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Improved Port Hinterland Connectivity/Freight Forwarding Practice: Imperative to Boost Nigeria's Logistics Performance Index

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Abstract

The aims to improve port hinterland connectivity and freight forwarding practice in Nigeria in order to boost the country's Logistics Performance Index. Among others, the objectives were to evaluate the existing infrastructure, transportation networks, and logistics services connecting ports to inland destinations in Nigeria; investigate current freight forwarding practice in Nigeria by exploring how they contribute to or hinder efficient logistics operations and overall performance in the supply chain; identify and analyze the key challenges hindering effective port-hinterland connectivity in Nigeria; analyze the economic implications of improved port-hinterland connectivity and freight forwarding practices on Nigeria's trade competitiveness and economic development and propose strategic recommendations to stakeholders (government, private sector, logistics providers) for enhancing port-hinterland connectivity and freight forwarding operations in Nigeria. The study adopted the Taro Yamane formula to determine the sample size of 431 and 422 responded with 97.91% 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. Accordingly, among others, the study recommends that Public-private partnerships (PPPs) should be encouraged to finance and develop logistics infrastructure and services in Nigeria and a review and update of the regulatory framework governing logistics and transportation in Nigeria is necessary to enhance port hinterland connectivity.

Keywords: *freight forwarding, port hinterland connectivity, logistics performance index, congestion, competition*

Introduction

Since no country is an island unto itself due to globalization (which has resulted in interdependence and global integration), global merchandise trade, which is over 80% seaborne requires efficient maritime transport (ports and shipping operations), and customs and logistics processes to enhance a country's Logistics Performance Index as critical trade facilitators. Thus, in order to improve a country's Logistics Performance Index (LPI), the factors to consider are: transport infrastructure development, customs efficiency, logistics efficiency, tracking and tracing, timeliness of delivery of goods, international shipment and trade facilitation. These factors are related to port hinterland connectivity, customs clearance and freight forwarding practice (known as clearing and forwarding in Nigeria) (World Bank, 2023).

Accordingly, unless reliable port hinterland connections and customs and logistics efficiency are assured, the likelihood of port congestion is high, particularly since 90% by weight and over 80% by volume of world trade is carried by maritime shipping, all of which must pass through seaports (Korinek & Sourdin, 2009). Consequently, the case for customs and

logistics efficiency and functional port hinterland connectivity in Nigeria is urgent and very important in view of their significance in logistics performance.

The competitiveness of a seaport is a function of the promptness and safety of the cargo handled (courtesy of customs and logistics efficiency backed by freight forwarding operations) as the port seeks to reach its hinterland destination (Acciaro& McKinnon, 2013). The importance of hinterland connections has been acknowledged as one of the most central factors in port competitiveness and development in most ports around the world (Olaf &Notteboom, 2015). However, in Nigeria, aside from the deficit port infrastructure, port hinterland connections, customs and logistics operations (worsened by poor freight forwarding practice) are ineffective and inefficient due to deplorable maritime and land transport infrastructure, and institutional challenges. These all combine to deny meaningful and efficient maritime/land access and result in poor logistics performance.

Ports around the world have fashioned multiple strategies to improve their hinterland connections. This is in response to the challenges created by increasing traffic, shrinking public budgets, competition for road and rail use from passenger and personal vehicle and the proximity of many ports to densely urbanized areas. These strategies have resulted in several policies such as the development of dry-ports (e.g. Bergqvist, Wilmsmeier, & Cullinane, 2013a; 2013b; Roso, Woxenius & Lumsden, 2009), improving stakeholder management (e.g. Bergqvist, 2012), developing appointment systems to improve port gate efficiency (e.g. Giuliano, & O'Brien, 2007), extending operation times (e.g. Giuliano, & O'Brien, 2008), extending the borders of the port beyond the port precinct (Veenstra, Zuidwijk& van Asperen, 2012) or influencing the port modal split (e.g. Moniosand Lambert, 2013).

It will therefore make a lot of sense if Nigeria equally responds by improving the port hinterland connectivity to ease port congestion and facilitate trade in light of emerging issues of increased volume of maritime trade occasioned by port concession to private terminal operators in the face of dwindling public finances (Eto, 2021).The inadequate port-hinterland connections, inefficient customs and logistics processes (including poor freight forwarding operations) and port infrastructural deficits in the country have severally and jointly contributed to the dismal rating of the Logistics Performance Index in Nigeria (Lagos Chamber of Commerce and Industry, 2018).

The Problem

Port-hinterland connectivity is a function of functional transport system. However, the transport system in Nigeria is in a poor state, with undeveloped infrastructure coupled with improper regulatory and institutional framework (inefficient customs and freight forwarding processes). This explains why Nigeria loses over $12 billion (N6 trillion) annually of agricultural produce that otherwise could have been processed and exported to international market but for the poor intermodal transport system, the dismal port hinterland connectivity, and inefficient customs and logistics processes (Eto, 2021).

The quality of port hinterland connectivity has significant effect on the overall door-to-door performance of the logistics chain and on the choice of a port of call by shipping lines. Efficient freight distribution from seaports to inland terminals depends on port hinterland connectivity and effective customs and logistics process in order to enhance port competitiveness (Acciaro& McKinnon, 2013).

