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КОНТЕЙНЕРНЫЕ ПЕРЕВОЗКИ: НА ПРИМЕРЕ ВОСТОЧНОЙ АФРИКИ

Аннотация. *Статья раскрывает исторические особенности внешней торговли Восточноафриканского региона и ее транспортного обеспечения. В ходе исследования выполнен анализ структуры экспортно-импортных грузопотоков Восточной Африки как в колониальный период, так и в настоящее время. Рассмотрены объекты инфраструктуры региона, в том числе морские порты, учтена их привлекательность для инвестиций и ведения бизнеса. Показан текущий уровень сервиса контейнерных линий по обслуживанию транспортной составляющей внешнеэкономических сделок, выделены главные порты Восточной Африки по уровню линейного сервиса и по контейнерообороту. Выявлены основные проблемы и возможности наращивания торговых поставок Восточной Африки и их логистического обслуживания.*

Ключевые слова: *Восточная Африка, контейнерные перевозки, контейнерная линия, внешняя торговля, морской порт, контейнерный терминал, грузопоток, транспортная инфраструктура*

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CONTAINER TRAFFIC: EAST AFRICAN CASE

Abstract. *The article reveals the historical features of foreign trade and its transport support in the East African region. In the course of the study an analysis of the export-import cargo flows structure in East Africa both in the colonial period and at the present time has been carried out. The region infrastructure facilities, including seaports, have been considered, their attractiveness for investments and doing business has been taken into account. The current level of container line service for providing the foreign economic transactions transport component has been shown and the main East African ports by level of line service and container turnover have been identified. The main problems and opportunities for increasing East African trade supplies and their logistics services have been revealed.*

Keywords: *East Africa, container traffic, container line, foreign trade, seaport, container terminal, cargoflow, transport infrastructure*

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Introduction

East Africa is a unique region due to its unrivalled geographic location between East and West, as well as to its wide range of opportunities, such as human resources, national economic integration, significant agricultural export supplies and industrial development prospects. Nevertheless, East Africa is considered as an impoverished area with a large number of obstacles to the realisation of the above opportunities, including frequent war conflicts, piracy, social problems, weak infrastructure network, low liner carriers' activity level in East African ports, investment drought, etc.

Despite the above, East Africa does have significant trade flows in the world market, with a certain amount of the commodities being delivered in containers from East African traders to foreign buyers and vice versa. When it comes to the agricultural products grown in the region, their value is estimated at dozens of USD billions. Thus, the question arises: how the growing demand for goods transportation in containers can be met?

East African foreign trade requires a productive transport system along with improved liner shipping. The main objectives of the paper are a sequential consideration of inbound and outbound trade structure, a research of East

African container ports and port hinterlands as well as the certain position of the region in global shipping industry in relation to container line services. Another objective is to define regular liner routes between East Africa and the rest of the world. Other equally important purposes of the study are to compare container handling volumes of East African states to assess the current market situation, to define the key maritime transport hubs and to point out their competitive advantages.

Historical background and overview of East African trade

Most African territories were ruled by European Colonial Powers until the second half of the 20th century, the same applying to East Africa. In 1913 almost all African territories belonged to the Europeans with the exception of the Ethiopian Empire, which could save its independence for a long period and resist the European influence. East Africa was divided into colonies ruled by Italy, France, Germany, Great Britain and Portugal.

The lands of East Africa were predominantly agricultural [18], therefore their foreign trade was based on raw materials export. Moreover, in the epoch of industrialisation East African colonies kept falling behind strong economies of the time (the USA, France, Great Britain) and the dominions (Canada, Australia, New Zeeland). In addition, East African local population had no autonomy to make decisions about its international trade and manufacture. As a result, the mentioned colonies had to strengthen trade relations with their metropolitan country, but their producing market was primarily domestic, even though some of the East African goods were included in the commodity turnover of entire Africa. Animal husbandry was one of the most traditional economic activities in East Africa, while plant growing was a complicated work because of poor soils, drought and technological backwardness. The main colonial products of East Africa were coffee, tea, oil seeds, nuts, wheat, corn, cattle meat, cattle skins, tobacco and others. The most significant production of East Africa domestic export was bagged coffee beans, its share in export structure being estimated as one third [11; 21].

