

Challenges of Inland Container Depots in Nigeria

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Abstract

The concept of inland container depots (ICD) has been in existence for over 35 years to mitigate the major problem of port congestion in developed and developing countries due to the continuous increase in international business transactions through containers. As a result, most nations with Nigeria as a case study have faced serious challenges in implementing and operating inland container depots. This research summarizes the major challenges from literature review and findings from port stakeholders based on the current trend. A functional process framework and effective linkages from the ports to respective ICD with modern intermodal transport infrastructure are required for sustainable operation of ICD.

Keywords: Inland container depots; inland terminals; intermodal transport; container handling; dry port.

1. Introduction

The existing main ports across the world are experiencing significant challenges in expanding port capacity due to challenges on land availability in the locality of existing terminals. These problems have created an impact on traffic congestion and quality of life. Advanced countries like the United States have had most of their ports congested and this has been mainly attributed to the increasing volume of import and export cargo in marine containers. African nations have realized the market for goods and services are growing and this has now called for increased demand for transportation of products to other nations with the help of water transport. This is due to the huge challenges and risk in managing mainland or deep seaports as well as inland container depots [1] A significant challenge is the problem of congestion in the seaports which is being experienced by most developing economies. These congestion affects the general operation of the ports as well as the velocity of business transactions, specifically, the congestion at the Nigerian ports which has caused decline of the competitive advantage of ports in the African sub-region as well as increasing direct cost such as port congestion penalties, surcharges and indirect costs such as storage costs to the port users.

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Consequently, transportation costs to and from the ports are also at a premium due to longer pickup times from the port and delivery to client base. The author in [2] noted that modifications in the current transport chain led to the development of inland container depots. Inland container depots helps to reduce port capacity and they become a competitive advantage for the less developed ports. This permits them better connections with the hinterland, thereby attracting extra cargo. Inland container depots become an additional link in the present transport chain, while the use of intermodal transport technology enables expediting of transport processes, thereby reducing the total transport costs. He also mentioned that in the current transport chain, there have also been modifications in the mode of shipment from the manufacturer or producer to the port and also from the port to the end users.

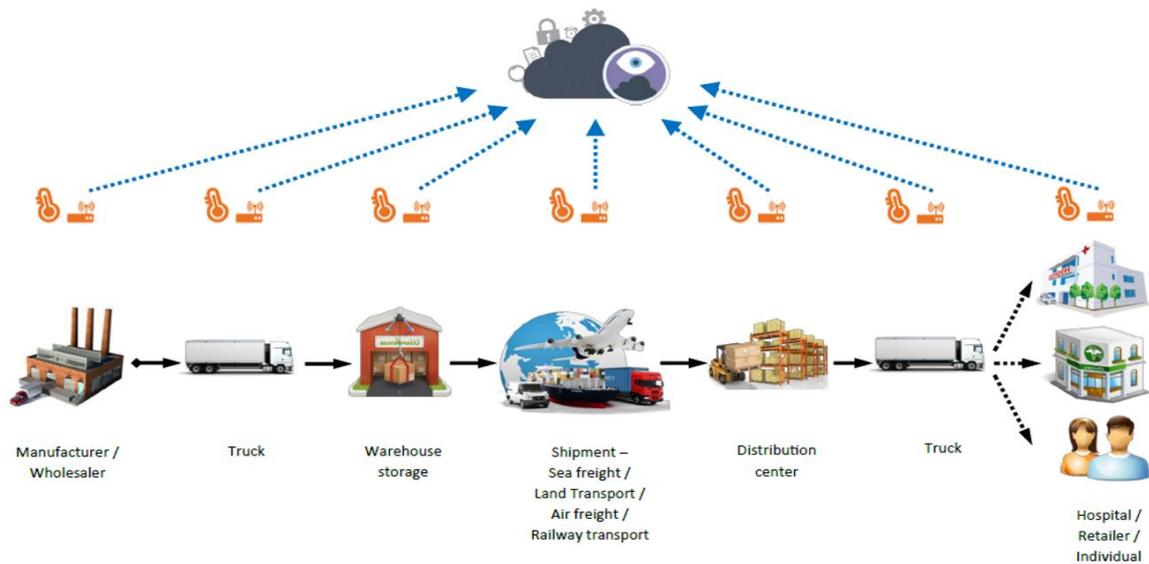


Figure 1: Distribution chain from source through seaports and ICDs (distribution center) to end user.

There is a renewed vigor towards the establishment and efficient functioning of ICD in Nigeria. State governments are beginning to see it as an avenue to attract foreign investors and trigger the growth and expansion of business in their respective states. This renewed commitment to the implementation of ICDs in the Nigeria is commendable. Apart from the jobs that will be created and decongestion of the Lagos ports, it will also contribute to the ease of doing business, since shippers may not have to travel far distance to clear their goods.

