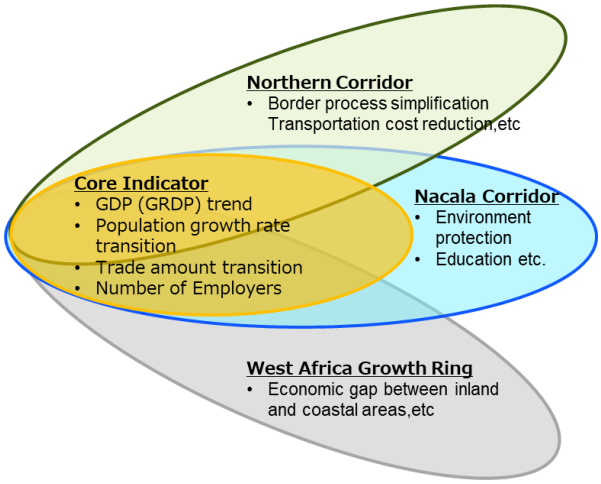
	Northern Corridor Development	Nacala Corridor Development	West Africa Growth Ring
Publication of the report	March, 2017	April, 2015	March, 2018
Target countries	Kenya, Uganda	Mozambique	Côte d'Ivoire, Ghana, Togo, Burkina Faso
	Neighboring countries: Rwanda, Burundi, South Sudan, eastern DRC	Neighboring countries: Malawi, Zambia	Neighboring countries: Nigeria
Population in the region	81.2 Million (2015)	10.55 Million (2007)	80 Million (2015)
Status	Manufacturing industry sector formation has already occurred along the corridor. Local core cities are scattered.	Underdeveloped areas where the impact of conflict remains. Inland coal, offshore natural gas, fertile land exist.	The three Corridors from Côte d'Ivoire, Ghana, and Togo lead to the inland Burkina Faso. Urbanization of the coastal areas progressed well, with the political and economic stability of Abidjan and oil exploitation in Ghana. Inland areas are still underdeveloped and arid.
Main development issues	Development of infrastructures for natural resources transportation Development of infrastructures that would support rapidly growing investment and population that the region is facing	Undeveloped logistic networks and high transportation costs	Ensuring the inclusiveness of the entire region, including low development issue and the gap between coastal and inland areas
Features	Proposal for Corridor Activation Policy with a focus on the manufacturing industry and value chain sectors	Development of regional infrastructures with a strong focus on natural resources Implementation of investment and development regulation guidance using the potential of the agriculture sector	Create strategies to link coastal areas growth potential with inland areas

Source: Prepared by the JICA Study Team based on the information from JICA's "corridor development and strategic master plan briefing session for Africa" material

1.3 Evaluation / Impact Measurement Method: Method, Framework, Procedure

As is well known, corridor development has been conducted not only in Africa but also in Asia and Latin America. The development plan of each corridor aims to realize a broad economic and social development of the target area, mainly based on the improvement of transportation infrastructures. Thus, those development plans can be used as important reference materials for setting effective indicators for the three corridors targeted by this study.

However, as the vision of each corridor has been formulated in consideration of regional characteristics, it is also necessary to select impact indicators based on these assumptions. For this reason, the study team tried to set the indicators, and collected and analyzed the related data by dividing the impact indicators in two categories: "basic impact indicators that can be compared among corridors" and "impact indicators that reflect the characteristics of a specific corridor".



Source: JICA Study Team

Figure 1.3.1 Example of Key Indicators

A key problem is that the collection system of statistical data in target areas is not as developed as Asian countries. For this reason, it is necessary to establish a framework that can verify the impacts within the range of collectable data while referring to the case of corridor development in Asia and Latin America.

As the Nacala Corridor Economic Development Strategies in the Republic of Mozambique was formulated in 2015 and the related projects have been implemented, it is possible to partly grasp progress and impacts. However, as the Master Plan on Logistics in Northern Economic Corridor and the Corridor Development for West Africa Growth Ring Master Plan have been recently defined, it could be too early to evaluate impacts.

Based on the above, the evaluation method and impact measurement method is conducted in the following order: first "setting of core indicators common to the three corridors", second "extraction and verification of specific indicators matching the characteristics of each corridor", and last "validation of impact". The contents of each process are shown below.

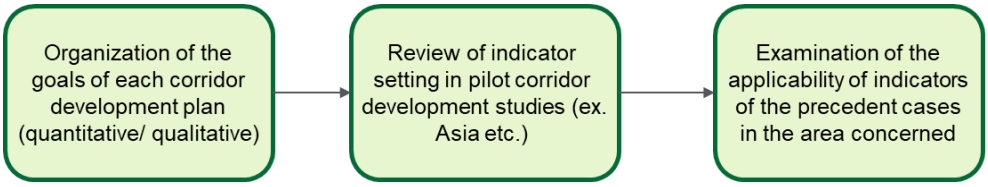
1.3.1 Setting Core Indicators to Three Corridors

Common core indicators were set so that comparisons can be made on the development impacts of the three corridors. The following points are considered;

- Main macroeconomic indicators such as GDP and trade amount, as there can be widely understood
- Data collection is regularly performed in each corridor member country, and,
- As far as possible the information are collected at corridor area scale and not at country scale.

1.3.2 Extraction and verification of specific indicators that match the characteristics of each corridor

The indicators for measuring the impacts of each corridor's characteristics and goals are set after sorting the targets for each existing development plan, the example of the indicator setting / impact measuring method are extracted from the leading development plans in Asia and Latin America. Based on this, and focusing on the data collection system aspect, the study team will analyze whether the indicators and impacts measurement methods in precedent cases can be applied to the three African priority corridors. If it appears that quantitative analysis is difficult, the setting of qualitative impact indicators will also be considered.



Source: JICA Study Team

Figure 1.3.2 Process of Indicator Extraction and Examination

1.3.3 Impact Evaluation

Impact evaluation will be implemented for the indicators. As described above, since there is a difference in the time elapsed from the planning of each corridor. On the other hand, considering the fact that development and improvement of mainly transport related infrastructure has already delivered before the formulation of the corridor master plan, the study team will “evaluate the current impact based on the time of planning” for the Northern Corridor. As for the Nacala Corridor and the West Africa Growth Ring, the study team will “create the current base materials to allow impacts measurement in the future (2030)”. If differences are observed in the data collection status among the three corridors, the “core indicator” could be adjusted.

1.3.4 Implementation Structure of the Study

This study was conducted by the following members.

Table 1.3.1 Implementation Structure of the Study

Role	Name	Title
Supervision/ Economic and Financial Analysis	Jin Sasaki	Deloitte Tohmatsu Financial Advisory LLC
Macroeconomic Analysis/Trade Balance	Hidefumi Takahashi	Deloitte Tohmatsu Financial Advisory LLC
Logistics/ Industrial Development/ Investment Promotion	Manabu Fujikawa	Regional Planning International Co., Ltd.
Logistics data collection and analysis	Kazuharu Oide	Nittsu Research Institute and Consulting, Inc.
Social development, impact evaluation, impact measurement (1)	Masaharu Nogami	Deloitte Tohmatsu Financial Advisory LLC
Social development, impact evaluation, impact measurement (2)	Mayuko Okamoto	Deloitte Tohmatsu Financial Advisory LLC
Social development, impact evaluation, impact measurement (3)	Melissa Lemiere Soda	Deloitte Tohmatsu Financial Advisory LLC

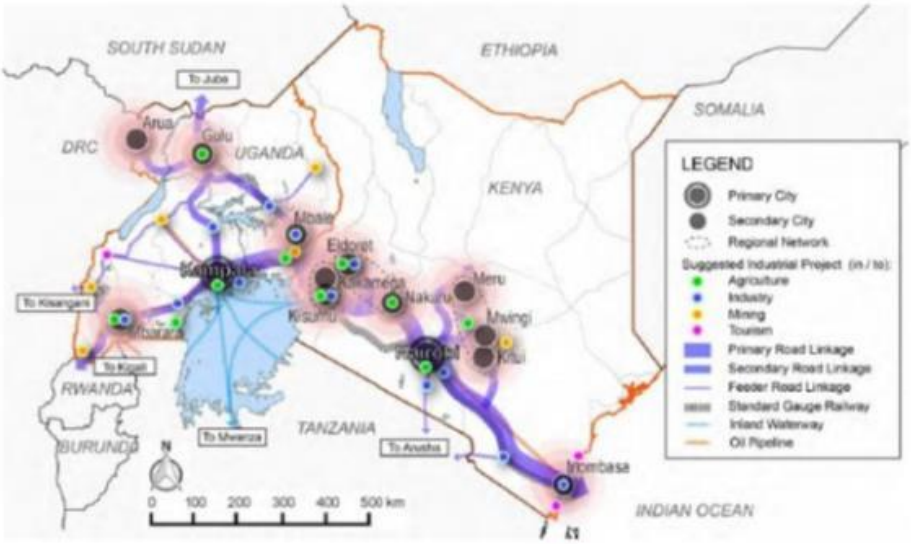
CHAPTER 2 Outline of Each Corridor and Outline of Each Master Plan

2.1 Master Plan on Logistics in Northern Economic Corridor

2.1.1 Position and Issues of the Northern Corridor, and Background of Master Plan Development

The Northern Corridor starts from Mombasa Port in Kenya, then passes through Nairobi and Uganda, and leads to Rwanda and Burundi or the Democratic Republic of Congo. The Corridor consists of multiple modes of transportation such as roads, railways, pipelines, and inland waterways, and is an important corridor for the East African logistics. While its importance is increasing, many bottlenecks are still remaining. One of the bottlenecks is the high transport cost, which prevents the development of the regional economy, especially for inland areas.

Therefore, the corridor master plan for the development of the Master Plan on Logistics in Northern Economic Corridor was formulated with the target to be achieved by 2030. The corridor master plan includes comprehensive regional economic strategies consistent with national plans and regional plans of each country. JICA has supported the development of this corridor master plan. The support project was implemented from March 2015 to August 2016, and the report was finalized and released in March 2017.



Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

Figure 2.1.1 Future Image of the Northern Corridor Area Space Planning

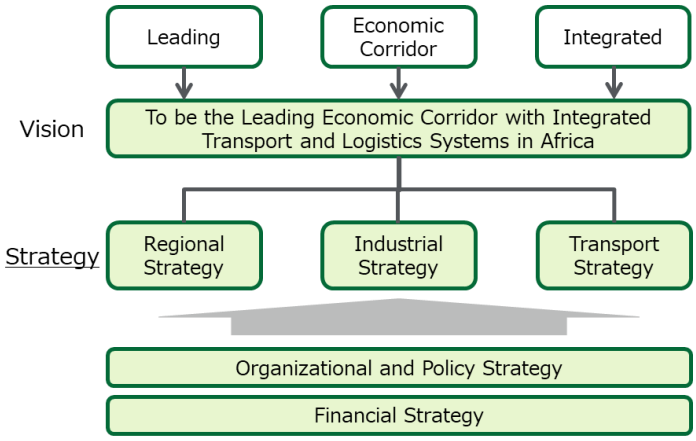
2.1.2 Development Vision

In the Northern Corridor Master Plan, the following three were set as keywords.

- Leading: to be the leading, most efficient and reliable corridor in Africa and the success of NEC can be disseminated to other African regions
- Economic Corridor: which stimulates regional economic development in the area surrounding the corridor through the development of transport infrastructure and logistic facilities and creating industries

- Integrated: integrated transport and logistics system, which offers diversified and multimodal options (road, rail, waterway, and pipeline), facilitates regional integration in East Africa, and connects and promotes industrial areas

Also, under these three keywords, as a development vision, "To be the Leading Economic Corridor with Integrated Transport and Logistics Systems in Africa" is proposed. In addition, under the development vision, three strategies are defined: regional strategy, industrial strategy, and transportation strategy. Their overall structure is shown in the following figure.



Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

Figure 2.1.2 Structure of the Northern Corridor Distribution Network Development Master Plan in Africa

The following is an overview of regional strategies, industrial strategies, and transportation strategies.

(1) Regional Strategies: Linking Production Center and Corridors

These aim to improve the distribution network of agricultural products and mineral resources with added value by improving the transportation infrastructure between major cities through trunk roads and developing secondary cities, the development of distribution bases and the better connectivity between corridors.

Table 2.1.1 Target of "Regional Strategy" and Specific Programs

Target	Specific Program
Linking agricultural productive areas and mineral resources through development of secondary cities	Strengthening urban functions combined with regional industrial systems ・ Achieve balanced growth and efficient logistics network in the Northern Economic Corridor Region through strengthening of the urban functions of 12 secondary cities ・ The secondary city, which is the center of the region, serves to provide urban services and logistic hub functions to the region, as well as linking the regional production base to the metropolitan area.
Linking with LAPSSET, Central Corridor, and Kampala-Juba-Addis Ababa-Djibouti Corridor	Examples of main infrastructure contributing to consolidation ・ Inland water transportation on Lake Victoria ・ Ring road around Lake Victoria ・ Connected infrastructure from Eldoret to LAPSSET Corridor ・ Corridor connecting Mombasa and Lamu

	・ Kampala-Juba (South Sudan)-Addis Ababa (Ethiopia)-Road improvement in the Djibouti Corridor and connection with the Northern Economic Corridor in both Kenya and Uganda
Major Suggested Projects for Regional Strategies	Urban and regional development projects in Kenya ・ Preparation of strategic urban development plans for metropolitan regions ・ National land information management ・ Preparation and implementation of integrated land use framework and plan Urban and regional development proposal project in Uganda ・ Preparation of strategic urban development plans for regional cities ・ Preparation of strategic physical development plans for strategic cities ・ National Land Information Management ・ Preparation and implementation of integrated land use framework and plan Corridor linking project ・ Improvement of Lake Victoria Circular Road and Mt. Kilimanjaro foothill road ・ LAPSSET (The Lamu Port Southern Sudan-Ethiopia Transport) Corridor and the Kampala –Juba (South Sudan) – Addis Ababa (Ethiopia) - Djibouti Corridor should be upgraded and connected to NEC in both Kenya and Uganda

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

(2) Industrial Strategy: Effective and Efficient Logistical System for Industry and Trade

It aims to promote industries that will be growth drivers to increase exports and decrease imports, and to promote businesses focusing on the development of distribution infrastructure to support development.

Table 2.1.2 Targets of "Industrial Strategy" and Specific Programs

Target	Specific Program
Promotion of growth drivers to increase export, reduce import, and economic development	35 growth drivers have large potentials for: i) increasing the export to East African region or international market, ii) decreasing the import through expansion of domestic production, and iii) large contribution that adds value to the local economy ・ Expansion of export in Kenya: Tea, Coffee, Cut Flower, Processed Fruits and Vegetables, Crude Oil, Niobium and Rare Earth Elements, Construction Materials (e.g., iron and steel, glass), Consumer Goods (e.g., soaps and detergents, processed foods), Textile and Apparel ・ Expansion of export in Uganda: Coffee, Oil Seeds, Crude Oil, Phosphate, Other Minerals (e.g., gold, iron ore, wolfram, tin, tantalite, copper etc.), Leather, Construction Materials (e.g., iron and steel), Consumer Goods (e.g., soaps and detergents, processed foods) ・ Reduction of Import (Kenya): Rice ・ Reduction of Import (Uganda): Palm Oil, Rice, Petroleum ・ Value Addition to Local Economy (Kenya): Meat Production, Coal, Natural Gas, Tourism, Logistic Service ・ Value Addition to Local Economy (Uganda): Meat Production, Coal, Cement, Leather articles, Tourism, Logistic Service Infrastructure development to support growth drivers (power, water supply, ICT, etc.)
Connecting industrial areas to logistic hubs through Cargo Oriented Development (COD)	Establishment of logistics hubs at standard gauge railway(SGR) stations, in strategic cities, important industrial areas, etc.; at least three in Kenya and four in Uganda
Establishment of logistic hubs with ICD and Logistic Center r	Multi-modal function + distribution center function as Inland Container Depot (ICD)

Major Suggested Projects for Industrial Strategies	Agricultural development project in Kenya and Uganda Kenya ・ Agricultural financing improvement ・ Food processing hub development program ・ Distribution improvement program of commercial crop ・ Fertilizer promotion ・ Specialty coffee export promotion ・ Tea brand development ・ Flower export promotion ・ Value chain of livestock development ・ Mwea Irrigation Uganda ・ Agricultural union commercialization support ・ Irrigation Scheme Development project in Central and Eastern Uganda ・ Fertilizer promotion ・ Superior seed production enhancement projects for small scale sesame farmers support ・ Rice Production Promotion ・ Maize promotion support ・ Specialty coffee export promotion ・ Livestock processed products prom ・ Kalangala PPP Industrial Development Project in Kenya ・ SEZ development: Dongo Kundu SEZ, Naivasha Industrial Park, Athi River Industrial Park, Machakos -Kajiado Leather Industrial Park, Konza Tech City ・ Packaging industry development for food-processing Industrial Development Project in Uganda ・ Industrial park development: Bweyogerere Industrial Park in the suburbs of Kampala, Mbarara, Masaka, Mbale, Soroti, Gulu, and Kasese ・ Building capacity of Standard, Metrology, Quality Infrastructure ・ Leather Industry Infrastructure Upgrading ・ Marketing hubs for DRC and South Sudan Industrial development proposal project in Kenya and Uganda ・ SME Financing for Processing, Manufacturing and Logistics Sector Development ・ Building up Competitiveness of Construction Materials and Machinery Industry Mineral and Oil Development Project in Kenya ・ Coal Transportation Infrastructure (railway main line-Kitui coal mine. F/S needed) ・ Expansion/Extension of Oil Product Pipeline (pipeline replacement, and expansion) Mineral and Oil Development Project in Uganda ・ Refinery and Oil Product Tailing Pipeline Construction (near Kampala, implemented through PPP) ・ Cross Border Product Oil Pipeline (extending to Kampala and Kigali) ・ Mineral Master Plan Creation Project Logistics Hub Project (Reprinting): Maintenance in Mombasa, Nairobi, Kisumu, Tororo, Kampala, Gulu, and Mbarara

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

(3) Transportation Strategy: Efficient and Integrated Multimodal Transportation System

In the transportation strategy, it is particularly noted that projects have been proposed to improve transportation capacity and safety by introducing multi-modal transportation and transportation systems.

Table 2.1.3 Targets of "Transportation Strategy" and Specific Programs

Target	Specific Programs
Modal shift from truck to rail and pipeline	Standard Gauge Railway (SGR) project
Reduction of bottlenecks of freight traffic and logistics	More efficient customs clearance procedures, wider access roads, realization of multiple lanes and dedicated lanes under Single Customs Territory (SCT) measures at the Malaba border, improvement of inland containers and depots, speeding up the scanning of export cargo in ports, road improvement, decrease traffic accident
Enhancement of existing transport infrastructures	Besides the roads and new SGR, existing transport structures such as MGR, Mombasa port, waterway in Victoria Lake, international airports should be reactivated or enhanced.
Major proposed projects on transportation and transportation strategies	Logistics Highway Project ・ Complete 4 lanes of Main route (Mombasa-Nairobi-Kampala-Kigali-Bujumbura) (with central reserve) ・ Truck Service Stations Project ・ Maintenance of facility having 3 functions of rest, accommodation, information offer
	Railway (Short-term) ・ Determine an operating format for the Mombasa-Nairobi SGR. ・ Implement SGR from Nairobi to Malaba and Malaba to Kampala ・ Involve the private sector in railway investments such as ICD or terminal or smaller initiatives like leasing rail wagons and locomotives to the railways and shippers (Medium-term) ・ Implement SGR to Gulu, Pakwach and Nimule ・ Implement ICDs and railway yards and obtain operators. ・ Develop a plan for meter gauge and standard gauge side-by-side operations. ・ Use policies and regulations to support the shift of cargo from road to rail. (Long-term) ・ Invest in and maintain the standard gauge railway
	Port ・ Construction of Second Container Terminal (depth: 15m and 11m; berth ×.2) ・ Construction of an access road (approx. 1.6km) ・ Dredging works (dredging volume: approx. 3 million cubic meters) ・ Construction of a new standard gauge railway linking Mombasa with Nairobi, ・ Kampala and other hinterland destinations ・ Construction of a southern by-pass for Mombasa linking the south to north coasts
	Air Port ・ Capacity expansion of Jomo Kenyatta International Airport (under delivery) ・ Runway extension and cargo facility at Eldoret International Airport ・ Air cargo facilities improvement at Entebbe International Airport
	Water transportation ・ Rehabilitation of Port Bell in Uganda ・ Development of new port (Mwambani port in Tanga, Musoma Port and New Kampala Port in Bukasa) ・ Further examination of Bukasa port development ・ Capacity building in operation and management of companies operating lake transportation
	Border Post: Necessary projects at the Malaba border ・ Establishing multiple lanes (multiple lanes installed at gate) ・ Designated lanes for specific commodities/transporters (Fast lanes)

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

2.1.3 Expected Impacts and Evaluation Indicators of the Corridor Master Plan

The impacts of the corridor master plan are classified into three categories: "Regional Development", " Development of Growth Drivers", and "Logistics Improvement". The viewpoints to measure those impacts are shown below.

(1) Regional Development

In the corridor master plan, the formation of the secondary cities as the regional base for industrial activities and basic public services and distribution systems is described as an impact.

Table 2.1.4 Proposed Regional Production Centers and Primary & Secondary Cities

Country	City	Industry	Main products
Uganda	Moroto	Mining	Limestone
	Gulu	Agriculture	Coffee, maize, sesame, and rice
	Hoima	Oil	Crude oil and natural gas
	Nakasongola	Manufacture	Agro- and food processing
	Fort Portal	Tourism	Wildlife
	Kasese	Mining	Limestone, copper, cobalt, gold
	Tororo	Mining	Limestone, phosphate, rare earth elements
	Jinja	Manufacture	Construction materials, agro- and food processing, and consumer goods
	Masaka	Manufacture	Agro- and food processing
	Mbarara	Agriculture	Coffee
	Kabale	Mining	Gold, columbite / tantalum stone, tungsten, etc.
Kenya	Eldoret	Manufacture	Agro- and food processing, agricultural inputs, construction materials
	Kisumu	Manufacture	Agricultural products / food processing, consumer goods, construction materials
	Nakuru	Agriculture	Vegetables, tea, coffee
	Naivasha	Manufacture	Agro- and food processing, agricultural inputs, construction materials
	Kajiado-Machakos	Manufacture	Garment, consumer products, leather industries, construction materials, agro- and food processing
	Voi	Manufacture	Agro-processing, construction materials, livestock related industries
	Malindi	Tourism	Beach
	Mombasa	Manufacture	Food processing, clothing, construction materials
	Diani	Tourism	Beach

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

(2) Development of Growth Drivers

In the corridor master plan, tea, coffee, textiles and sewing, niobium ore, soda ash, processed fruits and vegetables, palm oil and oil products, and fat crops are positioned as export-oriented products among the growth drivers produced in the regional industry bases. For this reason, the significantly increasing volume of cargos for exports, the development of a seamless corridor distribution network for coping volume of

export-oriented products, and the improvement of the distribution system are set as expected impacts. Also the corridor master plan aims to reduce imports by strengthening production of growth driver products including rice, petroleum products, phosphate fertilizers, and maize currently relying on imports at regional industrial bases.

Export Cargo Volume Results in 2014		Outlook 2030
1.49 Million ton	→	3.28 Million ton

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

Figure 2.1.3 Flow of Export-Oriented Growth Drivers through Mombasa Port

Production volume and Import Results in 2015			Outlook 2030
Production-Kenya	1.75 Million ton	→	5.2 Million ton
Production-Uganda	1.95 Million ton	→	4.4 Million ton
Import	3 Million ton	→	0

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

Figure 2.1.4 Current Status and Future Prospects of Rice Production and Import

(3) Logistics Improvement

Specific indicators are set for the cost reduction impact of the logistics improvement and the GDP ratio when the projects proposed in the corridor master plan are implemented. As for imports, the cost of inland transportation by truck will be reduced by 20-25%, and the cost of inland transportation by rail is expected to be reduced by about 30-40%. As for exports, it is expected that 30-40% reduction can be expected by trucks and 50 to 60% by railways. As a result, a total reduction in inland transportation costs has been calculated “with and without” case, and it will reach about USD 1 billion annually (equivalent to about 1% of the GDP forecast in 2030).

Table 2.1.5 Summary of Estimated Reduction of Inland Transportation Cost in Truck (USD/40 Feet Container)

From Mombasa	Item	Current cost	Reduction of truck charges	Reduction of cost for procedures	Returning empty containers by rail
To Nairobi	Reduction rate	0	45 USD	200 USD	180 USD
	Amount	1,915 USD	1,870 USD	1,670 USD	1,490 USD
	Degree of reduction	100%	98%	87%	78%
To Kampala	Reduction rate	0	50 USD	400 USD	450 USD
	Amount	3,600 USD	3,550 USD	3,150 USD	2,700 USD
	Degree of reduction	100%	98%	87%	75%

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

Table 2.1.6 Summary of Estimated Reduction of Inland Transportation Cost in Rail (USD/40 Feet Container)

From Mombasa	Item	Current cost	Reduction of truck charges	Reduction of cost for procedures	Returning empty containers by rail etc.
To Nairobi	Reduction rate	0	0	200 USD	682 USD
	Amount	2,280 USD	2,280 USD	2,080 USD	1,398 USD
	Degree of reduction	100%	100%	91%	61%
To Kampala	Reduction rate	0	0	400 USD	1,050 USD
	Amount	3,260 USD	3,260 USD	2,860 USD	1,810 USD
	Degree of reduction	100%	100%	88%	56%

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

Table 2.1.7 Summary of Estimated Reduction of Inland Transportation Cost for Expert (USD/40 Feet Container)

From Mombasa	2015		2030		Reduction	
	Truck	Rail	Truck	Rail	Truck	Rail
To Nairobi	1,580	2,080	1,080	830	500(68%)	1,250(40%)
To Kampala	3,130	2,810	1,930	1,330	1,200(62%)	1,480(47%)

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

Table 2.1.8 Total Reduction of Inland Transportation Cost in 2030 (Million USD)

	Without master plan case		With master plan case		Total reduction of Inland Transport Cost			GDP in 2030	Reduction/ 2030 GDP
	Import	Export	Import	Export	Import	Export	Total		
Kenya	1,610	543	1,203	325	407 (75%)	218 (60%)	625	91,257	0.7%
Uganda	1,063	137	762	75	300 (72%)	63 (54%)	363	19,491	1.9%
Total	2,673	680	1,965	400	707 (74%)	281 (59%)	988	110,748	0.9%

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

Table 2.1.9 Projection of Reduction of Inland Transportation Cost and Production Cost

	Cost of inland transportation per container (USD)		Total cost of production using one container of raw materials (USD)		Percentage of reduced cost in total cost
	Before reduction	After reduction	Before reduction	After reduction	
To Nairobi	1,000 USD	780 USD	25,000 USD	24,780 USD	0.9%
To Kampala	4,250 USD	3,188 USD	28,333 USD	27,271 USD	3.8%

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

(4) Others

In addition to the above, in the "Development Vision" and other chapters, descriptions related to goals and impact indicators are included. The outline is summarized below.

1) Economic Framework

While GDP growth rates in Kenya and Uganda will reach around 8-10% in the 2020s, it is estimated to slow down to around 6% in 2030. While the GDP share of agriculture in both countries will be consistently declined, it is estimated that the manufacturing industry will rise in the short run and eventually the service industry will grow. The figure for each corridor area is not shown.

Table 2.1.10 GDP Growth Forecast for 2015-2030 of Each Country

Country	GDP/Sector	2015	2020	2025	2030
Kenya	GDP growth rate (base case)	5.6%	8.6%	7.9%	5.7%
	Agriculture (of total)	24.0%	22.5%	20.9%	20.0%
	Manufacturing industry (of total)	21.0%	24.2%	25.9%	25.4%
	Service (of total)	55.0%	53.3%	53.3%	47.4%
Uganda	GDP growth rate (base case)	5.0%	9.5%	10.8%	5.7%
	Agriculture (of total)	13.4%	10.0%	7.1%	8.2%
	Manufacturing industry (of total)	28.6%	40.4%	39.3%	39.9%
	Service (of total)	58.0%	49.7%	51.6%	51.9%

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

2) Land Use

The forest area in Kenya's Vision 2030 and the ratio of forest and wetland areas in Uganda's Vision 2040 are cited as reference. There is no indicator for the corridor area.

Table 2.1.11 Ratio of Forest and Wetland Area

		Base 2012	Short-term 2020	Middle-term 2025	Long-term 2030
Kenya	Forest (% of total land area)	4.4%	6%	8%	10%
Uganda	Forest (% of total land area)	14%	18%	20%	22%
	Wetland (% of total land area)	11%	12%	12.5%	13%

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

1) Import Time Required: Truck

Current, and short-term, medium-term and long-term goals have been set for “dwell time at Mombasa port”, “customs procedure at port”, “time required at Malaba border”, “export procedure”, and “transit time”.

Table 2.1.12 Travel Time (Truck): Current and Target

	Current	Short-term	Middle-term	Long-term
Mombasa Port (Port dwell time)	2-3 days	2 days (48 hours)		
Customs procedure at port	Port residence time at Container Freight Station (CFS): average 2.7 days	2 days	1.5 days	1 day
Malaba border	1.5 days to west, 1 day to east	Passing procedure itself within 6 hours. Assume risks such as night breaks and congestion, and aim for passing within one day both to west and to east		
Export	3 days before arrival at the Container Yard (CY). Wait for below 2 days for scanning exam	Two days before arrival at the port of entry Scanning waiting time: 1 day	Two days before arrival at the port of entry. Scanning waiting time: within 6 hours	
Unloading time of container from port for transit continuation (after entering port)	4-6 days	4.0 days	3.5 days	3 days

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

Table 2.1.13 Possible Institutional Framework for Logistic Promotion and Multimodal Transport

		2015	2030
Freight volume		2,600 million ton	6,200 million ton
Mode share	Truck	71% of cargo at Mombasa	47% of cargo at Mombasa
	Railway	8% (MGR) of cargo at Mombasa	32% (SGR+MGR) of cargo at Mombasa
	Pipeline	21% of cargo at Mombasa	21% of cargo at Mombasa

Source: Project for Master Plan on Logistics in Northern Economic Corridor, JICA

2.2 Nacala Corridor Economic Development Strategies in the Republic of Mozambique (PEDEC-Nacala)

2.2.1 Positioning and Issues of the Nacala Corridor and Background of Master Plan Development

Although the regions along the Nacala Economic Corridor have not been actively developed until recently, they have started attracting investment from domestic and foreign companies and, especially Nacala port area has been one of the most invested since the establishment of the Special Economic Zone in 2009. Also, a large-scale coal mining projects delivered in Tete Province are the driving force behind the successful corridor development. On the other hand, it is certain that existing transport related infrastructure such as railways and terminal facilities cannot cope with increasing coal productions in the future. Therefore, the development and improvement of those infrastructure should be delivered. While investment is expected from both private and public sector in the Nacala Corridor region, there is concern over unorganized/unplanned development and negative impacts of development (e.g., urban environment degradation, pollution, competition for land acquisition, and the exhaustion of environmental resources). Hence, it is necessary to prepare a development strategy covering the whole region.

2.2.2 Development Vision

(1) Future Vision

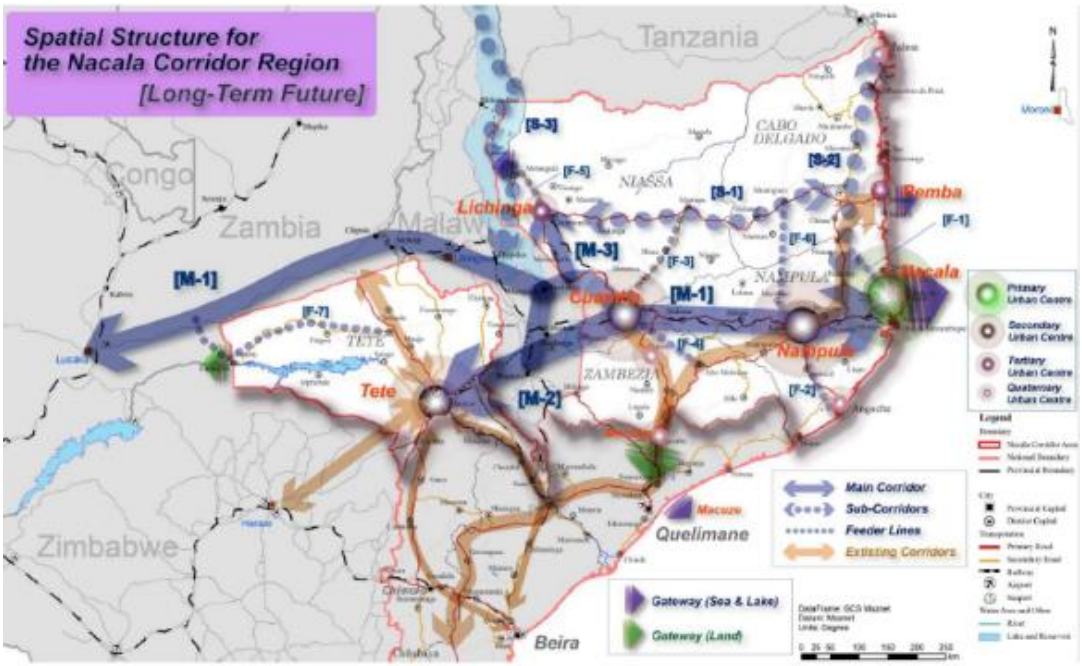
The Project for Nacala Corridor Economic Development Strategies in the Republic of Mozambique (PEDEC-Nacala), proposes the vision for the future of the Nacala Corridor Region as "A peaceful, prosperous, equitable, and sustainable region free from poverty in harmony with the environment", and the four key values of "peace", "prosperity", "equality", and "sustainability" are integrated into this phrase. The objective of PEDEC-Nacala is to "design a strategy for guiding appropriate development and investment" for the Nacala Corridor, and has set the following four goals as goals: 1) to enhance social capacity and economic growth in the Nacala Corridor Region, 2) to effectively guide appropriate development in the Nacala Corridor Region, 3) to promote private investment in an appropriate manner in the Nacala Corridor Region, and 4) to appropriately manage resources of the Nacala Corridor Region.

(2) Overall Development Strategy and Important Development Strategy

PEDEC-Nacala has formulated an "Overall Development Strategy" that addresses short-, medium-, and long-term issues. In addition, it formulates and proposes "important development strategies" for regional development that will be implemented in the short and medium terms in parallel with the overall development strategies.

1) Overall Development Strategy

PEDEC-Nacala set the development scenario in which the development of various industrial sectors are achieved based on the corridor network covering an inter-regions. It is expected to become an integrated regional economy which widely covers not only Mozambique but also Malawi and eastern Zambia mutually, which will be developed by the development of a large corridor network with supplemental corridor of feeder lines (branch lines). As the development impacts, the following specific impacts are expected: 1) forestry and forest products processing industry (around Lichinga) and agriculture and agriculture processing industry (around Cuamba) are developed in inland area, 2) not only large companies but also SMEs participate in development opportunities, 3) agricultural value chains extend to a whole area of the Nacala Corridor Region improves, 4) access to markets for small farmers improves, and 5) cost of daily necessities and construction materials is reduced.



Source: Africa corridor development and strategic master plan briefing session materials: "The project for Nacala corridor - economic development strategies in the Republic of Mozambique (PEDEC-Nacala)", Oriental Consultants Global Co., Ltd., January 18th, 2017

Figure 2.2.1 Spatial Structure for the Nacala Corridor Region in 2035 (Long-Term Future)

To achieve this development scenario, PEDEC-Nacala has set the following seven general development strategies for the Nacala Corridor Region.

Table 2.2.1 Overall Development Strategy of Nacala Corridor Region

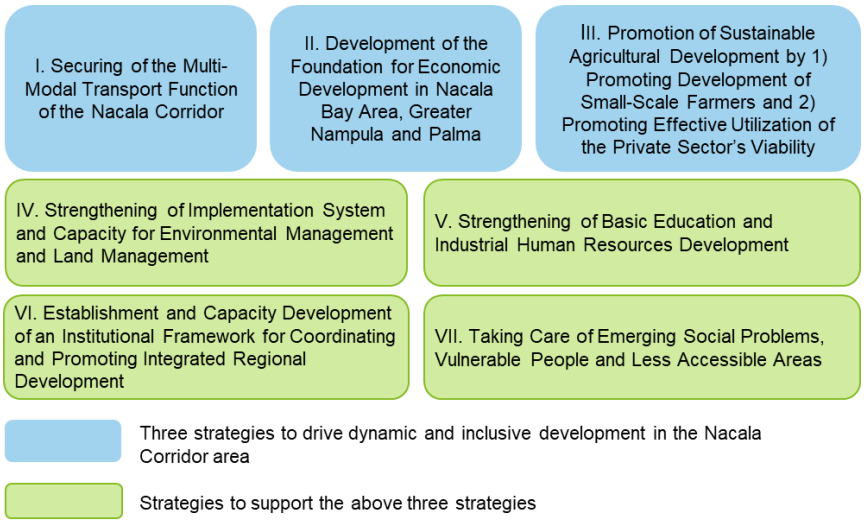
Strategy	Future direction
Creation of Effective Region-Wide Transport and Logistics Systems	Creation of an effective region-wide transport and logistics system by ensuring that key transport projects could come into operation, the railway could be used for general cargoes, containers and passengers, not limited to coal transport, and inter-modal cargo transshipment could be secured among sea transport, rail transport and road transport
Strengthening of the Foundation for Manufacturing Sectors in Major Urban Centers	Strengthening of the foundation for manufacturing sectors at major urban centers in addition to commercial and logistics functions
Promotion of Agriculture and Other Economic Sector Development oriented to Non-Mineral Resources	Promotion of agricultural development and other economic sectors development that are oriented toward non-mineral resources by implementing support measures in addition to upgrading of the transport corridors
Strengthening of Environmental Management and Land Management	Strengthening of environmental management by capacity development for enforcement of environmental regulations and monitoring of environmental management and by assuring "Principles for Responsible Investment in Agriculture and Food System (rai Principles)" and Voluntary Guidelines on the Responsible Governance of Tenure (VGGT) of Land, Fisheries and Forests in the Context of National Food Security
Strengthening of Human Resources Development	Strengthening of Human Resources Development by improving both basic education and technical and vocational education and training (TVET)
Coordination and Promotion	Establishment of an institutional framework and implementation of capacity development

of Integrated Regional Development	for coordinating and promoting integrated development.
Seeking of Region-Wide Inclusive Development	Coping with emerging social problems, socially vulnerable people, and geographically less accessible areas for promoting inclusive development widely in the region

Source: "The project for Nacala corridor - economic development strategies in the Republic of Mozambique (PEDEC-Nacala) Final report", JICA, April 2015

1) Important Development Strategy

Seven key development strategies consisting of three major strategies and four sub-strategies are set in the PEDEC-Nacala. Those strategies are supported by a series of measures.



Source: Africa corridor development and strategic master plan briefing session materials: "The project for Nacala corridor - economic development strategies in the Republic of Mozambique (PEDEC-Nacala)", Oriental Consultants Global Co., Ltd., January 18th, 2017

Figure 2.2.2 Africa Region Nacala Corridor-Important Strategy for Development

Following table shows the specific actions in the three key development strategies.

Table 2.2.2 Key Important Development Strategies

Strategy	Specific actions
I. Securing of the Multi-Modal Transport Function of the Nacala Corridor	Transport functions of major corridors (Nacala-Nampula-Nayuchi-Nkaya-Moatize) will be secured by utilizing existing and planned transport projects. ・ Assuring Coal Railway Transport from Moatize to Nacala Port ・ Assuring Non-Coal Railway Transport for the Nacala Corridor ・ Port-Road Integration in Nacala Bay Area ・ Securing the Upgraded Road Function of the Nacala Corridor
II. Development of the Foundation for Economic Development in Nacala Bay Area, Greater Nampula, and Palma	Establish a manufacturing base and promote the manufacturing sector in the Nacala Bay area, Nampula metropolitan area, and Palma ・ Development of the foundation (investment promotion, roads, electricity distribution and water supply, along with other urban infrastructure and services) for manufacturing sectors in Nacala bay area, greater Nampula, and Palma ・ Water resource development and urban water supply for Nacala bay area, greater Nampula, and Palma
III. Sustainable agriculture development by promoting development of small-scale farmers and effective utilization of the private sectors	Starting from the area around the main corridor between Nacala, Nampula, Cuamba, Mandimba, and Lichinga Effective use of the private sector's vitality and funds for assisting small-scale farmers: ・ To increase agricultural production and its diversification, and improvement of productivity ・ To establish supply chains for agricultural products and to generate added value ・ To develop a social infrastructure to assist community improvement ・ To realize appropriate private investment applying "Principles for Responsible Investment in Agriculture and Food System (rai Principles)" and Voluntary Guidelines on the Responsible ・ Governance of Tenure (VGGT) of Land, Fisheries, and Forests in the Context of National Food Security

Source: "The project for Nacala corridor - economic development strategies in the Republic of Mozambique (PEDEC-Nacala) Final report", JICA, April 2015

Table 2.2.3 Sub-strategies Supporting the Realization of the Three Major Key Development Strategies (I - III)

Strategy	Specific actions
IV. Strengthening of Implementation System and Capacity for Environmental Management and Land Management	Start with the strengthening of implementation systems and capacity development for environmental management and land/forest management: ・ Strengthening of Implementation System for Environmental Management including Environment Monitoring ・ Capacity Development for Appropriate Operation of DUAT (Direito do Uso e Aproveitamento da Terra) System (Right of land use) in accordance with Land/Forest Management Policies
V. Strengthening of Basic Education and Industrial Human Resources Development	Start with the strengthening of basic education ・ Improving the quality of basic education ・ Development of technical education and vocational training facilities
VI. Establishment and Capacity Development of an Institutional Framework for Coordinating and Promoting Integrated Regional Development	Start with the establishment and capacity building of a new organization specifically designed to coordinate and promote integrated development ・ Establishment of an institutional framework for promoting and coordinating integrated development in the Nacala corridor region ・ Capacity development of the special organization for promoting and coordinating integrated development in the Nacala corridor region
VII. Taking Care of Emerging Social Problems, Vulnerable People, and Less Accessible Areas	Start with implementing measures for emerging social and environmental issues and vulnerable groups or people in remote areas. ・ Measures for emerging social problems, establishment of places for dialogue with vulnerable groups and people in remote areas

Source: "The project for Nacala corridor - economic development strategies in the Republic of Mozambique (PEDEC-Nacala) Final report", JICA, April 2015

1) Medium- and Long-term Measures

PEDEC-Nacala proposes the practice of measures mentioned in a short and medium term perspective followed by a medium and long term perspective for achieving the key development strategy.

Table 2.2.4 Medium- and Long-term Measures After Important Development Strategies

Strategy	Specific actions
I. Securing of the Multi-Modal Transport Function of the Nacala Corridor	In the medium and long terms, develop a region-wide corridor network by extending sub-corridors and feeder lines · Strengthening of Cuamba-Lichinga Route of Northern Railway · Upgrading of Nkaya-Lilongwe-Mchinji route of Malawi railway system · Upgrading of train operation at Mchinji-Chipata · Extending of Mchinji-Chipata up to Mpika to connect with TAZARA railway · Strengthening of capacity of road maintenance
II. Development of the Foundation for Economic Development in Nacala Bay Area, Greater Nampula, and Palma	In the medium and long terms, develop the foundation for manufacturing sectors in other major urban centres, such as Tete-Moatize, Cuamba City, Lichinga City, Pemba City, and Palma · Tete/Moatize as an inland regional administration and business center on the main corridor · Cuamba as an inland regional logistics and industrial center on the main corridor · Palma as a chemical industrial center · Pemba as a provincial growth pole and service center including the function of supporting base for natural-gas exploitation and tourism center · Lichinga as provincial growth pole and service center including the function of academic and research function, as well as wood processing industry
III. Sustainable agriculture development by promoting development of small-scale farmers and effective utilization of the private sectors	In the medium and long terms, implement small-scale farmers supporting strategies, extend a value chain for agriculture, and promote other economic sectors in areas along sub-corridors and feeder lines · Areas along Lichinga-Marrupa sub-corridor · Areas along Cuamba-Marrupa feeder line · Areas along Marrupa-Montepuez sub-corridor · Tourism development
IV. Strengthening of Implementation System and Capacity for Environmental Management and Land Management	Continue the strengthening of implementation systems and capacity development for environmental management and land/forest management · Increase of technical personnel for environmental management · Expansion of variety of chemical substances to be analyzed by environmental laboratories · Capacity development of technical personnel for environmental laboratories
V. Strengthening of Basic Education and Industrial Human Resources Development	Continue the strengthening of basic education, especially in less accessible areas, and improvement of TVET institutions by paying attention to the needs of economic sectors · Continuation of improvement of basic education · Paying more attention to less accessible areas for improvement of basic education · Improvement of vocational education and training institutions in accordance with needs of industrial and business sectors
VI. Establishment and Capacity Development of an Institutional Framework for Coordinating and Promoting Integrated Regional Development	Coordinate and promote further integrated development while revising the PEDEC strategy based on monitoring and evaluation. · Revise PEDEC strategy based on monitoring and evaluation analysis results · Improvement and coordination of the mechanism of promotion and coordination of integrated development in the Nacala Corridor Region · Coordination and facilitation for implementing the revised PEDEC strategy

VII. Taking Care of Emerging Social Problems, Vulnerable People, and Less Accessible Areas	Continue the coordination and promotion for integrated development by revising PEDEC strategies based on monitoring and evaluation · Revision of PEDEC Strategies Based on Analysis of Results of Monitoring and Evaluation · Improvement and Adjustment of Mechanism and Organization for Promoting and Coordinating Integrated Development in the Nacala Corridor Region · Coordination and Promotion for Implementation of Revised PEDEC Strategies

Source: "The project for Nacala corridor - economic development strategies in the Republic of Mozambique (PEDEC-Nacala) Final report", JICA, April 2015

2.2.3 Expected Impacts and Evaluation Indicators of the Corridor Master Plan

PEDEC-Nacala formulates sectoral development strategies in addition to overall development strategies and key development strategies in the short and medium terms. The sectoral development strategies include the following areas: economic sector, infrastructure sector, urban development, environmental management, social sector development and institutional development.

(1) Economic Sector Development Strategy

1) Agriculture

PEDEC-Nacala analyzes the supply and demand balance of agricultural products based on the "Strategic Plan for Agricultural Development (PEDSA: Ministry of Agriculture) 2011-2020". As for maize, the potential for export, food processing and livestock feed grain is pointed out, and as for cassava, the potential of utilization as a starch raw material is pointed out. On the other hand, while rice can be cropped in the Nacala Corridor Region, the report recommends that demand for rice should be satisfied by the import as same as wheat.

Table 2.2.5 Current Status and Future Prospects of Agricultural Production and Import (Unit: Thousand Ton)

Products	2011	2017	2025	2035
Maize	1,199	2,269	3,212	3,326
Millet	28	65	97	171
Sorghum	145	490	701	686
Rice	-390	-532	-606	-1,113
Wheat	-237	-359	-436	-660
Beans	369	678	947	936
Cassava	3,044	7,135	10,637	11,198
Potatoes	71	174	253	241
Sweet Potatoes	-96	116	232	265
Groundnuts	67	212	328	314
Cotton	98	152	208	225
Tobacco	70	129	176	191
Tea	4	7	9	10
Sunflower Seed	9	14	19	21
Sesame	67	131	181	196
Soybeans	18	76	624	781
Cashew Nuts	68	98	130	302

Source: "The project for Nacala corridor - economic development strategies in the Republic of Mozambique (PEDEC-Nacala) Final report", JICA, April 2015

Based on the analysis above, the agricultural strategy sets to upgrade the capacity of small farmers and upgrade transport corridors to support supply chain creation.

2) Forestry

Based on interviews with stakeholders and data from the Forestry Association of Niassa, PEDEC-Nacala estimates transportation volume of timber and wood products based on planned planting area, and estimates that transportation volume in 2035 will increase to 28,000 tons per day. The strategy aims to cope with the increase in timber exports by securing the railway transport of the Nacala Corridor and harmonizing port and road transport network. At the same time, it is also necessary to consider sustainable forest conservation and relationships with communities.

Table 2.2.6 Estimated Production and Transportation Volume of Wood & Wood Products in the Nacala Corridor

Item	Unit	2025	2035
Total production of wood & wood products	1,000 m^3/year	4,223	7,170
Transportation	ton/day	16,621	28,201

Source: "The project for Nacala corridor - economic development strategies in the Republic of Mozambique (PEDEC-Nacala) Final report", JICA, April 2015

3) Mining Sector

Based on the results of a study conducted by New Energy and Industrial Technology Development Organization (NEDO), total coal production in Tete is expected to increase from 25 million tons in 2013 to 53 million tons in 2017, and 60 million tons in 2022. It also mentions the development plan of other mineral resources such as iron, phosphate, base metals, gold, REE, graphite, ilmenite, zircon, and rutile in the Nacala Corridor Region because of the necessity for considering a strategy to develop a railway network that transports variety of mineral resources. At the same time, it is also necessary to consider the reduction and minimization of the negative impacts on the environment and society.

Table 2.2.7 Plan for Coal Production by Four Operating Projects in Tete Province (Unit: Million Ton per Year)

Project	2013	2017	2022
Beacon Hill	0.4	2.2	2.2
Vale	6.4	22.0	22.0
Rio Tinto	2.4	19.2	25.6
Jindal Steel	3.0	10.0	10.0
Total	12.2	53.4	59.8

Source: "The project for Nacala corridor - economic development strategies in the Republic of Mozambique (PEDEC-Nacala) Final report", JICA, April 2015

4) Natural Gas

PEDEC-Nacala refers to the gas demand forecast in the Natural Gas Master Plan (GMP) scenario by the Mozambican government. While produced gas will be provided to domestic users, a large amount of natural gas will be transmitted from the Temane gas field to Secunda of South Africa through the existing Sasol pipeline. Also, a large amount of natural gas produced in the Rovuma Basin will be

exported from Palma as Liquefied Natural Gas (LNG).

Table 2.2.8 Domestic Gas Demand Forecast in GMP-Scenario (million GJ/year)

Year	Current MGC[1] Demand (from P-T fields)	SME MGC Demand (from P-T fields)	Power Plants in South (from P-T fields)	Power Plants in North (Rovuma)	Fertilizer (Rovuma)	GTL[2] (Rovuma)	Total P-T	Total Rovuma	Grand Total
2014	3	0.2	4				7.2		7
2015	3	0.25	10				13.3		13
2016	3	0.3	10				13.3		13
2017	3	0.37	21				24.4		24
2018	3	0.43	21	10			24.4	10	34
2019	3	0.5	21	10	9		24.5	19	44
2020	3	0.5	21	21	18	90	24.5	129	154
2021	3	0.5	21	21	18	175	24.5	214	239
2022	3	0.5	21	21	18	175	24.5	214	239
2023	3	0.5	21	21	18	175	24.5	214	239
2024	3	0.5	21	33	18	175	24.5	226	251
2025	3	0.5	21	44	18	175	24.5	237	262

Notes: MGC: Matola Gas Company、P-T：Pande-Temane

Source: “The project for Nacala corridor - economic development strategies in the Republic of Mozambique (PEDEC-Nacala) Final report”, JICA, April 2015

In line with the GMP scenario, PEDEC-Nacala sets the strategy to create an economic development base in the Nacala Bay area near natural gas mining areas.

5) Manufacturing Industry

As for a manufacturing industry, PEDEC-Nacala refers to the potential industries to be developed in the future in the Nacala Corridor Region or identified by the Mozambique government. In order to promote those industries, PEDEC-Nacala suggests to improve the environment for starting business in a manufacturing industry of major cities.

Table 2.2.9 Promoted Manufacturing Industries by Provinces in the Nacala Corridor Region

Province	Industry
Cabo Delgado	Repairing & maintenance factory for various equipment (electrical equipment, mechanical machines)
	Small docks for repairing service boats
	Fresh Vegetable & Fruit processing factory
	Drilling Pipe Cutting Factory
	LNG plant and LNG Storage Tanks
	Fertilizer Plant (urea, ammonium nitrate, ammonium, mitrate phosphate, DAP, TST, etc.)
	Petrochemical Factory (methanol, ethylene, HDPE, LDPE, and downstream products of natural gas)
Nampula	Chemical, glass, ceramic industry
	Dry dock for ship-repairing
	Plastic products/parts factory (pipe, domestic products, packing materials, etc.)
	Metal industry (steel mill for reinforcing steel bar, steel wire, steel fabrication)

[1] MGC: Matola Gas Company
[2] GTL: Gas to Liquid

	Cable factory for industrial use
	Assembling of agricultural equipment and other machinery for various fields
	Light industries
Zambezia	Agro-products such as processed fresh vegetables for overseas market, dry fruits, flavors, cultivated shrimp processing, etc.)
	Plastic Industry especially for packing materials such as plastic film, bags, etc.
Niassa	Wood-industry for export (plywood, printed plywood, furniture, especially made of plywood, etc.)
Tete	Industry related to mining (such as repairing of mining machinery and equipment, or goods and equipment used for mining.)
	Environmental protection industry (such as sanitation facilities, water filter equipment, etc.)

Source: "The project for Nacala corridor - economic development strategies in the Republic of Mozambique (PEDEC-Nacala) Final report", JICA, April 2015

6) Logistics Sector

The volume of transport in the Nacala Corridor Region is projected to increase by 2.3 times in 2025 and 5 times in 2035 compared to that in 2012. Therefore, development of a railway network for both passenger service and general cargo transportation other than mineral resources is suggested in the strategy.

Table 2.2.10 Transport Volume Forecast in the Nacala Corridor Region

Year	Cargo Volume (ton/day)	Annual Growth Rate (%)
2012	195,000	6.6% (2012～2025)
2025	449,000	8.7% (2025～2035)
2035	1,038,000	-

Source: "The project for Nacala corridor - economic development strategies in the Republic of Mozambique (PEDEC-Nacala) Final report", JICA, April 2015

7) Tourism Sector

Six of the seven special tourism zones designated by the Ministry of Mozambique Tourism (MITUR) in December 2010, are located in the Nacala Corridor Region. Improvement of accessibility between major cities and tourist destinations is considered to be a key factor for promoting the tourism sector. As a result, various programs will be developed for appealing the nature and cultural sites.

(2) Development Strategy in Infrastructure

1) Railway

The railway cargo volume was about 140,000 tons annually from Nacala port to the inland area and 80,000 tons from the inland area to Nacala port. The cargo volume from Nacala port to the inland area is expected to reach to about 930,000 tons in 2022 – 2025 annually and about 1,630,000 ton in around 2035 which are seven times and twelve times larger than the volume in 2010 and 2012, respectively. As for the opposite direction, the cargo volume is expected to reach to about 1,210,000 tons in 2022 – 2025 annually and about 3,040,000 ton in around 2035 which are fifteen times and thirty-nine times larger than the volume in 2010 and 2012, respectively

Table 2.2.11 Breakdown of Freight Volume of Nacala Corridor Railway (Unit: Ton / Year)

From Nacala port to inland area and inland country				
	From Nacala Port to Malawi	From Nacala Port to Niassa	From Nacala Port to Zambia	Total
Current (2010-2012)	137,700	-	-	137,000
10 years later (2022-2025)	753,000	89,000	84,000	926,000
20 years later (2035)	1,227,000	145,000	255,000	1,627,000
From Inland and inland countries to Nacala Port				
	From Malawi to Nacala Port	From Niassa Province to Nacala Port	From Zambia to Nacala Port	Total
Current (2010-2012)	78,300	-	-	78,300
10 years later (2022-2025)	324,000	800,000	84,000	1,208,000
20 years later (2035)	528,000	2,400,000	112,500	3,040,500

Source: "Strategic Master Plan for Strengthening Nacala Corridor Wide Area Distribution Network for Agriculture and Resource", JICA, April 2015

Cargo volume to Malawi is expected to dominate over 70% of total cargo volume from Nacala port to inland regions after 10 - 20 years. On the other hand, cargo from the inland area to Nacala port is expected to be greatly expanded by the transportation of timber produced in Niassa province. There is a strategy to secure the multimodal transport function of the main corridors by the improvement of railway, port and road transportation network considering the demand forecast of increase in rail freight.

2) Port

The forecast for the amount of cargo that can be handled at the port of Nacala is as follows.

Table 2.2.12 Cargo Throughput (Unit: Thousand Ton)

Type of Cargo	2017	2018	2019
Container Cargo	1,770	3,713	8,959
(Container Cargo) (1,000 TEU)	(192)	(393)	(944)
Mineral	18,000	25,000	37,500
Bulk (Wood Chip & Clinker)	490	577	951
Bulk (Liquid)	653	1,151	2,423
Bulk (Food)	683	974	2,379
Bulk (Others)	414	868	2,235
Vehicle	126	282	604
Total	22,136	32,565	55,051

Source: "Strategic Master Plan for Strengthening Nacala Corridor Wide Area Distribution Network for Agriculture and Resource", Section 15.4.1, JICA

As the improvement of infrastructure including water supply, electricity, and communication are necessary for the economic growth of major cities where a manufacturing industry is developed, the infrastructure development is taken as one of the key strategies in PEDEC-Nacala.

3) Water Resource

Water demand is also expected to rise in proportion to population and economic growth.

Table 2.2.13 Water Demand and Proposed Supply Sources for Greater Nampula and Nacala Bay Area

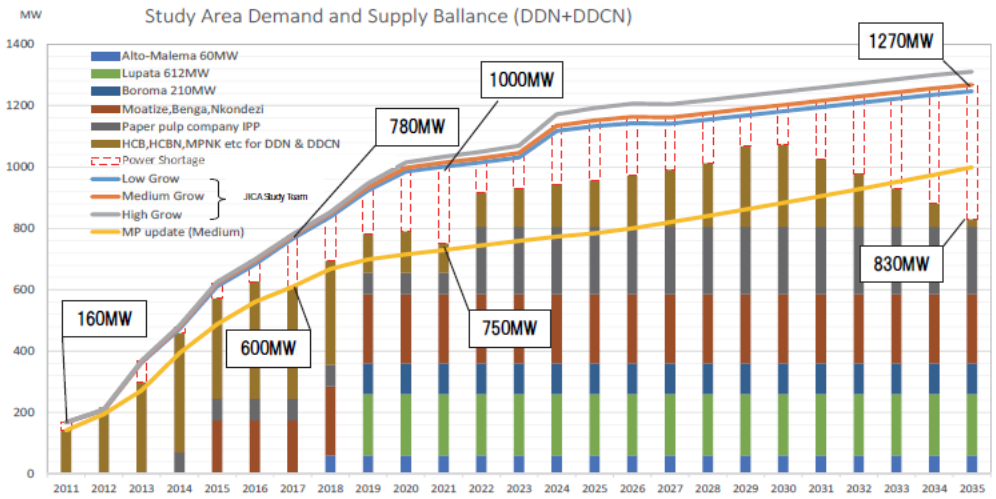
Area	Demand / Supply Source		2017 (m^3/day)	2025 (m^3/day)	2035 (m^3/day)
Greater Nampula	Demand	Expanded Supply Area	140,000	235,000	389,000
		Limited Supply Area	131,000	217,000	341,000
	Supply Source	Monapo Dam	20,000		
		Monapo Dam + Monte Tiza Dam		279,000	
		Monapo Dam + Monte Tiza Dam + Mutelele Dam			400,000
Nacala Bay Area	Demand	Expanded Supply Area	127,000	191,000	371,000
		Limited Supply Area	120,000	180,000	344,000
	Supply Source	Muecula Dam + Sanhute Dam	73,000		
		Muecula Dam + Sanhute Dam + Lurio River Reserve		503,000	503,000

Note: Expanded Supply Area will serve 100% of the urban population while Limited Supply Area will serve 80% of the urban population

Source: "Strategic Master Plan for Strengthening Nacala Corridor Wide Area Distribution Network for Agriculture and Resource", Section 15.5.7, JICA

4) Power Sector

Electricity supply and demand is calculated based on the master plan formulated by the Mozambique government. While demand will be increase year by year, supply is expected to be short even in 2035.



