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## CARGO THROUGHPUT AND NIGERIA MARITIME GDP IN THE PRE-CONCESSION AND POST-CONCESSION ERA

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### ABSTRACT

This study evaluated the impact of the cargo throughput on the Maritime GDP in Nigeria between 1996 to 2016 using a simple regression analysis. The result indicated that the Maritime GDP depends on the volume of inward and outward cargo in the ports by 68%. The statistical relationship identified was given by:  $MTGDP=264+0.000073CT+\varepsilon$ . Also, the performance of the Nigerian ports in terms of the cargo throughput and the maritime transport Gross Domestic Product during and after the concession was analyzed and result showed that, the Nigerian ports had a better average annual growth rate of the cargo throughput during the pre-concession era but better maritime GDP average annual growth rate in the port-concession era. Under the period in review, the AAGR for cargo throughput in pre-concession and post-concession were, 13% and 5% respectively. While the AAGR for the maritime GDP before and after the concession was 6% and 10% separately.

**KEYWORDS:** Port Performance, Nigerian Ports, Maritime Transport, Cargo Throughput, Gross Domestic Product, Concession

### 1. INTRODUCTION

It is widely known that over 90% of the volume of world trade is conveyed by sea and the economic growth of any country depends greatly on its performance in the international market (Nwokedi, et al., 2016). It would not be possible to convey these marketable goods and perform effectively in the global market without efficient maritime transport (Osadume & University, 2020). This shows that the maritime sector is an important component in facilitating international trade, and for this industry to be efficient, there should be, among other things, well-functioning ports. Therefore, the operation of ports, and its facilities are important for countries located in the coastal region.

Nigeria, a globally identified maritime country is endowed with over 13,000 kilometers of navigable inland and coastal channels. Its geographical location is in West Africa and borders Niger in the north,



Chad within side from the northeast, Cameroon in the east, the Republic of Benin within side in the west, and borders the Gulf of Guinea to the south, masking a place of 923,769 kilometers with a populace of over 200 million (World Bank, 2022). Nigeria began the operations and development of ports in order to provide facilities for ships in the 19th century (NPA, 2021). This birthed the opening of Lagos Lagoon in 1909 and the establishment of seven other ports across the country followed. By the beginning of the 21st century, the Nigerian government decided to reorganize the ports, thereby reducing the eight ports to six major ports with two in Lagos, referred to as the Western Ports and four located in Port Harcourt, Onne, Warri, and Calabar, referred to as Eastern Ports. The development of ports in Nigeria can be categorized as Pre-concession and Post-concession era.

During the Pre-concession era, the Nigerian ports were totally controlled by the government agency, Nigerian Port Authority (NPA). The responsibility of this body was to govern the operation of the ports in Nigeria while reporting to the Federal Ministry of Transport. During this time, Nigeria operated a service port model. It is significant to mention that the average cargo throughput and vessel turnaround time during this era was 14,467,024 metric tons and 7.35 days respectively (Eniola, et al., 2014). The Nigerian port suffered from a great score of ills which included longer vessel turnaround time, mal-functioned cargo handling equipment and high rate of corruption and these problems led to the rating of the Nigerian port as one of the costliest in the world. In a bid to drive towards improving the port efficiency, the Federal Government of Nigeria initiated the plan to adopt the port landlord model which birthed the concession of the ports (NPA, 2021).

In 2006, the Federal Government of Nigeria adopted the landlord port model and concedes the twenty-five (25) port terminals to private companies. In line with this agreement, the Nigerian Port Authority ceded some of its functions to the concessionaires. Cargo handling operations were transferred to these private companies and the NPA assumed the role of providing electricity, marine services and maintenance of facilities in the port (NPA, 2021). Several studies have investigated the impact of the reform on the Nigerian ports and all showed that the concession improved the performance of the seaports (B.E.A, et al., 2012), (Okeudo, 2013), (Eniola, et al., 2014), (Omoke, et al., 2015), (Somuyiwa & Ogundele, 2015), (Akinyemi, 2016), (Buhari, et al., 2017), (Onwuegbuchunam, 2018), (Nwolozi & Ndubuisi, 2020).