Seaports as nodes of logistics networks have to constantly adapt their facilities and equipment to the frequent changes in ships in order to remain connected to the international supply chain. However, the inefficiency of Nigerian ports due to infrastructural deficit and custom/freight forwarding operations and logistics lapses have resulted in slower national economic growth, less employment, higher logistics costs for importers and exporters, poor coordination between public and private agencies resulting in lack of predictability and reliability. Hence, the World Bank ranked Lagos ports (which handle 75% of the country's import) as 358th out of 370 ports, assessed globally based on Container Port Performance Index 2021 report. This is with the result that cargoes are being diverted to ports in neighbouring countries and increase in freight charges (Tunji, 2022).

In 2024, Nigeria ranked 88th position out of 141 countries in the World Bank Logistics Performance Index (LPI). The LPI is a global logistics ranking and an interactive benchmarking tool created to help countries identify the challenges and opportunities they face in trade logistics and what they can do to improve their performance (Ogunsile, 2024).

The country's poor ranking in the Logistics Performance Index is a major concern to her trade partners because the flow in the supply chain is severely disrupted in Nigeria due to poor human, institutional and infrastructural factors. This is with a destabilizing effect on regional and global agenda because logistics solutions are crucial to development (Yousough, 2024).

According to Olaf and Notteboom (2015), one of the main issues related to the development of adequate hinterland connections in ports is the need to coordinate multiple actors often with conflicting mandates that constitute the misunderstanding between private and public institutions that govern port hinterland infrastructure development. In Nigeria, the numerous actors involved in port hinterland transport operations are difficult to organize and coordinate because of their conflicting interests. This also contributes to the country's low Logistics Performance Index ranking.

Literature Review and Conceptual Clarification

Port Hinterland

There are many definitions of ports hinterland. The first known definition of port hinterland was provided in 1938 by Sargent as "the area served by a port" (Sargent, 1938). Other authors are of the opinion that the hinterland is a land space on which a port sells its services

and interacts with its customers or a market area; other scholars define the hinterland as the area in which a port has a monopolistic position, *i.e.* the inner region provided by a port (Slack, 1993, van Klink & van den Berg, 1998 and Fageda, 2004).

The port hinterland comprises two parts (Fig. 1). Namely: (A) the main hinterland and (B) the competitive margin hinterland (Rodrigue, 2020). The main hinterland is the market area that surrounds the port; it is a physical space over which a port sells its services and interacts with its users. It stands for the regional market share that the terminal owns, compared to other terminals that serve the same region. It brings together all the customers directly connected to the terminal and the land areas from which it derives its clientele and to which it distributes freight. The competitive hinterland is the market area in the inland in which the port must compete more closely with the other ports for customers.
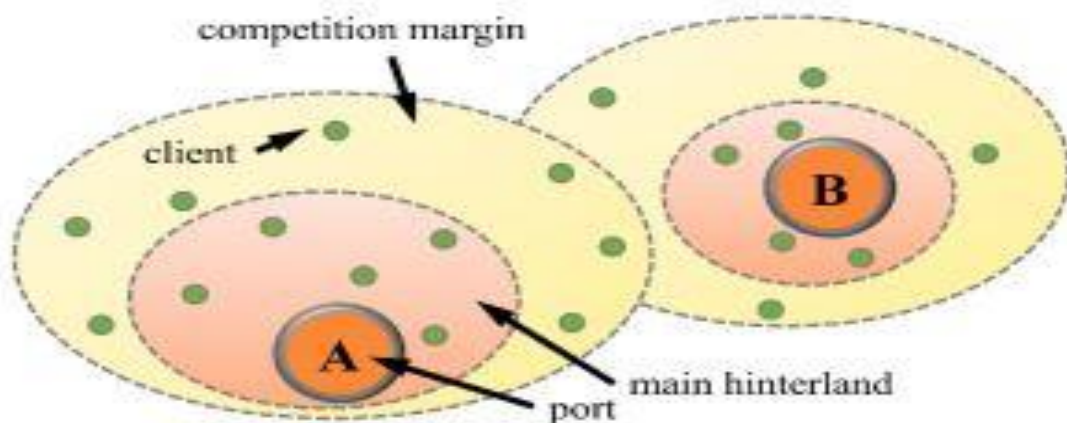

Figure 1: Port hinterland types
Source: Rodrigue (2020). *The Geography of Transport Systems*

In the view of Gattuso, Gian-Carla & Pellicanò (2023), hinterland can be further classified in relation to the kind of freights handled; as a matter of fact, each type of freight originates from a particular supply chain serviced by a particular port terminal with specific spatial relationships.

Port Hinterland Connectivity

If ports are to perform their role efficiently, they require inner linkages (hinterland connectivity) since they are not storage points but transit centres. Ports and their hinterland transport systems can only attract users and additional volumes if the whole hinterland transport network is efficient and effective. The significance of port hinterland connectivity is buttressed by the fact that the competitiveness of a seaport depends on the extent the cargo handled in the port can reach its hinterland destination (e.g. Acciaro& McKinnon, 2013).
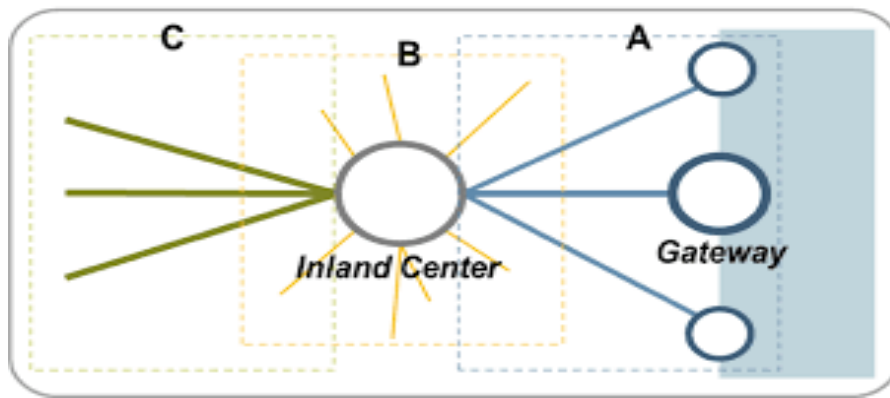
Figure 2: Port hinterland connectivity
Source: Notteboom & Rodrigue (2005)