Source: "The project for Nacala corridor - economic development strategies in the Republic of Mozambique (PEDEC-Nacala) Final report", JICA, April 2015, Figure 15.6.1 *Balance of Demand and Supply of Power (Peak Demand and Supply)*

Figure 2.2.3 Electricity Supply and Demand Forecast

5) Telecommunications Sector

Expanding areas covered by the telecommunication network including rural areas, and enhancing capacity in data communication and ICT users are set as a strategy.

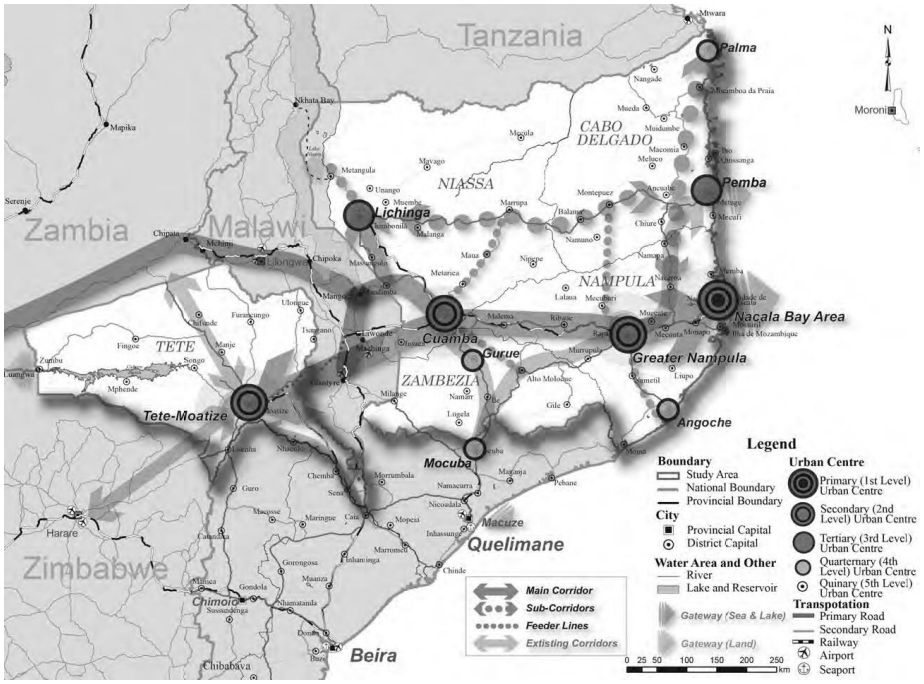
(3) Urban Development Strategy

PEDEC-Nacala plans to create a key industrial base. Based on its size and functional level, it is divided into international cities, major national and regional cities, major provincial cities and etc. Following are the summary of major cities in the Nacala Corridor region and their function based on the comprehensive development strategy and the future spatial plan.

Table 2.2.14 Classification of Urban Centres: Current and in 2025-2035

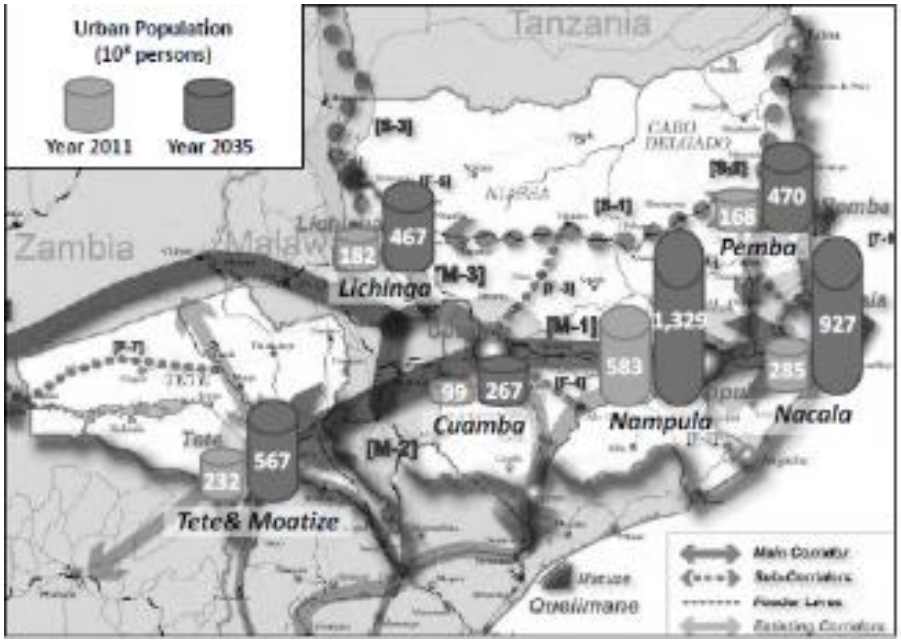
Level	Current	2025－2035	
Primary Urban Centre (1st Level: International)	None	Nacala Bay area (Nacala a Vella)	First International City in Business, Industry, Tourism: A New Gateway to the African Continent
Secondary Urban Centre (2nd Level: National & Regional)	Nampula, Nacala	Nampula metropolitan area	Northern Region Growth Base
		Cuamba	Logistics and industrial bases in inland areas
		Tete-Moatize	Government and business base in inland area and coal mining support base
Tertiary Urban Centre (3rd Level: Provincial)	Pemba, Lichinga, Tete	Lichinga	Government and business base in inland area and coal mining support base
		Pemba	State's growth base and service center where natural gas drilling and tourism base are located
Quaternary Urban Centre (4th Level: Sub-Provincial)	Nacala A Velha, Angoche, Cuamba, Moatize, Gurue, Mocuba	Angoche	Commercial and service center
		Gurue	Commercial and service center
		Mocuba	Commercial, service, and industrial bases where manufacturing base is located
		Palma	Commercial, service, industrial base with natural gas drilling and chemical base
Quinary Urban Centre (5th Level: District)	Other cities / counties	Other cities / counties	

Source: Africa corridor development and strategic master plan briefing session materials: “The project for Nacala corridor - economic development strategies in the Republic of Mozambique (PEDEC-Nacala)”, Oriental Consultants Global Co., Ltd., January 18th, 2017



Source: "Strategic Master Plan for Strengthening Nacala Corridor Wide Area Distribution Network for Agriculture and Resource", JICA, April 2015

Figure 2.2.4 Hierarchical Pattern of Urban Centres in the Nacala Corridor Region, Year 2025-2035



Source: "Strategic Master Plan for Strengthening Nacala Corridor Wide Area Distribution Network for Agriculture and Resource", JICA, April 2015

Figure 2.2.5 Population Forecast of Major Cities along the Nacala Corridor

(4) Others

Population and economic growth projected through the development of the Nacala Corridor region are cited as effective indicators. The outline is as follows.

1) Social Framework

In PEDEC-Nacala, the future population of Mozambique is calculated using INE (National Statistics Agency) estimations. On the other hand, the project population at provincial level is calculated by the study team considering the estimations made by INE.

Table 2.2.15 Nacala Corridor-Population Projection by Province

	Population (thousand)				Annual average population growth rate (%)	
Province	2011	2017	2025	2035	2011-2025	2011-2035
Niassa	1,415	1,739	2,112	2,648	2.9%	2.6%
Annual average population growth rate (%)	-	3.5%	2.5%	2.3%		
Cabo Delgado	1,762	1,987	2,413	3,026	2.3%	2.3%
Annual average population growth rate (%)	-	2.0%	2.5%	2.3%		
Zambezia (7 northern provinces)	2,022	2,365	2,787	3,263	2.3%	2.0%
Annual average population growth rate (%)	―	2.6%	2.1%	1.6%		
Tete	2,136	2,723	3,639	4,964	3.9%	3.6%
Annual average population growth rate (%)	―	4.1%	3.7%	3.2%		
Nacala Corridor Region	11,862	14,065	17,190	21,404	2.7%	2.5%
Annual average population growth rate (%)	―	2.9%	2.5%	2.2%		
Other area	11,188	13,064	15,975	20,150	2.6%	2.5%
Annual average population growth rate (%)	―	2.6%	2.5%	2.3%		
Mozambique	23,050	27,129	33,165	41,554	2.6%	2.5%
Annual average population growth rate (%)		2.8%	2.5%	2.3%		

Source: “Strategic Master Plan for Strengthening Nacala Corridor Wide Area Distribution Network for Agriculture and Resource”, JICA, April 2015

According to the existing JICA report, the labor force by manufacturing industry until 2035 is projected as follows.

Table 2.2.16 Labor Force Projection by Economic Sector in the Nacala Corridor Region (Unit: Thousand)

	2007	2011	2017	2025	2035
Total - Nacala Corridor Region	3,833	4,369	5,243	6,772	9,635
Agriculture, Livestock, Fishery & Forestry	3,249	3,701	4,390	5,535	7,382
Mining	12	12	20	52	72
Manufacturing	90	117	135	204	385
Energy	4	4	6	9	22
Construction	49	57	73	111	281
Commerce & Finance	259	300	374	520	792
Transport & Communication	19	29	28	39	79
Other Services	151	149	218	303	621

Source: "Strategic Master Plan for Strengthening Nacala Corridor Wide Area Distribution Network for Agriculture and Resource", JICA, April 2015

2) Economic Framework

PEDEC-Nacala cites the GDP growth forecast which includes the natural gas sector in future economic frame which is mentioned in the National Development Strategy (ENDE) 2015-2035. The Gross Regional Domestic Product (GRDP) growth rate across the Nacala Corridor Region is estimated to maintain a higher rate until 2035 than in other Mozambique regions. In particular, higher growth in GRDP are forecasted in the provinces of Cabo Delgado and Tete.

Table 2.2.17 GRDP by Province, Years 2011, 2017, 2025 and 2035

	GRDP (million MT, 2003 constant price)				Annual Growth Rate (%)	
	2011	2017	2025	2035	2011-2025	2011-2035
Niassa	5,272	8,000	14,200	27,800		
Annual growth rate (%)	-	7.2%	7.4%	6.9%	7.3%	7.2%
Cabo Delgado	8,152	12,600	31,400	143,500		
Annual growth rate (%)	-	7.5%	12.1%	16.4%	10.1%	12.7%
Nampula	26,551	40,700	72,700	148,500		
Annual growth rate (%)	-	7.4%	7.5%	7.4%	7.5%	7.4%
Zambezia	7,615	11,600	20,600	41,000		
Annual growth rate (%)	-	7.3%	7.4%	7.1%	7.4%	7.3%
Tete	10,038	17,400	43,000	89,400		
Annual growth rate (%)	-	9.6%	12.0%	7.6%	11.0%	9.5%
Nacala Corridor Region	57,629	90,300	181,900	450,200		
Annual growth rate (%)	-	7.8%	9.1%	9.5%	8.6%	8.9%
Other Area	120,143	185,004	324,626	698,971		
Annual growth rate (%)	-	7.5%	7.3%	8.0%	7.4%	7.6%
Mozambique	177,772	275,304	506,526	1,149,171		
Annual growth rate (%)	-	7.6%	7.9%	8.5%	7.8%	8.1%

Source: "Strategic Master Plan for Strengthening Nacala Corridor Wide Area Distribution Network for Agriculture and Resource", JICA, April 2015

2.3 The Corridor Development for West Africa Growth Ring Master Plan

2.3.1 Positioning of the West Africa Growth Ring - Background of the Corridor Master Plan

The economies of the West Africa Growth Ring Corridor (WAGRIC) countries consisted of Burkina Faso, Côte d'Ivoire, Ghana, and Togo have been developed through export of mineral resource and agricultural products to the countries outside the corridor. The economic growth has been accelerated due to soaring price of mineral resources and agricultural products worldwide since 2000, and the production volume has increased accordingly. However, while the WAGRIC countries have enjoyed economic growth in the 2000's, Côte d'Ivoire and Ghana are still classified as lower middle income countries, and Burkina Faso and Togo remain low-income countries. In addition, the economy highly relying on the export of mineral resource resulted in a wide income gaps. Furthermore the poverty rate in each country still remains high or even higher than the past.

Thus, although the economic growth in the WAGRIC countries continue, there are some issues from the viewpoint of sustainability in the future. The share of the two major export industries, mineral resource and traditional agricultural products, accounts for the majority of GDP, and those countries would become stagnant economies without them. Also, although some agricultural products are exported, the countries cannot provide citizens with enough foods without import from foreign countries. Moreover, as light industries and food processing industries are not developed, countries rely on the imported commodities. In addition, there is concern about the rapid population grow in rural areas might result in increasing poverty rate. Moreover, immigration of economically disadvantaged people from rural areas to urban areas might result in the population increase of the poor in urban cities as well.

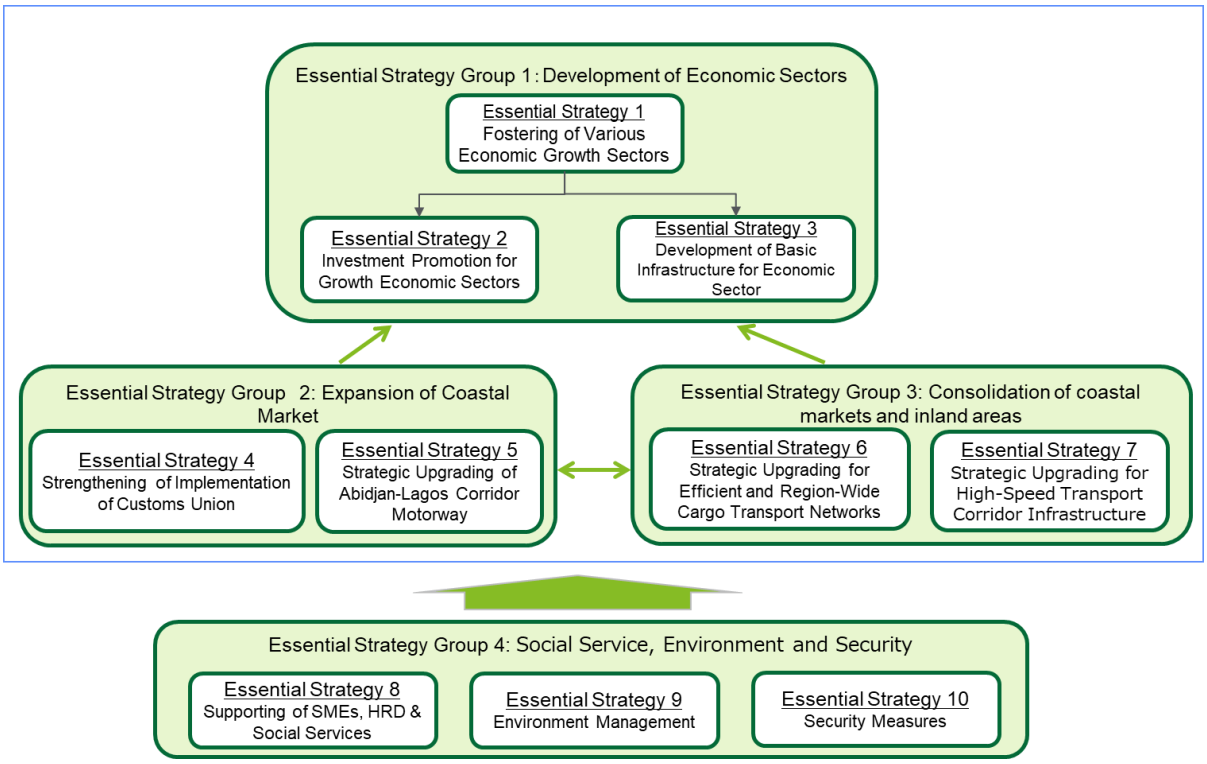
2.3.2 Vision for the Development

In the Corridor Development for West Africa Growth Ring Master Plan, the improvement of transport related infrastructures is not a single major impact on the industrial development. Therefore, the WAGRIC Master Plan set the strategy for the industrial development focusing on the rapidly growing regional market for consumer goods. Specifically, the strategy propose to classify and identify specific consumer goods for the industrial development, and restructure measures for regional market-oriented industrial development along with improving transportation functions.

In the WAGRIC countries, the regional economic integration is expected to be strengthened. For that purpose, connecting the four countries with north-south direction and east-west direction along the coast will be inevitable, as well as promoting an industrial development simultaneously. The inland industry can access to the coastal consumer market by the connection, furthermore coastal area can expand the consumer market by horizontal connection. This policy calls for a more balanced socio-economic development throughout the region and aims to achieve comprehensive development.

In order to achieve the development vision, ten individual essential strategies are defined in the four essential strategy group. The essential strategy group 1 is supported by group 2 and 3. In addition, group 4 supports all the strategies above. Supplementary essential strategies consisting of specific programs have

been set up for supporting the idea of the each essential strategy group. The relationship between each strategy is as follows.



Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

Figure 2.3.1 Image of the WAGRIC Master Plan Important Strategy

(1) Essential Strategy Group 1: Development of Economic Sectors

1) Essential Strategy No.1: " Fostering of Various Growth Economic Sectors" that Contribute to Region-Wide Development

In addition to the existing priority industries such as mineral resources and agricultural products, the industries which target the demand in inland and coastal areas should be fostered respectively. In order to promote the regional-oriented industry, it is necessary to compete with imported products from outside the region. Therefore, the WAGRIC Master Plan identifies the strategies of "Essential Strategy No.2" and "Essential Strategy No.3" below, and the industrial development measures to create value chains for each industry are shown as follows.

Table 2.3.1 Measures and Programs for Industrial Value Chain Development

Measures	Programs
Important measures for increasing rice production	・ Breed improvement of rice varieties ・ Dissemination of necessary production technology ・ Provision of rice mills and rice storage facilities by private sector ・ Fostering of private rice distributors
Important measures for fostering poultry industries	・ Increasing of production of maize for poultry feeds ・ Fostering of poultry feeds producers
Important measures for productivity improvement and production scale expansion of inland aquaculture	・ Expanding the factory production of feeds for aquaculture ・ Fostering production of the feeds for aquaculture in sub-region and trade them to neighboring countries by the advantage of custom union
Important measures for increasing production and expansion of sub-regional sales market for fresh vegetables and fresh fruits	・ Breed improvement ・ Promoting local specialties ・ Branding ・ Establishment of refrigerated transportation technologies for fresh fruits and vegetables ・ Construction of parts of the north-south motorways, construction of bypass roads and widening of roads to high-standard four-lane roads (long term) ・ Simplifying border crossing procedures for sub-regional products
Important measures for farmers in inland areas/inland countries to enhance access to coastal markets	・ development of distribution linkage between agricultural producers in inland areas and inland country with large scale distributors
Important measures for sustainable development of extensive distribution of live cattle and livestock	・ Preventing communicable disease of livestock from spreading ・ Distributing livestock hygienically ・ Modernization of transport means for livestock ・ Resolving conflicts between transhumant cattle raisers and farmers
Important measures for development of processed food and drinks for middle income population, increase of their production and strengthen competitiveness against imported goods	・ Expanding and upgrading industrial areas with necessary basic infrastructure ・ Supporting to accession of provenance certificate ・ Strengthening of implementation of the customs union

Source: “The Project on the Corridor Development for West Africa Growth Ring Master Plan”, JICA, March 2018

2) Essential Strategy No.2: " Investment Promotion for Growth Economic Sectors” by Taking Advantage of Integration and Expansion of Sub-Regional Markets

This strategy strengths and implement “regional consumer market industry” to promote investment as essential strategy No.1. In order to compete with goods imported from foreign countries, it is necessary to gain their superiority. Hence, investment on the target industries from inside and outside countries is required. However, it is assumed to be issue that the population and economic size of the WAGRIC countries might be less attractive for investments.

Table 2.3.2 Specific Policy of Essential Strategy No.2

Measure	Impacts of investment promotion by measure
Investment Strategy	・ Accelerate investment promotion by paying attention to growing opportunities of exporting neighboring countries (sub-regional markets) in addition to the industries for the domestic market and the overseas market
Strengthen Customs Union	・ Bringing in investment reducing cost of raw material import from neighboring countries by exempted taxes
Follow-up of post Investment	・ Monitoring and support for companies that have advanced by investment

Source: “The Project on the Corridor Development for West Africa Growth Ring Master Plan”, JICA, March 2018

3) Essential Strategy No.3: "Development of Basic Infrastructure for Economic Sectors" to Support the Development of Growth Economic Sectors in both Inland and Coastal Areas

The development of infrastructure that connects the inland and coastal areas, and the adjacent countries in the coastal area is necessary. As a result, the development of industries by connecting the inland and market at coastal area is expected. Also, the strategy aims to develop other essential infrastructures such as energy, electricity, access roads, water resources, and industrial estates that can support the development of each growing industry.

Table 2.3.3 Development Projects Required by Essential Strategy No.3

Measure	Impacts of investment promotion by measure
Development of Energy and Electricity Supply Sector Infrastructure which is Fundamental for all Economic Sectors	・ Infrastructure development to support sustainable exploitation and development of Côte d'Ivoire and Ghana (gas pipeline) ・ Strengthening power connections among the WAGRIC countries and with the countries surrounding ・ Enhancement of natural gas and hydropower generation in Ghana and Côte d'Ivoire ・ Augmented power generation using natural resources in Burkina Faso and Togo
Road Development for Improving Access to Potential Agricultural Areas in the Inland	・ Road improvement in the east-west direction for access from the north-south corridor road to the surrounding agricultural potential area (inland of coastal country, rural areas of inland country)
Water Resources Development and Development of Irrigation Facilities for Agricultural Development in Inland Areas	・ Develop water resources facilities and irrigation facilities to promote agriculture in inland area of coastal countries and rural area of an inland country
Water Resources Development and Water Supply Necessary for Urban Development in Inland Areas and Coastal Areas	・ Water resource development and expansion of water supply infrastructure to meet the increased water demand through the expansion of economic activities including population and industrial development in regional core cities
Development of Industrial Parks with Basic Infrastructure for Economic Sectors in Inland Areas and Coastal Areas	・ In order to promote manufacturing for the regional market, develop industrial parks with access to power, and water tower industrial infrastructure around the metropolitan area of the regional core cities in the inland area and the Abidjan Lagos Corridor in the coastal area

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

(2) Essential Strategy Group 2: Expansion of the Size of Coastal Market

Currently, the amount of trade among the WAGRIC countries is small, and region's economic integration is limited. On the other hand, there is potential to integrate the economy and the market by the improvement of customs union and the development of transportation infrastructure among countries. In addition, it is possible to attract investment in the industries which target expanding market in the coastal area. The purpose of the essential strategy group 2 is to expand the size of the market in a coastal area and consists of the following two individual strategies.

1) Essential Strategy No.4: "Strengthening of Implementation of the Customs Union" and "Facilitation of Sub-Regional Trade" on National Borders, Sea Ports and Transport Corridors among the WAGRIC Countries

In order to promote intra-regional economic integration, expand intra-regional market, revitalize intra-regional trading, and promote investment in growth industries, the strategy implement the improvement of customs union in the WAGRIC countries and correspond to combat harassments at customs points.

Table 2.3.4 Concrete Implementation Measures for Regional Economic Integration

Concrete implementation measures
Implementation of manual preparation and training for "zero tariff on regional products"
Practice campaign of "Zero Tariff for Local Product" with West African Economic and Monetary Union (UEMOA) and the Economic Community of West African States (ECOWAS)
Strengthen enforcement of harassment control at borders, ports, and corridors

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

2) Essential Strategy No.5: Strategic Upgrading of Abidjan-Lagos Corridor Transport Infrastructure (Super-Mega Economic Corridor)

In order to enhance the spatial connectivity, the Coastal Corridor Expressway will be developed to integrate cross-border markets. Moreover, the integrated and expanded market is expected to attract investment and industrial activities for targeting the demand in the WAGRIC countries. Specifically, the 1,000 km of the coastal areas between Abidjan and Lagos will be connected by expressways, including other metropolitan areas such as Accra, medium-sized cities such as Sekondi-Takoradi, Lomé, Cotonou, and other small cities. In addition to basic infrastructure such as electricity, water and ICT in areas along expressways and other existing trunk road network, other important infrastructure such as international airports, airport city and international port are also being developed for the creation of a large industrial corridor.

Table 2.3.5 Gulf Cities Reachable within 12 hours from Abidjan (2040)

	Within 12hours	Market population
If the Abidjan-Lagos Expressway is NOT improved	Abidjan-Accra	23 Million
If the Abidjan-Lagos Expressway is improved	Abidjan-Lagos	65 Million

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

(3) Essential Strategy Group 3

It consists of two separate essential strategies that are aimed at enhancing coastal market and inland connectivity. The connection between the coastal area and the inland area is important for promoting and growing industry in the inland area.

1) Essential Strategy No.6: Strategic Upgrading of for Establishment of Efficient and Region-Wide Cargo Transport Networks (Railways, Multi-Modal Dry Ports, Inland Water Transport and Pipelines) for Reducing Transport Costs

In order to foster industries for the regional consumer demands of both coastal and inland countries, it is important to develop a streamlined long-distance freight transportation between inland countries and coastal areas and reduce costs for transport.

Table 2.3.6 Development Policy for Long Distance Freight Transport Infrastructure

Target	Development policy and approach
WAGRIC	・ Expanded service range through combined rail and truck transport. In addition, strengthening of truck overload regulations.. ・ Development of a railway line connecting the coast and inland areas (possibility of Ghana or Togo). Competition with other means of transport results in reducing costs of transport. ・ Practical use of water transportation via Lake Volta (from Tema Port to Inland of Burkina Faso) ・ The railway development will be promoted by the private sector, taking advantage of mineral resource development also being promoted by them. ・ Establishment and operation of an international railway maintenance committee (Study on policy for joint transportation maintenance of railway and Tonlac through maintenance of multimodal and dry port, promotion of implementation, railway development between Ouagadougou and Lomé, Abidjan-Ouagadougou-Niamey-Cotonou railway maintenance, and Ouagadougou-Page-Accra-Tema Railway)
Côte d'Ivoire and Burkina Faso	・ Development of multimodal dry ports in Abidjan urban area and inland Falkesedugu ・ Establish a multimodal dry port at Ouagadougou and use Bobojulasso's existing multimodal dry port to strengthen combined rail and truck transport
Ghana	・ In order to strengthen the connectivity in the north-south direction, a multimodal transportation system will be constructed which consists of three parts: 1) a new railway between Tema port and Akosombo port at lake Volta, 2) inland water transport at lake Volta, and 3) an oil pipeline between Buipe and Bolgatanga. ・ Rehabilitate Tema- Accra-Boan Kura-Kumasi Railway East Line (Short-term), and development of a new railway line between Kumasi and Page (Medium- and long-term) ・ New Railway construction incorporating private sector initiatives for mineral resource development
Togo	・ Railway development between Lomé and Britta (short term) ・ Railway development between Britta and Kaboo (middle term) ・ Railway development between Kaboo and Shinkase (long term)

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

2) Essential Strategy No.7: Strategic Upgrading of Transport Corridor Infrastructure by Emphasizing the Importance of High Speed Transport and Services for Investment Promotion for Inland Areas (Motorways, High-Standard 4-Lane Roads, Air Transport and ICT)

To speed up the movement of "people, goods and information" between major cities in the coastal and the inland area, the strategy propose to construct selected part of motorways, high standard 4-lane roads, strengthening of domestic and sub-regional air transport and strengthening of ICT network.

Table 2.3.7 Implementation Strategy of Each Sector

Sector	Implementation strategy
Road	Development of the North-South Corridor Expressway and 4-lane high-standard road ・ Construction of expressways and 4-lane high-standard roads ・ Strengthen existing major North-South Corridor Road Infrastructure ・ Reconstruction of Deteriorated Bridges on the North-South Corridor Road ・ Improving the pavement of the north-south corridor road ・ Development of urban bypasses and ring roads located in the north-south corridor ・ Widening of major roads in the city located in the North-South Corridor ・ Improvement (flyover maintenance) of major intersections located in the north-south corridor Confirmation and implementation of international expressway network and 4-lane high-standard road maintenance program in the WAGRIC countries

Aviation	Strengthening domestic and sub-regional aviation: short-term maintenance is difficult, but it is necessary to increase the frequency gradually
ICT	Internet use and infrastructure development: important components of the speed-oriented corridor infrastructure in the critical infrastructure industry · Establishment of data centers in capitals of each country · Optical fiber network reinforcement · A public internet kiosk is installed in a small city inland · Development of ICT human resources

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

(4) Essential Strategy Group 4

In order to achieve the future vision of the region, it consists of three individual strategies that include social, environmental, and security objectives.

1) Essential Strategy No.8: Supporting of Small and Medium Enterprises, Development of Human Resources for Economic Sectors and Strengthening of Basic Social Services in order to Enable More People to Participate in Emerging Development Opportunities due to Sub-Regional Corridor Development

In order to enable people to participate in corridor development opportunities, the enhancement of basic education and health services in the corridor countries is inevitable, including the development of human resources skills, especially in inland countries and inland areas of coastal countries.

2) Essential Strategy No.9: Development of Systems and Activities of Environmental Management that could Respond to Potential Risks to the Natural and Social Environments Increasing across Wide Areas due to Sub-Regional Corridor Development

Increasing negative impacts on environment and society might be concerned as a result of industrial development activities. Therefore, it is necessary to develop the legal system of an environmental management, establish the organizations, and improve the technical capabilities for coping with those issues.

3) Essential Strategy No.10: Strengthening of Security Measures for Maintaining Safe and Secure Societies and Sustainable Economies in the Sub-Region

Precautionary activities against terrorism that threatens the security and stability of local communities and economies are necessary.

2.3.3 Expected Impacts and Evaluation Indicators of the Corridor Master Plan

The WAGRIC Master Plan sets "social and economic indicators" for evaluating the impacts as a result of programs and projects in the plan. Furthermore, "local industry promotion" and "traffic and logistics infrastructure" are considered as indicators to show the current status of each individual strategy. The following are summaries of the indicators.

(1) Socio-economic Indicator

Socio-economic indicators, population and economy, are prepared to show the impacts of the development of the WAGRIC Master Plan. The following are the lists of indicators.

1) Population Framework

The population framework is set considering the accelerated development of the Abidjan-Lagos Corridor and incorporating population inflow into major coastal cities based on the medium variant of the United Nations World Population Prospects 2015. According to the said framework, the population growth rate in the WAGRIC countries will remain over 2% despite of slowing down the growth rates from 2025 to 2040. It is estimated that from 2015 to 2040, the population of the WAGRIC countries will double.

Table 2.3.8 Population of the WAGRIC Countries and Future Population Forecast

Country		2015	2025	2040
Burkina Faso	Population (‘000)	18,106	23,903	34,695
	Annual average growth rate		2.82%	2.52%
Côte d’Ivoire	Population(‘000)	22,720	28,717	39,882
	Annual average growth rate		.238%	2.21%
Ghana	Population(‘000)	27,410	34,312	43,454
	Annual average growth rate		2.27%	1.59%
Togo	Population(‘000)	7,305	9,352	12,991
	Annual average growth rate		2.50%	2.22%
WAGRIC Total	Population(‘000)	75,523	96,284	131,022
	Annual average growth rate		2.46%	2.07%

Source: “The Project on the Corridor Development for West Africa Growth Ring Master Plan”, JICA, March 2018

2) GDP

The WAGRIC countries are estimated to achieve high GDP growth rates of over 5%. While Burkina Faso, Côte d’Ivoire, and Togo show stable GDP growth, Ghana's outstanding GDP growth in 2017 is due to the development of oil field to be completed in that year and oil exports are expected to start. Moreover, as for the analysis on GDP by industry, it is estimated that the WAGRIC countries will shift from primary industry to secondary industry and tertiary industry. This is much anticipated in the case of Cote d'Ivoire and Ghana, where the movement from primary industry to tertiary industry is clearly evident.

Table 2.3.9 Forecasting GDP Growth Rate of the WAGRIC Countries

GDP growth rate	2015	2016	2017	2018	2019	2020
Burkina Faso	4.0	5.5	7.0	7.0	6.9	6.8
Côte d’Ivoire	7.0	7.6	7.4	7.2	6.9	6.8
Ghana	3.5	5.7	9.5	7.5	5.1	3.7
Togo	5.5	6.0	6.1	6.1	6.2	6.2

Source: World Economic Outlook Database、 Ministry of Economy and Finance of Burkina Faso, Ministry of Economy and Finance of Togo, “The Project on the Corridor Development for West Africa Growth Ring Master Plan”, JICA, March 2018

Table 2.3.10 Economic Structure Change Forecast of the WAGRIC Countries

		2014	2025	2033	2040
Burkina Faso	Added value (CFA million)	3,749	7,600	13,700	22,900
	Primary industry (%)	28	24	21	19
	Secondary industry (%)	22	26	28	29
	Tertiary industry (%)	50	50	51	52
Côte d'Ivoire	Added value (CFA million)	12,787	27,400	48,800	78,600
	Primary industry (%)	23	17	14	12
	Secondary industry (%)	22	23	23	24
	Tertiary industry (%)	55	60	63	64
Ghana	Added value (GHC* million)	31.2	59.3	107.6	174.6
	Primary industry (%)	24	19	16	14
	Secondary industry (%)	27	28	29	30
	Tertiary industry (%)	49	52	55	56
Togo	Added value (CFA million)	1,406	2,700	4,900	8,100
	Primary industry (%)	30	34	32	30
	Secondary industry (%)	20	25	25	26
	Tertiary industry (%)	49	41	43	43

*GHC: Ghanaian cedi

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018, IMF World Economic Outlook

Table 2.3.11 WAGRIC Countries' Industry Growth Rate Projection

		2015-2020	2021-2025	2026-2033	2034-2040
Burkina Faso	Primary industry (%)	5.3	5.6	6.0	6.4
	Secondary industry (%)	8.6	8.5	8.7	8.4
	Tertiary industry (%)	6.4	7.1	8.1	7.8
Côte d'Ivoire	Primary industry (%)	4.0	4.6	5.0	5.0
	Secondary industry (%)	7.5	7.6	7.7	7.5
	Tertiary industry (%)	8.1	7.9	7.9	7.3
Ghana	Primary industry (%)	4.0	4.6	5.0	5.0
	Secondary industry (%)	6.8	6.5	8.3	7.5
	Tertiary industry (%)	6.9	7.0	8.4	7.3
Togo	Primary industry (%)	8.2	7.0	7.0	6.5
	Secondary industry (%)	8.9	7.6	7.8	7.8
	Tertiary industry (%)	3.5	5.1	8.6	7.0

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

3) Local Industry Promotion

The corridor master plan provides quantitative data about the current status of the important local industries in the WAGRIC countries. Future forecasts as indicators are not conducted in the corridor master plan.

■ Agricultural products

In the inland country as well as inland areas of coastal countries, the agricultural sector is the most important one. In average, the agriculture sector makes up 60% of income and 20% of GDP in the WAGRIC countries. Currently, cashew nuts, cotton, cocoa, and sesame are the main export-oriented products and main destinations for exports are the EU, the United States and Japan. On the other hand,

cereal and bean crops are mainly for domestic consumption or intra-regional exportation. In addition, as most of the agricultural products coming from inland areas and inland countries are exported as raw materials, the value added in the agricultural business tends to be very low. Likewise, the sales amount is low compared to the production. The WAGRIC countries aim to foster the agro-processing industry in order to increase the value of the agricultural industry.

Table 2.3.12 Major Cash Crops and Major Export Destinations in the WAGRIC Countries

	Major cash crops	Value (USD)	Amount (ton)	Export to (share)
Burkina Faso	Cotton	441,051,593	274,282	China (26), Singapore (13), Malaysia (12)
	Sesame	161,305,723	113,093	Singapore (33), Japan (29), Togo (11)
	Cashew nuts	52,162,410	82,563	Ghana (30), Vanuatu (19), Singapore (16)
Côte d'Ivoire	Cocoa beans	2,044,455,853	813,891	United States (23), Netherlands (19), Belgium (13)
	Natural rubber	759,555,406	259,860	Malaysia (22), Germany (15), United States (13)
	Cashew nuts	339,418,200	430,736	India (49), Vietnam (47), Brazil (1)
Ghana	Cocoa beans	1,380,501,318	526,187	Netherlands (30), United States (9), Belgium (8)
	Cashew nuts	416,862,629	184,966	India (26), Switzerland (20), Japan (16)
	Sesame	33,448,221	514,268	Switzerland (95%), Japan (3), China (1)
Togo	Cotton	60,236,849	33,867	Indonesia (22), China (16), Bangladesh (16)
	Cocoa beans	15,045,566	15,019	China (35), Belgium (18), United States (14)
	Cashew nuts	4,101,700	13,840	Luxembourg (37), France (37), Burkina Faso (21)

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

Table 2.3.13 Major Agricultural Products for the Region in the WAGRIC Countries

	Major cash crops	Value (USD)	Amount (ton)	Export to (share)
Burkina Faso	Fresh vegetables	9,440,918	40,440	Ivory Coast (55), Ghana (16), Mali (14)
	Maize	6,955,312	25,709	Niger (99.7), Cameroon (0.2), Mali (0.1)
	Beans	5,947,170	12,073	Ivory Coast (37), Mari (33), Burkina Faso (30)
Côte d'Ivoire	Rice	13,954,432	29,263	Burkina Faso (61), Mari (21), Ghana (16)
	Maize	2,859,862	15,687	Senegal (44), Niger (28), Burkina Faso (16)
	Fresh vegetables	1,406,499	4,304	Burkina Faso (37), Mari (21), Ghana (19)
Ghana	Fresh vegetables	8,091,331	2,991	Nigeria (75), Togo (1)
	Nuts and beans	7,752,463	2,494	Nigeria (90), Togo (1)
	Maize	398,649	3,406	Niger (49), Burkina Faso (42), Togo (7)
Togo	Maize	209,296	516	Cameroon (100)
	Fresh vegetables	232,215	597	Gabon (60), Burkina Faso (13), Benn (2)
	Beans	60,704	197	Gabon (81)

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

Table 2.3.14 Agricultural Processing Ratio

Country	Products	Processing ratio	Target processing ratio in 2020
Burkina Faso	Cotton	12% (by 2015)	25%
Côte d'Ivoire	Cocoa beans	30% (by 2014)	50%
	Other (Cashew nuts, etc.)	>5% for others	100% for cashew nut
Ghana	Cocoa beans	27% (by 2013)	60%
	Cashew nuts	>5% for cashew	75%
Togo	Cocoa beans	19% (by 2015)	29%

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

■ Livestock products

Coastal countries mainly rely on exports of livestock products from countries outside the WAGRIC countries. Livestock goods produced mainly in inland areas of coastal countries or in inland countries are consumed in the high-income areas of coastal countries. However, the breeding and export costs are high because the technology of breeding livestock has not been developed. Therefore, it is said that their products cannot meet the consumption demand.

Table 2.3.15 Imported Livestock Products

	Cow		Goat and Sheep		Pig		Chicken	
	Amount (ton)	Value (USD)	Amount (ton)	Value (USD)	Amount (ton)	Value (USD)	Amount (ton)	Value (USD)
Burkina Faso	22	177,493	0	0	13	28,122	52	156,907
Côte d'Ivoire	1,329	5,444,048	1,087	3,183,000	18,593	15,973,438	112	323,982
Ghana	2,319	5,316,388	3,947	6,285,000	1,259	1,271,254	1,460	1,300,194
Togo	50	40,391	0	0	31	31,416	44	30,830

Source: FAOSTAT, UN Comtrade Database, "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

■ Fishery

The WAGRIC countries have a long history of eating fish. However, due to illegal overfishing by foreign vessels and the undeveloped fishing style relying on traditional techniques, the catch amount is low and does not meet domestic consumption demand. While freshwater aquaculture is also practiced in inland areas, it cannot meet the consumption demand due to its small scale. Therefore it relies on imports from other countries such as China.

Table 2.3.16 Consumption and Import of Fishery Products

Country	Consumption (ton)	Import (ton)	Import ratio
Burkina Faso	112,885	63,208	56.00%
Côte d'Ivoire	306,623	288,001	93.90%
Ghana	636,403	278,658	43.80%
Togo	76,525	51,069	66.70%
Total	1,132,436	680,936	60.10%

Source: FAOSTAT Fisheries Statistical Collections Consumption, "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

■ Mineral resources development

Mineral resource development is one of the most important industries of the WAGRIC countries. Especially, exportation of gold (an abundant mineral in the area) is a mean to earn foreign currency. In addition to gold, iron, manganese, bauxite, and other minerals are exported, with high potential of developing new mining resources. On the other hand, the mining industry is less developed in the landlocked country of Burkina Faso as private companies tend to be reluctant to enter the industry because of high transportation costs. In line with this, the corridor master plan aims to promote the export of mineral resources by reducing time and cost for export.

Table 2.3.17 Contribution Ratio of GDP and Exports of Mineral Resources

Country	GDP (2014, MUSD)	Total export value (2014, MUSD)	Mineral resources export volume (2014, MUSD)	GDP ratio of mineral resources	Total export ratio of mineral resources export
Burkina Faso	12,503	2,845.60	1,462.90	7.90%	51.40%
Côte d'Ivoire	33,741	12,985.10	703	6.10%	5.40%
Ghana	38,616	13,277.20	3,725.80	8.30%	28.10%
Togo	4,594	724.9	90.3	3.30%	12.50%

Source: IMF World Economic Outlook Database, October 2015; Ghana Statistical Service; and ECOWAS, Regional Economic (http://www.ecomac.ecowas.int/en/index.htm), "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

■ Manufacturing

With the exception of Côte d'Ivoire, the share of the manufacturing sector as a percentage of GDP is very low in the WAGRIC countries. Ghana also has a low share of the manufacturing industry. However, due to the contribution of its petroleum industry, the share of the secondary industry's GDP ratio is relatively higher than those in other the WAGRIC countries.

Table 2.3.18 Secondary Industry, GDP Contribution of Manufacturing Industry, and Outline of Manufacturing Industry in Each Country

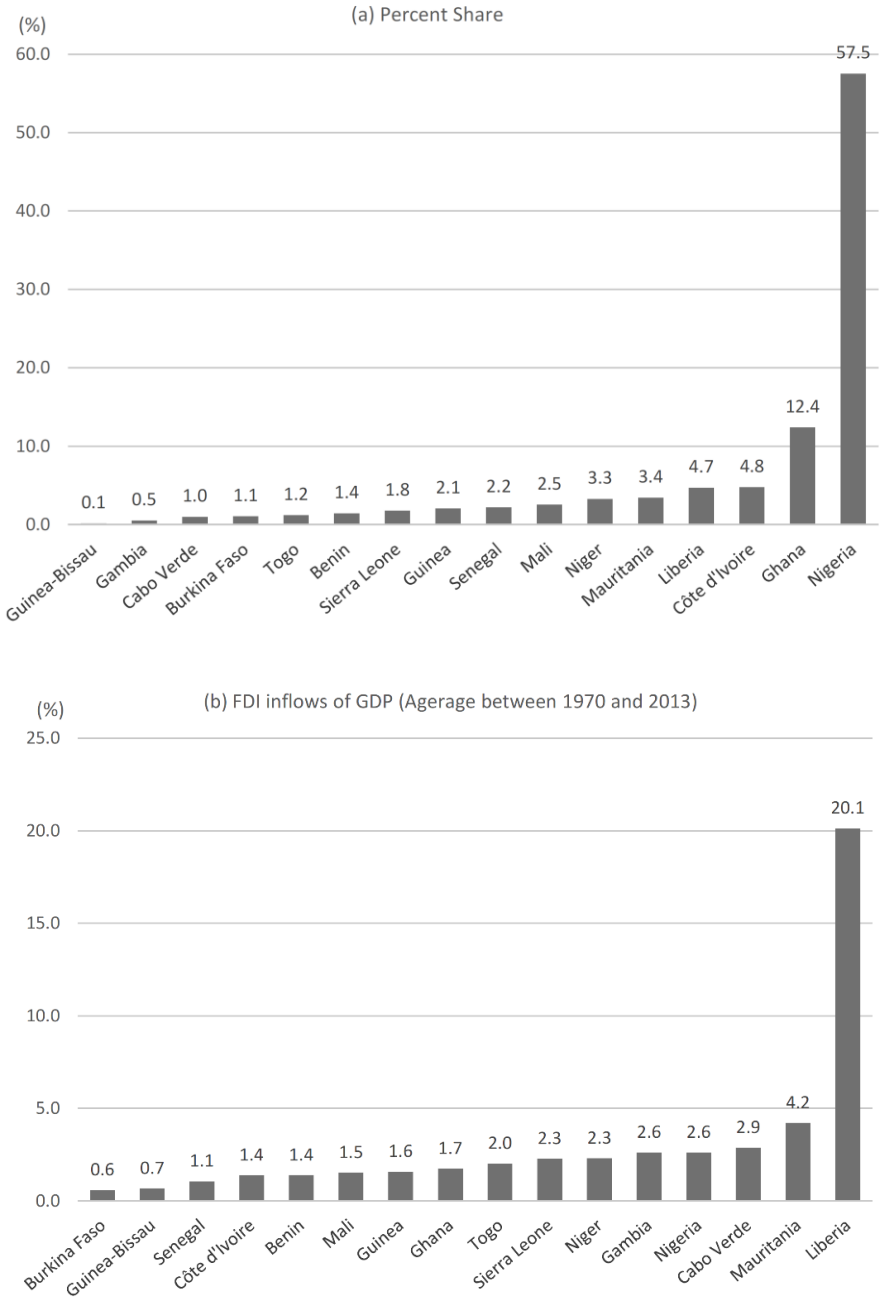
	Burkina Faso	Côte d'Ivoire	Ghana	Togo
Nominal GDP (2014)	12,503 MUSD	33,741 MUSD	38,616 MUSD	4,594 MUSD
Secondary industry (% of GDP)	21.90%	23.20%	27.70%	19.60%
Mineral resources	7.90%	6.10%	8.30%	3.30%
Oil and gas	n.a.	n.a.	7.50%	n.a.
Manufacturing	6.30%	13.80%	5.10%	6.50%
Supply of electricity, gas, and water	0.80%	0.70%	1.00%	3.40%
Construction	6.90%	2.70%	13.20%	6.50%
Number of manufacturing companies*/ Number of SEZ	2,346 (2008)	5,200 (2012)	99,437 (2015)	90 * (2014)
Number of manufacturing workers	9804 (2011)	550,839 (2012)	437,316 (2015)	2,408 * (2013)
Major manufacturing sectors	Agricultural processing	Agricultural processing	Agricultural processing	Agricultural processing
	Beverage processing	Petroleum refining products	Chemical products	Beverage processing
	Textile industry	Plastic products	Construction materials	Cement
	—	—	—	Chemical products

* Number of companies in the SEZ

Source: IMF World Economic Outlook Database, October 2015; Ghana Statistical Service; and ECOWAS, Regional Ecomac (http://www.ecomac.ecowas.int/en/index.htm), Directorate General of Industry, Minister of Industry, Commerce and Handicrafts of Burkina Faso, Information of Ivorian Economy, Ministry of Industry and Mines of Côte d'Ivoire, Summary Report of Integrated Business Establishment Survey of Ghana (2015), and Ministry of Commerce, Industry, Private Sector Promotion and Tourism of Togo, "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

■ Foreign Direct Investment (FDI)

Foreign direct investments (FDI) in the WAGRIC countries is limited, as more than half of FDI in West Africa are directed to Nigeria. The WAGRIC countries are urgently required to develop attractive industries and establish institutional framework to promote FDI. There is no WAGRIC country within the top 100 of 'Doing Business' reported by the World Bank which scores each country's investment climate.



Source: "The Project on the Corridor Development for west Africa Growth Ring Master Plan", JICA, March 2018

Figure 2.3.2 West African Countries' Foreign Direct Investment

Table 2.3.19 World Bank Doing Business 2019 (Unit：Ranking among the 190 Countries Surveyed)

	Burkina Faso	Côte d'Ivoire	Ghana	Togo
Doing Business	151	122	114	137
Start business	79	26	108	74
Dealing with construction permits	58	142	115	133
Getting electricity	181	143	86	105
Registering property	145	112	123	127
Getting credit	144	44	73	144
Protecting minority investors	149	149	99	149
Paying tax	153	175	115	172
Trading across boarders	120	162	156	129
Enforcing contracts	165	106	116	137
Resolving insolvency	107	80	160	86

Source: World Bank "Doing Business" (http://www.doingbusiness.org/)

4) Logistics Infrastructure

In order to evaluate the impacts of cost and time reductions due to the improvement of distribution network, the status of the current distribution infrastructure is analyzed in the corridor master plan. In addition to roads, railways, and ports, integrated indicators for evaluating the status of logistics are also set.

■ Road

Many major roads along the corridor have been developed with the support of international donors and donor countries, but there are still undeveloped roads and areas where conditions of roads have been deteriorated due to insufficient maintenance. Unpaved roads as well as roads in poor condition potentially increase traffic congestion and detours, and become a bottleneck for activating logistics in the corridor.

Table 2.3.20 Road Conditions along the Corridor

	Abidjan-Ouagadougou	Accra-Ouagadougou	Lomé-Ouagadougou
Total distance	1,148km	1,040km	948km
Structure	Highway 4 lanes (Abidjan- Yamoussoukro)	Paved road 4 lanes (Accra-Bunso: Paved)	Paved road 4 lanes (Lomé-Tsévié)
	Paved road 2 lanes (Yamoussoukro-Ouagadougou)	Paved road 2 lanes (Bunso- Ouagadougou)	Paved road 2 lanes (Tsévié- Ouagadougou)
Border traffic volume	612 per day	465 per day	746 per day
	Percentage of large vehicles: 61.6%	Percentage of large vehicles: 76.3%	Percentage of large vehicles: 76.1%

Note: Traffic volume is from JICA survey in 2015.

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

Table 2.3.21 Paved Road Length and Percentage

Corridor	Full length	Paved road	Dirt road
Coastal	544 km	544 km (100%)	0 km (0%)
Eastern	697 km	348 km (49.9%)	349 km (50.1%)
Central	814 km	814 km (100%)	0 km (0%)
Western	802 km	515 km (64.2%)	287 km (35.8%)
Northern	363 km	164 km (45.2%)	199 km (54.8%)
Upper East-West	384 km	104 km (27.1%)	280 km (72.9%)

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018, "Road Condition Report Year 2014", Ghana Highway Authority

■ Railway

Although railways have been developed in the WAGRIC countries, most of them, especially in Ghana and Togo, have been closed and the development has been suspended. Hence, they have not functioned sufficiently as means of logistic and passenger services. The speed of trains is only about 20 to 30 km / hour. Railway transportation doesn't have advantages over road transportation.

Table 2.3.22 Railway Business Overview of the WAGRIC Countries

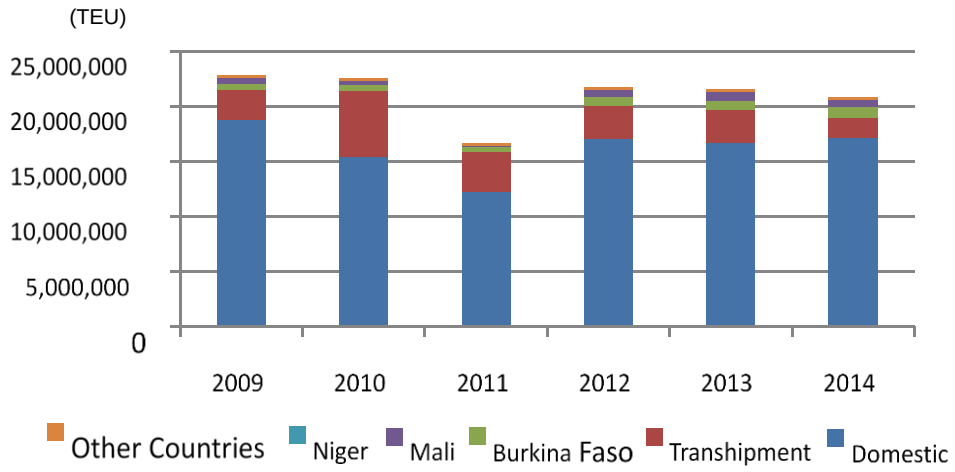
Country	Truck / distance	Operation status	Operating company
Burkina Faso, Côte d'Ivoire ・Total extension 1,206 km (including closed rail 106 km) ・Single track, non-electric	Abidjan-Ouagadougou 1154 km (Total distance) - 638 km (CI) - 516 km (BF)	Cargo: ・3-4 vehicles / day ・Travel time: 60 hours ・Speed: 19 km / hours ・800,000 tons / day Passenger: ・3 vehicles / week ・Travel time: 33 hours ・Speed: 33km / hours ・No operation between Ouagadougou and Kaya	Sitarail
Ghana ・Total extension: 947 km (including closed rail 806 km) ・Single track, non-electric	Tema – Accra – 35 km	Passenger: 1 per day	Ghana Railway Company Limited
	Accra – Nsawam (Eastern Line) - 40.5 km	Passenger: 1 per day	
	Takoradi – Nsuta (Western Line) 65 km	Passenger: 1 per day Freight: 2 round trips / day	
Togo ・Total extension: 559 km (including closed rail 442 km) ・Single track, non-electric	Lomé – Blitta – 276 km	No operation (closed at 2012)	M.M.Mining
	Lomé-Kpalime – 119 km	No operation (closed at 1996)	
	Lomé- Aného – 47 km	No operation (closed at 1986)	
	Lomé-Tabligbo – 77 km	Clinker only	Togo Rail
	Lomé-Aflao (to Ghana) – 4 km		
	Kpeme-Dagbati – 30 km Kpeme-Avéta – 6 km	Phosphate only	SNPT

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

■ Port

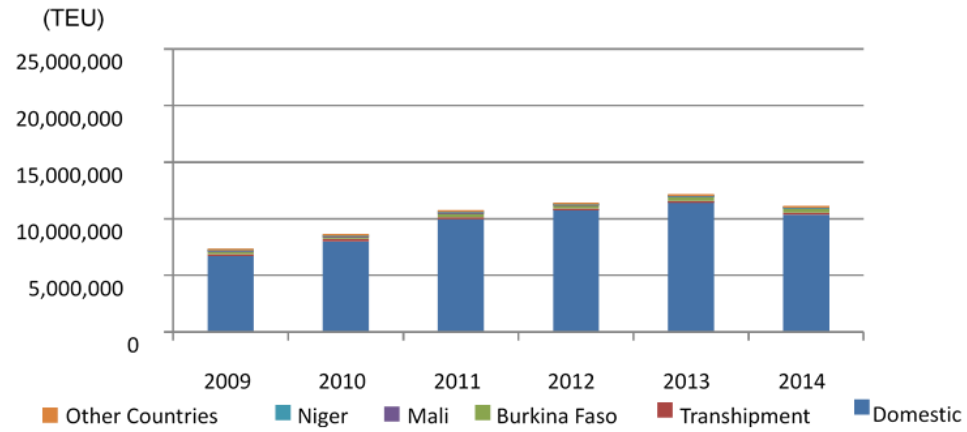
Among the five ports in the WAGRIC countries (San Pedro, Abidjan, Takoradi, Tema, Lomé), Abidjan, Tema and Lomé ports are taken as both the country's domestic import and export base and transit base

for import and export of goods for inland countries. On the other hand, San Pedro and Takoradi ports are mainly used as import and export points of each country's agricultural products and mineral resources of Ghana and Côte d'Ivoire respectively.



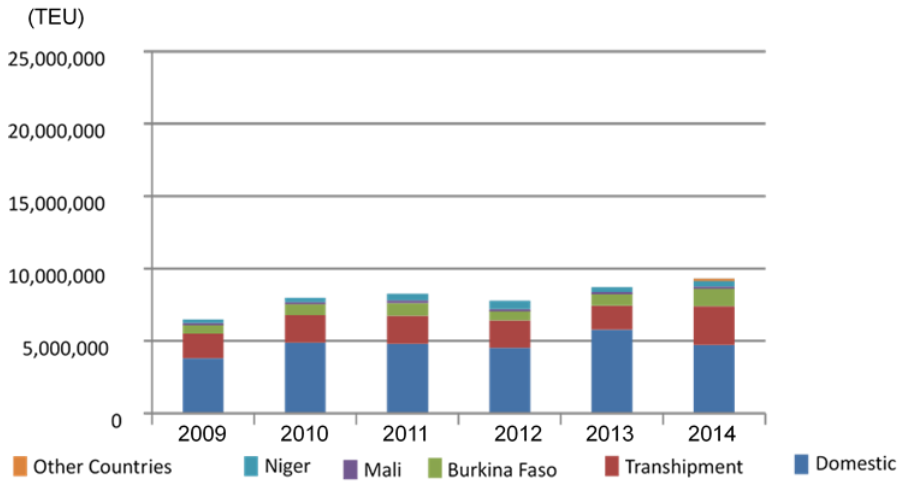
Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

Figure2.3.3 Country Freight Handling Volume at Abidjan Port



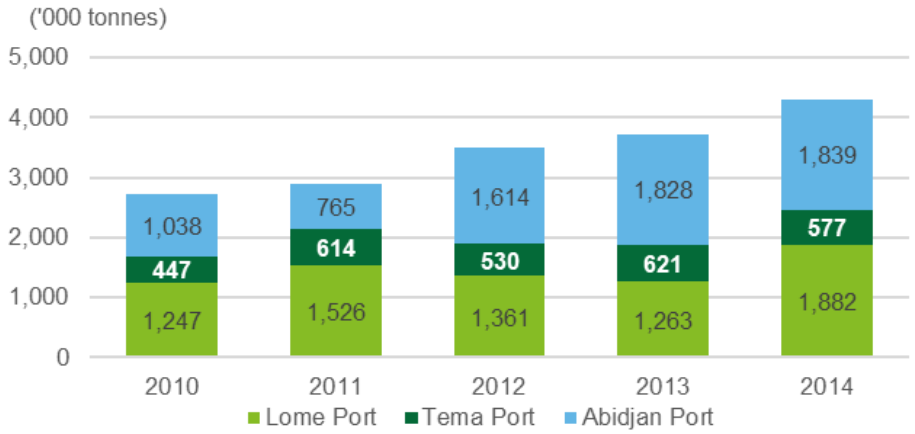
Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

Figure2.3.4 Freight Volume by Country at Tema Port



Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

Figure 2.3.5 Freight Volume by Country at Lomé Port



Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018

Figure 2.3.6 Throughput of Inland Countries' Cargoes at Three Major Ports

■ Logistics

Corridors connecting coastal countries (Côte d'Ivoire, Ghana, and Togo) to Burkina Faso of the inland country are through roads and railways. In the corridor master plan, analysis has been made for the comparison of the corridors in the traffic volume at the border and the percentage of trucks in the past and present. In that analysis, traffic volume between Côte d'Ivoire and Burkina Faso has increased by 360% between 2012 and 2015. In addition, as for the Logistic Performance Index (LPI), which is an interactive benchmarking tool to help countries identify the challenges and opportunities they face in their performance on trade logistics implemented and updated by the World Bank every two years, the WAGRIC countries have been suffering at low-ranking but at higher among West African countries. As for logistics costs, data was collected and analyzed in each corridor and each transportation modes. Furthermore, cost comparison between containers and bulk shipments was made. In the analysis, rail transportation can carry goods and passengers at lower costs than roads on the same route. On the other

hand, even if the transportation modes are the same, the cost could be depending on corridors.

