GPH-International Journal of Business Management
(E-ISSN 3027-0537 || P-ISSN 3027-0375)
Volume 09 | Issue 10 | October 2026
Published by: Global Publication House
DOI: https://doi.org/10.5281/zenodo.23613905
Available online at: www.gphjournal.org
Journal homepage: https://gphjournal.org/index.php/bm/index

PORTS INFRASTRUCTURE ADMINISTRATION IN NIGERIA: PROBLEMS AND PROSPECTS

IDONIBOYE, IBISO INEBA[1]*, H. AGBARAKWE[1], I. E. BOSCO[1]

[1]INSTITUTE OF INTERNATIONAL TRADE AND DEVELOPMENT, FACULTY OF SOCIAL SCIENCES, UNIVERSITY OF PORT HARCOURT, NIGERIA
*CORRESPONDING AUTHOR

Abstract

The study investigated port infrastructure administration in Nigeria by assessing the major challenges affecting infrastructure development and prospects for improving port performance. The study was anchored on the Balanced Theory of Port Competitiveness and adopted a qualitative descriptive-analytical design based on documentary analysis and comparative assessment of selected global port systems, including Singapore, Rotterdam, China, and Morocco. The study found that although recent investments, particularly the Lekki Deep Sea Port, have introduced modern facilities and improved cargo-handling capacity, major challenges persist across Nigeria's traditional port terminals. These challenges include inadequate funding, ageing infrastructure, weak road and rail connectivity, limited maintenance culture, institutional fragmentation, and ineffective oversight of concession arrangements. The study further found that these constraints contribute to congestion, prolonged cargo dwell time, increased logistics costs, and reduced competitiveness of Nigerian ports within the regional maritime environment. The study concluded that improving port infrastructure administration requires more than isolated facility upgrades, rather, it demands an integrated approach that covers long-term infrastructure planning, reliable financing, effective governance, and stronger accountability mechanisms. It recommended the adoption of coordinated port development strategies that integrate modern deep-water facilities with industrial zones and efficient transport networks, while ensuring transparent management of concessions and sustained maintenance of existing infrastructure.

Keywords:

Port Infrastructure Administration; Maritime Trade; Port Competitiveness; Cargo Throughput; Terminal Concessions; Trade Facilitation.

INTRODUCTION

For centuries, maritime trade has served as a catalyst for global commerce by enabling the cross-continental movement of goods, capital, and technology (Rodrigue, 2024). As shipping operations expanded over time, seaports gradually transformed from simple embarkation points into multi-modal logistics hubs. Because of this evolution, the operational efficiency, cargo throughput, and commercial competitiveness of any maritime nation are now directly contingent on the structural quality and administrative capacity of its port infrastructure.

© 2026 Author(s). Published by Global Publication House (GPH).
This is an Open Access article distributed under the terms of the CC BY 4.0 License.

This administrative process encompasses the strategic planning, funding, maintenance, and operational management of essential physical assets, including quay walls, berths, navigation channels, storage yards, cargo-handling equipment, and intermodal transport connections. The value of such administrative discipline is clearly portrayed by leading international maritime centres like Singapore, Rotterdam, and Shanghai, which have committed to sustained capital investment, channel deepening, and seamless hinterland integration. Hence, these global hubs have overtime accommodated ultra-large container vessels, minimized vessel turnaround times, and maintained their dominance in global trade (Menon Economics & DNV, 2024).

In Nigeria, the evolution of port infrastructure administration has closely mirrored the nation's shifting economic priorities as primary seaports, including Lagos, Port Harcourt, Onne, Warri, and Calabar, initially developed around agricultural export corridors before expanding to support crude oil exports and rising import volumes (Badejo & Solaja, 2017). To keep pace with this growing volume, successive administrations implemented structural interventions aimed at modernizing port assets, notably through public-private terminal concessions, channel dredging, facility expansion, and technology integration. However, while these initiatives succeeded in upgrading operational capacity across select terminals, systemic legal and administrative friction has hindered these gains from been transformed into sector-wide efficiency.

Consequently, severe structural bottlenecks have impaired the daily administration of Nigerian ports, particularly in terms of infrastructure, which distribution has been uneven, leaving multiple terminals constrained by obsolete handling equipment, coupled with inadequate storage capacity, dilapidated access roads, and weak intermodal linkages (Gabriel & Afolabi, 2025). These physical deficits directly generate severe port congestion, extended cargo dwell times, and inflated logistics costs, factors that have collectively imposed an estimated ₦2.5 trillion in annual losses on commercial enterprises (Olusola, 2025). Compounding this operational strain is a conspicuous geographic imbalance, reflected in the over-utilization of Apapa Port Complex in Lagos, which handled over 70% of national international trade in early 2025, leaving viable eastern ports significantly underutilized (NBS, 2025). As a result, despite rising import demand, these persistent physical limitations have frequently forced major shipping lines to bypass Nigerian ports entirely, diverting larger ocean vessels to competing deep-water hubs within the West African sub-region (NPA, 2026; Onyenucheya, 2025a).

Given Nigeria's strategic geographical position and its ambition to lead regional trade integration, resolving these administrative and structural deficiencies has become an urgent economic priority. Modernizing port administration is therefore essential not only for lowering the cost of doing business locally, but also for restoring the nation's competitive edge in the regional maritime market. Against this backdrop, the study critically examines the administration of port infrastructure in Nigeria, analyzing its primary structural impediments and proposing practical pathways for sustainable infrastructural reform as lessons from more developed maritime regions.

LITERATURE REVIEW

Conceptual Framework

Ports Infrastructure Administration

Ports infrastructure administration, being the dominant concept of the study, holds a simple and clear meaning. However, to ensure a simplistic understanding of the concept, it is pertinent to first explore the meaning of the term "infrastructure" and "administration."

Infrastructure resists a single definition, as its meaning shifts depending on the analytical perspective applied. Economically, infrastructure is seen as a necessary precondition for capital circulation and productivity, creating the foundational environment that enables industries, trade, and markets to function (Rosenstein-Rodan, 1943; Tinbergen, 1962). From a social perspective, it represents "social overhead capital", the essential public assets, services, and regulatory foundations that support human welfare, civic participation, and equitable living standards (Hirschman, 1958; Beeferman & Wain, 2016; Ekeuwei, 2025). Technically, infrastructure consists of the physical, engineered structures, such as roads, power grids, and public works, which form a nation's material backbone (World Bank, 1994; Petroski, 2009). As a synthesis, infrastructure is best defined as the organized system of physical, technical, and institutional facilities and services that enable economic activity, support social well-being, and promote sustainable development.

The concept of administration itself has long been associated with the coordination of human and material resources towards the attainment of collective goals. Scholars such as Pfiffner & Presthus (1967), White (1955), and Simon (1947) viewed administration primarily as a process of organizing people and resources, coordinating collective effort, and directing institutional activities towards predetermined objectives. While these perspectives differ in emphasis, they converge on the understanding that administration is both a continuous process and a purposeful activity requiring planning, organization, coordination, supervision, and control. Subsequently, other scholars further expanded this view by recognizing administration as not only a technical or procedural exercise but also a human-centred process that depends on cooperation, accountability, and effective leadership (Fatile, 2007; Niah, 2022).

Building on the foregoing, port infrastructure represents the complex network of physical assets and engineered structures situated within and around a seaport. It serves as the primary multi-modal interface between waterborne and overland transport, encompassing basic fixed elements (navigation channels, breakwaters, quays, and berths) as well as operational superstructures (cargo terminals, specialized cranes, storage yards, and hinterland road-rail links) (Ademola, 2024; Melnyk et al., 2025; Rožić et al., 2025). However, physical facilities alone cannot move cargo or accommodate vessels without structured governance, necessitating shifting focus toward port infrastructure administration, which explains the strategic planning, policy direction, institutional oversight, financial management, and regulatory control of port physical assets. While port infrastructure supplies the physical assets (such as deep berths, quay walls, and handling equipment), administration provides the institutional capacity that ensures these assets are continuously maintained, efficiently funded, transparently concessioned, and legally regulated.

