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MODERNIZING MARITIME TRANSPORTATION INFRASTRUCTURE IN NIGERIA TOWARDS TRANSFORMATION INTO REGIONAL TRANSshipment HUB IN WEST AFRICA

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ABSTRACT

The study examines the impact of maritime transportation infrastructure on Nigeria's economic growth and development. The objectives were to: assess the current state of maritime transportation infrastructure in Nigeria and identify critical gaps hindering its transformation into a regional transshipment hub; analyze global best practices and models of successful transshipment hubs (e.g., Singapore, Rotterdam, Djibouti) and evaluate their applicability to the Nigerian maritime context; examine the role of policy frameworks, institutional coordination, and regulatory reforms necessary for supporting maritime infrastructure modernization in Nigeria; evaluate the potential economic, trade, and employment benefits of developing Nigeria as a transshipment hub in West Africa; and propose strategic investments, technological upgrades, and public-private partnership (PPP) models required to achieve efficient, secure, and competitive maritime infrastructure in Nigeria. The study adopted the Taro Yamane formula to determine the sample size of 272 out of 299, thus giving a 90.97% response rate. Observation and structured questionnaire was used for the collection of data. Quantitative data was analyzed using descriptive statistics, while qualitative data was coded and analyzed using the 4-point Likert Scale. The study finds, amongst others that the current port facilities in Nigeria are inadequate to handle large-scale transshipment operations; investment in maritime infrastructure would stimulate growth in related sectors such as logistics, warehousing, and inland transportation and transforming Nigeria into a transshipment hub would significantly boost national revenue and foreign exchange earnings. Accordingly, among others, the study recommends that government should consider expediting efforts towards strategic investment in deep seaports and logistics corridors to enhance Nigeria's competitiveness as a transshipment hub and encourage public-private partnerships (PPP) towards financing and managing large-scale port and maritime infrastructure projects in Nigeria.

Keywords: Transshipment, public-private partnership, infrastructure, congestion, investment

INTRODUCTION

Nigeria's renewed effort this year (2025) at re-election into Category "C" of the International Maritime Organization (IMO) Council is coming 16 years since re-election bids started. The country has only been elected into the IMO Council three times – in 2000, 2007 and 2009 for tenure of two years per time while all other attempts at re-election since 2009 have failed (Agha, 2024). In response to Nigeria's continued preparation for re-election, a report of the IMO Member State Audit Scheme (IMSAS) in 2016 raised questions that centred on observed gaps in the maritime sector, part of which included maritime infrastructure deficit (Eto, 2021).

To be elected into IMO Category C Seat, part of the requirement is for the country to modernize her maritime and port infrastructure given her strategic location, in order to enhance her influence in the global maritime space as well as boost her leadership position and facilitate foreign investment, boost trade, job creation, and economic development. Accordingly, it is expected that the construction of deep seaports would encourage the modernization of maritime infrastructure in tandem with what obtains in the 21st Century in order to encourage investors, facilitate trade and boost Nigeria's international ranking.

The construction of deep seaports in various locations boost the country's Maritime Dependency Factor, would further increase the chances of Nigeria attaining transshipment hub status (through container throughput capacity). Currently, neighbouring countries claim transshipment hub status because they boast of efficient cargo handling process and speedy evacuation to hinterland locations in the face Nigeria's glaring maritime infrastructure deficit and cumbersome, manual-driven clearing process (Eto, 2021).

The advent of ultra large vessels and very large vessels is a big challenge to existing ports in Nigeria owing to inadequate harbor infrastructure that limits the country's ability to accommodate

modern generation vessels. The ports' channels are mostly shallow. For instance, Lagos ports have channel depth of between 9 and 13.5m. Eastern port channels depth: Onne is between 8 and 11m, Port Harcourt is between 7.1 and 9.1m; Warri is between 6.5 and 7.6m; and Calabar is between 5.4 and 6.4m, while Ghana (19m) and Republic of Benin (15m) (Eto, 2021). Only the Lekki deep seaport has a depth of 16m in Nigeria (Olisa Agbakoba Legal, 2023).

It is certain that the completion of other proposed deep seaports like Ibom deep seaport in Akwa Ibom State; Badagry deep seaport in Lagos State; Bonny deep seaport in Rivers State; Burutu deep seaport in Delta State; Olokola deep seaport in Ogun State and Bakassi deep seaport in Cross River State would add to the number of seaports with draught comparable to deep seaports elsewhere (Eto, 2021).

One major advantage of deep seaports is that they would lessen the cargo burden on existing ports and avert the challenge of congestion that has been a persistent issue at Lagos ports. This is because they would be constructed to feature modern maritime infrastructure with the result that trade imbalance due to inadequate implementation of modern technology, lack of 24-hour port operations, manual cargo inspection by the Nigeria Customs Service (NCS), and low-capacity utilization by terminals would be a thing of the past (Olisa Agbakoba Legal, 2023).

Obsolete maritime and port infrastructure, which results in port congestion, also contributes to the menace of severe gridlock of trucks within the ports and cargo congestion at terminals. Bureaucratic bottlenecks, lack of synergy between relevant agencies, burdensome clearing processes, frequent public holidays, and short working hours, are other factors that contribute to cargo ships having to wait for upward of a month in the anchorage before discharging their cargoes in Lagos ports. Thus, judging from the immense advantages derived from the functionality of Lekki deep seaport, it is poised to promote Nigeria's quest for transformation into a regional transshipment hub given its modern maritime infrastructure to berth vessels that are four times the size of vessels currently berthing at Lagos ports. It is therefore desirable that the construction of the other proposed deep seaports be expedited.