Table 2.3.23 Traffic Volume at the Border along the Corridor

Border	Traffic volume (vehicles / day)	Ratio of Truck use	Percentage of other vehicles	Truck traffic growth rate from 2012
Côte d'Ivoire / Burkina Faso (Léraba)	612	61.60%	38.40%	359%
Ghana/ Burkina Faso (Page)	465	76.30%	23.70%	173%
Togo/ Burkina Faso (Cinkassé)	746	76.10%	23.90%	106%

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018, 2015 Traffic Survey by the JICA Study Team

Table 2.3.24 Logistics Performance Index (LPI) Comparison of the WAGRIC Countries

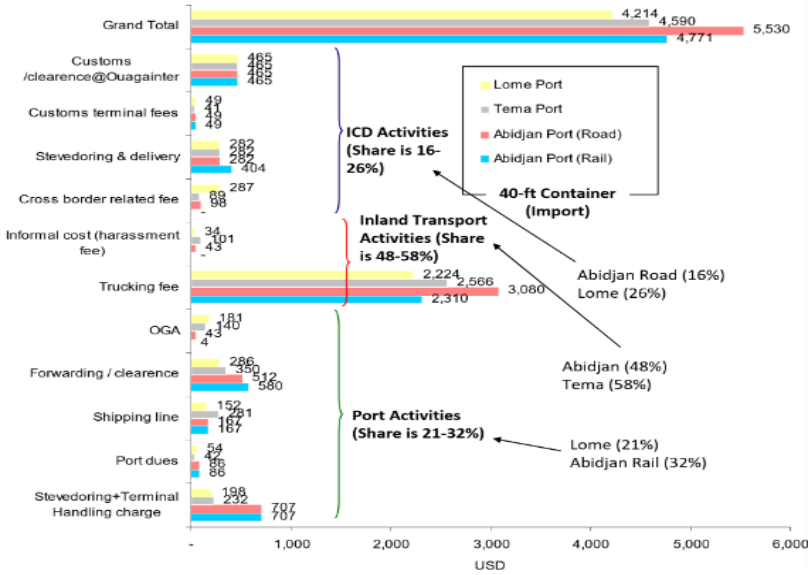
Country	LPI Ranking (World ranking)			LPI ranking (ranking in West Africa)
	2010	2014	2016	
Burkina Faso	134	98	81	1
Côte d'Ivoire	83	79	95	5
Ghana	108	100	88	2
Togo	97	139	92	4

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018,, Logistics Performance Index, World Bank, 2016

Table 2.3.25 Cross-Corridor, Cost Comparison by Means of Transportation

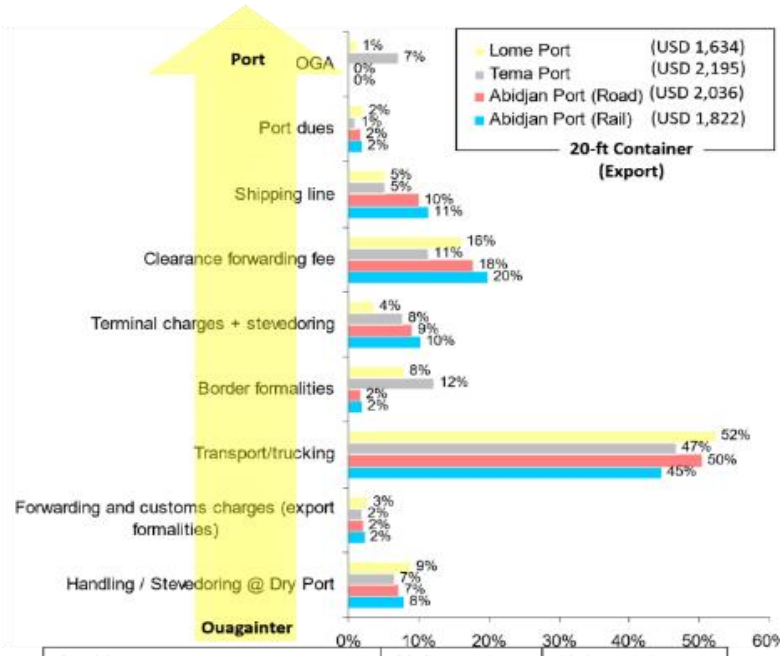
Corridor	40-ft container (24 t)	Bulk loading (24 t)	Difference
Abidjan-Ouagadougou (Road)	5,531	4,929	602
Abidjan-Ouagadougou (Rail)	4,772	4,345	427
Tema/Accra-Ouagadougou (Road)	4,590	3,591	999
Lomé-Ouagadougou (Rail)	4,214	3,393	821

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018



Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018, 2016 Logistics Survey by the JICA Study Team: Logistics Chain Survey (between Port to Final Destination) and Supply Chain and Distribution System of Major Manufacturing Companies

Figure 2.3.7 Comparison of Travel Cost of the Three Corridors of the WAGRIC countries



Corridor	20-ft container	40-ft container
Abidjan- Ouagadougou (Road)	2,036	2,830
Abidjan- Ouagadougou (Rail)	1,822	2,385
Tema/Accra- Ouagadougou (Road)	2,195	3,098
Lomé- Ouagadougou (Road)	1,634	2,158

Source: "The Project on the Corridor Development for West Africa Growth Ring Master Plan", JICA, March 2018, 2016 Logistics Survey by the JICA Study Team: Logistics Chain Survey (between Port to Final Destination) and Supply Chain and Distribution System of Major Manufacturing Companies

Figure 2.3.8 Comparison of Export Costs of the Three Corridors of the WAGRIC countries

CHAPTER 3 Outline of Development Status of Each Corridor and Supports by Other Donors

3.1 Master Plan on Logistics in Northern Economic Corridor

3.1.1 Major projects

The "Flagship Projects" in the corridor master plan are shown in the following table

Table 3.1.1 Flagship Project List of Northern Corridor as of the Master Plan Formulation

	Country	Sector	Project
1	Both countries	Oil & Mining	Eldoret – Kampala – Kigali Oil Pipeline Project
2	Both countries	ICT	ICT Project in Northern Corridor
3	Both countries	Road	Logistics Highway Project
4	Both countries	Logistics	Logistic Hub Project
5	Kenya	Road	Eldoret – Juba Highway Project
6	Kenya	Port	Mombasa Port Development Project
7	Kenya	Urban Development	Project for Support of Re-organizing Logistics Facilities around Mombasa Port Area
8	Kenya	Water	Stony Athi Dam and Upper Athi Dam Project
9	Kenya	Water	Mwache Dam Project
10	Kenya	Power	Isinya – Nairobi East Transmission Line Project
11	Kenya	Manufacturing	Geothermal Energy Based Regional Industrial Development in Rift Valley
12	Kenya	Power	Geothermal Project in Rift Valley
13	Kenya	Power	Mombasa Coal Power and Mariakani Substation Project
14	Kenya	Power	Dongo Kundu – Mariakani Transmission Project
15	Kenya	Manufacturing	Mombasa Special Economic Zone Project
16	Kenya	Manufacturing	Project for Building Up Competitiveness of Construction Materials and Machinery Industry in Kenya
17	Kenya	Agriculture	Agricultural Financing Improvement Project in Nairobi
18	Kenya	Agriculture	Value Chain of Agricultural Development Pilot Project in Kenya
19	Kenya	Urban Development	Great Kisumu Metropolitan Logistic Based Regional Development Project
20	Uganda	Oil & Mining	Study on Mining Master Plan in Uganda
21	Uganda	Manufacturing	Project for Building Up Competitiveness of Construction Materials and Machinery Industry in Uganda
22	Uganda	Agriculture	Value Chain of Agricultural Development Pilot Project in Uganda
23	Uganda	Power	Kampala – North – Namungoona – Mutundwe 132kV Transmission Line Refurbishment
24	Uganda	Power	Northern Corridor Integration Backbone (Power Generation, Transmission and Interconnectivity)
25	Uganda	Urban Development	Greater Kampala (including Jinja) Logistic Based Urban Development Project
26	Uganda	Transport	MP for Urban Transport Development for Regional cities
27	Uganda	Manufacturing	Special Economic Zone Development Project in Jinja

Source: JICA (2017) “Project for Master Plan on Logistics in Northern Economic Corridor, Final Report”

3.1.2 Overview of Each Country of Corridor Areas and the Status of Major Projects

(1) Kenya

Table 3.1.2 shows the summary of political, economic, and social movements, as well as infrastructure projects in Kenya before and after the corridor master plan was formulated. With regard to the economy, although the economic growth rate slows down during the turmoil of the presidential election, it has a stable and continuous growth with an average of around 5% since 2010. With regard to major infrastructure projects since 2010, a new container terminal at Mombasa Port was completed in 2016, and progress has been made on various logistics operations in major cities such as the improvement of road infrastructure, and development of a new railway between Mombasa and Nairobi.

Table 3.1.2 Major Events (Political, Economic, and Social) in Kenya and Infrastructure Projects since 2010

Year	Major events		
	Politics, Economy, and Society	GDP growth rate [3]	Infrastructure
2010	・ Elimination of customs duties in East African Community (EAC) with some exceptions	8.4%	—
2011	—	6.1%	
2012	—	4.6%	・ Tika Superhighway opened
2013	・ Common Visa of Kenya, Uganda and Rwanda in EAC ・ Al Shabaab (Somalia's antigovernment organization) attacked a shopping center	5.9%	—
2014	・ Al Shabaab attacked Garissa University ・ The number of new car sales reached a record high of 19,492 in 2015	5.4%	—
2015	—	5.7%	・ Olkaria I 4 ・ 5 Geothermal Power Plant Completed ・ Northern Corridor Transportation Improvement Project Completed (started in 2004)
2016	・ Drought outbreak (2.7 million people affected), and national disaster declaration	5.9%	・ New container terminal (Berth 20 and 21) opened at Mombasa Port ・ Nairobi Southern bypass opened
2017	・ General election was held. President Kenyatta re-elected (term of 5 years). The Supreme Court receives an opposition from candidate Odinga and decides to invalidate the presidential election. A re-election took place in October and announces the re-election of President Kenyatta	4.9%	・ Madaraka Express railway (Nairobi-Mombasa) opened

[3] GDP growth rates for 2014-2017, Refer to World Bank Open Data (https://data.worldbank.org/indicator/ny.gdp.mktp.kd.zg)

	・ Economic stagnation due to the elections ・ Kenyan government announced the "BIG4", as the key set of economic policies for the next five years, (1) manufacturing, (2) food and nutrition security, (3) universal health coverage, and (4) affordable housing supply		
2018	・ Kenyan government announced to raise the legal minimum wage by 5.0% compared to the previous year ・ Announcement of proposed amendments to customs duties and value-added taxes	5.9%[4]	—

Source: Prepared by the JICA Study Team based on articles from newspapers, press release, etc.

(1) Uganda

Table 3.1.3 shows the outline of the political, economic, and social movements in Uganda and the infrastructure projects before and after the formulation of the corridor master plan. In 2013, with the assistance of JICA, the "Athiak – Nimle Road Rehabilitation Project" linking Athiak in Uganda and Nimle in South Sudan was completed, contributing to the stimulation of economic activities in both countries. On the other hand, although not listed in the table, Karuma hydroelectric power station supported by China will be completed in the late 2019.

Table 3.1.3 Major Events (Political, Economic, and Social) in Uganda, and Infrastructure Projects since 2010

Year	Major events		
	Politics, Economy, and Society	GDP growth rate [5]	Infrastructure
2010	・ Elimination of tariffs in East African Community (EAC) with some exceptions	5.6%	—
2011	・ Presidential and parliamentary elections were held. President Museveni was re-elected for fourth term.	9.4%	—
2012	・ Completion of return of internally displace persons (IDPs) (end of UNHCR support)	3.8%	・ Completion of Bujagali Hydroelectric Power Station ・ Completion of Bujagali transmission (Cooperative finance between JICA and AfDB
2013	—	3.6%	・ Atiak-Nimle road improvement project completed
2015	・ Second national Development Plan (NDP II) formulated (2015/2016-2019/2020)	5.2%	—
2016	・ Presidential and parliamentary elections were held. President Museveni was re-elected for fifth term. ・ A multitudes of refugees flow to Uganda after armed confliction at a South Sudan	4.8%	—

[4] Refer to African Development Bank Country information(https://www.afdb.org/en/countries/west-africa/cote-d%E2%80%99ivoire/cote-divoire-economic-outlook/)

[5] GDP growth rates for 2010-2016, Refer to World Bank Open Data (https://data.worldbank.org/indicator/ny.gdp.mktp.kd.zg)

2017	・ Holding the United Nation Refugee Solidarity Summit in Uganda ・ Refugees from South Sudan are over a million ・ Abolition of age restrictions for presidential candidates is approved by the parliament	3.9%	—
2018	・	—	Completion of Nile bridge (ODA loan by JICA)
2019	・	—	Completion of Isimba Hydroelectric dam

Source: Prepared by the JICA Study Team based on articles from newspapers, press release, etc.

3.1.3 Progress of the Corridor Master Plan

Road projects under development or completed in recent years are shown in the table below[6].

Table 3.1.4 Status of Major Projects in the Northern Corridor

NO.	Project	Status	Responsible Party
1	Eldoret – Kampala – Kigali Oil Pipeline Project	-	Kenya Pipeline Company
2	ICT Project in Northern Corridor	-	Ministry of Energy and Mineral Development
3	Logistics Highway Project	Kenya; Nairobi-Nakuru Section The project is planned to be delivered through PPP and indicative project cost is USD 1.8 billion. Concessioner will be selected by the end of 2019 (as of January 2019)	Kenya: Kenya National Highways Authority Uganda: Uganda National Road Authority
4	Logistic Hub Project	-	Kenya: Kenya Port Authority Uganda: Ministry of Works and Transport
5	Eldoret – Juba Highway Project	Total of 960km road will be upgraded to a paved road. Project commenced with the support of the World Bank in 2015 and will be completed in 2021[7].	Kenya National Highway Authority
6	Mombasa Port Development Project	Loan Agreement of Mombasa Port Development Project phase 2 was in 2014 following the phase 1 project; the new container terminal at phase 1 was open in 2016 and construction of additional container terminals of phase 2 will be completed in 2021 (as of January 2019).	Kenya Ports Authority
7	Project for Support of Re-organizing Logistics Facilities around Mombasa Port Area	Loan Agreement of Mombasa Port Area Road Development Project phase 2 (JPY 12.5 billion) through the support of JICA was signed in 2017 following the phase 1 project (JPY 27.7 billion).As the phase 2 project, road which	Kenya National Highways Authority

[6] These do not necessarily coincide with the Corridor Master Plan description project.
[7] Construction Kenya, 2015 September, Construction of Sh135bn Eldoret-Juba road finally gets underway (https://www.constructionkenya.com/2849/eldoret-juba-construction/)

		connects the new container terminal and Northern Corridor and a part of the bypass road to south area where Mombasa SEZ is planned will be developed for the completion in 2021.	
8	Stony Athi Dam and Upper Athi Dam Project	-	Athi Water Services Board
9	Mwache Dam Project	Construction work commenced in October 2018 and will last four years for the completion. USD 150 million project is delivered with the support of French ODA (Agence Francaise De Development)[8].	National Water Conservation and Pipeline Corporation
10	Isinya – Nairobi East Transmission Line Project	Under construction with the support of AfDB (as of January 2019)	Kenya Electricity Transmission Co. Ltd
11	Geothermal Energy Based Regional Industrial Development in Rift Valley	-	Ministry of Industry, Trade and Cooperatives
12	Geothermal Project in Rift Valley	**Olkaria** Total of six power plants will be developed ; Olkaria 1 -5 have already been completed and Olkaria 6 will be completed with loan from World Bank, EIB, KfW and AFD. Turbines of Olkaria 1-3 were equipped with the support of JICA (USD 95 million). **Eburru** Phase 1 (2.4MW) project was completed by US Geothermal Development Associates and Phase 2 project (25MW) is under construction by Kenya Electricity Generating Company. **Menengai** There are four phases of the project in which total power generation will be 1,600 MW. Phase 1 project (Menengai I, II and III) commenced; Menengai I and II have been under construction since 2011 (operation will commence in 2020) and III will commence in 2020. The project is financed by AfDB and Climate Investment Fund.[9] **Suswa** The plant of 330 MW will be developed by American company, CYRQ Energy with the target of the completion in 2024. **Baringo/Silali** Test drilling is underway with the support of KfW. The project will delivered by IPP. Expected capacity of the total of three phases will be 100 MW.	Geothermal Development Company, Kenya Electricity Generating Company, IPPs
13	Mombasa Coal Power and Mariakani Substation Project	**Mariakani Substation Project** The project will be financed by AfDB and the government of Kenya (USD 30 million) and be completed in October 2020 (as of January 2019)[10].	Kenya Electricity generating company

[8] Coast Development Authority, article about Mwache Dam Multipurpose Development Project (http://cda.go.ke/mwache-dam/)
[9] Article of Jiji.com, 9th June, 2019 (https://www.jiji.com/jc/article?k=2019060800382&g=int)
[10] Announcement of Kenya Electricity and Transmission Co. Ltd. 27th January 2016 (https://www.ketraco.co.ke/news/2016/Mariakani.html), and Kenya Broad Casting 1 article, 22nd May 2019, Mariakani

14	Dongo Kundu – Mariakani Transmission Project	The Kenya Electricity Transmission Company has submitted the application of the project to the government of Kenya. Total project cost will be USD 30 million[11]. JICA implements a F/S for the project (as of January 2019).	Kenya Electricity generating company
15	Mombasa Special Economic Zone Project	JICA delivered "Project on Master Plan for Development of. Mombasa Special Economic Zone" from 2014 to 2015, "the Project for Infrastructure development in Mombasa Special Economic Zone in 2017, and F/S as of January 2019.	Ministry of Industry, Trade and Cooperatives, Kenya Port Authority
16	Project for Building Up Competitiveness of Construction Materials and Machinery Industry in Kenya	-	Ministry of Industry, Trade and Cooperatives, Kenya Port Authority
17	Agricultural Financing Improvement Project in Nairobi	-	Ministry of Agriculture, Ministry of Finance, AfDB
18	Value Chain of Agricultural Development Pilot Project in Kenya	JICA evaluates possible supports for the project as a part of the Northern Corridor Agricultural Value Chain Development project (as of January 2019).	The Agriculture, Fisheries and Food Authority
19	Great Kisumu Metropolitan Logistic Based Regional Development Project	-	Ministry of Industry, Trade and Cooperatives, Ministry of Urban Planning, County government
20	Study on Mining Master Plan in Uganda	-	Ministry of Energy and Mineral Development
21	Project for Building Up Competitiveness of Construction Materials and Machinery Industry in Uganda	-	Ministry of Trade, Industry and Cooperatives, Uganda National Bureau of Standard
22	Value Chain of Agricultural Development Pilot Project in Uganda	The project will be financed by AfDB. While the cabinet gave approval of the project, the approval of the congress will be required for starting the project (as of January 2019).	The Ministry of Agriculture, Animal Industry and Fisheries
23	Kampala – North – Namungoona – Mutundwe 132kV Transmission Line Refurbishment	Loan Agreement with JICA (JPY 13.7 billion) was signed as a part of "Kampala Metropolitan Transmission System Improvement Project" in April 2018. Selection of a contractor is underway (as of January 2019).	Uganda Electricity Transmission Company

substation to increase geothermal power supply in Coast (https://www.kbc.co.ke/mariakani-substation-to-increase-geothermal-power-supply-in-coast/)

[11] Business Daily article, 12th February 2019, State plans power line to Dongo Kundu SEZ (https://www.businessdailyafrica.com/news/counties/State-plans-power-line-to-Dongo-Kundu-SEZ/4003142-4978796-hd0iodz/index.html)

24	Northern Corridor Integration Backbone (Power Generation, Transmission and Interconnectivity)	Transmission line of the section of Karuma – Kawanda and Karuma – Olwiyo are delivered as a part of Karuma hydroelectric power plant supported by the Export-Import Bank of China. The development of transmission line between Olwiyo and Juba is planned and the loan for F/S is examined by AfDB. The government of Uganda requested a financial supports to JICA at the loan agreement on "Kampala Metropolitan Transmission System Improvement Project" (as of January 2019).	Governments of Kenya and Uganda
25	Greater Kampala (including Jinja) Logistic Based Urban Development Project	The Multi-Modal Urban Transport Master plan for the Greater Kampala Metropolitan Area (GKMA) was formulated with the support of World Bank in 2018. Moreover, EU supported the mid-term review on the National Transport Master Plan (NTMP) ; the review recommended that the new NTMP should focus not only on the development of urban transport system in GKMA but also on that in regional cities. EU has a plan to finance the formulation of the new NTMP.	Ministry of Trade, Industry and Cooperatives, Ministry of Land, City government
26	MP for Urban Transport Development for Regional cities	The new transport master plan 2021 – 2040 is under preparation by Danish consulting company, COWI with the support of EU[12].	Ministry of Works and Transport
27	Special Economic Zone Development Project in Jinja	-	Ministry of Trade, Industry and Cooperatives

Source: Prepared by the JICA Study Team based on articles from newspapers, press release, etc.

3.2 Nacala Corridor Economic Development Strategies in the Republic of Mozambique

3.2.1 Major Projects

The major projects in the corridor master plan, PEDEC-Nacala, are designated as "Priority Projects". Among these projects, those considered to be particularly important are selected from the following perspectives:

- To effectively operationalize the transport corridor as an initial impetus for the Nacala Corridor Region.
- Reduce the negative impact on the natural and social environment brought by the development of the transport corridor.
- Activate the economic sector by taking advantage of development opportunities created by the improvement of the transport corridor.
- Activate regional development and implement smoothly the other important development aspects.
- The relevant agencies have a good understanding and maturity of management.

[12] World Construction Network, 2019 Mar 6th, COWI to develop transport master plan for Uganda (http://www.worldconstructionnetwork.com/news/cowi-to-develop-transport-master-plan-for-uganda)

· The impact on the environment and society is surely mitigated.

The list of the priority projects is shown below:

Table 3.2.1 Priority Projects in the Nacala Corridor

No.	Country	Sector	Project
1	Mozambique	Urban Development	Nacala Industrial Park Project
2	Mozambique	Urban Devlopment	Nacala Industrial Belt Area Development Project
3	Mozambique	Port/Road	Nacala Port Access Road Project
4	Mozambique	Logistics	Nacala Multi-Modal Terminal and Railway Shunting Yard Project
5	Mozambique	Power	Project for Urgent Installation of Thermal Power Generator with Capacity of 30-40 MW in Nacala Bay Area
6	Mozambique	Power	Nacala Thermal Power Plant Project
7	Mozambique	Water	Nacala Urban Water Supply Expansion Project
8	Mozambique	Urban Development	Nacala SEZ/IFZ Management Improvement Project
9	Mozambique	Road	Nampula Southern Road Bypass Project
10	Mozambique	Rail	Nampula Railway Bypass Project
11	Mozambique	Logistics	Nampula Multi-Modal Terminal and Railway Shunting Yard Relocation Project
12	Mozambique	Rail	Railway Crossings Improvement Project
13	Mozambique	Road	Cuamba Road Bypass Project
14	Mozambique	Urban Development	Cuamba Industrial Park Project
15	Mozambique	Road	Cuamba-Marrupa Road Upgrade projects
16	Mozambique	Port	Palma Port Project
17	Mozambique	Power	Palma Thermal Power Plant Project
18	Mozambique	Water	Palma Urban Water Supply Project
19	Mozambique	Urban Development	Palma Urban Expansion Project
20	Mozambique	Road	Bridge Replacement Project for Pemba-Palma-Negomano Roads
21	Malawi	Logistics	Malawi Central Inland Container Depot Project (Malawi)
22	Zambia	Logistics	Chipata Inland Container Depot Project (Zambia)
23	Mozambique	Road/Logistics	N-13 Highway Service Stations and Truck Terminals Establishment
24	Mozambique and Malawi	Border	Mandimba One Stop Border Post Project
25	Mozambique	Logistics/Urban Development	Logistics Improvement Project for Mocuba SEZ
26	Mozambique	Rail	Railway Regulator Capacity Development Project
27	Mozambique	Meteorology	Meteorological and Hydrological Observation Network System and Capacity Development Project
28	Mozambique	Water	Sanhute Dam Project (for Urban Water Supply to Nacala)
29	Mozambique	Water	Project for Study on Integrated Water Resources Management of River Basins surrounding Nacala Bay Area and Lurio River Basin
30	Mozambique	Water	Monte Tiza Dam Project (for Urban Water Supply to Nampula)
31	Mozambique	Power	Nampula-Nacala Power Substation Reinforcement Project
32	Mozambique	Power	Chimuara-Namialo-Nacala Transmission Line Project
33	Mozambique	Power	Palma-Penba-Nacala Transmission Line Project
34	Mozambique	Fuel	Tete Coal Briquette Project
35	Mozambique	Environment	Environmental Management Capacity Development Project
36	Mozambique	Land	Project for Strengthening on the DUAT Acquisition Process

37	Mozambique	Resettlement	Project for Capacity Development for the Resettlement Process
38	Mozambique	Education	Community-Based School Management Programme
39	Mozambique	Education	Programme for Strengthening of Secondary Education with Focus on Science and Mathematics
40	Mozambique	Education	Nacala Medium-Level Technical and Vocational School Project
41	Mozambique	Education	Cabo Delgado Medium-Level Technical and Vocational School Project
42	Mozambique	Education	Nacala Superior Polytechnic Project
43	Mozambique	Education	Cabo Delgado Superior Polytechnic Project
44	Mozambique	Institutional Design	Nacala Corridor Regional Development Management Reinforcement Project
45	Mozambique	Industry	Large-Scale Projects and Local Industry Linkage Project
46	Mozambique	Land	Support Programme for DUAT Acquisition for Small-Scale Farmers in Less Accessible Areas
47	Mozambique	Education	Programme for Primary School Development in Less Accessible Areas
48	Mozambique	Education	Programme for Health Centre Development in Less Accessible Areas

Source: Oriental Consultants Global (2017) "THE PROJECT FOR SUPPORTING THE PROMOTION OF NACALA CORRIDOR DEVELOPMENT" Presentation Material

3.2.2 Overview of Mozambique and Status of Major Projects

The table below shows the summary of the political, economic, and social movements in Mozambique and the infrastructure projects during and after the formulation of the corridor master plan. The undisclosed debt problem that was found in 2016 caused the economic turmoil, but as of 2019, the method of payment has been agreed. Although the fiscal deficit has been continued, high economic growth is expected in the future, by the mining sector, such as the progress of gas development.

Table 3.2.2 Major Events (Political, Economic and Social) in Mozambique and Infrastructure Projects since 2010

Year	Major events		
	Politics, Economy and Society	GDP growth rate [13]	Infrastructure
2014	・ Presidential and parliamentary elections and state legislative elections were held. Nyusi was elected as the President.	7.4%	・ Nacala new airport opened. ・ Nampula-Cuamba road improvement started (as of May 2019, it has not been completed).
2015	・ President Nyusi took office. ・ The rainfall from October to December has been the lowest in the past 35 years. ・ Declaration of a state of emergency brought about by extreme drought.	6.6%	・ JICA Nacala Port Operation Improvement Project completed (Nacala Port rehabilitation by JPY3.2 billion grant started in 2012). ・ JPY29.2 billion loan contract for the Nacala Port development Phase 2 was engaged (Phase 1 was contracted in 2013) ・ Coal transportation between Moatize and Nacala-a Velha started.
2016	・ Government admitted the undisclosed debt in 2016 (USD 1.35 billion as of April). ・ Moody's downgraded Mozambique's issuer rating for the second time. IMF, the World Bank, the UK and other partners froze providing financial support.	3.8%	・ Lichinga-Cuamba rail rehabilitation

[13] GDP growth rates for 2014-2017, Refer to World Bank Open Data (https://data.worldbank.org/indicator/ny.gdp.mktp.kd.zg)

2017	・ JETRO Maputo Office opened	3.7%	・ Opening ceremony of Nacala Corridor Railway and Port Infrastructure business, which Mitsui & Co., and Vale, a Brazilian mining company, owned 50% of stocks by each, was held.
2018	・ JBIC, private financial institutions and African Development Bank (AfDB) decided to co-finance total of USD 2.73 billion for railway and port construction projects in the Nacala Corridor ・ Ministry of Economics and Finance announced that they agreed with some creditors on undisclosed debt restructuring (USD 726 million out of approximately USD 2 billion) ・ Afonso Dhlakama, the leader of Mozambique's main opposition group, RENAMO, died. Mr. Momade was selected as the interim leader ・ Government and RENAMO agreed on military reunification as part of a peace process ・ Nationwide local election was held in October	3.3%[14]	・ Nacala port development by Japanese loan (signed in 2015, construction started in 2018) ・ Tohoku Electric Power Company, Inc. and LNG 1 co-invested by Anadarko and other companies agreed on the purchase of LNG. ・ ExxonMobil signed an oil and gas exploration contract with the Mozambique government.
2019	・ Mozambique's RENAMO opposition party elected Ossufo Momade as its leader ahead of a general election.	―	・ Port operation management advisory has been dispatched as part of the Nacala Port operation improvement support (technical cooperation) by JICA

Source: Prepared by the JICA Study Team based on articles from newspapers, press release, etc.

Although the undisclosed debt problem negatively affected Mozambique's infrastructure investment promotion, the function of Nacala Port has been maintained and improved in some aspects including the introduction of customs EDI and enhancement of port management capabilities. In addition, Nacala Port area expansion plan started in 2018 using loan for the Nacala Port Development Phase 2 signed in 2015, and the development of access roads inside the port has been developed. However, no significant progress could be confirmed in this study with regard to the access roads around the ports and roads along the corridor,

3.3 The Corridor Development for the WAGRIC Master Plan

3.3.1 Major Projects

The major projects in the Corridor Development for the WAGRIC Master Plan have been designated as "Top Priority Projects". Among these projects, those considered to be particularly important are selected from the following perspectives.

・ Various growth industries contributing to the development of the whole region and industrial promotion

[14] Mozambique National Institute of Statistics (INE), March 2019

- Promote investment in growing industries by strengthening customs alliance and regional economic integration, considering future market expansion
- Strengthen customs alliance between the four countries targeted by the master plan, to promote regional economic integration and facilitate regional trade between borders, ports, and corridors
- Strategic improvement of time-efficient transport corridor infrastructure to promote regional economic integration and inland investment
- Integrate railway and road transport to develop more efficient and broader freight transport areas
- Investment promotion and infrastructure development for expansion and promotion of "mineral resources" and "traditional agricultural products" that are sources of sustainable economic growth
- Development of infrastructure to improve business environment in the corridor
- Human resource capacity development for industries Enrichment of human resources training in the industrial sector and fundamental social services, in order to provide corridor development opportunities to all residents
- Development of environmental management activities to cope with environmental and social risks due to corridor development
- Preservation of a safe and secure society and economy by reinforcing security

The list of top priority projects is shown below.

Table 3.3.1 Top Priority Projects in the WAGRIC Countries

No,	Country	Sector	Project
1	Burkina Faso	Mining	Expansion of Mining Operation of Tambao Manganese Mine by Rehabilitation and Construction of Railway between Tambao and Ouagadougou through Dori and Kaya
2	Burkina Faso	Agriculture	Project for Development of Signature Agricultural Products and Marketing for Sub-Regional Markets
3	Burkina Faso	Agriculture	Projects for Expansion of Livestock Production including 1) Project for Basic Service Improvement for Cattle and Small Ruminants, 2) Project for Technical Development for Fodder Crop Production and Feeding Method, and 3) Project for Value Chain Development for Animal Products
4	Burkina Faso	Investment	Investment Promotion for Economic Sectors targeting Sub-Regional Markets
5	Burkina Faso	Road	Projects for Improvement of Roads for Providing Better Access to Potential Agricultural Areas in Inland Areas
6	Burkina Faso	Power	Project for Electricity Interconnection Line (Kompienga-Porga [Benin]) Development (Construction of Interconnected Power Transmission Lines between Burkina Faso and Benin)
7	Burkina Faso	Agriculture	Project for Development of Irrigation Schemes in Wetlands
8	Burkina Faso	Rail	Projects for Development of Loading and Off-Loading Facilities for Cattle and Cattle Waiting Pens at Railway Stations (Suburban Ouagadougou, Suburban Bobo-Dioulasso and Kaya)
9	Burkina Faso	Logistics	Strengthening of Implementation of Customs Union for Sub-Regional

			Products at National Borders
10	Burkina Faso	Logistics	Project for Construction and Operation of Multi-Modal Dry Port in Ouagadougou
11	Burkina Faso	Logistics	Project for Expansion of Multi-Modal Dry Port in Bobo-Dioulasso
12	Burkina Faso	Road	Construction of Southern Section (between N1 and N4) of Ouagadougou Outer Ring Road (Southern Bypass)
13	Burkina Faso	Road	Projects for Construction of Motorway between Ouagadougou and Koudougou and Motorway between Koudougou and Bobo-Dioulasso
14	Burkina Faso	ICT	Project for Construction and Management of Data Centre in Ouagadougou
15	Burkina Faso	Security	Project for Strengthening of Airport Security by Installing Security Equipment
16	Togo	Agriculture	Support Project for Development for Kara, Oti, and Mono Agropoles (Water Resources Development and Logistics Centre)
17	Togo	Logistics	Project for Construction of Industrial Park along the Motorway in Greater Lomé
18	Togo	Industry	Project for Construction of Industrial Park in Kara
19	Togo	Industry	Project for Construction of Industrial Park in Sokodé
20	Togo	Investment promotion	Investment Promotion for Economic Sectors targeting Sub-Regional Markets
21	Togo	Road	Projects for Improvement of Roads for Providing Better Access to Potential Agricultural Areas in Inland Areas (for Kara, Oti, and Mono Agropoles)
22	Togo	Power	Project for Construction of Adjarala Dam and Hydropower Plant
23	Togo	ICT	Project for Construction and Management of Data Centre in Lomé
24	Togo	Logistics	Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders
25	Togo	Road	Project for Construction of Greater Lomé Sections of Abidjan-Lagos Motorway
26	Togo	Rail	Investment Promotion for Reactivating Bandjeli Iron Ore Mining and Railway Construction between Lomé and Kabou (410 km)
27	Togo	Road	Construction of Sokodé Bypass Road as part of 4-Lane High-Standard Road (10 km)
28	Togo	Road	Project for Construction of Motorway between Lomé Bypass and New International Airport (including Tsévié Bypass)
29	Togo	ICT	Project for Construction of Optic Fibre Cable in the North-South Corridor
30	Union économique et monétaire ouest-africaine (UEMOA)	Industry	UEMOA Programme for Coordination and Promotion for Implementation of Fostering of Economic Sectors targeting Sub-Regional Markets
31	UEMOA	Agriculture	UEMOA Programme for Promotion of Utilization of Principles of Responsible Investment to Agriculture, Livestock, and Fisheries Sector
32	UEMOA	Comprehensive	UEMOA Programme for Coordination and Promotion for Implementation of Development of Basic Infrastructure for Growth Economic Sectors including Access Roads, Railways, Electricity, Water Resources, ICT, and Oil and Gas
33	UEMOA	Logistics	Project for Building Consensus for Strengthening Implementation of Customs Union in the WAGRIC Countries prior within the 8 Member Countries of UEMOA and 15 Member Countries of Economic Community of West African States (ECOWAS) (through Coordination within UEMOA Commission and Coordination with ECOWAS)
34	UEMOA	Logistics	Project for Studying and Implementing Possible Measures for Promoting Railway and Truck Multi-Modal Transport

35	UEMOA	Road	Project for Promoting Implementation of the Sub-Regional Road Network Programme including Motorways and High-Standard 4-Lane Roads
36	Côte d'Ivoire	Agriculture	Project for Development and Effective Use of Agricultural Infrastructure and Bas-fonds
37	Côte d'Ivoire	ICT	Project for Human Resources Development for ICT Specialists
38	Côte d'Ivoire	Industry	Project for Construction of Cattle Market and Slaughterhouse Complex in Anyama
39	Côte d'Ivoire	Industry	Projects for Establishment of Industrial Park in Bonoua, Bouake, Yamoussoukro, and Korhogo
40	Côte d'Ivoire	Investment promotion	Investment Promotion for Economic Sectors targeting Sub-Regional Markets
41	Côte d'Ivoire	Road	Projects for Improvement of East-West Roads for Providing Better Access to Agricultural Potential Areas from Central Corridor
42	Côte d'Ivoire	Rail	Projects for Construction of Railway from San-Pédro to Iron Ore Mines in Tonkpi Region (Mt. Nimba, Mt. Klahoyo, and Mt. Gao)
43	Côte d'Ivoire	Natural resource	East Pipeline Development Project (with a total length of about 132 km from Abatta to Assinie)
44	Côte d'Ivoire	ICT	Project for Construction and Management of Data Centre in Grand-Bassam
45	Côte d'Ivoire	Rail	Construction of Off-Loading Facility of Cattle for Railway at Anyama Railway Station
46	Côte d'Ivoire	Power	Project for Development of 330kV Interconnection Line with Ghana (150 km)
47	Côte d'Ivoire	Power	Project for Improvement of Transmission and Distribution Networks including Construction and Upgrading of Substations in Greater Abidjan
48	Côte d'Ivoire	Water/ Sanitation	Project for Development of Surface Water of the Me River and Groundwater of Dabou for Greater Abidjan
49	Côte d'Ivoire	Water/ Sanitation	Project for Expansion of Intake and Water Treatment Plant from Bandama River for Yamoussoukro
50	Côte d'Ivoire	Water/ Sanitation	Project for Expansion of Water Treatment Plant in Loca Dam for Bouaké
51	Côte d'Ivoire	Water/ Sanitation	Project for Expansion of Intake and Water Treatment Plant from Bandama River for Korhogo
52	Côte d'Ivoire	Logistics	Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders
53	Côte d'Ivoire	Road	Construction of 4-Lane Motorway of the East Exit Line Cocody-Bonoua (45 km)
54	Côte d'Ivoire	Road	Project for Construction of 6-Lane Motorway between Bonoua and the border of Ghana (115 km)
55	Côte d'Ivoire	Logistics	Project for Construction and Operation of Multi-Modal Dry Port in the Suburban Area of Great Abidjan
56	Côte d'Ivoire	Logistics	Project for Construction and Operation of Multi-Modal Dry Port in Ferkessédougou
57	Côte d'Ivoire	Road	Projects for Construction of Motorway between Yamoussoukro and Bouaké (including Yamoussoukro Bypass Road and part of Bouaké Outer Ring Road) and Motorway between Bouaké and Niakaramandougou
58	Côte d'Ivoire	Security	Project for Strengthening of Airport Security by Installing Security Equipment
59	Ghana	Agriculture	Northern Zone's Agricultural Cluster Area Development Programme (Tamale-Mamprusi Cluster, Atebubu-East Gonja Cluster, and Gonja Kintampo and Bole-Tain Cluster)
60	Ghana	Industry	Project for Establishment of Prampram Industrial Park

61	Ghana	Industry	Project for Establishment of Tamale Industrial Park
62	Ghana	Industry	Project for Establishment of Ashanti Technology Park in Ejisu
63	Ghana	Investment promotion	Investment Promotion for Economic Sectors targeting Sub-Regional Markets
64	Ghana	Road	Projects for Improvement of Inter-Regional and Regional Roads for Providing Better Access to Agricultural Potential Areas from Central Corridor
65	Ghana	Natural resource	Project for Construction of Aboadze-Tema Gas Pipeline (250 km)
66	Ghana	Power	Project for Development of 330kV Interconnection Line (Dunkwa 2-Côte d'Ivoire)
67	Ghana	Water/ Sanitation	Project for Expansion of Water Treatment Plant in Weija Dam for Greater Accra
68	Ghana	Water/ Sanitation	Project for Expansion of Water Treatment Plant in Barakese Dam for Greater Kumasi
69	Ghana	Water/ Sanitation	Project for Tamale Water Supply Project
70	Ghana	Logistics	Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders
71	Ghana	Road	Project for Urban Transportation Master Planning for Greater Accra
72	Ghana	Road	Project for Construction of East-West Motorway in Greater Accra (100km)
73	Ghana	Road	Project for Construction of Motorway between Tema and Prampram (16 km)
74	Ghana	Rail	Project for Construction of Tema – Akosombo Railway
75	Ghana	Port	Project for Construction of Debre Port at Volta Lake
76	Ghana	Rail	Project for Rehabilitation of Tema Port – Boankra – Kumasi Section of Eastern Railway
77	Ghana	Rail	Project for Rehabilitation of Takoradi – Awaso Section of Western Railway
78	Ghana	Rail	Project for Construction of Railway between Awaso – Nyinahin
79	Ghana	Road	Project for Construction of Greater Kumasi Outer Ring Road North-East Section (25 km)
80	Ghana	Road	Project for Construction of 4-Lane High-Speed Way of National Road No.1 (Juaso, Yawkwei, and Konongo Bypass Roads, 15 km)
81	Ghana	Security	Project for Strengthening of Airport Security by Installing Security Equipment

Source: Oriental Consultants Global (2018) " WAGRIC-CACAO" presentation material

3.3.2 Overview of Each Country and Status of Major Projects

Updated information on individual projects on the entire corridor were obtained from a desktop research and interview surveys of government agencies and companies, and are as follow.

(1) Burkina Faso

Table 3.3.2 shows the summary of political, economic, and social movements in Burkina Faso and the outline of infrastructure projects before and after the development of the corridor master plan. In 2018, the government of Burkina Faso cut off diplomatic relations with Taiwan and established diplomatic relations with China. It may be possible that its relation with China will be strengthened in economic terms as well.

Table 3.3.2 Major Events (Political, Economic, and Social) in Burkina Faso and Infrastructure Projects since 2010

Year	Major events		
	Politics, Economy, and Society	GDP Growth[15]	Infrastructure
2010	・ Presidential election. President Compaore re-elected	5.3%	—
2011	・Cabinet reform	6.6%	—
2013	・Cabinet reform	5.7%	—
2014	・Protesters who oppose the referendum bill on the revision of the clause prohibiting a third presidential term assembled into a mob and resulted in worsened security situation. President Compaore announced his resignation and evacuated abroad. 27 years after the end of 27 years of Compaore's administration, the Kafando interim administration was formed.	4.3%	—
2015	・ The Presidential election and National Assembly elections are held. Kaboré was elected in a presidential election.	3.8%	—
2017	—	6.3%	・ 3 MW Zatgouli Solar power Project Completed ・ JICA concluded a grant agreement for the "Wagadoug Southeastern Tansova Bypass Road Improvement Project" up to JPY 5.8 billion in August 2017
2018	・ The government of Burkina Faso cut off diplomatic relations with Taiwan and established diplomatic relations with China.	—	・ 15 MW Essakane solar power project completed in Sahel.

Source: Prepared by the JICA Study Team based on articles from newspapers, press release, etc.

The following table shows the current status of the project confirmed through interviews with concerned agencies in February 2019.

Table 3.3.3 Status of Priority Projects in Burkina Faso as of March 2019

NO.	Project	Sub-project	Status	Source
1	Expansion Mining Operation of Tambao Manganese Mine by Rehabilitation and Construction of Railway between Tambao and Ouagadougou through Dori and Kaya	—	In negotiations with Chinese companies (finance and construction).	DGNET
2	Projects for Expansion of Livestock Production including 1) Project for Basic Service Improvement for Cattle and Small Ruminants,	—	It is included in the Livestock Sector Development Support Project for Burkina Faso adopted by the World Bank in July 2017. The total cost of the	WB

[15] Refer to World Bank Open Data（https://data.worldbank.org/indicator/ny.gdp.mktp.kd.zg）

	2) Project for Technical Development for Fodder Crop Production and Feeding Method, and 3) Project for Value Chain Development for Animal Products		project is USD 78.9 million (including 60 million from the World Bank)	
3	Projects for Improvement of Roads for Providing Better Access to Potential Agricultural Areas in Inland Areas	Improvement of Road (R21) between Banfora and Douna	Work has already been completed with Millennium Challenge Account finance.	DGNET
		Improvement of Road (N17) connecting N5 and N16 (Guiba – Garango)	F/S has been completed with the financial support from the Islamic Development Bank. It is in procurement stage for selecting an entity for constructing the road..	DGNET
		Improvement of Road (R9 and N29) connecting N16 and N17 for Providing Better Access to Bagrepole	Under construction, financed by WB	DGNET
4	Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders	—	Cinkanse customs checkpoints are being prepared by UEMOA, Togo, and Burkina Faso governments	UEMOA
			It is part of the Transport Sector Modernization and Corridor Trade Facilitation Project adopted by the World Bank in January 2017. The total cost of the project is USD 25 million (including 20 million from the World Bank).	WB
5	Project for Construction and Operation of Multi-Modal Dry Port in Ouagadougou	—	CCIBF is the project leading entity. A site of 300 hectares is planned for the development and the total cost of the project is planned to be 78 billion FCFA (approximately 15.6 billion yen). The F/S is funded by the African Development Bank and will start in April 2019 (to be completed in 6 to 7 months). Pre-F/S has already been completed at CCIBF's own expense. Regarding financing, discussion are being conducted with JICA and UEMOA. The financing scheme has not been decided yet, but PPP or public finance (such as foreign government) is assumed.	Chambre de Comme et d'Industrie du Burkina FASO （CCIBF）
6	Project for Expansion of Multi-Modal Dry Port in Bobo-Dioulasso	—	An expansion of 120 hectares has been decided. (The existing dry port is 19 hectares and will be expanded by 20 hectares at a time). The first phase of the expansion is funded by West African Development Bank (BOAD) and Burkina Faso commercial banks. It is at procurement stage for selecting a construction company.	Chambre de Comme et d'Industrie du Burkina FASO （CCIBF）

7	Construction of Southern Section (between N1 and N4) of Ouagadougou Outer Ring Road (Southern Bypass)	—	Funding by BOAD, under construction by COGEB (local company) and AGM.	DGNET
8	Projects for Construction of Motorway between Ouagadougou and Koudougou and Motorway between Koudougou and Bobo-Dioulasso	Motorway between Ouagadougou and Koudougou	CCIBF is the lead entity and is currently in negotiations with Chinese companies (finance and construction)	DGNET

Source: JICA Study Team

(2) Côte d'Ivoire

Table 3.3.4 shows the state of political, economic, and social movements as well as the infrastructure projects in Côte d'Ivoire before and after the formulation of the corridor master plan. The economy was unstable with the First Ivorian Civil War in the 2000s and during the confusion over the 2010 presidential election (the Second Ivorian Civil War). However, in recent years, expansion work of Abidjan Port started with the support of China. The movement for infrastructure renewal and expansion has also been activated.

Table 3.3.4 Major Events (Political, Economic and Social) in Côte d'Ivoire and Infrastructure Projects since 2010

Year	Major events		
	Politics, Economy, and Society	GDP Growth[16]	Infrastructure
2010	・ Both Mr. Ouattara and Mr. Gbagbo both held presidential oaths.	2.0%	—
2011	・ Constitutional House declared that Ouattara was elected as the president. President Ouattara conducts another oath and inauguration ceremony. ・ Prime Minister Soro formed the fourth cabinet. ・ National Assembly Election has been held for the first time in 11 years.	- 4.3%	—
2012	・ Prime Minister Ahoussou-Kouadio formed the cabinet in March. ・ Prime Minister Duncan formed the cabinet in November.	10.7%	—
2015	・ Presidential election was held and President Ouattara was re-elected.	8.9%	・ Deregulation of cargo handling services at Abidjan Port ・ Expansion work of Abidjan free port started with Chinese finance. It planned to expand the port capacity from 1.2 million TEU / year (2015) to 3 million TEU / year (2020). The project cost is USD 1.2 billion and the Chinese government has 85% stake.
2016	・ Prime minister Duncan formed the second cabinet.	8.0%	・ Songon 375 MW power plant construction was started.

[16] Refer to World Bank Open Data (https://data.worldbank.org/indicator/ny.gdp.mktp.kd.zg)

	・ Third Republic Constitution was established. ・ "PND2016-2020" (National Development Plan) was published. ・ GDP growth rate was 8.3%. However, the downturn of international cacao price depressed the country's economy. ・ The collapse of the 250 meter bridge built in 1910 over the Nzi River disrupted the railway connection between the country and Burkina Faso for several days.		・ The contract was awarded to the Italian National Railways for the development of a 1,000-km railway link between San Pedro port in Côte d'Ivoire and Bamako, the capital of Mali.
2017	・ GDP growth rate was7.8%.	7.7%	・ Soubre Hydroelectric Power Dam was completed (China's Export-Import Bank, Sinohydro Corp.).
2018	・ Prime minister Gon Coulibaly established the second cabinet.	7.4%[17]	―
2019	・ The Government of Côte d'Ivoire decided on a Cabinet Order to implement the phase 1 of phase-out abolition of import duties on EU products under a provisional economic partnership agreement with the EU. ・ Côte d'Ivoire Investment Promotion Center (CEPICI) announced that the amount invested in the country in 2018 has reached a record high of 700.3 billion CFA francs (approximately 133.6 billion yen), an increase of 50.8% over the previous year..	―	・ The expansion of the Vridi Canal as part of the Abidjan Port Expansion Project, has been completed. ・ Abidjan drinking water project is delivered by Veolia.

Source: Prepared by the JICA Study Team based on articles from newspapers, press release, etc.

No field survey for confirming the status of planned projects has been conducted in Côte d'Ivoire. Table 3.3.5 shows the projects that have been confirmed by desktop survey. It was noted that there was movement to use Chinese funds for port development.

Table 3.3.5 Status of Priority Projects in Côte d'Ivoire as of March 2019

NO.	Project	Sub-project	Status	Source
1	Project for Construction of Cattle Market and Slaughterhouse Complex in Anyama	―	The project will be implemented by private investment. The Pre-F/S was updated by the National Survey and Development Department (BNETD) (as of May 2016).	―
2	Projects for Establishment of Industrial Park in Bonoua, Bouake, Yamoussoukro, and Korhogo	―	F/S was implemented for Bonoua and Yamoussoukro Project. The project cost is estimated at USD 30 million with 50 ha each. Concession is considered (as of May 2016)	―
3	Projects for Construction of Railway from San-Pedro to Iron Ore Mines in Tonkpi	Railway between San-Pedro - Man	F/S is underway. The total cost of the project is expected to be USD	―

[17] Prediction of AfDB（https://www.afdb.org/en/countries/west-africa/cote-d%E2%80%99ivoire/cote-divoire-economic-outlook/）

	Region (Mt. Nimba, Mt. Klahoyo, and Mt. Gao)		1.4 billion. Concession is considered (as of May 2016).	
4	Project for Construction and Operation of Multi-Modal Port in Ferkessedougou	—	It is to be financed by China.	—
5	Projects for Construction of Motorway between Yamoussoukro and Bouake (including Yamoussoukro Bypass Road and part of Bouake Outer Ring Road) and Motorway between Bouake and Niakaramandougou	Motorway between Yamoussoukro and Bouake	Works have started in November 2018. The total cost of the project is estimated to be CF 17 billion.	—

Source: JICA Study Team

(3) Ghana

Table 3.3.6 shows the outline of the political, economic, and social movements in Ghana and the infrastructure business before and after the formulation of the corridor master plan. With the start of commercial production of oil, Ghana achieved an economic growth rate of about 15% in 2011. However, Ghana faced a sharp drop in the price of Ghana Cedi and high inflation. Ghana requested the IMF's financial support program in 2015 and worked on austerity. As a result, the financial situation improved. Meanwhile, in the infrastructure business, oil-related and other energy-related businesses have been firmly established. There were also movements toward the implementation of railway and port development and expansion projects.

Table 3.3.6 Major Events (Political, Economic, and Social) in Ghana and Infrastructure Projects since 2010

Year	Major events		
	Politics, Economy, and Society	GDP Growth[18]	Infrastructure
2011	・ GDP Real growth rate reached 15% in 2011 because of the start of oil production in December 2010.	14.0%	—
2012	・ President Mills passed away. Deputy President Mahama took office as president. ・ Presidential election and National Assembly Election were held. President Mahama was elected. ・ Ghana faced sudden drop in Cedi and high inflation.	9.3%	—
2013	—	7.3%	・ For the development of TEN oil field, Mitsui, Marubeni, and Mitsui O.S.K. Lines concluded the contract for a deep water floating oil and gas production storage and offloading equipment (FPSO)
2014	・ Real GDP growth slowed down to 4% to 2015.	2.9%	・ Ghana Takoradi T2 Expansion Project was completed.

[18] Refer to World Bank Open Data (https://data.worldbank.org/indicator/ny.gdp.mktp.kd.zg)

			・ The first phase of the rehabilitation project of Kumasi Airport was completed.
2015	・ The government of Ghana received the IMF's support program (USD 960 million for 3 years). The government worked on spending cut, but finance was getting worse due to election spending.	2.2%	―
2016	・ As a result of the presidential election, Akufo-Addo was elected. Also, as a result of the National Assembly election, the ruling and opposition parties reversed for the first time in eight years.	3.4%	・ Railway: F/S of the 340 km western line was started. ・ Expansion work at Terminal 3 of Kotoka International Airport in Accra started on March 2016. ・ Second Floating Production, Storage, and Offloading system (FPSO) for Ghana Offshore Oil Field started on TEN Field in August. ・ JICA provided a USD 100 million development loan to build a 520-meter bridge over Dofor Adidome's Volta River (part of Corridor Development Project).
2017	・ The current-account deficit shrunk to 4.5% of GDP. The primary balance was in surplus for the first time in 15 years, and the fiscal deficit shrunk to 6.0% of GDP. GDP growth rate reached 8.4%.	8.1%	・ A unified IT system for management of trade and transportation data was established: NSW online registration started. ・ YPPL signed an Floating Production Storage & Offloading System (FPSO)'s 15-year long-term contract with Eni Ghana Exploration and Production Ltd, a subsidiary of an Italian major oil company Eni SPA, and started oil production at the OCTP block approximately 60 kilometers southwest of Ghana in May 2017. ・ Ghacem, a local cement company, started construction of a cement truck terminal in Takoradi in June (costing 1.2 million euros). ・ Ghana Railway Development Authority signed MoU with Geoservice, a Russian railway company, for the construction of a 947-km railway line from Accra to Paga. ・ The government entered into contract with China for the development of energy and infrastructure projects including multi-purpose hydropower planning and solar power generation at Pwalugu (planned to be funded through the China Development Bank). ・ The government signed a USD 19-billion deal with China providing a portion (less than 5%) of bauxite reserves to China in exchange for funds

2018	—	6.2%[19]	・ Italy's oil company, Eni, started gas production in Sankofa oil and gas field off Ghana.
2019	—	—	・ Meridian Port Services (GPHA, Bolloré, APM Terminals joint venture), will complete a three-stage USD 1.5 billion expansion project at port of Tema.

Source: Prepared by the JICA Study Team based on articles from newspapers, press release, etc.

In Ghana, the Ministry of Planning and the National Development Planning Commission has been coordinating and monitoring the implementation of the priority projects described in the Corridor Development for West Africa Growth Ring Master Plan. The progress of each project at the time of the field survey conducted in March 2019 is shown in the table below. Many projects have already been completed or are under implementation, but some projects are still at the conceptual stage.

