The Driver of Hub Port Development in Africa

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Abstract
Maritime transport is a strategic function with over 80% of global trade by volume. Throughout the last century, seaborne world trade volume, has seen a general trend of increases but continues to be largely determined by developments in the world economy and trade. In 2018, according to UNCTAD Africa is having 7% of the share of maritime trade in export and 5% imports by volume, but only 4% of container trade, despite his economic potential. This can be explained by the low quality of the infrastructure of the port, but also of the hinterland. This paper aims to explore global hub port criteria in an international context in order fill in the gap on the basic criteria that can make a hub port in Africa. In addition, it will investigate the driver of the development of a hub port in Africa, an overview of the top three major African hub ports (Tangier Med, Port Said and Durban) is provided. The results and interpretations of this finding could have a significant effect on the African stakeholder’s to understand main factors inducing to develop global hub port in Africa.

Keywords
Global hub port, maritime transport, logistics in Africa, shipping network and transshipment flows.

Introduction
Transport and logistics services assist the progress of the international trade. The quality and efficiency of logistics services is imperative for the international trade. Logistics infrastructure and operational processes can be the principal advantage of the global trade integration (1). Efficient and cost-effective transportation is strong link of the global supply chains and the drive of economic development. UNCTAD valuated that over 80% of a global trade by volume and more than 70% of the value of the merchandise are moved by sea and handled by ports (2017). The maritime transportation is a strategic function and the most important mode of international transportation. The trade competitiveness of all the countries relies on the effective access to international shipping services and ports efficiency. According to Albert Zeufack, World Bank chief economist for the African region “growth has rebounded in sub-Saharan Africa, but not fast enough. And still far from pre-crisis growth levels” With only 1.7 of the economic growth in 2016. It accounts for approximately 2.7% of global trade by value. The continent contributes higher shares to global seaborne trade – 7% of maritime exports and 5% of maritime imports by volume. While one-third of African countries are landlocked, maritime transport remains the main gateway to the global trade and depends heavily on ships and ports to service its intercontinental trade. (UNCTAD 2017)
Africa is a source of raw materials of many developed countries; about 40% of goods exported by sea were crude oil in 2017. With 54 countries, Africa has 1.1 billion inhabitants in 2013, the second most populous continent in the world, and its population has grown on average by 2% per year since 2000. According to Business analysts, researchers and organism (6); (7); (8) on the continent, the population’s growth, the increasing wealth and the regional integration aims to facilitate the international trade and maritime trade. Nevertheless, there is still concern about the poor infrastructure of ports for freight and hinterland access.

Ports are often critical interfaces and constitute the entry of a continent and the main trade route between Africa and the world (2). However, Africa does not have the efficient port to accommodate the existing traffic and support its growth. The 3 main ports in the northern and Southern of the continent are Port Said at the Suez Canal, Durban in South Africa and Tangier Med in Morocco. The rest of the ports suffer of problems of capacity, efficiency and terrestrial connectivity. West African’s port, are concentrated but congested and handicapped by regional political crises and security problems. East Africa has a less concentrated port but presents similar issues (5).

Egypt, Morocco and South Africa have implemented many measures to strengthen the competitiveness of their ports including, the national port strategy by 2030 for Morocco, strategic plan of ports regulator of South Africa 2017/18 to 2021/22 or strategic vision to develop the Egyptian port 2020. Ports are considered an integral part of supply chains but in many cases and particularly in developing countries of Africa, ports are not yet well integrated with other elements in supply chains. It is subsequently imperative to examine the situation in African ports and evaluate the key factors or criteria to develop this concept in this continent.

The Evaluation of the port’s performance is a complex task, due to the diversity of variables and operations associated to ports (9). Literally, the efficiency of a port is due to diverse factors and criteria. In this paper, we will be investigating the main factors affecting the development of hub port in Africa. (11) First of all, we will be reviewing the definition and characteristics of a hub port and determine its assessment criteria. An overview of the seaborne situation in Africa is important to truck the development, then we will explore these criteria to analyze the hub ports in Africa and finally we will be providing suggestions to develop new regional hub ports in Africa.