Table 1

East African colonial goods

Territory	Colonial goods
South Sudan	Cotton, animal skins, peanut products
Eritrea	Beeswax, animals, skins, fish, canned meat, salt, shells, pearls, vegetable ivory
Djibouti (French Somaliland)	Coffee, tobacco
Ethiopia	Khat, coffee, durra, corn, beans, bananas, peanut products, peaches, melons
British Somaliland	Animal products, live sheep
Italian Somaliland	Sheepskins, goatskins, cereals, fruits, vegetables, sugar, coffee, tea, spices, cocoa, fish, sesame, cotton
Kenya	Coffee, sisal, tea, animal skins, meat, canned food, cement, textiles, glass, paint, chemicals, paper, metal, footwear, brewing products, sugar, tobacco, soda ash, beans
Tanganyika (Tanzania)	Coffee, cotton, sisal, tea, oilseeds, bananas, canned food, brewing products, sugar, tobacco, paint, textiles, metal, sunflower seeds, cashew nuts, timber
Uganda	Coffee, cotton, animal feed, animal skins, sugar, tobacco, canned food, textiles, metal
Mozambique	Cotton, tropical foodstuffs, copper, tea, tobacco, sugar, copra, rice, sisal
Nyasaland (Malawi)	Tung oil, ivory, rubber, tobacco, tea, coffee, cotton
Northern Rhodesia (Zambia)	Copper, peanut products, zinc, tobacco

End of Table 1

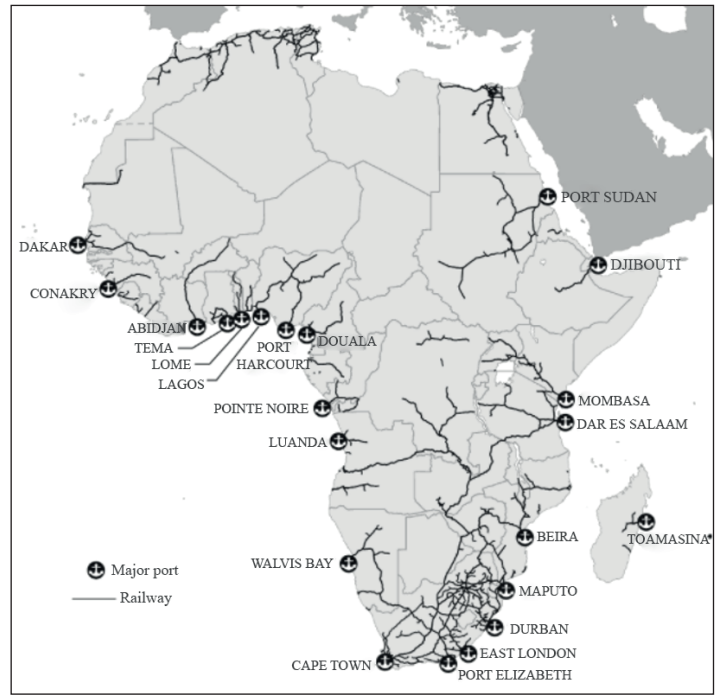
Territory	Colonial goods
Southern Rhodesia (Zimbabwe)	Tobacco, tea, animal skins, bananas, sugar, asbestos, chromite
Ruanda-Urundi (Ruanda, Burundi)	Coffee, cotton, palm oil, rubber, peanuts, tea, beans, peas, sugar, tropical food
Madagascar	Tobacco, vanilla, coffee, graphite, cloves
Zanzibar	Cloves, copra, coconuts, coconut oil, oilcake, shells, animal skins, chillies, fibres
Comoros	Vegetables, groundnuts, cotton, meat, animal skins, timber, cereal, tobacco
Mauritius	Sugar, tea, tobacco, sackcloth, fibre

Sources: [5; 8; 10; 12; 13; 20; 28; 32; 33; 34]