In the quest for transformation into a maritime transshipment hub, modernizing maritime infrastructure in Nigeria is a sine qua non. The competitive advantage provided by modern maritime infrastructure is that when incorporated into the construction of the deep seaports they enhance the capacity to receive larger vessels and unload ships twice as quickly. While recognizing the significance of deep seaports in the drive towards transformation into transshipment hub, there is need for existing ports to be equipped with modern maritime infrastructure in order to reduce port congestion and minimize the length of time required for a vessel stays in the port, which leads to cost savings for importers and exporters.

The Problem

By reason of population and capacity for trade, Nigeria generates over 65% of the cargo coming to the West and Central Africa region and was initially tipped to be the load centre (trans-shipment base for cargo vessels of all types and sizes) in the sub region (Eto, 2021). However, when World Bank experts conducted a study in West Africa to ascertain which of the countries in the sub region qualified as load centre, their empirical report did not favour Nigeria even with the tremendous size of her trade and vast coastline (Ugwoke, 2015).

A load centre is a point of convergence for vessels trading in a particular region. Such that rather than bigger vessels having to take cargoes to every port in the region, they simply deliver such cargoes to a trans-shipment base (load centre) from where small vessels take such cargoes for final delivery to other neighbouring ports (Ugwoke, 2015).

Among others, one of the key factors that counted against Nigeria being considered as a transshipment centre was lack of modern maritime infrastructure. The other factors were: (1) the issue of high cost of doing business (2) high level of corruption in the port system (3) multiplicity of agencies and agents of government (4) extortion of money from importers and ship-owners (5)

the size of the ports and facilities, including the shallow level of the draught (draught restrictions) (Ugwoke, 2015).

The lack of maritime and port infrastructure coupled with bureaucratic bottlenecks at the seaports were so unappealing that the World Bank ranked Lagos ports (which handle 75% of the country's import) to be 358th out of 370 ports, based on Container Port Performance Index 2021 report. This is with the result that cargoes destined for Nigeria were being diverted to ports in neighbouring countries where there were relatively modern maritime infrastructure backed with efficient services that guaranteed quick ship turnaround time and moderate freight charges (Tunji, 2022). It was in recognition of the need to rehabilitate the deteriorating quay walls for landside operations and other physical infrastructure at Lagos ports and the need to deepen their draught to 16.5m to accommodate larger vessels that compelled NPA to apply for a loan facility of \$700m from UK Export Finance (Business Transport, 2024). This underlies the significance of modern maritime infrastructure in the 21st Century.

Neighbouring countries are constructing deep seaports with modern amenities and maritime infrastructure to handle larger cargo carrying ships. Consequently, landlocked nations like Chad and the Republic of Niger, which previously patronized Nigerian ports as transit hubs for their shipments, have switched to Ghana, Togo, the Benin Republic, Côte d'Ivoire, and Cameroon. Consequently, cargo diversion has cost Nigeria a huge amount of money in capital flight, amounting to billions of naira yearly. In the same vein, due to the absence of modern maritime infrastructure, investors also avoid Nigeria's port and maritime sector only to invest somewhere else (Olisa Agbakoba Law Firm, 2023). Thus, Nigeria's lack of modern infrastructure and lack of sufficient number of functional deep seaports have caused her to gradually lose the prospect of being the maritime transshipment hub of West Africa.

Some projects embarked upon towards modernizing maritime infrastructure in Nigeria and towards attaining maritime transshipment hub include the construction of Lekki Deep Seaport, which is capable of handling post-panamax vessels and over 1.2 million TEUs annually; Badagry port project, designed for container, bulk, oil, and RORO terminals. Onne port expansion is an initiative towards serving as a key logistics base for offshore drilling activities and digitalization of port operations, which entailed the Port Community System and E-Call-Up System to reduce bottlenecks, improve turnaround times, and enhance investor confidence (Wigmore Trading Nigeria, 2021).

Therefore, considering the impact of maritime transport on international trade and economic growth in Nigeria, and in view of the country's quest to be the maritime transshipment hub in West Africa, the call for the modernization of maritime transport infrastructure cannot be over emphasized. This is because it would improve cargo handling capacity at the seaports, boost maritime trade, and support maritime jobs and local economies (Wigmore Trading Nigeria, 2021). Modernizing maritime transport infrastructure towards attaining maritime transshipment hub would lead to sustainability, long-term economic growth and resilience of the industry towards shaping the country's maritime trade. However, this requires maritime finance to enable investments in ships, requisite infrastructure, and technological advancements which is the lifeline of the global shipping industry. Hence, the aim of the study was to examine the essence of modernizing maritime infrastructure in Nigeria towards transformation into regional transshipment hub in West Africa with the following objectives:

1. To assess the current state of maritime infrastructure in Nigeria and identify critical gaps hindering its transformation into a regional transshipment hub.
2. To analyze global best practices and models of successful transshipment hubs (e.g., Singapore, Rotterdam, Djibouti) and evaluate their applicability to the Nigerian maritime context.
3. To examine the role of policy frameworks, institutional coordination, and regulatory reforms necessary for supporting maritime infrastructure modernization in Nigeria.

4. To evaluate the potential economic, trade, and employment benefits of developing Nigeria as a transshipment hub in West Africa.
5. To propose strategic investments, technological upgrades, and public-private partnership (PPP) models required to achieve efficient, secure, and competitive maritime infrastructure in Nigeria.