Table 3.3.7 Status of Priority Projects in Ghana as of March 2019

NO.	Project	Sub-project	Status	Responsible Party
1	Northern Zone's Agricultural Cluster Area Development Programmes (Tamale-Mamprusi Cluster, Atebubu-East Gonja Cluster, and Gonja-Kintampo and Bole-Tain Cluster)	Development of Irrigation Infrastructure for Agricultural Production for export and Agro-industry at Tamne, phase 1. Upper East Region	Work Ongoing	Ministry of Food and Agriculture (MoFA)
		Construction of Irrigation Infrastructure for Agricultural Production for export and Agro-industry at Tamne, phase II. Garu, Upper East Region	Yet to Commence	MoFA
		Construction, completion and maintenance of irrigation infrastructure for Agricultural production for export and agro industry at Kiape and Mandari. Bole, Northern Region	Completed Financed by Edaif	MoFA
2	Project for Establishment of Prampram Industrial Park		There is a PPP arrangement on the Dawa Industrial Zone since 2017	Ministry of Trade and Industry (MoTI)
3	Project for Establishment of Tamale Industrial Park		Land has been acquired and documentation underway.	MoTI
4	Project for Establishment of Ashanti Technology Park in Ejisu		Yet to Commence	MoTI & GHANA FREE ZONE AUTHORITY
5	Investment Promotion for Economic Sectors targeting Sub-Regional Markets		Work Ongoing	MoTI, Ghana Investment Promotion Centre (GIPC)

[19] Prediction of AfDB（https://www.afdb.org/en/countries/west-africa/cote-d%E2%80%99ivoire/cote-divoire-economic-outlook/）

6	Projects for Improvement of Inter-Regional and Regional Roads for Providing Better Access to Agricultural Potential Areas from Central Corridor	AWGU - WA (352 km)		MRH, Ghana Highway Authority (GHA)
		1. Wa - Walewale	Work Ongoing	MRH, GHA
		2. Upgrading of Walewale - Gambaga (km 27-38)	Completed	MRH, GHA
		3. Walewale - Gambaga - Nakpanduri (km 4-26)	Work Ongoing	MRH, GHA
		4. Construction of two (2) bridges at kulun and Ambalala	Work Ongoing	MRH, GHA
		5. Nalerigu - Nakpanduri (km 0-25.8) and Bende - Bunkrugu (km 0 - 16.2) to be upgraded	Yet to Commence	MRH, GHA
		NAVRONGO - FIAN (184 km)		MRH, GHA
		1. Upgrading of Fian - Wahabu Road	Completed	MRH, GHA
		2. Construction of one (1) bridge at Sissili	Work Ongoing	MRH, GHA
		NAVRONGO - BANU (64 km)		MRH, GHA
		1. Navrongo - Chuchuliga Road	Work Ongoing	MRH, GHA
		2. Navrongo - Naga Road (km 2.7 - 42.2)	Procurement	MRH, GHA
		TAMALE - MAKANGO (140.60)		MRH, GHA
		1. Upgrading of Temale - Salaga Road (km 51 - 113.4)	Work Ongoing	
		2. Rehabilitation of Tamale - Salaga - Makango Road.	Work Ongoing	
		YEJI - KINTAMPO (77KM)		MRH, GHA
		1. Upgrading of Prang - Kintampo Road (km 10 - 21)	Work Ongoing	
		2. Upgrading of Prang - Kintampo Road (km 21 - 31)	Work Ongoing	
		3. Upgrading of Prang - Kintampo Road (km 36 - 66)	Work Ongoing	
		SALAGA - BIMBILLA (76 km)	Procurement	MRH, GHA
		TECHIMAN - AGORDEKE	Yet to Commence	MRH, GHA
		KPANDO - TORKOR - GOLOKWATA (21.5 km)	Yet to Commence	MRH, GHA
		BEREKUM - BANDA NKWANTA (140 km)		MRH, GHA
		1. Upgrading of Jema Nkwanta - Nkoranza Road	Work Ongoing	
		2. Upgrading Berekum - Seikwa Road (km 0 - 36)	Work Ongoing	
		3. Upgrading Menji - Bui Road (km 30 - 43)	Work Ongoing	
		4. Upgrading Odumase - Seikwa Nkwanta Road	Procurement	
		BOLGATANGA- BAWKU - POLIMAKUM (116.1 km)	Work Ongoing	MRH, GHA
		LAWRA - NAVRONGO (222km)		MRH, GHA

		1. Partial reconstruction of Navrongo - Chuchuliga - Tumu road	Work Ongoing	
		2. Upgrading Tumu - Han - Lawra Road	Work Ongoing	
		3. Upgrading of Tumu Sissili Road	Work Ongoing	
7	Project for Construction of Aboadze-Tema Gas Pipeline (Construction of pipeline between Takoradi and Tema: 250 km)		Field Studies Completed	Ghana Gas, Min of Energy
8	Project for Development of 330 kV Interconnection Line (Prestea-Côte d'Ivoire)		Pending	Ministry of Energy and GRIDCO
9	Project for Expansion of Water Treatment Plant in Weija Dam for Greater Accra		Pre-feasibility Done Cabinet and Parliamentary Approval still to be sought.	Ghana Water, Min of Sanitation and Water Resources
10	Project for Expansion of Water Treatment Plant in Barakese Dam for Greater Kumasi		Contract signed in 2012. Cabinet and Parliamentary Approval received but Ministry of Finance yet to sign on the Project.	Ghana Water, Min of Sanitation and Water Resources
11	Project for Tamale Water Supply		Project Proposal Document prepared. Cabinet Memorandum is being prepared.	Ghana Water, Ministry of Sanitation and Water Resources
12	Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders			GRA Customs, Min of Foreign Affairs, NFC
13	Project for Urban Transportation Master Planning for Greater Accra		Completed	Ministry of Transport (MoT)
14	Project for Construction of East-West Motorway in Greater Accra (100 km)		Proposed	MRH
15	Project for Construction of Motorway between Tema and Prampram (16 km)		Proposed	MRH
16	Project for Construction of Tema – Akosombo Railway		22% Completed	Ministry of Railways Development (MoRD)/Ghana Development Company Ltd (GRDA)

17	Project for Construction of Debre Port at Volta Lake	Removal of Debre Shoals /Debre Shoals Dredging Project	Yet to commence	MOT, VLTC, GMA
18	Project for Rehabilitation of Tema Port – Boankra Section of Eastern Railway		Procurement of Private Sector Investor on-going	MoRD/Ghana Railway Company Ltd (GRDA)
19	Project for Rehabilitation of Takoradi – Awaso Section of Western Railway	Construction of Kojokrom-Eshiem	40% Completed	MoRD/GRCL
		Construction of Eshiem - Manso	0%	MoRD/GRCL
20	Project for Construction of Awaso – Nyinahin		Discussion on-going	MoRD
21	Project for Construction of Greater Kumasi Outer Ring Road North-East Section (25 km)		Proposed	MRH
22	Project for Construction of 4-Lane High-Speed Way of National Road No.6 (Juaso, Yawkwei, and Konongo Bypass Roads, 15 km)		Proposed	MRH
23	Project for Strengthening of Airport Security by million by installing security equipment	1. Installation of Instrument Landing System (ILS) Equipment in Kumasi to improve on navigational services.	Completed	Ministry of Aviation
		2. ADS-C / CPDLC Project (Surveillance system / data link communications for Oceanic Traffic)	Completed	Ministry of Aviation
		3. ATC Communications Upgrade at Regional Airports.	Completed	Ministry of Aviation
		4. Installation of New HF Radio System for Accra	Completed	Ministry of Aviation
		5. ATM System Upgrade at KIA	Completed	Ministry of Aviation
		6. Installation of New VSAT Network	Completed	Ministry of Aviation
		7. Installation of ILS Equipment at Tamale Airport	Completed	Ministry of Aviation
		8. Construction of Modern ANS Center to provide State-of-the- Art Equipment & Offices for the Controllers & Engineers	55% Completed	Ministry of Aviation
		9. USA FAA Category 1 Program in Safety Oversight	Work Ongoing	Ministry of Aviation
		10.Decoupling of GCAA	Work Ongoing	Ministry of Aviation

Source: Ministry of Planning

(4) Togo

Table 3.3.8 shows the outline of the political, economic, and social movements and infrastructure projects in Togo before and after the formulation of the corridor master plan. As in the other sub-Saharan countries, the deterioration of the financial situation has become an issue. Meanwhile, the Lomé Container Terminal at Lomé Port was inaugurated in 2015. It serves as a distribution hub by making use of its strategic location with Nigeria, Ghana, and Côte d'Ivoire.

Table 3.3.8 Major Events (Political, Economic and Social) in Togo and Infrastructure Projects since 2010

Year	Major events		
	Politics, Economy, and Society	GDP Growth[20]	Infrastructure Projects
2010	・ Prime minister Houngbo established the second cabinet.	6.0%	—
2012	・ Prime minister Ahoomey-Zunu established the cabinet. ・ GDP growth rate was around 5% since 2012.	6.5%	—
2013	・ National Assembly Election	6.1%	—
2015	・ As a result of the presidential election, Faure Essozimna Gnassingbé Eyadéma was re-elected for a third term. ・ Prime minister Komi Klassou established the cabinet.	5.7%	・ Lomé Port Container Terminal opened.
2017	・ Public debt reached 77.3% of GDP. Reduction of current account deficit and public debt became issues.	4.4%	—
2018	・ Asian Infrastructure Investment Bank (AIIB) approved Togo as a member country.	4.7%[21]	—
From 2019 onward	・	—	・ Preparatory Survey by JICA on Sokodé Bypass Construction Project Formation (Grant) is planned to implement

Source: Prepared by the JICA Study Team based on articles from newspapers, press release, etc.

No field survey has been conducted in Togo. The following table shows the projects that have been confirmed by a desktop survey. African Development Bank (AfDB) actively supports project formulation, while Chinese companies are also building dam and hydropower plants.

Table 3.3.9 Status of Priority Projects in Togo as of March 2019

NO.	Project	Sub-project	Status	Responsible Party
1	Support Project for Development for Kara, Oti, and Mono Agropoles (water Resources Development and Logistics Centre)	Agri-food processing project	With the approval of AfDB, the project is scheduled to start in July 2019. In addition to the finance by AfDB and Togo government, private investment is also be expected.	—
		Kara Agropole pilot	Of the total project cost of 64 billion CFA, 27 billion CFA will be provided by the Saemaul Globalization Fund.	
2	Project for Construction of Adjarala Dam and Hydropower Plant	—	It is under construction by a Chinese company - Sinohydro Africa. Total project cost will be CFA 266 billion.	—
3	Project for Construction of Greater Lomé Sections of Abidjan – Lagos Motorway	—	The F/S on environmental and socio-economic impacts will be conducted with the financial	—

[20] Refer to World Bank Open Data（https://data.worldbank.org/indicator/ny.gdp.mktp.kd.zg）

[21] Prediction of AfDB（https://www.afdb.org/en/countries/west-africa/cote-d%E2%80%99ivoire/cote-divoire-economic-outlook/）

			support from the AfDB. The total cost is expected to be 2 billion US dollars.	
4	Investment Promotion for Reactivating Bandjeli Iron Ore Mining and Railway Construction between Lomé and Kabou (410 km)	—	Private participation was expected as of October 2015	—
5	Construction of Sokodé Bypass Road as part of 4-Lane High Standard Road (10 km)	—	JICA is implementing Cooperation Preparation Survey	—

Source: Presidential Office

3.4 Support Status of Other Donors

3.4.1 Support Status of Other Donors

The following is an overview of the other donors 'support policies in the three target priority corridors and their projects which are currently active or planned.

(1) Support policy for Multilateral Development Banks

1) World Bank

The World Bank Group focuses on economic growth and poverty reduction, economic diversification, and a new comprehensive development framework in the African region. The priority areas are: "Improve agricultural productivity", "Secure energy", "Regional integration", "Urbanization" and "Provide trainings to young people as high-quality human capital". To improve agricultural productivity, the focus is on promoting technical and financial support for small farmers, investing in agribusiness, water resource management, and climate-friendly agriculture. As for energy, the focus is on the supply of cheap, stable and sustainable energy, and climate change adaptation and disaster prevention. Urbanization focuses on managing water, sanitation, transportation, housing, power and governance, with the aim of increasing productivity and income. Regarding the development of young people, the intent is to support the improvement of young people's technical skills with the aim of closing the gap between employment needs and human resources.

2) UNDP

UNDP is a UN development assistance agency that promotes poverty eradication, reduces inequalities and promotes sustainable development. The UNDP 2018-2021 Strategic Plan provides a guideline to support the eradication of extreme poverty, correction of inequality, and efforts to achieve SDGs. The pillars of activity include six areas: poverty eradication, maintenance of institutional mechanisms, strengthening of crisis response capabilities to disasters and conflicts, environmental protection, the spread of clean energy, and gender equality. It combines policy recommendations, technical assistance, funding, and support programs according to the situation of each country, and provides comprehensive solutions for achieving the SDGs. In Africa, areas of particular importance to UNDP are sustainable development, democratic governance and peacebuilding, climate change and disaster resilience.

Regarding the measures related to the corridors, UNDP announced “The Northern Ghana Human Development Report (NG-HDR)” in 2018, and proposed to conduct an analysis that looks into factors that impede progress in Northern Ghana, which is an inland area. The pillars of the proposed initiative are investment promotion for improvement of social development, sustainable urbanization, improvement of infrastructure, effective use of the environment and resources, and lack of data for measuring issues and efforts of Northern Ghana. UNDP mentions and recommends that innovative approaches should overcome these challenges. Specifically, satellite data will be used to clarify the actual conditions of deforestation, illegal mining and land use. It is also suggested that the integration of census and living standard survey data will enable the creation of poverty maps at district level.

3) IFC

IFC, one of the organizations of the World Bank Group, is an international development agency dedicated to private sector development in developing countries. The aim of IFC is to increase corporate productivity and enhance access to larger markets, expand financial and social inclusion, as well as provide opportunities for prosperity through conflict control. In order to develop Sub-Saharan Africa, IFC's priority investment areas are agriculture, electricity, job creation, health and sanitation, education and capital markets, in cooperation with other World Bank Group agencies. In addition, IFC cites the reduction of infrastructure gaps, support for productive industry construction, and the promotion of a comprehensive business approach as priorities.

4) African Development Bank (AfDB)

The African Development Bank Group has launched a new policy based on a ten-year strategy set out in the inauguration speech by President Akinwumi Adesina in September 2015. The policy prioritizes five broad areas of development: (1) Light up & Power Africa, (2) Feed Africa, (3) Industrialize Africa, (4) Integrate Africa, and (5) Improve the quality of life of the people of Africa. This is called the "High 5s" (high fives). The AfDB believes that these five areas will bring about changes in the lives of people in Africa, which will also lead to the achievement of the United Nations 'SDGs.

5) European Investment Bank（EIB）

The EIB invests extensively in sub-Saharan Africa, from small projects such as microfinance institutions for small businesses and innovators, to large infrastructure projects. The objective of the EIB's activities in Africa is to improve life, create business opportunities, and support sustainable economic development. Initiatives are based on key principles that guide the EU and its member states in cooperating with developing countries – “The European consensus on development” which shows a strategy for achieving the SDGs.

Table 3.4.1 EIB Case Example：Eldosol and Radiant PV Solar Plants (80MW)

Project	2 PV Solar plants (Eldosol, Radiant), (Greenfield)
Place	Near Eldoret, Kenya
Capacity	Eldosol: 40MW, Radiant: 40MW
Amount	Total: USD 151.18m (Eldosol-USD75.59m, Radiant-USD75.59m)
Value	Total: USD 151.18m Breakdown ・Equity: USD 49.19m (Investment ratio: Frontier Capital Management 25%, Paramount Bank 25%, Interpro International 25%, CDC Group 25%) ・Debt: USD 101.99m (EIB: USD51m, FMO:USD51m)
Financial close	14th February 2019

Source: IJGlobal (https://ijglobal.com/)

6) Islamic Development Bank（IsDB）

Sub-Saharan Africa has the second largest population of the four regions in which the IsDB operates . Out of the total IsDB Group financing (USD 130.8 billion) since its inception to the end of Q3 2017, USD 21.7 billion has been channeled to Sub-Saharan Africa. The majority of net approvals for this region were mainly in the transport sector. IsDB cites large infrastructure gaps, the severity of the investment and regulatory environment, and weaknesses in governance and institutional capacity as key issues in sub-Saharan Africa. As a solution to short-term issues, the main focus areas of the IsDB are economic growth, financial stability, food security, agricultural sector development, and youth unemployment improvement. On the other hand, IsDB also focuses on the importance of developing human capital as well as infrastructure as mid- and long-term issues.

Table 3.4.2 IsDB Case Example：Togo-Benin Transmission Line (692km)

Project	The financing will be used for the development of a 692km long transmission line in Togo and Benin. In Togo, it will connect the cities of Atakpame, Kara, Dapaong and Mango over 345km of line, while the 347km Benin section will run between Djougou, Natitingou, Parakou,N'Dali and Bembereke.
Amount	N/A
Value	Total: N/A Breakdown: ・Equity: N/A ・Loan: N/A (IsDB is in discussions with the government of Togo)

Source: IJGlobal (https://ijglobal.com/)

7) Development Bank of Southern Africa（DBSA）

DBSA, a government-affiliated financial institution established in 1983, mainly invests in infrastructure development projects for the Southern African Development Community (SADC) member states (South Africa and other countries). DBSA provides the South African government and other African governments with the necessary skills and capacity building assistance to promote infrastructure programs for priority sectors such as education, health and housing and municipal infrastructure projects (e.g. water, roads, electricity etc.).

8) West African Development Bank（BOAD）

BOAD is a regional financial institution established in 1973 to support the development of projects in eight countries (Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo), which are members of the West African Economic and Monetary Union (UEMOA). The main supporting sectors are 1) rural development and food security, 2) basic infrastructure (transportation, telecommunications, airports, ports, and electricity), 3) service industries (such as hotel business and transportation). BOAD provides short, medium and long-term loans, guarantees and other financial services.

Table 3.4.3 BOAD Case Example: Singrobo Hydropower Plant (44MW)

Project	Singrobo Hydropower Plant (Greenfield)
Place	Côte d'Ivoire
Capacity	44MW
Business formation	SPV: Ivoire Hydro Energy (IHE)
Amount	Total: USD 354.53m
Value	Total: USD 354.53m Breakdown ・ Equity: USD 46.06m (Investment ratio: Africa Finance Corporation 52%, FMO 24%, Ivoire Hydro Energy 24%) ・ Debt: USD 308.47m (AfDB: USD56.25m, West African Development Bank:USD 28.12m, OPEC Fund for International Development: USD 28.12m, DEG: USD 28.13m, IFC: USD 168.05m)
Financial Close	3, 11, 2019

Source: IJGlobal (https://ijglobal.com/)

9) Eastern and Southern African Trade and Development Bank (TDB)

TDB, formerly the PTA Bank, is a multilateral, treaty-based development financial institution, with assets of over US$ 5.6 billion. The Bank's mandate is to finance and foster trade, regional economic integration and sustainable development, through trade finance, project and infrastructure finance, asset management and business advisory services. The headquarters is located in Bujumbura in Burundi, and the management team is stationed in Nairobi, Kenya. The member includes 20 regional members which are also COMESA, EAC or SADC members: Burundi, Union of the Comoros, Democratic Republic of Congo, Djibouti, Egypt, Eritrea, Kingdom of Eswatini, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Somalia, Sudan, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe, 2 non-regional members: JSC Development Bank of Belarus and People's Bank of China, and 13 institutional members including African Development Bank.

10) East Africa Development Bank (EADB）

EADB was established in 1967 under the treaty of the East African Cooperation with its headquarters in Kampala, Uganda. The main task is to provide a wide range of financial services that contribute to socio-economic development and regional integration in member countries. Currently, East African Community (EAC) countries such as Kenya, Uganda, Tanzania, Rwanda, and other development financial institutions and commercial financial institutions are funded. EADB specializes in investment

and loans to SMEs in the industrial sector, services, and agriculture sector, and the development of cross-border infrastructure, etc.

(2) Support policy for local communities and initiatives

1) ECOWAS

ECOWAS was established in 1975 as a subregional organization promoting regional economic integration in West Africa. The member states are 15 countries in West Africa (Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, Gambia, Gambia, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo). ECOWAS places priority on industrial, transportation, communications, energy, agriculture, natural resources, commerce, currency and financial issues, social and cultural issues, especially in the area of peace and security, for a regional economic integration.

2) East African Community (EAC)

EAC is a regional intergovernmental organization established in 2001. Currently the EAC consists of 6 Partner States: the Republics of Burundi, Kenya, Rwanda, South Sudan, Tanzania, and Uganda., with its headquarters in Arusha, Tanzania. The regional integration process is in full swing as reflected by the encouraging progress of the East African Customs Union, the establishment of the Common Market in 2010 and the implementation of the East African Monetary Union Protocol.

3) New Partnership for Africa's Development（NEPAD）

NEPAD is an initiative for Africa's own development adopted at the African Union (AU) Summit in July 2001, and includes peace and security, governance, democracy, politics and economy, and market expansion. NEPAD also promotes regional cooperation to strengthen competitiveness as a prerequisite for development. Specific areas of priority are "natural resource governance and food security", "regional integration, infrastructure and trade", "industrialization, science and technology and innovation", and "human resource development". As a resource for development, NEPAD aims to secure market access through debt reduction, ODA, securing of funds by attracting private investment, diversification of production and promotion of exportations.

(3) Support policy for other countries

1) France

The French Development Agency (AFD) is an ODA implementing agency under the jurisdiction of the French Ministry of Foreign Affairs, the Ministry of Economy and Finance, and the Ministry of the Interior, and also has the function of a development bank. AFD's range of activities is particularly close to Africa, as it is geographically close and because some countries in the African continent were French colonies. Indeed, 60% of AFD's budget is allocated to Sub-Saharan Africa. The key issues in Africa include: "Efforts to address employment and youth issues", "Building sustainable areas and cities", "Expanding access to clean and competitive energy", "Improvement of social governance", and "Contribution as a bank to create innovation in Africa".

2) China

As part of its support to Africa and the strengthening of their relations, China held the first “China-Africa Cooperation Forum” in 2000 and has been conducting it every three years in China and Africa alternately since then. At the latest forum held in Beijing in September 2018, the Chinese government announced a total contribution of USD 60 billion, including USD 15 billion in grant aid, as support for Africa, and debt exemption for some countries. In addition, China announced "eight major actions" to focus on in the next three years, (1) industrial promotion, (2) infrastructure consolidation, (3) trade facilitation, (4) green development, (5) capacity development, (6) health and hygiene, (7) people and cultural exchange and cooperation, as well as (8) peace and security. As for Kenya and other areas near the northern corridor, the Chinese government has been providing strategic support for infrastructure, being one of the focal areas for the "One-Sided Road (Silk Road)" promoted by China. In 2017, Ghana has agreed with the Chinese government on bauxite exploration with the goal of exploring West Africa's mineral resources for 150 million Rand, and in March 2018, ECOWAS will build its headquarters in Nigeria and signed a contract with China for about USD 31.6 million[22]

Table 3.4.4 Investment and Loan Status of Chinese Institutions in Corridor Related Projects (Including Planned Projects)

Organizations		Equity/Debt
Debt	China Import & Export Bank	・ Kenya Standard Gauge Railway Phase 1 (609KM) ・ Kenya Standard Gauge Railway Phase 2A (120KM) ・ Garissa-Isiolo Transmission Line (285KM) (Kenya) ・ Nairobi Transmission Grid Upgrade (Kenya) ・ Kibwezi-Mutomo-Kitui Highway (472KM) Phase 1 (Kenya) ・ Karuma Hydroelectric Power Plant (600MW) PPP(Uganda) ・ Isimba Falls Hydropower Plant (183.2MW) (Uganda) ・ Coral South FLNG (Mozambique) ・ Adjarala Hydropower Plant (147MW) (Benin, Togo)
	Bank of China	・ Coral South FLNG (Mozambique) ・ Offshore Cape Three Points (OCTP) Phase 1(Ghana) ・ Tema Port Expansion (Ghana) ・ KPLC Additional Facility 2015 (Kenya)
Equity	China Petroleum Corporation	・ Mamba LNG (Mozambique) ・ Coral South FLNG (Mozambique)
	China Machinery Engineering Corporation	・ Acquisition of a 60% Stake in Ncondezi Coal-Fired Power Plant (300MW) and Ncondezi Coal Mine (Mozambique)
	Power Construction Corporation of China	・ Illasit - Njukini - Taveta Road (67KM) PPP (Kenya)
	State Grid Corporation of China	・ Mozambique Regional Transmission Backbone (CESUL)
	China Three Gorges Corporation	・ Isimba Falls Hydropower Plant (183.2MW) (Uganda)

Source: IJGlobal (https://ijglobal.com/)

[22] Business Insider South Africa, Sep 25, 2018, 10 massive projects the Chinese are funding in Africa - including railways and a brand-new city , https://www.businessinsider.co.za/here-are-150-million-rand-projects-in-africa-funded-by-china-2018-9

3) India

India became an outlying member of AfDB in 1983. The AfDB 52nd Annual Meeting in 2017 was held in Jaipur, India, considering the potential of strengthening their relationship. The first India-Africa Forum Summit was held in New Delhi in 2008, and a systematic approach with African countries was launched. The third session was held in 2015, and an agreement to work together on issues related to climate change, cybersecurity, energy, food shortages, and water resource protection was established.

India's development cooperation includes power projects and dams in Sudan and Rwanda, water treatment facilities in Tanzania, sugar factories in Ethiopia, IT parks in Mozambique and Swaziland, presidential palaces in Ghana, and the construction of the Gambian Parliament Building. Modi has made Africa a top priority in recent years, and in 2017, in cooperation with Japan, announced the launch of the Asia-Africa Growth Corridor (AAGC), an Indian initiative in Africa. With China increasing its development presence in Africa, India also started focusing on supporting African countries in cooperation with third countries such as Japan and the United States in addition to India alone[23]. The 14th CII-EXIM Banking Conference on the India-Africa Project Partnership was held in March 2019.

In recent years, as a project in a country that constitutes a vital corridor, the Indian Export Bank has used Buyers Credit for the 84.8km railway project that links the Accra metropolitan area (Tema) in Ghana and the Akokosombo port on Lake Volta. The bank decided to provide a loan of USD 398 billion to Ghana government.

3.4.2 Outline of Related Projects by Corridors (Status: Active/Planning)

The outline of the related projects (active/ planning) for each corridor is shown in the following table.

Table 3.4.5 Number of Projects Implemented by Organizations (as of March 2019)

	North Corridor						Nacala Corridor		
	Kenya			Uganda			Mozambique		
	Active	Planning	Total	Active	Planning	Total	Active	Planning	Total
World Bank	47	10	57	26	6	32	42	7	49
UNDP	-	-	22	-	-	20	-	-	19
IFC	56	21	77	18	1	19	21	6	27
AfDB	16	10	26	18	8	26	17	-	17
EIB	7	5	12	1	-	1	2	1	3
IsDB	-	-	9	-	-	35	-	-	30
DBSA	-	-	0	-	-	-	-	-	0
BOAD	-	-	0	-	-	-	-	-	0
NEPAD	-	-	22	-	-	20	-	-	18
AFD	-	-	27	-	-	-	-	-	20
Total No.	405						183		

[23] Gateway House, https://www.gatewayhouse.in/is-indias-africa-policy-working/

West Africa Growth Ring												
	Ghana			Côte d'Ivoire			Togo			Burkina Faso		
	Active	Planning	Total	Active	Planning	Total	Active	Planning	Total	Active	Planning	Total
World Bank	34	8	42	25	8	33	13	5	18	34	9	43
UNDP	-	-	16	-	-	22	-	-	10	-	-	24
IFC	38	10	48	21	10	31	-	-	-	4	3	7
AfDB	14	6	20	14	5	19	8	1	9	12	3	15
EIB	4	0	4	4	1	5	0	0	0	2	0	2
IsDB	-	-	2	-	-	23	-	-	41	-	-	40
DBSA	-	-	0	-	-	0	-	-	0	-	-	0
BOAD	-	-	0	-	-	5	-	-	2	-	-	9
NEPAD	-	-	20	-	-	11	-	-	14	-	-	15
AFD	-	-	18	-	-	22	-	-	14	-	-	3
Total No.												607

Note: Institutions for which data couldn't be extracted are excluded.

Source: Prepared by the JICA Study Team based on official site data of each organization

The following are the result of a comparison of corridor-related project costs specific to the World Bank, UNDP, EIB and BOAD, obtained by a desktop research..

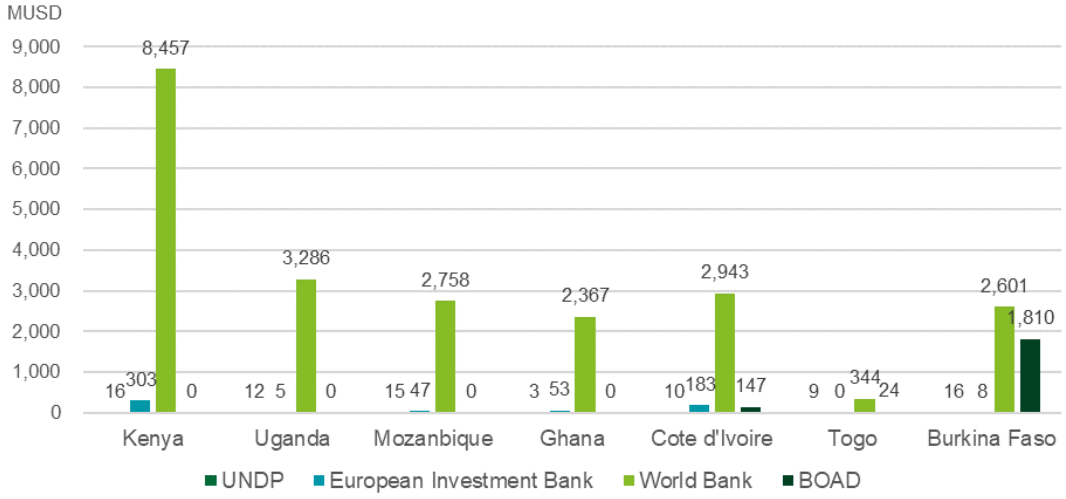
Table 3.4.6 Project Costs by Organizations in the Three Corridors (as of March 2019)

Unit: Million USD

	North Corridor		Nacala Corridor	West Africa Growth Ring			
	Kenya	Uganda	Mozambique	Ghana	Côte d'Ivoire	Togo	Burkina Faso
World Bank	8,457.48	3,285.94	2,758.24	2,366.61	2,943.48	344.10	2,601.46
UNDP	15.54	12.30	14.85	3.07	10.01	8.80	15.99
EIB	303.00	4.50	47.08	53.31	182.70	0.00	7.98
BOAD	0.00	0.00	0.00	0.00	147.00	24.00	1,810.00

Note: No data available for International Finance Corporation (IFC), African Development Bank (AfDB), IsDB, Development Bank of South Africa (DBSA), New Partnership for Africa's Development (NEPAD), Economic Community Of West African States (ECOWAS) and the Agence Francaise de Development (AFD).

Source: JICA Study Team prepared based on official site data of each organization, United Nations Development Programme (https://www.undp.org/), April, 23rd, 2019, European Investment Bank (https://www.eib.org/en/) , April, 23rd, 2019, West African Development Bank (https://www.boad.org/en/) , April, 23rd, 2019



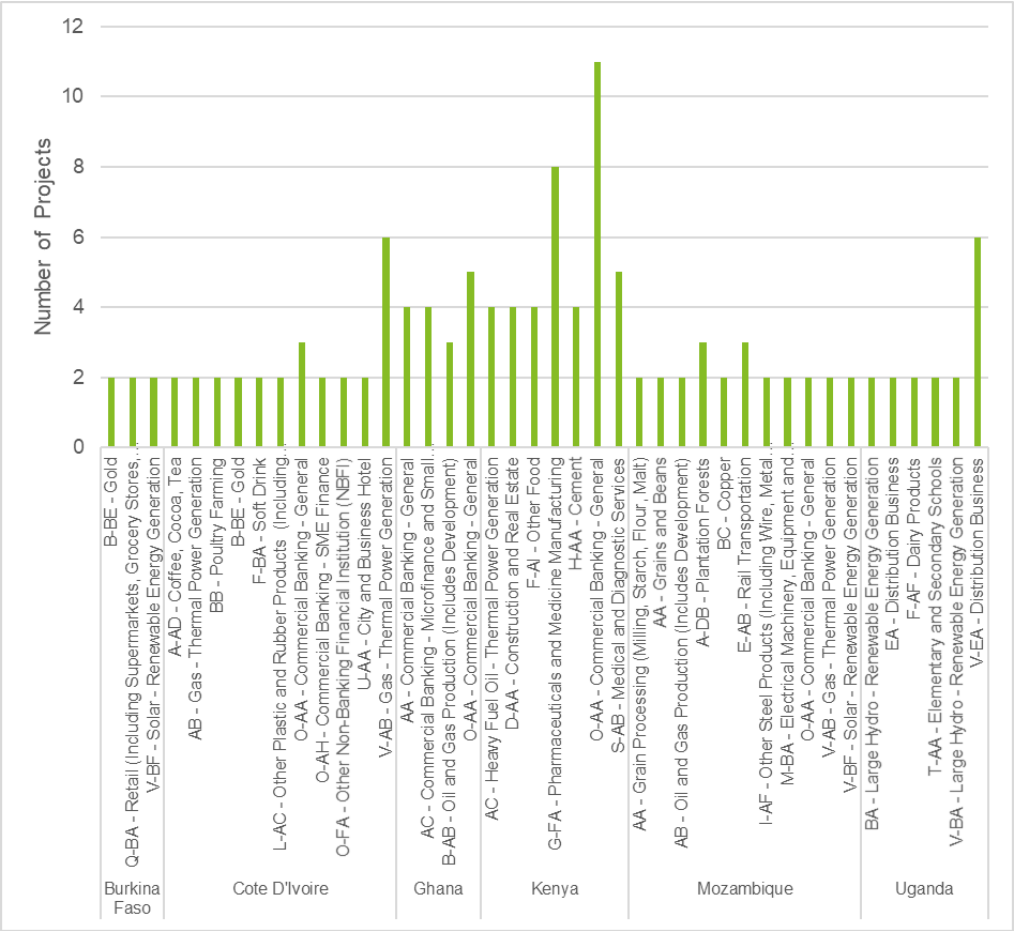
Source: JICA Study Team prepared based on official site data of each organization, United Nations Development Programme (https://www.undp.org/) , April, 23rd, 2019, European Investment Bank (https://www.eib.org/en/), April, 23rd, 2019, World Bank (https://www.worldbank.org/), April, 23rd, 2019, West African Development Bank (https://www.boad.org/en/) , April, 23rd, 2019

Figure 3.4.1 Project Costs by Organizations in the Three Corridors (as of March 2019)

The following points were confirmed as a result of comparing the number and costs of every corridor-related project implemented by each organization.:

- By comparison, the West Africa Growth Ring has the highest number of planned and/or delivered projects (607), followed by the Northern Corridor (405) and the Nacala Corridor (183). World Bank has the highest number of projects implemented, followed by the IFC and IsDB.
- In the Northern Corridor, the number of projects implemented by agencies other than IsDB and BOAD is high in Kenya. In Uganda, the number of projects implemented by AfDB and IsDB is high, while the number of projects implemented by the AFD and EIB is low (0~1).
- In the Nacala Corridor, the World Bank has the highest number of projects implemented. On the other hand, IsDB has the highest number of projects implemented in Mozambique.
- Regarding the West African Growth Ring, Côte d'Ivoire receive the highest amount of support among the four countries. Kenya has the highest number of projects implemented by the IFC followed by Ghana. While the number of projects implemented by major organization is low and project costs are relatively low in Togo , the number of projects implemented by the IfDB is as high as 41 cases. It can be said that IfDB is strategically supporting Togo and Burkina Faso instead of countries which have relatively high GDP such as Kenya and Ghana and where other institutions are actively investing and lending.

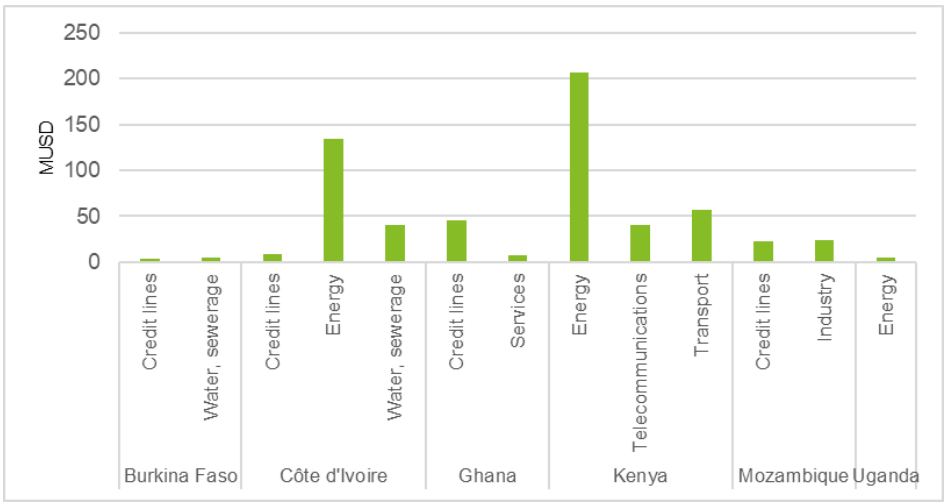
For IFC and EIB, the study team organized the type of projects implemented by country.



Note: Extracted on, top 3 highest number of project categories in each country
Source: JICA Study Team prepared based on the data from IFC（https://disclosures.ifc.org/#/landing）

Figure 3.4.2 IFC Projects by Country/Number

According to the implementation details of IFC's projects in each country in the Northern Corridor, the number of support to the commercial banking sector and the pharmaceutical sector is high in Kenya. In Uganda, the number of support for wholesale retail is high. In the Nacala Corridor, no major features are found in the project implementation content in Mozambique. As for the West African Growth Ring, the number of support to the commercial banking sector is high in Ghana, and the number of support to thermal power generation is high in Côte d'Ivoire.



Source: EIB, https://www.eib.org/en/projects/index.htm

Figure 3.4.3 EIB Projects by Country and Project Costs

According to the project contents in each country for EIB, in the Northern Corridor, the number of support to the energy sector is high in both Kenya and Uganda. In the Nacala Corridor, EIB offers credit lines. On the other hand, support to the industrial sector has the same extent in Mozambique. Regarding the West African Growth Ring, EIB's support is similar to the IFC's support, with a high number of credit lines in Ghana and a high number of projects for the energy sector in Côte d'Ivoire.

3.5 Interviews with Japanese Companies

3.5.1 Summary

Interviews with Japanese companies that are conducting businesses in Africa, especially in the prioritized three corridors, were carried out to analyze their strategies for the promotion of industry in the area, possibilities of the area for the selection, and business.

In Africa, Japanese company's business strategy was based on the establishment of offices in major regional bases for conducting marketing and business expansion to surrounding areas. On the other hand, due to the long distance from Japan and differences in business practices between Japan and African countries, they were cautious about rapid business expansion and tended to consider further business development after stabilizing the business at the bases of operation. In addition, companies note a strong tendency to consider collaborating with local companies in line with trends in the local market in countries where they have recently operated. With regard to the manufacturing industry, companies have been observed to move from the export of assembled products to the establishment of local production bases. This can be seen as consideration of the marketability of each country that makes up the corridor.

As mentioned above, although there are many companies taking a cautious stance on business development in African countries as a whole, the future marketability of Africa is highly considered. There is a strategy to capture future market demand by setting in place the groundwork for business in the corridor countries particularly in countries with many young people, future population growth and economic development is

expected.

On the other hand, some companies pointed out that the challenge is the high logistics cost and time due to the lack of infrastructure, which is considered a bottleneck in business development. In addition, other companies pointed out that they were anxious about the regulatory and operational deficiencies / opacity, and sudden regulatory changes. As it turns out, country risk is still a standing issue in African countries, including countries within the corridors.

3.6 Interviews with Stakeholders in the Three Corridors

For the purpose of collecting data that cannot be collected through desktop survey, the study team conducted field surveys to understand the impacts of the projects on economy and society, including conducting interviews with stakeholders involved in corridor development. The field survey covered four major countries (Kenya, Mozambique, Ghana, and Burkina Faso) among the three corridors.

3.6.1 Northern Corridor (Kenya)

Targets for interviews in the Northern Corridor are as shown in the table below. As a result of the interviews, it has become apparent that the efficiency of ports has improved. Although there are challenges in the inland transport system, flowers and cut vegetables are considered to have export potential. It is thought that opportunities will further expand if the logistics systems are improved.

Table 3.6.1 Places Visited in Kenya

Public	・ Kenya National Bureau of Statistics (KNBS) ・ National Treasury, PPP Unit ・ Advisor to the Ministry of Energy
Private	・ Bollore ・ East Africa Growers ・ Japan Port Consultants (JICA Professional) ・ TradeMark East Africa

Source: JICA Study Team

Table 3.6.2 Summary of Interviews

Potential	・ In the Northern Corridor Region, there is potential for export of agricultural products (especially flowers and cut vegetables). Currently, they are exported to the United Kingdom and the Netherlands among others. ・ Lamu Port-South Sudan-Ethiopia Transport Corridor (LAPSSET Corridor) attracts attention as a next potential corridor development area to the northern corridor from the viewpoint of regional development throughout Kenya. From Lamu Port to South Sudan and Ethiopia, there are also business opportunities for oil development and pipeline planning. (TradeMark East Africa)
Impact of development	・ Cargo Volume of Mombasa Port has rapidly increased from 11.8 million tons to 26.7 million tons in 2005 and 2015 respectively, while transportation time has been reduced. The Port becomes a very important logistic hub. (TradeMark East Africa)

Challenge	【Industrial Development】 ・ Although the development direction and value chain for each sub-sector are described in the report of the Northern Corridor Master Plan, there seems to be no F/S so far and no specific development model presented. Moreover, no pilot project has been implemented so far. A realistic proposal based on the situation at the site was desirable. (TradeMark East Africa) 【PPP】 ・ PPP is one of the effective methods to attract foreign capital in corridor development. However, the use of PPPs is still not yet fully optimized. Furthermore, there is still a persistence of corruption.（TradeMark East Africa）

Source: JICA Study Team

3.6.2 Nacala Corridor (Mozambique)

Table 3.6.3 shows the target of interviews at the Nacala Corridor. The potential for Nacala Corridor Development is due to the abundance of traditional agricultural production and natural resources such as coal, iron ore, and natural gas. Since the Nacala Port is the natural deep water port and potential for expansion, if these resources can be exported efficiently and effectively, it will contribute to the acquisition of foreign currency, the attraction of foreign-affiliated companies, and the development of a regional economy. In addition, cargo has been efficiently transported through the projects implemented so far, and the ripple impacts such as improvement of production volume, attraction of new enterprises, and population growth have been achieved. On the other hand, challenges include raising funds for carrying out projects to further operational efficiency, lack of human resources for carrying out more advanced and efficient projects, and competition with neighboring countries and other corridors.

Table 3.6.3 Places Visited in Mozambique

Public	・ UTI-PEDEC, APIEX, Ministry of Industry & Trade ・ National Directorate of Support for Private Sector, MOIT (Ministry of Industry and Trade) ・ National Directorate of Industry, MOIT (Ministry of Industry and Trade) ・ IFC ・ ANE ・ INE（National Institute of Statistics） ・ Portos do Norte, S.A ・ CFM (Mozambique Ports and railways)
Private	・ Mota-Engi Africa ・ CDN/CEAR/VALE ・ CTA（Federation of Economic Association of Mozambique）

Source: JICA Study Team

Table 3.6.4 Summary of Interviews

Potential	・ Mozambique's main industries are traditional agriculture and mining, especially Tete's coal, as well as natural gas in the future (during development off Palma). Those industries are only means of acquiring foreign currency, and have important impact on the economy of Mozambique. Corridor development has potential and the country has the possibility of exporting more competitive resources through the improvement of transport efficiency and effectiveness. (IFC)
Impact of development	・ Infrastructure development along the Nacala Corridor (especially the section between Nampula and Cuamba, and Cuamba and Lichinga, which need to treat a large volume of cargo) has progressed, and companies along the corridor produce more efficiently and effectively. It will promote the improvement of the production volume in each area (especially, the improvement of the production volume of traditional agricultural products, agricultural processed products, and poultry farming among others). The improvement of productivity leads to more substantial profit and attraction of companies. Many new companies are established in the Nacala Corridor, resulting in the increase of population and benefits to the locality. Relatively large-scale manufacturing industries that have recently operated in the area include cement and flour factories. In addition, the Nacala Corridor is also linked to Malawi and Zambia, and the inland countries also benefit from infrastructure development and customs clearance development of the said corridor. (MOIT, ANE) ・ The impact to the area along the corridor is the increasing employment, as there is a provision requiring employment of a certain number of Mozambicans when carrying out infrastructure development projects and other projects. In addition, when foreign-affiliated companies conduct business in Mozambique from the state government, they are also required to take measures such as environment and noise control, contribution to community development initiatives such as hospital and school construction. (CDN)
Challenge	【Financing】 ・ The biggest challenge for the Nacala Corridor Development is the lack of funds needed for Corridor development. The government has approved the implementation of corridor development but it cannot allocate budget for the initiative. The project needs to be implemented with the support of donors and the government. However, due to the hidden debt by the Mozambique government that was discovered in 2016, and reputation was damaged, the Mozambican government has difficulties to obtain investment or loan from foreign companies and international development agencies. As such, it has become difficult to access loans and equity investments. (MOIT, UTI-PEDEC, CTA)[24] 【Capacity development of human resources】 ・ The Nacala Corridor is an area where traditional agriculture was originally the main industry. Therefore, vocational skills of human resources are required to shift the industry to the manufacturing industry in recent years. With the improvement of manufacturing competitiveness and the improvement of product quality, capacity development and securing of labor have become major issues. Within the Nacala Corridor is Mozambique's second largest city - Nampula. It has a large working population but has not received enough vocational training. As such, provision of vocationally- trained local human resources is needed to promote development (MOIT). ・ Various of industries are growing, but there are lack of interaction between these industries. As a result, there is no comprehensive economic development. Collaboration between companies is also necessary to increase added value. On the other hand, there is also a problem that the coordination is very complicated because the knowledge / cooperation of experts in various fields is required. (UTI-PEDEC) 【Partnership and competition with neighboring countries】

[24] On the other hand, although there is reputation risk on Mozambique government, private companies are continuously investing in development in LNG or large scale infrastructure for exporting coals

	・ One of the issues for corridor development is the need for the knowledge and cooperation of experts in many fields, such as collaboration with many sectors and other countries. The government needs to negotiate and cooperate with Malawi as the Nacala Corridor connects both countries (e.g. the rail departs from Tete (Mozambique) to Nacala by way of Malawi). Also, agricultural development requires mutual cooperation, such as road maintenance, efficient distribution, and human resource development. The current cooperation is not successful, and some initiatives are taking time to progress. (UTI-PEDEC) ・ Competition with neighboring corridors (Beira port, Maputo port, Durban port, Dar es Salaam port) has been harsh. It is necessary not only to shorten the transportation cost and travel time due to the development of related infrastructure, but also to reduce the total running time and the total handling value by enhancing the soft infrastructure. The main issue of transportation time is the balance between supply and demand at Nacala Port, which takes time to carry in and out. In addition, there is a gap between imports and exports, and transport of empty containers is increasing. (CDN, CTA)

Source: JICA Study Team

3.6.3 West Africa Growth Ring Corridor (Burkina Faso and Ghana)

The interviewees for the West African Growth Ring Corridor are shown at Table 3.6.5 (interviews in Burkina Faso) and Table 3.6.6 (interviews in Ghana). Potentials for the West African growth ring corridor development include traditional agricultural production and natural resources such as oil and gold. As the Corridor Development for West Africa Growth Ring Master Plan was formulated only in recently, only a small numbers of projects have been completed for now. Therefore, clear impacts cannot be seen yet. On the other hand, there were many organizations that expressed concern regarding connectivity with inland countries such as Burkina Faso – which itself is an inland country. There are many places where infrastructure is not developed for physical connectivity, but there are also many soft infrastructure issues such as bribery and unduly long and useless port residence time.

Table 3.6.5 Places Visited in Burkina Faso

Public	・ Institut National des Statistiques et de la Démographie (INSD) (Statistical bureau) ・ Direction Générale de la Normalisation et des Etudes Techniques (DGNET) ・ UEMOA ・ SOPAFER-B ・ Directorate General of Cooperation （DGCOOP） ・ CCI
Private	・ Société Publique des Infrastructures Ferroviaires, Aériens et Maritime (SPIFAM) ・ Agence Burkinabe des Investissements (ABI) ・ Agence pour la Promotion des Exportations du Burkina (APEX)

Source: JICA Study Team

Table 3.6.6 Summary of Interviews

Potential	・ For coastal countries, the connection to the inland area through the West African Growth Ring can improve the connectivity to other parts of ECOWAS. That access links not only to Burkina Faso but also to markets of further inland countries such as Mali and Niger. (AGI)
Impact of development	―
Challenge	【Financing】 ・ The serious challenge for the West Africa growth ring corridor development is the lack of funding needed. Burkina Faso does not have financial capacity due to its accumulated debt and inability to fund priority projects. In addition, the fact that the funding process itself takes too long time is also a hurdle for progress. 【Infrastructure Development】 ・ Burkina Faso is a landlocked country and the access to international markets is not developed due to the lack of required infrastructure. In the West Africa Growth Corridor, new transport related infrastructure projects are planned for better access to Tema Port, Abidjan Port and Lomé Port to promote export. On the other hand, there are also problems with time-consuming customs clearance processes and cost increases due to harassment and extortion. In addition, manufacturing industry promotion activities are limited because there are no facilities such as exhibition halls to promote agricultural and processed products. (APEX) ・ There are infrastructure connectivity issues even within the undeveloped value chain. As there is only one rail route to the port (Abidjan-Ouagadougou), it is important to secure alternative routes to Tema port and Lomé port. Also, since connectivity improvement has been practiced separately sector by sector (railways, roads, waterways), it is necessary to improve inter-modal connectivity (DGNET) ・ Ghana's logistic industry is less competitive than those in neighboring countries. In particular, the distribution costs are higher than those of Côte d'Ivoire and Togo. In order to ease port congestion, that is the main cause of the high costs, Tema Port is being rehabilitated and expanded. The elimination of port congestion may reduce delays and a reduce port residence time. This will lead to significant transaction cost reductions. In addition to hard infrastructure improvements, we also deal with soft infrastructure issues. Particularly, introduction of a paperless system has been carried out to reduce unnecessary interference, and significant improvements in physical distribution costs and times have been achieved. (AGI) ・ It takes long time and high cost for farmers to send their products to the market. Also, residents in hinterlands have difficulties to access educational and health facilities due to underdeveloped infrastructure. As a result, living standards in the hinterlands have not improved. On the other hand, the government has shown concern that the expected impact of the project is relatively small for the size of the investment amount. (AGI) 【Capacity Development of human resources】 ・ The main issue in the northern region of Ghana is the shortage of human resources in the areas of agricultural production and engineering. The northern part has a large population (working age population), but education infrastructure has not been developed enough. Consequently, talented people have moved to the southern cities where job opportunities exist, and there are not enough people to carry out projects and improve production in norther part of the country. (NDA)

Source: JICA Study Team

CHAPTER 4 Results and Evaluation of the Corridor Master Plans 'Impacts

4.1 Survey of Related Existing Reports and their Implication on this Study

4.1.1 Impacts of Corridor Development Plans in Other Regions

The JICA study team conducted a survey and review of existing corridor development plans 'impacts (case studies) with a focus on Asia. Related reports and surveys are shown in the table below.

Table 4.1.1 Target Reports About Corridor Development Plans

Report	Organization
The Web of Transport Corridors in South Asia	WB
Wider economic benefits of investments in transport corridors and the role of complementary policies	WB
What is economic corridor development and what can it achieve in Asia's subregions	ADB
Transport Corridors and Their Wider Economic Benefits	WB
Transport corridors and their wider economic benefits: a critical review of the literature	WB
Trade and transport corridor management toolkit	WB
Central Asia Regional Economic Cooperation Corridor Performance Measurement and Monitoring	ADB
Performance Measurement and Monitoring of the Selected Bangladesh's Trade Corridors	UNESCAP
Economic Corridor Development for Inclusive Asian Regional Integration: Modeling Approach to Economic Corridors	ADB
Mekong India Economic Corridor Development	ERIA

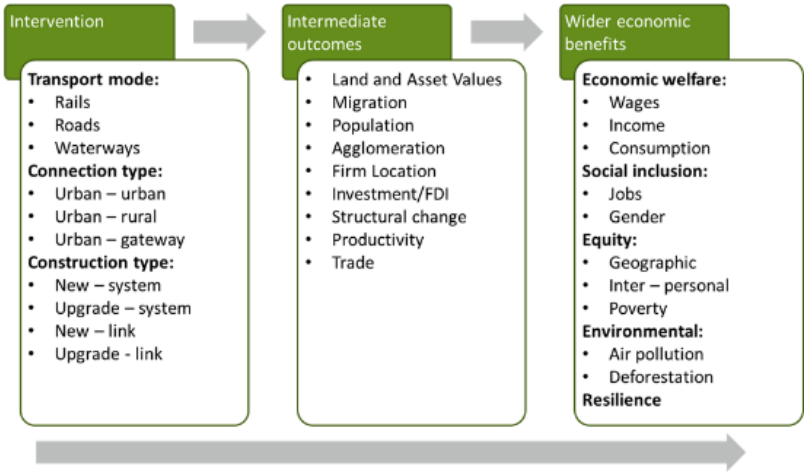
Source: JICA Study Team

4.1.2 Concept of Indicators Classification

The World Bank report "Transport corridors and their widget economics: a critical review of the literature", classifies the expected impacts of corridor development plans in three stages: "Intervention", "Intermediate outcomes", and "Wider economic benefits". The "Intervention" stage includes transportation mode (railway, road, water transport, etc.), connectivity type (city-city, city-district, and city-gateway), type of infrastructure (system maintenance and upgrade, connectivity maintenance and upgrade). The "Intermediate outcome" stage that shows the impacts, includes land value, migrants, population, population concentration, location of business activities, investment / foreign direct investment, structural change, productivity, and trade. The "Wider economic benefits" stage that is the final objective of the corridor development plan, includes economic welfare (wage, income, and consumption), social inclusion (employment and gender), equality (geographical, interpersonal relationship, and poverty), environment (air pollution, and deforestation), and resilience are taken into account.

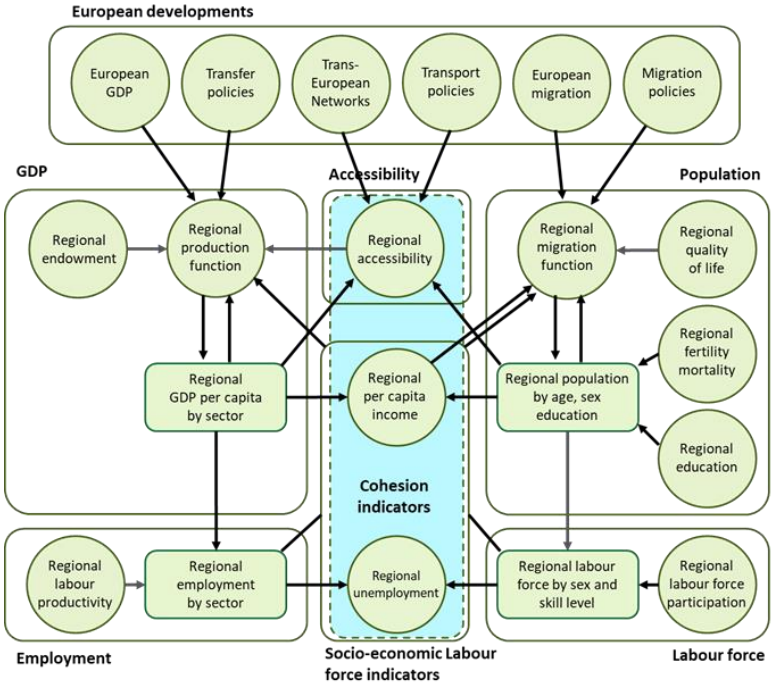
Furthermore, the ADB report "Economic Corridor Development for Inclusive Asian Regional Integration: Modeling Approach to Economic Corridors" introduces the "Socioeconomic and Spatial Impacts: SASI" model, adopted for the EU development corridors. In a EU where transportation infrastructures were an important policy issues, SASI's objective was to increase the economic level of the target area to the same

average level of the EU member countries. Thus, SASI was developed as a model monitoring the regional integration. Under the SASI model, the EU member countries, Norway, Switzerland, and the West Balkans were classified into approximately 1,330 regions, and were connected by railways, roads, and air networks. Furthermore, it set the numeric conversion of transportation infrastructures, investment, transportation systems improvement, as EU's district socioeconomic development impacts indicator. However, as it is difficult to collect accurate indicators related to the labor force and its quality, and the unemployment rate at district level for the present study, it is difficult to conduct simulations based on this model for this study.



Source: World Bank, "Transport corridors and their wider economic benefits : a critical review of the literature", January 2018

Figure 4.1.1 Flow of Expected Impacts in Corridor Development



Source: Asian Development Bank "Economic Corridor Development for Inclusive Asian Regional Integration: Modeling Approach to Economic Corridors, 2014"

Figure 4.1.2 Structure of SASI Model

Moreover, ADB assessed the development status of the Asia-Pacific region in collaboration of the Sustainable Development Goals (SDGs), advocated by the United Nations, and published the results in the report "Development Effectiveness Review". In this report, the indicators are divided into two categories, “poverty” and “others”, and are defining the indicators numerical values for each of the SDG’s outcomes (see Table 4.1.2). This evaluation system is also used by ADB to assess the impacts of corridor development plans.

Although many of these indicators are also difficult to obtain at the district level in the countries targeted by this study, as the corridor master plans and the SDGs have similar objectives, is important to continuously measure their impacts by collecting data as much as possible.

Table 4.1.2 ADB’s Structure for Development Status Evaluation in Asian-Pacific

Item		Related SDG	Example of Indicator
Poverty	Promoting Prosperity	No Poverty	Proportion of the population below the international poverty line of USD 1.90 a day
		Decent Work and Economic Growth	Annual growth rate of real gross domestic product (GDP) per capita
		Reduced Inequality	Wage and salaried workers in total employment
	Investing in People	Zero Hunger	Under-5 mortality rate, and maternal deaths per 100,000 live births
		Good Health and Well-Being	Ratio of Non-communicable diseases, and social assistance programs provided by government
		Quality Education	Gross lower secondary education graduation rate based on the gender parity index in education
Others	Infrastructure for Sustainable Development	Affordable and Clean Energy	Proportion of the population with access to electricity, and proportion of population relying on fossil fuels
		Clean Water and Sanitation	Proportion of the population with access to safely managed drinking water services, and safely managed sanitation services
		Industry, Innovation, and Infrastructure	Paved roads (km) per 10,000 people, and proportion of population with access to a 2G mobile network or better
	An Enabling Environment for Sustainable Development	Decent Work and Economic Growth	Time to start a business, intraregional trade in total Asia and Pacific, and proportion of adults (15 years and older) with an account at a bank or other financial institution or with a mobile money service provider trade
		Peace, Justice, and Strong Institutions	Governance and Public Sector Management Assessment Index
		Partnerships for the Goals	
	Protecting the Planet	Climate Action	Percentage of forest area as a proportion of total land area, carbon dioxide (CO2) emission per unit of value added, and proportion of fossil fuels account of the region’s greenhouse gas emissions
		Life on Land	Air pollution

Source: Asian Development Bank “2017 Development Effectiveness Review, May 2018”

However, in its report “Performance Measurement and Monitoring of the Selected Bangladesh’s Trade Corridors”, UNESCAP narrowed the impact indicators to the ones related to the improvement of the logistics situation (see Table 4.1.3).

