CAUSES AND EFFECTS OF PORT CONGESTION IN NIGERIA: THE WAY FORWARD

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Abstract

The paper examined the causes and effects of port congestion in Nigeria. The descriptive research design was deplored just as the population of the study was 489 comprising dockworkers and managers from the six major seaports in the country, which also formed sample size. Two objectives and commensurate research questions and hypotheses guided it. A well-structured instrument entitled "Causes and Effects of Port Congestion Questionnaire (CEPCQ)" was prepared for the study. The research questions were answered using mean and standard deviation while the hypotheses were analyzed using z-test statistical tool at 0.05 level of significance with aid of statistical package for social sciences (SPSS) Version, 23. The result found that technical inefficiency, freight volume, quay crane equipment, physical and soft infrastructure, customer clearance procedure, container cargo dwell time, vessels and truck turnaround time and integrated IT system are among the causes of port congestion. It was recommended among others that the federal government in collaboration with port stakeholders should train dockworkers with requisite information communication technology as this will enable them to improve on their skills and contribute to the growth and profitability of ports. Also, there should be periodic check by government on the ports to ensure better operations.

Key Words: Decking, Dwell Time, Ports, Ports Congestion, Ship,

Introduction

Seaports have a major place in national and international economies as they facilitate shipping trade flows and enhance handling of logistical materials and operations across all sectors of the economy. This is mainly because the service, manufacturing, trade and extractive sectors of the national

economy in one form or the other rely on them for shipping and exporting-importing of raw materials, finished and semi-finished products among others which help to maintain the economy.

Shipping is a major aspect of the logistics functions; even as seaports represent essential nodes in the transport, logistics and supply chains of all industrial sectors responsible for shipping and delivery of orders to the consignee's warehouses across supply chain networks (Ndikom, 2016). They equally represent an interface at the waterfront/seashore where land, water, air, rail and pipeline transport modes meet (multimodal transport interface); and at which the maritime transport mode feeds other modes and is itself fed with cargo / consignments and passengers from other modes. Thus, port operations greatly affect shipping trade and maritime logistics and operations by influencing costs, efficiency, output, time, safety and security risks associated with the utilization of maritime transport mode, in cargo handling and delivery both in the supply chain sector and global logistics (Ewuzie, 2018).

Sea transportation is a modest and affordable way to convey cargo globally (Asabe, 2021). It may lack timeliness but has the advantage of transporting goods of all sizes at affordable rates. There is an increase in international trade among nations due to globalization, development and technology, which is of the upmost benefit to humanity. It has brought with it some demerits as well, one of which is port congestion. Port congestion affects both the national economy and international trade negatively. It happens where ships are prevented from berthing as a result of backlog of ships from delays experienced at the ports (Onyema et al, 2015). The occurrence of port congestion shows that more effective, efficient and technologically driven changes are required, which also involves adequate planning, an overhaul of existing systems and creating space for more modern and effective modifications to be implemented. Disappointingly, the longer trucks spend idle at terminals, the more costs are incurred, which affect the purchasing power of the customers (Godfrey, 2018).

While port congestion may be familiar all over the world, the ability for ports to run effectively and efficiently is essential to the economy of the country. Movement of cargo, efficiency of trade within and outside the country, employment and more depend on the efficiency with which ports function (Khiem et al, 2016). Moreover, research has shown that different countries' ports have their dwell time for cargoes (Fajar, 2015; Godfrey, 2018). Ports in Nigeria for example have a dwell time of about 5.08 days. That of Singapore is 1.5 days, Hong Kong has dwell time of 2 days, that of France is 3 days. Los Angeles is 4 days while Leam Chabang, Thailand has a dwell time of 5 days. Ewuzie (2018) further stated that the consideration of different level in cargo dwell time within the African ports, ranges from fourteen days in most West African countries to four days in South Africa. Prolonged dwell time affects the Yard Occupancy Ratio (YOR); which results in no land for the

container to be stacked from the berthing ship. This connotes that as dwelling time increases, logistical cost equally increases.