Theoretical Review: Balanced Theory of Port Competitiveness

The Balanced Theory of Port Competitiveness was introduced by Douglas Hales, Jasmine Siu Lee Lam, and Young-Tae Chang in 2016 to address a fundamental divide in maritime studies, which historically evaluated port performance by focusing either exclusively on attracting cargo customers or on satisfying financial investors (Hales et al., 2016). Developed in the wake of the severe market disruptions caused by the 2008 global financial crisis, the theory emerged from an empirical analysis of seventy-two top global container ports. The scholars concluded that port competitiveness does not stem from prioritizing one stakeholder group over the other, but instead arises from a synchronized alignment of customer-oriented operational factors (such as location, service quality, fees, infrastructure quality, and throughput volume) and investor-oriented administrative requirements (including organizational reputation, financial capacity, governance structures, legal frameworks, and pricing strategies) (Hales et al., 2016; Hales et al., 2017).

The theory rests on the core premise that ports operate within a complex, multi-stakeholder ecosystem where administrative decisions aimed at one constituent group generate immediate operational and financial trade-offs for the other. Specifically, it assumes that optimizing a port's competitive position requires administrative bodies to maintain a delicate equilibrium between user demand for high-quality, cost-effective service and investor demand for fiscal sustainability, transparent legal frameworks, and long-term asset yields (Hales et al., 2016; Peng et al., 2023). Furthermore, the theory assumes that while external geographical and macroeconomic conditions establish a port's baseline potential, proactive administrative strategy and managerial judgment are the decisive determinants in adapting physical infrastructure, regulatory processes, and service delivery to market uncertainties (Hales et al., 2016; Yalcin et al., 2019).

The theory is directly relevant to the study because it moves from the presence of physical assets to the administrative quality required to make those assets functional. Emphasizing that port performance is dependent on a dual alignment of satisfying port users through service speed, reliable infrastructure, and fair pricing while simultaneously reassuring investors through institutional stability, clear legal frameworks, and enforceable concessions, the theory particularly provides a measure for assessing Nigeria's maritime challenges. In the Nigerian context, persistent bottlenecks like terminal congestion, prolonged cargo dwell times, and the heavy centralization of trade in Lagos are rarely caused by a total lack of facilities, rather stemming from administrative failures, including as uncoordinated intermodal linkages, weak oversight of private concessionaires, and cumbersome clearance processes that alienate port users and discourage long-term investment. Consequently, the theory diagnoses these operational problems and identifies practical prospects, noting that improving port performance is conditioned on administrative strategies which consider physical infrastructure, digital systems, and regulatory governance as an interconnected, balanced unit.

METHODOLOGY

The study adopted a qualitative descriptive-analytical research design based on documentary analysis. Data were obtained from secondary sources, including Nigerian Ports Authority reports, National Bureau of Statistics publications, policy documents, academic literature, and international reports on port infrastructure development. The study also employed a comparative analysis by examining infrastructure administration practices in selected global

ports, including Singapore, Rotterdam, and China, to identify lessons applicable to Nigeria. The collected information was analyzed thematically, focusing on the state of ports infrastructure, problems of port infrastructure administration, and prospects for Nigeria as lessons from selected advanced maritime jurisdictions.

RESULTS

1. State of Ports Infrastructure in Nigeria

Nigeria's ports form the backbone of the country's foreign trade system, handling the vast majority of imports and exports. The main ports are Apapa and Tin Can Island in Lagos, and Onne in Rivers State. These ports differ widely in capacity, equipment, connectivity, and operational efficiency. However, despite growth in cargo volumes, infrastructure challenges have overtime limited performance and efficiency. This limited performance is captured in recent NPA data, which indicate a sharp increase in port activity. Between 2023 and 2024, total cargo throughput rose from 71.2 million metric tons to 103.3 million metric tons, a 45% increase. In the same vein, ship calls increased from 3,791 to 4,005, while container throughput reached 1.74 million TEUs, up nearly 10% from the previous year (NPA, 2025a). Onne Port recorded a 9.4% rise in cargo throughput, while Tin Can Island Port saw a 7.3% increase, showing rising demand across the four key terminals under consideration (NPA, 2025b). These numbers denote some improvements in the use of existing infrastructure and terminal operations, but they also indicate the existence of persistent gaps in capacity and quality.

Within this period, Apapa Port was Nigeria's largest and busiest container port. Its terminal spans 55 hectares with an annual handling capacity exceeding 1 million TEUs. It has 13 mobile harbour cranes, 14 rubber-tyred gantry cranes, and warehouse space of about 3,025 m^2, in addition to large open yards (Oritse, 2021; Ekanem, 2024; NPA, 2024; NPA, 2025a-c; UNISCO, n.d). The port uses electronic systems for container tracking and invoicing (Ekanem, 2024; NPA, 2025a). However, despite this, external factors such as severe road congestion often slow down cargo movement, limiting the full benefit of the infrastructure.

This was followed by Tin Can Island Port, which is Nigeria's second busiest. The port has 8 mobile cranes, 15 rubber-tyred gantry cranes, 14 reach stackers, and 45 trailers. The port's storage capacity is approximately 20,000 TEUs, and there is a 28,000-tonne grain silo for bulk commodities (NPA, 2024; NPA, 2025c; NPA, 2025c-d). It is however observed that sections of quay walls and aprons are deteriorating, requiring urgent repairs to enable modern cargo equipment to operate efficiently (Nwaogbe et al., 2024)

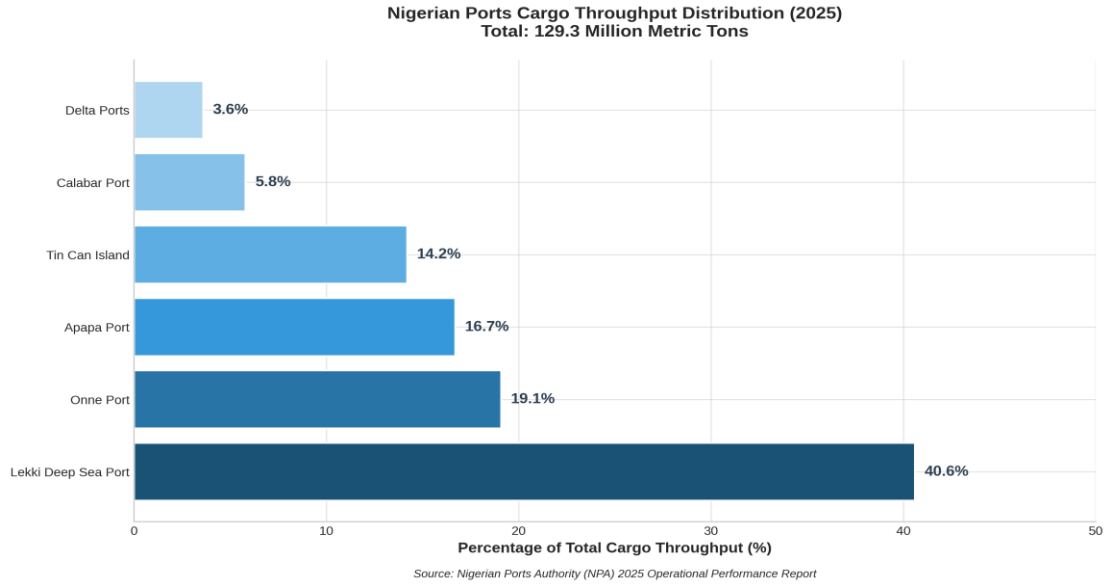
The third, Onne Port, serves as a critical hub for general cargo and oil and gas shipments. Onne's equipment includes heavy-lifting cranes capable of moving very large cargos, hence, a Public-Private Partnership expansion project, valued at $2.9 billion, is underway, with berths 7 and 8 over 60% complete and $110 million invested in modern terminal infrastructure (Gold, 2025, NPA, 2025e-f). The aim of the project include to increase quay capacity, improve handling equipment, and deepen berths for larger vessels (NPA, 2025f).