Port hinterland connectivity (Figure 2) is not the sole responsibility of government. It involves many actors and activities, requiring intense collaboration and coordination to work effectively and efficiently. The actors include railway terminal operators, trucking industry/carriers, third party logistics providers (freight forwarders), industry regulators, shippers – exporters/importers and ICD operators. Port hinterland connectivity assumes a crucial part in ensuring an efficient supply chain facilitated by the various actors (Eto, 2024).

The ability to penetrate the hinterland is realized through efficient freight forwarding operations/ inland logistics and connections which are able to guarantee the speed of goods flows.   Ports have to be configured as efficient and logistically effective interface between oceanic maritime trade and inland trade which have different characteristics, dimensions and rhythms (Gattuso et al., 2023). This calls for deliberate efforts to improve a country's Logistics Performance Index through making provision for the requisite parameters by policy, which involve capacity training and development of logisticians and freight forwarders.

Key components of Logistics Performance Index

The 2018 report of the World Bank "Connecting to Compete" contains an analysis of the logistics performance of 160 countries based on the following six indicators. Global Logistics Performance Index is a perception of a country's logistics performance based on the following parameters:

- Efficiency of customs clearance process

- Quality of trade – and transport-related infrastructure

- Ease of arranging competitively priced shipments

- Quality of logistics services

- Ability to track and trace consignments, and

- Frequency with which shipments reach the consignee within the scheduled time (The World Bank, 2018).

According to Abiodun (2020), Nigeria ranked 110 out of 160 countries in Global Logistics Performance Index in 2018 due to some factors, which include: Crippling traffic situation, poor port and transport infrastructure, inefficient logistics/freight forwarding operations among others. These add to the huge trade costs in Nigeria.

Methodology

Observation and structured questionnaire were used for the collection of data. Quantitative data were analyzed with the use of descriptive statistics while qualitative data were coded and analyzed using the 4-point Likert Scale.

Population for the Study

The population for this study was made up of 4,387 individuals made up of three private terminal operators operating in Nigeria's ports and four government maritime regulatory agencies. The workers of the organizations involved are the major stakeholders. The population of the study is shown below in Table 1.

Table 1: Population of the study

S/N	Organizations	Number of staff
1	Nigerian Ports Authority	1,457
2	Nigerian Maritime Administration and Safety Agency	1,653
3	Nigerian Shippers' Council	333
4	Nigerian Customs Service	13,000
5	ENL Consortium	311
6	AP Moller	1,450
7	SIFAX Group	762
	Total	18,966

Source: Researchers' Field work, 2024

Sampling Technique and Method of Data Collection

Sampling is a selection of small group of element drawn from the study population through a particular sampling technique. For this study the simple random sampling technique was adopted to cover very large proportion of the population.
In determining the sample size for this research, the Taro Yamane's formula given as *(equ 1)* was used:

$$n = \frac{N}{1+N(e)^2} = \text{..} \quad (1)$$

Where:

      n   =   sample size

N   =   population size (18,966)

e   =   level of significance (our level of significance is chosen at 5%)

Applying the formula at significant level of 5%;

$$n = \frac{18,966}{1 + 18,966(0.05)^2}$$

$$\frac{18,966}{1 + 47.41}$$

$$\frac{18,966}{48.41}$$

$$= 391.78$$

Therefore, the sample size = 391.78, which is approximated to be 392. However, 39 (i.e.10%) is added to accommodate non-response and this brings the sample size to 431.

The data collection methods for primary data required were through survey by questionnaire and interviews, and secondary data were sourced through identified relevant organizations. To elicit their responses on relevant questions posed to them, a structured, 4-point Likert scaled questionnaire was designed and administered to the targeted respondents. The questionnaire comprised two sections. Section A contained questions on socioeconomic profile of the respondents. Likert-scaled rating response questions were used.

A total of 431 copies of the questionnaire were distributed to various categories of respondents that are considered to be major stakeholders in the maritime transport sector. Out of this number, 422 were returned to represent 97.91% response rate.

Gender Distribution

The gender distribution of the respondents is shown in the Table 2. The distribution shows that 316 or 74.88% of the respondents were male while 106 or 25.12% 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 19 or 4.50%. Those whose age fell into the age bracket 18-35 years were 127 or 29.86%. The distribution shows that respondents whose age bracket fell into 36-65 years

were 226 or 53.55%, which happened to be the majority. The respondents whose age was 66 years above were 51 or 12.09%.

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 16or3.79%. The respondents who attained Secondary School education were 43 in number and 10.19% and those with tertiary education were 363 or 86.02%.