Nigeria currently has six ports, namely Apapa & Tin-can Island ports in Lagos, Warri port in Delta Stae, Calabar port in Cross-River State and Onne and Port Harcourt ports in Rivers State. Likewise, in 2006, the Nigerian Port Authority adopted the landlord model of port management, which led to the concession of its terminals to the private sector. It features five private terminals namely Apapa Bulk Terminal Ltd. (ABTL), AP Moller Terminal Ltd. (APMT), ENL Consortium Ltd. (ENL), Lilypond Inland Continer Terminal and Greenview Development Nigeria Ltd. (GNDL). The port also features two logistic bases which are the Lagos Deep Offshore Logistics (LADOL) and Eko Support Service Ltd. (NPA, 2021).

Several factors appear to contribute to port congestion at ports such as inadequate port and vessel facilities, inefficient port organization and administration, restraints arising from stringent and unfavourable policies, poor road network, inadequate transportation facilities and reliance on one major port. These factors may hinder the efficient and effective running of the ports (Saeed & Larsen, 2016; Radifan et al, 2020). Furthermore, port congestion in berths results in delays, fines, gridlocks, accidents, queuing and extra costs. There is also an issue of pricing and other fees associated with the ports.

Cargo dwell time can be used to persuade more port users to transport their cargo through their ports for profit making as its reduction is a marketing strategy for port efficiency. A delay of cargo clearance is a hindrance for growth and increase in poverty in the environment and also a tool in the measurement of port efficiency which can double terminals throughput without much marketing and more investments (Saeed & Larsen, 2016). Similarly, the performance of the port agencies including the Nigeria Custom Services (NCS) affects the cargo clearing processes. Hence, port performance is characterized by the improvement and efficiency of the port stakeholders or the management in attaining the international Maritime Organization (IMO) stipulated order in the clearance of port cargo to decongest the port terminals within the 48 hours stipulated time (Igbokwe, in Okwong et al, 2020).

Some studies have been done on the Nigerian sea ports. For instance, Nwokedi et al (2021) reported that the malfunctioning, old, insufficient and obsolete equipment including scanning facilities, makes it difficult for Nigerian ports to meet the 24 hours IMO stipulated hours for cargo clearance and further reduces its performance level through the yearly reduction in cargo throughput. These studies however did not consider its effect and especially, concrete ways of reducing dwelling time which is the gap that this study attempts to fill.

Causes of Port Congestion

Port congestion is the obstruction at the dockyard, boatyard or wharf due to massive anchorage of cargo ships for offload of shipments and cargoes. Essential to the conceptualization of port congestion are terminals and gateway port. Consequently, terminals are sections of the Port where ships harbour or bunk for the offloading of the merchandize. The apparatus utilized in the terminus for offloading cargoes entails cranes, forklifts, lighters, etc. while the gateway is the route that connects shipments to the hinterland either by road or rail transportation (Gidado, 2015).

Several factors contribute to port congestion and mitigate against the effectiveness and efficiency of international trade. They include unrealistic policies, poor and obsolete port infrastructure and lack of technological infrastructure to help improve the services rendered at the ports (Nze & Onyemechi, 2018). Also, congestion occurs in several ways such as ship berth congestion that is triggered by several ship engaging the spaces allotted to the newly arrived ship. Congestion can also happen (ship work congestion) when there are delays attributed to gaps during loading and unloading ship. This could be dire in that it lengthens the amount of time a vessel should remain at Port, thus, causing more inconveniences.

Effects of Port Congestion

The inability for ship to berth, load and offload when they reach the Port maybe due to the port's incapacity to offer adequate spaces for cargo ships. This affects the way ship connect and provokes scheduling problems all around (Bofinger et al, 2015). Thus, they have no choice but to queue up and wait for their turn literally. Sadly, this is dangerous and poses a lot of problems for businesses, as it makes them to increase their operational costs.