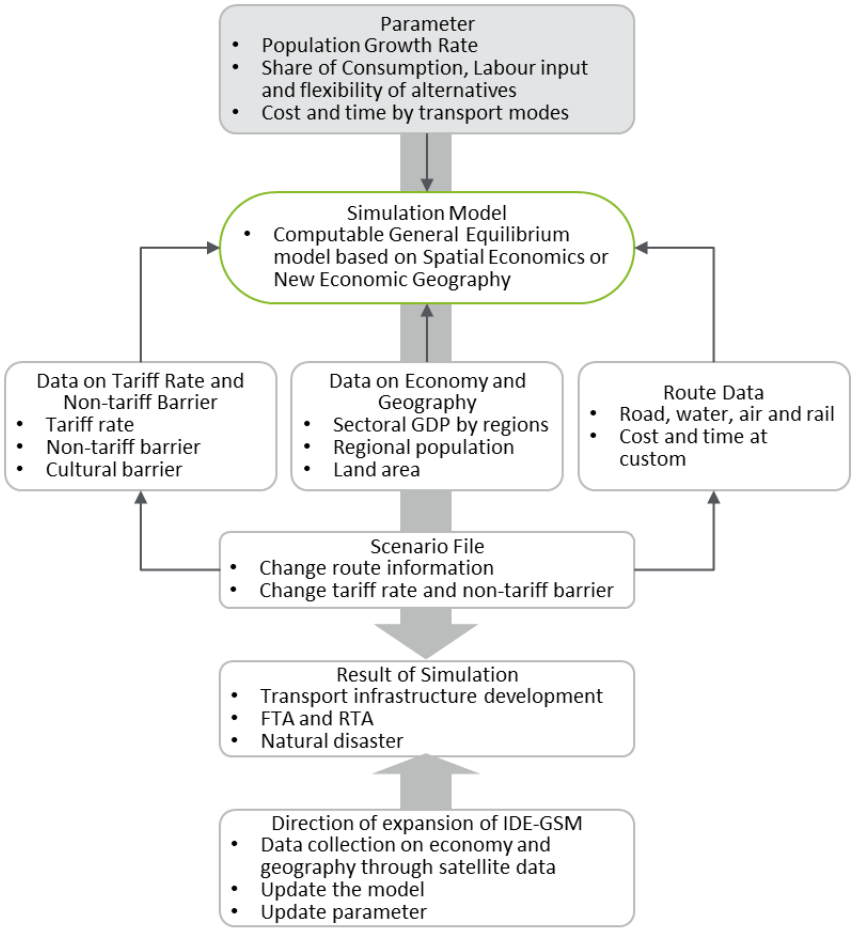
Table 4.1.3 Examples of Indicators for Assessing Trade Corridor

Indicator
Total Distance (km)
Total Travel hours with delay
Total Stops
Total Stoppage Hours
Total Travel hours without delay
Speed with delay (SWD) (km/hours)
Speed without delay (SWOD) (km/hours)
Official costs incurred in corridor (in USD)
Official costs incurred in corridor/ Ton (in USD)
Total Costs (in USD)
Total Costs per Ton (in USD)

Calculate maximum, minimum and average

Source: United Nations Economic and Social Commission for Asian and the Pacific, "Performance Measurement and Monitoring of the Selected Bangladesh's Trade Corridors", 2017

In addition to the evaluation indicators created by the ADB and the World Bank, the Institute of Developing Economies – Japan External Trade Organization (IDE-JETRO) also developed an economical and geographical simulation model called ""Institute of Developing Economies-Geographical Simulation Model (IDE-GSM)", based on the New Economic Geography (NEG) theory. IDE-JETRO's simulation model estimates the geographical distribution of the population and the industry at regional level in East Asia on the long term. The basic structure of this model is shown in the following figure.



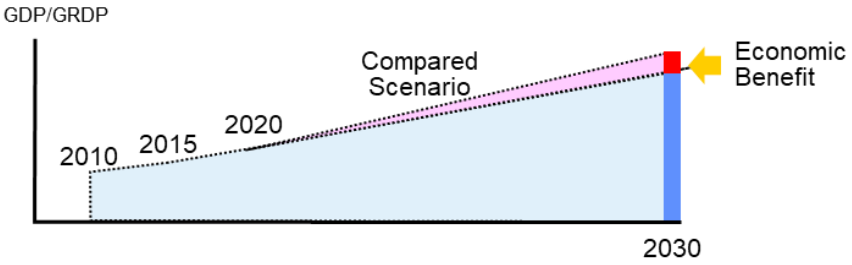
Source: Kumagai and Isono "Geo-economic simulation model"

Figure 4.1.3 Basic Structure of IDE-GSM

Launched in 2007, this model started as being the one connecting 361 regions in 10 countries via roads with the Mekong region in the center. As a results of continuous data collection, the model covered up to 1,800 districts in 18 countries via terrestrial, maritime, air, and railway roads in 2014. Projections developed by this model are used by several international organizations such as the Economic Research Institute for ASEAN and East Asia (ERIA). As economic data at regional level have not been fully developed for the entire East Asia region, some indicators have been partly substituted for some countries and regions.

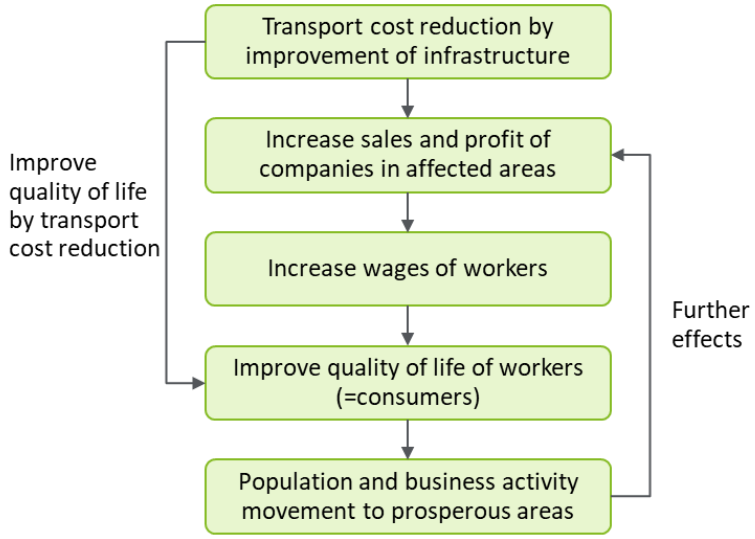
Furthermore, this model does not evaluate only past policies' impacts, but also focus on providing projections for policies 'future impacts, as it is not possible to obtain enough data sets to verify past policies 'impacts in the target East Asia region. In this model, the economic impacts are estimated by calculating the difference of GDP between whether trade and traffic facilitation policies have been implemented or not (see Figure 4.1.4). The "economic impacts" used in this model consider cost saving, transportation time saving, and economic activities cause. This model estimates that the development of transportation infrastructure impacts the GDP as the development of regional infrastructures lead to a decrease of the transportation costs. As a result, sales and profits of local companies are increased, as well as workers 'wages. Therefore, living standards of workers (consumers) in the target area improve, and population

movements occur in this area as there are better conditions than other areas. This estimation flow by the IDE-GSM is made by utilizing various accumulated data.



Source: Isono "Process of Economic Benefit Analysis by IDE-GSM and its Application to Policy-making: Economic corridor and Agreement on Disaster Resilience and Free Trade"

Figure 4.1.4 Economic Benefit Defined by IDE-GSM



Source: Isono "Process of Economic Benefit Analysis by IDE-GSM and its Application to Policy-making: Economic corridor and Agreement on Disaster Resilience and Free Trade"

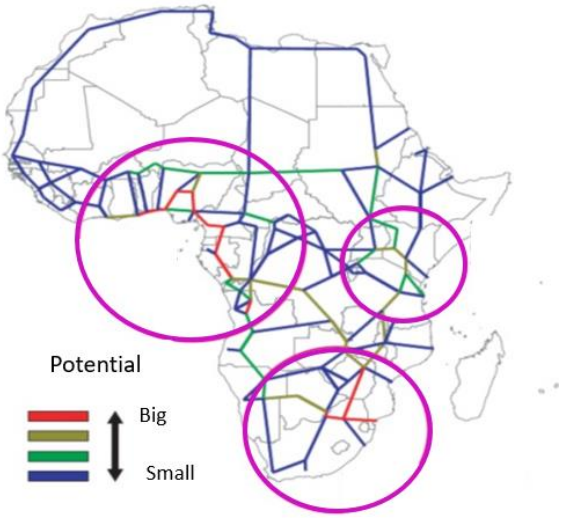
Figure 4.1.5 Impact of Transport Related Infrastructure Development on GDP in IDE-GSM

In order to implement this simulation model, in addition to the initial data (population in each region, industry-specific Gross Regional Product (GRP), routes connecting regions), various scenarios and parameters such as customs facilitation measures, free trade agreements, and special economic zones are required. In Africa, which is the target of this survey, it is often impossible to collect such relevant data, and the simulation model is closely related to models, programs, parameters, data, and scenarios. Thus, concerned parties need to confirm and adjust them to use this model. Therefore, this requires the general publication and general use of this model but this is not the case yet. Thus, it is impossible to use the exact same model to estimate the economic activity of the target countries / regions.

The gravity model focusing on the trade volume is also used, as it is seen as a major factor for corridor development. This model, based on Newton's gravity law, states that the trade volume between two countries are determined by the economic scale of each countries and the distance between the two countries.

This model was first applied by Tinbergen as well as Poyhonen in the 1960s, and several researchers set its foundation afterwards.

In previous Africa related studies, JICA also used this gravity model to estimate the regional trade volume. The analysis showed that Central Africa region including the West Africa Growth Ring, and South Africa have a large potential, whereas East Africa including the Northern Corridor have a small potential (see Figure 4.1.6). It is impossible to estimate the trade volume for the target areas of each corridors with this model, but is it possible to do it at country level. As the required data are relatively basic, such as trade volume, GDP, distance, list of industries impacting trade, it can also be collected in the target countries of this study.



Source: JICA "A Passage Across Borders: Towards Growth and Development - Transcending Borders in Africa"

Figure 4.1.6 Regional Trade Potential in Sub-Saharan Africa by the Gravity Model of International Trade

4.1.3 Evaluation Criteria and Prerequisites for Assessing the Impacts of the Corridor Master Plans

The following are the investigations made to set the impact indicators for the three corridor master plans.

(1) Target Area

As the level of local governments collecting data are different for each countries, the study team set the corridors development impact scope according to the level of the available data. As province level data related to the road networks for were available for Togo, all provinces are targeted in this study.

Table 4.1.4 Targeted Regions for Assessment

Corridor	Country	Targeted Regions
Northern Corridor	Kenya	Province Level: Mombasa, Kwale, Killifi, Taita, Taxeta, Machakos, Makueni, Kiambu, Uasin-Gishu, Nandi, Baringo, Nakuru, Kajiado, Kericho, Kakamega, Bungoma, Busia, Nairobi
	Uganda	Region Level: Central (Kampala), Eastern, Western
Nacala Corridor	Mozambique	Provincial Level: Niassa, Cabo Delgado, Nampula, Zambezia, Tete
West Africa Growth Ring Corridor	Burkina Faso	Division Level: Boulgou, Kouritenga, Ganzourgou, Kadiogo (Ouagadougou), Bazega, Zoundweogo, Nahouri, Boulkiemde, Sanguie, Les Bale, Tuy, Houet, Comoe
	Ghana	Provincial Level: Upper East, Northern, Brong-Ahafo, Ashanti, Eastern, Greater Accra (Accra), Central, Western
	Côte d'Ivoire	Region Level: Savanes, la vallee du bandama, lacs, N'zi Comoe, l'agnerb, lagunes (Abidjan), moyen comoe, sud-Comoe
	Togo	Provincial Level: Savanes, Kara, Centrale, Plateaux, Maritime (Lomé)

Source: JICA Study Team

(2) Population and Economy

Regarding the population, in addition to the overall information (population in the target area), structure of urban areas and population density, number of migrants motivated by the economic development, are adopted as indicators. Moreover, regarding the indicators measuring the area's economic development, correlation between poverty reduction and GDP/GRDP, and correlation between electricity consumption and environmental destruction with GDP/GRDP are adopted as indicators, in addition to the GDP/GRDP growth rate.

Table 4.1.5 Examples of Indicators in Economy and Data Collection in Corridor Countries

Item	Indicator	Data in targeted Corridors		
		Northern	Nacala	West Africa
Population	Population (actual and increase rate)	○	○	○
	The number of migrants	×	×	×
	Structure of urban area (population of urban area)	○	○	○
	Population density	○	○	○
GDP	GDP growth rate	○	○	○
	GRDP	Δ	○	Δ
	Poverty reduction	Δ	Δ	Δ
	Correlation between electricity consumption and GDP growth rate	×	×	×
Trade	Amount of trade	○	○	○
	Variety of export goods and amount	○	○	○
Revenue	Revenue increase at regional level	×	×	×
	Nominal revenue	×	×	×
	Spatial Distribution	×	×	×
Expense	Expense and its increase rate	Δ	○	×
Other	Land price	×	×	×

Legend : ○Data collected at regional level, ΔData collected at regional level of some countries (data is not collected periodically), × Data not collected

Source: JICA Study Team

(3) Industrial Structure and Employment

Regarding the industrial structure, changes in the industrial sector (per sector), the number of companies in specific sectors, and the status of cultivable lands, are adopted as indicators. Regarding the investment, Foreign Direct Investments and the number of establishments and abolition of private companies are adopted as indicators. In addition, several indicators regarding the establishment of supply chains (changes in resources used, market size, changes in production locations, and inventory management expenses) are also adopted. Regarding to employment, employment growth and labor productivity are possible indicators.

Table 4.1.6 Examples of Indicators in Industrial Structure and Employment and Data Collection in Corridor Countries

Item	Indicator	Data in targeted Corridors		
		Northern	Nacala	West Africa
Industrial structure	Export complexity	×	×	×
	Change of population and industry in targeted regions	○	○	○
	Ratio of specific sectors to overall economy	△	○	△
	The number of companies in non-agricultural sectors by ownership types	△	○	△
	Competitive advantage*	×	×	×
	Percentage of cultivated land	△	△	△
Investment	Foreign Direct Investments (FDI)	○	○	○
	The number of company establishments and abolitions	×	×	×
Supply chain	Change of resources for economic activities	×	×	×
	Market scale	△	△	△
	Change of production location	×	×	×
	Inventory cost	×	×	×
Employment	The number of employee	×	×	×
	Labor productivity	×	×	×

*Competitive advantage of the regions connected by a corridor in traded sectors

Legend：○Data collected at regional level, △Data collected at regional level of some countries (data is not collected periodically), × Data not collected

Source: JICA Study Team

(4) Logistics

Transportation cost and time, transportation volume, are considered as main indicators. In addition, there were cases where the delivery of specific projects (e.g. infrastructure development) are set as indicators

Table 4.1.7 Examples of Indicators in Logistics and Data Collection in Corridor Countries

Item	Indicator	Data in targeted Corridors		
		Northern	Nacala	West Africa
Cost	Transportation cost	○	○	△
Time	Travel time and speed	○	○	△
	The number and time of staying	○	○	△
Volume	Volume and distance of transportation	○	○	△
Transportation mode	The number of airport	○	○	○
	Connectivity between major cities (number of passenger and volume)	△	△	△

Legend：○Data collected at regional level, △Data collected at regional level of some countries (data is not collected periodically), × Data not collected

Source: JICA Study Team

(5) Environment

Regarding natural environment, air pollution and deforestation are adopted as indicators. Moreover, regarding social environment, the provision of educational opportunities, gender equality, and better access to banking and financial services are used as indicators.

Table 4.1.8 Examples of Environmental Indicators and Data Collection in Corridor Target Countries

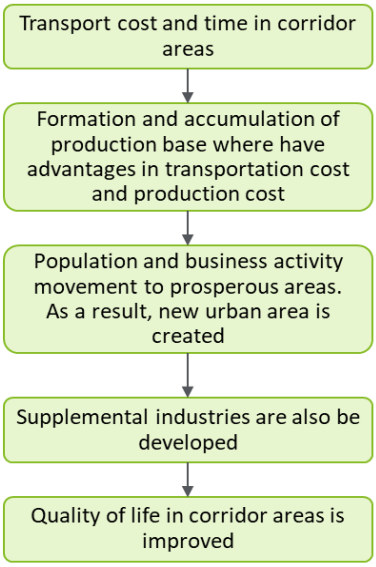
Item	Indicator	Data in targeted Corridors		
		Northern	Nacala	West Africa
Natural environment	Air pollution（NO）	×	×	×
	CO2 emission	×	×	×
	Deforestation	×	×	×
Social environment	Equality for education opportunities (e.g. secondary education)	Δ	×	×
	Gender equality	×	×	×
	Access to banking and financial services	×	×	×

Legend：〇Data collected at regional level, ΔData collected at regional level of some countries (data is not collected periodically), × Data not collected

Source: JICA Study Team

4.2 Setting Indicators for Evaluating the Impacts of the Corridor Master Plans

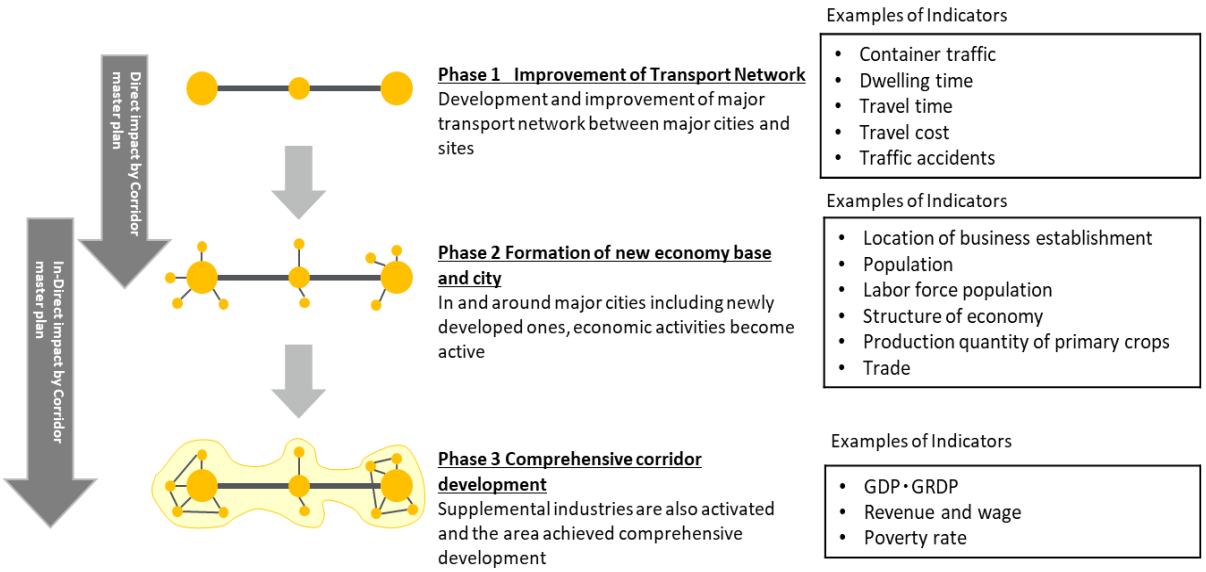
The evaluation of impacts of the corridor master plans is conducted based on precedent examples and data available in each of the three strategic African corridors. The corridor master plans aim to achieve not only economic development, but also a well-balanced development including social and environmental development. Considering the objective to develop the entire corridor area across countries 'borders, and as there is an opportunity to improve migration environment between the different bases, movement of people and goods, as well as appropriate location of production and residence bases are expected. Therefore, data were collected by focusing on the impact on logistic infrastructures improvement (core indicator), as it is considered to be the trigger for the other impacts. Moreover, and as it will be explained later, collection of data and information that can comprehensively cover all the regions of the corridor master plans target countries were not possible. Therefore, the study team decided to collect statistical data that can allow as much as possible the use of the frame below.



Source: JICA Study Team

Figure 4.2.1 Scenario of the Corridor Development Triggered by the Improvement of a Logistics System and the Improvement of Institutional Framework

In addition, based on each corridor's specificities, each corridor master plan includes projects that are not related to logistic systems. Therefore, indicators regarding expected impacts from these projects are also considered. On the other hand, since statistical data and information of target countries are not collected and tabulated systematically, it was extremely difficult to prove the correlation between master plan's effects and statistical results from the data obtained in this survey.



Source: JICA Study Team

Figure 4.2.2 Examples of Indicators for Evaluating the Impact of Corridor Master Plans

4.3 Notes for the Evaluation

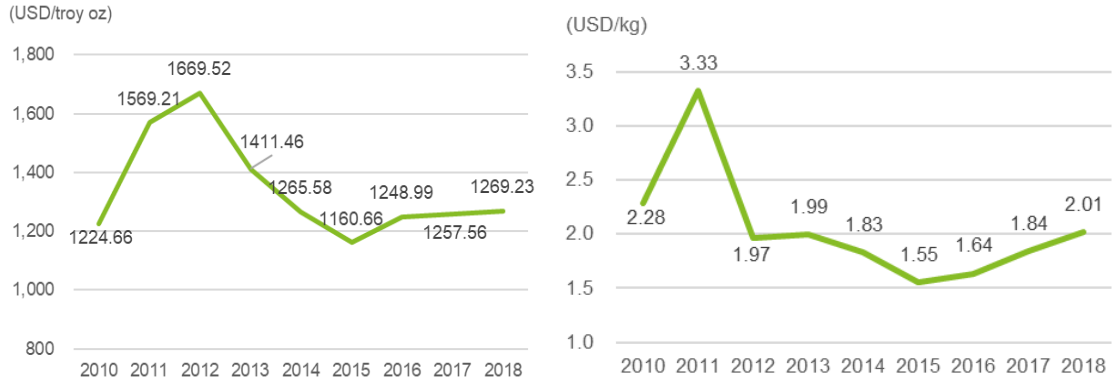
In many of the target countries of this study, export of primary products is the leading driver of the economy (see Table 4.3.1).

Table 4.3.1 Primary Product for Export of Target Countries

Corridor	Country	Main Export goods
Northern	Kenya	Tea, Cut Flowers, Coffee, and Seafood
	Uganda	Coffee, Petroleum oils, Maize, and Cacao beans
Nacala	Mozambique	Aluminum, Coke and semi-coke, Natural gas, Electricity, and Tobacco
West Africa Growth Ring	Burkina Faso	Gold, Raw cotton, and Oily seeds
	Côte d'Ivoire	Cocoa beans/products, Refined petroleum, and Rubber
	Ghana	Gold, Crude petroleum, Cocoa beans/products, and Coconuts
	Togo	Calcium phosphate, Row cotton, Cement, and Gold

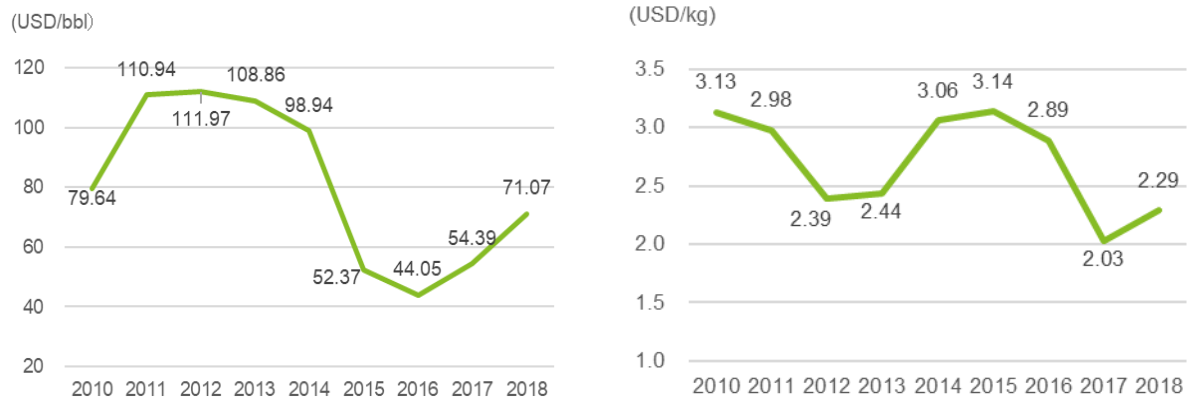
Source: Ministry of Foreign Affairs of Japan

Prices of primary products highly fluctuate depending on the international market situation, and in some countries, price decrease have caused the deterioration of public finance situation. One of the ultimate objectives of the corridor master plans is the shift to an economic structure that does not mainly relies on the export of primary goods. However, as many of the projects have only long term impacts, price and demand fluctuation risks have to be considered as having an impact of the country's macro economy.



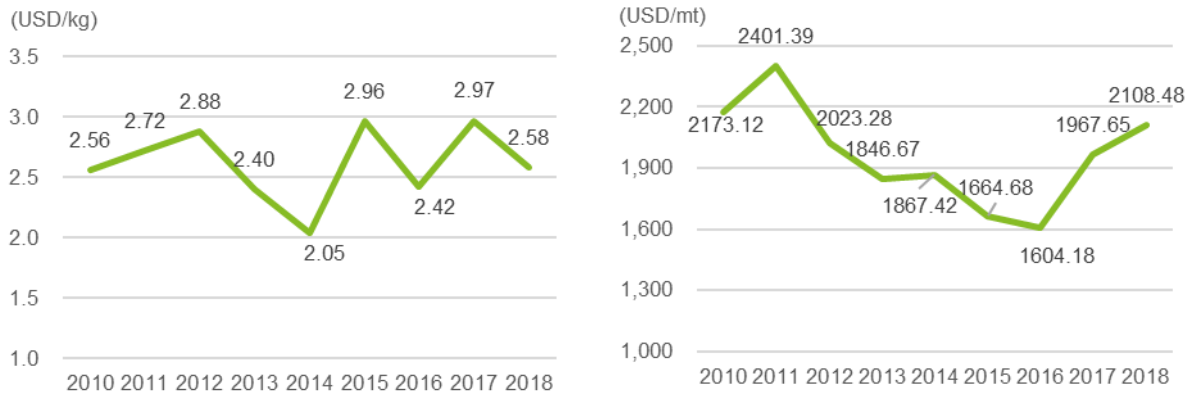
Source: World Bank (https://www.worldbank.org/) as of April 23, 2019

Figure 4.3.1 Annual Gold price (New York Market) (Left) and Cotton Price (A-index) (Right) (Nominal)



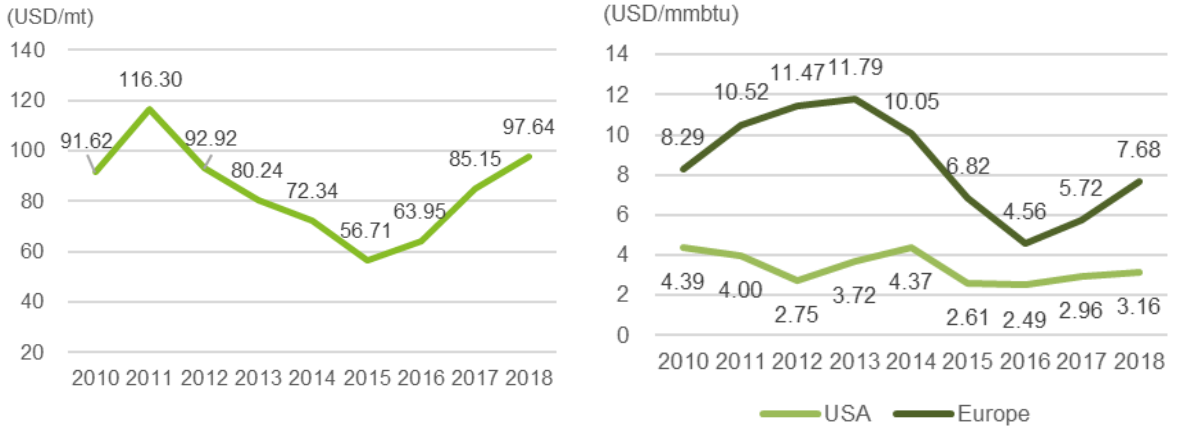
Source: World Bank (https://www.worldbank.org/) as of April 23, 2019

Figure 4.3.2 Annual Crude oil, Brent Price (Left) and Cocoa Beans Price (Right) (Nominal)



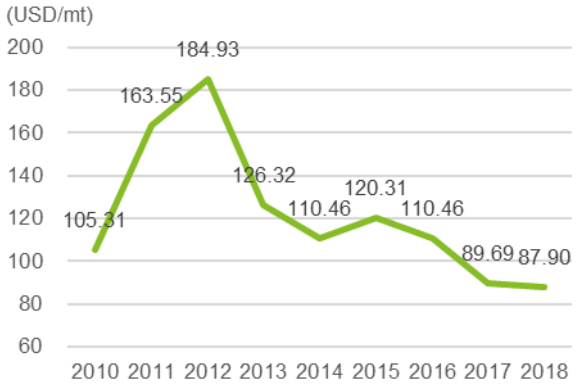
Source: World Bank (https://www.worldbank.org/) as of April 23, 2019

Figure 4.3.3 Annual Tea Price (Mombasa Auction) (Left) and Aluminum Price (Right) (Nominal)



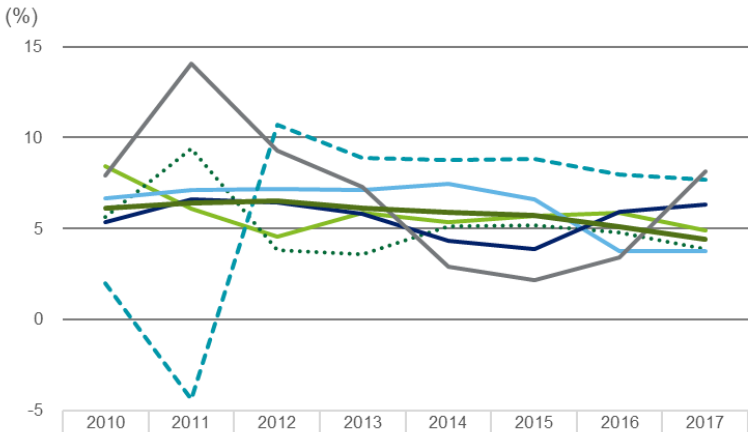
Source: World Bank (https://www.worldbank.org/) as of April 23, 2019

Figure 4.3.4 Annual Coal Price (South Africa) (Left) and Natural Gas Price (US and Europe) (Right) (Nominal)



Source: World Bank (https://www.worldbank.org/) as of April 23, 2019

Figure 4.3.5 Annual Phosphate Rock Price (Nominal)



	2010	2011	2012	2013	2014	2015	2016	2017
Kenya	8.4	6.1	4.6	5.9	5.4	5.7	5.9	4.9
Uganda	5.6	9.4	3.8	3.6	5.1	5.2	4.8	3.9
Mozambique	6.7	7.1	7.2	7.1	7.4	6.6	3.8	3.7
Burkina Faso	5.4	6.6	6.5	5.8	4.3	3.9	5.9	6.3
Cote d'Ivoire	2.0	-4.4	10.7	8.9	8.8	8.8	8.0	7.7
Ghana	7.9	14.0	9.3	7.3	2.9	2.2	3.4	8.1
Togo	6.1	6.4	6.5	6.1	5.9	5.7	5.1	4.4

Source: World Bank (https://www.worldbank.org/) as of April 23, 2019

Figure 4.3.6 GDP Growth Rate of Target Countries

4.4 Analysis of the Impacts

4.4.1 Analysis of the Impacts regarding Logistics

(1) Data Collection

The following table shows the results of the data collection conducted to evaluate the impacts on logistics.

Table 4.4.1 Result of Data Collection in Logistics

	Northern		Nacala		West Africa Growth Ring	
	Result	Period	Result	Period	Result	Period
A1. Container traffic	○	2013-2017	○	2013-2018	○	2013-2017
A2. Travel time between major sites	○	2010, 2015, 2017 2013-2017	○	2011, 2017,	○	2008, 2012
A3. Logistics cost between major sites	○	2010, 2015, 2017 2013-2017	○	2011, 2017	○	2012, 2016, 2008
A4. Port Operation efficiency	○	2013-2018	○	2018	○	2012, 2016
A5. Traffic volume	○	2015-2018.	○	2011-2017	×	—
A6. Traffic accidents	△ (whole country)	2013-2017	×	—	×	—
Lead time at ports	○	2013-2017	×	—	×	—

Legend: ○ Collected △ Partly collected × Not collected

Source: JICA Study Team

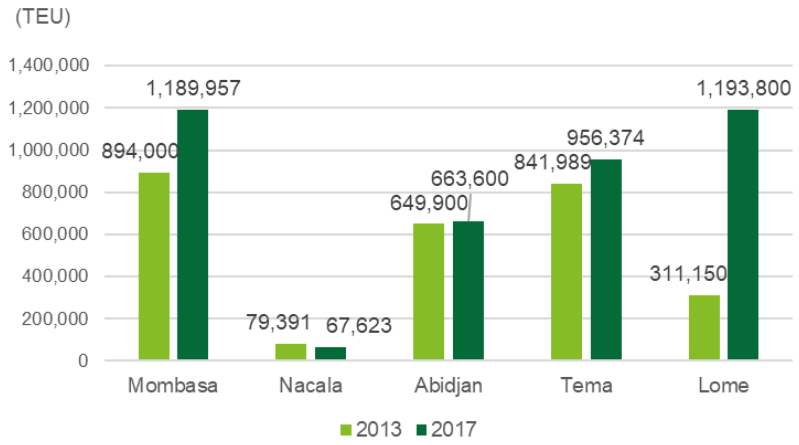
(2) Analysis of Impacts based on Collected Data

1) Indicators A1：Container Traffic

■ Overview of the analysis

As shown in the figure below, the container traffic of major ports in the target corridors is increasing. In particular, throughput in Lomé port has surged fourfold in four years, increasing from 0.31 million TEUs in 2013 to 1.19 million TEUs in 2017. According to newspaper articles, the starting of operation of the container terminal greatly contributed to the increase in container traffic volume at Lomé Port, and allowed Lomé Port to become the port with largest throughput in West Africa by surpassing Nigeria's Lagos Port[25]. In addition, throughput in Mombasa Port in Kenya and Tema Port in Ghana are also steadily increasing as development and expansion of infrastructure are continuously progressing. On the other hand, throughput of Abidjan Port in Côte d'Ivoire and Nacala Port in Mozambique has been sluggish due to delays in the improvement of port facilities and access road infrastructures.

[25] Togo First (https://www.togofirst.com/en/logistics/2910-1898-lome-s-port-becomes-west-africa-s-leading-container-port-overtaking-lagos)



Source: Port authorities of each country, Maritime Executive and Port Autonome de Lomé (https://www.togo-port.net/statistiques-pal/conteneurs-port-autonome-de-lome/) as of April 23, 2019

Figure 4.4.1 Cargo Throughput of Major Ports in Corridors (Year 2013 and 2017)

The table below shows each port's change in throughput, and the impacts, and their background and causes.

Table 4.4.2 Container Traffic in Major Ports and Factors for Changes

Corridors	Port	Impact	Background and Factor
Northern	Mombasa	↗	The expansion work at Mombasa Port has been completed.. The handling capacity has been improved. Significant progress has also been made in relation to infrastructure development such as access roads.
Nacala	Nacala	→	One of the possible main reasons that the handling volume have not increased is that there is a physical limitation that the port area is narrow. However, a port operation improvement project supported by JICA has been completed, and a port operation management adviser has been dispatched. These have contributed to the improvement of efficiency. With regard to access roads, JICA's preparatory survey was already completed, and the World Bank is under consideration for grants. Therefore, there is a possibility that the handling volume will increase in the future. Also, as other negative factors, the effects of poor agricultural production due to drought and flood, and undisclosed debt problem are also assumed.
West Africa Growth Ring	Abidjan	↘	Current related infrastructure cannot cope with growing demand.
	Tema	↗	The expansion of related infrastructure is progressing steadily, and the handling volume is increasing.
	Lomé	↑	Development of large-scale container terminal was completed. In addition, the companies intending to avoid congestion in the nearby Lagos port has used Lométhis port.

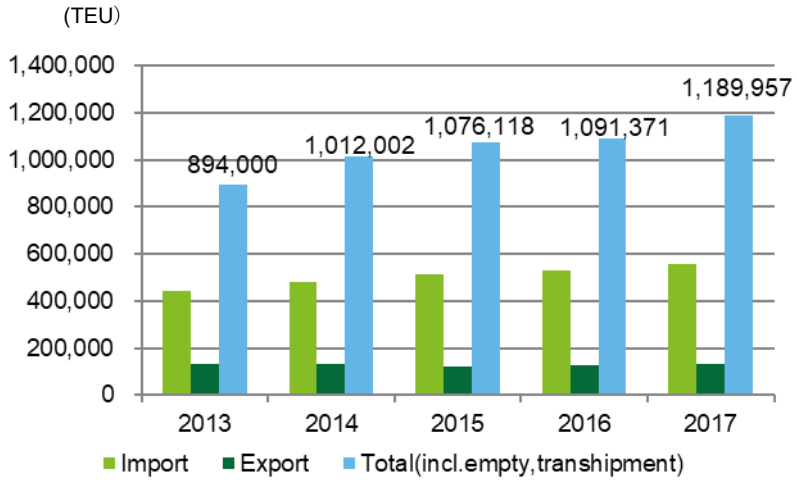
Source: JICA Study Team

In order to increase the throughput of container cargo, it is necessary to develop hard infrastructure related to containers. Among the target corridors, the ports which have already developed container-related infrastructures have succeeded in accommodating container cargo. However, in the case of the Nacala Port, it has yet to install gantry cranes, thus its handling volume is small compared to other ports. However, a port operation improvement project by JICA was completed, and a port operation management adviser is dispatched now. The efficiency improvement is progressing despite severe geographical constraints. With regard to access roads, as JICA's cooperation preparatory survey was completed and the World Bank is in under consideration for the grant aid. It is expected that this will lead to the improvement of the port operation efficiency and the improvement of the handling volume by advancing the improvement of the port environment.

■ Evaluation of Each Corridor

A) Project for Master Plan on Logistics in Northern Economic Corridor (Mombasa)

Mombasa Port in Kenya is one of the largest commercial ports in East Africa and it is also the gateway to the Northern Corridor connecting inland countries such as Uganda and Rwanda to other countries. With the development of inland countries and Kenya's major cities, the port demand is rapidly increasing, and expansion works are being carried out to meet the handling demand. The capacity of Mombasa Port has increased from 720,000 TEUs in 2014 to 1.3 million TEUs in 2015 at the end of Phase 1 and will be further increased to 1.8 million TEUs at the completion of Phase 2 by the end of 2021. As shown in the figure below, the port's cargo throughput was about 890,000 TEU in 2013, but has risen to about 1.19 million TEU in 2017. In addition, demand is expected to exceed 2.6 million TEUs by 2025. However, the situation of import surplus has not changed, and the increase of exports is seen as one of the future issues.



Source: JICA Study Team based on data provided by Kenya Port Authority

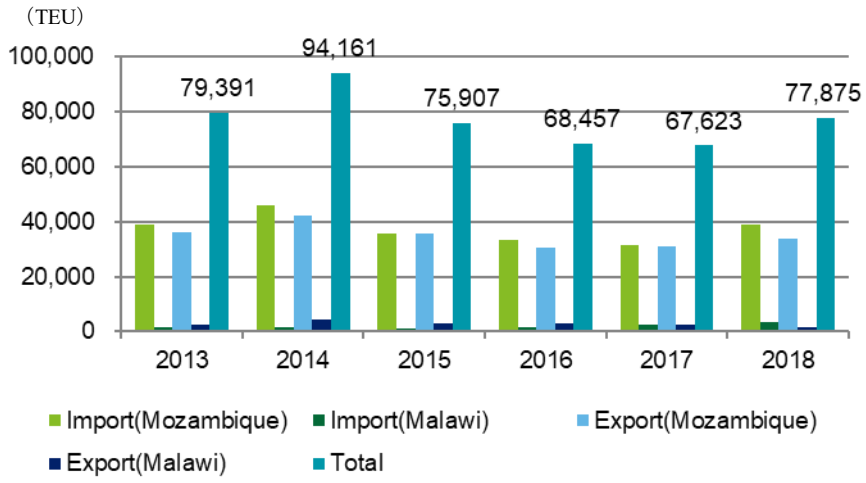
Figure 4.4.2 Cargo Traffic at Mombasa Port

As shown in Chapter 3, expansion of Mombasa port and improvement of access roads are listed as flagship projects of the corridor master plan. It is recognized that the corridor master plan has promoted those projects and, as a result, has contributed in the increase of the throughput of Mombasa port.

B) Project for Nacala Corridor Economic Development Strategies in the Republic of Mozambique (Nacala Port)

The handling capacity of Nacala Port is less than 100,000 TEUs, and the throughput is extremely small compared to other ports. There have not been many activities to increase the scale of handling capacity of this port. The yard at the port is currently narrow, and container handling is done through the use of ship cranes. Therefore, throughput of container liners is small. As a result, the throughput of Nacala port has not increased as much as other corridors 'ports. Container traffic increased from 79,000 TEUs in 2013 to 94,000 TEUs in 2014 but then decreased to 78,000 TEUs in 2018. The decrease in crop production due to drought in 2015 and the discovery of undisclosed debt in 2016 might be also considered to be factors affecting the decrease.

On the other hand, if the export of coal, which is the main product handled at Nacala Port, is going to increase, there is a concern that the efficiency of container handling will decline, so it is necessary to remove the physical constraints of the port in the future.



Source: JICA Study Team based on data provided by Port do Norte SA

Figure 4.4.3 Container Traffic at Nacala Port

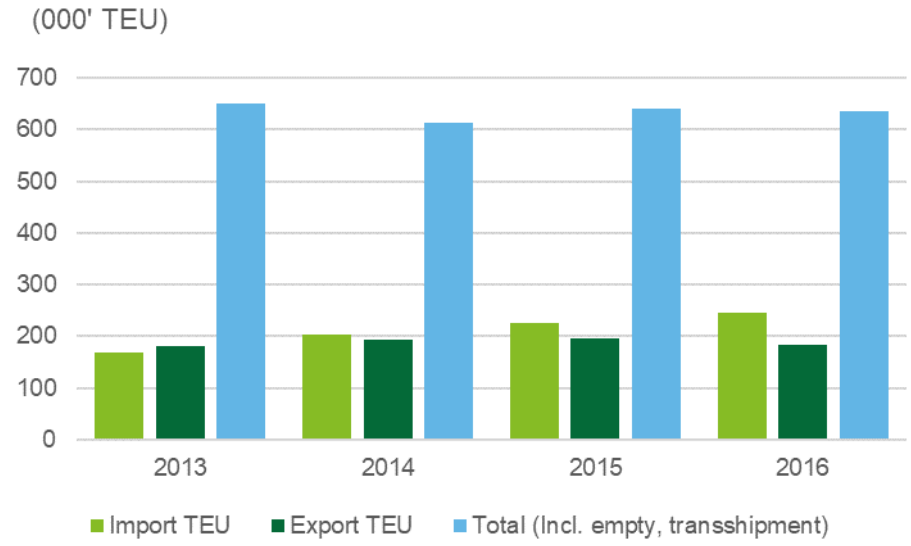
Currently, there are plans to develop access roads in and around the Nacala Port, but the capacity limit of Nacala Port itself is recognized. During the field survey, it was confirmed that the port side is also trying to renovate the equipment in the yard while the handling of coal is increasing, and the port function is maintained under physical constraints. JICA's assistance to the port operation management advisory is currently being implemented, and in the interviews of this study, the port authorities also pointed out that the port capability has been improved by the assistance.

C) The Corridor Development for West Africa Growth Ring Master Plan

Abidjan Port (Côte d'Ivoire)

Abidjan Port is one of the main ports in Sub-Saharan Africa, and serves as a gateway connecting the inland parts of Côte d'Ivoire and inland countries such as Burkina Faso and Mali. The port's container traffic in 2013 was 650,000 TEUs. However, no major investment has been made since the 1980s. In addition, the existing port handling capacity cannot keep up with the increase in cargo volume due to population and economic growth in Côte d'Ivoire, Mali, Burkina Faso, and other inland countries. The throughput of Abidjan Port has not changed substantially from 2013 to 2018.

On the other hand, although the effect of WAGRIC Master Plan has not appeared until 2018, there are various plans to improve the container throughput by Abidjan Port cereal berth construction project, development of access road between Abidjan Port to coastal area, improvement of logistic base, as mentioned in WAGRIC Master Plan.

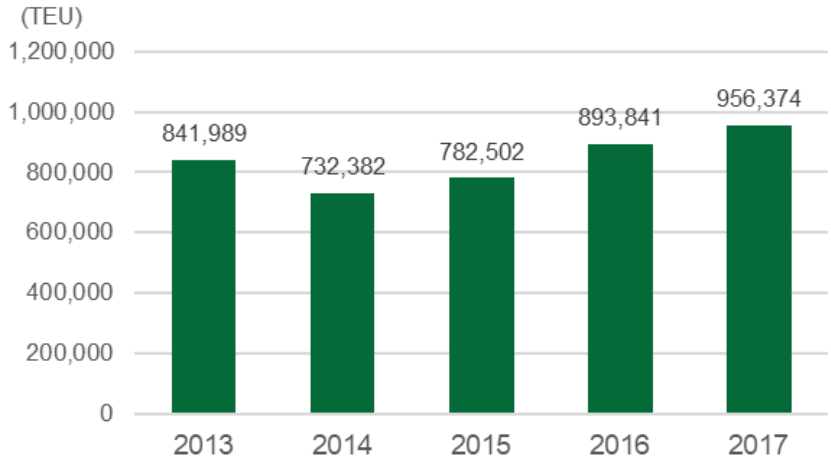


Source: JICA Study Team based on data from Port management association of west and central Africa

Figure 4.4.4 Container Traffic at Abidjan Port

Tema Port (Ghana)

Ghana has two major commercial ports along the Gulf of Guinea, Takoradi Port and Tema Port. Takoradi Port handles exports while Tema Port located near Accra handles imports. In recent years, the facilities at Tema Port have been enhanced. As a result, Tema port can now handle both imports and exports which accounts for about 85% of the import and export movements of the whole country. The container traffic at Tema Port decreased temporarily from 840,000 TEUs handled in 2013, but then increased and reached 960,000 TEUs by 2017. The decline in throughput from 2013 to 2014 could be due to the impact of the economic crisis that occurred around this period.

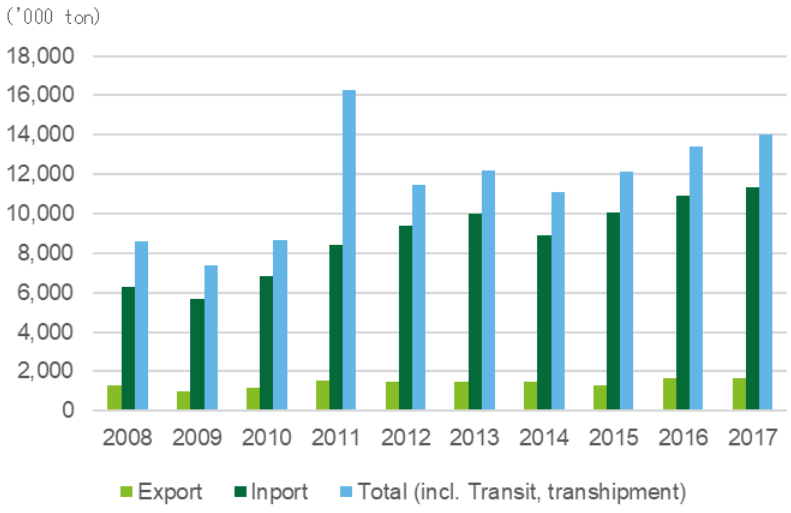


Source: JICA Study Team based on data from Ghana Ports and Harbour Authority

Figure 4.4.5 Container Traffic at Tema Port

Cargo throughput is basically the same as container throughput. Similar to other African ports, the ratio of import throughput is high. As of 2019, a million TEUs are the maximum handling capacity at Tema Port, but by adding the berth which is currently under construction, the maximum handling capacity will increase to 3.7 million TEUs.

In addition to the extension of the port berth, the throughput is expected to increase by the development of access road from Tema Port to other coastal countries as mentioned WAGRIC Master Plan.



Source: JICA Study Team based on data provided by Port management association of West and Central Africa

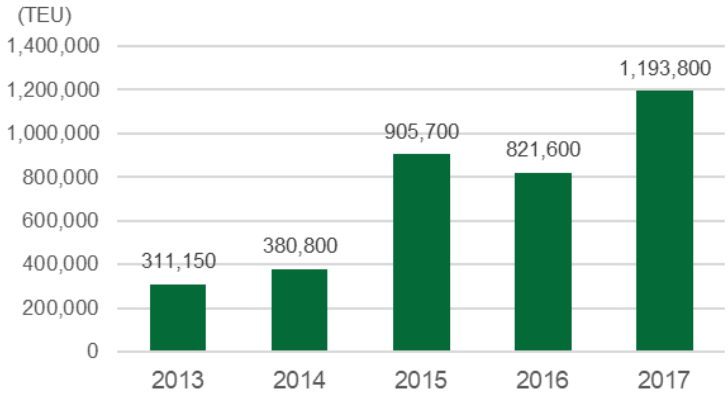
Figure 4.4.6 Cargo Traffic at Tema Port

As the Corridor Development for West Africa Growth Ring Master Plan was formulated in 2018, it was not possible to confirm the correlation between the port's cargo throughput and the corridor master plan.

Lomé Port (Togo)

Lomé Port is a deep-sea port (deeper than 10m, 2nd wharf 12m) where large cargo vessels can be anchored. It is not only a transport base for the inland area as it also became a potential hub port. Indeed containers from large cargoes are transshipped to small and medium sized vessels, connecting them to other West African ports (Lagos Port in Nigeria, Cotonou Port in Benin, Accra Port in Ghana, Abidjan Port in Côte d'Ivoire). As mentioned above, the new container terminal, which began full operation for large vessels in 2015, has greatly contributed to increase the throughput. It is said that companies willing to avoid congestion and low quality services of Lagos Port in Nigeria, are shifting to Lomé Port. Thus, the port has grown rapidly and to became the largest port in West Africa. On the other hand, it is pointed out that exports and imports to and from Togo are sluggish, due to the shortage of container head capacity, and the waiting time for ships entering the port that became a routine.

Since West Africa Growth Ring Master Plan has just completed in the beginning of 2018, the result of data is not estranged between the study and Master Plan.



Source: Port Autonome de Lomé (https://www.togo-port.net/statistiques-pal/conteneurs-port-autonome-de-lome/)

Figure 4.4.7 Port Traffic at Lomé Port

2) Indicators A2: Transportation Time between Major Sites

■ Overview of the analysis

Although the data acquisition time differs depending on the corridor, the travel time between major points has been shortened in all corridors compared to around 2010. The analyses on possible factors about travel time reduction are shown on the table below (Table 4.4.3) . In addition to the improvement of port and road infrastructure, it is considered that the introduction of the electronic data interchange (EDI) at customs clearance helped to reduce travel time between major points.

Table 4.4.3 Travel Time Reduction between Major Sites

Port		Impact	Background and Factor
Northern	Mombasa – Nairobi/ Kampala	↗	The development of related roads, port infrastructure development, operator capacity strengthening, and improvement of customs clearance procedures contributed significantly to travel time reduction.
Nacala	Nacala - Blantyre	↗	The improved efficiency through port automation and the introduction of customs clearance EDI contributed to travel time reduction.
West Africa Growth Ring	Tema～Ouagadougou	↗	Improvements in port infrastructure and road infrastructure contributed travel time reduction.

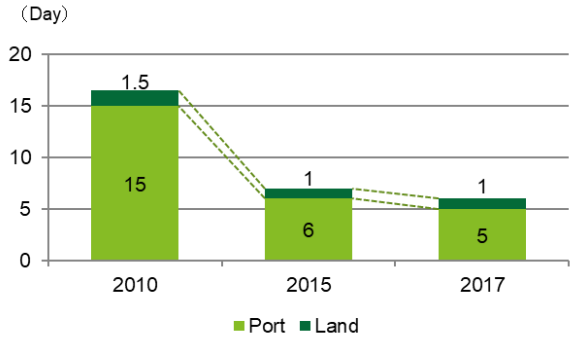
Source: JICA Study Team

Travel time is the total time needed for port, customs clearance, land transportation, border crossing, and other procedures for cargo handling. In particular, as customs clearance is conducted while the cargo stays in the port, the time from "ship entry to customs clearance, and unloading" is extremely long compared to the transportation part. Port operation time has been shortened by the installation of port equipment accommodating containers, and by the implementation of the EDI customs clearance. As for land transportation, it is necessary to shift the support policy to the improvement of the vehicle itself, improvement of the working environment, and improvement of the depot, etc., as development of road infrastructure is already in progress.

■ Analysis on Each Corridor

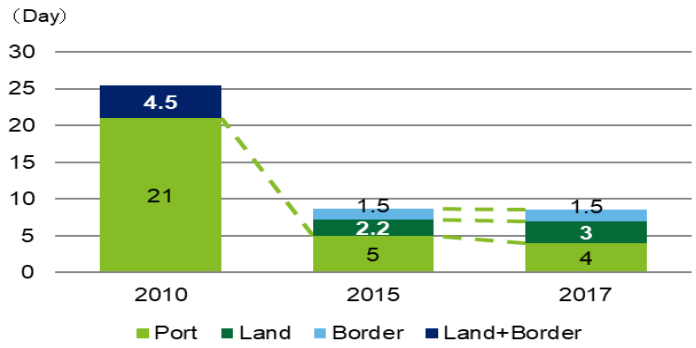
A) Project for Master Plan on Logistics in Northern Economic Corridor

Travel time between Mombasa, the main port of the Corridor, and Nairobi, Kenya's industrial center, and Kampala, the capital of Uganda, were compared as of 2010, 2015, and 2017. As shown in the figure below, travel time has greatly improved since 2010. Even in the most recent data between 2015 and 2017, the shortened travel time has shortened for about 1 day for both port routes. On the other hand, the time reduction impact on the road is still limited. Indeed, travel time between Mombasa and Kampala is longer by about half a day in 2017 compared to 2015. However, significant mitigation in traffic congestion on roads around Mombasa has been reported during an interview with forwarders.



Source: Year 2010：CPCS “ Impact assessment of the northern corridor performance activities”
Year 2015：JICA(2017) “Project for Master Plan on Logistics in Northern Economic Corridor, Final Report”
Year 2017：JICA Study Team based on the interview with local forwarders and NTTCIA “Observatory survey”

Figure 4.4.8 Travel Time Between Mombasa and Nairobi

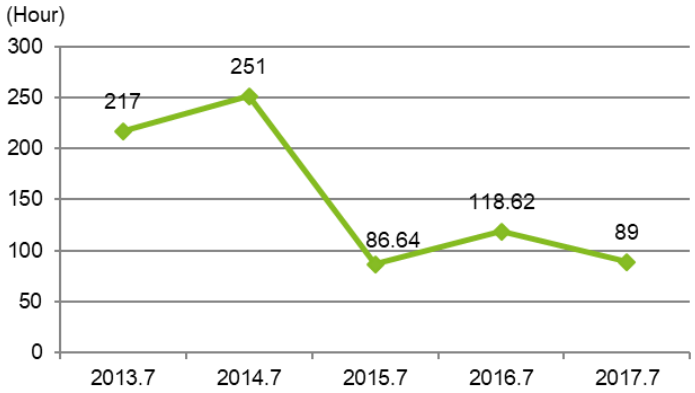


*Data in 2010 cannot be divided into land and border. Therefore, total of land and border is shown.
Source: Year 2010：CPCS “ Impact assessment of the northern corridor performance activities”
Year 2015：JICA(2017) “Project for Master Plan on Logistics in Northern Economic Corridor, Final Report”
Year 2017：JICA Study Team based on the interview with local forwarders and NTTCIA “Observatory survey”

Figure 4.4.9 Travel Time Between Mombasa and Kampala

NTTCIA also measures road travel time between Uganda border (Malaba) and Kenya from once customs procedures at ports are completed to the end of transport procedures (see Figure 4.4.10). A year-on-year comparison shows that the decrease has been steady until 2015, but has since stopped declining in 2017. This shows a tendency similar to the data in above Figure 4.4.8 and Figure 4.4.9.

As shown in Chapter 3, the expansion of Mombasa port, operation rationalization, and access roads improvement are listed as flagship projects in the corridor master plan. The data above shows that time savings in port-related activities were confirmed. It can be recognized that the corridor master plan has promoted related projects and as a result, has made a certain contribution to shortening transportation time.



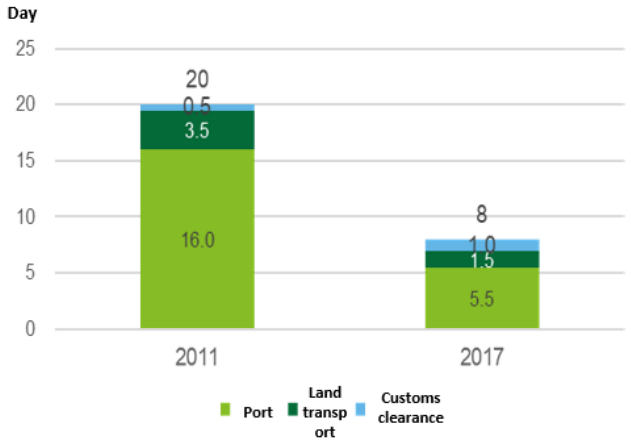
Source: NTTCIA ”Observatory survey”

Figure 4.4.10 Travel Time between Mombasa and Malaba

B) Project for Nacala Corridor Economic Development Strategies in the Republic of Mozambique

Travel time from Nacala Port to Blantyre, the industrial center of Malawi, was analyzed using 2011 and 2017 data. By comparing 2011 and 2017, it can be noted that time required at the port has been reduced from 16 hours to 5.5 hours (about one third) and road transportation time has been reduced

from 3.5 days to 1.5 days (about half). This reduction is assumed to be the result of efforts after Nacala Port's privatization in 2013, and mechanization of the port to overcome the limited space issue.. In addition, customs EDI was introduced. Before, its introduction, it took three to four days from customs declaration to issuance of permit before introduction, but now it takes only a few hours, which also contributes to the reduction of travel time. Moreover, the travel time reduction of land transportation was due to the improvement of the road infrastructure along the corridor from Nacala Port to Nampula, the second largest city of Mozambique. Traffic volume at the border between Mozambique and Malawi is low, but despite the slight fluctuation from 2011 and 2017, there is no significant one. Although the border crossing procedure has been simplified and progress has been made to ease deposit requirements, it seems that the desired impact has not manifested yet.



Source: Year 2011: United States Agency for International Development（2012）"Logistics review of the Beira and Nacala corridor",
Year 2017: USAID (2018) "Nacala corridor ad port performance assessment"

Figure 4.4.11 Transport Time in Nacala Corridor

As shown in Chapter 3, the corridor master plan includes both hard infrastructure for logistics and soft infrastructure such as the strengthening of software and the rationalization of customs operation as well as checkpoints. Although the improvement of Nacala Port itself and access roads have not progressed, it was confirmed that the improvement of soft infrastructures could shorten transportation time. In that sense, it can be recognized that the corridor master plan has promoted those projects and, as a result, has made a certain contribution to the reduction of transportation time along the corridor.

C) The Corridor Development for West Africa Growth Ring Master Plan

It is difficult to acquire transportation time data regarding the West African Growth Ring Corridor. It was however possible to confirm the situation for the distance between Tema Port and Ouagadougou, the capital of Burkina Faso, based on a USAID survey that compared transportation time between these two points in 2008 and 2012. Although the data are old, it could be confirmed that port and land transportation times were reduced by about one day each, resulting on a reduction of about two days for the both required travel time. It is thought that this reflects the improvement of ports and roads infrastructures by various donors. The time required for customs clearance is included in the land

transportation time, but it was not possible to identify time required at the border between Ghana and Burkina Faso. The WAGRIC Master Plan study formulated in 2018, doesn't include data collection and analysis of transportation time either.