These studies confirmed that the Nigerian port experienced a consistent rise in technical efficiency throughout the post-concession period. However, there are still some issues affecting the performance of the ports and that includes, high port charges, delay in cargo clearance, multiple taxation, and development of intermodal transport. All of these have been traced to the failure of the government to assume its regulatory role in the industry (Akinyemi, 2016). Despite the amount of improvement, one major disadvantage is low job creation, as the national ports could only account for 3,000 employees



against the 13,000 workers employed before the port concession (Nwolozi & Ndubuisi, 2020). This shows that the Nigerian Port Authority lost some of its responsibilities to the concessionaires who have now taken over the major operations of the port which the government usually operates with a good number of workers and constantly creating jobs in the industry. It is obvious that the government is the highest employer of labor and cannot be compared with the private operators whose aim is profit maximization and therefore, cannot create substantial amount of job opportunities creditable for the ever increasing and teeming Nigerian youths.

The main objective of this study is thus to analyze the performance of the ports before and after the concession by calculating the average annual growth rate of the cargo throughput and the maritime sector Gross Domestic Product. The research will consider the cargo throughput of the port 10years before the concession and 10years after the concession. The study will also investigate the relationship between the cargo throughput and the maritime GDP using a simple linear regression model. It is expected that the findings will justify the affirmation from previous research and ascertain if there exist a statistical relationship between the GDP of the Nigerian maritime sector and the cargo throughput.

This research work is divided into six chapters: following the introduction in the first section, section two provides a review of literature; it highlights the challenges bedeviling the ports, and port performance indicators. Section three presents the methods which was used to carry out the study, whilst sections four discuss the results, section five and six states findings and conclusion of the study, and recommendations respectively.

## **2.0 LITERATURE REVIEW**

The ill-performance of the Nigerian ports has been due to infrastructure and logistics deficits, congestion, security concerns, policy and regulatory inconsistencies, absence of supply chain culture and corruption (Ojadi & Walters, 2015). Clearly, these impeding challenges has imposed tremendous costs to the economy (Lloyd, et al., 2020); distorting development policies and undermining confidence of foreign and local port users in the Nigerian port operations. Most shippers prefer to use neighboring ports to convey their consignments to avoid all the troubles at the Nigerian ports.

### **2.1 Infrastructural Deficits**

Lack of cargo handling equipment have always been a problem at the Nigerian port. The port operational facilities are outdated and there is no maintenance culture. Less than 50% of the installed cargo handling equipment at the Nigerian ports is functional and this has contributed to cargo delay, high vessel turnaround time and increased ship waiting time (Onwuegbuchunam, et al., 2021). This research (Somuyiwa & Ogundele, 2015) investigated the relationship between the port equipment and



the performance of the port. It deduced that, prior to the port reform, the cargo handling equipment were few and obsolete which made the productivity of the port nothing to write home about. However, after the reform, the productivity of the port increased due to the improved facilities.

One of the factors that contributes to cargo delay and high vessel turnaround time is lack of functional cargo handling equipment (Godfrey Chukwugozie & Obed Boniface, 2012), (Ndikom, et al., 2017). In order to avoid these delays, shippers prefer ports that possesses higher level of terminal facilities and high crane efficiency (Onwuegbuchunam, 2013). In this article (Emeghara, et al., 2016), a Nigerian port was compared to a port in Benin Republic, one of the neighboring countries to Nigeria. The study assessed these two ports based on twelve different criteria in which cargo handling equipment and transit time were listed. The Nigeria port had 5/12 while the port in Benin Republic had 7/12. Result showed that the port in Benin has better port facilities compared to the Nigerian port. Most of these port users have abandoned the Nigerian port due to this factor which has led to obstruction in the ease of doing business.

It is worth to mention that when a port lacks the important equipment to carry out operations, congestion is inevitable, high vessel turnaround time will be the order of the day, cargo delays will be experienced, and port users will eventually divert their business to more operational ports leading to less revenue for the ports. Port infrastructure needs to be improved to achieve a faster vessel turnaround time and increased cargo throughput in order to maximize port revenue (Buhari, et al., 2017).