The lack of mineral resources and low-developed mining industry enhanced the technological and economical gap. There are lodes of copper, gold, diamonds, soda ash located in the area. This region has also wood and water resources. Nevertheless, there is a shortage of coal and oil, which causes obvious problems to East African heavy industry development [29]. Of course, when it comes to overseas trade, it is necessary to define all transport details in the considered area. The colonies of East Africa owned extremely useful railway network, it partially replaced horse transport and porterage. Maritime infrastructure also had some developments during the colonial period when new deep water berths were put into operation at the East coast of Africa [9; 27]. The essential factor for East Africa transport system development was the construction of roads, which allowed to reduce time of the ports delivery. What is more, congestion and logistics delays also decreased (figures 1, 2). It is necessary to notice, though, that the roads quality was unsatisfactory, since they had no surfacing material. By the way, tropical climate conditions bring significant costs to East African road constructing and maintenance, as this region infrastructure is liable to floods and water level change [25].

Source: [6]

Fig. 1. African railway network: existing lines, 1979



Source: [19]

Fig. 2. African railway network: existing lines, 2009

Therefore, by the 21st century East African export trade flow comprised mostly agricultural products and natural resources. Colonialism effect assumed the development of primitive mining and farming economic activity,

while maintenance and improvement of the industrial sphere used to play minor roles. The infrastructure problems are still felt in East Africa causing shipping delays, turnover limits, common ineffectiveness. But it should be noted that there have been some positive developmental changes of the region, such as a strong increase in foreign trade volume, specifically in exports [1].

General analysis of East African trade turnover

Between the colonial period and today the region's foreign merchandise trade flows have undergone only slight changes. It is necessary to sort out the details: most of the economies in question are still based on agricultural and pastoralist activities, and are classified as least developed countries. The most prospective market player in East Africa is Kenya, its export commodities include construction materials, cement, lime, plastic, paper, cardboard, metal products, medications, soap, chemicals, footwear and textile, as well as farming products: fruit, sugarcane, cut flowers, coffee, tea, etc. Tanzania, Rwanda, Mozambique, Ethiopia, Uganda and others still export the same raw goods. However, the most common import goods for entire East Africa are: machinery, electronics, motor vehicles, transportation equipment, pharmaceutical products, foodstuff, metal work, palm oil, constructing materials, etc. Of course, import cargo flows involves bulk and breakbulk cargoes as well, e.g. fertilizers, tubes, coal, oil and ore [4]. It is obvious that such exported and imported containerized cargo flows are compulsory to be serviced by container terminals. As in the past, the external trade relations of the central East Africa are maintained by Kenyan and Tanzanian ports, of the north East Africa – by Djibouti, of the south part of the region – by Beira and Maputo, the East Africa island countries – by their own national ports.

In compliance with Africa infrastructure index, the most advanced transport network in East Africa is in Mauritius, Kenia, Zimbabwe and Djibouti [2].

The current state of East African maritime trade and container ports

Maritime transportation infrastructure is a vital part of the region's export-import commodity flows coming from supply and demand in the hinterland. Thus, ports are able to maintain sufficient turnover, depending on several conditions, e.g. investment and enterprising, port facilities and performance, liner connectivity and cargo volumes. Of course, there is a competitive environment in trade gateway services, with ports competing for domestic outbound and inbound cargoes, so every market player has its own specific volume of traffic and freight to attract. Everyone who manages supply chains – freight forwarders or other customers of the carrier and the port (more precisely, a container terminal) – requires highly skilled handling and shipping services. The above might be provided by a developed container line shipping network in the area and progressive infrastructure, superstructure and terminal cargo works.

Table 2

East African container ports in terms of trade importance and hub attractiveness

Port	Country (LSCI)	Terminal	Container lines, direct services	Direct connection with foreign (non-African) countries
Mombasa	Kenya (17.24)	Mombasa Terminal KPA (Kenya Ports Authority), Kilindini Container Terminal	ONE, OOCL, CMA CGM, MSC, COSCO, Maersk: East Africa – East Asia Service, East Africa – South Asia, East Africa – Middle East, East Africa – Red Sea, Feeder service	Shri Lanka, Malaysia, Singapore, China, India, Jordan, Saudi Arabia, Egypt, UAE, Oman
Dar Es Salaam	Tanzania (15.47)	Tanzania International Container Terminal Services Ltd (TICTS), Conventional Terminal	ONE, OOCL, CMA CGM, MSC, COSCO, Maersk: East Africa – East Asia Service, East Africa – South Asia, East Africa – Middle East, Feeder service	Maldives, Shri Lanka, Malaysia, Singapore, China, UAE, Oman