Literature Review/Conceptual Clarifications

Nigeria's Deep Seaports: the Quest for Transshipment Hub and Readiness to Meet IMO Criteria

The competitiveness of the country's maritime industry is determined by the state of her maritime infrastructure and the level of compliance with International Maritime Organization (IMO) standards. Therefore, Nigeria's inability to satisfy the stipulated conditions of IMO has always contributed to the futile campaign to occupy Category C Seat of the Council, which has been ongoing after the electoral success of 2009 when Nigeria last occupied that position.

This aspiration has remained elusive and the failure to secure re-election into the IMO Council in subsequent electoral years has been attributed to the nation's inability to address the challenges of the maritime industry in line with recognized global best standards and practices. This forms the basis for Nigeria's active participation at the July 2025 Global Maritime and Aviation Symposium in Singapore as part of her broader international engagement strategy for election into the IMO Council this year 2025 (Yousouph, 2025).

Moreover, Nigeria has earmarked several proposed deep seaports and so far the only one that has been completed and is functional is the [Lekki Deep Sea Port](#) in Nigeria. It was commissioned in 2023, and is the largest of its kind in West Africa. It is located at the centre of the Lagos Free Zone. Its construction took into account the need for modern maritime infrastructure as it has become the first fully-automated port equipped with Super Post-Panamax ship-to-shore cranes and Rubber tyred gantry (RTG) cranes. The port is aspiring to accommodate vessels transporting about 15,000 containers. It is well equipped with highly sophisticated 13 quay cranes for a capacity of 2.5 million Twenty-Foot Equivalent Units (TEUs) on a 1.2-kilometre quay with a depth of 16 meters (Olisa Agbakoba Legal, 2023).

The Lekki Deep seaport commenced transshipment operations to some regional ports such as Togo, Ghana, and Cote d'Ivoire in West Africa. It processed 6,076 TEUs of transshipment containers in 2023 thereby reclaiming a market share that Nigeria once lost to neighbouring countries (Ameh News, 2024). Between January and June, 2025, the port processed 222,000 TEUs with the ultimate target being 500,000 TEUs by 2025 ending (Ozoemena, 2025).

Challenges of Nigeria's Maritime Transportation Infrastructure

Wigmore Trading Nigeria (2021) observes that maritime infrastructure development in Nigeria faces the following challenges:

1. Aging infrastructure at Lagos Port Complex and Tin Can Island port.
2. Traffic congestion in port corridors.
3. Bureaucratic delays and customs inefficiencies.
4. Security concerns in coastal waters

The Significance of Modernizing Maritime Transportation Infrastructure in Nigeria

Eto (2021) has advanced the following reasons to modernize maritime infrastructure in Nigeria:

- **Improved Cargo Handling Capacity:** Upgrading ports and terminals would enable Nigeria to handle larger ships and increased cargo volumes, reducing vessel waiting times and improve container throughput. This would reposition the country as a maritime transshipment hub in West Africa.
- **Boost to Trade and Industry:** An enhanced infrastructure would support Nigeria's role as a regional logistics hub, facilitating oil and gas exports, agricultural shipments, and containerized imports.

- **Job Creation and Local Economic Growth:** Modern ports and terminals would contribute to employment, skills development, and industrial expansion in coastal communities.
- **Enhanced Security:** Modernizing maritime infrastructure would include implementing security measures such as coastal surveillance radar systems, drone monitoring, and integrated command and control centers to combat piracy and protect assets.
- **Environmental Sustainability:** Green port initiatives, such as LNG bunkering and clean energy infrastructure, would help reduce the environmental impact of maritime operations.
- **Increased Competitiveness:** Modernized ports and efficient logistics systems would improve Nigeria's global competitiveness, thereby attracting foreign investment and stimulating economic growth.

Financing Maritime Transportation Infrastructure

Maritime finance entails financial strategies and instruments that are used to fund the acquisition, construction and operations of ships and maritime transportation infrastructure. The shipping industry can only prosper in the light of maritime finance, which is the backbone that drives investment in ships, ports and infrastructure. This understanding applies to ship owners who are interested in growing their fleet, investors who are desirous of exploring opportunities or financial experts who are navigating complex transactions. The maritime industry is a dynamic sector that sits at the intersection of economics, regulation and technology (Shipfinex, 2025).

Financing maritime transportation infrastructure involves a blend of public and private funding, which include traditional bank loans, private equity, government-backed funds, and public-private partnerships (PPPs). International financial institutions such as the IFC and bilateral/multilateral agreements can also play a crucial role (Matekenya & Ncwadi, 2022).

Sources of Funding:

According to Shipfinex (2025) and Eto and Okon (2025), the following are some sources of funding for maritime transportation infrastructure:

- **Traditional Bank Loans:** Ships can be used as collateral for loans, making this a common method of financing
- **Private Equity and Institutional Investors:** The investors provide capital for long-term shipping projects
- **Debt Financing:** This includes bonds and maritime loans, providing various avenues for securing funding
- **Government-Backed Funds:** These funds support both domestic and international shipping enterprises
- **Public-Private Partnerships (PPPs):** PPPs can attract foreign investment and expertise for projects like port development and operations
- **International Financial Institutions:** Organizations like the International Finance Corporation (IFC) can facilitate investments
- **Bilateral and Multilateral Agreements:** Agreements with other nations and organizations can provide financial and technical support
- **Emerging Trends:** Crowd funding and alternative investments are expanding capital access

Empirical Review

A number of studies have established a positive relationship between investing in maritime transportation infrastructure and enhancing the chances of international trade, transshipment hub status and economic growth of a nation. In the view of the World Economic Forum (2015) cited in Shi W and Li KX (2017), quality infrastructure does not only reduce the distance between regions but also integrates national markets and connects them at low costs to other economies. This

informs the reason for the call to modernize maritime transportation infrastructure in order to conform to emerging technologies in the 21st Century.