Methodology
This methodology aims to analyze the port’s framework of the African continent by region, in order to define the key success factors for developing a hub port in Africa. Our primary goals is to define new research gaps in the literature regarding criteria of hub port in Africa. Our review consists on the following steps. First, the evolution of the definition of port over time was reviewed. Second, the scientific literature based on the criteria in the international context was examined, and few ones in the African context. Third, the data relative to the African port was analyzed. Finally, data analysis and synthesis were performed. Here we discuss with more details our methodological approach. We found that it efficient to use the databases of the World Bank and the data of the United Nations, as well as any other study that has analyzed or quantified data concerning the ports in Africa. These databases contain key indicators that measure the efficiency and performance of African ports. After collecting the data, we will analyze them, based on a comparative analysis of African ports indicators to international ports. In order to assess the competitiveness and efficiency of its ports in relation to the world scale. These elements will then allow us to analyze the main obstacles and problems that hinder the development of hubs in Africa, as well as the key success factors in order to develop the maritime industry in the continent and emerge from the regional hubs.

Literature Review of Hub Port
This section reviews literature associated with global logistics hub port and selection criteria of hub port. Despite the numerous studies of selection of criteria of hub port, research has not yet addressed the issue of logistics in developing countries, particularly in Africa. Although research interest in this continent is growing, in this case, we will use the data and studies of North America, Europe and East Asia context.

Global Hub Port Analysis Criteria
Nowadays, clients of ports such as shipping lines, agent, forwarders and shippers, select a port depending on many criteria. The most relevant factors are cost and quality of service according to (Porter, 1990) (17). There are very significant numbers of studies on port determination criteria, from the perspective of shippers, carriers and few ones made by freight forwarders. These studies have defined a number of criteria to evaluate the performance of hub port. Regarding hub port selection, in 1988, (Bird and Bland) have demonstrated that frequency of shipping service, Time on the route and labor problems at port are the main reasons to choose a seaport (13). In 2006, Koi Yu Adolf indicate
that cost is not the only factor explaining port attractiveness but there are other factors, notably, time efficiency, geographical location and service quality(14). In 1991, the results of Murphy studies showed that equipment’s availability, loss/damage performance, large shipment capabilities, convenient pickup and delivery times are the most important factors in selecting international ports from the perspective of different market player (carrier, freight forwarder, and shippers) (15). So far, in 2001 Malchow and Kanafani have identified that the increase in either the oceanic distance or the inland distance between the port and the shipment’s origin or destination served to make a port less attractive (16). In 2004, lim and al reveals through the AHP survey for the transshipment that ‘Handling Cost of Containers’, ‘Proximity to Main Navigation Routes’, ‘Proximity to Import/Export Areas’, ‘Basic Infrastructure Condition’ and ‘Existing Feeder Network’ were to be the five service attributes with the highest importance in the global container terminal industry(17). In 2007, Tangzon found that operational efficiency in port is very important for policy makers and operators to gain competitive advantage and win in the competition. In addition, it is notable that strategic location in the main maritime lines is critical for hub and government with efficient and simplified administrative processes are crucial to attract operators (19). In 2009, Panayides & Dong-Wook have selected four key parameters for the integration of ports in global supply chain, its included ‘information and communication systems’, ‘value-added services’, ‘multimodal systems and operations’, and ‘supply chain integration practices’ (20). Joyce and al. demonstrate using a logit model for the assessment, that port efficiency and scale economies are the most important dimensions in determining port success as a hub port in the Asian context (21). The findings of Tongzon in 2007, suggest that factors as high port efficiency, good geographical location, low port charges, adequate infrastructures, wide range of port services, connectivity to other ports, are important in the port selection process.

In 2011, Wang reveals that port’s locations, feeder services, intermodal connections and port efficiency are important hub port selection criteria in Europe. Zarei demonstrates in 2015, that ship suppliers play important role in attracting shipping companies to the port, the quality of products supplied by chandlers, advanced port management, infrastructure, and quality of suppliers’ services are the main factors for port selection (22).