Calabar Port is smaller and less active, constrained by shallower channels and limited dredging. Its infrastructure includes seven berths, container stacking yards covering roughly 36,000 m^2, and other cargo storage facilities. Though rehabilitation of the port is ongoing, the throughput

remains far lower than Lagos or Onne due to restricted access and limited handling capacity (Asare, 2024; NPA, 2025f; Unor, 2025; Idowu, 2025).

However, the recently released 2025 data shows a significant shift in cargo distribution, with Lekki Deep Sea Port emerging as the dominant facility in Nigeria, as shown in the figure below.

Figure 1: Nigerian Ports Cargo Throughput Distribution (2025)



Source: Nigerian Ports Authority (NPA) 2025g Operational Performance Report. https://nigerianports.gov.ng/2025/12/29/from-congestion-to-global-influence-inside-npas-historic-2025-maritime-transformation.

Figure 1 shows that in 2025, Nigeria's maritime sector underwent a major shift as Lekki Deep Sea Port became the nation's dominant facility, handling 40.6% of the total 129.3 million metric tons of cargo throughput. This represents a significant redistribution of traffic away from traditional hubs like Apapa (16.7%) and Onne (19.1%), driven by Lekki's superior capacity for larger vessels and modern infrastructure. In total, the sector saw a nearly 25% increase in total volume compared to 2024, signaling Nigeria's growing role as a regional transshipment hub for West Africa.

It is important to note that investments in port infrastructure come from both private operators and the government. Instances of private investments include the $438 million investment by APM Terminals at Apapa in 2021, and the $115 million by West Africa Container Terminal at Onne in 2024, and smaller amounts from other concessionaires (Habibic, 2021; Oni, 2024). These funds have gone into cranes, gantry units, terminal tractors, and container handling systems. Additionally, the Federal Government, through the NPA, has committed $1.1 billion to rehabilitate eastern ports, specifically targeting Onne, Rivers, Calabar, and Warri, focusing on quay walls, pavements, breakwaters, and cargo handling infrastructure (NPA, 2025f)

Furthermore, the table below shows the 2025 comprehensive Port Performance Index of the Five Major Nigerian Ports to show the level of infrastructure performance of these ports.

Table 1: Comprehensive Port Performance Index of the Five Major Nigerian Ports

Performance Metric	Lekki Deep Sea	Onne Port	Apapa Port	Tin Can Island	Calabar Port
Vessel Turnaround Time	~18 Hours	~22 Hours	~28 Hours	~24 Hours	~33 Hours
Truck Turnaround Time	~50 Minutes	~90 Minutes	150+ Minutes	120+ Minutes	~60 Minutes*
Average Annual Container Throughput	~350k TEUs	~400k TEUs	~850k TEUs	~400k TEUs	~120k TEUs
Berth Occupancy Rate	62%	92**%**	85%	76%	48%
Crane Productivity (Moves/Hr.)	28	22	16	14	10
Digital Maturity Score	78**%**	60%	45%	40%	35%

Source: Nigerian Ports Authority (NPA) 2025g Operational Performance Report. https://nigerianports.gov.ng/2025/12/29/from-congestion-to-global-influence-inside-npas-historic-2025-maritime-transformation.

The 2025 Comprehensive Port Performance Index shows a transformation in Nigeria's maritime sector, where the newly operational Lekki Deep Sea Port has emerged as the national leader in efficiency, achieving a digital maturity score of 78% and the highest crane productivity at 28 moves per hour. While Apapa Port maintains the highest annual container throughput at approximately 850,000 TEUs, it is burdened by logistical constraints, with truck turnaround times exceeding 150 minutes, contrasting sharply with Lekki's streamlined 50-minute average. Onne Port has solidified its role as a critical regional hub with a high berth occupancy rate of 92%, while Calabar faces under-utilization. This buttresses the strategic necessity of the National Port Distribution Strategy to balance cargo traffic across the federation.

Going forward, it is necessary to state that port access and connectivity are burdened by major bottlenecks in port infrastructure in Nigeria. For instance, roads leading to the Lagos ports, particularly the Apapa–Oworonshoki Expressway, are highly congested, slowing truck movements and cargo evacuation. Following this are rail networks, which are fragmented and underutilized, reducing the efficiency of inland cargo transport (Onyenucheya, 2025b). This also leads to poor access, which sabotages the performance of even the most modern port infrastructure.

Comparatively, Nigerian ports lag behind regional neighbours as ports in Senegal, Mozambique, and Benin, are known to attract cargo that might otherwise be handled in Nigeria, as a result of faster turnaround times and better hinterland connectivity. Nigerian ports still rank in the lower quartile of global port performance indices, which indicate weaknesses in intermodal integration and infrastructure quality (World Bank & S&P Global Market Intelligence, 2024).

To reflect this scenario, the table below African Ports ranked by CPPI in 2024 (Top 7).

Table 2: Ranking of African Ports by CPPI in 2024

Global Rank	Port	Country	CPPI Index Score	Regional Position
24	Port Said	Egypt	+137.2	1st in Africa
25	Tanger Med	Morocco	+136.8	2nd in Africa
183	Dakar	Senegal	+23.1	1st in Sub-Saharan Africa
211	Lomé	Togo	+8.4	2nd in Sub-Saharan Africa
278	Tema	Ghana	-19.6	West Africa
315	Apapa	Nigeria	-41.2	Lower Quartile
342	Tin Can Island	Nigeria	-62.8	Lower Quartile

Source: World Bank & S&P Global Market Intelligence (2024), The Container Port Performance Index 2023/2024 Edition.

Table 2 presents the ranking of African ports based on the Container Port Performance Index (CPPI). Ports such as Port Said (Egypt) and Tanger Med (Morocco) rank among Africa's best performers owing to efficient operations, modern infrastructure, advanced technology, and strong connectivity to global shipping networks, with Dakar (Senegal) leading performance in Sub-Saharan Africa. Similarly, Lomé (Togo) has maintained a strong position through governance reforms, operational improvements, and favourable investment policies. By contrast, Nigeria's Apapa and Tin Can ports rank 315th and 342nd globally with negative index scores, placing them in the lower quartile. This indicates persistent infrastructural challenges including congestion, poor access roads, bureaucratic bottlenecks, limited digitalization, and weak institutional coordination. These constraints contribute to longer cargo dwell times, higher logistics costs, and reduced competitiveness. The comparison further indicates that high-performing African ports function appropriately as a result of the combination of modern infrastructure with effective planning, maintenance, and strong transport linkages, an area where Nigerian ports are still lagging behind. (Ecofin Agency, 2024).

2. Problems of Port Infrastructure Administration in Nigeria

The problems of port infrastructure administration in Nigeria stems from a combination of financial, structural, administrative, and policy weaknesses that affect the physical facilities, cargo handling equipment, access roads, rail links, and overall operational capacity of ports under consideration. These challenges are analyzed below.