Table 4.4.4 Comparison of Travel Time in West Africa Growth Ring Corridor

	Year	Port (Days)	Land (Days)	Total (Days)
Tema-Ouagadougou	2008	3.7-6.6	3.8-5.5	10.5-18.1
	2012	3.0-3.8	1.3-5.7	8.9-17.3

Source: United States Agency for International Development（2013）"Trends in transport and logistics Tema-Ouagadougou-Bamako corridor"

As the Corridor Development for West Africa Growth Ring Master Plan was formulated in 2018, it was not possible to confirm the correlation between the port's handling volume and the corridor master plan.

3) Indicators A3: Logistics Cost between Major Sites

■ Overall Analysis

As shown in Table 4.4.5, all corridors have achieved a certain reduction in logistics costs. In particular, the impacts on Mombasa Port to Nairobi / Kampala are remarkable. However, as it is necessary to set usage fees that secure profitability when delivering port and railway projects through a Public-Private Partnership (PPP), it is difficult to expect significant reduction on logistics costs. Not limited to PPPs, this logic is also applied to large port and railway projects that require large investments.

As a factor of cost reduction, it is possible to increase the revenue per unit time and to reduce the total logistics cost by shortening transportation time and increasing the turnover rate of the equipment used by the logistics company. In addition, the expansion of the volume of shipments will encourage new entry into the market, and will result in further price reductions due to competition among companies. For instance, in the case of the Northern Corridor, cost reduction have been successfully achieved by realizing both of the above-mentioned time reduction impacts and competition effects. However, no cost improvement impact has been observed at border crossing points. In the Nacala corridor, the volume has not increased, and the cost reduction impact remain limited. In this context, the West Africa Growth Ring Corridor has not achieved as much cost savings as the Northern Corridor.

Table 4.4.5 Logistics Cost Reduction between Major Sites

Port		Impact	Background and Factor
Northern	Mombasa – Nairobi/ Kampala	↗	As a result of infrastructure development, truck charges are decreasing. Railway charges have also been lowered due to the development of new lines but it is difficult to reduce their charges significantly. In addition, railway has no competitiveness against road transport.
Nacala	Nacala - Blantyre	→	The overall fare market has stabilized by maintaining the quality level of the port operation, development of a road infrastructure, and reduction of customs clearance time. On the other hand, the charges for railway tended to rise due to PPP.

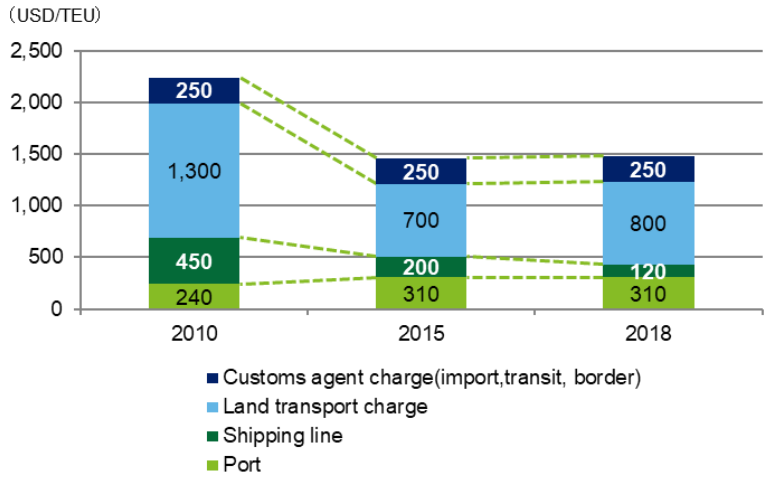
West Africa Growth Ring	Tema～Ouagadougou	→	Although some travel time reductions can be seen due to infrastructure development, no major impacts on cost have been achieved.

Source: JICA Study Team

■ Analysis on Each Corridor

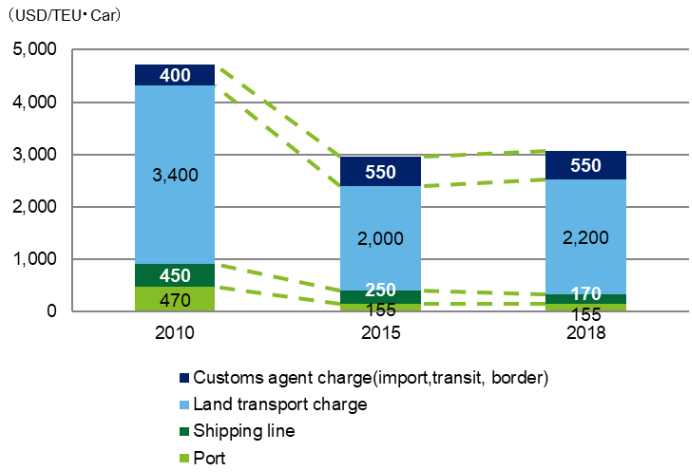
A) Project for Master Plan on Logistics in Northern Economic Corridor

Regarding the Northern Corridor, the logistics costs of 1 TEU transported from Mombasa Port to major cities (Nairobi and Kampala) at the completion of the Northern Corridor master plan in 2015 and 2018 were compared in this survey.



Source: Year 2010: CPCS " Impact assessment of the northern corridor performance activities, May 2015"
Year 2015：JICA(2017) "Project for Master Plan on Logistics in Northern Economic Corridor, Final Report"
Year 2017：JICA Study Team based on the interview with local forwarders and NTTCIA "Observatory survey"

Figure 4.4.12 Logistics Cost between Mombasa and Nairobi



Source: Year 2010: CPCS " Impact assessment of the northern corridor performance activities, May 2015"
Year 2015：JICA(2017) "Project for Master Plan on Logistics in Northern Economic Corridor, Final Report"
Year 2017：JICA Study Team based on the interview with local forwarders and NTTCIA "Observatory survey"

Figure 4.4.13 Logistics Cost between Mombasa and Kampala

The basic components of logistics costs are port charges, land transportation costs (trucks or railways), customs fees, and shipping costs.

The port charges have not been revised since 2013. The Mombasa Port is managed by the Kenya Port Authority (KPA) and not by a global port operator. Many expectations that privatization of the Port management would result in port charges reduction were heard. However, it is difficult for KPA to reduce the current port charges as they still have to repay the terminal construction costs.

With regard to land transportation charges, the Northern Corridor Transit and Transport Coordination Authority (NCTTCA) analyzed that costs were reduced by approximately 100 to 200 USD from 2015 to 2017. However, based on the interview results, the Study Team considered that there was no cost reduction during this period. With regard to railway transportation, the standard gauge rail service in Mombasa and Nairobi started in 2018, resulting in a significant transport charge reduction compared to before.

With regard to customs clearance costs, the Kenyan government is requesting shippers and logistics companies to clear their cargo containers for Nairobi at Nairobi Railway Station. Therefore, it was pointed out that the development of railway cargo seen from January to March 2018 was not determined by the market itself. The railway transportation cost is not competitive compared to trucks for short distances, but the competitiveness comes out when the needed distance to be covered exceeds 1,000 km. Therefore, price competitiveness for the 480km between Mombasa and Nairobi cannot be expected. When comparing transportation costs between 2015 and 2018 across transport routes, a rise in transportation costs could be noted, instead of a reduction.

As mentioned above, it was not possible to confirm the impact of the corridor master plan.

B) Project for Nacala Corridor Economic Development Strategies in the Republic of Mozambique

Regarding logistics costs in the Nacala Corridor, the cost comparison between Nacala Port and Malawi-Blantyre in 2011 and 2017 is shown in the table below.

Table 4.4.6 Logistics Cost between Nacala – Blantyre (20 FT, USD)

	2011		2017	
	Truck	Rail	Truck	Rail
Port	230	265	230	265
Shipping Line	250	300	250	300
Land Transportation Charge	2,600-4,600	2,300	2,300	2,500
Terminal Charge	-	-	200	260
Border Charge	100	80	100	80
Total (USD)	3,180-5,180	2,945	2,980	3,325

Source: 2011 United States Agency for International Development（2012）"Logistics review of the Beira and Nacala corridor"; JICA(2013)" Data collection survey for potential industries in Malawi"; JICA（2012）"Project for the study on development of the Sena corridor in the Republic of Malawi : final report"; 2017: United States Agency for International Development (2018) "Nacala corridor ad port performance assessment" Competition and fair trading commission Malawi "Competition assessment in Malawian transport sector"

The port charges have risen by about 10% from 2011 to 2017. This could be due to the increase in the port operation cost, caused by maintenance and expansion costs. Regarding land transportation, the cost of truck transportation has decreased. The wide range in truck costs in 2011 could be attributed to the fact that truck transportation demand was scarce and transportation market prices was not formed yet. However, transportation market price was stabilized in 2017 as freight volumes increased, with lower rates compared to 2011. On the other hand, railway transportation costs are on the rise. After railways privatization, it can be considered that it is impossible to reduce the charges in order to recover the railway development costs.

On the other hand, for Nacala Port, if the handling volume of coal will increase in the future, there is a concern that the current port capacity may adversely effect on the transportation time again, which may become a bottleneck for corridor development. At present, it is difficult to significantly improve the port capacity, but it is important to continue the tangible and intangible support as implemented by JICA and others.

C) The Corridor Development for West Africa Growth Ring Master Plan

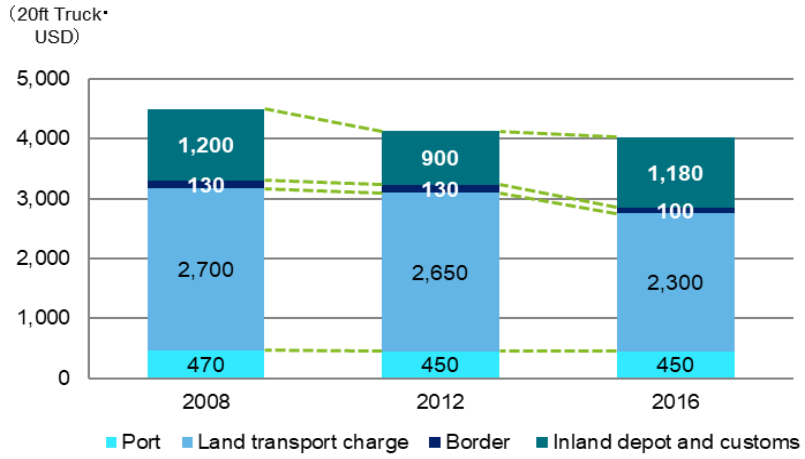
It is possible to compare the cost from Abidjan Port and Tema Port to Ouagadougou. While the railway route from Abidjan Port to Ouagadougou is operational, the route from Tema Port to Ouagadougou is still at planning stage, thus the route is served only by truck transportation. Land transportation cost from Abidjan Port to Ouagadougou shows a certain reduction from 2012 to 2016. However, costs other than port charges, ship owner charges, and customs fees have not decreased. In the case of transportation cost from Tema Port to Ouagadougou, truck transportation costs and inland costs (depot fees and customs fees) were reduced by 11% in total between 2012 and 2016 .

Table 4.4.7 Logistics Costs between Abidjan and Ouagadougou (20FT, USD)

	2012		2016	
	Truck	Rail	Truck	Rail
Port	520	520	600	600
Shipping Line	130	130	170	170
Land Transport Charge	2,800	2,200	2,200	1,800
Terminal Charge	900	900	900	900
Border Charge	220	220	250	300
Total	4,570	3,970	4,120	3,770

Source: Year 2012: United States Agency for International Development（2013） “Trends in transport and logistics Tema - Ouagadougou - Bamako corridor”

Year 2016: JICA（2016）“The project on the corridor development for west Africa growth ring master plan final report”



*Port charge in 2016 can be divided into Port charge (USD 200) and Shipping line charge (USD 250). Moreover, Inland depot and customs can also be divided into Inland depot charge (USD 280) and Customs agent charge (USD 900).
Source: Year 2012: United States Agency for International Development（2013） "Trends in transport and logistics Tema-Ouagadougou-Bamako corridor"
Year 2016: JICA（2016）"The project on the corridor development for west Africa growth ring master plan final report"

Figure 4.4.14 Logistics Cost between Tema and Ouagadougou (20FT, USD)

As the Corridor Development for West Africa Growth Ring Master Plan was formulated in 2018, it was not concerned as the impact of the Master Plan. On the other hand, infrastructure developments and technical assistance for custom inspections after 2016, the trading cost is assumed to improve in the future.

4) Indicators A4: Port Operation Efficiency

■ Overall Analysis

Crane productivity, berth occupancy rate, and dwelling time at ports were adopted as indicators showing port operation efficiency. Crane productivity refers to the amount of containers that can be handled per hour at port. As there are some variations in the type and timing of data that can be acquired depending on the port, evaluation of the impacts is difficult. However, port operation efficiency at Mombasa Port is far superior compared to other ports. Mombasa Port has made a progress in the development of port infrastructure with support from JICA, and these efforts are considered to have greatly contributed to improve its efficiency.

Table 4.4.8 Summary of Operation Efficiency at Major Ports

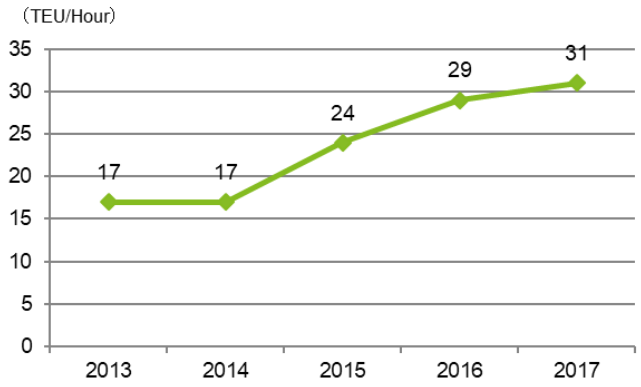
	Northern	Nacala	Western Africa Growth Ring		
	Mombasa	Nacala	Abidjan	Tema	Lomé
Crane productivity (TEU/hour)	31 (2017)	5-6 (2018)	18.23 (2018)	28-30 (2018)	18-20 (2018)
Berth occupancy rate (2017)	75%	N/A	N/A	N/A	N/A
Dwelling time at port	3.7 days (89hours)	10-12 days	0.92 days	6.1-21.3 days	18 days

Source: JICA Study Team

■ Evaluation on Each Corridor

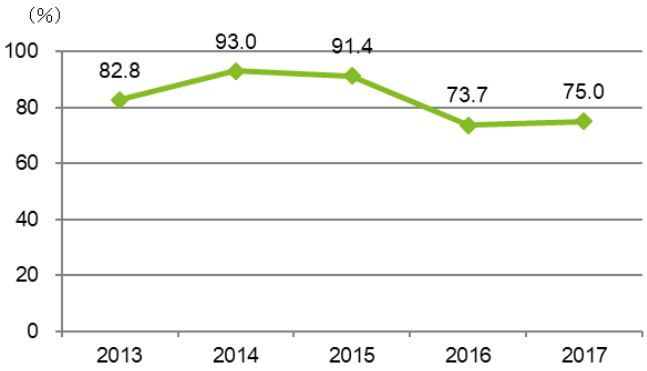
A) Project for Master Plan on Logistics in Northern Economic Corridor (Mombasa Port)

The figures below show data on operation efficiency of Mombasa Port. A significant improvement has been achieved in recent years. Crane productivity at Mombasa Port has greatly improved due to the start of operation of Berth 21, a new container terminal, in 2016. In 2016, the berth occupancy rate was in the appropriate range (70-75%). Before 2016, the berth was too crowded, but the berth occupancy rate eventually decreased. Realization of more efficient operation was due to the improvement of port operations, and support including human resources capacity building[26]. The dwelling time at port has significantly improved since the opening of the new container terminal in 2016. The increase in the number of pick-up gates and the installation of storage areas near air containers contributed to this improvement[27],



Source: Kenya Port Authority（Mombasa）, Port do Norte SA（Nacala）

Figure 4.4.15 Container Handling Efficiency at Mombasa Port



Source: Kenya Port Authority, World Bank (Why Does Cargo Spend Weeks in Sub-Saharan African Ports, Lessons from Six Countries, 2012)

Figure 4.4.16 Berth Occupancy Rate at Mombasa Port (%)

[26] The dwelling time at a port is the time from cargo unloading to customs clearance and cargo unloading. The figure is the total lead time including cargo handling speed, customs procedures, gate work, and can be taken as the "total ability" of port.

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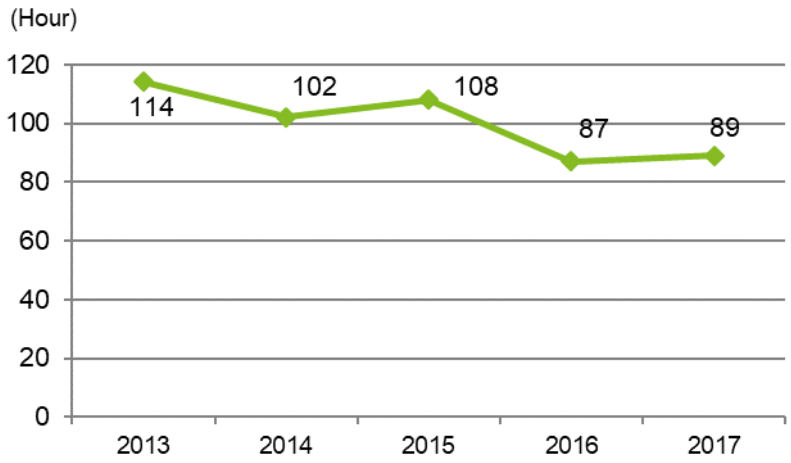


Source: Nacala Port do Norte SA (Nacala), 2013-2014 Observatory survey and 2015-2017 Port Charter (Mombasa)

Figure 4.4.17 Dwelling Time at Mombasa Port

It is considered that the modernization of Mombasa Port based on the corridor master plan (including the starting of operation of Berth 21 in 2016) greatly contributed to improve the efficiency of port operations.

B) Project for Nacala Corridor Economic Development Strategies in the Republic of Mozambique (Nacala Port)

Only recent data could be collected for Nacala Port, but the field survey confirmed that the cargo handling capacity per container is only four to five. This is mainly due to the fact that container handling is done by using ship's gear rather than by gantry crane. However, the introduction of gantry cranes is planned for 2020. The latest data on berth occupancy rate could not be collected. Only the latest dwelling time data in the port could be collected, and it appears that the dwelling time is longer in Nacala corridor compared to the other corridors. The port authority pointed out that this is due to the narrow port yard and the fact that customs procedures stop at nighttime, stopping operation at night.

At present, it is difficult to significantly improve the capacity of the port, but the intangible support, which has been implemented by JICA such as the port operation management advisory, has contributed to the improvement of efficiency.

C) The Corridor Development for West Africa Growth Ring Master Plan

Abidjan Port

Abidjan Port is equipped with four gantry cranes (40 MT), 2 cranes (Quay 14), 2 cranes (100 MT) and 20 mobile cranes (10 to 200 MT). The cargo handling rate is 18.23 TEU/ hour at commercial rate. The average operation rate of gantry cranes is 93.94%. Data regarding berth occupancy rate was not available. The dwelling time of container terminal is relatively short (0.92 days), and operation is delivered very efficiently compared to other ports in Africa. However, it was not possible to confirm the impact of the corridor master plan.

Tema Port

Twenty-seven gantry cranes were installed in December 2018, and their operation is planned to commence in 2019. After their completion, the cargo handling volume is expected to increase by 3.5 million TEUs and the cargo handling efficiency will be greatly enhanced. Currently, the loading operation is 28 to 30 TEU / hour. Data regarding berth occupancy rate could not be collected. According to UNCTAD's "Maritime Transportation Review 2017", although the data collected were in 2011, the dwelling time at Tema Port was 30 days, which is the worst one within the major ports in Africa (e.g. Sub Saharan average is 16 days; Durban Port is 4 days). In addition, according to the report from the Meridian Port Service, dwelling time at the port was 16.7 days for container import, 21.3 days for container transshipment, 4.2 days for container export, and 6.1 days for empty container export. It was not possible to confirm the impact of the corridor master plan.

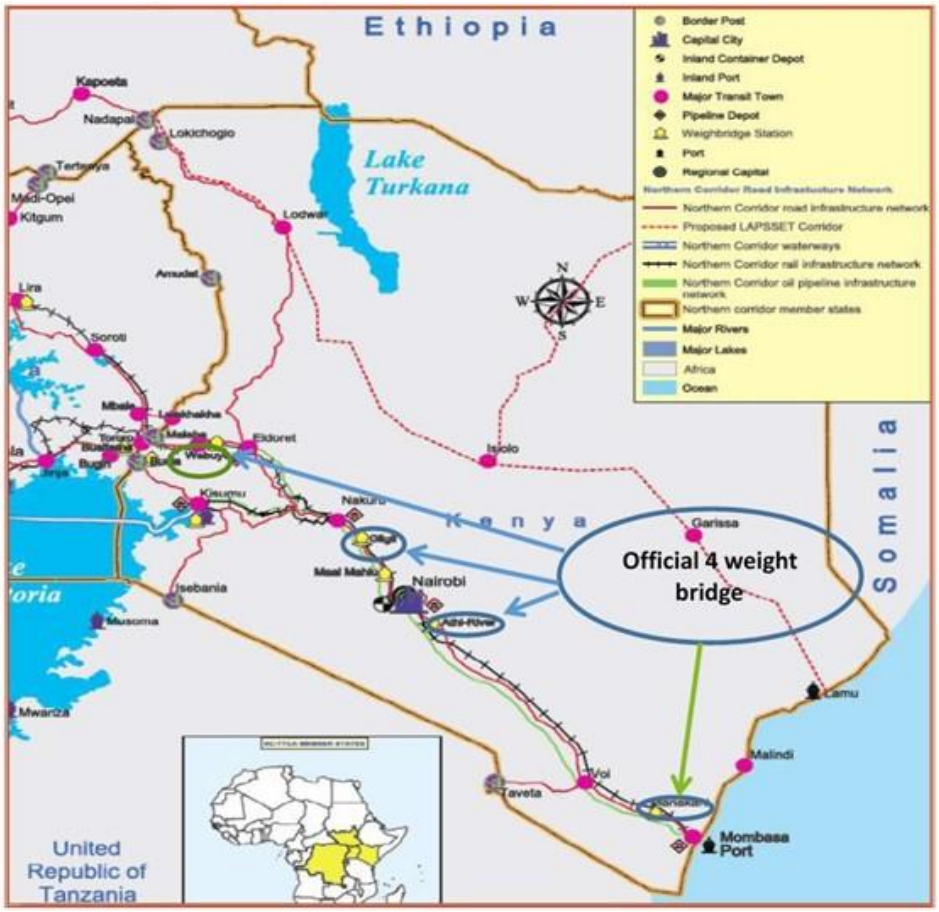
Lomé Port

The current handling efficiency of Lomé Port is 18 to 20 TEU/hour. Data regarding berth occupancy rate could not be collected. Since its privatization in 2001, the port's export volumes to West and Central Africa have increased, largely exceeding the port's processing capacity. As the market scale of Togo is small compared to other ports in West Africa (Abidjan Port, Tema Port, Kotono Port), extending dwelling time at the port with no extra charge for twenty-one days is the strategy adopted to appeal the use of the port. Therefore, the dwelling time at Lomé port tends to be long; 18 days in 2012. It was not possible to confirm the impact of the corridor master plan.

5) Indicators A5: Proportion of Road Transportation

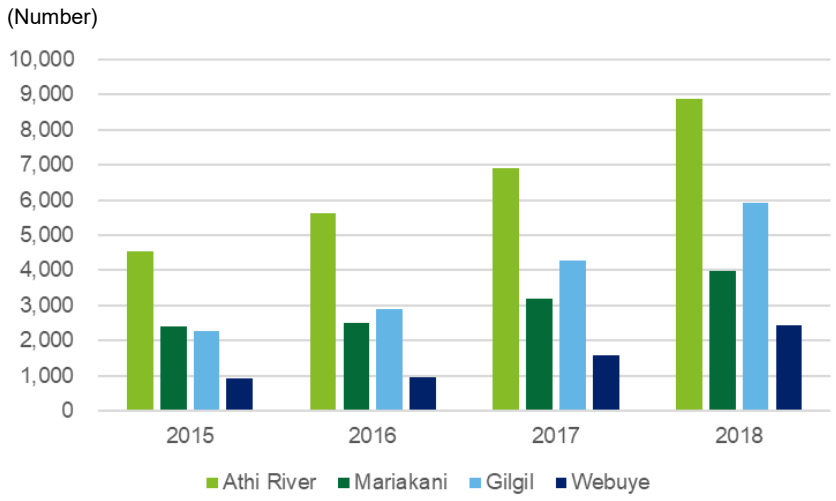
A) Master Plan of Logistics in Northern Economic Corridor

The number of trucks passing through the four truck weight bridges in Kenya as the road transportation volume (trucks) from 2015 (converted to daily basis) was collected as an indicator. Based on this data, the traffic between Athi River and GilGil around Nairobi is extremely important . The data showed that in addition to the cargo flow to / from Mombasa, the cargo flow to / from Nairobi area is also important (data for January-March 2018 is disclosed, so it is estimated on an annual basis). Although the transport volume beyond GilGil is small compared to Nairobi, it is growing steadily. It is thought that this is due to the impact of corridor development. In addition, railway services to Nairobi are available (Mombasa-Nairobi Standard Gauge Railway) since January 2018. Although, a decrease in truck transport is forecasted, it is also noteworthy that demand is still growing without losing market share.



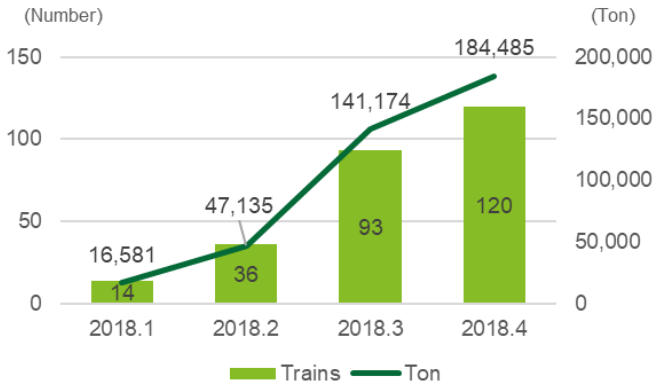
Source: NCTTCA "Observatory survey"

Figure 4.4.18 Location of Weight Bridges



Source: NTTCIA "Observatory survey"

Figure 4.4.19 Road Traffic Volume in Northern Corridor (Daily)



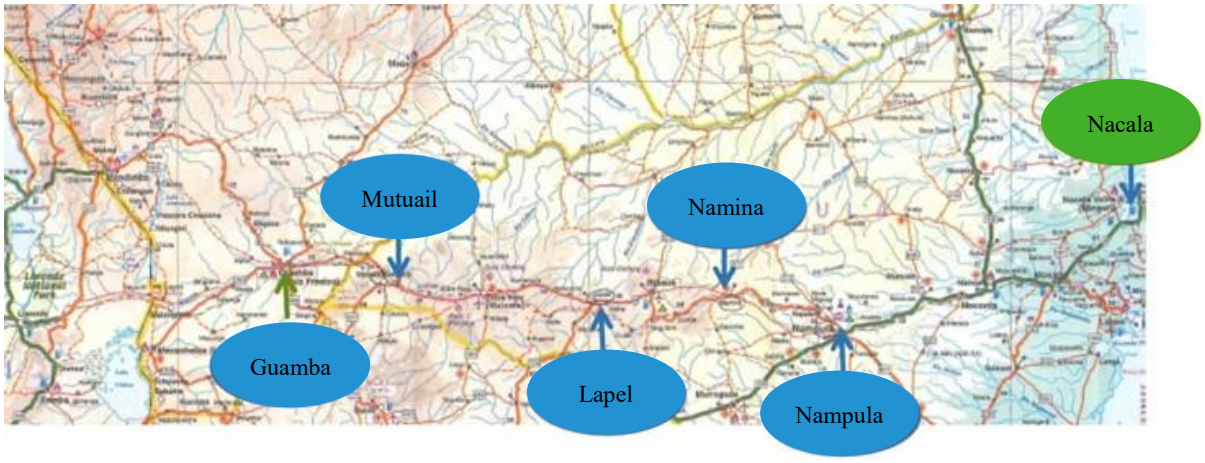
Source: NTTCIA "Observatory survey"

Figure 4.4.20 Transportation Amount of Mombasa-Nairobi Standard Gauge Railway (SGR)

Although it is difficult to examine the correlation between the corridor master plan and the transportation capacity improvement, it is considered that road improvement based on the corridor master plan has made a certain contribution.

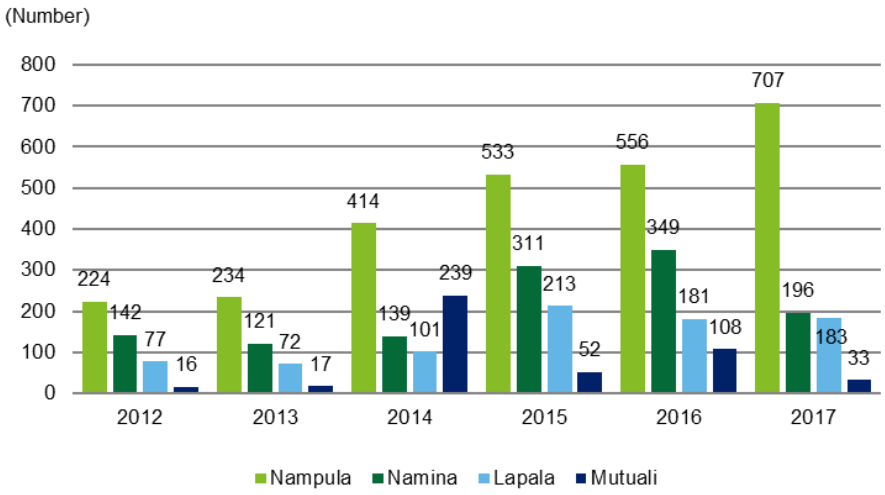
B) Project for Nacala Corridor Economic Development Strategies in the Republic of Mozambique

The Mozambique Road Bureau has been collecting data on Average Annual Daily Traffic (AADT) at road checkpoints since 2012. Truck transportation volume is very small (monthly at 707 * 30 = 21,210 vehicles). In addition, there are very few truck transportations to regions beyond Nampula. Therefore, it can be said that the economic activity of the corridor itself is still quite small. While all the major roads in the Northern Corridor are paved, the development of road infrastructure in the Nacala Corridor is lagging. While the traffic volume between Nacala and Nampula (where the road maintenance status is relatively good) has been increasing steadily since 2012, there is no change in the volume of road transportation to regions beyond the Nampula. However, the development of road infrastructure between Nampula and Cuamba is being promoted by cofinancing of JICA, AfDB, etc., and it is expected that the amount of traffic will increase after the development of road is completed.



Source: Prepared by the JICA Study Team

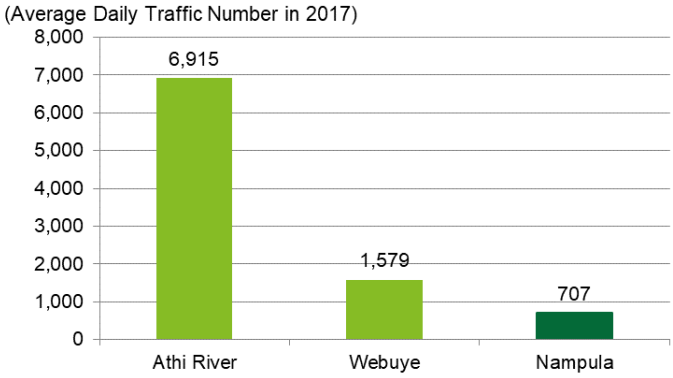
Figure 4.4.21 Route from Nacala Port to Guamba



Source: JICA Study Team based on the data provided by ANC

Figure 4.4.22 Road Traffic Volume in Nacala Corridor (Annual Average Daily Traffic of Heavy Vehicles)

Compared to the Northern Corridor, the transportation volume of the Nacala Corridor is substantially small. The latest data in 2017 showed that Webuye has the smallest trucks traffic volume with 44%. Athi River, the largest point, has only 10% of trucks traffic volume.



Source: JICA Study Team based on the data from NTTCIA and ANC

Figure 4.4.23 Road Traffic Volume of Major Points in the Northern and Nacala Corridor (annual average daily traffic)

Although the volume is small, it can be judged that the master plan contributed to increase in traffic volume between Nacala and Nampula.

C) The Corridor Development for West Africa Growth Ring Master Plan

Regarding Côte d'Ivoire (Abidjan-Ouagadougou), both the road and the railway have been operational in the Abidjan / Ouagadougou Corridor. Sitarail is operating the railway through a PPP agreement. Limited maintenance due to its high cost, resulted in aging tracks and shortage of railroad vehicles.

Transport capacity to meet demand cannot be secured.

As for Ghana, although rail transport is expected to be built between Accra and Ouagadougou, road-based transport remain the primary means for connecting both cities. Ghana also implemented shaft weight restrictions promoted by the EU and UEMOA. Imported goods from Tema Port are not transported only to Ouagadougou, but also to Mali. Roads to Accra are heavily deteriorated due to the frequent passage of heavy trucks transporting mining products.

As for Togo (Lomé - Ouagadougou), road transportation is currently the main means for connecting both points. The road infrastructure between Lomé- Ouagadougou was improved, and the EU introduced the One-Stop-Boarder-Posts (OSBP) at Togo border, allowing the streamlining of border procedures.

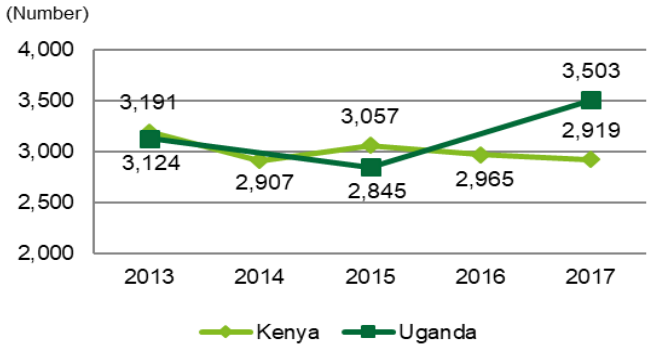
As for the coastal area (Abidjan-Lagos), it is an important corridor connecting Abidjan Port, Takoradi Port, Tema Port, Lomé Port, Cotonou Port (Benin), and Lagos Port (Nigeria). Expansion of infrastructures between these points have allowed the enlargement of port use option, causing competitiveness between the different ports and thus decreasing transportation costs. The development is progressing with the support of Japan and the World Bank.

It was not possible to confirm the impact of the corridor master plan.

6) Indicators A6: Traffic Accidents

One of the negative impacts of corridor developments is the increasing number of traffic accidents caused by the increase in traffic volume and travel speed. However, the related data could not be collected at regional/provincial level. Data regarding only the Northern Corridor area wasn't measured until now, but a study analyzed points where traffic accident frequently occurred between June and December 2017, as well as their causes. Traffic accidents between Mombasa and Nairobi accounted for 48% of all accidents in the Northern Corridor. Traffic fatalities throughout Kenya have not increased significantly since 2013. Compared to the growth of traffic volume, the growth of traffic accidents is warm. It is thus presumed that safety measures and education are being conducted.

It was not possible to confirm the impact of the corridor master plan.



Source: Kenya：Kenya National Bureau of Statistics "Economic survey", Uganda: NTTCIA（2018）"Observatory survey"

Figure 4.4.24 Traffic Fatalities in Countries of the Northern Corridor

4.4.2 Formation of New Economic Activities

(1) Data Collection

Table 4.4.9 shows the results of collected data needed to evaluate the impacts on the formation of new economic activities. Due to the lack of statistical data prepared by each country, there were many cases where data at regional/provincial level did not exist. Therefore, collected data was limited and fragmented.

Table 4.4.9 Result of Data Collection in Formation of New Economic Activities

Corridor	Northern		Nacala	West Africa Growth Ring			
Country	Kenya	Uganda	Mozambique	Burkina Faso	Côte d'Ivoire	Ghana	Togo
B1. Establishment of new entities	○	×	○	○	×	×	×
	Year 2016	—	Year 2016/2017	Year 2014-2016 (Sectoral)	—	—	—
B2. Establishment of entities (Reference)	○	×	×	×	×	△	×
	Year 2012 and 2017	—	—	—	—	—	—
B3. Number of companies (Reference)	○	○	○	×	×	○	○
	Year 2016	Year 2001/2002 and 2010/2011	Year 2014/2015	—	—	Year 2015 (Regional)	Year 2013-2018 (National)

Source: JICA Study Team

It was not possible to confirm quantitatively and adequately the correlation between the corridor master plans and the changes in indicators. This is mainly due to the difficulty to acquire data for the evaluation as data collected by each country's government agencies is limited.

(2) Analysis based on the Collected Data

1) Indicators B1: Number of New Location of Economic Activities

■ Overview of the Analysis

Aside from the improved efficiency in logistics services, creation of new production bases and promotion of existing industries are expected. Within the corridor areas, there are movements to actively promote industry by establishing Special Economic Zones (SEZ) and Export Processing Zones (EPZ).

Table 4.4.10 Location of New Business Activities in Corridor Areas

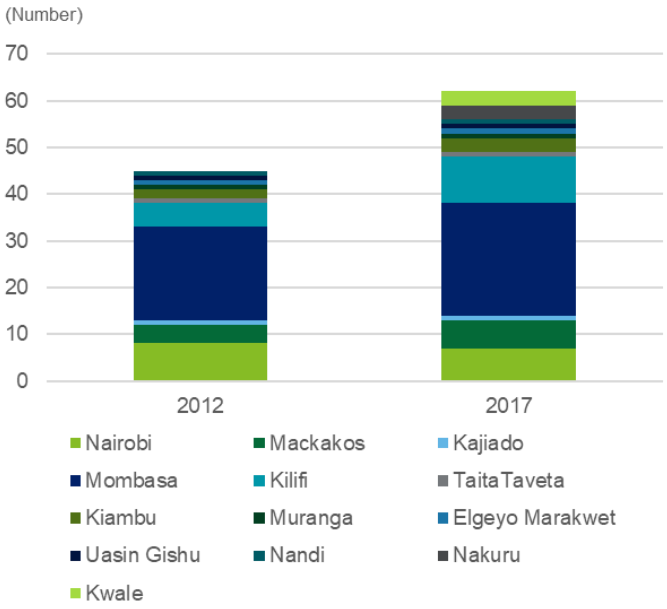
Country		Impact	Background and Factor
Northern	Kenya	↗	Increase in the number of EPZs is seen around Mombasa, the entrance of the northern corridor. On the other hand, the number of business locations on a nationwide basis is concentrated in the Nairobi area, which means that the industry is formed from the area with existing population concentration.
	Uganda	↗	The number of business establishments in the country has increased. The growth of Central Area including the capital city is remarkable.
Nacala	Mozambique	↗	Although the number of business establishments has increased, the number is not as significant compared with the national average. It will take more time to evaluate the effectiveness of logistics infrastructure development.
West Africa Growth Ring	Burkina Faso	↗	The number of business establishments is increasing as a whole.
	Côte d'Ivoire	N/A	No related data was collected.
	Ghana	↗	The number of tenants at EPZs near Tema Port, which is the core part of the corridor in Ghana, is increasing. Port facility improvement could have contributed to that phenomena.
	Togo	↗	The number of establishments tends to increase as a whole country.

Source: JICA Study Team

A) Project for Master Plan on Logistics in Northern Economic Corridor

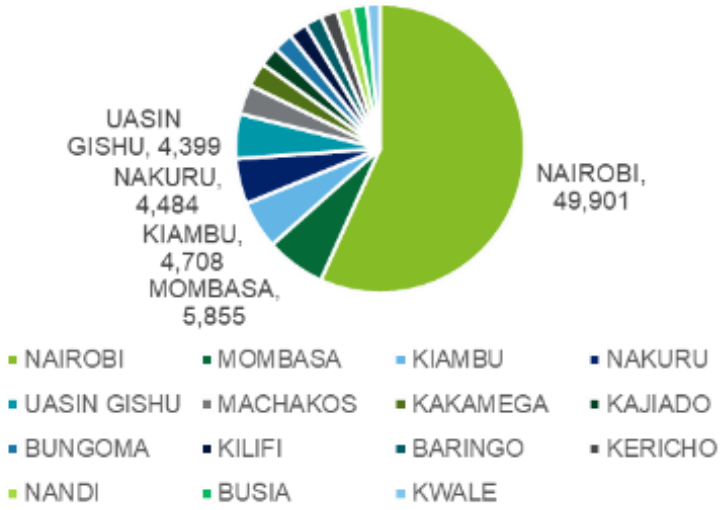
Kenya

The number of Export Processing Zones (EPZs) in the corridor area has increased from 45 in 2012 to 62 in 2017. In particular, the increase in Mombasa and Kilifi are remarkable. However, by looking at the break down of the number of business establishments in 2017 by administrative division, it seems that the number of establishments in Nairobi exceeds half of the administrative divisions of the target areas. Thus, the issue of the concentration of economic functions in Nairobi has not been resolved yet.



Source: EPZ Annual Performance Report 2017（https://www.epzakenya.com/index.php/annual-performance-report.html）

Figure 4.4.25 Number of Export Processing Zones (EPZ) in the Corridor Area (Kenya)

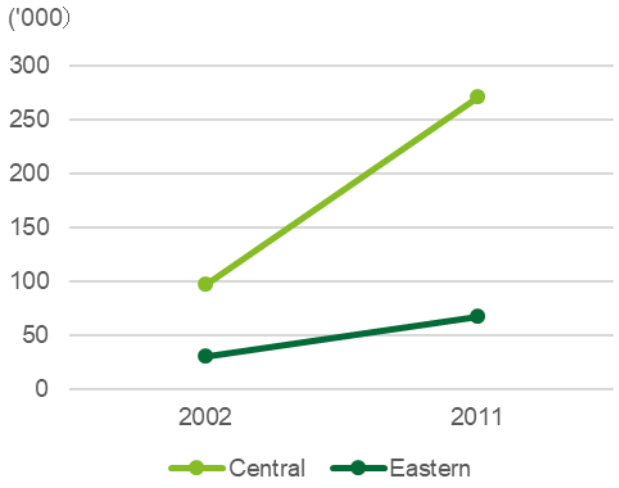


Source: EPZ Annual Performance Report 2017（https://www.epzakenya.com/index.php/annual-performance-report.html）

Figure 4.4.26　Breakdown of the Number of Business Establishments by Province (Year 2017)

Uganda

The development of economic activity has been especially remarkable in the Central area. The number of business establishments has increased by 2.5, from 97 cases to 271 cases in 10 years since 2002. As the Central region includes the capital city Kampala, it is assumed that similarly to Kenya, there is also a concentration of the economic functions in Kampala.



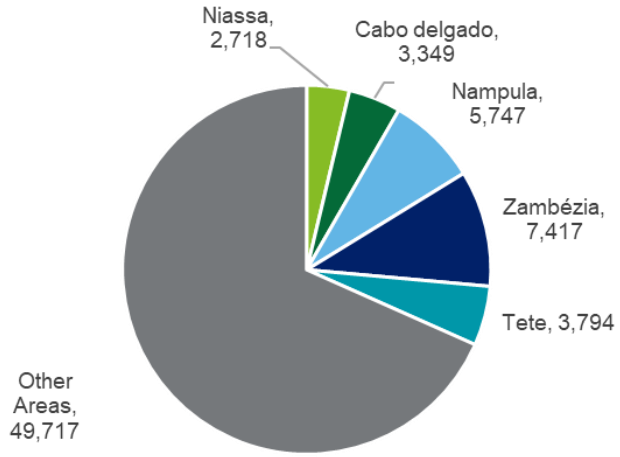
Source: Uganda Bureau of Statistics, Census of Business Establishments (2010/2011）

Figure 4.4.27　Number of Business Establishments in the Corridor Area (Uganda)

B) Nacala Corridor Economic Development Strategies in the Republic of Mozambique

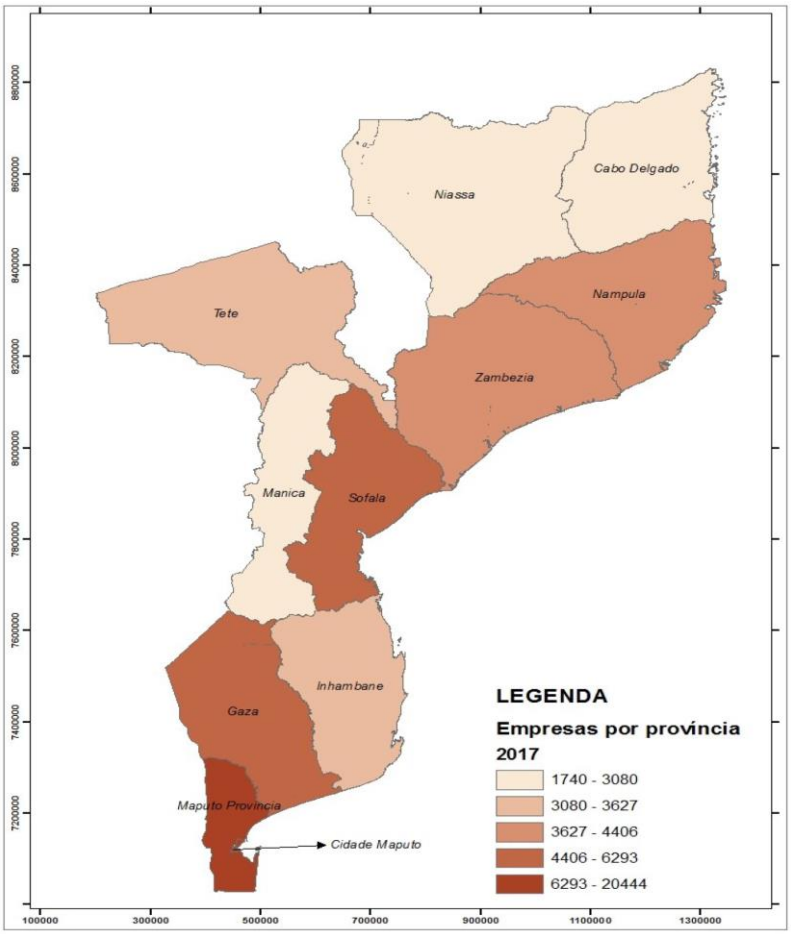
Mozambique

In the area covered by the Nacala Corridor Economic Development Strategies in the Republic of Mozambique, the number of business establishments increased in Zambezia and Nampula, with 7,417 and 5,747 cases respectively. However, the share of the whole country still represents less than 30%. This could be because, unlike the other corridors, the target area of the corridor does not include population / industrial clusters as in capital cities. On the other hand, looking at the comparison between 2016 and 2017 alone, it can be said that the number of business establishments has increased. Economic activity is also becoming active in the corridor target area. In the sectoral division of businesses within the corridor area, the proportion of tertiary industries is growing.



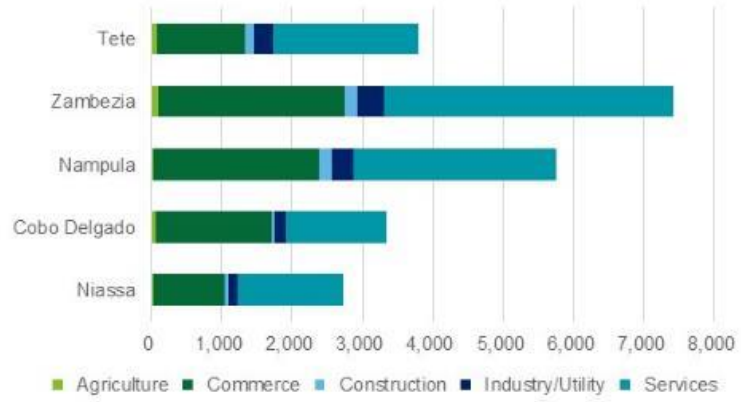
Source: Instituto Nacional de Estatística (INE), Empresas em Moçambique: Resultados do Segundo Censo Nacional 2014-2015

Figure 4.4.28 Business Establishments in Mozambique at Regional Level



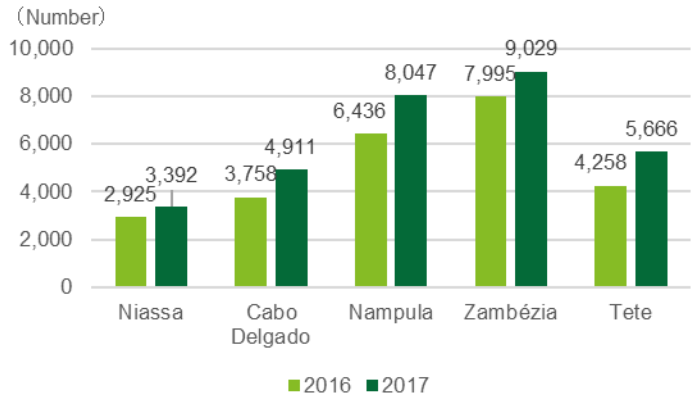
Source: Instituto Nacional de Estatística (INE), Estatísticas do Ficheiro de Unidades Estatísticas 2017

Figure 4.4.29 Provincial Distribution of Business Establishments



Sources: Instituto Nacional de Estatística (INE), Empresas em Moçambique: Resultados do Segundo Censo Nacional 2014-15

Figure 4.4.30 Breakdown of Business Establishments (Sectoral and Provincial)



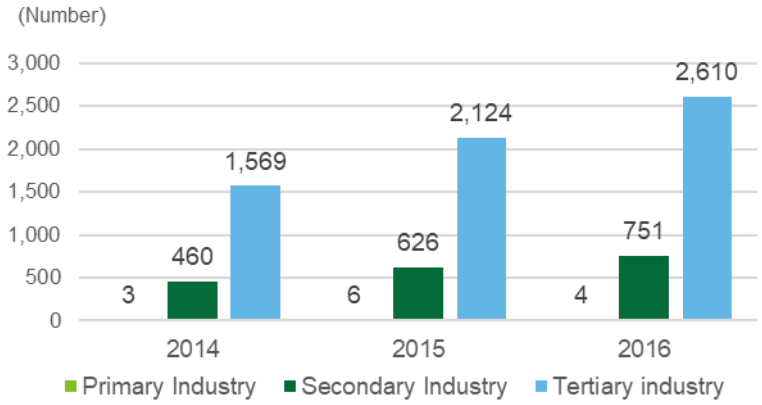
Source: Instituto Nacional de Estatística (INE), Estatísticas do Ficheiro de Unidades Estatísticas 2017

Figure 4.4.31 Number of Business Establishments in Target Provinces (Year 2016 and 2017)

C) The Corridor Development for West Africa Growth Ring Master Plan

Burkina Faso

The growth of the tertiary (i.e. service) industry is remarkable. On the other hand, there are few new business establishments in the primary industry, which is the traditional industry. However, this can be explained by the fact that the primary sector has many competitors from neighboring countries.



Source: Transports internationaux de marchandises (CBC)

Figure 4.4.32 Number of New Business Establishments in Burkina Faso

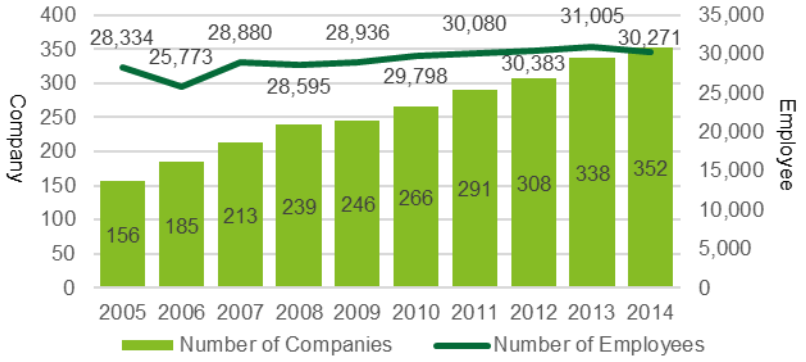
Côte d'Ivoire

Although the data on the number of business establishments and newly established entities could not be collected, the development of industrial park and dry port contribute to increase the establishment of new entities.

Ghana

The number of companies in the multipurpose Tema EPZ developed by the Ghana Free Zone Board (GFZB) has been steadily increasing since 2005 and reached to about 350 in 2014. On the other hand, the number of employees has not increased significantly since 2010. The reason for the increase in

the number of companies seems to be due to the proximity of Tema Port to the capital Accra. On the other hand, during interviews, local stakeholders pointed out that the industrial formation in central and northern areas is still not sufficient. There is still a difference in the strength of corporate activities between the coastal and the inland areas including the capital and Tema Port.

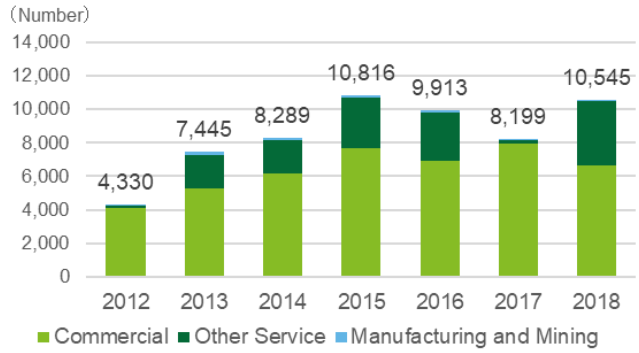


Source: Ghana Free Zone Board (GFZB)

Figure 4.4.33 Number of Companies and Employees in Export Processing Zone (EPZ) and FTZ in Ghana

Togo

Economic activity in Togo has been developing in recent years. The number of new business establishments, which was 7,000 in 2013, increased by 1.5 times, achieving 10,500 in 2018 (mainly commercial and service sector). The Togolese government established the "Cellulle Climat des Affaires" (business environment organization) in November 2017. The "Loi des finances 2018" (Finance Act 2018) was adopted in 2018 for simplifying entrepreneurial process and decreasing the cost. It is considered that the impacts of the said government policy and action contributed to vibrant business activities.



Source : Centres de Formalites des Entreprises du Togo "Statistiques de Creation d'Entreprises au CFE Togo, 2012 a Novembre 2018"

Figure 4.4.34 New Business Establishments in Togo

4.4.3 Development of Existing Cities and Formation of New Cities

(1) Data Collection

The following table shows the data collected for the purpose of evaluating the development of the existing cities and the formation of new cities. There were many cases where data at regional level did not exist. Thus, data collected were fragmentary.

Table 4.4.11 Result of Data Collection in Development of Existing Cities and Formation of New Cities

Corridor	Northern		Nacala	West Africa Growth Ring			
Country	Kenya	Uganda	Mozambique	Burkina Faso	Côte d'Ivoire	Ghana	Togo
C1. Population of the corridor area (proportion to country's population)	○ Year 2010-2015 (Province)	○ Year 2014	○ Year 2007 and 2017	○ Year 2006, 2015, 2016, and 2017 (Estimate except 2006)	○ Year 2014	○ Year 2010 and 2015 - 2018 (Estimate except 2010)	△ Year 2015-2017 (Nation)
C2. Urban Population (Reference)	○ Year 2000 and 2010	△ Year 2005 - 2017 (Nation)	△ Year 2005 - 2017 (Nation)	△ Year 2005 – 2017 (Nation)	△ Year 2005 – 2017 (Nation)	△ Year 2005 – 2017 (Nation)	△ Year 2005 – 2017 (Nation)

Source: JICA Study Team

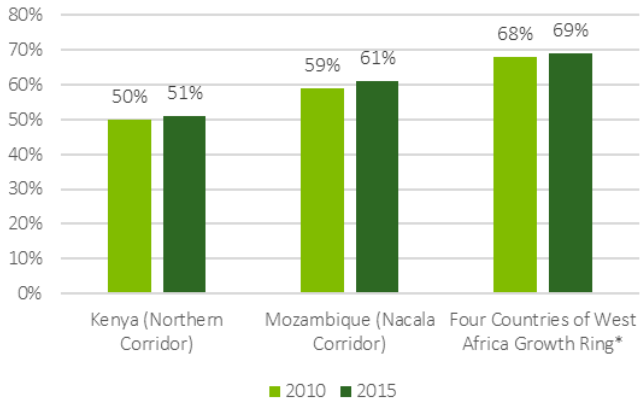
It was not possible to confirm quantitatively and adequately the correlation between the corridor master plans and the changes in indicators. This is mainly due to the difficulty to acquire data for the evaluation as data collected by each country's government agencies is limited.

(2) Analysis based on the Collected Data

1) Indicators C1: Population in the Corridor Area

■ Overview of the Analysis

Balanced population growth between regions is expected in the corridor area with the development and expansion of production bases where logistics related infrastructures were established. Population growth has recently been progressive in the corridor areas. In the Nacala Corridor Region in particular, the population ratio of the whole country is increasing. On the other hand, in the Northern Corridor area, although the population is increasing as a whole, there is no significant change in the proportion of the population throughout the country. Although, the population growth rate in Nairobi and Mombasa is high, and it can be seen that the situation has not reached the level where de-centralized urban structures is achievable. In the West Africa Growth Ring, although population growth continues as a whole in the target countries, the regional population distribution trend has yet to change.



* Data collected on West Africa Corridor Ring (2006 and 2015)
Source: JICA Study Team based on data from statistics authority of each country

Figure 4.4.35 Proportion of Population in Corridor Area to That of their Country (Year 2010 and 2015)

The table below shows the status of population change in the corridor areas.

Table 4.4.12 Status of Population Growth in Corridor Areas

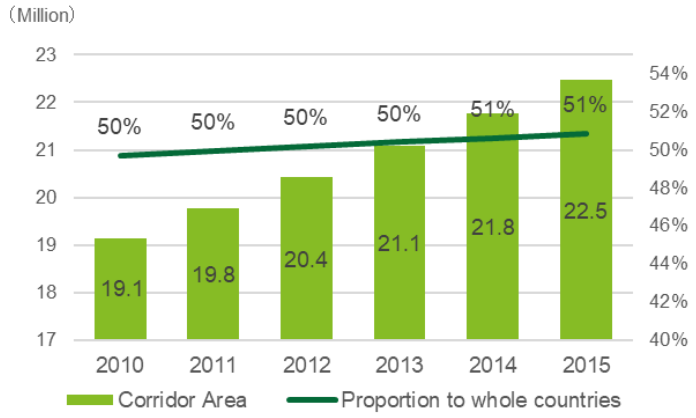
Country		Impact	Background and Factor
Northern	Kenya	→	Although population is increasing as a whole, population concentration on industrial agglomerations such as the capital Nairobi and Mombasa port continues.
	Uganda	N/A	
Nacala	Mozambique	↗	The proportion of population in the Nacala Corridor region in Mozambique is rising. In particular, the population of Nampula City and Nacala City, which are the base cities in the corridor, are also rapidly increasing.
West Africa Growth Ring	Burkina Faso	→	While population in the corridor area has been increasing, its proportion to the whole country hasn't changed.
	Côte d'Ivoire	↘	While population in the corridor area has been increasing, its proportion to the whole country hasn't decreased.
	Ghana	→	While population in the corridor area has been increasing, its proportion to the whole country hasn't changed.
	Togo	↗	The population has increased nationwide.