As per Gohomene et al. (2016), the port selection decision could vary across geographic regions factors influencing shipping lines’ port choice decisions , as the port choice results in Africa are significantly different Asia, North America, and Europe , where port cost and service quality often appear to be in the top priority criteria for carriers’. The authors, also shows that the strategies of ports are important for the development of hub port (23). van Dyck (2015) established that high port efficiency and performance, stable political environment of the country concerned, and adequate port infrastructure and handling facilities were the three most important requirements/influential factors respectively for a potential West-African hub port, according to the major shipping lines calling at ports in the region (24). Regarding the policy issues World Bank have highlighted in 2010 the public African port capacity is low, performance is poor, and this is inducing to a higher cost and a loss of market share. In the same context the world Bank suggest to the African government to find the appropriate responses to changes in shipping markets

The Following is a summary of the fundamental port choice criteria:

- Geographical location: hub ports are developing in regions located at the confluence of commercial maritime and land lines with access to airlines.
- Harbor facilities (Infrastructure): capacity of port facilities for example berths capacity, the cargo handling capacity, the intermodal transport infrastructure.
- Operational efficiency: many indicators can measure this such as Time to export/Import (the time necessary to comply with all procedures required to export goods. The time calculation for a procedure starts from the moment it is initiated and runs until it is completed. Including port Clearance, inland transport and customs clearance), vessel turnaround time (is the average number of days that container vessels need to enter and exit ports of the world); Port dwell time (refers to the time cargo spends within the port or its extension and connectivity
- The hinterland: is a land space over which a port terminal, sells its services and interacts with its clients. It accounts for the regional market share that a terminal has relative to a set of other terminals servicing a region. It regroups all the customers directly bound to the terminal and the land areas from which it draws and distributes traffic (40). In 2002 Haezendonck and Notteboom have given an examination to demonstrate that the hinterland accessibility, productivity, quality, notoriety, security and reliability are very important to improve a port competitiveness.
- The government is the catalyst that set up the incentives to attract the private sector
Background on International Hub Port

International Hubs

The changes in the global geography manufacturing, industrial production and consumption is accompanied by the changes of geography of freight distribution and the emergence of new hub port with high level of traffic concentration. This is mainly the case of Pacific Asian port emerging in large-scale high throughput nodes such as Hong Kong, Singapore, Shanghai, Busan and Kaohsiung (Rimmer, 1997). These hubs are the largest container ports in the world. In the case of North America, the hubs are the strategic gateways at east and west coasts, for Example the port of San Pedro bay in Los Angelos and the port of New Jersey in New York. The growth of trade and transport in general, supported by economic growth and the enlargement of market areas are the principal reason of the expansion of such places. Recent European developments seem to be the same. European Distribution Centers (EDC) are becoming larger to consolidate distribution centers into European centers. With access to a significant part of the European marketplace required, Europe entre is the preferred location namely Benelux and eastern France. The Netherlands is emerging as the most favored location for European logistics, due to excellent accessibility, advanced terminal and transport infrastructure, critical mass of logistics functions and attractive operating conditions the Port of Rotterdam are among the most important hubs for international freight flows in Europe. So far in Africa new hubs are developed in the last decades, and constitute the best-connected port in Africa namely Tangier-Med, Port Said and Durban. The connectivity indices of Morocco is progressing due to the trans-shipment hub Tangier–Mediterranean. In Eastern of Africa, a new trans-shipment hub is in progress in Djibouti benefiting from its geographical position and private investments. To Summarize the key nodes of the density of container ships in 2016 according to UNCTAD 2017 are Malacca, Panama, the Strait of Gibraltar and Suez, and traffic is denser in general in the northern hemisphere, with exceptions, for example around Santos (Brazil), South Africa and Mauritius.

According to “review of transport maritime 2017” the best connected hub ports per region are Panama in central and south America, Morocco in Africa, China in Eastern Asia, Singapore in South-East Asia, Sri Lanka in Southern Asia and United Arab Emirates in Western Asia.