In addition, it presents a burden on shipping lines, cargo owners and certainly port management. Therefore, port managers need to work towards increasing efficiency when managing ships, enlarging and developing their infrastructure as well as employing more staff (Xchange, 2020).

Empirical Review

Nwokedi et al (2021) investigated determinant port related factors affecting the flow of shipping trade and logistics in Nigerian seaports. The need to eliminate bottlenecks to port operations in Nigeria was a fundamental goal of the port privatization about two decades ago. Current trends in ports management; however, suggest existence of numerous inefficiency challenges reflected in long ship turnaround time, increasing trend of cargo dwell time, high cargo pilferage risk rate, poor

condition of port infrastructure and superstructure, multiple charges and government agencies, cumbersome cargo clearance and examination procedures, port congestion related delays particularly in Apapa and Onne ports, etc. The study identified the decisive port-related factors constraining the flow of shipping trade in Nigerian ports using a survey to obtain data on the influence of the identified factors on the flow of shipping trade in Nigerian ports. The Principal Component Analysis (PCA) was used to analyze the data obtained. The results indicated that high cargo pilferage risk profile, long ship turnaround time and increasing trend of cargo dwell time constituted the significant port-related factors constraining the flow of shipping in Nigerian ports. It can be concluded that terminal operators should prioritize solutions to the problems of high cargo pilferage risk profile, long ship turnaround time and increasing cargo dwell time, which constitute the major constraints to the flow of shipping trade.

Gidado (2015) investigated consequences of port congestion on logistics and supply chain in African ports. Congestion in ports is a phenomena associated with delays, queuing and extra time of voyage and dwell of ships and cargo at the port, which always occur with unpleasant consequences on logistics and supply chain. These often translate into extra costs, loss of trade and disruption of trade and transport agreements. In a study to identify the consequences of port congestion on logistics and supply chain operations in some African ports, this paper has examined the common port congestion scenarios, their dimensions and the various factors that trigger congestion in the ports of Lagos, Durban, Mombasa and the catchment ports of the Suez canal. This paper typically applied the concept of variations in turn-around time of ships and cargo vis-à-vis the port's capacity and relative efficiency level in order to identify the active factors that cause port congestion in African ports. The results provided some explanations on the consequences arising from these on notable African logistics and supply chain networks. The findings revealed that the bane of congestion in African ports emanates entirely from either planning, regulation, capacity, efficiency or a combination of these. The paper therefore recommended that African ports should enhance their regulatory mechanisms and improve capacity and efficiency level in order to shoulder the ever increasing challenges of port congestion in years ahead.

Gap in Literature

Previous studies have concentrated on in-land transportations routes such as road and railway transportation and their challenges. This researcher however, discovered that there has been no study within South South Nigeria that treated causes and effects of port congestion in Nigeria; hence a vacuum, which has been filled by present study.

Methodology

The descriptive design was employed for this study. The reason for selecting this design was to enable the researcher explain how port congestion affects business operations in Nigerian ports. The population comprised all the male and female dockworkers and managers in the six major ports in Nigeria namely Apapa & Tin-can Island ports in Lagos, Warri port in Delta Stae, Calabar port in Cross-River State and Onne and Port Harcourt ports in Rivers State, numbering 489 (Obot, 2023). They also served as the sample size. The study equally made use of both primary and secondary sources of data. While the primary sources of data comprised the research questionnaire, secondary sources of data consisted of textbooks, journals and documentaries. Consequently, the instrument for the data collection was a self-structured questionnaire entitled, "Causes and Effects of Port Congestion in Nigeria Questionnaire, (CEPCNQ)"; based on a modified four point Likert rating scale with numerical value assigned to them as follows: Strongly Agreed - (SA) - 4points, Agreed - (A) - 3points, Disagreed - (D) - 2points and Strongly Disagreed - (SD) - 1point. The Cronbach alpha statistical tool was used to analyze the data collected with a reliability index of 0.86 ascertained. While mean and standard deviation statistics were used in answering the research questions, z-test was used to test the hypotheses at 0.05 level of significance with the aid of statistical package for social science (SPSS) version 23.