Occupation Distribution

The occupation distribution shows that 78 or 18.48% were Admin staff. Freight forwarders were 66 or 15.64%. Terminal Operators were 15 or 3.55%. Dockworkers were 32 or 7.58%, Monitoring & Enforcement staff were 54 or 12.80%, Shippers were 150 or 35.55% and Regulatory Affairs Staff were 27 or 6.40%.

Status Distribution

The status distribution of respondents shows that 190 or 45.03% were of the top-level management. Majority of the respondents (210 or 49.76%) belonged to the Senior-level management cadre and 22 or 5.21% were of the junior management level.

Table1: Demographic Analysis of Respondents

Characteristics	Frequency	Percentage (%)
Gender		
Male	316	74.88
Female	106	25.12
Total	**422**	**100**
Age (Years)		
Less than 18	19	4.50
18-35	126	29.86
36-65	226	53.55
66 Above	51	12.09
Total	**422**	**100**
Educational Level		
Primary	16	3.79
Secondary	43	10.19
Tertiary	363	86.02
Total	**422**	**100**
Occupation		

Admin Staff	78	18.48
Freight forwarders	66	15.64
Terminal Operators	15	3.55
Dockworkers	32	7.58
Monitoring & Enforcement	54	12.80
Shippers	150	35.55
Regulatory Affairs staff	27	6.40
Total	**422**	**100**
Status		
Top-level Management	190	45.03
Senior-level Management	210	49.76
Junior Management	22	5.21
Total	**422**	**100**

Source: *Researchers Field Survey, 2025*

Analysis and Discussion of Findings

Table 3: Objective 1: Evaluate the existing infrastructure, transportation networks, and logistics services connecting ports to inland destinations in Nigeria.

S/N	Question Items	SA	%	A	%	D	%	SD	%	Total	%
1	To what extent do you agree that the transportation infrastructure (roads, railways, inland waterways) connecting ports to inland destinations in Nigeria are in good condition?	52	12.32	61	14.46	78	18.48	231	54.74	422	100
2	How much do you agree that logistics services (e.g. warehousing, freight forwarding, customs clearance) connecting ports to inland destinations in Nigeria are efficient and reliable?	24	5.69	45	10.66	89	21.09	264	62.56	422	100
3	To what extent do you agree that different transportation modes (roads, railways, inland waterways) connecting ports to inland destinations in Nigeria are well-integrated and coordinated?	16	3.79	34	8.06	91	21.56	281	66.59	422	100
4	How much do you agree that the transportation network connecting ports to inland destinations in Nigeria has sufficient capacity to handle the volume of goods and cargo?	23	5.45	34	8.06	86	20.38	279	66.11	422	100
5	To what extent do you agree that the existing infrastructure, transportation network, and logistics services connecting ports to inland destinations in Nigeria meet your expectations and needs?	10	2.37	36	8.53	84	19.91	292	69.19	422	100

Based on Objective 1: Evaluate the existing infrastructure, transportation networks, and logistics services connecting ports to inland destinations in Nigeria, Table 3 shows the responses to question 1: To what extent do you agree that the transportation infrastructure (roads, railways, inland waterways) connecting ports to inland destinations in Nigeria are in good condition? The Table shows that 231 (54.74%) respondents strongly disagreed that the transportation infrastructure (roads, railways, inland waterways) connecting ports to inland destinations in Nigeria are in good condition; 78 (18.48%) disagreed; 61 (14.46%) agreed while 52 (12.32%) strongly agreed. This implies that the transportation infrastructure (roads, railways, inland waterways) connecting ports to inland destinations in Nigeria are not in good condition.

The Table also shows the responses to question 2: How much do you agree that logistics services (e.g. warehousing, freight forwarding, and customs clearance) connecting ports to inland destinations in Nigeria are efficient and reliable? The Table shows that 264 (62.56%) respondents strongly disagreed; 89 (21.09%) disagreed; 45 (10.66%) agreed while 24 (5.69%) strongly agreed. This implies that logistics services (e.g. warehousing, freight forwarding, and customs clearance) connecting ports to inland destinations in Nigeria are not efficient and reliable.

Furthermore, the Table shows the responses to question 3: To what extent do you agree that different transportation modes (roads, railways, inland waterways) connecting ports to inland destinations in Nigeria are well-integrated and coordinated? The Table shows that 281(66.59%) respondents strongly disagreed; 91 (21.56%) disagreed; 34 (8.06%) agreed while 16 (3.79%) strongly agreed. This implies that different transportation modes (roads, railways, inland waterways) connecting ports to inland destinations in Nigeria are not well-integrated and coordinated.

Also, the Table shows the responses to question 4: How much do you agree that the transportation network connecting ports to inland destinations in Nigeria has sufficient capacity to handle the volume of goods and cargo? The Table shows that 279 (66.11%) respondents strongly disagreed; 86 (20.38%) agreed; while 23 (5.45%) strongly agreed. This implies that the transportation network connecting ports to inland destinations in Nigeria does not have sufficient capacity to handle the volume of goods and cargo.

Additionally, the Table shows the responses to question 5: To what extent do you agree that the existing infrastructure, transportation network, and logistics services connecting ports to inland destinations in Nigeria meet your expectations and needs? The Table shows that 292 (69.19%) respondents strongly disagreed; 84 (19.91%) disagreed; 36 (8.53 %) agreed while 10 (2.37%) strongly agreed. This implies that the existing infrastructure, transportation network, and logistics services connecting ports to inland destinations in Nigeria do not meet the expectations and needs of users.

Table 4: Objective 2: Investigate current freight forwarding practices in Nigeria, exploring how they contribute to or hinder efficient logistics operations and overall performance in the supply chain.