For instance, Jiang (2010) examines the investment in seaport towards economic development in China and Korea and found that there is a positive relationship between investing in seaport infrastructure and economic growth. According to Matekenya and Ncwadi (2022), the study by Song and Geenhuizen (2014) confirmed that there is a positive relationship between investing in maritime transportation infrastructure and the promotion of regional transshipment hub which trigger regional growth. In the same vein, Hargono et al. (2013) cited in Matekenya and Ncwadi (2022) found a positive relationship between seaports exports and imports aided by investment in modern maritime transportation infrastructure and economic growth in China.

In a study titled “Critical assessment of Nigerian seaports as potential growth-poles: challenges and prospects of achieving transshipment hub status”, Eto (2021b), observes that about 87% of global seaborne trade by volume was handled by only 20 of the world’s seaports in 2017. This according to the author is clearly an open invitation for Nigeria, with its competitive advantage, to be counted among countries with world class transshipment facilities. The country lacks sufficient number of large-scale deep-water seaports and the speed of port modernization is still low notwithstanding the much-touted port concession. Worst still, existing ports do not have the capacity to accommodate Very Large and Ultra Large vessels (Olisa Agbakoba Legal, 2023).

Furthermore, Ismail and Mahyideen (2015) examine the impact of the quality of port infrastructure on trade flows in some Asian countries and found a measurable increase in trade flows due to modernization of transport infrastructure in those countries. Similarly, Kazutomo and Wilson (2019) cited in Matekenya and Ncwadi (2022) examine the impact of port infrastructure on exports and imports of emerging economies in East Asia and found that port congestion tended to increase transport costs. Thus, Matekenya and Ncwadi (2022) concluded from their studies that a significant amount of investment in maritime transport infrastructure would have a positive impact on exports and consequently reduce transport costs. This justifies the clamor for the modernization of maritime transportation infrastructure in Nigeria towards transformation as maritime transshipment hub in West Africa.

METHODOLOGY

The study uses cross-sectional survey design which involves 4-point Likert Scale questionnaire and structured interview to gather data from the population. The population and sample of the study were drawn from the five groups that are major stakeholders in the maritime sector in Nigeria. The sample selection was by multi-stage sampling techniques that involved stratified and random sampling techniques due to its thoroughness and accuracy of representation. In order to analyze the data gathered, descriptive statistics was used. Respondents used a scale of 1 (Strongly Agree) to 4 (Strongly Disagree) for their answers.

Table 1 Population of the study

S/N	Respondents	Population
1	Barge Operators	98
2	Terminal Operators	28
3	Shippers (importers and exporters)	282
4	Freight Forwarders	267
5	Boat Operators	171
	Total	846

Source: Researcher’s compilation, 2025

The study adopted the Taro Yamane formula to determine the sample size, out of population of study of 846.

Taro Yamane method: $n = \frac{N}{(1+N(e)^2)}$
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Where:

n = sample size required

N = number of people in the population

e = allowable error (%) which is 0.05

After substitution 299 was derived. Hence the sample size for the study was 299.

Table 2: Sample Size Determination

S/N	Respondents	Population	Proportion	Sample size
1	Barge Operators	98	$\frac{299(98)}{846}$	35
2	Terminal/ Jetty Operators	28	$\frac{299(28)}{846}$	10
3	Shippers (importers and exporters)	282	$\frac{299(282)}{846}$	100
4	Freight Forwarders	267	$\frac{299(267)}{846}$	94
5	Boat Operators	171	$\frac{299(171)}{846}$	60
	Total	846		299

Source: Researchers' Computation (2025)

RESULTS AND DISCUSSION

Summary of Questionnaire Distributed

The questionnaire distributed and the number of copies retrieved is presented in Table 3.

Table 3: Copies of Questionnaire Administered

Number of copies of Questionnaire Distributed	Number of copies of Questionnaire Retrieved	% of Copies of Questionnaire Retrieved
299	272	90.97

Source: Field survey (2025)

A total of 299 copies of the questionnaire were distributed to major stakeholders in the maritime sector. 272 copies were returned to represent 90.97% response rate as shown in the Table above.

Gender Distribution

The gender distribution of the respondents is shown in the Table 2. The distribution shows that 147 or 54% of the respondents were male while 125 or 46% were female. This shows that majority of the respondents were male.

Age Distribution

The age distribution shows that the number of respondents who were less than 18 years of age was nil. Those whose age fell into the age bracket 18-35 years were 84 or 31%. The distribution shows that respondents whose age bracket fell into 36-65 years were 157 or 58%, which happened to be the majority. The respondents whose age was 66 years above were 31 or 11%.

Educational Level

The formal education of respondents is shown in Table 2 shows that all the respondents attained one level of formal education or another. Those who attained Primary School education were 21 or 8%. The respondents who attained Secondary School education were 164 or 60% and those with tertiary education were 87 or 32%.