Data Analyses

Objective One: Causes of port congestion in Nigeria.

Table 1: Mean scores and standard deviation of respondents on the causes of port congestion in Nigeria.

S/N	Causes of port congestion in Nigeria.	Dockworkers (300)		Managers (189)		Mean Set	Decision
		Mean	St.D	Mean	St.D		
1	A major reason for port congestion in Nigeria is poor planning.	3.2	0.9	3.0	1.0	3.1	Agree
2	Another reason is inefficient management staff running the ports.	3.2	0.9	3.4	0.9	3.3	Agree
3	Another reason is limited technical manpower.	3.2	0.8	3.4	0.9	3.3	Agree
4	Another reason is inadequate infrastructure at the ports.	3.3	0.9	3.3	0.9	3.3	Agree

5	Another reason is corrupt practices by the port officials.	3.1	0.8	3.3	0.8	3.2	Agree
	Aggregate mean scores & St.D	**3.2**	**0.9**	**3.3**	**0.8**	**3.3**	Agree

Source: Author's Computation, 2025

Data on Table 1 present the mean and standard deviation scores of dockworkers and managers in Nigerian ports. Their mean scores revealed that all the respondents on items 1-5 agreed that the causes of port congestion in Nigeria are poor planning, inefficient management staff, inadequate infrastructure, corrupt practices and limited technical manpower, with mean scores of 3.1, 3.3, 3.3, 3.3 and 3.2, resulting to a cumulative mean score of 3.3. This further means that the aggregate mean score of 3.3 is greater than the criterion mean of 2.5 while the mean score of 3.2 for dockworkers and 3.3 for managers implies that the respondents accept the items on the table.

Objective Two: Effects of port congestion in Nigeria.

Table 2: Mean scores and standard deviation of respondents on the effects of port congestion in Nigeria.

S/N	Effects of port congestion in Nigeria	Dockworkers (300)		Managers (189)		Mean Set	Decision
		Mean	St.D	Mean	St.D		
6	Port congestion may lead to loss of business investments / investors.	3.2	0.8	3.3	0.9	3.3	Agree
7	Port congestion may lead to loss in profits.	3.4	0.8	3.3	0.7	3.3	Agree
8	Port congestion may lead to reduced GDP of the nation.	3.3	0.8	3.0	0.9	3.3	Agree
9	Port congestion may lead to reduced GNP in Nigeria.	3.2	0.9	3.3	0.7	3.3	Agree
10	Port congestion may encourage stealing and destruction of businesses/properties.	3.3	0.8	3.3	0.9	3.3	Agree
	Aggregate mean scores & St.D	**3.3**	**0.8**	**3.3**	**0.8**	**3.3**	Agree

Source: Author's Computation, 2025

Data on Table 2 present the mean and standard deviation scores of dockworkers and managers in Nigerian ports. Their mean score revealed that all the respondents on items 6-10 agreed that the effects of port congestion may lead to loss of business investments, profits, reduced GDP, reduced GNP and stealing and destruction of business properties; with mean scores of 3.3, 3.3, 3.3, 3.3 and 3.3, resulting to a cumulative mean score of 3.3. This further means that the aggregate mean score of 3.3 is greater than the criterion mean of 2.5 while the mean score of 3.3 for dockworkers and 3.3 for managers implies that the respondents accept the items on the table.

Test of Hypotheses

Ho_1: There is no significant difference between the mean scores of male and female dock workers and managers with regard to the causes of port congestion in Nigeria.

Table 3: Summary of the analysis of z-test on the causes of port congestion in Nigeria.