S/N	Question Items	SA	%	A	%	D	%	SD	%	Total	%
1	To what extent do you agree that freight forwarding companies in Nigeria make effective use of technology (e.g. transportation management systems, tracking software) to streamline logistics operations condition?	52	12.32	56	13.27	78	18.49	236	55.92	422	100
2	How much do you agree that freight forwarding companies in Nigeria provide adequate communication and visibility to customers regarding shipment status, transit times, and delivery schedules?	24	5.69	45	10.66	89	21.09	264	62.56	422	100
3	To what extent do you agree that freight forwarding companies in Nigeria comply with relevant regulations and standards (e.g. customs clearance, safety protocols) to ensure smooth logistics operations?	16	3.79	34	8.06	91	21.56	281	66.59	422	100
4	How much do you agree that freight forwarding companies in Nigeria are flexible and adaptable in responding to changes in customer demand, market conditions, or unexpected disruptions?	18	4.27	39	9.24	86	20.38	279	66.11	422	100
5	To what extent do you agree that current freight forwarding practices in Nigeria contribute to efficient logistics operations and overall performance in the supply chain?	10	2.37	36	8.53	84	19.91	292	69.19	422	100

Based on objective 2: Investigate current freight forwarding practices in Nigeria, exploring how they contribute to or hinder efficient logistics operations and overall performance in the supply chain, Table 4 shows the responses to question 1: To what extent do you agree that freight forwarding companies in Nigeria make effective use of technology (e.g. transportation management systems, tracking software) to streamline logistics operations condition? The Table shows that 236 (55.92%) respondents strongly disagreed; 78 (18.49%) disagreed; 56 (13.27%) agreed while 52 (12.32%) strongly agreed. This implies that freight forwarding companies in Nigeria do not make effective use of technology (e.g. transportation management systems, tracking software) to streamline logistics operations condition.

The Table also shows the responses to questions 2: How much do you agree that freight forwarding companies in Nigeria provide adequate communication and visibility to customers regarding shipment status, transit times, and delivery schedules? The Table shows that 264 (62.56 %) respondents strongly disagreed; 89 (21.09%) disagreed, 45 (10.66%) agreed and 24 (5.69%) strongly disagreed. This implies that freight forwarding companies in Nigeria do not provide adequate communication and visibility to customers regarding shipment status, transit times, and delivery schedules.

The Table shows the responses to question 3: To what extent do you agree that freight forwarding companies in Nigeria comply with relevant regulations and standards (e.g. customs clearance, safety protocols) to ensure smooth logistics operations? The Table shows that 281 (66.59%) respondents strongly disagreed; 91 (21.56%) disagreed; 34 (8.06%) agreed while 16 (3.79%) strongly agreed. This implies that freight forwarding companies in Nigeria do not comply with relevant regulations and standards (e.g. customs clearance, safety protocols) to ensure smooth logistics operations.

The Table shows the responses to question 4: How much do you agree that freight forwarding companies in Nigeria are flexible and adaptable in responding to changes in customer demand, market conditions, or unexpected disruptions? The Table shows that 279 (66.11%) respondents strongly disagreed; 86 (20.38%) disagreed, 39 (9.24%) agreed, while 18 (4.27%) strongly agreed. This implies that freight forwarding companies in Nigeria are not flexible and adaptable in responding to changes in customer demand, market conditions, or unexpected disruptions.

Furthermore, the Table shows the responses to question 5: To what extent do you agree that current freight forwarding practices in Nigeria contribute to efficient logistics operations and overall performance in the supply chain? The Table shows that 292 (69.19 %) respondents strongly disagreed; 84 (19.91%) disagreed; 36 (8.53%) agreed while 10 (2.37%) strongly agreed. This implies that current freight forwarding practices in Nigeria do not contribute to efficient logistics operations and overall performance in the supply chain.

Table 5: Objective 3: Identify and analyze the key challenges hindering effective port-hinterland connectivity in Nigeria

S/N	Question Items	SA	%	A	%	D	%	SD	%	Total	%
1	To what extent do you agree that the poor condition of transportation infrastructure (roads, railways, inland waterways) hinders effective port hinterland connectivity in Nigeria?	236	55.92	78	18.48	61	14.46	47	11.14	422	100
2	How much do you agree that inefficient customs processes contribute to delays and challenges in port hinterland connectivity in Nigeria?	264	62.56	89	21.09	50	11.85	19	4.50	422	100
3	To what extent do you agree that limited intermodal connectivity (e.g. lack of seamless transfer between modes) hinders effective port hinterland connectivity in Nigeria?	276	65.41	91	21.56	39	9.24	16	3.79	422	100
4	How much do you agree that inadequate logistics infrastructure (e.g. warehouses, distribution centres) contributes to challenges in Port Hinterland connectivity in Nigeria?	23	5.45	39	9.25	81	19.19	279	66.11	422	100
5	To what extent do you agree that an ineffective regulatory and policy framework hinders effective port hinterland connectivity in Nigeria?	292	69.19	84	19.91	36	8.53	10	2.37	422	100

Based on objective 3: Identify and analyze the key challenges hindering effective port-hinterland connectivity in Nigeria, Table 5 shows the responses to question 1: To what extent do you agree that the poor condition of transportation infrastructure (roads, railways, inland waterways) hinders effective port hinterland connectivity in Nigeria? The Table shows that 236 (55.92%) respondents strongly agreed; 78 (18.48%) agreed; 61(14.46%) disagreed while 47 (11.14%) strongly disagreed. This implies that the poor condition of transportation infrastructure (roads, railways, and inland waterways) hinders effective port hinterland connectivity in Nigeria.