Results and Discussions

1- Background on African Port Development

1.1- Evolution of Maritime Traffic in Africa

Africa accounts around 2.7% of world trade in value (Word trade organization report 2017), the continent trade depends strongly on ports. It contributes much more to world maritime trade in volume, accounting for 7% of exports and 5% of imports by sea (Figure 1). Maritime transport remains the main means of access to the global market, while one third of African countries are landlocked. According to UNCTAD Data base (2016), the analysis of the structure of imports by sea reflects a predominance of dry cargo (76%) in 2016, which explains the emergence of containerization in African imports, while oil and gas products are only 24%. On the other hand, the exportations of Africa are mainly bulky oil and gas products with 45% in 2016. Figure (2&3)
According to UNCTAD estimation, the world container port increased by 1.7 percent in 2015. Regional shares of world container traffic for 2016 are illustrated in figure 4, Asia accounted for 64 % of world container port throughput, with Eastern and South-east Asia being the key players. Remaining container cargo flows were handled by ports in Europe (16 per cent), North America (8 per cent), Developing America (6 per cent), Africa (4 per cent) and Oceania (2 per cent). In Africa, a regression of -0.7 per cent were recorded. According to World Trade Bank, African maritime transports and ports are not always in line with global trends and standards. Apart from four container terminals located in Morocco, Egypt and South Africa, no African port appears on the 2016 list of the world's top 100 container ports.

1.2- African Container Port

Africa includes about 53 nations, 38 of them have access to the coastline with 30,490 kms and 15 continent are landlocked. There are around 80 ports dealing with global and regional traffic. Most of these ports are qualified as small and medium size ports according to the international standards. The principal international shipping route in Africa, transits between the Red Sea through the Suez Canal and the Mediterranean through the Strait of Gibraltar. (4) Vessels travelling along this route deliver goods to and from Asia and Europe, although in recent years intraregional trade has been increasing. As a reminder, it is helpful to remember the leading ports in each zone of Africa.

- Capacity of container handling

In North Africa, there is a huge competition between countries particularly Tunisia, Algeria and Morocco, to be the best hub in the region. Egypt occupies the top ranking with an estimated 8.8 M container traffic in 2014. (UNECA 2016). In West Africa, the port of Lagos (with 1.66 million containers in 2014) dominates the ranking, followed by the ports of Tema in Ghana (730 000), Abidjan (650 000), Dakar (450 000), Cotonou (350 000) and Lomé (350 000). The Autonomous Port of Douala is the leader in Central Africa. In 2013, the port's traffic has passed through 10Mt. Cameroon is serving the landlocked countries of Chad and the Central African Republic. In East Africa, The port of Mombasa (1.3 MEVP in 2014) is a logistics hub port of the region; the port is serving Uganda, Burundi and South Sudan. In southern Africa, the port of Durban is the first port in Africa (4.6 MEVP in 2014).This port is serving Botswana, Zimbabwe, Lesotho, Swaziland and Zambia). (5)
The largest volume of container are recorded in the interoceanic crossing. In Morocco with Tangier-Med (3 M EVP in 2014), in Egypt around the Mediterranean duo Port-Said (4 M TEUs) and Damietta (0.7 M TEU), and finally in South Africa with the port of Durban (2.6 M TEUs) and the Ngqura hub (0.7 M TEUs). The only exception to this pattern is Nigeria, with the Lagos port complex recording 1.66 million TEUs in 2014.

A comparison of the evolution of container ports between 2004-2014, shows that the most significant increases are those of Lagos, the only millionaire port in the Gulf of Guinea and Mombasa since the addition of a quay at the container terminal operated by the Kenya Ports Authority. Traffic in Luanda and Pointe Noire has also increased significantly due to the establishment of new deep-water terminals and now exceeds 600,000 TEUs. This evolution on container traffic is explained by the evolution of port governance, this contributes to modernization and equipment of all ports supported by many concessions made in recent years. The container port volumes are largely handled by international terminal operators. (Figure 6)

<table>
<thead>
<tr>
<th>Region</th>
<th>Port</th>
<th>M EVP 2004</th>
<th>M EVP 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Africa</td>
<td>Tanger-Med</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Port Said</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>West Africa</td>
<td>Lagos</td>
<td>0.44</td>
<td>1.66</td>
</tr>
<tr>
<td></td>
<td>Tema</td>
<td>0.34</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>Abidjan</td>
<td>0.67</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>Dakar</td>
<td>0.33</td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td>Pointe noir</td>
<td>0.06</td>
<td>0.64</td>
</tr>
<tr>
<td></td>
<td>Luanda</td>
<td>0.28</td>
<td>0.91</td>
</tr>
<tr>
<td>East Africa</td>
<td>Mombassa</td>
<td>0.44</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Djibouti</td>
<td>0.16</td>
<td>0.86</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Durban</td>
<td>-</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Figure 5 - The of African container Traffic 2004-2014 – Source ISEMAR 2016