End of Table 2

Port	Country (LSCI)	Terminal	Container lines, direct services	Direct connection with foreign (non-African) countries
Djibouti	Republic of Djibouti (35.10)	Doraleh Container Terminal (DCT)	CMA CGM, MSC, COSCO: East Africa – Red Sea, East Africa – Southeast Asia, East Africa – East Asia, East Africa – Middle East	Saudi Arabia, China, Singapore, Jordan, Egypt, Oman, UAE
Beira	Mozambique (14.36)	Cornelder de Mocambique (CdM)	MSC, CMA CGM: East Africa – Southeast Asia, Feeder service	Singapore, Malaysia
Port Reunion	France (Reunion 22.37)	Pointe des Galets Terminal	MSC, CMA CGM: East Africa – Middle East, East Africa – Oceania, East Africa - Southeast Asia, Feeder service	UAE, Australia, Singapore
Port Louis	Mauritius (33.55)	Mauritius Container Terminal	MSC, CMA CGM: East Africa – South Asia, East Africa – Oceania, East Africa - Southeast Asia, Feeder service	China, Shri Lanka, Malaysia, China, Australia
Port Victoria	Seychelles (8.53)	Land Marine Terminal (Victoria Port Terminal)	CMA CGM, Maersk: East Africa – South Asia, East Africa – Southeast, East Africa – Middle East, Feeder Service	Maldives*, Shri Lanka*, Malaysia*, Singapore*, UAE, Oman
Port Longoni	France (Mayotte 5.32)	Longoni Terminal Smart	CMA CGM, MSC: East Africa – Middle East, Feeder Service (*Mozambique)	UAE
Maputo	Mozambique (14.36)	DP World Maputo Container Terminal	MSC, CMA CGM, Maersk: East Africa – South Asia, East Africa – Southeast, Feeder Service	Singapore, Malaysia
Nacala	Mozambique (14.36)	Terminal de contentores (PDN)	CMA CGM, Maersk: East Africa – South Asia, East Africa – Southeast, Feeder Service	Singapore, Malaysia
Toamasina	Madagascar (7.48)	MICTSL (Madagascar International Container Terminal Services Limited)	MSC, CMA CGM: Feeder Service	-
Berbera	Somalia (9.99)	Berbera Terminal (Berbera Sea Port)	MSC, CMA CGM, Maersk: East Africa – Red Sea, Feeder Service	Saudi Arabia, *Egypt, *Oman, *UAE
Massawa	Eritrea (3.46)	Massawa Port Authority	CMA CGM: East Africa – Red Sea, Feeder Service	Saudi Arabia

Note: * – one-sided liner service (only import/export branch).

Sources: [15], official websites of the given container lines

LSCI – Liner Shipping Connectivity Index, is an indicator of a country's access to the global maritime liner container shipping network and therefore has a significant impact on containerised trade flows. The UNCTAD LSCI is calculated on the basis of five statistics: the number of calls on liner scheduled services, number of liner carriers providing the service, number of vessels on these service routes, total carrying capacity of the vessels in TEUs and the capacity of the largest vessel on the route. The LSCI UNCTAD may be used to estimate manufactured and agricultural goods in containerised trade flows between particular countries [7].

According to table 3, East African ports have incredibly limited container line service. The largest ones having the listed transport links with Asia, Mauritius and Reunion are specific cases, all of them having connection with Oceania. Most East African continental ports have stable liner connections with Middle East, including Saudi Arabia (Jeddah Red Sea Gateway Terminal, NCT King Abdullah Port), Oman (Salalah APM Terminal) and UAE (DP World Jebel Ali Port Terminal). Till present time, in the region there is a large number of ports having only feeder services, e.g. Zanzibar, Vohemar, Nosy-Be, Port d'Ehoala, Tulear, etc. This level of container lines service increases delivery costs, and the main reason for this is the cost of sea transportation, which in its turn is caused by the need to transship in the world's busiest ports. In some cases, transshipment in the big regional ports is required (in Durban, Mombasa, etc.).