Source: JICA Study Team

■ Analysis on Each Corridor

A) Master Plan on Logistics in Northern Economic Corridor

The population of the Northern corridor area has increased by more than 3 million, from 19.14 million in 2010 to 22.48 million in 2015. On the other hand, the proportion of population of the two countries as a whole remains roughly at 50%. Meanwhile, according to the population projection published by the Kenyan authorities, the ratio of Nairobi County to the total population has increased from 8.2% in 2010 to 9.6% in 2015. Similarly, Mombasa district also slightly increased from 2.5% in 2010 to 2.6% in 2015. Therefore, it can be said that the population is concentrated in some urban areas where existing industries are important and major infrastructure projects are being implemented.



Source: Kenya National Bureau of Statistics "Analytical Report on Population Projection Volume XIV, July 2017", Uganda Bureau of Statistics "National Population and Housing Census 2014: Main Report, 2016"

Figure 4.4.36 Population in Corridor Area and its Proportion to Whole Nations (Northern Corridor)

B) Nacala Corridor Economic Development Strategies in the Republic of Mozambique

The population in the Nacala Corridor Region jumped from 12.04 million in 2007 to 18.18 million in 2017. The population in the corridor area, which represented 61% of the country in 2008, has risen to 63% in 2017. Even though Nampula province is far from Maputo which is the economic center in the southern part of Mozambique, the population has been increasing from 4 million in 2007 to 6.1 million in 2017. This is mainly due to the industrial concentration in the corridor area including Nacala city and Nampula city.

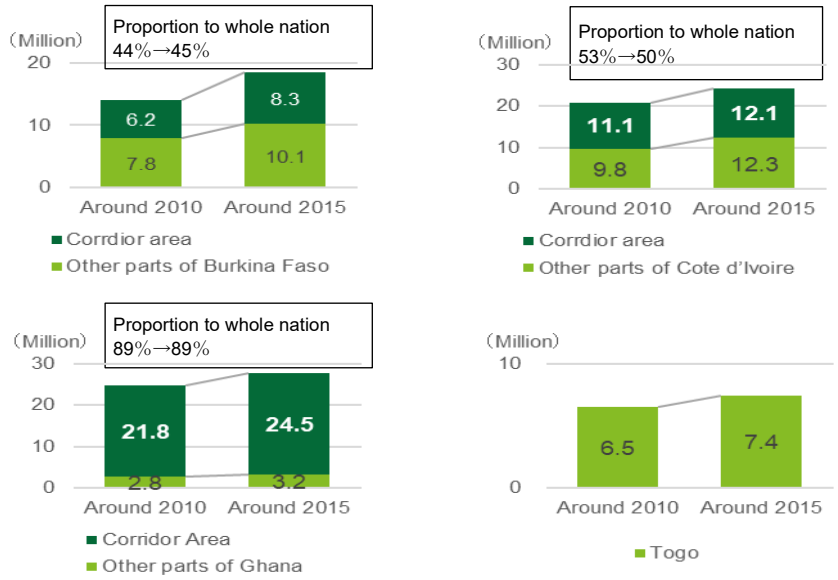
Source: Instituto Nacional de Estatística (INE), Resultados Preliminares, Censo 2017 e definitivos

Figure 4.4.37 Population in Corridor Area and its Proportion to Whole Nation (Mozambique)

C) The Corridor Development for West Africa Growth Ring Master Plan

Population in the West Africa Growth Ring Corridor area continues to increase from around 2010 to around 2015. On the other hand, there has been no significant change in the proportion of population

across the whole area. There is a declining trend in Côte d'Ivoire.



Source: International Monetary Fund (https://www.imf.org/external/index.htm) as of April 23, 2019, and data from statistical authority of each country,
Kenya: Kenya National Bureau of Statistics (https://www.knbs.or.ke/) as of April 23, 2019
Mozambique: Instituto Nacional de Estatistica (http://www.insd.bf/n/) as of April 23, 2019
Burkina Faso: Institut National de la Statistique et de la Demographie (http://www.insd.bf/n/) as of April 23, 2019
Côte d'Ivoire: Institut National de la Statistique (http://www.ins.ci/n/) as of April 23, 2019
Ghana: Ghana Statistica Service (http://statsghana.gov.gh/) as of April 23, 2019
Togo: Institut National de la Statistique et des Etudes Economiques et Demographiques (http://www.stat-togo.org/) as of April 23, 2019

Figure 4.4.38 Estimated Population in Corridor Area and its Transition of Proportion to Whole Nations (WAGRIC)

4.4.4 Activation of Society and Economy

(1) Data Collection

The following table shows the data collected for the evaluation of social and economic activities in the corridor area representing the current situation of corridor areas. .

Table 4.4.13 Result of Data Collection in Activation of Society and Economy

	Northern		Nacala	West Africa Growth Ring			
Country	Kenya	Uganda	Mozambique	Burkina Faso	Côte d'Ivoire	Ghana	Togo
D1.a Labor force population	△ Year 2018 (Economic Survey 2018) (Nation)	○ Year 2011/2012 and 2016/2017 (NLF & CAS (National Labour Force and Child Activities	○ Year 2014 (Empresas Em Mozambique: Resultad os do Segundo Censo Nacional (2014-2015)	○ Year 2014 (Annuaire statistique du marche de l'emploi 2015)	○ Year 2012 (Annuaire des Statistiques Demographiques et Sociales)	○ Year 2015 (Integrated Business Establishments Survey (IBES) II, Comprehensive Sectoral Report, June 2018, GSS)	○ 2014 – 2015 ILO

		Survey) 2011/2012, NLFS 2016/2017)					
D1.b Number of employees by industry	×	×	○	○	○	○	○
	-	-	Year 2014 (Empresas em Mozambique: Resultados do Segundo Censo Nacional (2014-2015)	Year 2014 (Annuaire statistique du marche de l'emploi 2015)	Year 2013 (Enquete Nationale Sur La Situation de L'Emploi et du Travail des Enfants (Ensete 2013)	Year 2015 (Integrated Business Establishment Survey (IBES) II, Comprehensive Sectoral Report, June 2018, GSS)	2014 – 2015 ILO
D2. Major agricultural product outputs	△	△	○	○	△	○	△
	Until 2008 (Nation)	Year 2008 and 2014 (Nation)	Until 2008	Data can be collected in annual base	Until 2014 (Nation)	Data can be collected in annual base	Until 2013 (Nation)
D3. Trade (in and out of corridor)	△	△	△	△	△	△	△
	Data can be collected in annual base (Nation)	Data can be collected in annual base (Nation)	Data can be collected in annual base (Nation)	Data can be collected in annual base (Nation)	Data can be collected in annual base (Nation)	Data can be collected in annual base (Nation)	Data can be collected in annual base (Nation)

Source: JICA Study Team

It was not possible to confirm quantitatively and adequately the correlation between the corridor master plans and the changes in indicators. This is mainly due to the difficulty to acquire data for the evaluation as data collected by each country's government agencies is limited.

(2) Analysis on the Collected Data

1) Indicators D1: Overall Labor Force Population and the Number of Employees by Industry

■ Overview of the analysis

The labor force population is roughly divided into the formal sector (farmers engaged in agriculture in large farms and communal farms in rural areas, those engaged in public agencies, manufacturing, and service in urban areas) and the informal sector (open marketers and sellers on roads). In this study, the labor force refers to the workers in the formal sector where data can be collected. The size and structure of the labor force population is one of the main factors that indicate the country's economic productivity. It provides a guide to know the economic level of each country through statistical measurement.

Table 4.4.14 Status of Labor Force Population Growth in Corridor Areas

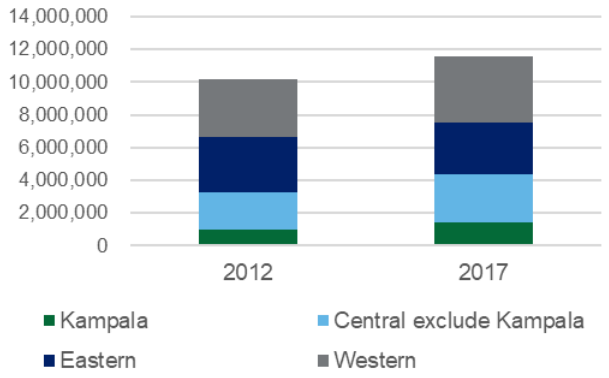
Country		Impact	Background and Factor
Northern	Kenya	→	The historical number of workers cannot be traced.
	Uganda	↗	The labor force population in the corridor area is on the rise.
Nacala	Mozambique	↗	It is assumed that the labor force population in the corridor area has increased. In addition, in the Nacala area, industrial concentration has gradually progressed, and the proportion of secondary industries is slightly higher than the national average.
West Africa Growth Ring	Burkina Faso	→	The population of labor force cannot be analyzed. On the other hand, comparing the number of workers by industry, the percentage of primary industries in the corridor area is slightly lower than the national average, while the percentage of tertiary industries is 8 points higher than the national average.
	Côte d'Ivoire	→	The population of labor force cannot be analyzed. On the other hand, in comparing the number of workers by industry, the percentage of primary industries in the corridor area is lower than the national average, while the percentage of secondary and tertiary industries is higher than the national average.
	Ghana	→	The population of labor force cannot be analyzed. On the other hand, comparing the number of workers by industry, the percentage of primary industries in the corridor area is lower than the national average, while the percentage of tertiary industries is higher than the national average.
	Togo	→	The population of labor force cannot be analyzed. The proportion of workers by industry in Togo is 27% for primary industry, 14% for secondary industry, and 59% for tertiary industry.

Source: JICA Study Team

■ Analysis on Each Corridor

A) Master Plan on Logistics in Northern Economic Corridor

While data related to changes in the labor force trends in Kenya were not available, changes are noticeable between 2012 and 2017 for Uganda. In Uganda, the labor force population has increased from 2012 to 2017.



Source: Uganda Bureau of Statistics (https://www.ubos.org/) as of April 23, 2019

Figure 4.4.39 Labor Force Population in Uganda

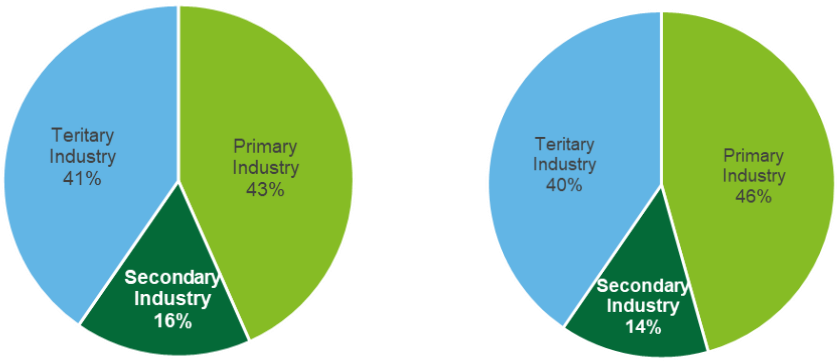
As shown in the table below, a smaller number of workers in the primary industry in Kampala, the capital city of Uganda, was observed while the tertiary industry has the largest number of workers. In other areas, agriculture occupies the largest percentage in the industrial structure, with 30% to 50%, followed by the tertiary industry. It is difficult for the primary industry to increase productivity per person even if the number of workers increases. Conversely, the tertiary industry is generally high in productivity per person, and the contribution to GRDP is relatively large.

Table 4.4.15 Proportion of Labor Force (Sector and Region)

Region	Agriculture, Forestry, and Fishing	Production	Service
Kampala	1.9%	18.8%	79.4%
Central	51.3%	14.9%	33.8%
Eastern	34.2%	15.9%	49.9%
Northern	34.4%	25.5%	40.1%
Western	59.2%	10.2%	30.6%

Source: Uganda Bureau of Statistic National Labour Force Survey 2016/2017

The figure below compares the ratio of the number of employed workers by industry at national and corridor area level. There is no significant difference between the two.

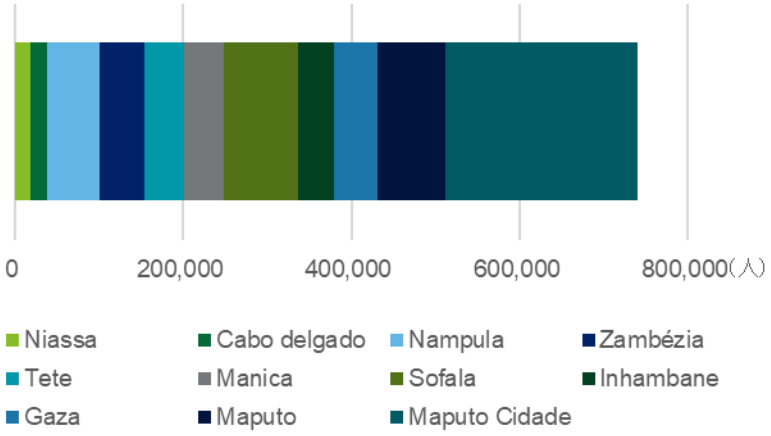


Source: Uganda Bureau of Statistic

Figure 4.4.40 Ratio of Population by Industry : National (Left) and Corridor Area (Right)

B) Nacala Corridor Economic Development Strategies in the Republic of Mozambique

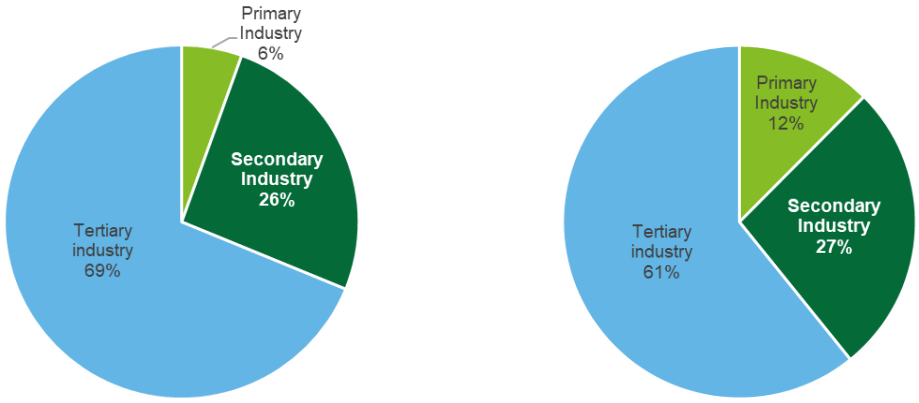
Sixty-two percent of workers in Mozambique are based in the corridor area. This ratio is almost the same as the national population. Since the population ratio of the corridor area to the total population is gradually increasing, it is assumed that the working population ratio within the area to the total number of workers will also increase.



Source: JICA Study Team based on the data by INE

Figure 4.4.41 Distribution of Labor Force in Mozambique (Year 2007)

The figure below shows the ratio of population by industry for Mozambique at national and corridor area level. Both of them shows that the percentage of the tertiary industry is high. On the other hand, in the corridor area, the ratio of primary industry represents more than twice that of the whole country. In addition, in the corridor area, industrial agglomeration (transfer of processing industry, new establishment, etc.) has gradually progressed, and the ratio of the secondary industry is slightly higher than the national average.



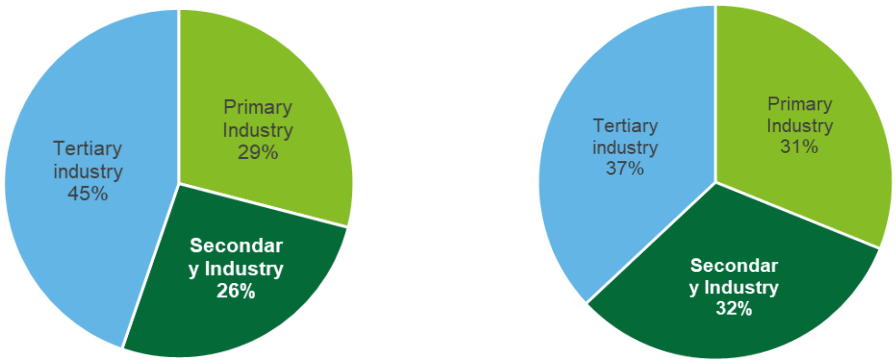
Source: JICA Study Team based on the data by National Institute of Statistics (INE) and National Accounts

Figure 4.4.42 Ratio of Population by Industry : Nation (Left) and Corridor Area (Right) (Mozambique)

C) The Corridor Development for West Africa Growth Ring Master Plan

Burkina Faso

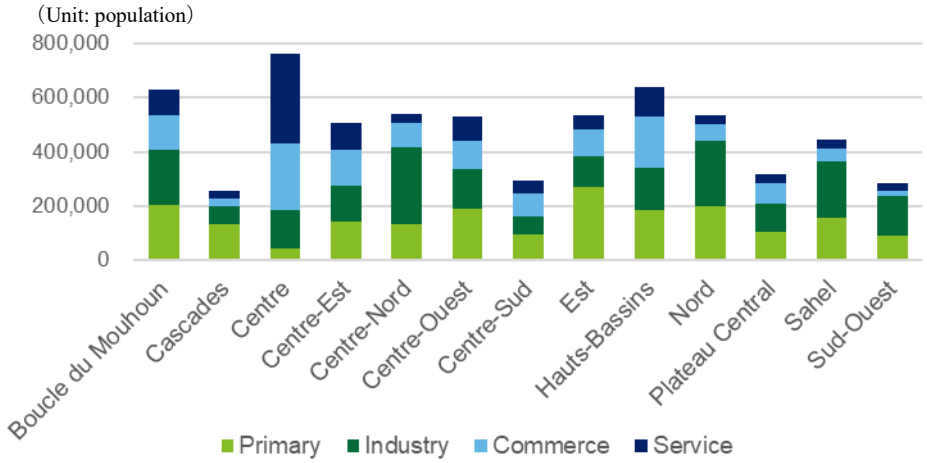
As shown in the figure below, the proportion of the primary industry in the corridor target area in Burkina Faso is slightly lower than the national average, while the proportion of the tertiary industry is about 8% higher .



Source: JICA Study Team based on the data from Annuaire statistique du marche de l'emploi 2015

Figure 4.4.43 Ratio of Population by Industry : National (Left) and Corridor Area (Right) (Burkina Faso)

The labor force population in Burkina Faso represented about 6,280,000 in 2015. Labor force population by prefecture and proportion by industry show that the labor force in the corridor area tends to be engaged in relatively high value-added occupations such as service and commerce compared to other areas.



Source: Annuaire statistique du marche de l'emploi 2015

Figure 4.4.44 Labor Force Population by Prefecture

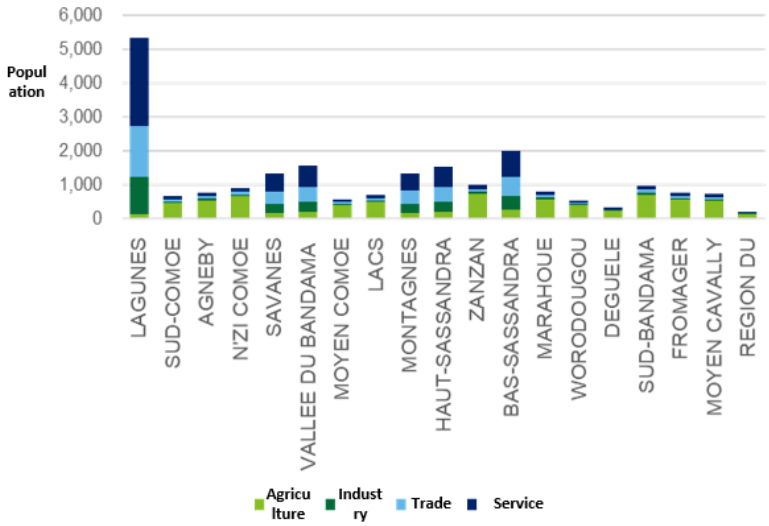
Côte d'Ivoire

The ratio of population by industry in Côte d'Ivoire shows that the primary industry has lower population in the corridor area than in the national average, while the population proportion in the secondary and tertiary industries are high.

Source: JICA Study Team prepared based on data from Institut national de la statistique (INS)

Figure 4.4.45 Ratio of Population by Industry : National (Left) and Corridor Area (Right) (Côte d'Ivoire)

Currently, the labor force population in Côte d'Ivoire is about 16.76 million. The largest city, Abidjan (the central city of the Lagunes region) is the driving force of the economy. A larger number of workers are engaged in services and commerce / trade than in industry.

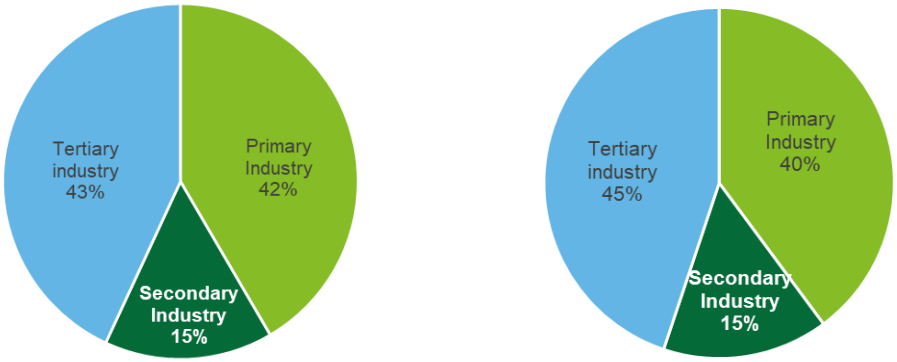


Source: Institut national de la statistique (INS)

Figure 4.4.46 Regional Labor Force Distribution in Côte d'Ivoire

Ghana

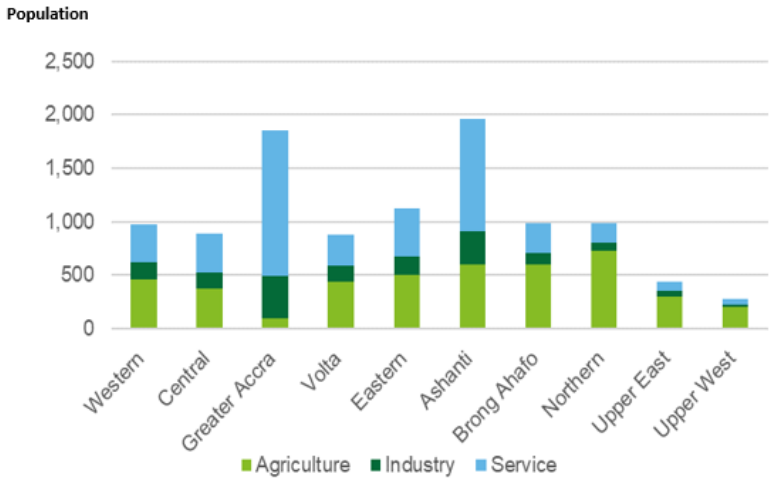
As shown in the figure below, labor force population by industry in the corridor area is 2% lower in the primary industry and 2% higher in the tertiary industry than those in the national average. Proportion of the secondary industry is the same.



Source: JICA Study Team based on data from Population Census 2010

Figure 4.4.47 Ratio of Population by Industry : National (Left) and Corridor Area (Right) (Ghana)

As shown below, a large part of the labor force in Ghana is concentrated in the capital city of Accra, which is nearly twice as large as the inland Northern Province. A small proportion of the population in Accra is engaged in agriculture while many make a living in the industrial and service industries. Therefore, GRDP in Accra is considered higher than in the Northern area where the proportion of farmers represents over 50% of the total workers.

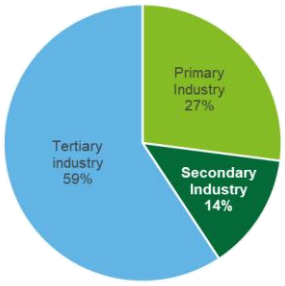


Source: Population Census 2010

Figure 4.4.48 Regional Labor Force Distribution in Ghana

Togo

As shown in the figure below, the ratio of population in the primary industry consists of 27% while the secondary industry is 14% and the tertiary industry is 59%. In the case of Togo, the national and corridor areas are assumed to be the same .



Source: JICA Study Team based on data from Africa Information Highway

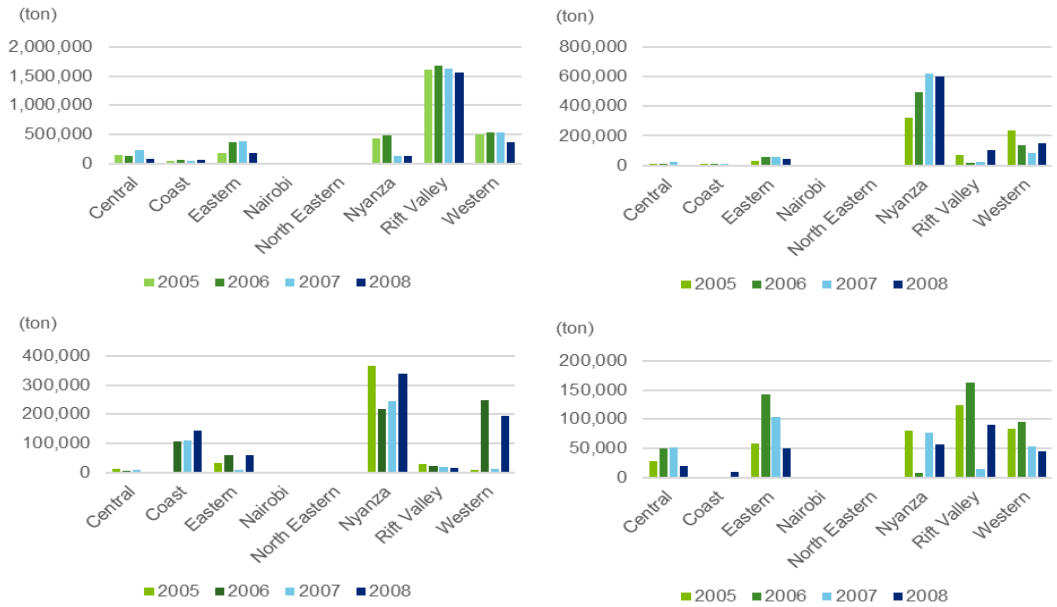
Figure 4.4.49 Ratio of Population by industry (Togo)

2) Indicator D2: Major Agricultural Product Outputs

■ Overall Summary

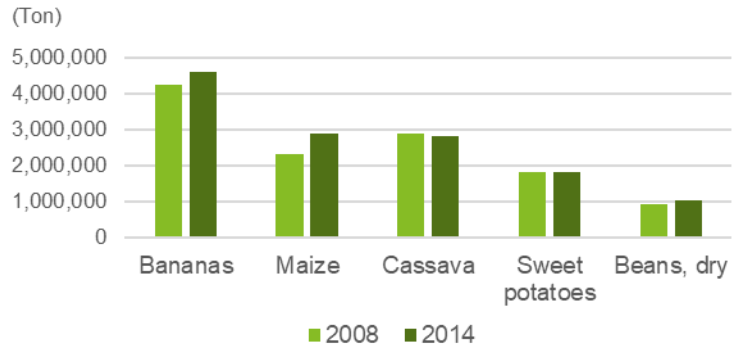
A) Master Plan on Logistics in Northern Economic Corridor

As the related regional level data can only be collected until year 2008 in Kenya and 2014 in Uganda, it is not possible to evaluate the impacts of the corridor master plan.



Source: Food and Agriculture Organization (http://www.fao.org/home/en/) as of April 23, 2019, and "CountryStat"

Figure 4.4.50 Production Quantity of Maize (Upper Left), Sweet Potato (Upper Right), Cassava (Lower Left), and Dried Beans (Lower Right) in Kenya (Year 2005 – 2008)

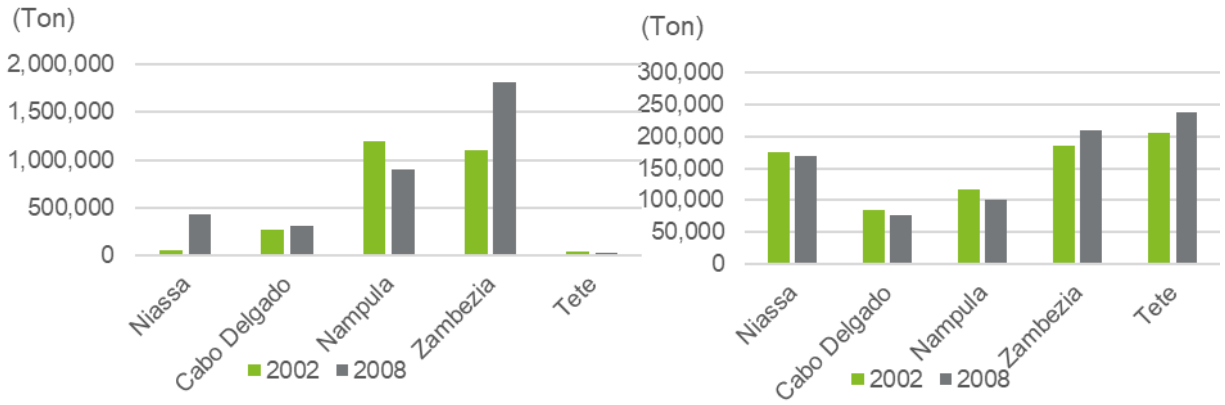


Source: Food and Agriculture Organization (http://www.fao.org/home/en/) as of April 23, 2019, and "CountryStat"

Figure 4.4.51 Production Quantity of Primary Crops in Uganda (Year 2008 and 2014)

B) Nacala Corridor Economic Development Strategies in the Republic of Mozambique

As the related data at regional level can be collected only until year 2008 in Mozambique from the study, it is not possible to evaluate the impacts of the corridor master plan.



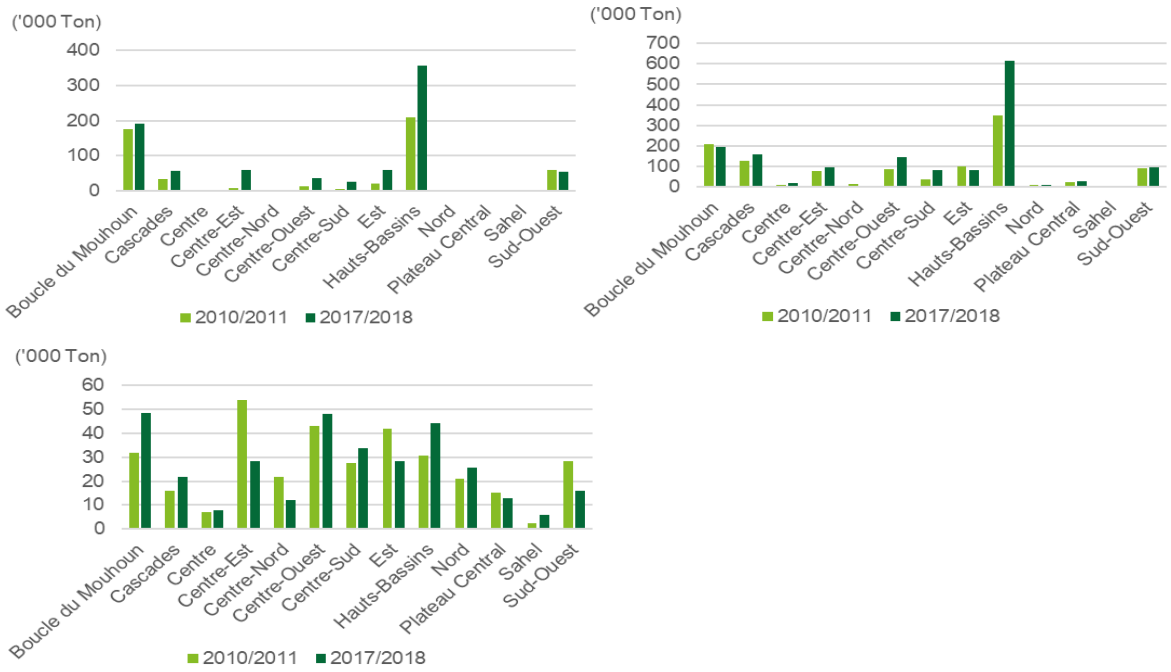
Source: Food and Agriculture Organization (http://www.fao.org/home/en/) as of April 23, 2019, and "CountryStat"

Figure 4.4.52 Production Quantity of Primary Crops in Mozambique (Left: Cassava, Right: Corn) (Year 2002 and 2008)

C) The Corridor Development for West Africa Growth Ring Master Plan

i. Burkina Faso

The main agricultural products of Burkina Faso, such as cotton, corn, and peanut, have been on the rise in recent years. The government of Burkina Faso aims to accelerate economic growth through the promotion of agriculture in which the majority of the population is engaged, and it is thought that data reflects the implementation of such a policy.

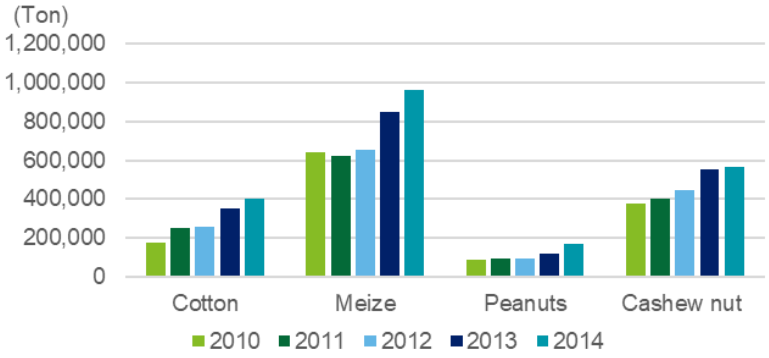


Source : Institut National de la Statistique et de la Demographie "Annuaire statistique 2017"

Figure 4.4.53 Production Quantity of Cotton (Upper Left), Maize (Upper Right), and Peanuts (Lower Left) in Burkina Faso (Year 2010/2011 - 2017/2018)

ii. Cote d'Ivoire

As the related data can only be collected at national level until year 2014 in Cote d'Ivoire, it is not possible to evaluate the impacts of the corridor master plan.

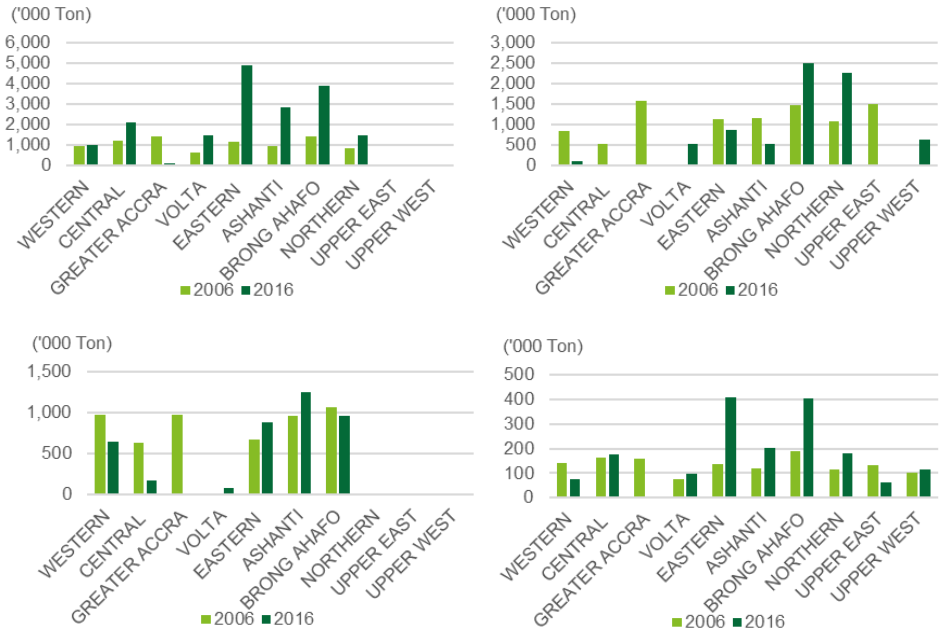


Source: Institut National de la Statistique Cote d'Ivoire "Annuaire Statistique des Productions Vegetales 2014"

Figure 4.4.49 Production Quantity of Primary Crops in Cote d'Ivoire (Year 2010 – 2014)

iii. Ghana

Among the primary crops in Ghana, the production quantity of cassava and maize has increased significantly. The production volume of Ghana's cassava and corn has likewise increased. On the other hand, yam and plantain production decreased.

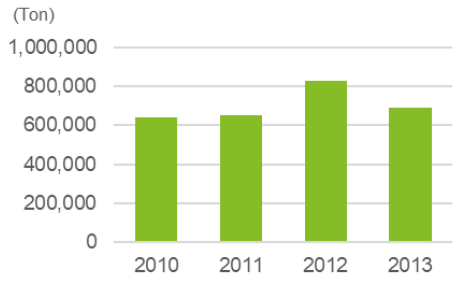


Source: Food and Agriculture Organization (http://www.fao.org/home/en/) as of April 23, 2019, and "CountryStat"

Figure 4.4.54 Production Quantity of Cassava (Upper Left), Yam (Upper Right), Plantain (Lower Left), and Maize (Lower Right) in Ghana (Year 2006 and 2016)

iv. Togo

As the related data can only be collected at national level until year 2013 in Togo, it is not possible to evaluate the impacts of the corridor master plan.



Source: Africa Information Highway, (http://dataportal.opendataforafrica.org/apps/atlas/Togo/Production-of-Maize-in-Tonnes), as of April 23, 2019

Figure 4.4.55 Production Quantity of Maize in Togo (Year 2010 – 2013)

3) Indicator D3: Trade (with/without Corridor countries)

■ Overall Analysis

One of the goals of corridor development is to encourage the movement of people and goods across borders. Increase in the amount of trade among the corridor countries helps to evaluate the degree of strengthening economic ties. An increase in the amount of trade with countries outside the corridor could be taken as an indicator that shows the strength of the economic zone as a corridor. The amount

of trade (inside and outside the corridor) and the results of factor analysis are shown in the table below. It can be seen that trade volume is steadily growing in each country. On the other hand, intra-corridor trade rates are decreasing in Kenya, Côte d'Ivoire, Ghana, and Togo.

Table 4.4.16 Trade Volume of Corridor Countries and the Proportion of Intra-corridor Trade (Year 2010 and 2017)

	Trade Volume（Ton）			Ration of Trade inner corridor countries		Component countries in the corridor
	Year 2010	2017	Growth Rate	2010	2017	
Kenya	24,302,417	33,561,477	38%	9.9%	7.4%	Uganda
Uganda	9,291,683	12,711,371	37%	9.0%	9.6%	Kenya
Mozambique	7,102,359	9,786,958	38%	0.6%	1.9%	Malawi, Zambia
Burkina Faso	2,957,356	4,810,083	63%	20.9%	26.6%	3 countries other than the country
Côte d'Ivoire	15,844,682	19,082,769	20%	7.8%	6.9%	3 countries other than the country
Ghana	16,208,369	22,851,626	41%	4.8%	3.6%	3 countries other than the country
Togo	2,340,288	3,206,	37%	8.5%	8.1%	3 countries other than the country

Source: JICA Study Team

The table below shows the trend of trade volume (inside and outside the corridor) in the member countries of the corridor area.

Table 4.4.17 Trend of Trade Volume of Corridor Countries

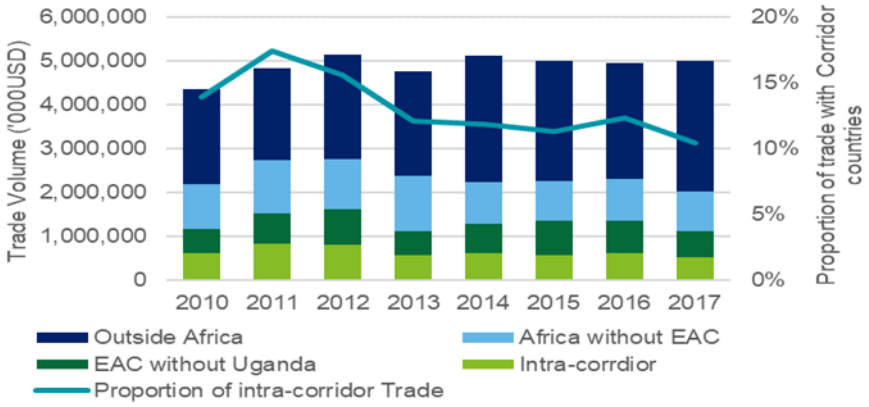
Country		Impact	Background and Factor
Northern	Kenya	→	Although trade volume is steadily increasing, the proportion of trade with corridor countries is declining.
	Uganda	→	Although trade volume is steadily increasing, the proportion of trade with corridor countries is at similar level.
Nacala	Mozambique	→	Although trade volume is steadily increasing, the proportion of trade with corridor countries is slowly increasing.
West Africa Growth Ring	Burkina Faso	↗	Both trade volume and the proportion of trade with corridor countries has steadily risen. These trends resulted in stronger economic ties with corridor countries.
	Côte d'Ivoire	→	Although trade volume is steadily increasing, the proportion of trade with corridor countries is declining.
	Ghana	→	Although trade volume is steadily increasing, the proportion of trade with corridor countries is declining.
	Togo	→	Although trade volume is steadily increasing, the proportion of trade with corridor countries is at similar level.

Source: JICA Study Team

A) Master Plan on Logistics in Northern Economic Corridor

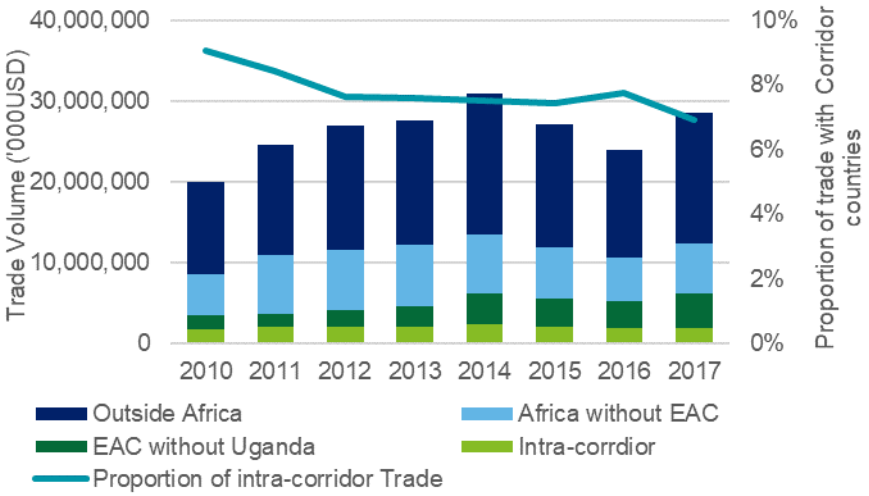
Kenya

While Kenya's imports have increased, exports have not shown a significant increase. The export-import ratio from/to Uganda has decreased, and the export ratio to other parts of Africa has increased. While exports are struggling to increase, there is a possibility that the volume of imported goods is increasing as domestic demand is currently growing.



Source: United Nations Conference on Trade And Development Statistics (https://unctad.org/en/Pages/statistics.aspx)

Figure 4.4.56 Export Value and its Destination: Kenya



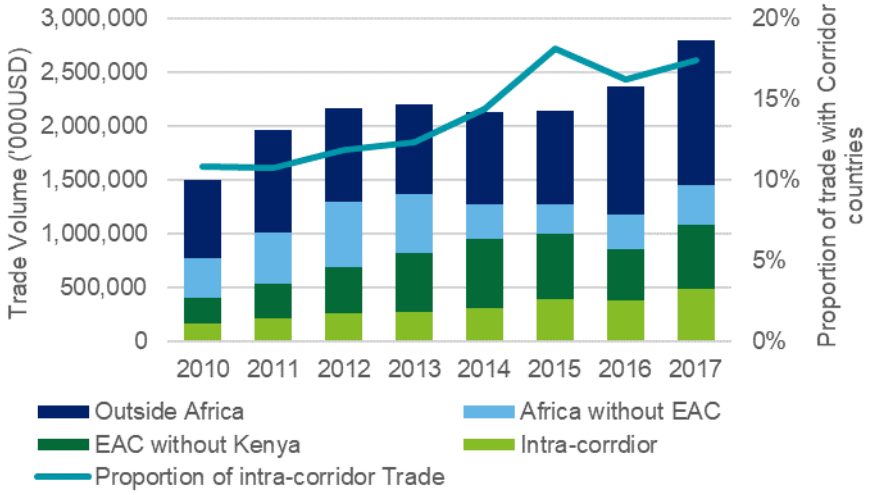
Source: United Nations Conference on Trade And Development Statistics (https://unctad.org/en/Pages/statistics.aspx)

Figure 4.4.57 Import Value and its Origins: Kenya

Uganda

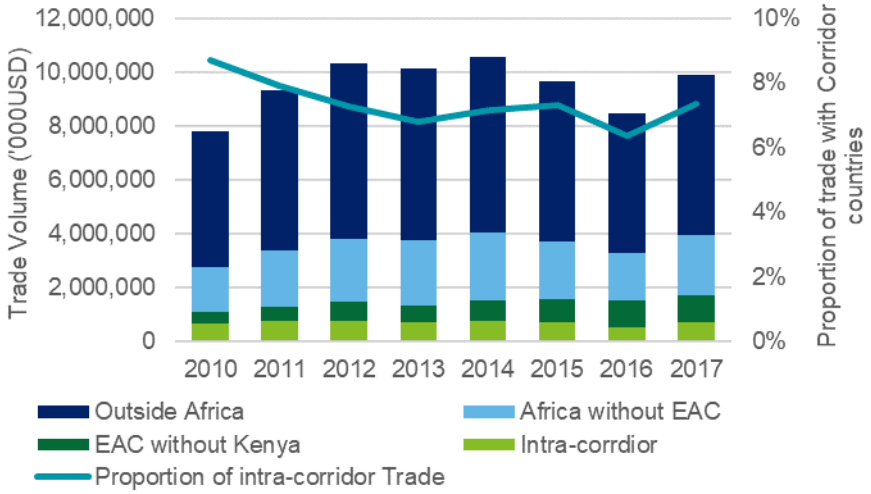
Although there is no significant change in imports, exports are steadily expanding. In addition, the proportion of export products to foreign countries is decreasing. On the other hand, exports to Kenya are becoming larger, which means that economic ties with Kenya are becoming stronger. The impacts of the penetration of the corridor development concept and the elimination of intra-

regional tariffs within the East African Community (EAC) implemented in 2010 might gradually appear.



Source: United Nations Conference on Trade And Development Statistics (https://unctad.org/en/Pages/statistics.aspx)

Figure 4.4.58 Export Value and its Destination: Uganda



Source: United Nations Conference on Trade And Development Statistics (https://unctad.org/en/Pages/statistics.aspx)

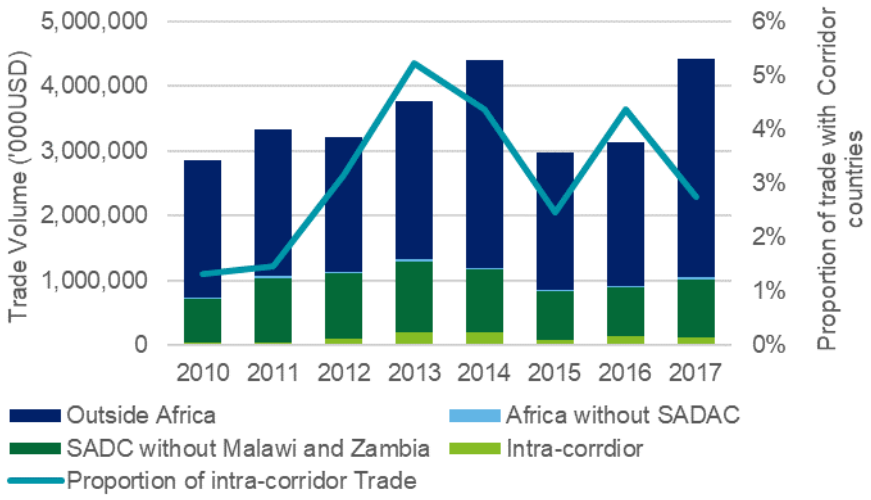
Figure 4.4.59 Import Value and its Origins: Uganda

B) Nacala Corridor Economic Development Strategies in Mozambique

Mozambique

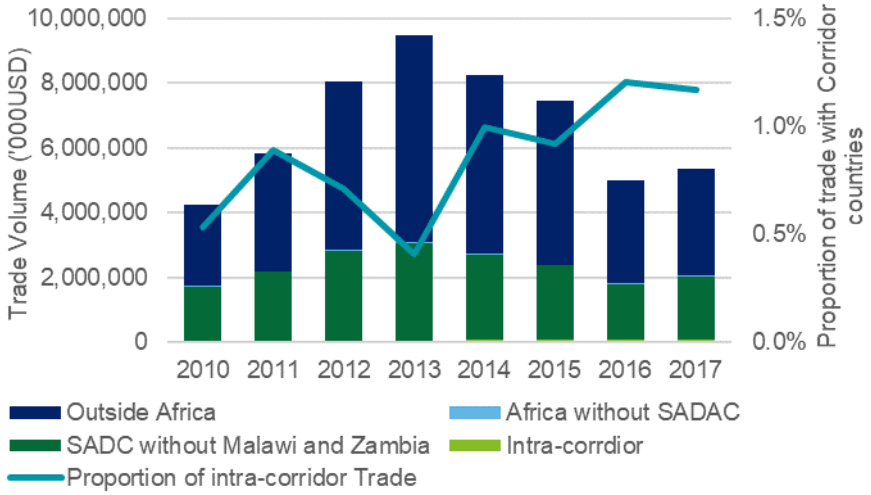
The trend of trade in Mozambique is different from the other corridor countries. Mozambique hardly imports from Malawi or Zambia, but continues to export. There is a large volume of trade with SAEC (South Africa Economic Community: Zambia, Tanzania, Botswana, Mozambique, Angola, Lesotho, Malawi, Swaziland, Zimbabwe, Namibia, South Africa, Mauritius, Seychelles, Democratic Republic of the Congo, Madagascar, Comoros) while the volume of trade with other

African countries is limited.



Source: United Nations Conference on Trade And Development Statistics (https://unctad.org/en/Pages/statistics.aspx)

Figure 4.4.60 Export Value and its Destination: Mozambique



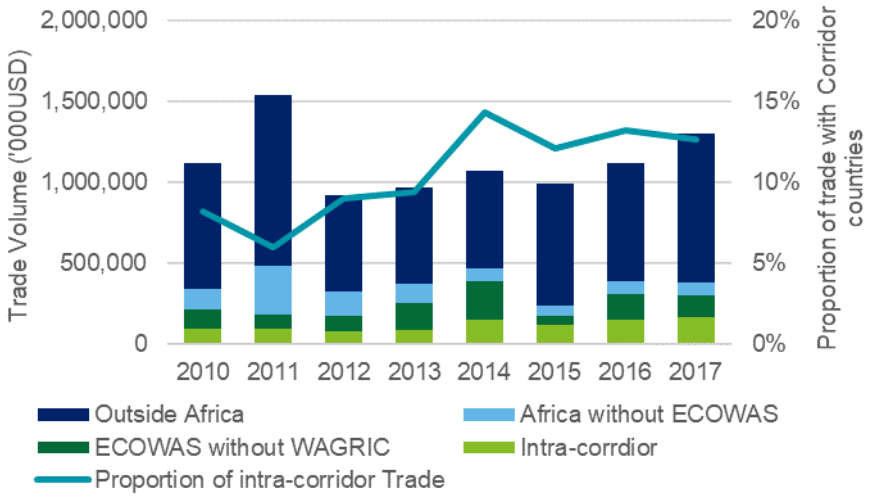
Source: United Nations Conference on Trade And Development Statistics (https://unctad.org/en/Pages/statistics.aspx)

Figure 4.4.61 Import Value and its Origins: Mozambique

C) The Corridor Development for West Africa Growth Ring Master Plan

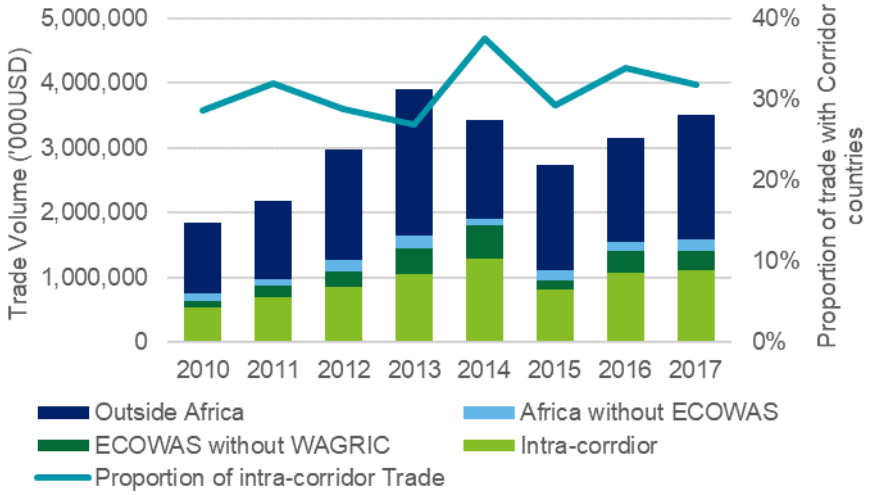
Burkina Faso

Both exports and imports are on the rise. In addition, the volume and proportion of trade with corridor countries also tend to increase.



Source: United Nations Conference on Trade And Development Statistics (https://unctad.org/en/Pages/statistics.aspx)

Figure 4.4.62 Export Value and its Destination: Burkina Faso

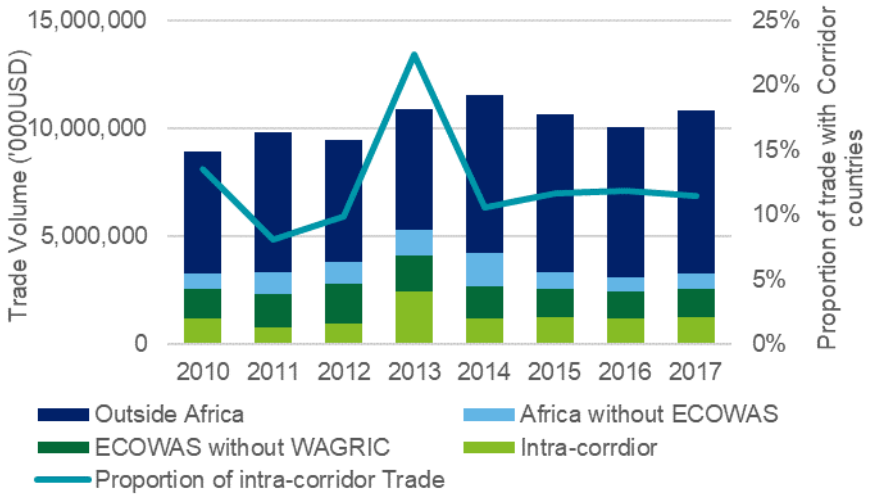


Source: United Nations Conference on Trade And Development Statistics (https://unctad.org/en/Pages/statistics.aspx)

Figure 4.4.63 Import Value and its Origins: Burkina Faso

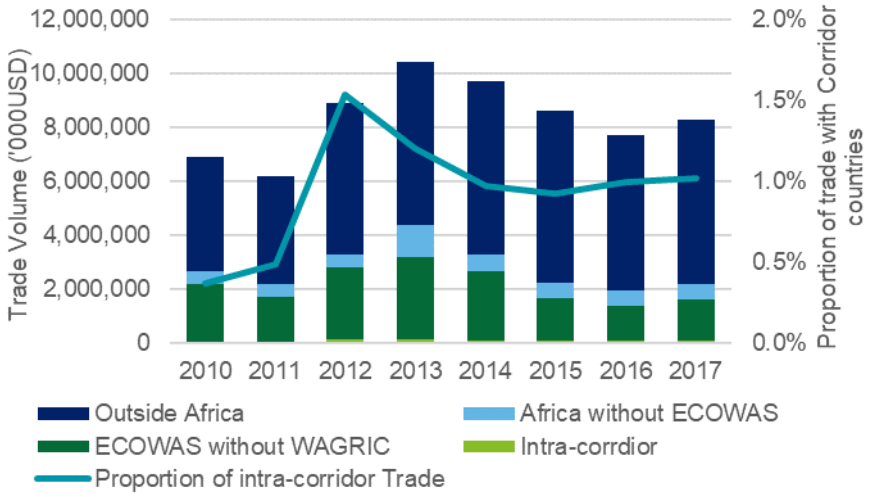
Côte d'Ivoire

The trade volume tends to increase in the medium and long term with some fluctuations. On the other hand, the proportion of trade volume with corridor countries has slightly decreased. This might be related to the decline of the country's economic position in West Africa.