## 2.2 Security Issues

The Nigerian Maritime Industry has been plagued with piracy and security threats for years. Till date, port users have great fear when they must use the Nigerian ports. Previous studies highlight the negative economic implication of piracy and armed robbery on the Nigerian maritime industry and shows that Nigeria lost about 45 million dollars annually in 5 years due to this terrorist attack (Wajilda, 2013). The relationship between the security challenge and the internally generated revenue of the Nigerian Port Authority is inverse (Olalere, et al., 2015). That is, a surge in the security challenge adversely affects the efficiency in operation of the Nigerian ports and thereby reduces the Internally Generated Revenue (IGR). The Nigerian Maritime Industry has great potential contribution to the Gross Domestic Product of the nation (Nze & Okeudo, 2013) (Nwokedi, et al., 2016). Hence, there is need for improvement of the maritime security in Nigeria. If the Nigeria water ways is properly secured, the country will benefit more from the maritime industry and in turn have a positive effect on the economic situation of the country.

However, for Nigeria to totally eradicate the pirate issues, the Nigerian government must show



willingness to implement and enforce IMO regulations. Those who are piracy sponsors and involved in corruption scandals should be properly investigated and prosecuted in accordance with the domestic laws (Anele & Lee, 2015). The government must also provide funds that will be used to procure state of the art surveillance facilities and training for the security officials because the security officials at the ports do not have the necessary equipment (Edet, 2016). Nigeria must join forces with other neighboring nations particularly in information sharing, maritime domain awareness and joint military exercises.

### **2.3 Lack of Digitalization and Skilled Personnel**

One of the reasons for cargo diversion is the traffic congestion experienced at the Nigerian ports. It is obvious that one of the key reasons for this gridlock is due to the delays from custom clearance and documentation (Chilaka, 2019). Amongst the 5 key performance indicators that was analyzed in research, the stakeholders seem dissatisfied with the port congestion while cooperative relations, health and safety/security, organization and environment were rated fairly (Mekwa & Salleh, 2020). This means that the stakeholders are not happy with the congestion experienced at the Nigerian Ports and this could influence the decision of port users when considering port choice.

Various studies have highlighted the importance of ICT in the Nigerian maritime industry (Uchenna Jerome, 2012), (Onwuegbuchunam, et al., 2021), (Somuyiwa, et al., 2021). One of the reasons for cargo delay and longer vessel turnaround time at the Nigerian port is because most of the activities are not digitalized. In order to meet up with global trend, the documentations at the Nigerian ports need to be modernized as this will fast track the movement of cargo at the port and promote the ease of doing business. Undoubtedly, a significance level of ICT processes and procedures have been adopted in port terminal operations since the port concession (Onwuegbuchunam, et al., 2021) but there is need for improvement.

It is also sad to note that, the operational performance, productivity and overall administration of this vital sub-sector, has been left to the crotchet and caprices of unprofessional managers. The Nigerian port lack skilled manpower, and this has contributed to the operational deficiency and poor equipment maintenance culture. Only a professional will know when and how to operate and cater for the tools and equipment in the port because he understands the importance of these facilities. All of these can be sorted when the right professionals are hired in this field. The government needs to hire professionals to handle the affairs of the port industry and train the personnel at the port how to use this equipment and encourage the habit of maintenance.

### **2.4 Government Role; Policy and Regulations**

An effective shipping policy will have a positive effect on the maritime sector (Benson & David,



2018). Previous studies reiterate that shipping policy, maritime sector and economic growth has a linear relationship. Hence, a good shipping policy will lead to an improved maritime sector that will cause a development in the national economy. The government has its role to play in the maritime sector and this include but not limited to; regulation, control and licensing, monitoring and execution of set goals, maintenance of infrastructural facilities, standardization of port operations and activities, promoting the ease of doing business in the environment for all maritime actors and stakeholders, provision of collateral and finance so that maritime goals and objectives for the nation can be realized, coordination and implementation of maritime regulations within the context of the national transport policy and the socio-economic thrust of the government, acting as a mediator for maritime operators on international issues, protecting indigenous maritime operators in such a way that incremental growth and development of the sector can be achieved (BC, et al., 2017).

However, it has been identified over the years that the Nigerian government have failed in its role and the inconsistent policies have hampered the development of the maritime sector and especially the nation's port system. The maritime sector is one that must operate with well-defined conventions, rules and regulations that is in line with global standards. But the Nigerian government seem not to support this ideology, and this has left the port users, on several occasions, confused and frustrated, regarding coping with the problems arising from such policies.