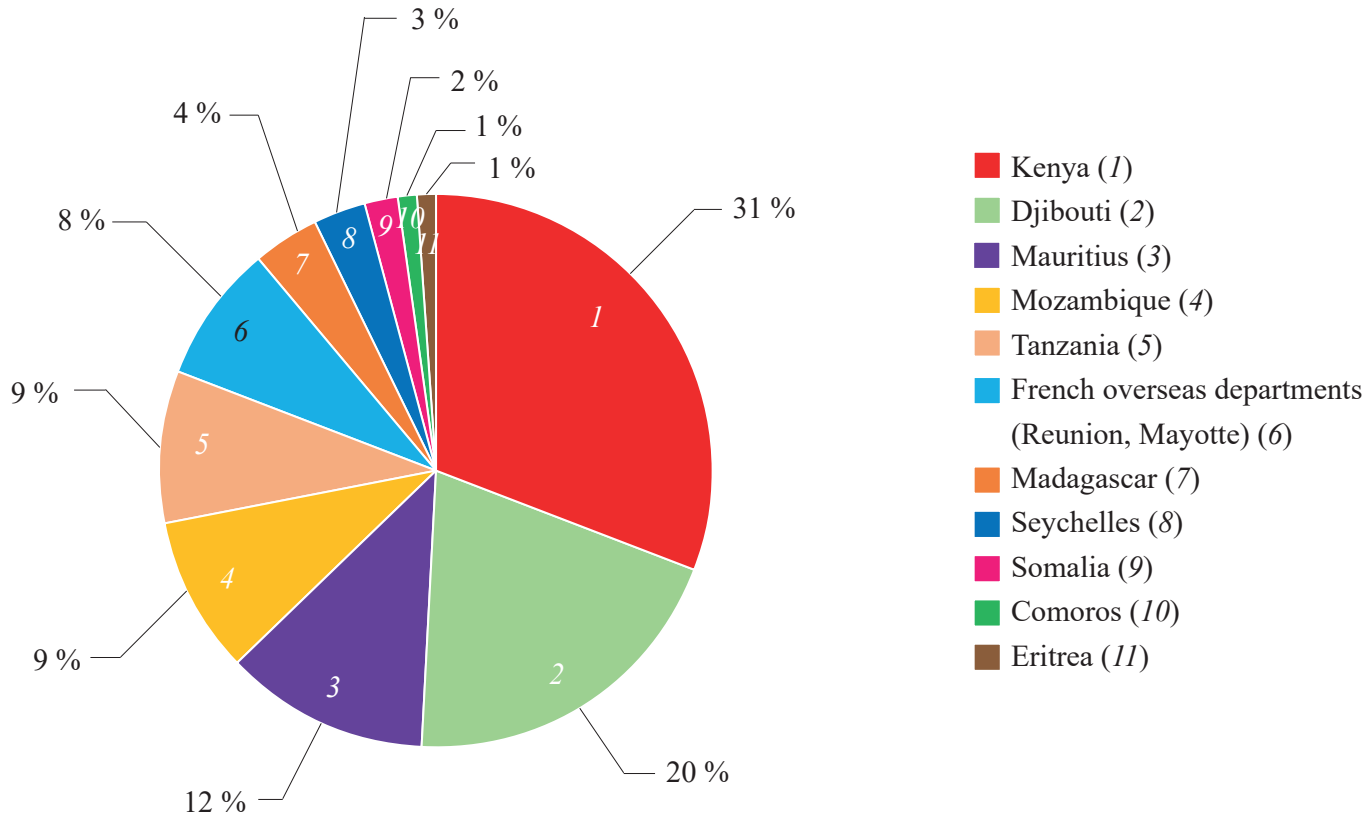
Table 3

Overview of East African container ports throughput dynamics

Port	Container throughput, TEU (thousands)			
	2012	**2014**	**2016**	**2019/2020**
Mombasa	903	1012	1091	1416.654//2019
Djibouti	791	856	987	932//2019
Dar es Salaam	562	665	622	450.775 (Tanzania in total)//2019
Port Louis	576	554	511	570.8 (Mauritius in total)//2019
Port Reunion	210.957	225.938	324.673	374.869//2019
Toamasina	182	207	209	199.713 (Madagascar in total)//2019
Beira	171	207	197	427.3 (Mozambique in total)//2019
Port Victoria	133 (Seychelles in total)	150 (Seychelles in total)	132 (Seychelles in total)	154 (Seychelles in total)//2019
Maputo	88	125	97	427.3 (Mozambique in total)//2019
Berbera	36	53	92	92.238 (Somalia in total)//2019
Nacala	65	97	71	427.3 (Mozambique in total)//2019
Zanzibar	65	79	77	450.775 (Tanzania in total)//2019
Moroni	17	18	18	54.3 (Comoros in total)//2019

Sources: [3; 16; 22; 24; 30]

The statistics indicates that the largest proportion of containerised cargo handling is shared by the ports of Mombasa, Djibouti and Dar es Salaam, which can be explained by the fact that the above ports, apart from advanced superstructure, are provided with developed auto- and railroads connecting the ports with their hinterland. Well-developed auto infrastructure reduces drive time to or from ports, equaling to 24–48 hours for remote hinterland zones. For example, a lorry with cargo from Rwanda can reach Mombasa in this time interval, though transit time from Addis Ababa to Djibouti is up to 18 hours. Hinterland may also be considered as a reason for these three ports' market domination. There are many landlocked states in East Africa: South Sudan, Ethiopia, Uganda, Rwanda, Burundi, Malawi, Zambia, Zimbabwe. Having no access to sea, they generate trade flows that can be maintained in ports. Meanwhile the ports are interested in increasing freight traffic, and normal competitiveness shows that they struggle for cargo flows. Distribution zones of Mombasa are Uganda, South Sudan, Central African Republic, Rwanda, Burundi, DR Congo; the ones of Djibouti are Ethiopia, Sudan, South Sudan; of Dar es Salaam are Zambia, Rwanda, Burundi. In