Occupation Distribution

The occupation distribution shows that 32 or 12% were Barge Operators. Freight forwarders were 84 or 31%. Terminal Operators were 6 or 2%. Jetty operators were 4 or 1%, Boat Operators were 54 or 20%, Importers were 71 or 26% and Exporters were 21 or 8%.

Status

The status distribution of respondents shows that 64 or 24% were of the top-level management. Majority of the respondents (166 or 61%) belonged to the Senior-level management cadre and 42 or 15% were of the junior management level.

TABLE4: DEMOGRAPHIC ANALYSIS OF RESPONDENTS

Characteristics	Frequency	Percentage (%)
Gender		
Male	147	54
Female	125	46
Total	272	100
Age (Years)		
Less than 18	Nil	Nil
18-35	84	31
36-65	157	58
66 Above	31	11
Total	272	100
Educational Level		
Primary	21	8
Secondary	164	60
Tertiary	87	32
Total	272	100
Occupation		
Barge Operators	32	12
Freight forwarders	84	31
Terminal Operators	6	2
Jetty Operators	4	1
Boat Operators	54	20
Importers	71	26
Exporters	21	8
Total	272	100
Status		
Top-level Management	64	24
Senior-level Management	166	61
Junior Management	42	15
Total	272	100

Source: *Researchers Field Survey, 2025*

Analysis and Discussion of Findings

Table 5: Objective 1: To assess the current state of maritime infrastructure in Nigeria and identify critical gaps hindering its transformation into a regional transshipment hub

S/N	Question Items	SA	%	A	%	D	%	SD	%	Total	%
1	The current port facilities in Nigeria are adequate to handle large-scale transshipment operations.	18	7	31	11	43	16	180	66	272	100
2	Existing cargo handling equipment and terminal technologies in Nigerian ports meet international standards.	23	8	29	11	56	21	164	60	272	100
3	Poor connectivity between ports and inland transport networks (roads, rail, inland waterways) is a major barrier to Nigeria becoming a transshipment hub.	149	55	62	23	34	12	27	10	272	100
4	Nigerian ports experience significant delays due to inefficient administrative or customs procedures.	178	65	51	19	22	8	21	8	272	100
5	There is a low of investment in critical infrastructure such as deep seaports, container terminals, and logistics hubs necessary for transshipment competitiveness.	152	56	49	18	42	15	29	11	272	100

Source: Field survey, 2025

Objective 1 aims to assess the current state of maritime infrastructure in Nigeria and identify critical gaps hindering its transformation into a regional transshipment hub. The questions aim to help gather valuable insights into the current state of port facilities and determine the investment drive in critical infrastructure towards transformation of Nigeria into regional transshipment hub.

Based on objective 1, Table 5 shows the responses to question 1 which is that: The current port facilities in Nigeria are adequate to handle large-scale transshipment operations. The Table shows that 18 (7%) respondents strongly agreed that the current port facilities in Nigeria are adequate to handle large-scale transshipment operation; 31 (11%) agreed; 43 (16%) disagreed while 180 (66%) strongly disagreed. This implies that the current port facilities in Nigeria are inadequate to handle large-scale transshipment operations.

The Table also shows responses to question 2, which states that: Existing cargo handling equipment and terminal technologies in Nigerian ports meet international standards. The Table shows that 23 (8%) respondents strongly agreed that existing cargo handling equipment and terminal technologies in Nigerian ports meet international standards; 29 (11%) agreed; 56 (21%) disagreed, while 164 (60%) strongly disagreed. This implies that existing cargo handling equipment and terminal technologies in Nigerian ports do not meet international standards.

Furthermore, the Table shows responses to question 3, which states that: Poor connectivity between ports and inland transport networks (roads, rail, inland waterways) is a major barrier to Nigeria becoming a transshipment hub. The Table shows that 149 (55%) respondents strongly agreed that poor connectivity between ports and inland transport networks (roads, rail, inland waterways) is a major barrier to Nigeria becoming a transshipment hub; 62 (23%) agreed; 34 (12%) disagreed, while 27 (10%) strongly disagreed. This implies that poor connectivity between ports and inland transport networks (roads, rail, inland waterways) is a major barrier to Nigeria becoming a transshipment hub.

The Table also shows responses to question 4, which states that: Nigerian ports experience significant delays due to inefficient administrative or customs procedures. The Table shows that 178 (65%) respondents strongly agreed that Nigerian ports experience significant delays due to inefficient administrative or customs procedures; 51 (19%) agreed; 22 (8%) disagreed; while 21 (8%) strongly disagreed. This implies that Nigerian ports experience significant delays due to inefficient administrative or customs procedures.

Table 5 also shows responses to question 5, which states that: There is a low of investment in critical infrastructure such as deep seaports, container terminals, and logistics hubs necessary for transshipment competitiveness. The Table shows that 152 (56%) respondents strongly agreed that there is a low of investment in critical infrastructure such as deep seaports, container terminals, and logistics hubs necessary for transshipment competitiveness; 49 (18%) agreed; 42 (15%) disagreed, while 29 (11%) respondents strongly disagreed. This implies that there is a low of investment in critical infrastructure such as deep seaports, container terminals, and logistics hubs necessary for transshipment competitiveness.