- Quality of port infrastructure

Despite this evolution of container port volume, the study of UNECA 2016 confirmed that except for few countries including Egypt (from 6.25 M TEU in 2009 to 8, 81M TEU in 2014) , Morocco (1.22 M TEU in 2009 to 3.07 M TEU in 2014) and South Africa. Container traffic through African seaports remain relatively low, compared to other developing countries such as Malaysia, Brazil, Vietnam and Mexico.
Regarding the quality of port infrastructure, according to the world trade Bank Data Base, African infrastructures excluding North African ones got the lower quality ratio of (3.34) in 2017, compared with other regions including North America (5.6), European Union (4.86), East Asia and Pacific (4.44), Middle East and North Africa (4.44), Latin America & Caribbean (3.96) and south Asia (3.38).

In Africa, the poor score in the quality of transport services leads to delays in shipping and higher cost.

1.3 AFRICAN CONTAINER PORT PERFORMANCE:

Over the years, several metrics have been used to measure the performance of ports. The objective is to evaluate the utilization and the productivity of cranes, berths, yards, gates and gangs. Improving the efficiency and operational performance of a port is essential in the liner shipping market. That is why ports need to increase their performance, including in particular the turnaround time (time in port of ships), dwell time (time in port of cargo), gate operations, hinterland connections and intermodal connectivity.

- Average turnaround time (ATT)

According to the study of “Ducruet” using data collected by monitoring vessel movements between 1996 and 2011 in the ports of world, African ports indicate an overall reduction in port turnaround time (TT). However, the last map in 2011 confirms the decline of time efficiency all over Africa except from Moroccan ports, the Average TTs in Africa are still high (2.535). While Asian ports strengthened his turnaround time exceeding the world average notably through time efficiency of Singapore (0.5 days), Hong Kong (0.72 days), and Shanghai (0.79 days). The Exportation of many African countries is particularly based on the bulky shipping of raw material, so the evolution of time efficiency for containers was not reflected in African case, as result this Average turnaround time significantly decline from 1996 to 2011.

- Dwell Time

Dwell time plays a main role in determining container terminal efficiency, improving port efficiency and reducing port dwell time is necessary to optimize the costs and enhance trade competitiveness. In this context, the finding of Raballand et al.(2012) Provides cargo dwell times in sub-Saharan Africa, using data collection in six ports Tema (Ghana), Lomé (Togo), Douala (Cameroon), Mombasa (Kenya), Dar es Salaam (Tanzania), and Durban (South
Africa. The result confirms that dwell time in sub-Saharan is long, compared to performances in other regions such as Asia and Europe, where cargo dwell times in large ports are usually under one week. The average cargo dwell time in most ports in sub-Saharan Africa is estimated at 20 days except Durban and Mombasa.

<table>
<thead>
<tr>
<th>Port</th>
<th>Dwell time (2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durban</td>
<td>4</td>
</tr>
<tr>
<td>Douala</td>
<td>19</td>
</tr>
<tr>
<td>Lomé</td>
<td>18</td>
</tr>
<tr>
<td>Tema</td>
<td>20</td>
</tr>
<tr>
<td>Mombasa</td>
<td>11</td>
</tr>
<tr>
<td>Dar es Salaam</td>
<td>14</td>
</tr>
</tbody>
</table>

Figure 9: Average cargo dwell time in sub-Saharan Africa, 2011 (Number of days) (Raballand et al. (2012))

- Customs, Time to import/Export a container and connectivity

In Africa excluding the North Africa, it takes on average 30 days to export and 38 days to import a container in the region, while the equivalent values were 18 and 19 days respectively in East Asia and Pacific region. The best connected in Africa were in northern and southern of the continent, recording the international maritime routes notably Morocco, Egypt and South Africa, Next come sub-regional loading centers, particularly Djibouti and Togo.