addition, liner services at Mombasa, Djibouti and Dar es Salaam make maritime carriage cheaper and less complicated, since the ports are involved in ocean service routes and the container feeder transshipment is usually not needed. Coastal countries can also be included in the hinterland of a large port, which is caused by poor infrastructure of national transport network and limited container line service. Thus, two options are proposed: compulsory ship call at a hub port (e.g., Durban) or road transportation to a hub port, avoiding sea transshipment.



Source: [14]

Fig. 3. East African ports container handling volumes by country

The total container traffic is estimated at 4,57 million TEUs, the leading positions are occupied by Kenya, Djibouti, Mozambique, Tanzania (coastal countries); Mauritius, Reunion (island countries). Almost 15 % of entire African container traffic is serviced in the East African ports, but such volumes are still relatively small compared to other regions: for instance, the collective market share of Egypt, South Africa and Morocco is 51 %. It is caused by different obstacles including East African ports' and transport network development, as well as low operational efficiency, long dwell time, high cargo operations costs, poor connections to ports by sea and land [26].

Overview of East African trade flow patterns

Table 4

East African exports

Outbound trade flows (export)		
Country	**Main commodities**	**Value, billion USD**
Kenya	Agricultural: coffee, tea, spices, cut flowers, plants, vegetables, fruits, nuts, oils, fats, tobacco Manufactured: cigarettes, metalwork, cement, foodstuffs	5.83 (2019) 6.02 (2020)
Tanzania	Manufactured: electronics, equipment, machinery, furniture, metalwork, vehicles, plastic, cement, animal feed, toys, foodstuffs, quicklime Agricultural: tea, cotton	4.97 (2019) 5.21 (2020)
Djibouti	Manufactured: vehicles, machinery, rubber, foodstuffs, electronics, toys, cement, chemicals Agricultural: oils, fats, milk	0.11 (2019) 0.09 (2020)
Mozambique	Manufactured: aluminum products, plastic, machinery, chemicals, pharmaceutics Agricultural: tobacco, sugar, fats, oils, cereals, cotton	4.72 (2019) 3.46 (2020)