Table 6: Objective 2: To analyze global best practices and models of successful transshipment hubs (e.g., Singapore, Rotterdam, Djibouti) and evaluate their applicability to the Nigerian maritime context

S/N	Question Items	SA	%	A	%	D	%	SD	%	Total	%
1	Adopting global best practices from transshipment hubs like Singapore and Rotterdam can significantly improve port efficiency in Nigeria.	129	47	57	21	45	17	41	15	272	100
2	The Nigerian maritime environment can support the implementation of automated port systems used in advanced transshipment hubs	154	57	43	16	37	13	38	14	272	100
3	Public-private partnership models used in ports like Djibouti are applicable and feasible for Nigeria's port development.	155	57	41	15	34	13	42	15	272	100
4	Customs and regulatory reforms implemented in global hubs can be realistically adapted to Nigeria's port operations.	139	51	54	20	41	15	38	14	272	100
5	Lessons from successful transshipment hubs can help Nigeria design port policies that attract more regional cargo traffic.	137	50	56	21	48	18	31	11	272	100

Source: *Researcher's Field Survey, 2025*

Objective 2 aims to analyze global best practices and models of successful transshipment hubs (e.g., Singapore, Rotterdam, Djibouti) and evaluate their applicability to the Nigerian maritime context. The questions aim to help gather valuable insights into how lessons from notable transshipment hubs can apply to Nigeria in order to attract regional cargo traffic.

Based on objective 2, Table 6 shows the responses to question 1 which is that: Adopting global best practices from transshipment hubs like Singapore and Rotterdam can significantly improve port efficiency in Nigeria. The Table shows that 129 (47%) respondents strongly agreed that adopting global best practices from transshipment hubs like Singapore and Rotterdam can significantly improve port efficiency in Nigeria; 57 (21%) agreed; 45 (17%) disagreed while 41(15%) strongly disagreed. This implies that adopting global best practices from transshipment hubs like Singapore and Rotterdam can significantly improve port efficiency in Nigeria.

The Table also shows responses to question 2, which states that: The Nigerian maritime environment can support the implementation of automated port systems used in advanced transshipment hubs. The Table shows that 154 (57%) respondents strongly agreed that the Nigerian maritime environment can support the implementation of automated port systems used in advanced transshipment hubs; 43 (16%) agreed; 37 (13%) disagreed, while 38 (14%) strongly disagreed. This implies that the Nigerian maritime environment can support the implementation of automated port systems used in advanced transshipment hubs.

Furthermore, the Table shows responses to question 3, which states that: Public-private partnership models used in ports like Djibouti are applicable and feasible for Nigeria's port development. The Table shows that 155 (57%) respondents strongly agreed that public-private partnership models used in ports like Djibouti are applicable and feasible for Nigeria's port development; 41 (15%) agreed; 34 (13%) disagreed, while 42 (15%) strongly disagreed. This implies that public-private partnership models used in ports like Djibouti are applicable and feasible for Nigeria's port development.

The Table also shows responses to question 4, which states that: Customs and regulatory reforms implemented in global hubs can be realistically adapted to Nigeria's port operations.

The Table shows that 139 (51%) respondents strongly agreed that Customs and regulatory reforms implemented in global hubs can be realistically adapted to Nigeria's port operations; 54 (20%) agreed; 41 (15%) disagreed; while 38 (14%) strongly disagreed. This implies that Customs and regulatory reforms implemented in global hubs can be realistically adapted to Nigeria's port operations.

Table 5 also shows responses to question 5, which states that: Lessons from successful transshipment hubs can help Nigeria design port policies that attract more regional cargo traffic.. The Table shows that 137 (50%) respondents strongly agreed that lessons from successful transshipment hubs can help Nigeria design port policies that attract more regional cargo traffic; 56 (21%) agreed; 48 (18%) disagreed, while 31 (11%) respondents strongly disagreed. This implies that lessons from successful transshipment hubs can help Nigeria design port policies that attract more regional cargo traffic.

Table 7: Objective 3: To examine the role of policy frameworks, institutional coordination, and regulatory reforms necessary for supporting maritime infrastructure modernization in Nigeria

S/N	Question Items	SA	%	A	%	D	%	SD	%	Total	%
1	Current maritime policies in Nigeria are insufficient to drive the modernization of port infrastructure	141	52	47	17	26	10	58	21	272	100
2	There is a lack of effective coordination among key stakeholders such as port authorities, regulatory agencies, and private operators	169	62	51	19	35	13	17	6	272	100
3	Outdated regulatory frameworks hinder investment and innovation in Nigeria's maritime sector.	158	58	46	17	38	14	30	11	272	100
4	Policy consistency and government commitment are critical to successful maritime infrastructure reforms.	161	59	47	17	29	11	35	13	272	100
5	Establishing a centralized maritime regulatory authority would enhance the efficiency of infrastructure modernization efforts	53	19	41	15	76	28	102	38	272	100

Source: *Researcher's Field Survey, 2025*

Objective 3 aims to examine the role of policy frameworks, institutional coordination, and regulatory reforms necessary for supporting maritime infrastructure modernization in Nigeria. The questions aim to help gather valuable insights into current policies and government's commitment, the extent of cooperation among stakeholders and regulatory framework for investment.

Based on objective 3, Table 7 shows the responses to question 1 which is that: Current maritime policies in Nigeria are insufficient to drive the modernization of port infrastructure. The Table shows that 141 (52%) respondents strongly agreed that current maritime policies in Nigeria are insufficient to drive the modernization of port infrastructure; 47 (17%) agreed; 26 (10%) disagreed while 58 (21%) strongly disagreed. This implies that current maritime policies in Nigeria are insufficient to drive the modernization of port infrastructure.