2- Critical Issues in the African port

- Harbor facilities

In order to continue the growth in containerized cargoes, ports need to offer large berth size and high capacity of container-handling activity. However, there is a lack of capacity to handle gearless ships; port equipment’s are inadequate and poorly maintained. At the time of ships are up to 15,000 TEUs are now navigating through the major international routes, most African ports cannot receive ships exceeding 2,500 TEUs. (UNECA 2016)

The regression analysis applied with IBM SPSS v20 reveals that there is a significant relationship between cargo throughput and other port performance indicators in Nigeria for the study period (2005 - 2014). More so, the test reveals that there is a significant relationship between cargo throughput and berth occupancy rate, which is significantly indicative of port congestion (28). Many African ports also face serious capacity problems that are accentuated by an ineffective inland transport system. The average draft in African ports is less than 11m. This means large ships cannot berth. (UNECA 2016).

In all the ports of North Africa, cranes are connected to national rail networks, supporting an efficient movement of goods. The Ports in the central and West Africa are the least developed infrastructure in Africa, according to the Port Management Association. This is mainly due to a lack of concrete programs for the transport sector, leading to lower prioritization of resources to the ports subsector.

- Operational efficiency

In Africa, almost all ports, with the exception of ports in Morocco, are highly inefficient, and have long cargo dwell time compared to ports in other parts of the world. According to marine traffic data, time in port for container vessel is 0, 87 days (UNCTAD, 2017), while turnaround time of African container port is 2.54 days. (35).

In Africa dwell time is relatively high (measured in days, whereas in high-performing ports it is typically hours), as shown in figure 9. Mombasa appears to be one of the most efficient ports, with only 5 days’ dwell time. Dwell times are particularly high in Port Sudan in the Sudan, Matidi in DRC (which also has low productivity), Tema in Ghana, and Lagos in Nigeria, although berth productivity is often reasonably high. The major problem in these ports is poor turnaround times; in such cases, increasing efficiency could increase capacity utilization and reduce costs. Dakar in Senegal seems to be the most efficient of the West African ports.

Another problem is affecting the dwell time, relative to inefficient customs operations at ports and land boarders in Africa (an average of 35–40 days to complete complicated border crossing procedures and paperwork).

- The Hinterland

Cargo and merchandise entering or leaving ports transit by the hinterland via transport corridors, the links between ports and the hinterland must operate well to avoid bottlenecks in the ports. In Eastern and Southern Africa, there

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is a poor hinterland transport infrastructures, particularly rail and road. In addition, the main issue in East Africa is the security risk in the Indian Ocean due to growing attacks by Somali pirates (42). Another concern in major East African ports (Mombasa in Kenya and Dar es Salaam in Tanzania) is relative to the congestion, due to low investment in infrastructure and poor connection to the hinterland. The hard infrastructure ensures access to intermodal transportation through connections to roads, railroads, and inland waterways; it is determining factor to define the efficiency of a port. Particularly for the land lock nations (15 in Africa), the infrastructures (railroads and highways) and the inland waterway constitute a crucial link to international market (43). West Africa counts numerous ports but there is a luck on the regional strategy to organize the different flow of ships connecting the hinterland. (42)

Going forward this analyze, there a huge challenges in terms of hard infrastructure requirements in ports and infrastructure of transport linking the port to the hinterland (rail, road, and waterways), in this context public and private investment is required.

3- The key Driver of Development of African Hub Port

Africa’s maritime traffic has been growing rapidly across all cargo types, but container traffic is highly imbalanced and faces major challenges because of the lack of efficient infrastructures, operations and link to the hinterland. Shipping markets in Africa are small, thin, and creating high costs (25). UNCTAD supports Africa in these with several programs and measures involving targeted interventions by national, regional and international players. Particularly, the technical assistance programs in port management, UNCTAD is also actively supporting customs reforms with its ASYCUDA program, which is implemented in most African countries. However, this depends on the harbor facilities and other activities and operations, including policy reforms that governments are able to put in place toward port development. Below we will find the key driver of development of African hub Ports

3.1- Harbor facilities

Hub ports require deep-water channels or berths and storage facilities; these facilities determine the capacity of cargo that ports can handle and the type and capacity of the vessels it can receive. A Hub port also needs inside railroad terminals or lines, and road access to the major transport corridors.