The Table also shows the responses to questions 2: How much do you agree that inefficient customs processes contribute to delays and challenges in port hinterland connectivity in Nigeria? The Table shows that 264 (62.56 %) respondents strongly agreed; 89 (21.09%) agreed, 50 (11.85%) disagreed and 19 (4.50%) strongly disagreed. This implies that inefficient customs processes contribute to delays and challenges in port hinterland connectivity in Nigeria.

Table 5 shows the responses to question 3: To what extent do you agree that limited intermodal connectivity (e.g. lack of seamless transfer between modes) hinders effective port hinterland connectivity in Nigeria?   The Table shows that 276 (65.41%) respondents strongly agreed; 91 (21.56%) agreed; 39 (9.24%) disagreed while 16 (3.79%) strongly disagreed. This implies that limited intermodal connectivity (e.g. lack of seamless transfer between modes) hinders effective port hinterland connectivity in Nigeria.

The Table shows responses to question 4: How much do you agree that inadequate logistics infrastructure (e.g. warehouses, distribution centres) contributes to challenges in Port Hinterland connectivity in Nigeria? The Table shows that 279 (66.11%) respondents strongly agreed; 81 (19.19%) agreed, 39 (9.25%) disagreed, while 23 (5.45%) strongly disagreed. This implies that inadequate logistics infrastructure (e.g. warehouses, distribution centres) contributes to challenges in port hinterland connectivity in Nigeria.

Furthermore, the Table shows responses to the question 5: To what extent do you agree that an ineffective regulatory and policy framework hinders effective port hinterland connectivity in Nigeria? The Table shows that 292 (69.19 %) respondents strongly agreed; 84 (19.91%) agreed; 36 (8.53%) disagreed while 10 (2.37%) strongly disagreed. This implies that an ineffective regulatory and policy framework hinders effective port hinterland connectivity in Nigeria.

Table 6: Objective 4: Examine the impact of technological advancement on improving freight forwarding effectiveness and port hinterland connectivity in Nigeria.

S/N	Question Items	SA	%	A	%	D	%	SD	%	Total	%
1	To what extent do you agree that the adoption of digital technologies (e.g. transportation management systems, blockchain) has improved freight forwarding companies in Nigeria?	52	12.32	61	14.46	73	17.30	236	55.92	422	100
2	How much do you agree that the use of real-time tracking and visibility technologies (e.g. GPS, RFID) has enhanced the efficiency of freight forwarding operations in Nigeria?	19	4.50	50	11.85	89	21.09	264	62.56	422	100
3	To what extent do you agree that the automation of freight forwarding processes (e.g. customs clearance, documentation) has improved process efficiency and reduced costs in Nigeria?	16	3.79	34	8.06	91	21.56	281	66.59	422	100
4	How much do you agree that the use of data analytics and business intelligence has enabled freight forwarders in Nigeria to make more informed decisions and improve their operations?	18	4.27	39	9.24	86	20.38	279	66.11	422	100
5	To what extent do you agree that technological advancements have positively impacted port hinterland connectivity in Nigeria by improving the efficiency, reliability, and visibility of freight forwarding operations?	10	2.37	41	9.72	79	18.72	292	69.19	422	100

Based on the Objective 4: Examine the impact of technological advancement on improving freight forwarding effectiveness and port hinterland connectivity in Nigeria, Table 6 shows the responses to question 1: To what extent do you agree that the adoption of digital technologies (e.g. transportation management systems, blockchain) has improved freight forwarding companies in Nigeria? Table 6 shows that 236 (55.92%) respondents strongly disagreed; 73 (17.30%) disagreed, 61 (14.46%) agreed while 52 (12.32%) strongly agreed. This implies that digital technologies (e.g. transportation management systems, blockchain) have not been adopted in order to improve freight forwarding companies in Nigeria.

The Table shows the responses to question 2: How much do you agree that the use of real-time tracking and visibility technologies (e.g. GPS, RFID) has enhanced the efficiency of freight forwarding operations in Nigeria? The Table shows that 264 (62.56%) strongly disagreed; 89 (21.09%) disagreed, 50 (11.85%) agreed while 19 (4.50%) strongly agreed. This implies that there is no use of real-time tracking and visibility technologies (e.g. GPS, RFID) to enhance the efficiency of freight forwarding operations in Nigeria.

Also, the Table shows the responses to question 3: To what extent do you agree that the automation of freight forwarding processes (e.g. customs clearance, documentation) has improved process efficiency and reduced costs in Nigeria? The Table shows that 281 (66.59%) strongly disagreed; 91 (21.56%) disagreed; 34 (8.06%) agreed while 16 (3.79%) strongly agreed. This implies that there is no automation of freight forwarding processes (e.g. customs clearance, documentation) to improve process efficiency and reduce costs in Nigeria.

The Table shows the responses to question 4: How much do you agree that the use of data analytics and business intelligence has enabled freight forwarders in Nigeria to make more informed decisions and improve their operations? The Table shows that 279 (66.11%) strongly disagreed; 86 (20.38%) disagreed, 39 (9.24%) agreed while 18 (4.27%) strongly agreed. This implies that the use of data analytics and business intelligence is non-existent to enable freight forwarders in Nigeria to make more informed decisions and improve their operations.