Chronic Underfunding and Neglect

Between 2016 and 2024, capital allocations from the federal budget to port-related projects showed wide fluctuations but generally fell short of what would be needed to fully maintain and expand facilities. In 2016, capital expenditure for ports management stood at ₦83.091 billion, with recurrent spending at ₦67.853 billion (Senate Committee on Marine Transport, 2016). The following year, 2017, saw a substantial increase in capital allocations to ₦174.11 billion, alongside ₦96.42 billion in recurrent expenditure (House Committee on Ports, Harbours and Waterways, 2017). In 2019, capital spending decreased to ₦119.21 billion, followed by ₦108.94 billion in 2020, with recurrent expenditure at ₦93.64 billion (Budget

Office of the Federation, 2020). By 2024, capital expenditure rose to ₦252.29 billion, indicating a sustained effort to catch up on deferred maintenance and modernization (Adisa, 2024).

Despite these figures, the bulk of actual investment in port infrastructure does not come directly from the federal budget instead originating from the NPA's internally generated revenue and from private concessionaires managing port terminals (Infrastructure Concession Regulatory Commission, 2022). In 2025, the NPA's management indicated that over 70% of its own budget was earmarked for capital projects aimed at improving efficiency, including dredging, quay expansion, and yard rehabilitation (Omolaoye, 2025). Consequently, while other West African countries have invested more aggressively to upgrade their ports, Nigerian ports suffer from deteriorating, aging facilities. This underinvestment has caused quay walls, aprons, and container yards to deteriorate, slowing cargo handling and extending vessel turnaround times. Furthermore, at Tin Can Island and Onne ports, parts of the quay aprons have reportedly collapsed, showing the depth of gross neglect in Port infrastructure investments in Nigeria ports (Ugbodaga, 2021).

Insufficient Fulfillment of Private Investment Commitments

The introduction of the port concession model was intended to bring private capital and expertise into port management. However, in practice, some operators have not delivered on their commitments. For example, it is observed that concessionaires promised roughly $3 billion for the development of Badagry port, but several years later, most of this investment had not materialized (Azeez, 2022). The result is that many terminals remain outdated, and modernization of cargo handling systems is slow. Hence, while the concession model in its practical state remains a pathway for upgrades, the uneven flow of private capital in Nigerian Port administration has limited the improvement of infrastructure across the country (Umoh, 2023).

Overreliance on Road Access and Weak Multimodal Links

Modern ports rely on a combination of road, rail, and inland waterways to handle high volumes efficiently. In Nigeria, this integration is weak as access roads to major ports like Apapa are usually hindered by severe traffic congestion, with trucks queueing for days or even weeks before they can enter or leave the terminals (Onyenucheya, 2025b). This congestion reduces the efficiency of cranes and yard space, as containers cannot be moved quickly enough. While the government has funded projects such as the $652 million China Exim Bank Road link to Lekki Deep Sea Port and a $747 million loan for the Lagos-Calabar coastal highway, these initiatives are still ongoing and have not fully resolved the problem (Reuters, 2025; NwaChukwu, 2025). Also, rail connections, which could have provided relief, are mostly limited and underutilized, forcing most cargo onto already congested roads, particularly in the Apapa area of Lagos, further raises safety concerns.

Bureaucratic Fragmentation and Policy Inconsistencies

In Nigeria, several federal agencies are involved in port operations and regulation, but their roles are usually overlapping, and responsibilities are not clearly defined. Agencies such as the Nigerian Ports Authority (NPA), the Nigerian Maritime Administration and Safety Agency (NIMASA), the Nigeria Customs Service (NCS), the Nigerian Shippers' Council (NSC), the

Standards Organization of Nigeria (SON), the National Drug Law Enforcement Agency (NDLEA), and the National Environmental Standards and Regulations Enforcement Agency (NESREA) all carry out inspections or enforce regulations at ports simultaneously, thereby creating the problems of duplication of tasks, repeated checks, and conflicting requirements (Omali, 2024). For example, a ship arriving at Apapa or Tin Can Island may be inspected separately by Customs, NIMASA, NSC, and SON, with each agency requiring its own forms or reports. Since these inspections are not well coordinated, shipping agents and importers may spend days moving between offices to obtain clearances (Adenubi, 2021). The consequences of this are slow cargo movement, increased costs for traders, and the creation of opportunities for unofficial payments.

Policy inconsistencies further worsen the aforestated challenge as agencies sometimes issue guidance or procedures that do not match each other. By law, the NSC is supposed to regulate port tariffs and provide a clear framework for charges, but it lacks the authority or budget to enforce these rules consistently. Simultaneously, terminal operators and Customs may publish separate tariff notices that do not align with NSC directives, creating confusion for shipping companies and freight operators (Onyegbula, 2022). Efforts to improve coordination, such as the National Single Window system, have also faced challenges. This system was meant to allow all port agencies to share data digitally and reduce redundant paperwork. However, it has run into technical difficulties and delays because agencies still operate many processes separately and have not fully adopted the shared framework (Nwokorie, 2026; Bala, 2026). Additionally, frequent changes in government leadership and shifts in agency priorities make long-term planning harder. For instance, plans to create rail-linked cargo corridors to ease congestion and connect ports to inland markets have been announced by different administrations (Oloruntoba, 2021), however, progress achieved so far has been slow due to lack of continuous policy commitment and weak coordination between agencies.

Corruption and Inefficient Use of Resources

A major challenge for Nigerian ports has been the gap between what is budgeted or promised for infrastructure and what is actually delivered. Large sums are usually allocated or reported as internally generated revenue, however, much of it barely reaches the physical infrastructure projects it is meant to support. This gap has been linked to weak administration, poor oversight, and, in some cases, mismanagement of funds. Supporting this are Senate reports, audit queries, and oversight investigations, which have shown multiple instances where planned or approved budgets were not fully realized. For instance, in 2018, the Nigerian Senate began investigating a reported ₦177 billion surplus from the NPA's 2017 revenue. The Senate Committee on Marine Transport questioned why this large sum was not remitted to the Federal Government or used for port infrastructure upgrades. There was no clear accounting for the surplus, indicating unaccountable management of port revenues (Olawoyin, 2018). Similarly, in 2022, the Senate Public Accounts Committee reported that the Bureau of Public Enterprises failed to remit $679.4 million from port concession rents covering 2015 to 2016. These rents, linked to 23 NPA concession agreements, had not been collected or properly transferred to government accounts according to the Auditor-General. (Baiyewu, 2022). If these funds had been accounted for, they could have gone into the rehabilitation and modernization of ports.

Budget allocations in the 2023 federal budget further exposed these inconsistencies. Although the Ministry of Transportation and the NPA emphasized urgent needs for port rehabilitation at

Apapa, Tin Can Island, Onne, Calabar, Warri, and Koko, the budget made no provisions for these projects (Egole, 2022). Furthermore, of the ₦38.33 billion allocated to the Ministry of Marine and Blue Economy in the 2025 budget, none was specifically earmarked for port modernization or rehabilitation. Instead, as a significant portion went to office administration, vehicles, and minor expenditures, contradicting earlier planning documents that had prioritized port reconstruction (Onyenucheya, 2025c).

In other years, federal budgets included capital expenditure lines for ports, but oversight reports and Senate investigations show that these allocations were only partially used. For example, in 2024, the NPA surpassed its revenue target of ₦865.39 billion by recording an actual income of ₦894.86 billion and ₦1.97 trillion in 2025, surpassing the targetted ₦1.468 trillion (Ukwu, 2026). However, out of a projected expenditure of ₦850.92 billion in 2024, only ₦417.86 billion was utilized by end of the fiscal year, indicating that a substantial portion of available funds was not deployed for infrastructure expansion or rehabilitation (Yakubu, 2025). The consequence has been decaying infrastructure, including collapsed quay walls and inadequate dredging, which according to the NPA, would require over $1 billion in rehabilitation (Anagor-Ewuzie, 2023). Much of this funding remains unrealized despite repeated official announcements.

In support, the table below shows the Corruption Perception Index (CPI) scores and rankings of Nigeria from 2015-2024.