Category	N	Mean	St.D	Df	z-calculated Value	p-value	Decision
Dockworkers	300	3.2	0.9	487	13.888	.000	AG
Managers	189	3.3	0.8				

Data on Table 3 show the summary of the analysis of z-test on the causes of port congestion in Nigeria. The analysis presented in the table above showed that, the z-calculated value of 13.888 with a p-value of .000 at 387 degree of freedom is far more than the threshold value of 0.05 level of significance. This implies that the dockworkers and managers significantly agreed on the causes of port congestion in Nigeria. This means that the null hypothesis that there is no significant difference between the mean scores of male and female dockworkers and managers on port congestion in Nigeria is accepted.

Ho_2: There is no significant difference between the mean scores of male and female dock workers and managers with regard to the effects of port congestion in Nigeria.

Table 4: Summary of the analysis of t-test on the effects of port congestion in Nigeria.

Category	N	Mean	St.D	Df	z-calculated Value	p-value	Decision
Dockworkers	300	3.3	0.8	487	14.427	.000	AG
Managers	189	3.3	0.8				

Data on Table 4 show the summary of the analysis of z-test on the effects of port congestion in Nigeria. The analysis presented in the table above showed that, the z-calculated value of 14.427 with a p-value of .000 at 487 degree of freedom is far more than the threshold value of 0.05 level of significance. This implies that the dockworkers and managers significantly agree on the effects of port congestion in Nigeria. This further means that the null hypothesis that there is no significant difference between the mean scores of the male and female dockworkers and managers on port congestion in Nigeria is accepted.

Discussion of Findings

Causes of Port congestion in Nigeria

The Z-test statistics on the causes port congestion in Nigeria revealed that dockworkers and managers had a positive agreement on the subject. The positive relationship between dockworkers and managers is statistically significant. This implies that dockworkers and managerial events in Nigerian sea ports result in the causes of ports congestion. Both Lin et al (2019) and Kentis et al (2017) corroborated the findings by revealing that technical inefficiency and freight volume, quay crane equipment, both physical and soft infrastructure, customer clearance procedure, container cargo dwell time, vessels and truck turnaround time and integrated IT system are some of the causes of port congestion. Likewise, reducing berth times, customer clearance procedure and lack of integrated IT system influence the overall efficiency of the port.

Effects of Ports Congestion in Nigeria

The z-test statistics on the connection between dockworkers and managers on the effect of port congestion in Nigeria showed that dockworkers and managers had a positive agreement on the subject. Their positive agreement is statistically significant. This implies that dockworkers and managerial actions in Nigerian ports influence effects of port congestion. The findings of this study are in line with studies done by Gidado (2015) and (Obot, 2023). The result further infers that the effects of port congestion include loss of business investments, profits, reduced GDP, reduced GNP and stealing and destruction of business properties.

Conclusion

Ports congestion affects the discharge and delivery of goods at the wharfs both in Nigeria and beyond. When much time is used in clearing container goods, it could affect business in areas such as customer trust / relationship, individual time, reduction / loss of profit as a result of storage cost

and coverage area among others. Apparently, technical inefficiency and freight volume, quay crane equipment, both physical and soft infrastructure, customer clearance procedure, reducing berth times, container cargo dwell time, vessels and truck turnaround time and integrated IT system are some of the causes of port congestion. It is needful for government to come in with strategies of clearing container goods at the different ports in collaboration with port administrators so that less time will be spent and business will be faster and more efficient. This in turn will encourage investors to patronize the ports and increase the nation's GDP, which will bring in more development for the country.

Recommendations

From the foregoing, the following recommendations were made:

1. Federal government in collaboration with port stakeholders should train dockworkers with requisite information communication technology. This will enable them improve on their skills and contribute to the growth and profitability of port's activities.
2. Customer's clearance procedure and ship turnaround time should be strategized to reduce the time spent by vessels in the port.
3. Government should place sanctions on port managers for every delay in vessels or excess container dwell time. This will enable them to discharge their duties with greater level of seriousness.
4. There should be periodic check by government supervisory team on the ports to ensure better operations. It will equally help to identify problems on ground that should be handled promptly.

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