Furthermore, the Table shows the responses to question 5: To what extent do you agree that technological advancements have positively impacted port hinterland connectivity in Nigeria by improving the efficiency, reliability, and visibility of freight forwarding operations? The Table shows that 292 (69.19%) strongly disagreed; 79 (18.72%) disagreed, 41 (9.72%) agreed while 10 (2.37%) strongly agreed. This implies that there have not been technological advancements to positively impact port hinterland connectivity in Nigeria in order to improve the efficiency, reliability, and visibility of freight forwarding operations.

Table 7: Objective 5: Analyze the economic implications of improved port-hinterland connectivity and freight forwarding practices on Nigeria's trade competitiveness and economic development.

S/N	Question Items	SA	%	A	%	D	%	SD	%	Total	%
1	To what extent do you agree that improved hinterland connectivity and freight forwarding practices would significantly reduce trade costs, making Nigerian businesses more competitive in the global market?	236	55.92	78	18.48	61	14.46	47	11.14	422	100
2	How much do you agree that improved hinterland connectivity and freight forwarding practices would increase Nigeria's trade volume, leading improved Logistics Performance Index, higher economic growth and development?	264	62.56	84	19.91	50	11.84	24	5.69	422	100
3	To what extent do you agree that improved port hinterland connectivity and freight forwarding practices would enhance the competitiveness of Nigerian businesses, enabling them to compete more effectively in regional and global markets?	281	66.59	91	21.56	39	9.24	11	2.61	422	100
4	How much do you agree that improved Port Hinterland connectivity and freight forwarding practices would have a positive impact on Nigeria's economic growth, leading to increased investment, job creation, and poverty reduction?	279	66.11	81	19.19	39	9.24	23	5.46	422	100
5	To what extent do you agree that improved port hinterland connectivity and freight forwarding practices would be crucial for Nigeria's economic development, enabling the country to achieve its development goals and become a major player in regional and global trade?	292	69.19	79	18.72	41	9.72	10	2.37	422	100

Based on Objective 5: Analyze the economic implications of improved port-hinterland connectivity and freight forwarding practices on Nigeria's trade competitiveness and economic development, Table 7 shows the responses to question 1: To what extent do you agree that improved hinterland connectivity and freight forwarding practices would significantly reduce trade costs, making Nigerian businesses more competitive in the global market? The Table shows that 236 (55.92%) respondents strongly agreed; 78 (18.48%) agreed, 61 (14.46%) disagreed while 47 (11.14 %) strongly disagreed. This implies that improved hinterland connectivity and freight forwarding practices would significantly reduce trade costs, making Nigerian businesses more competitive in the global market.

The Table shows the responses to question 2: How much do you agree that improved hinterland connectivity and freight forwarding practices would increase Nigeria's trade volume, leading to improved Logistics Performance Index, higher economic growth and development? The Table shows that 264 (62.56%) respondents strongly agreed; 84 (19.91%) agreed, 50 (11.84%) disagreed while 24 (5.69%) strongly disagreed. This implies that improved hinterland connectivity and freight forwarding practices would increase Nigeria's trade volume, leading to improved Logistics Performance Index, higher economic growth and development.

The Table also shows the responses to question 3: To what extent do you agree that improved port hinterland connectivity and freight forwarding practices would enhance the competitiveness of Nigerian businesses, enabling them to compete more effectively in regional and global markets? The Table shows that 281 (66.59%) respondents strongly agreed, 91 (21.56%) agreed, 39 (9.24%) disagreed while 11 (2.61%) strongly disagreed. This implies that improved port hinterland connectivity and freight forwarding practices would enhance the competitiveness of Nigerian businesses, enabling them to compete more effectively in regional and global markets.

Furthermore, the Table shows the responses to question 4: How much do you agree that improved port hinterland connectivity and freight forwarding practices would have a positive impact on Nigeria's economic growth, leading to increased investment, job creation, and poverty reduction? The Table shows that 279 (66.11%) respondents strongly agreed; 81 (19.19%) agreed, 39 (9.24%) disagreed while 23 (5.46%) strongly disagreed. This implies that improved port hinterland connectivity and freight forwarding practices would have a positive impact on Nigeria's economic growth, leading to increased investment, job creation, and poverty reduction.

The Table also shows the responses to question 5: To what extent do you agree that improved port hinterland connectivity and freight forwarding practices would be crucial for Nigeria's economic development, enabling the country to achieve its development goals and become a major player in regional and global trade? The Table shows that 292 (69.19%) respondents strongly agreed; 79 (18.72%) agreed, 41 (9.72%) disagreed while 10 (2.37%) strongly disagreed. This implies that improved port hinterland connectivity and freight forwarding practices would be crucial for Nigeria's economic development, enabling the country to achieve its development goals and become a major player in regional and global trade.