Table 3: CPI Scores and Rankings of Nigeria (2015-2024)

Year	CPI Score (0–100)	Global Rank (out of 180)
2015	26	136
2016	28	136
2017	27	148
2018	27	144
2019	26	146
2020	25	149
2021	24	154
2022	24	150
2023	25	145
2024	26	140

Source: Data aggregated from Transparency International Nigeria and Trading Economics (2025).

From Table 3, Nigeria's Corruption Perceptions Index (CPI) scores between 2015 and 2024 remained consistently low, ranging from 24 to 28 out of 100, indicating a sustained perception of high public sector corruption. This is relevant to port infrastructure administration because it portrays an environment where weak accountability and administrative inefficiencies

negatively affects the effective use of public funds. Consequently, despite repeated budgetary allocations for port infrastructure, projects such as rehabilitation, equipment upgrades, and quay reconstruction have experienced funding shortfalls or implementation delays, connoting that planned investments have not consistently matured into corresponding improvements in port infrastructure.

3. Approaches to Port Infrastructure Administration in Selected Countries: Prospects for Nigeria

Port of Singapore

Singapore expands and renews port infrastructure through full replacement instead of patch repairs. Old terminals are not continuously rehabilitated, hence, when infrastructure reaches its limit, it is phased out and replaced with new facilities built to future demand levels. Serving as a perfect example, the Tuas Mega Port is not an upgrade of existing terminals but a complete relocation and consolidation of port activity into a single modern complex (Business Excellence, 2023).

In Singapore, infrastructure investment covers berth depth, quay strength, crane capacity, yard layout, automation systems, and inland connectivity at the same time. There is no separation between physical works and operational systems, as infrastructure is treated as a single integrated system (Seatrade Maritime, 2024). Extensively, planning is led by the Maritime and Port Authority of Singapore under a legally backed national port master plan, which runs across several decades and is approved at cabinet level. Once approved, funding is locked in and not revisited annually, thereby removing uncertainty (Urban Redevelopment Authority, 2026). Additionally, capital funding comes directly from the state, not from yearly revenue fluctuations of the port, while contractors are selected through transparent international bidding, and construction is phased, and each phase is completed and tested before the next begins (Mindur, 2020). Maintenance is institutionalized because equipment replacement cycles are fixed in advance, while dredging schedules are planned years ahead, and there is no waiting for breakdowns before action is taken (Mindur, 2020).

From the foregoing, effective port infrastructure administration requires long-term planning rather than periodic rehabilitation of ageing facilities. The Singaporean model shows the necessity of integrating infrastructure development with automation, logistics, and transport connectivity under a single strategic plan backed by stable government funding. It also shows that transparent procurement, phased project implementation, and institutionalized maintenance is more likely to improve infrastructure quality and prevent the deterioration associated with reactive repairs. For Nigeria, adopting a similar long-term planning framework, improving funding certainty, promoting transparent project delivery, and embedding preventive maintenance into port management would enhance infrastructure reliability and improve the overall administration of its ports.

Port of Rotterdam

At the Port of Rotterdam, port infrastructure is considered a part of a wider national logistics system rather than an isolated maritime facility. As a result, investment is extensive, going beyond the terminal area. Considerable resources are directed toward rail corridors, inland waterways, pipeline networks, and digital traffic control systems that manage cargo flows into

and out of the port (Pangea Network, 2024). This strategy recognizes that port performance is mutually dependent on what happens at the quay and on how smoothly cargo moves through the entire transport chain. In the same vein, terminal infrastructure is organized strictly by cargo type because container terminals, liquid bulk facilities, dry bulk yards, and industrial feedstock terminals are developed as separate systems, each with infrastructure suited to its operational needs (Pangea Network, 2024). This aims to avoid the inefficiencies that arise when a single infrastructure model is forced onto very different cargo operations.

In terms of resource planning and finance, the Port of Rotterdam authority operates as a publicly owned but corporatized entity, which gives it financial independence while keeping it accountable to the state. Infrastructure development is financed through a combination of retained port revenues, long term borrowing, and public investment guarantees (De Langen & Heij, 2014; De Langen, 2023). On this basis, the authority prepares multi-year investment plans that clearly state what projects will be executed, the timelines for delivery, and the sources of funding (De Langen & Heij, 2014). Since financial reports are audited and openly published, it is difficult for planned projects to disappear without explanation. Thus, any gap between approved investment and actual delivery becomes visible to regulators and stakeholders.

Furthermore, coordination across institutions is built into the infrastructure process from the outset. For instance, formal agreements link the port authority with rail operators and inland waterway agencies so that access infrastructure is planned alongside terminal expansion. Similarly, timelines are aligned before construction begins, reducing the risk that new port capacity will be cut off by weak hinterland connections (Port of Rotterdam, 2025).

As a lesson, Nigeria can manage its ports as part of an integrated national transport and logistics system instead of isolated maritime facilities. This requires coordinated investment in port infrastructure, road and rail networks, inland waterways, and digital logistics systems to improve cargo movement. In addition, adopting multi-year infrastructure plans with clearly defined funding sources, ensuring greater transparency in project implementation, and improving coordination among port authorities and transport agencies would help address infrastructure gaps, while aiding more efficient port administration.

Chinese Mega Ports (Shanghai and Ningbo)

China's major ports, particularly Shanghai and Ningbo, are built around the idea of scale and long term capacity. Hence, infrastructure is developed with room to handle future demand while not being limited to current traffic levels. More specifically, deep water berths are a central feature of this strategy, enabling the ports to receive the largest vessels without frequent dredging interruptions (Li et al., 2022). This reduces operational disruptions and ensures that infrastructure does not quickly become obsolete as ship sizes increase. Alongside berths and terminals, port development in China includes large industrial parks, logistics zones, and bonded areas that are physically linked to port facilities. In this way, port infrastructure facilitates production, storage, and export processing as part of one connected system, instead of serving only as a point of ship entry and exit (Spencer et al., 2025).

With respect to structure, major ports are formally designated as strategic national assets, which places their development under direct coordination between central and provincial governments (Africa Center for Strategic Studies, 2025). Once a project is approved, funding is secured through public budgets and policy banks, reducing uncertainty and delays. Construction and

expansion works are typically executed by state owned firms operating under clear delivery schedules. These firms are expected to meet strict timelines and quality benchmarks, emphasizing the importance attached to port infrastructure in national economic planning (Aritua et al., 2022).

Another defining feature is how performance is enforced as port managers and senior officials are assessed against measurable outcomes such as cargo throughput growth, vessel turnaround time, and the reliability of infrastructure systems, indicators which are linked to promotion and career advancement within the public sector (Cullinane & Wang, 2006). Consequently, infrastructure failure carries personal and professional consequences. In contrast, Nigerian ports operate without such direct accountability mechanisms; infrastructure breakdowns and project delays rarely lead to sanctions for port leadership, which weakens incentives for timely maintenance and disciplined project execution. Hence, Nigeria should approach port development as a long-term economic strategy by building deep-water facilities that anticipate future trade volume and integrating them directly with industrial and logistics parks. Furthermore, Nigeria can eliminate chronic project delays, speed up vessel turnaround times, and ensure continuous infrastructure maintenance by treating ports as vital national assets with dedicated public funding and holding port officials strictly accountable through performance-driven career incentives.

Tanger Med, Morocco

Morocco's Tanger Med port is a useful contrast to Nigerian ports because it was planned and built without the burden of old port structures. The port was developed on a new site, which enabled planners to design infrastructure around modern shipping needs from the start, with priority given to deep berths and reinforced quay walls that could safely handle large container vessels over long periods, thereby reducing the need for frequent repairs and emergency dredging (The Cooperative Logistics Network, 2025). Also, terminal equipment including ship to shore cranes and yard handling systems were installed before commercial operations began. As a result, the port did not rely on temporary fixes or gradual upgrades once traffic increased. Also, free trade zones, access roads, and rail connections were constructed alongside the port itself, while cargo evacuation and industrial activities were therefore planned as part of the same project, not added later in response to congestion (Felipe, 2025).