Source: United Nations Conference on Trade And Development Statistics (https://unctad.org/en/Pages/statistics.aspx)

Figure 4.4.64 Export Value and its Destination: Côte d'Ivoire

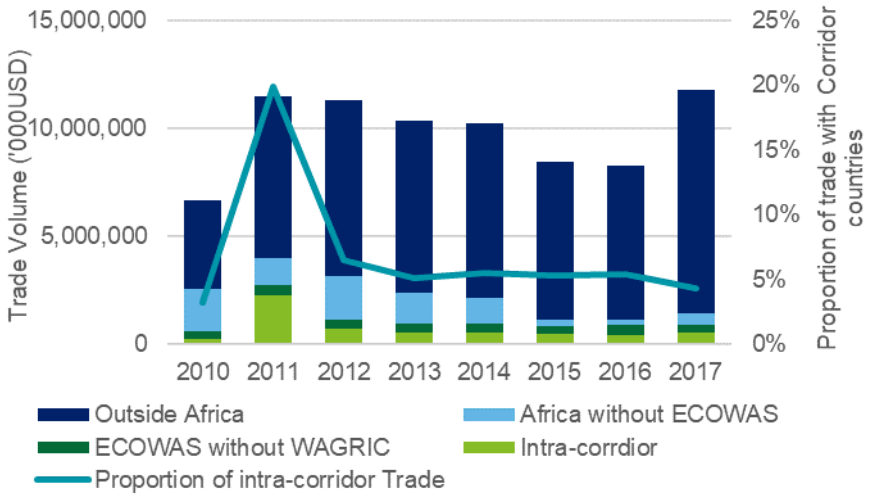


Source: United Nations Conference on Trade And Development Statistics (https://unctad.org/en/Pages/statistics.aspx)

Figure 4.4.65 Import Value and its Origins: Côte d'Ivoire

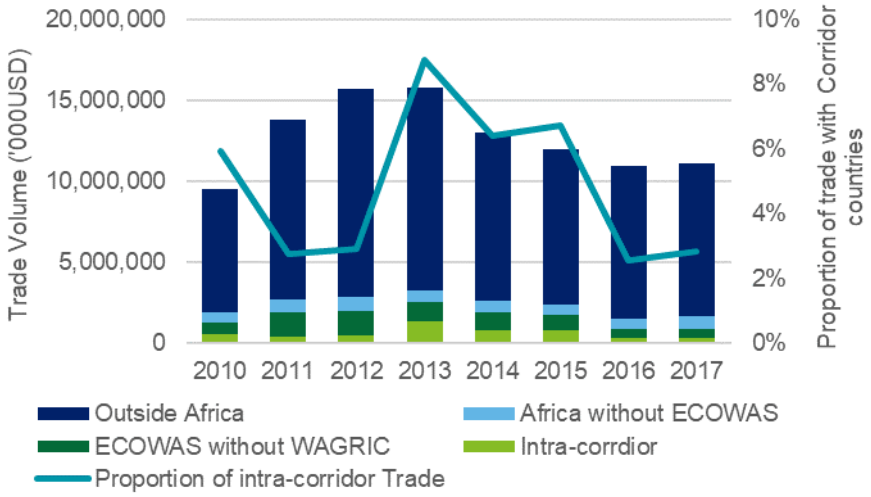
Ghana

Trade volume tends to increase in the medium and long term. However, due to the impacts of the economic crisis, trade volume has fallen from 2014 to 2016. The proportion of trade with corridor countries did not see steady growth. It can be assumed that the country relies on products such as gold, oil, and cacao, which are mainly exported to countries outside the corridor.



Source: United Nations Conference on Trade And Development Statistics (https://unctad.org/en/Pages/statistics.aspx)

Figure 4.4.66 Export Value and its Destination: Ghana

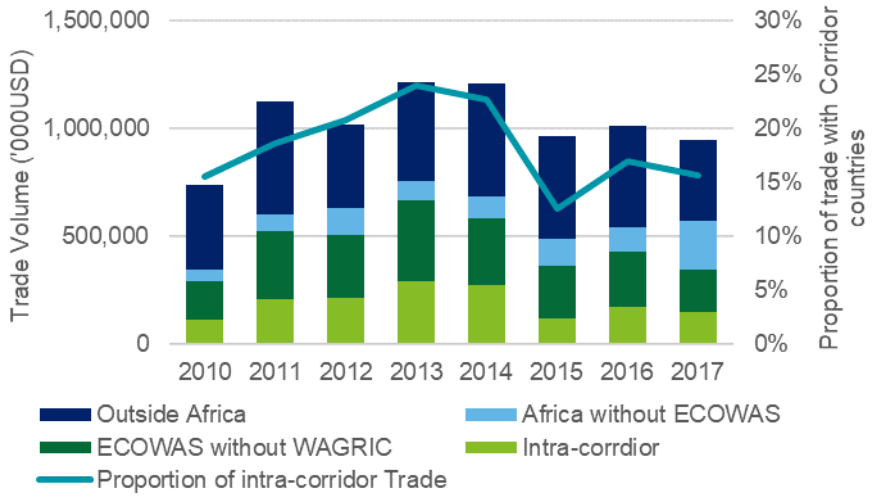


Source: United Nations Conference on Trade And Development Statistics (https://unctad.org/en/Pages/statistics.aspx)

Figure 4.4.67 Import Value and its Origins: Ghana

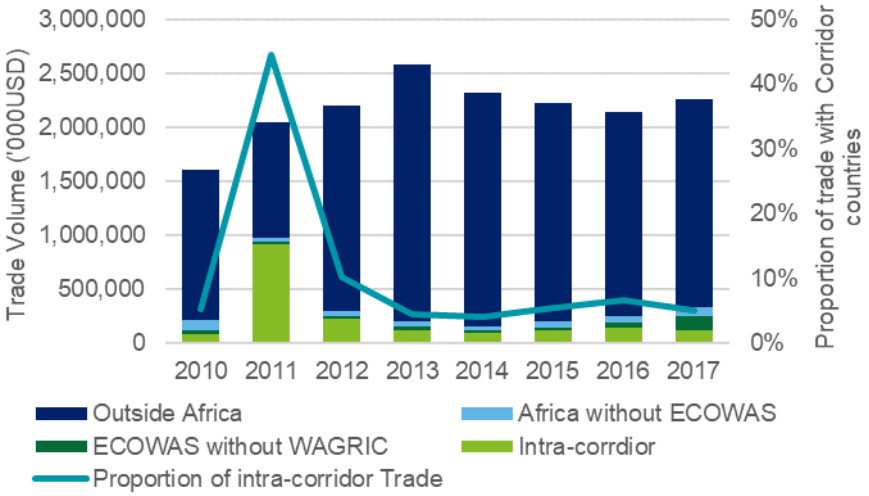
Togo

Trade value has steadily increased. Regarding exports, the proportion of trade with ECOWAS excluding the WAGRIC countries is high. This is mainly due to the strength of economic ties with Nigeria.



Source: United Nations Conference on Trade And Development Statistics (https://unctad.org/en/Pages/statistics.aspx)

Figure 4.4.68 Export Value and its Destination: Togo



Source: United Nations Conference on Trade And Development Statistics (https://unctad.org/en/Pages/statistics.aspx)

Figure 4.4.69 Import Value and its Origins: Togo

4.4.5 Improvement of Income Level and Standard of Living

(1) Data Collection

The table below shows the data collected for the evaluation of impacts on income level and standard of living in the corridor areas. As the criteria of poverty rate differs from country to country, this study mainly used country data released by international organizations, except for Kenya.

Table 4.4.18 Result of Data Collection on Income level and Standard of Living

	Northern		Nacala	West Africa Growth Ring			
Country	Kenya	Uganda	Mozambique	Burkina Faso	Côte d'Ivoire	Ghana	Togo
E1. GRDP	○ Year 2013 – 2017 (Gross County Product 2019 Report)	△ Year 2008/2009 - 2017/2018 (Nation) Estimates GRDP based on the population by industries of target area	○ Year 2007-2017	△ Year 2018 (Nation) Estimates GRDP based on the population by industries of target area	△ Year 2017 (Nation) Estimates GRDP based on the population by industries of target area	△ Year 2014 (Nation) Estimates GRDP based on the population by industries of target area	△ Nation
E2. Poverty rate	○ Year 2005/2006 and 2015/2016	○ Year 2012/2013 and 2016/2017	○ Year 2002, 2008, and 2014	○ Year 2003, 2009, and 2014	△ Nation	○ Year 2005/2006 and 2012/2013	△ Nation

Source: JICA Study Team

It was not possible to confirm quantitatively and adequately the correlation between the corridor master plans and the changes in indicators. This is mainly due to the difficulty to acquire data for the evaluation as data collected by each country's government agencies is limited..

(2) Analysis based on Collected Data

1) GRDP Indicator E1: GRDP

■ Overall Analysis

GRDP per capita is adopted for evaluating the production capacity of each corridor. The below table shows the trend of GRDP in the corridor areas.

Table 4.4.19 Result of Data Collection on Income level and Quality of Life

Country		Impact	Background and Factor
Northern	Kenya	→	Although the growth rate in rural areas is on the rise, the economic gap with urban cities and industrial clusters such as Nairobi and Mombasa is still large.
	Uganda	→	The economic gap between Kampala and rural areas is still large.
Nacala	Mozambique	↘	Although economic growth continues, the economic growth of the corridor area is slightly lower than that of the whole country. However, as for Tete province, growth exceeds the national average. One factor that can be considered is that industries other than mining are not yet fully developed.
West Africa Growth Ring	Burkina Faso	→	Clear impact by the corridor master plan cannot be confirmed. Actual growth rate is slightly lower than expected one.
	Côte d'Ivoire	→	Although clear impact by the corridor master plan cannot be confirmed, actual growth rate is higher than expected.
	Ghana	→	Clear impact by the corridor master plan cannot be confirmed. Actual growth rate is slightly lower than expected.
	Togo	→	Clear impact by the corridor master plan cannot be confirmed. Actual growth rate is slightly lower than expected.

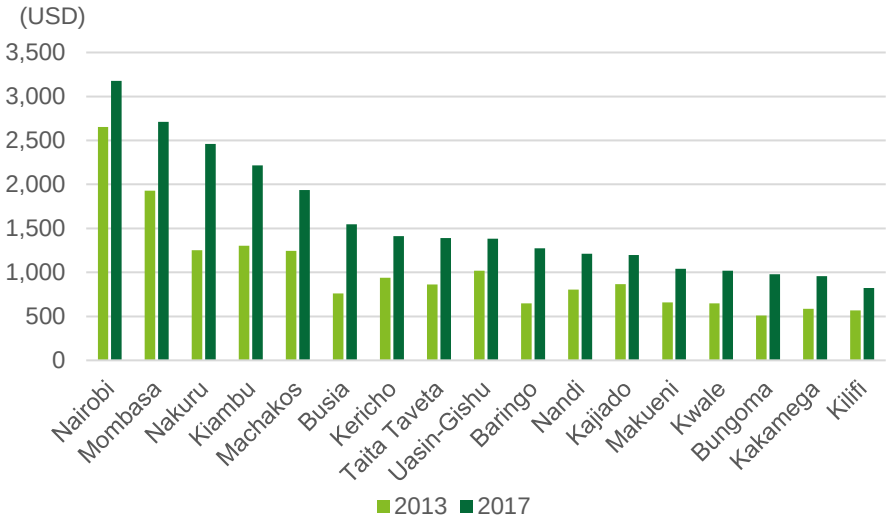
Source: JICA Study Team

■ Analysis on Each Corridor

A) Master Plan on Logistics in Northern Economic Corridor

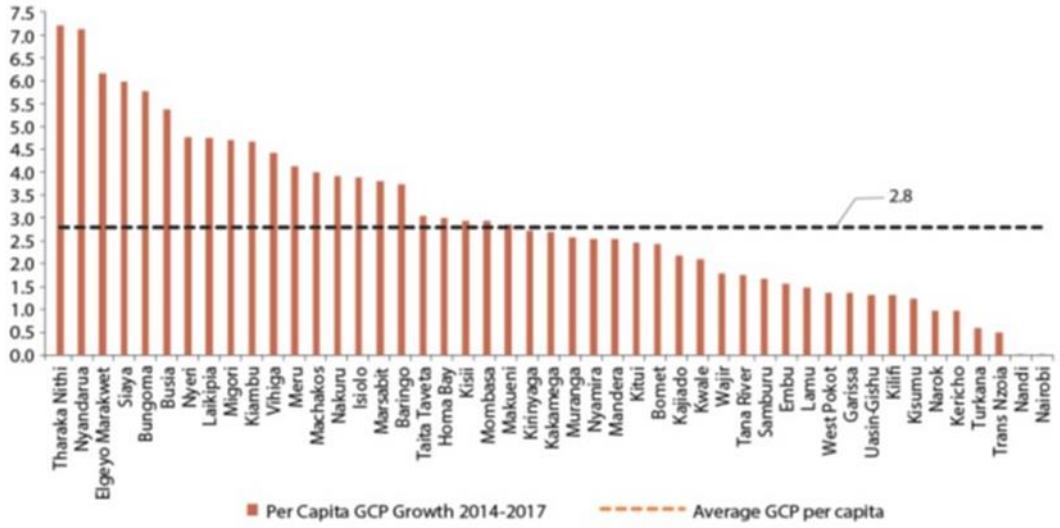
Kenya

In general, GRDP per capita of urban cities and industrial clusters such as Nairobi (USD 3,177) and Mombasa (USD 2,710) tend to be high based on the data in 2017; which is three times as high as Kilifi (USD 824), the lowest city. However, it can be noted that Nairobi registered the lowest annual GRDP growth rate per capita from 2014 to 2017. On the other hand, considerably high growth is seen in other regions. It can be seen as an indication of economic vitalization.



Source: JICA Study Team based on Gross Country Product 2019 Report by Kenya National Bureau of Statistics

Figure 4.4.70 GRDP Per Capita in Cities along Northern Economic Corridor in Kenya (Year 2013 and 2017)



Source: Kenya National Bureau of Statistics (2019) "Gross Country Product 2019 Report"

Figure 4.4.71 GRDP Growth Rate of Counties of Kenya (Average between 2014 and 2017)

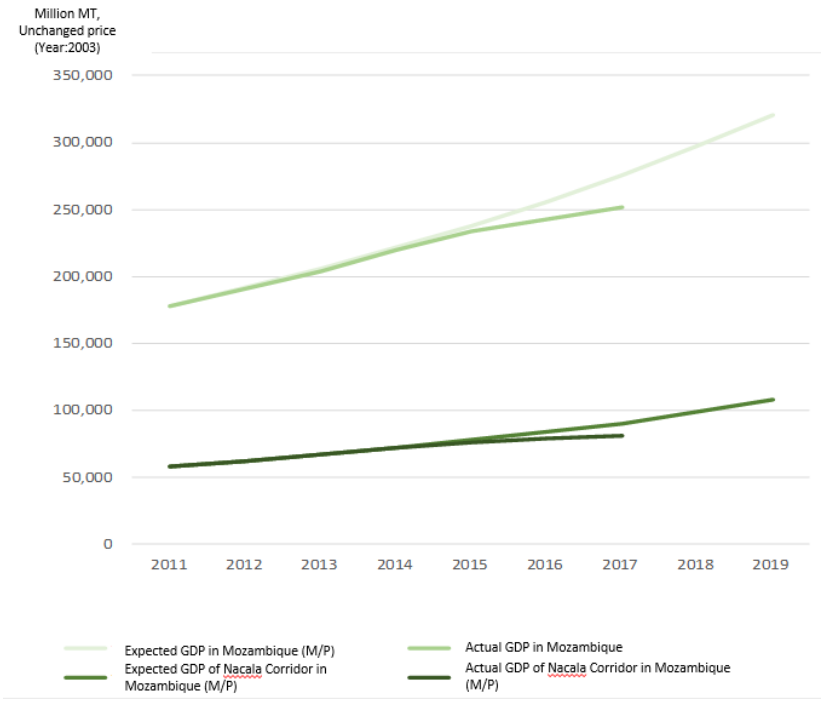
Uganda

Similarly to Kenya, the gap between GRDP per capita is still large between the capital city Kampala and other areas.

B) Nacala Corridor Economic Development Strategies in the Republic of Mozambique

Mozambique

While GRDP in the corridor area continues to grow, its growth rate is sluggish compared with that of the whole country. As shown in the figure below, the estimated GDP of Mozambique overall and the estimated GRDP value of the target area in the corridor master plan are higher than the actual values. This is because the economy of Mozambique, which has achieved GDP growth of around 6 to 7% since 2010, has at that time not yet revealed government-guaranteed foreign debts of the three state-owned companies (Tuna Corporation, National Military Company, and Asset Management Corporation). This information was disclosed in 2016 and IMF and major donors froze financial support to Mozambique, which resulted in an economic slowdown. However, it is said that economy is on recovery, as the Mozambican government and international organizations have made efforts to solve the problem since then.



Source: JICA Study Team based on JICA (2018) "The project for supporting the promotion of Nacala corridor development final report"

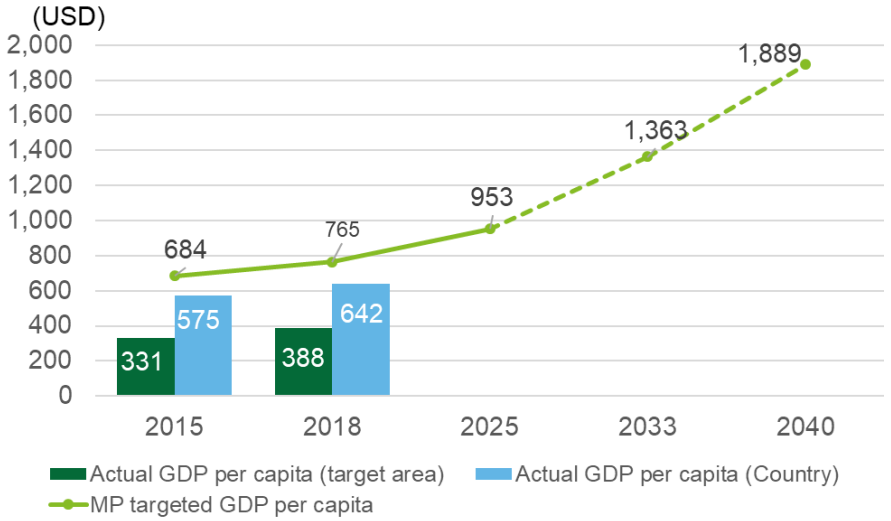
Figure 4.4.72 GRDP-GDP Per Capita in Corridor Provinces and Whole Country

C) The Corridor Development for West Africa Growth Ring Master Plan

In the Corridor Development for West African Growth Ring Master Plan, specific provinces have not been identified in each country. Therefore, there was no GRDP data. The study team estimated GRDP based on the latest GDP on the ratio of labor force and between industries.

Burkina Faso

GDP per capita of Burkina Faso is expected to be USD 765 by 2018 in the corridor master plan. However, current GRDP is estimated to be USD 388, which is well below the expected number.

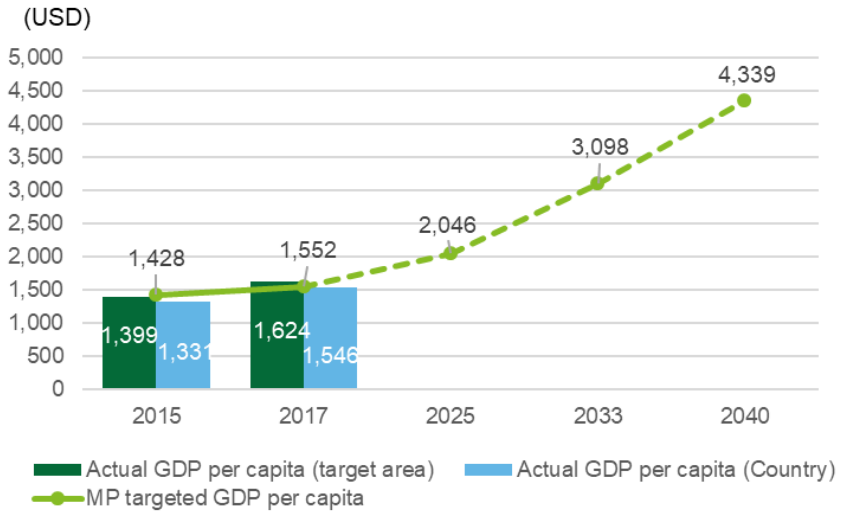


Source: JICA Study Team based on the data from Africa Information Highway (http://dataportal.opendataforafrica.org/apps/atlas/Burkina-Faso/GDP-current) as of April 23, 2019, Institut National de la Statistique et de la Demographie "Annuaire Statistique 2017" and JICA(2017) " The project on the corridor development for West Africa growth ring master plan"

Figure 4.4.73 Estimated and Target GRDP per Capita in Provinces along WAGRIC and Whole Nation in Burkina Faso

Ghana

The target of GDP per capita of Ghana in the corridor master plan was to achieve USD 1,552 in 2017. However, as of 2017, GRDP per capita is estimated to be over than USD 1,500 in the corridor area and USD 1,624 for the whole country.

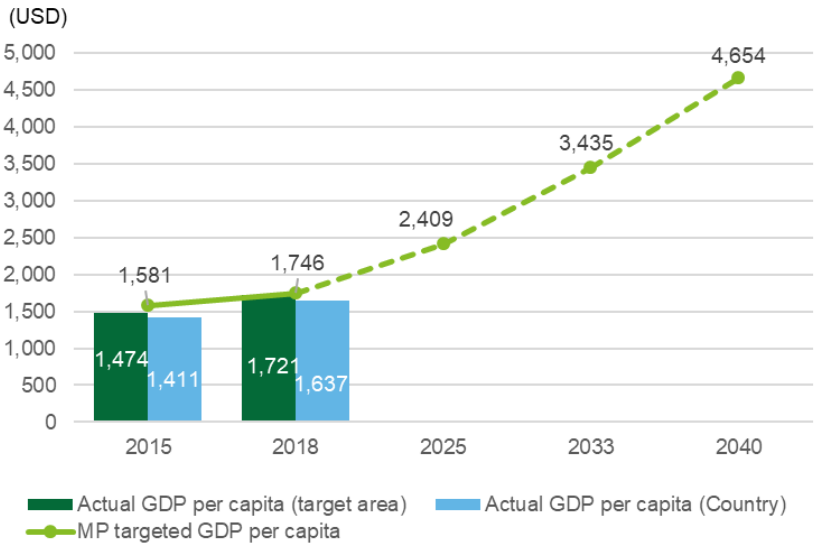


Source: JICA Study Team based on data from International Monetary Fund (https://www.imf.org/external/index.htm) as of April 23, 2019; Population Census and JICA(2017) " The project on the corridor development for west Africa growth ring master plan"

Figure 4.4.74 Estimated and Target GRDP per Capita in Provinces along WAGRIC and Whole Nation in Ghana

Côte d'Ivoire

As of 2017, GRDP per capita of the corridor area is estimated to be USD 1,721, nearly at the same level with the target of the corridor master plan which is USD 1,746. In Côte d'Ivoire, the economy has been stagnant for nearly 10 years since the political turmoil in 2002 including the civil war. Since 2013, when it began to settle down, foreign capital and economic aid resumed, with the restoration of the 1990s economic growth momentum.

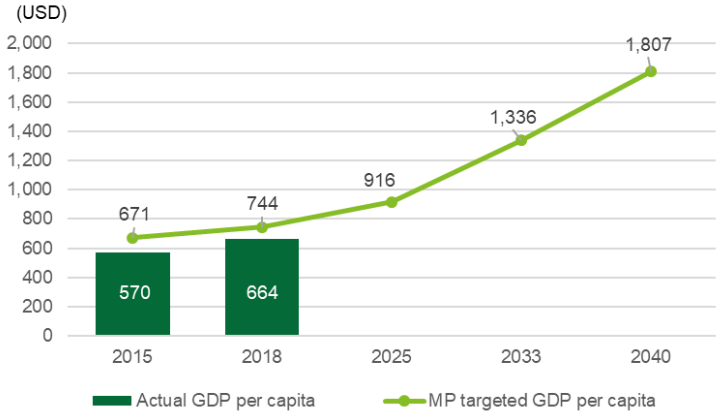


Source: Institut National de la Statistique (http://www.ins.ci/n/) as of April 23, 2019 and JICA (2017) "The project on the corridor development for West Africa growth ring master plan"

Figure 4.4.75 Estimated and Target GRDP per Capita in Provinces along WAGRIC and Whole Nation in Côte d'Ivoire

Togo

Togo's GDP per capita is currently slightly lower than the target GDP per capita set in the corridor master plan. GDP per capita is estimated to be USD 916 by 2025 in the corridor master plan. However, if the current growth rate continues, GDP per capita will not be able to reach the target level. One of the reasons why GDP per capita has not grown as expected is the delay in the expansion plan of Lomé Port, the largest trading port in Togo. The expansion work of Lomé Port, which started in 2011, has been delayed due to the relocation of the fishing village port at the planned expansion site. The completion of the port expansion would trigger increase in trade and promote industry in the inland areas, which may accelerate the growth of GDP per capita.



Source: JICA Study Team based on data from IMF, ILO, and JICA (2017) "The project on the corridor development for West Africa growth ring master plan"

Figure 4.4.76 Estimated and Target GDP per Capita in Togo

2) Indicator E2: Poverty Rate

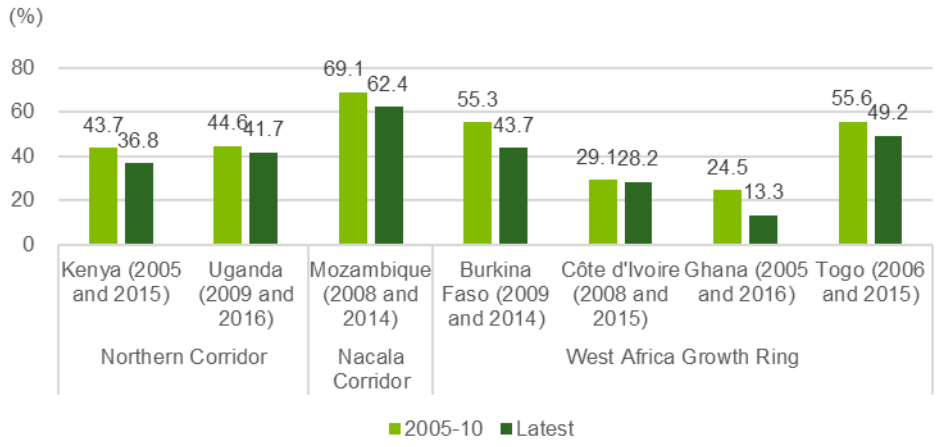
■ Overall Analysis

The poverty rate in which the population living with less than USD 1.90 a day has been declining for the past 10 to 15 years in each country. However, the trend differs depending on the country. Poverty rate has steadily declined in Kenya, Ghana, and Burkina Faso while it is almost stagnant in Côte d'Ivoire and Uganda. In particular, the case of Mozambique implies that economic growth exclusively based on the development of infrastructure and major industries does not necessarily lead to poverty reduction.

Table 4.4.20 Improvement of Poverty Rate in Corridor Countries

Country		Impact	Background and Factor
Northern	Kenya	↗	Improvement can be confirmed in the corridor area.
	Uganda	→	Improvement is still slow.
Nacala	Mozambique	→	Although improvement of poverty rate has been made, it is still slow considering the high economic growth of the country. "Growth without employment" can be one of the factors behind based on the fact that the unemployment rate has stayed high around 24~25% since 2014. This means that economic growth in Mozambique is not impacted in the employment.
West Africa Growth Ring	Burkina Faso	↗	There is a steady improvement with the poverty rate falling below 50%. It is thought that steady economic growth of around 5% a year is contributing.
	Côte d'Ivoire	↘	Improvement of poverty rate is slow compared with other countries. Economic stagnation due to civil war is seen as the primary cause.
	Ghana	↗	The poverty rate has been drastically decreased in the past 10 years. There has been no impact of the economic crisis since 2013-2014.
	Togo	→	Although poverty rate has been decreased, half of citizens are still suffering from poverty.

Source: JICA Study Team



Source: World Bank (https://worldbank.org/) as of April 23, 2019

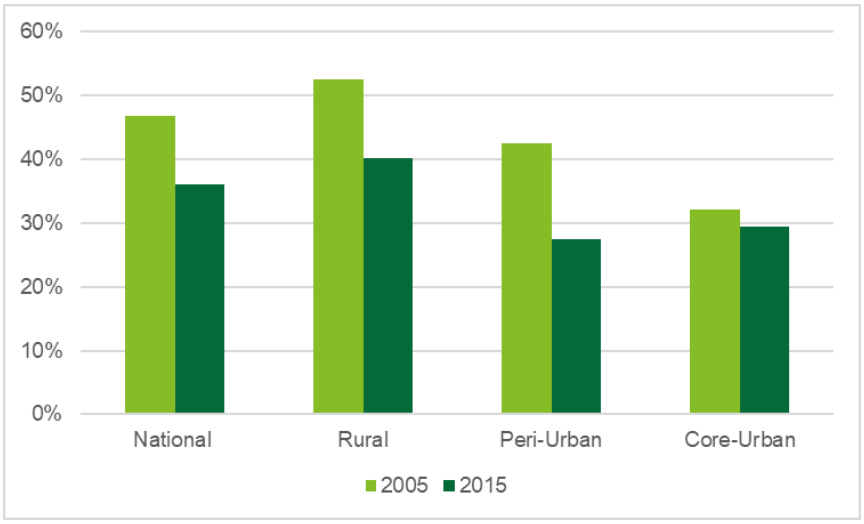
Figure 4.4.77 Poverty Rate of Target Countries

■ Analysis on Each Corridor

A) Master Plan on Logistics in Northern Economic Corridor

Kenya

Kenya's poverty rate declined from 2005 to 2015. In addition, as shown in the figure below, it can be seen that the poverty rate in the Northern corridor area has greatly decreased and exceeds the decreasing rates of other areas. However, there is a high possibility that improvements in large cities such as the capital Nairobi and Mombasa have significantly contributed to it.

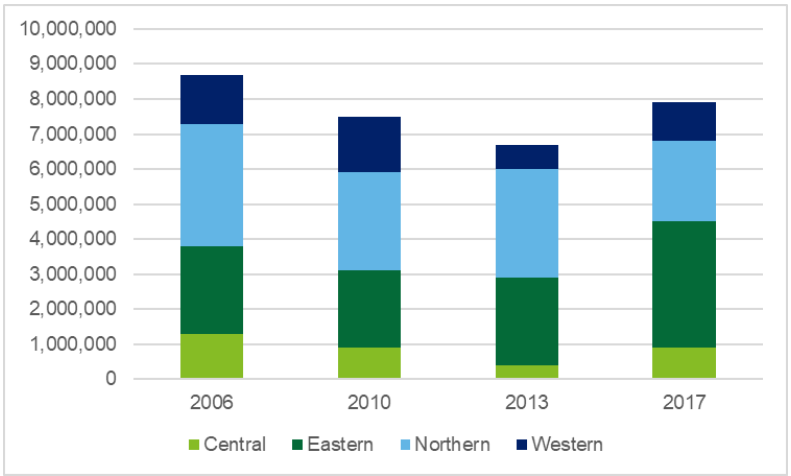


Source: Kenya National Bureau of Statistics (2015/2016 Kenya Integrated Household Budget Survey (KIHBS))

Figure 4.4.78 Poverty Rate in Kenya

Uganda

Poverty rate in Uganda has worsened in recent years. Also, same as the trend of GRDP per capita, the gap between Kampala where there is low poverty rates compared to the areas with many people suffering from poverty such as Eastern or Northern provinces is further widening. There are many infrastructure projects under planning and development, but only few projects have been completed. Therefore, there are few factors that change the flow of wealth concentration in the metropolitan area.



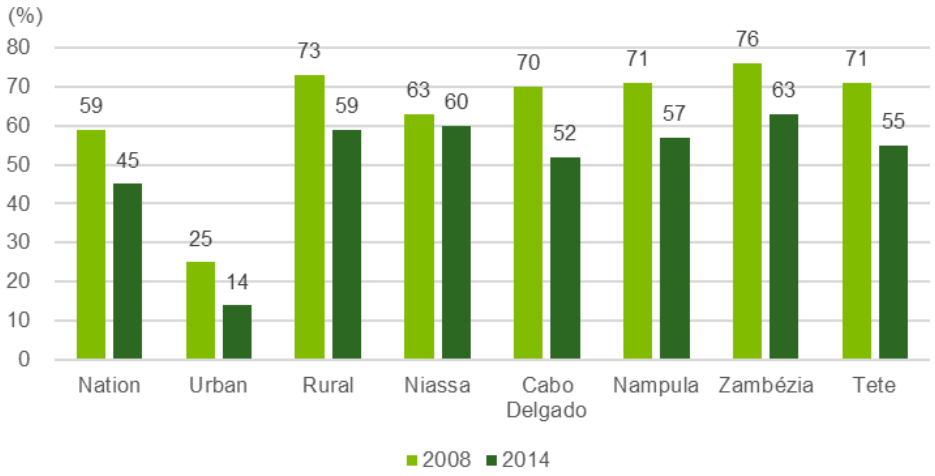
Source: The Uganda National Household Survey 2006-2013

Figure 4.4.79 Number of poor people in Uganda by province

B) Nacala Corridor Economic Development Strategies in the Republic of Mozambique

Mozambique

According to the Bureau of Statistics in Mozambique (INE), the poverty rate in the corridor area declined from 2008 to 2014, but still remains high compared with the whole country. As a country-wide trend, the poverty rate of agriculture and fishing villages is extremely high compared with the urban areas. The corridor area where urbanization is delayed is suffering from high poverty incidence. In addition, there is a large gap in the corridor area between the provinces where poverty rates are significantly improving (Cabo Delgado, Nampula, and Tele) and the provinces where it is not improving (Niassa).



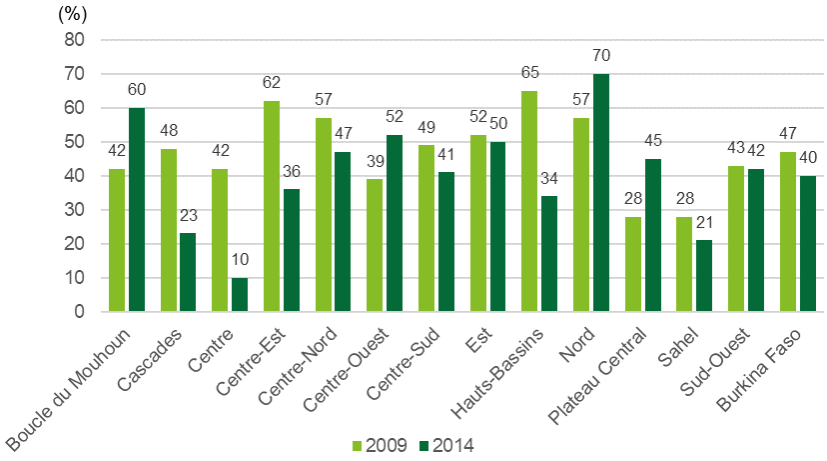
Source: JICA Study Team from the data by INE

Figure 4.4.80 Poverty Rate of the Target Provinces in Mozambique

C) The Corridor Development for West Africa Growth Ring Master Plan

Burkina Faso

According to the Bureau of Statistics in Burkina Faso (INSD), the poverty rate of the country declined from 2009 to 2014, but there has been a gap between the different provinces (due to the uprising in 2014 and impact of terrorist organizations in northern area). Burkina Faso adopted the National Plan for Economic and Social Development (Plan National de Development Economique et Social) in 2016 and has set a goal to reduce the national poverty rate to 20% by 2020 (currently 40%). Burkina Faso has set up a EUR 23.5 billion development plan for five years to bring about a "revolt against poverty" by 2020. The project involves several international organizations such as the World Bank, and aims to reduce the poverty rate in the future by strengthening and utilizing the domestic potential of agriculture and livestock.

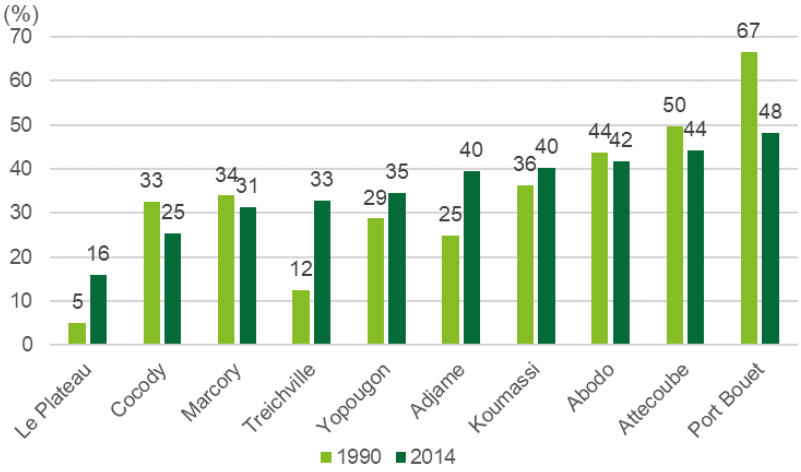


Source: Institut National de la Statistique et de la Demographie "Annuaire Statistique 2017 »

Figure 4.4.81 Poverty Rate of Target Provinces in Burkina Faso

Côte d'Ivoire

According to the Bureau of Statistics in Côte d'Ivoire (INS), the poverty rate in Abidjan declined overall from 1990 to 2014, although there have been significant increase in some regions (it might be due to civil wars and revolts). The poverty rate for the country as a whole was at 51% in 2012, but fell to 46.3% in 2015. In 2012, the government of Côte d'Ivoire set a goal to reduce the poverty rate by half by 2020, but the Prime Minister stated at the beginning of 2019 that it would be difficult to achieve the said goal. In parallel, the government established the Productive social safety nets project (Projet Filets Sociaux Productifs) in 2012 to provide poor households living in the rural areas access to quality food, education, and insurance services. As part of this, the government provided FCFA 144,000 / year to 35,000 households annually from 2012 to 2017. The number of target households will be raised to 100,000 in 2019.

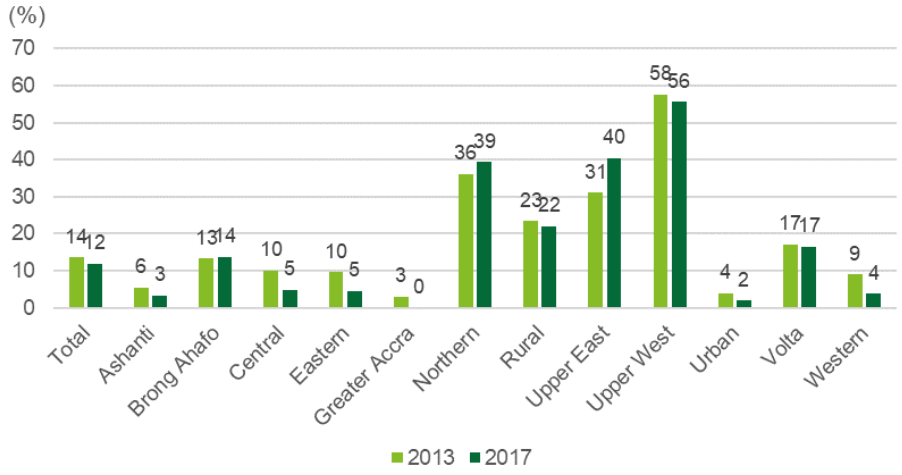


Source: Institut National de la Statistique "Recensement General de la Population et de l'Habitat 2014 Côte d'Ivoire"

Figure 4.4.82 Poverty Rate of Target Cities in Abidjan

Ghana

The poverty rate in Ghana declined from 2013 to 2017, but it has increased in some areas. For the city of Accra, the government succeeded in reducing poverty. The Government of Ghana adopted the "Livelihood Empowerment Against Poverty (LEAP) program" in 2008 in cooperation with the World Bank, UNICEF, and other international organizations. The program provides households living in poverty with financial and social security. Currently, 90,785 households of 144 districts are supported by this program. In addition, the government adopted LEAP 1000, targeting poor households with children under 2 years of age, mainly in the Northern and Upper Eastern regions where poverty rates have increased.

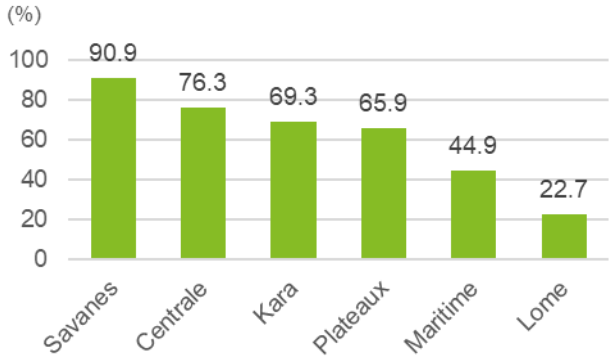


Source: Statistical Service Ghana Sustainable Development Goals (https://sustainabledevelopment-ghana.github.io/1-1-1/)

Figure 4.4.83 Poverty Rate of Target Provinces of Ghana

Togo

According to the government of Togo, the nation's poverty rate decreased from 55.1% in 2015 to 52.1% in 2017. The government was able to reduce poverty rates through the Five-Year Strategy for Accelerated Growth and Employment Promotion (Strategie de Croissance Accélérée et de la Promotion de l'Emploi) from 2013. The government tried to further reduce poverty rates for five years through the adoption of the National Development Plan (Plan National de Développement) in 2018.



Source: JICA Statistics and National Accounts of Togo, 2015 (http://togo.opendataforafrica.org/TGSNA2016/statistics-and-national-accounts-of-togo-2015?region=1000000-togo)

Figure 4.4.84 Poverty Rate in Provinces of Togo (Year 2011)

4.5 Summary of Evaluation and its Implication

4.5.1 Summary of Evaluation on the Corridor Master Plans

The table below is the summary of each indicator for this survey

Table 4.5.1 Summary of Indicators and Result of Data Collection

Types	Items	Northern		Nacala	West Africa Growth Ring			
		Kenya	Uganda	Mozambique	Burkina Faso	Côte d'Ivoire	Ghana	Togo
Logistic Data	A1. Container traffic	○	-	○	-	○	○	○
	A2. Travel time between major sites	○	-	○	-	○	○	○
	A3. Logistics cost between major sites	○	-	○	-	○	○	○
	A4. Port Operation efficiency	○	-	○	-	○	○	○
	A5. Traffic volume	○	-	○	-	×	×	×
	A6. Traffic accidents	△	-	×	-	×	×	×
	A7. Lead time at ports	○	-	×	-	×	×	×
Formation of New Economic Activities	B1.Establishment of new entities	○	×	○	○	×	×	×
	B2.Establishment of entities (Reference)	○	×	×	×	×	△	×
	B2.Establishment of entities (Reference)	○	○	○	×	×	○	○
Development of Existing Cities and Formation of New Cities	C1. Population of the corridor area (proportion to country's population)	○	○	○	○	○	○	△
	C2. Urban Population (Reference)	○	△	△	△	△	△	△
Activation of Society and Economy	D1.a Labor force population	△	○	○	○	○	○	○
	D1.b Number of employees by industry	×	×	○	○	○	○	○
	D2. Major agricultural product outputs	△	△	○	○	△	○	△
	D3. Trade (in and out of corridor)	△	△	△	△	△	△	△
Income level and Standard of Living	E1. GRDP	○	△	○	△	△	△	△
	E2. Poverty rate	○	○	○	○	△	○	△

Source: JICA Study Team

The table below is the summary of evaluation and analysis on the impacts of the corridor master plans.

Table 4.5.2 Summary of Evaluation on the Corridor Master Plans

		Northern Corridor	Nacala Corrido	West Africa Growth Ring Corridor
A	Logistics	○	△	—
		Logistics was improved through the opening of a new container terminal at Mombasa Port, which was mentioned in the master plan as well as the improvement of road and rail infrastructure. While the improvement is clear between Nairobi and Mombasa, the impact is diffused to other regions.	Although there has been no significant improvement in port capacity and volume, improvements have been seen in port efficiency, car transportation cost and lead time.	While logistics related to ports generally stagnated, it was confirmed that infrastructure upgrading and expansion progressed at some ports such as Lomé port, contributing to increased volume of port handling. However, the correlation with the master plan could not be confirmed.
B	Formation of New Economic Activities	△	—	—
		Compared with 2012 and 2017, the increase in the number of SEZs around Mombasa is remarkable. If the SEZ under development is completed, further industrial development can be expected. However, the correlation with the master plan is not clear since the master plan was completed in March 2017.	The sample survey from 2016 to 2017 confirmed the increasing number of new companies. However, it was not possible to confirm the correlation and effect of the master plan because there is no historical data for the survey.	Although the correlation between Master Plan and the number of companies could not be confirmed, since Ghana port infrastructure development is in progress, the number of companies in FTZ tend to increase. Likewise, the number of new established companies in other coastal countries are assumed to be increased by the development of FTZ.
C	Development of Existing Cities and Formation of New Cities	×	△	—
		Population concentration in large cities such as Nairobi and Mombasa is accelerating. On the other hand, the formation of new urban areas could not be confirmed.	Population in the corridor area increased and the ratio to the total population also increased. Although it cannot be concluded, certain effect of the master plan could be confirmed.	Although, formation of new cities along corridors was not identified, inland cities should be formed by the improvement of connectivity between the cities along corridor
D	Activation of Society and Economy	△	△	—
		As for Kenya, the transition of the number of labor force cannot be analyzed. On the other hand, in Uganda, the labor force in the corridor area is on the rise.	Accumulation of industrial activities has gradually progressed in the corridor area. The proportion of secondary industries is slightly higher than the national average.	There was no historical data and the impacts could not be evaluated.
E	Improvement of Income level and Quality of Life	△	×	—
		While GRDP per capita growth is slowing down in the Nairobi metropolitan area, other areas show signs of economic growth. However, the correlation with the master plan is unknown.	Although economic growth in the corridor area is confirmed, it is lower than the growth in Mozambique as a whole. The impacts of the master plan could not be confirmed.	There was no historical data and the impacts could not be established.

Legend: ○ Impact by the corridor master plan confirmed △ Impact by the corridor master plan partly confirmed × Impact by the corridor master plan not confirmed
Source: JICA Study Team

To summarize the impacts of the corridor master plans on each target corridors, first, with regard to the Master Plan on Logistics in Northern Economic Corridor, infrastructure development linking the bases started at a relatively early stage (from 2013 to around 2015). The expansion of Mombasa Port, the access road to the port, and the development of the major arterial roads connecting to the port are progressing smoothly. Thus, the impact of the corridor master plan could be confirmed. As a result, a significant increase in transport volume can be seen in the corridor area. At the same time, there was also the formation of production bases such as SEZs mainly in major cities along the corridor. However, population concentration in Nairobi and Mombasa is accelerating, and in terms of balance among cities across the country or along the corridor, the growth is still not balanced. This trend implies that, if the infrastructure development by the corridor master plan is too directed towards the development of hard infrastructure, there would be the so called "straw effect". Consequently, economic gap between regions could be widened. In order to avoid or alleviate such issues, there is a need to not only continue strengthening the infrastructure along the corridor but also to improve the feeder network and create new industries in areas other than Nairobi and Mombasa. In the future, it will be important to pay close attention to the development of not only Kenya, that has a large-scale port and gateway function to foreign countries, but also Uganda, which is an inland country.

As for the Nacala Corridor Economic Development Strategies in Mozambique, this study was not able to confirm the correlation between the major improvements in logistics within and near Nacala Port and the development of the corridor master plan (although partial correlation could be confirmed with the introduction of EDI). The following can be considered as the main factors.

1) Nacala Port's limited handling capacity;
2) Insufficient development of related infrastructures, including access roads and main roads;
3) Absence of major industries and production bases along the corridor area.

Considering those challenges, improvement of port operation efficiency and development/improvement of related infrastructures such as roads are required. On the other hand, industries related to the corridor master plan are currently highly dependent on export of resources such as coal, and no remarkable growth of other industries could be seen. In the future, it will be necessary to take multi-faced actions, such as providing assistance for the revival of agriculture and manufacturing industries, as well as the urbanizing these two industries 'bases and providing human resources capacity building support. In other words, without implementing them, great impacts cannot be expected, even by improving the hard infrastructures.

Regarding the Corridor Development for West Africa Growth Ring Master Plan, as it was formulated in 2018, it was difficult to confirm the impact of the corridor master plan. In addition, sufficient statistical data could not been collected in the four target countries. Therefore, the difficulty to grasp the current situation and to conduct an analysis based on the collected data was confirmed. However, this situation was expected from the beginning of this study, and the data and information collected through this study are expected to be used for future impact measurement of the corridor master plan and for the implementation of future measures.

As mentioned above, there were limitations in the available time, data, and information for this study. On

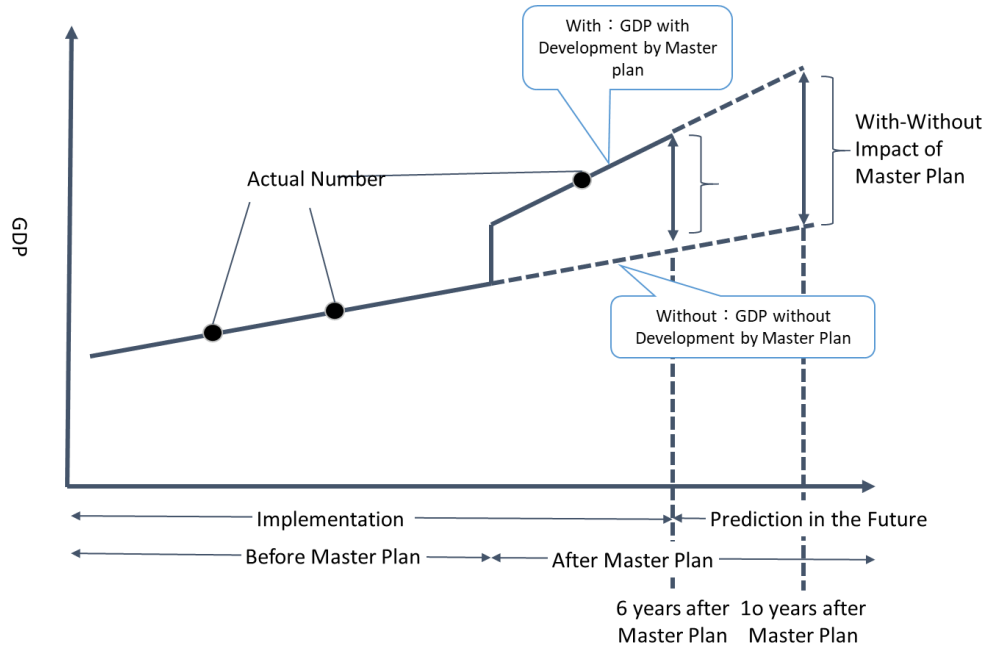
the other hand, focusing on the impacts of the corridor master plans, infrastructure development and expansion was seen in the coastal areas of Kenya, Ghana and Togo, resulting in an increase in port handling volume. In addition, there are some movements of industrial agglomeration in the coastal area. In that sense, support the development of the region from both hard and soft infrastructures through the corridor master plan can be expected to have a certain impact. On the other hand, from the viewpoint of eliminating the gap between coastal and inland areas, which is the purpose of the corridor master plans, no indication of the impact has yet been shown. According to the results of interviews conducted with government authorities, it could also be confirmed that the transfer of various functions to inland areas is not easy. Along with the development of the major infrastructure for transportation and logistics, the improvement of the efficiency of the existing industries, the development of urban infrastructures that can lead to improved quality living, and human resources capacity-building, will result in a long-term positive impacts on the corridor areas.

4.5.2 Implication of the Results of Evaluation and Key Aspects

The implication and key aspects to be taken from the evaluation of the impacts by the corridor master plans are as follows:

1) Impacts evaluation should be done by “With-Without”, in principle.

   The evaluation on the impacts in this study was conducted by comparing "Before-After" data due to some circumstances including data constraints. However, in order to highlight the impacts of the corridor master plans, it is desirable to evaluate the impacts by comparing the scenario in which specific projects proposed by the corridor master plans have been implemented, with the scenario in which they have not been implemented.



Source: JICA Study Team

Figure 4.5.1 Poverty Rate in Provinces of Ghana

When the impact of Master Plan is evaluated by the measurement of With-Without, "Without" is the estimated number which grow or remain same without any impacts from the projects mentioned in the Master Plan, and "With" is prediction number with taking the impact of Master Plan in consideration. Consequently, it is necessary to accumulate the past data, and set the standardized indicator among the area.

2) It is difficult to collect data about society and economy while the data on logistics can be collected relatively easily.

With regards to the data on logistics brought about by the development of port and road infrastructures, it is relatively easy to collect them and confirm their causal correlation. On the other hand, it is difficult to confirm causality between socioeconomic indicators such as GRDP, industrial development, population increase, income improvement and the corridor master plans. Therefore, the development of a methodology clarifying causal relationship is expected in the future.

3) It is important to confirm the status of specific projects rather than the corridor master plan itself.

Although the corridor master plan is important for suggesting the future direction of the area, that vision will be achieved through the implementation of the specific projects. Therefore, it is important to properly implement and monitor each project.

4) Evaluation on the impacts by supporting both hard and soft infrastructures is important.

As seen in the case of the Nacala Corridor of Mozambique, even if the development of hard infrastructure is limited, it can be supplemented by capacity development and introduction of new technologies such as IT. From the industrial point of view, it was confirmed that the development of hard infrastructure does not necessarily lead to the development of the industry sector along the corridor area. On the contrary, this suggests the importance of providing soft support.

5) Corridor master plans are not the only solution.

As explained in 3) above, the logistics and socio-economic development is not realized only by the corridor master plan, but it is also realized through the implementation of various policies, measures, and projects. Essentially, to properly grasp the impacts of the corridor master plans, it is necessary to take into consideration the relationship among them, the allocation of roles, as well as the synergy impacts.

6) It is important to consider the role of the private sector.

In every corridors, the drivers of socio-economic development are the activities of private companies. Indeed, new industrial formation is led by the private sector. Many of the development, maintenance, and operation of railways and ports are also delivered by the private sector. Moreover, their role is expected to increase in the future. It is important to clearly recognize the importance of the existence and role of such private players in the evaluation of the corridor master plans impacts and the review that will be conducted in the future.

7) It is important to consider the negative impacts of the corridor master plans.

In this study, while population concentration in urban areas has progressed, formation of cities and industries along the corridor could not be confirmed as a result of corridor development. Therefore, imbalance between regions may have been worsened. In addition, although data was not collected in this study, corridor development also has negative aspects such as increase in the number of traffic accidents and CO2 emissions. In the evaluation of corridor development impacts, it is important to grasp both positive and negative sides appropriately.

CHAPTER 5 Recommendations

Based on the results of this study, the following recommendations regarding the implementation and the review of the corridor master plans have been made.

5.1 Recommendations about the Implementation Structure and Arrangements of the Corridor Master Plans

1) Integrate corridor master plans in national development plans

In countries where field surveys were conducted, there were several cases where government officials did not know the contents or even the existence of the corridor master plans (especially for the Master Plan on Logistics in Northern Economic Corridor and the Corridor Development for West Africa Growth Ring Master Plan). In order to avoid the situation in which corridor master plans end only with surveys, it is important to show their true value. This can be done by making their existence known to a large public and integrating them into the national development plan of each target countries.

2) Strengthen cooperation among countries to implement the corridor master plan

The implementation of cross-border projects requires understanding, agreement and cooperation among the countries involved, but this is not always the case (especially for the Corridor Development for West Africa Growth Ring Master Plan). Thus, it is important for each country to cooperate and be aware of the implementation status of the concerned corridor master plan. Moreover, projects should be drafted and implemented to maximize the impact of the corridor master plans.

3) Implementation of the PDCA Cycle

Corridor master plans should be regularly reviewed and updates, as well as priority projects should be accurately monitored. Moreover, if bottlenecks exist, appropriate actions to remove them should be taken. In other words, the “Plan, Do, Check, and Action” cycle (PDCA cycle) should be implemented.

4) Strengthen statistical data service

Statistical data are required to conduct accurate monitoring and review of the corridor master plans. However, a lack of appropriate statistical services was noticed in several countries during this study (especially for the Nacala Corridor Economic Development Strategies in the Republic of Mozambique and the Corridor Development for West Africa Growth Ring Master Plan). It is thus necessary to call upon each country’s relevant organization to set indicators that enable comparison between the corridor master plans as well as collect data at province level within the country. These has to be done by taking into account each corridors specificities and each corridor master plans objectives.

5) Strengthen development partner’s communication and cooperation

The corridor master plans involve several development partners, such as the World Bank, AfDB, EU and Chinese government. Moreover, as there is a possibility that each actor is not aware of the whole picture, the implementation of the corridor master plans may not be fully optimized. Maximization of

the benefits for target countries and regions could be done by improving consistency between the different projects. In order to achieve that, analysis of each donors 'aid policy, including JICA's, sharing of opinion and information regarding corridor master plans, and implementation of co-financing scheme or a new fund, are required.

6) Creation of an impact evaluation platform

Once data required to evaluate the development impacts of the corridor master plans are made available, it is necessary to create an impact evaluation platform, as the SASI model in the EU and the Institute of Developing Economies – Geographical Simulation Model (IDE-GSM) in South-East Asia. Higher significance of the impact evaluation platform can be made by establishing a structure in which it can be internationally supported. Based on its experience, JICA can take the lead of such initiative in cooperation with the EU, as it is the international leader in regional development analysis, and establish an impact evaluation center for regional capacity building within an academic institution.

5.2 Recommendations to Enrich the Corridor Master Plans

1) Modify the balance between hard and soft infrastructures

As proposed by JICA, it has been confirmed by this study that in addition to the hard support such as infrastructure, soft support such as improvement of efficiency by introducing IT and capacity-building, as well as the development of industrial promotion measures, also have an impact. For example, there is only a little margin for hard support expansion in Nacala port in Mozambique, but is has been confirmed that the improvement of handling capacity efficiency have allowed to respond to the growing demand. The impact on the improvement of efficiency regarding ports and transboundary procedures have also been confirmed. Therefore, continuous development support approach and strengthening of both hard and soft aspects are required.

2) Share and apply successful experiences

Development of the Mombasa port and using it as a starting point for the development of other projects to expand development to the whole Northern Corridors, can be defined as one of the successful models of the corridor master plans. Although the development objectives, geographical characteristics and major industries differ depending on the country and region, the successful examples can be showcased and even implemented to other countries and regions (horizontal expansion) with proper adjustments.

3) Understand the negative impact by development

Although this study confirmed the development of major cities within the corridors, cities located on the corridors seem to experience delays in their development (for example, the population concentration in Nairobi and Mombasa). This is called the straw effect. Moreover, development can have negative impacts, such as an increase in the number of traffic accidents and higher carbon footprint. It is thus necessary to recognize these side effects, collect data and analyses them to implemented required counter measures.

4) Strengthen corridor master plans ‘industrial promotion logic

Strict causal correlation between specific projects and indicators related to industrial and socioeconomic development could not been confirmed in this study. In order to facilitate the confirmation of these impacts in the future, corridor master plans should clearly state the logic and scenario for each projects ‘industry and socioeconomic development. This would also greatly contribute to industrial and socioeconomic development.

5) Strengthen public finance management and promotion of comprehensive public-private partnership

Many of the target countries in this study suffer from heavy external debts. Therefore, strengthening public finance management, including debt management and investment budget securing, is required for a steady implementation of the corridor master plans ‘projects. In parallel, it is also necessary to promote private investments and management, as well as implementing industrial and regional development with more comprehensive public-private partnerships. Each governments are thus required to strengthen their awareness toward the importance of public and private sector cooperation, as well as conduct capacity-development for government officials and create a structure to support it, in order to properly implement the public-private partnership model.

6) Remove barriers for foreign companies including Japanese companies ‘participation and provision of incentives

In relation to the precedent points, development of the whole corridors requires not only participation of local private companies, but also investment from foreign companies. However, interviews with private companies conducted both in Japan and in target countries made clear that in addition to the investment environment, several barriers such as the lack of institutions, unequal taxation, administrative inefficiency, and poor governance, are preventing foreign companies to enter the local business markets. In parallel of implementing the corridor master plans, governments are also required to take actions to remove these barriers. They are also expected to create a system that would provide incentives to foreign countries willing to enter the local business market.