Table 8: Objective 6: Propose strategic recommendations to stakeholders (government, private sector, logistics providers) for enhancing port-hinterland connectivity and freight forwarding operations in Nigeria

S/N	Question Items	SA	%	A	%	D	%	SD	%	Total	%
1	To what extent do you agree that investing in modern transportation infrastructure (roads, railways, and inland waterways) is crucial for enhancing port hinterland connectivity in Nigeria?	236	55.92	78	18.48	61	14.46	47	11.14	422	100
2	How much do you agree that public-private partnerships (PPPs) should be encouraged to finance and develop logistics infrastructure and services in Nigeria?	259	61.37	89	21.09	50	11.85	24	5.69	422	100
3	To what extent do you agree that a review and update of the regulatory framework governing logistics and transportation in Nigeria is necessary to enhance port hinterland connectivity?	281	66.59	91	21.56	39	9.24	11	2.61	422	100
4	How much do you agree that capacity and training programmes for logistics professionals and stakeholders are essential for enhancing freight forwarding operations in Nigeria?	279	66.11	81	19.20	39	9.24	23	5.45	422	100
5	To what extent do you agree that adopting digital technological technologies (e.g. blockchain. IoT) can significantly improve the efficiency and transparency of freight forwarding operations in Nigeria?	287	68.00	84	19.91	41	9.72	10	2.37	422	100

Based on Objective 6: Propose strategic recommendations to stakeholders (government, private sector, logistics providers) for enhancing port-hinterland connectivity and freight forwarding operations in Nigeria, Table 8 shows the responses to question 1: To what extent do you agree that investing in modern transportation infrastructure (roads, railways, and inland waterways) is crucial for enhancing port hinterland connectivity in Nigeria? The Table shows that 236 (55.92%) respondents strongly agreed; 78 (18.48%) agreed, 61 (14.46%) disagreed while 47 (11.14 %) strongly disagreed. This implies that government has to encourage investment in modern transportation infrastructure (roads, railways, and inland waterways) in order to enhance port hinterland connectivity in Nigeria.

The Table shows responses to question 2: How much do you agree that public-private partnerships (PPPs) should be encouraged to finance and develop logistics infrastructure and services in Nigeria? The Table shows that 259 (61.37%) respondents strongly agreed; 89 (21.09%) agreed, 50 (11.85%) disagreed while 24 (5.69%) strongly disagreed. This implies that public-private partnerships (PPPs) should be encouraged to finance and develop logistics infrastructure and services in Nigeria.

The Table also shows the responses to question 3: To what extent do you agree that a review and update of the regulatory framework governing logistics and transportation in Nigeria is necessary to enhance port hinterland connectivity? The Table shows that 281 (66.59%) respondents strongly agreed, 91 (21.56%) agreed, 39 (9.24%) disagreed while 11 (2.61%) strongly disagreed. This implies that a review and update of the regulatory framework governing logistics and transportation in Nigeria is necessary to enhance port hinterland connectivity.

Furthermore, The Table also shows the responses to question 4: How much do you agree that capacity and training programmes for logistics professionals and stakeholders are essential for enhancing freight forwarding operations in Nigeria? The Table shows that 279 (66.11%) respondents strongly agreed; 81 (19.19%) agreed, 39 (9.24%) disagreed while 23 (5.46%) strongly disagreed. This implies that capacity and training programmes for logistics professionals and stakeholders are essential for enhancing freight forwarding operations in Nigeria.

The Table also shows the responses to question 5: To what extent do you agree that adopting digital technological technologies (e.g. blockchain. IoT) can significantly improve the efficiency and transparency of freight forwarding operations in Nigeria? Table shows that 287 (68.00%) respondents strongly agreed; 84 (19.91%) agreed, 41 (9.72%) disagreed while 10 (2.37%) strongly disagreed. This implies that adopting digital technological technologies (e.g. blockchain, IoT) can significantly improve the efficiency and transparency of freight forwarding operations in Nigeria.

Conclusion

Study reveals, among others, the following: the transportation infrastructure (roads, railways, inland waterways) connecting ports to inland destinations in Nigeria are not in good condition.

Logistics services (e.g. warehousing, freight forwarding, and customs clearance) connecting ports to inland destinations in Nigeria are not efficient and reliable. Different transportation modes (roads, railways, inland waterways) connecting ports to inland destinations in Nigeria are not well-integrated and coordinated. The transportation network connecting ports to inland destinations in Nigeria does not have sufficient capacity to handle the volume of goods and cargo. The existing infrastructure, transportation network, and logistics services connecting ports to inland destinations in Nigeria do not meet the expectations and needs of users. Improved hinterland connectivity and freight forwarding practices would significantly reduce trade costs, and make Nigerian businesses more competitive in the global market.

Improved hinterland connectivity and freight forwarding practices would increase Nigeria's trade volume, leading to improved Logistics Performance Index, higher economic growth and development. Improved port hinterland connectivity and freight forwarding practices would enhance the competitiveness of Nigerian businesses, enabling them to compete more effectively in regional and global markets. Improved port hinterland connectivity and freight forwarding practices would have a positive impact on Nigeria's economic growth, leading to increased investment, job creation, and poverty reduction. Improved port hinterland connectivity and freight forwarding practices would be crucial for Nigeria's economic development, enabling the country to achieve its development goals and become a major player in regional and global trade. Against the backdrop of these findings, the study recommends as follows.

Recommendations

1. Government has to encourage investment in modern transportation infrastructure (roads, railways, and inland waterways) in order to enhance port hinterland connectivity in Nigeria.
2. Public-private partnerships (PPPs) should be encouraged to finance and develop logistics infrastructure and services in Nigeria.
3. A review and update of the regulatory framework governing logistics and transportation in Nigeria is necessary to enhance port hinterland connectivity.
4. Capacity and training programmes for logistics professionals and stakeholders are essential for enhancing freight forwarding operations in Nigeria.
5. Adopting digital technological technologies (e.g. blockchain, IoT) can significantly improve the efficiency and transparency of freight forwarding operations in Nigeria.

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