Administratively, the Tanger Med Port Authority operates with a narrow and clearly defined mandate which focuses on port development and management, therefore, it does not share overlapping responsibilities with multiple regulators inside the port space. Funding for infrastructure has to come from a combination of direct state investment, loans from international development institutions, and private terminal operators working under concession agreements (Tanger Med Special Agency, 2025). These agreements are closely monitored and tied to clear performance and maintenance obligations.

Contrastingly, in Nigeria, concessions are usually weakly supervised, and maintenance clauses are rarely enforced with consistency, causing infrastructure to deteriorate even while terminals are operational. Nigeria should therefore adopt a Greenfield development model for port infrastructure by constructing new, modern deep-water facilities away from congested urban centers, ensuring that heavy terminal equipment, rail corridors, and industrial free zones are fully operational before commercial traffic begins. Simultaneously, the government should streamline port administration under a single, autonomous authority with a clear operational

mandate, while strictly supervising private terminal concessions to enforce maintenance standards and prevent infrastructure decay.

CONCLUSION

For Nigeria, the ability to translate its strategic maritime location and large market potential into practical economic benefits is influenced by the quality, reliability, and administration of its port infrastructure. Though recent developments, including the operational emergence of the Lekki Deep Sea Port, indicate the possibilities associated with modern port facilities, the wider port system still experience persistent constraints that limit its effectiveness. As identified in the study, these include ageing infrastructure, inadequate maintenance, insufficient funding, weak hinterland connectivity, and institutional inefficiencies.

Addressing these challenges requires a transition from fragmented interventions and periodic rehabilitation towards a more coordinated and long-term approach to port infrastructure development. Experiences from leading port systems in Singapore, Rotterdam, China, and Morocco show that for port performance to be sustainable, such must integrate modern infrastructure with effective planning, reliable financing, efficient governance, and accountable management practices. Therefore, if port infrastructure administration has to be improved sustainably, there must be practical efforts in bolstering long-term investment in critical facilities, stronger linkage between ports and transport networks, clearer institutional responsibilities, and improved accountability among public and private actors involved in port development. Specifically, such measures would reduce operational constraints, improve trade facilitation, and enable Nigerian ports to assume a more competitive role within the regional and global maritime economy.

REFERENCES

Ademola, B. I. (2024). An assessment of cargo handling in Nigerian seaports (A case study of Apapa Seaport in Lagos). *Journal of Business & Economy,* 17(2), 36-50.

Adenubi, T. (2021, August 5). Nigeria's abysmal joint vessel inspection regime and consequences. *Tribune Online*. https://tribuneonlineng.com/nigerias-abysmal-joint-vessel-inspection-regime-and-consequences/amp/.

Adisa, J. (2024, March 23). NPA presents N629.89BN spending plan for 2024 to Reps committee. *TVC* News. https://www.tvcnews.tv/npa-presents-n629-89bn-spending-plan-for-2024-to-reps-cmmittee/

Africa Center for Strategic Studies. (2025, March 10). *The logic behind China's infrastructure investment in Africa*. https://africacenter.org/spotlight/china-port-development-africa/.

Anagor-Ewuzie, A. (2023, April 26). It's time to reconstruct, and rehabilitate Tin Can Port Quay Walls – NPA. *Business Day*. https://businessday.ng/maritime/article/its-time-to-reconstruct-and-rehabilitate-tin-can-port-quay-walls-npa/.

Aritua, B., Chiu, H., Cheng, L., Farrell, S., & de Langen, P. (2022). Developing China's ports: How the gateways to economic prosperity were revived. International Bank for Reconstruction and Development / *The World Bank*.

https://documents1.worldbank.org/curated/en/099355105182214741/pdf/IDU0252045cf029fb04b3c0a3b8015c08103310d.pdf

Asare, A. (2024, July 25). Calabar Ports receives 16 mega vessels per month – Manager. *Daily Post*. https://dailypost.ng/2024/07/25/calabar-ports-receives-16-mega-vessels-per-month-manager/.

Azeez, W. (2022, August 3). FEC Okays development of $2.59bn Badagry Deep Seaport. *The Cable*. https://www.thecable.ng/breaking-fec-okays-development-of-2-59bn-badagry-deep-seaport/.

Badejo, B.A. and Solaja, O.M. (2017). The Nigerian seaports and development (1900-2015): Historical Perspectives and dynamics, *International Journal of Development and Sustainability*, 6 (9). 1007-1024.

Baiyewu, L. (2022, January 6). Senate probes BPE, alleges unremitted $679.4m rent on ports' concession. *The Punch*. https://punchng.com/senate-probes-bpe-alleges-unremitted-679-4m-rent-on-ports-concession/.

Bala, I. S. (2026). *Digitalization of Customs Clearance Procedures and Trade Facilitation in Nigeria*. Unpublished Dissertation, Institute of International Trade and Development, University of Port Harcourt.

Beeferman, L., & Wain, A. (2016, January). *Infrastructure: Defining matters*. Harvard Law School.

Business Excellence. (2023). Tuas Port project: The centrepiece of Singapore's bold ambitions. https://www.bus-ex.com/article/tuas-port-project-centrepiece-singapores-bold-ambitions/

Cullinane, K., & Wang, T.-F. (2006). Port governance in China. In Research in Transportation Economics (Vol. 17, pp. 331–356). *Elsevier*. https://doi.org/10.1016/S0739-8859(06)17015-8.

De Langen, P. (2023). Advancing Public Interests Through State Ownership: The Case of Port of Rotterdam. *GeoJournal*, 88(6), 6507-6521. https://doi.org/10.1007/s10708-023-10981-9.

De Langen, P. W., & Heij, C. (2014). Corporatisation and Performance: A Literature Review and an Analysis of the Performance Effects of the Corporatisation of Port of Rotterdam Authority. *Transport Reviews*, 34(3), 396–414. https://doi.org/10.1080/01441647.2014.905650.

Ecofin Agency. (2024, June 6). *Dakar port tops Sub-Saharan Africa in 2024 CPPI as Egypt, Morocco rank among world's best*. https://www.ecofinagency.com/news/2309-48933-dakar-port-tops-sub-saharan-africa-in-2024-cppi-as-egypt-morocco-rank-among-world-s-best

Egole, A. (2022, October 13). N258bn Port Reconstruction project missing in 2023 budget. *The Punch*. https://punchng.com/n258bn-port-reconstruction-project-missing-in-2023-budget/

Ekanem, S. (2024, November 8). Nigerian port makes history with the arrival of EA Centaurus, the largest container vessel. *Business Insider Africa.* https://africa.businessinsider.com/local/markets/nigerian-port-makes-history-with-the-arrival-of-ea-centaurus-the-largest-container/3nl3x7h#google_vignette.

Ekeuwei, T. A. (2025, August). Poverty alleviation, infrastructure development, and climate change policy implementation: A midterm review of President Tinubu's administration. *Journal of Public Policy and Development Studies*, 2(1), 20-42.

Fatile, J. O. (2007). Concept of Public Administration. In I. Olojede & B. Fajenyomi (Eds.), *Essentials of Public Administration* (pp. 5-27). Department of Public Administration, Lagos State University.