The Table also shows responses to question 2, which states that: There is a lack of effective coordination among key stakeholders such as port authorities, regulatory agencies, and private operators. The Table shows that 169 (62%) respondents strongly agreed that there is a lack of effective coordination among key stakeholders such as port authorities, regulatory agencies, and private operators; 51 (19%) agreed; 35 (13%) disagreed, while 17 (6%) strongly disagreed. This implies that there is a lack of effective coordination among key stakeholders such as port authorities, regulatory agencies, and private operators.

Furthermore, the Table shows responses to question 3, which states that: Outdated regulatory frameworks hinder investment and innovation in Nigeria's maritime sector. The Table shows that 158 (58%) respondents strongly agreed that outdated regulatory frameworks hinder investment and innovation in Nigeria's maritime sector; 46 (17%) agreed; 38 (14%) disagreed, while 30 (11%) strongly disagreed. This implies that outdated regulatory frameworks hinder investment and innovation in Nigeria's maritime sector.

The Table also shows responses to question 4, which states that: Policy consistency and government commitment are critical to successful maritime infrastructure reforms. The Table shows that 161 (59%) respondents strongly agreed that policy consistency and government commitment are critical to successful maritime infrastructure reforms; 47 (17%) agreed; 29 (11%) disagreed; while 35 (13%) strongly disagreed. This implies that policy consistency and government commitment are critical to successful maritime infrastructure reforms.

Table 7 also shows responses to question 5, which states that: Establishing a centralized maritime regulatory authority would enhance the efficiency of infrastructure modernization efforts. The Table shows that 53 (19%) respondents strongly agreed that establishing a centralized maritime regulatory authority would enhance the efficiency of infrastructure modernization efforts; 41 (15%) agreed; 76 (28%) disagreed, while 102 (38%) respondents strongly disagreed. This implies that establishing a centralized maritime regulatory authority would not enhance the efficiency of infrastructure modernization efforts.

Table 8: Objective 4: To evaluate the potential economic, trade, and employment benefits of developing Nigeria as a transshipment hub in West Africa

S/N	Question Items	SA	%	A	%	D	%	SD	%	Total	%
1	Transforming Nigeria into a transshipment hub would significantly boost national revenue and foreign exchange earnings	131	48	61	22	51	19	29	11	272	100
2	A functional transshipment hub in Nigeria would increase regional trade and cargo traffic through Nigerian ports	148	54	57	21	23	9	44	16	272	100
3	The development of transshipment infrastructure in Nigeria would create substantial employment opportunities across the maritime value chain	136	50	55	20	42	15	39	14	272	100
4	Improved maritime infrastructure would stimulate growth in related sectors such as logistics, warehousing, and inland transportation	151	55	43	16	38	14	40	15	272	100
5	Establishing Nigeria as a regional transshipment hub would enhance the country's competitiveness in the global maritime trade network	132	48	59	22	45	17	36	13	272	100

Source: *Researcher's Field Survey, 2025*

Objective 4 aims to evaluate the potential economic, trade, and employment benefits of developing Nigeria as a transshipment hub in West Africa. The questions aim to help gather valuable insights into possible benefits of transshipment hub in terms of boosting national revenue and foreign exchange earnings, increasing regional trade transshipment hub and enhancing the country's competitiveness in the global maritime trade network.

Based on objective 4, Table 8 shows the responses to question 1 which is that: Transforming Nigeria into a transshipment hub would significantly boost national revenue and foreign exchange earnings. The Table shows that 131 (48%) respondents strongly agreed that

transforming Nigeria into a transshipment hub would significantly boost national revenue and foreign exchange earnings; 61 (22%) agreed; 51 (19%) disagreed while 29 (11%) strongly disagreed. This implies that transforming Nigeria into a transshipment hub would significantly boost national revenue and foreign exchange earnings.

The Table also shows responses to question 2, which states that: A functional transshipment hub in Nigeria would increase regional trade and cargo traffic through Nigerian ports. The Table shows that 169 (62%) respondents strongly agreed that a functional transshipment hub in Nigeria would increase regional trade and cargo traffic through Nigerian ports; 51 (19%) agreed; 35 (13%) disagreed, while 17 (6%) strongly disagreed. This implies that a functional transshipment hub in Nigeria would increase regional trade and cargo traffic through Nigerian ports.

Furthermore, the Table shows responses to question 3, which states that: The development of transshipment infrastructure in Nigeria would create substantial employment opportunities across the maritime value chain. The Table shows that 136 (50%) respondents strongly agreed that the development of transshipment infrastructure in Nigeria would create substantial employment opportunities across the maritime value chain; 55 (20%) agreed; 42 (15%) disagreed, while 39 (14%) strongly disagreed. This implies that the development of transshipment infrastructure in Nigeria would create substantial employment opportunities across the maritime value chain.

The Table also shows responses to question 4, which states that: Improved maritime infrastructure would stimulate growth in related sectors such as logistics, warehousing, and inland transportation. The Table shows that 151 (55%) respondents strongly agreed that improved maritime infrastructure would stimulate growth in related sectors such as logistics, warehousing, and inland transportation; 43 (16%) agreed; 38 (14%) disagreed; while 40 (15%) strongly disagreed. This implies that improved maritime infrastructure would stimulate growth in related sectors such as logistics, warehousing, and inland transportation.