The implementation of the CABOTAGE Policy is one major problem in the maritime sector. It is known that the main objective of CABOTAGE is to retain the transport of goods and services within the Nigerian coastal and inland waters to vessels flying the Nigerian flag and owned by Nigerian citizens in conformity with the tenets of the law. The aim of this law was to stop continuous foreign domination in the carriage of local generated cargo which will in turn, create employment for the indigenes and improvement of revenue generation within the confines of the sector. The proper implementation of the Act would therefore amount to a definite revolution in the nation's maritime industry (BC, et al., 2017). It is unfortunate that, even up till now, the problem of foreign domination persists. Hence, the law is rational on paper but not in practice. There is a need to get this critical policy in a workable condition just like most developed economies of the world. Nevertheless, the vital ingredient for functional cabotage is to encourage investments in local vessel ownership.

At the Business Action Against Corruption (BAAC) Integrity Alliance inaugural meeting held in Lagos in 2021, the stakeholders insisted that, despite the capabilities of the maritime industry to facilitate international trade, poor law enforcement, lack of transparency and unfavorable government regulations have remained major challenges to the development of the industry (Guardian, 2021). The chairman of the maritime group, the Lagos Chamber of Commerce and Industry (LCCI), Mr. Aminu Umar lamented bitterly:





*“If you look at the payment procedure in the ports today, for example, if your vessel is supposed to berth in Apapa port and cannot because of congestion, and you want to berth in Tincan port, the approval process, if you have made a payment, it is impossible. Or if you want to move from Lagos to Port Harcourt because your customers are there – to avoid delaying for 10 days, it is impossible if you have made payment and it means you have lost the payment. You will need to make another payment and it is not supposed to be so because the port is a single entity and once you make payment to the authority, you should be able to use their services in any of their ports”*

The lack of government regulations and summersaulted policies have given room to corruption in Nigerian ports. If the Government had been steadfast in its responsibilities, there would not be duplication of roles amongst the agencies, the policies that would be beneficial to the growth of the maritime sector would have been implemented.

### **2.5 Port Performance Indicator**

A shorter time in a port, is a positive indicator of a port’s efficiency and trade competitiveness (UNCTAD, 2019). Apart from the strategic geographical location, port users prefer ports with faster vessel turnaround time and this in turn contributes to the cargo throughput of the port. The factor that may cause faster turnaround time at the port is the cargo handling capability and operational capacity. In the case of Nigerian ports, it was observed that after the concession, faster turnaround time was achieved due to the improvement of the infrastructural capacity and operational competence, and this led to the rise in the cargo throughput. Hence, the volume of product that goes through a port can be used as an indicator that the port is efficient.

## **3. METHODOLOGY**

The data used in this study were collected from the Nigerian Port Authority and Central Bank of Nigeria Statistical Bulletin with focus on information from 1996 – 2016 (CBN, 2018) (NPA, 2021). The aim is to use analytical method to calculate the annual average growth rate of cargo throughput and maritime transport economy 10years before the concession and 10years after the concession. The simple linear regression model will be used to affirm if there exist any statistical relationship between the cargo throughput and the maritime transport GDP under the year in review.

### **3.1 Average Annual Growth Rate**

The average annual growth rate is the average increase or decrease in the value of a portfolio or cashflow over a particular period. This is determined by taking the numerical mean of specified year on year growth rates.



$$AAGR = \frac{1}{N} \sum_n GR_y \quad (1)$$

Where:

$N$  is the total number of data set to be considered

$GR_y$  is the growth rate between the successive years.

### 3.2 Linear Regression

In order to examine the relationship between a quantitative outcome and a single quantitative explanatory variable, simple linear regression is the most considered analysis method (Howard, 2018). The two factors that are involved in simple linear regression analysis are depute  $X$  – dependent variable and  $Y$  – independent variable. The equation which shows the relationship between these two variables can be expressed using the structural model:

$$E(Y) = \beta_0 + \beta_1 X + \varepsilon \quad (2)$$

Where:

$\beta_0$  is the y-intercept of the regression line.

$\beta_1$  is the slope.