Felipe, A. (2025, April 13). Morocco's strategic port developments: Paving the way to global maritime leadership. *Financial Ports*. https://financialports.com/moroccos-strategic-port-developments-paving-the-way-to-global-maritime-leadership/

Gabriel, C. & Afolabi, Z. (2025, November 12). Billions Lost at the Ports: How Modernisation Can Turn Nigeria's Fortune Around. *OAL*. https://oal.law/billions-lost-at-the-ports-how-modernisation-can-turn-nigerias-fortune-around-introduction/#:~:text=Nigeria's%20ports%20are%20the%20gateways,%2C%20competitiveness%2C%20and%20investor%20confidence

Gold, R. (2025, August 27). Dantsoho's Eastern Ports Revolution: Transforming Nigeria's Maritime Landscape for Economic Diversification. *WATERWAYSNEWS*. https://waterwaysnews.ng/2025/08/27/dantsohos-eastern-ports-revolution-transforming-nigerias-maritime-landscape-for-economic-diversification/.

Habibic, A. (2021, December 21). APM Terminals invests $438 million in Apapa Upgrade. *Offshore Energy*. https://www.offshore-energy.biz/apm-terminals-invests-438-million-in-apapa-upgrade/

Hales, D. N., Chang, Y.-T., Lam, J. S. L., Desplebin, O., Dholakia, N., & Al-Wugayan, A. (2017). An empirical test of the balanced theory of port competitiveness. *International Journal of Logistics Management*, 28(2), 363-378. https://doi.org/10.1108/IJLM-06-2015-0101.

Hales, D., Lam, J. S. L., & Chang, Y.-T. (2016). The balanced theory of port competitiveness. *Transportation Journal*, 55(2), 168-189.

Hirschman, A.O. (1958) *The Strategy of Economic Development*. Yale University Press, New Haven. https://doi.org/10.1016/B978-0-444-51667-1.50041-0.

House Committee on Ports, Harbours and Waterways. (2017). Report on the harmonized 2017 budget proposal of the Nigerian Ports Authority (NPA). *National Assembly of Nigeria*.

https://placng.org/i/wp-content/uploads/2019/12/Report-of-the-House-Committee-on-Ports-Harbours-and-Waterways-on-the-Harmonized-2017-Budget-Proposal-of-NPA-NSC-NIWA-and-CRFFN.pdf

Idowu, O. (2025, August 25). NPA boosts Eastern ports' operations to drive economic diversification. *Premium Times*. https://www.premiumtimesng.com/business/business-news/816386-npa-boosts-eastern-ports-operations-to-drive-economic-diversification.html#:~:text=As%20part%20of%20efforts%20to,Eastern%20ports

Infrastructure Concession Regulatory Commission. (2022). *Public-private partnership (PPP) annual report: Port sector performance*. https://www.icrc.gov.ng/.

Li, D., Xu, X., & Zhou, S. (2022). Integrated governance of the Yangtze River Delta port cluster using niche theory: A case study of Shanghai Port and Ningbo-Zhoushan Port. *SSRN*. https://doi.org/10.2139/ssrn.4223225.

Melnyk, O., Shibaev, O., Koskina, Y., Drozhzhyn, O., Shcherbina, O., & Zaporozhets, A. (2025). Crosscurrent model analysis of commercial operations and logistics processes in ocean freight transportation. In O. Melnyk, O. Onishchenko, & A. Zaporozhets (Eds.), Maritime systems, transport and logistics I (Vol. 580, pp. 151-166). *Springer*. https://doi.org/10.1007/978-3-031-82027-4_10.

Menon Economics & DNV. (2024). *The leading maritime cities of the world 2024.* https://www.ssa.org.sg/wp-content/uploads/2024/04/Leading-Maritime-Cities-of-the-World-2024.pdf.

Mindur, M. (2020). Significance of the port of Singapore against the country's economic growth. *Scientific Journal of Silesian University of Technology*. *Series Transport,* 106, 107–121. https://doi.org/10.20858/sjsutst.2020.106.9.

NBS (2025, July). *Nigeria Gross Domestic Product Report Q1, 2025*. https://microdata.nigerianstat.gov.ng/index.php/catalog/147/download/1258/Q1_2025_GDP%20Report.pdf

Niah, A. (2022). Education administration perspective policy makers and educational institutions. *Indonesian Journal of Education* (*INJOE*), 2(3), 235-243. e-ISSN: 2810-059X.

NPA (2024). *Nigerian Ports Today.* https://nigerianports.gov.ng/wp-content/uploads/2024/04/NPA-Today-March-2024.pdf.

NPA (2025a). *Nigerian ports today: Oyetola's two-year voyage of reform, growth* (Vol. 13, No. 41). https://nigerianports.gov.ng/wp-content/uploads/2025/11/NPA-MAG-041.pdf.

NPA (2025b, June 18). *Synopsis of NPA Performance Improvements under Dantsoho*. https://nigerianports.gov.ng/2025/06/18/10830/#:~:text=One%20of%20the%20most%20notable,activities%20and%20improved%20operational%20efficiencies.

NPA (2025c, May 11). *Lagos Port Complex.* https://nigerianports.gov.ng/lagos-port/#:~:text=The%20Lagos%20Port%20Complex%20also,and%20Lilypond%20Inland%20Container%20Terminal

NPA (2025d, May 12). *Tin Can Island Port (TCIP)*. https://nigerianports.gov.ng/tincan/

NPA (2025e, August 5). *Onne Port Complex*. https://nigerianports.gov.ng/onne/

NPA (2025f). *Nigerian ports today: Oyetola's two-year voyage of reform, growth* (Vol. 13, No. 41). https://nigerianports.gov.ng/wp-content/uploads/2025/11/NPA-MAG-041.pdf.

NPA. (2025g, December 29). From congestion to global influence: Inside NPA's historic 2025 maritime transformation. https://nigerianports.gov.ng/2025/12/29/from-congestion-to-global-influence-inside-npas-historic-2025-maritime-transformation.

NPA. (2026, March 12). *NPA port modernisation, NSW as catalysts for new era of trade.* https://nigerianports.gov.ng/2026/03/12/npa-port-modernisation-nsw-as-catalysts-for-new-era-of-trade/.

NwaChukwu, O. (2025, July 9). Nigeria secures $747m syndicated loan for Lagos-Calabar coastal highway project. *Business Day*. https://businessday.ng/business-economy/article/nigeria-secures-747m-syndicated-loan-for-lagos-calabar-coastal-highway-project/

Nwaogbe, O. R., Abdulhamid, H. Y., Omoke, V., & Eru, J. U. (2024). Comparative analysis of hub and spoke seaport performance in Nigeria: Case of Apapa Port and Tin Can Island Port. *Journal of Sustainable Development of Transport and Logistics*, 9(1), 137-145. Doi:10.14254/jsdtl.2024.9-1.10.

Nwokorie, C. (2026). *Automated Customs Systems and Trade Facilitation in Nigeria*. Unpublished Dissertation. Institute of International Trade and Development, University of Port Harcourt.

Olawoyin, O. (2018, November 30). NPA replies Senate in N177 billion unremitted revenue allegation. *Premium Times*. https://www.premiumtimesng.com/news/top-news/298297-npa-replies-senate-on-n177-billion-unremitted-revenue-allegation.html?tztc=1

Oloruntoba, O. (2021, July 6). Nigeria doesn't have a coherent strategy to manage freight: How it can get there. *The Conversation*. https://theconversation.com/nigeria-doesnt-have-a-coherent-strategy-to-manage-freight-how-it-can-get-there-163095

Olusola, B. (2025, April 17). Nigerian businesses lose N2.5 trillion annually to inefficient ports and poor infrastructure. *MSME Africa*. https://msmeafricaonline.com/nigerian-businesses-lose-n2-5-trillion-annually-to-inefficient-ports-and-poor-infrastructure/#google_vignette

Omali, J. (2024). *Coordinated Border Management and Trade Facilitation in Nigeria*. Unpublished Dissertation. Institute of International Trade and Development, University of Port Harcourt.