Table 8 also shows responses to question 5, which states that: Establishing Nigeria as a regional transshipment hub would enhance the country's competitiveness in the global maritime trade network. The Table shows that 132 (48%) respondents strongly agreed that establishing Nigeria as a regional transshipment hub would enhance the country's competitiveness in the global maritime trade network; 59 (22%) agreed; 45 (17%) disagreed, while 36 (13%) respondents strongly disagreed. This implies that establishing Nigeria as a regional transshipment hub would enhance the country's competitiveness in the global maritime trade network.

Table 9: Objective 5: To propose strategic investments, technological upgrades, and public-private partnership (PPP) models required to achieve efficient, secure, and competitive maritime infrastructure in Nigeria

S/N	Question Items	SA	%	A	%	D	%	SD	%	Total	%
1	Increased government and private sector investment is essential for modernizing Nigeria's maritime infrastructure	148	54	59	22	35	13	30	11	272	100
2	Adopting smart port technologies (e.g. automation, digital tracking, AI systems) would significantly improve port efficiency and security in Nigeria	151	55	43	16	40	15	38	14	272	100
3	Public-private partnerships (PPP) are a viable approach to financing and managing large-scale port and maritime infrastructure projects in Nigeria	152	56	52	19	29	11	39	14	272	100
4	The lack of clear regulatory frameworks discourages private sector participation in maritime infrastructure development	167	61	49	18	33	12	23	9	272	100
5	Strategic investment in deep seaports and logistics corridors will enhance Nigeria's competitiveness as a transshipment hub	158	58	54	20	39	14	21	8	272	100

Source: *Researcher's Field Survey, 2025*

Objective 5 aims to propose strategic investments, technological upgrades, and public-private partnership (PPP) models required to achieve efficient, secure, and competitive maritime infrastructure in Nigeria. The questions aim to help gather valuable insights into possible initiatives (strategic investments, technological upgrades, and public-private partnership (PPP) models) to achieve efficient, secure, and competitive maritime infrastructure in Nigeria. Based on objective 5, Table 9 shows the responses to question 1 which is that: Increased government and private sector investment is essential for modernizing Nigeria's maritime infrastructure. The Table shows that 148 (54%) respondents strongly agreed that increased government and private sector investment is essential for modernizing Nigeria's maritime infrastructure; 59 (22%) agreed; 35 (13%) disagreed while 30 (11%) strongly disagreed. This implies that increased government and private sector investment is essential for modernizing Nigeria's maritime infrastructure.

The Table also shows responses to question 2, which states that: Adopting smart port technologies (e.g. automation, digital tracking, and AI systems) would significantly improve port efficiency and security in Nigeria. The Table shows that 151 (55%) respondents strongly agreed that adopting smart port technologies (e.g. automation, digital tracking, and AI systems) would significantly improve port efficiency and security in Nigeria; 43 (16%) agreed; 40 (15%) disagreed, while 38 (14%) strongly disagreed. This implies that adopting smart port technologies (e.g. automation, digital tracking, and AI systems) would significantly improve port efficiency and security in Nigeria.

Furthermore, the Table shows responses to question 3, which states that: Public-private partnerships (PPP) are a viable approach to financing and managing large-scale port and maritime infrastructure projects in Nigeria. The Table shows that 152 (56%) respondents strongly agreed that public-private partnerships (PPP) are a viable approach to financing and managing large-scale port and maritime infrastructure projects in Nigeria; 52 (19%) agreed; 29 (11%) disagreed, while 39 (14%) strongly disagreed. This implies that public-private partnerships (PPP) are a viable approach to financing and managing large-scale port and maritime infrastructure projects in Nigeria.

The Table also shows responses to question 4, which states that: The lack of clear regulatory frameworks discourages private sector participation in maritime infrastructure development. The Table shows that 167 (61%) respondents strongly agreed that the lack of clear regulatory

frameworks discourages private sector participation in maritime infrastructure development; 49 (18%) agreed; 33 (12%) disagreed; while 23 (9%) strongly disagreed. This implies that the lack of clear regulatory frameworks discourages private sector participation in maritime infrastructure development.

Table 9 also shows responses to question 5, which states that: Strategic investment in deep seaports and logistics corridors will enhance Nigeria's competitiveness as a transshipment hub. The Table shows that 158 (58%) respondents strongly agreed that strategic investment in deep seaports and logistics corridors will enhance Nigeria's competitiveness as a transshipment hub; 54 (20%) agreed; 39 (14%) disagreed, while 21 (8%) respondents strongly disagreed. This implies that strategic investment in deep seaports and logistics corridors will enhance Nigeria's competitiveness as a transshipment hub.

Conclusion

The study examines the prospects of modernizing maritime infrastructure in Nigeria towards being transformed into a transshipment hub in the West African sub region. The findings show that investment in maritime infrastructure would stimulate growth in related sectors such as logistics, warehousing, and inland transportation; it also finds that transforming Nigeria into a transshipment hub would significantly boost national revenue and foreign exchange earnings. However, the challenges include low level of investment in critical infrastructure such as deep seaports, container terminals, and logistics hubs and lack of clear regulatory frameworks which discourages private sector participation in maritime infrastructure development, which are necessary for transshipment competitiveness and trade facilitation through efficient shipping and logistics management. Therefore, government should consider expediting efforts towards strategic investment in deep seaports and logistics corridors to enhance Nigeria's competitiveness as a transshipment hub and encourage public-private partnerships (PPP) towards financing and managing large-scale port and maritime infrastructure projects in Nigeria.

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