$E(Y)$  is the expected value of  $Y$  for a given value of  $X$

$\varepsilon$  – The error term is used to account for the variability in  $Y$  that cannot be explained by the linear relationship between  $X$  and  $Y$ . If  $\varepsilon$  is not present, it would mean that knowing  $X$  would provide enough information to determine the value of  $Y$

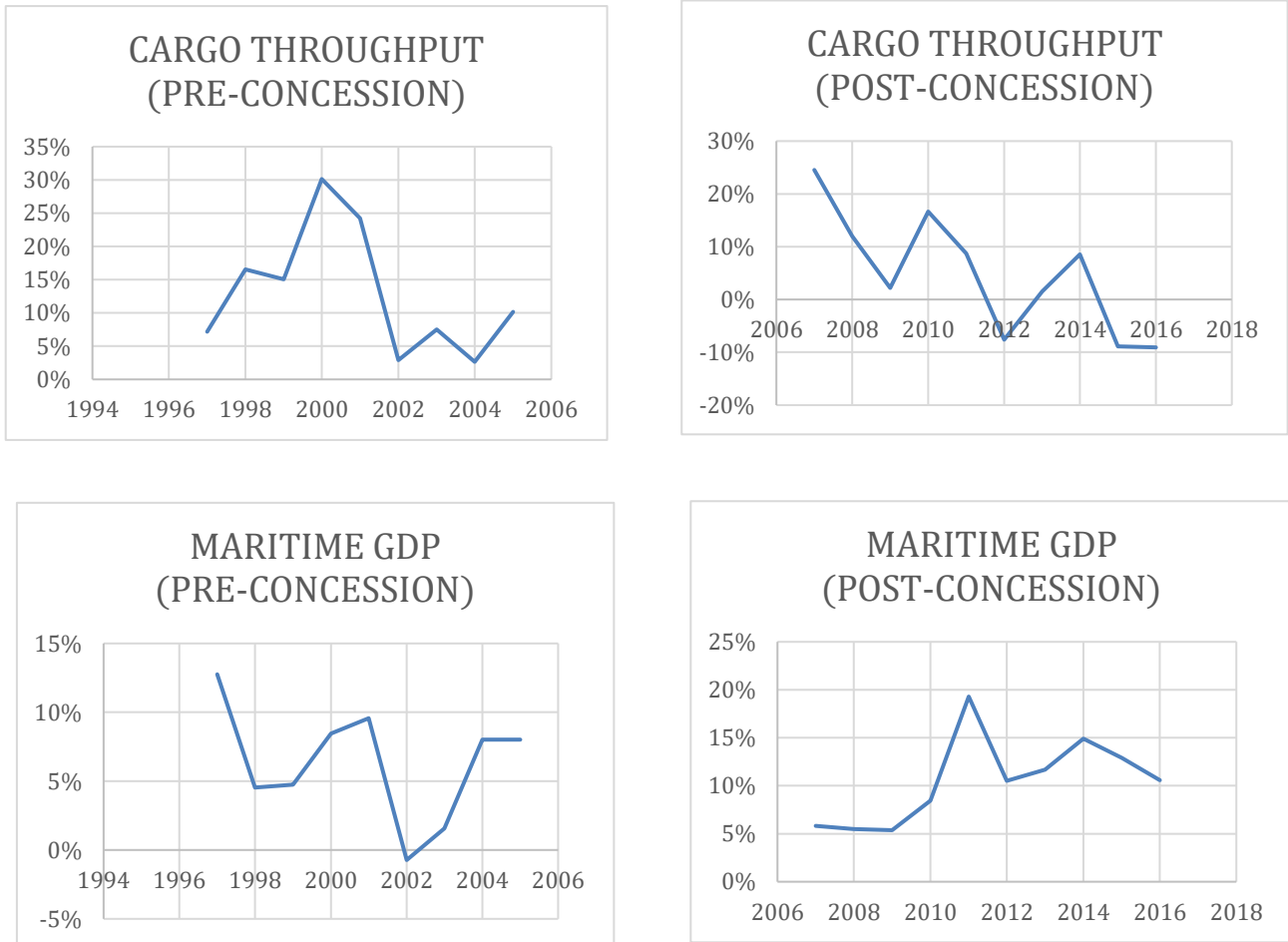


4. RESULT AND ANALYSIS

Regression Statistics					
Multiple R	0.824819934				
R Square	0.680327923				
Adjusted R Square	0.663503077				
Standard Error	1206.780994				
Observations	21				
ANOVA					
	df	SS	MS	F	Significance F
Regression	1	58887635.74	58887635.74	40.44	4.23E-06
Residual	19	27670087	1456320.37		
Total	20	86557722.73			
		Coefficients	Standard Error	t Stat	P-value
Intercept		263.3566833	642.5808228	0.41	0.69
Cargo Throughput		7.22684E-05	1.13649E-05	6.36	0.00
AAGR Throughput (Pre-Concession)	Cargo Throughput (Post-Concession)	AAGR Throughput (Post-Concession)	AAGR Maritime GDP (Pre-Concession)	AAGR Maritime GDP (Post-Concession)	
13%	5%	6%	10%		