End of Table 4

Outbound trade flows (export)		
Country	**Main commodities**	**Value, billion USD**
Uganda	Agricultural: tea, cocoa, cotton, coffee, sugar, corn, plants Manufactured: cement	3.56 (2019) 4.14 (2020)
Ethiopia	Agricultural: cotton, coffee, oil seeds, meat, vegetables, leather, beans, cloth Manufactured: electronics, machinery	2.67 (2019) 2.52 (2020)
Zambia	Manufactured: copper products, cement, chemicals, machinery Agricultural: tobacco, sugar, cotton	6.96 (2019) 7.80 (2020)
Zimbabwe	Manufactured: nickel products, Agricultural: tobacco, sugar, tea, cotton	4.27 (2019) 4.39 (2020)
Rwanda	Agricultural: coffee, tea, rice, wheat, flour Manufactured: tin products, yeasts	1.16 (2019) 0.88 (2020)
Madagascar	Agricultural: coffee, tea, tobacco, vanilla, cloves, crayfish Manufactured: cloth	2.56 (2019) 1.95 (2020)
Mauritius	Agricultural: fish, sugar, cotton Manufactured: cloth, plastic	1.87 (2019) 1.54 (2020)
Seychelles	Agricultural: seafood, fruits, nuts Manufactured: metalwork	0.84 (2019) 0.34 (2020)
Comoros	Agricultural: cloves, vanilla, fish Manufactured: scrap, metalwork	0.04 (2019) 0.01 (2020)
Malawi	Agricultural: tobacco, tea, sugar, soybeans, vegetables Manufactured: scrap, metalwork, animal fodder	0.91 (2019) 0.78 (2020)
Somalia	Agricultural: sesamum seeds, peanuts, seafood, fruits	0.41 (2019) 0.29 (2020)
Eritrea	Agricultural: spices, nuts, fruits, vegetables	0.49 (2019) 0.62 (2020)

Sources: [23; 31]

The above outlook shows that agricultural products still play the essential role in East African foreign trade. Its import commodities comprise a large number of industrial goods: metalwork, machinery, electronics, vehicles, medicine, paper, cardboard, foodstuffs, rubber tires, etc. [17]. The main import trade partners for entire East Africa are China, India, the UAE and the EU, while the ones for export trade include the USA, China, India, the EU, the UK and others.

Practical significance of the research

The paper presents the current state of logistic services for East African trade flows which have a great opportunity for economic growth, increased consumption and production, while the shipping sector still cannot get rid of the ordinary impediments slowing down the trade turnover. The reviewed data helps to successfully solve the key problems and identify potential implementation opportunities. The information concerning liner services and ports characteristics is definitely useful for the participants of East African transportation chains, including suppliers, traders, auto carriers and freight forwarders. On the other hand, the described sustainable cargo flows and volumes might attract a greater supply of maritime transport to fully meet the demand. At the same time, the consideration of East African container handling market competitiveness reveals a conjuncture that distinguishes the local hubs due to their geographic location or major industrial and agricultural areas. The recent increase in liner shipping covering East African ports makes a strong case to consider the region as appealing for private sector investments in ports, infrastructure, industry, local freight forwarding and shipping business.

Results

1. It has been revealed that the colonial period of East Africa has influenced its transport sphere, especially railways, as well as its export commodities represented by agricultural products.

2. The main East African container sea ports and their terminals have been specified: Mombasa (Mombasa Terminal KPA, Kilindini Container Terminal), Djibouti (Doraleh Container Terminal), Dar es Salaam (Tanzania International Container Terminal Services Ltd (TICTS), Conventional Terminal), etc. The competitive advantages of Mombasa, Djibouti and Dar es Salaam ports are: high value of LSCI, hinterland economic opportunities, accessibility to developed infrastructure, high port operations performance, transshipment traffic, investment environment, port security.

3. The most important problems of East African transport network have been highlighted, including the lack of infrastructure and superstructure, long dwell time, counterproductive port management, low level of cargo works efficiency, high costs of cargo handling operations, as well as limited container lines services.

4. Container handling market segmentation has been given. It has been concluded that the market is led by Kenya and Djibouti.

5. Consideration has been given to East African hinterland ports as well as to export and import commodities. The most exported goods are agricultural, while the most imported ones are industrial.

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