Omolaoye, S. (2025, June 23). NPA earns N894b in 2024, eyes N1.28trillion in 2025. *The Guardian*. https://guardian.ng/business-services/npa-earns-n894b-in-2024-eyes-n1-28tr-in-2025/.

Oni, A. (2024, August 26). *Tinubu to inaugurate revamped $115m container terminal in Onne Port*. TheCable. https://www.thecable.ng/tinubu-to-inaugurate-revamped-115m-container-terminal-in-onne-port/

Onyegbula, E. (2022, March 2). NSC Charges Port Terminal Operators to ensure tariffs match service delivery. *Vanguard*. https://www.vanguardngr.com/2022/03/nsc-charges-port-terminal-operator-to-ensure-tariffs-match-service-delivery/.

Onyenucheya, A. (2025a, April 30). Nigeria risks losing shipping grip as 16,000 TEUs vessels dock in Ghana, Togo. *The Guardian*. https://guardian.ng/business-services/maritime/nigeria-risks-losing-shipping-grip-as-16000-teus-vessels-dock-in-ghana-togo/

Onyenucheya, A. (2025b, May 7). Gridlock on Lagos port access roads over inadequate parking facilities. *The Guardian Nigeria*. https://guardian.ng/business-services/maritime/gridlock-on-lagos-port-access-roads-over-inadequate-parking-facilities/.

Onyenucheya, A. (2025c, January 15). Seaports Rehabilitation, others missing from N38.3 billion maritime allocation. The Guardian. https://guardian.ng/business-services/maritime/seaports-rehabilitation-others-missing-from-n38-3-billion-maritime-allocation/.

Oritse, G. (2021, February 17). APM Terminals Apapa boosts Operation with 4 Additional Rubber Tyred Gantry Cranes. *Vanguard*. https://www.vanguardngr.com/2021/02/apm-terminals-apapa-boosts-operation-with-4-additional-rubber-tyred-gantry-cranes/.

Pangea Network. (2024, February 19). *Port of Rotterdam: Global impact, technology, and analysis*. https://pangea-network.com/port-of-rotterdam-global-impact-technology-and-analysis/.

Peng, H., Cheng, Y., & Li, X. (2023). Real-Time Pricing Method for Spot Cloud Services with Non-Stationary Excess Capacity. *Sustainability*, 15(4), 3363. https://doi.org/10.3390/su15043363.

Petroski, H. (2009). Engineering: Infrastructure. *American Scientist*, 97(5), 370-374.

Pfiffner, J. M., & Presthus, R. V. (1967). *Public Administration* (4th ed.). Ronald Press Company.

Port of Rotterdam. (2025, March 6). *Optimizing inland shipping*. https://www.portofrotterdam.com/en/logistics/connections/intermodal-transportation/inland-shipping/optimising-inland.

Reuters. (2025, May 6). *Nigeria approves $652 million China Exim Bank road finance package*. https://www.reuters.com/world/africa/nigeria-approves-652-million-china-exim-bank-road-finance-package-2025-05-06/.

Rodrigue, J.-P. (2024). *The geography of transport systems* (6th ed.). Routledge. DOI: 10.4324/9781003343196.

Rosenstein-Rodan, P. N. (1943). Problems of industrialization of Eastern and South-Eastern Europe. *The Economic Journal,* 53(210), 202-211.

Rožić, T., Božić, D., Bajor, I., & Andrlić, B. (2025). The Ambidextrous Role of Inland Terminals in Enhancing Port–Hinterland Connectivity. *Logistics*, 9(1), 27-42. https://doi.org/10.3390/logistics9010027

Seatrade Maritime. (2024, February 14). World's largest automated terminal: PSA Tuas Port pioneering automation transformation with event-driven architecture. https://www.seatrade-maritime.com/ports/worlds-largest-automated-terminal-psa-tuas-port-pioneering-automation-transformation-event-driven-architecture/

Senate Committee on Marine Transport. (2016). Harmonized report of the joint committee on the Nigerian Ports Authority (NPA) 2016 appropriation. *National Assembly of Nigeria.* https://placng.org/i/wp-content/uploads/2019/12/Harmonized-Report-of-the-Joint-Committee-on-Senate-Committee-on-Marine-Transport-and-House-of-Reps-Committee-on-Ports-Harbours-and-Waterways-on-the-Nigerian-Ports-Authority-NPA-2016-Appropriation.pdf

Simon, H. A. (1947). *Administrative Behavior: A Study of Decision-Making Processes in Administrative Organization*. New York: Macmillan.

Spencer, M. D., Christiansen, E., Pires, S. F., Tsai, C.-H., Gondhali, U., & Petrossian, G. (2025). Identifying and explaining the distribution of Chinese-affiliated ports around the world: A case-control design. *Ocean & Coastal Management,* 269, 107819. https://doi.org/10.1016/j.ocecoaman.2025.107819.

Tanger Med Special Agency. (2025). *Annual report 2023. Tanger Med Special Agency.* https://www.tangermed.ma/wp-content/uploads/documentations/2025/1630-RAP-TMSA_Annuel_2023_A4VANG-1.pdf

The Cooperative Logistics Network. (2025, October 29). *Tanger Med: How Morocco Is building Africa's largest logistics* platform. https://blog.thecooperativelogisticsnetwork.com/2025/10/29/tanger-med-how-morocco-is-building-africas-largest-logistics-platform/

Tinbergen (1962) *Shaping the World Economy, Suggestions for an International Economic Policy.* The Twentieth Century Fund, New York.

Trading Economics. (2025). *Nigeria corruption rank*. https://tradingeconomics.com/nigeria/corruption-rank

Transparency International. (2025, February 11). *Corruption Perceptions Index 2024*. https://www.transparency.org/en/cpi/2024.

Ugbodaga, M. (2021, September 20). NPA: Tin Can Island, Onne ports infrastructure collapsing. *The Cable*. https://www.thecable.ng/npa-tin-can-island-onne-ports-infrastructure-collapsing/.

Ukwu, J. (2026, March 31). NPA proposes N1.49trn revenue target in 2026 budget. TheCable. https://www.thecable.ng/npa-proposes-n1-49trn-revenue-target-in-2026-budget/

Umoh, G. T. (2023, November). Port reforms and concession: A study of Apapa and Tin Can Island Seaports. *AKSU Journal of Administration and Corporate Governance,* 3(3), 160-179.

UNISCO (n.d). *Apapa, Nigeria*. https://www.unisco.com/international-ports/apapa-nigeria.

Unor, O. S. (2025). Draft Limitations and Logistics Constraints at Calabar Port: A Case Study of ECM Terminals. *American Journal of Traffic and Transportation Engineering,* 10(4), 80-89. https://doi.org/10.11648/j.ajtte.20251004.11.

Urban Redevelopment Authority. (2026, February 19). Master Plan. https://www.ura.gov.sg/Corporate/Planning/Master-Plan/.

White, L. (1955). *Introduction to the study of public administration*. New York: Macmillan

World Bank & S&P Global Market Intelligence. (2024). The Container Port Performance Index 2023: A comparable assessment of container port performance (4th ed.). *World Bank*. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099052224115538058/p179831109067d00918931168579347589e

World Bank. (1994). *World development report 1994: Infrastructure for development* (Report No. 13184). World Bank Group.

Yakubu, D. (2025, June 23). NPA projects N1 28tn revenue for 2025. *The Punch*. https://punchng.com/npa-projects-%E2%82%A61-28tn-revenue-for-2025/.

Yalcin, M. G., Chakravorty, S. S., & Yun, G. (2019). Informing the balanced theory of port competitiveness using ambidextrous supply chain strategy. *Transportation Journal*, 58(1), 21-37.