Table 1: Result on Analysis

From the analysis, it is observed that the average annual growth rate during the pre-concession is 13% while 6% for the post-concession. The annual growth rate during the pre-concession maintained a positive trend while the annual growth rate for the post-concession has been experiencing decline and in the negative trend. What this means is that the Nigerian ports experienced a better annual growth when it was operating the service port model, under the period in review. However, the economy of the Maritime industry performed better in the post-concession. Even though the average annual growth rate of the cargo throughput in the post-concession is lower compared to the pre-concession, the economic performance of the maritime industry can be attributed to the volume of cargo throughput in all the ports during this period. Figure 1 shows the annual growth performance of the cargo throughput and the maritime GDP before and after concession.



**Figure 1: Annual Growth Rate of the Cargo Throughput and Maritime GDP in Pre and Post Concession era**

Upon investigating if there exist a relationship between the cargo throughput and the maritime GDP, it was observed that the proportion of the variation in the maritime GDP that is predictable from the cargo throughput is 68%. We have observed that, even though other parameters contribute to the increase of the economy of the maritime industry, the cargo throughput is highly important. From table 1, we can see that the cargo throughput is statistically significance in the Maritime GDP because the p-value is < 0.05. The mathematical relationship may be expressed as:

$$MTGDP=264+0.000073CT+\varepsilon \quad (3)$$



## CONCLUSION

I have analyzed the performance of the ports before and after the reform in terms of the cargo throughput and maritime transport GDP. Though the cargo throughput after the concession has been increasing tremendously, but the average annual growth rate shows that the pre-concession performed better with difference of 8%. On the other hand, the economy of the maritime transport performs better in the post-concession compared to the pre-concession. In order to investigate the relationship between the cargo throughput and the maritime GDP, the data was modeled in a linear regression, and it shows that the economy of the Nigerian maritime transport depends on the cargo throughput by 68%. This research validates the posits by previous research that the reform had a positive impact on the performance of the Nigerian ports but, less concerned have been given to the rate at which the cargo throughput has been performing. Results indicated that, the concession only had impact on the Nigerian port till 2011, afterwards, the growth rate for both the cargo volume and maritime GDP has been diminishing. The relationship between the cargo throughput and the maritime GDP can be expressed in a simple form as:  $MTGDP=264+0.000073CT+\epsilon$  and thus, can form the basis upon which future contribution of the Cargo throughput to the Maritime economy can be projected.

## 6. RECOMMENDATION

Having assessed the cargo throughput and maritime GDP performance of the Nigerian ports before and after the concession, and the significance of the cargo throughput to the maritime economy, it is not an overstatement to say that the concession proved effective but did not last long. Also, that the volume of cargo going in and out of the Nigerian port influences the GDP of the maritime transport industry. I have identified that some factors contribute to the ill-performance of the concession and these action plans have been recommended in order to improve and cause a boom in this industry.

- The security of the port should be prioritized. The Nigerian government need to work judiciously with the Nigerian Maritime Administration and Safety Agency (NIMASA) integrating all other national security bodies to manage the insecurity issues that had led to loss of lives, damage and loss of maritime investment. On this note, the implementation of the International Ship and Port Facility Security (ISPS) should be compulsory for all ships and seaports.
- The government should invest in modern infrastructural facilities. One of the factors contributing to cargo delay and high vessel turnaround time is lack of modern cargo handling equipment. This delay has contributed to cargo diversion and made port users prefer to use other neighboring seaports.
- The intermodal transport system and inland container depot should be effectively implemented. The Nigerian government should invest in other means of transportation like the rail and road to promote effective operations of the Nigerian ports. The creating of good road



and rail networks, and ICDs will decongest the ports and enable fast and efficient operations of the port.

- The eastern ports should be patronized. Amongst the six seaports in Nigeria, only two is functioning near their optimal ability, the other four located in the southern part of Nigeria have been underutilized. If these ports are patronized, it will decongest the Lagos ports that are always congested.
- Employ the right man for the job. If a professional is employed in his field, he will do the job in the most efficient manner. The Nigerian maritime industry has been bedeviled with corruption and favoritism.

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