In order to prepare African ports to accommodate larger vessels, it is important to dredge for water depth and ensure adequate cargo handling equipment in place, according to UNCTAD 2017. The continent has made its port revolution; the container ports are actually equipped with container gantry cranes or mobile cranes. There is about ten ports that can accommodate ships between 5,000 and 6,600 TEU with a draft of 14 meters an others are to come such as Kribi in Cameroon, or the Nigerian projects of Lekki (granted to CMA CGM and ICTSI) and Badagry (granted to APMT), or the future Tanzanian port of Bagamoyo (China Merchants). The size of ships routed to Africa is in line with the international average. Another example is a new fleet of vessel of 9,400 TEU linking West Africa and Asia with stops in Ngura and Cape Town before reaching Pointe Noire and Luanda but these new major African ports are not necessarily destined to become major continental hubs. (26)

Investing in port capacity is not in itself a sufficient condition to transform a port into a hub

3.2- Operational efficiency:

African ports need to address challenges in port and terminal infrastructure, governance and hinterland connectivity. Turn-around time (TAT) and dwell time are measures of port efficiency. A high TAT is determinant for large shipping companies for calling at ports, and a high dwell time is determinant for both shippers and shipping companies. Improving port efficiency and reducing port dwell time is necessary to optimize costs and enhance trade competitiveness. (44). The efficiency of port operations is a major driver of trade competitiveness and the ability of hub ports to support its position in a complex and evolving market structure. In 2016, Ibeawuchi recommended regarding the port congestion in five African ports to adopt good strategies to manage and maintain all port entry channels and its vicinity by deploying adequate and accurate programming of ships’ arrival, anchorage and departure from the ports to avoid queuing and bunching of ships waiting around. In addition, the berth specialization should upgraded to enhance operational efficiency terminals and to optimize berth occupancy, and finally Improve average speed in cargo transfer to reduce dwell time and enhance ports’ cargo throughput. (41) It is essential to improve the understanding of the determinants of freight dwell time. Governments can help to fix inefficiencies and unblock capacity in ports through regulation, incentives, policy support and investment, to provide the effective operation of border management and customs clearance. In this context, a Survey conducted by the East African Logistics Performance reveals significant improvement in port and corridor efficiency. Ongoing reforms and infrastructure improvements at the port of Mombasa have produced significant results as cargo dwell time has dropped to 5 days in
2012. For comparison, existing benchmarks for container dwell time the dwell time in international ports is around 3 to 4 days. (36-37-38)

In the other hand, to support the adoption of appropriate technologies and solutions in ports, there is a number of measures to take in consideration (including customs automation and port community systems). The use of technologies and digital solutions aim to facilitate transport and trade, cut inefficiencies, improve processes and enhancing transparency. In this respect, Africa will have to revise the strategy of seaborne to improve its cargo'. (46)

This proved policy or approaches and sector participation singly import PAP's)

Furthermore the emergence of hub port. African port need to address challenges in port and terminal infrastructure, low productivity/efficiency, and low connectivity to other regions carried by maritime vessels, the expansion of cargo and volume of goods handled.

The growth in global trade over the past decade, together with increasing containerization and an improved policy framework in Africa have boosted demand for African port capacity. With 80 percent of the volume of world trade carried by maritime vessels, the port is playing an essential role in the logistics supply chain. However, congestion, low productivity/efficiency, and low connectivity to other regions blocked the development of port in Africa. Furthermore the emergence of hub port. African port need to address challenges in port and terminal infrastructure,

3.3- Hinterland

Efficient transportations, inland waterways, rail and road infrastructure, as well as transit regimes are all important instruments to improve a hub port (44). Starting from 2010, the adoption of PIDA “Program for development of infrastructure in Africa” have kicked off the development of corridors and links Gateways to hinterland. Improving access to the hinterland and landlocked countries by multimodal infrastructure, transport corridor approaches and harmonizing transport regulation. This can lead to reduce transport costs and improve African countries’ position in the global shipping networks. Vessel traffic and ports are essential elements of the Priority action Pan (PAP’S) planning of transport corridors linking island states to the mainland and trade routes. The special needs of fragile states in terms of regional infrastructure are recognized and will continue to be addressed by PIDA. For example, we can find the projects below:

- **Corridor multimodal Praia-Dakar- Abidjan project**: this program will enhance maritime transport and links island to continental countries by creating a new maritime service between regional ports and facilitating it through a modern computer system linking the maritime service to the ports and road corridor of the Dakar-Abidjan Corridor
- **West African Port and Rail Platform Program** to address future capacity problems in West African ports
- **Program for a port platform and rail link in Central Africa**: This program aim to address the future problem of capacity in Central Africa

3.4- Governance

The Government has a determinant role in supporting small and medium-sized ports to adapt to the new situation, including through policy and facilitative arrangements that can enhance their services in the hinterlands, and to compete for the international trans-shipment hub. To help smaller ports maintain their position and emerge as a regional hub steps should be engaged to identify the strategy permitting to attract mainline or feeder service providers.

Performing international or regional performance needs private sector participation. However, private sector participation requires environment that includes proper design of concessions, through transparent, well-designed competitive, long-term (at least 25-year) concessions (46). The benefits of private sector are realized when the incentives are weighted depending on the market and a high level of operators control. Enhancing port performance by encouraging private sector participation seems to be appropriate in Africa. The evolution of port governance regimes (except in South Africa) participates to the modernization and equipment of all the ports and assist this increase in tonnage. Thus in the West Africa (Dakar, Tema, Douala, Pointe Noire, Luanda) and in the East (Mombasa and Dar-es-Salim) the containerised traffic strongly increase these last years (26). These evolutions are taking place for competitiveness for African hub port. For example, Tangier-Med through its innovative governance mode with the creation of a public limited company “the Tangiers-Mediterranean Special Agency (TMSA)”, Responsible of the development and management of the Tangier Med industrial port complex”, is now playing an increasingly important role as a West African hub. 70% of its transshipment volumes are destined for Atlantic African ports (Nouadhibou (Mauritania) and Namibe (Angola)). Tangier Med benefits from the strategies of global operators who have heavily invested in the hub and offer shorter direct lines of the feeder type to African ports. The operation of the terminals, and all port activities are carried out under concession contracts by world-renowned operators. The Tangier Med port thus counts in its ranks the largest world shipping companies (Maersk, CMA-CGM, MSC...) as well as port leaders such as APM TERMINALS and EUROGATE.

Conclusions

The growth in global trade over the past decade, together with increasing containerization and an improved policy framework in Africa have boosted demand for African port capacity. With 80 percent of the volume of world trade carried by maritime vessels, the port is playing an essential role in the logistics supply chain. However, congestion, low productivity/efficiency, and low connectivity to other regions blocked the development of port in Africa. Furthermore the emergence of hub port. African port need to address challenges in port and terminal infrastructure,
operation efficiency, hinterland and governance. The analysis of this finding suggest to develop a hub port in Africa a package of measures is needed, this requires interventions by national regional and international actors, these include in particular:

- Prepare African ports port facilities to handle ever-larger ships by increasing their draught and ensuring appropriate equipment;
- Improving access to the hinterland and landlocked countries by multimodal infrastructure, transport corridor and harmonizing transport regulation including road and rail transport;
- Improve connectivity of maritime or land transport and improve the position of African countries in global maritime networks.
- Governments can help to fix inefficiencies and unblock capacity in ports through regulation, incentives, policy support and investment, to provide the effective operation of border management and customs clearance.
- Encourage the Public private concession, through transparent, well-designed, competitive, long-term concession.

These measures can lead order to reduce transport costs and develop the efficiency of ports; these new major African ports are not necessarily destined to become major continental hubs. They remain away from the large East-West ring road that concentrates the large flows and from which the need for transhipment and interlining are gigantic. In the other hand, the ability to serve the hinterlands (consumption basins, isolated areas) will allow the emergence of regional hubs. The emergence of such hub ports is important for the regional economic integration of African countries and for their integration in the world trading system. Key measures in the process to transform ports into regional hubs include encouraging and financing integrated port and transport facilities. In addition, policies that introduce and enhance competition are necessary to increase efficiency. In both these areas, global experiences have shown that the transformation of a public services port into a private model leads to a successful result.

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