1.1 Problem Discussion

Since the commencement of ICD in Nigeria, they have not been able to serve the purpose for which they were established and that is why this research seeks to find out the challenges of Inland Container Depots in Nigeria. With Nigeria’s major seaports concentrated in the south, clearing goods for shippers from the hinterland was a challenging task owing to the distance from the hinterlands to the seaports in Lagos and the inefficiency that described port operations. A series of reforms were introduced in Nigeria’s ports operations in 1995. The reforms were necessitated by the growing inefficiency in the ports at the time. The need for reforms in ports

operations was further amplified by the looseness that followed clearing of cargoes. Goods were cleared without the required Import Duty Report (IDR) and many importers experienced long delays in the clearance of their goods. It was estimated that the inefficiency in the port operations caused Nigeria a loss of about NGN8 billion by the end of 1995. The newly introduced reforms further affected the operations of ICDs in the country because the government was more interested in fishing out malpractices that had characterized port operations. More importantly, owing to the huge loss in revenue, the government directed that all Customs inspection should be done at the seaports. The reforms also led to the promulgation of the “Ports Related Offenses etc., Decree 1996” that gave birth to a task force on sea port security in the country, and the adoption of the Automatic System for Customs Data Entry (ASYCUDA), which is a United Nations initiative [3]. In spite of the different committees that were created at different times as a result of the port reforms in year 2000, the actualization of the ICD project remained an impossible task. However, events appear to be taking on a new dimension with the commissioning of the Kaduna Dry Port earlier this year. Currently, the Jos ICD is said to have attained 70% completion and expected to generate 5000 direct jobs upon completion. At the inauguration of the Kaduna Dry Port, President Muhammadu Buhari had informed the public on how the government was working to fast track the Plateau State ICD. The inauguration of Kaduna terminal has motivated the Plateau state government to do everything possible at her disposal to ensure its completion [3]. More importantly, the absence of effective rail network also calls to question the impact ICD may have on shipping and the economy at large. The reality before Nigeria is that, in the absence of efficient rail network, containers will still be transported to the ICD via the largely dysfunctional road networks, which will further contribute to the deterioration of the roads. In essence, until the country is fully networked by effective rail system, ICD may not contribute much to the maritime industry [3]. There is also a concern on how to ensure that the ICDs do not become counterproductive in the end especially for the Eastern corridor with Calabar, Warri, Port Harcourt and Onne Ports. ICDs are meant to play a complementary role in port operations. They are not meant to replace seaports.

2. Materials and Methods

2.1 Conceptual Review of Inland Container Depot

Port congestion is a familiar event in maritime business. Improvement in port operations led to the conception of inland container depots (ICDs) as veritable means to deal with port congestion and make business easier for shippers. There is no single definition which explains (classifies) inland facilities, but some literature lists several terms. In the available literature, inland container depots as important hubs in the transport network, are terminologically defined as: dry port, inland terminal, inland port, inland hub, inland logistics center and freight villages [2]. Inland container depots can also be referred to as inland container freight stations which operates majorly on containerized cargo. A committee of the United Nations Conference and Development [4] also defines Inland Container Depot as a common user facility with public authority status equipped with fixed installation and offering service for handling and temporary storage of any kind of goods (including containers) carried under the customs control and with customs and other agencies competent to clear goods for home use, warehousing, temporary admission, re-export, temporary storage for onward transit and outright export. (http://Commerce.nic.in/infr_guidedet.html).

The authors in [2] suggests that there are three main features that define inland facilities:

- Intermodal terminals - railway or inland waterways.
- Connection with the port terminal (terminals) by road and railway transport and/or inland waterways across a large capacity corridor.
- Group of connected logistic activities that organize cargo transportation.

Inland terminals are categorized by the authors in [5] according to their function in the overall intermodal transport network. They are divided into: terminals with direct connection with the port which have limited capacity and the cargo operations are carried out at locations close to the recipient of the cargo or the port; terminals on major networks designed for quick load transfer of transport units, and likewise terminals on fixed routes, but only for small quantities of cargo; hub-and-spoke terminals defined as the central hub through which all transport flows pass, with large volume and providing efficient cargo handling. The authors in [6] complemented dry ports and ports, and stated the significance of collaboration between ports and inland facilities on the basis of partnership rather than as competitors. Ports hinterland are also identified as an inner region served by the port at a lower cost than other ports in the region [7]. Other authors in [8] demystified cargo transportation towards ports hinterland, where large volumes of containers that pass through the port make intermodal transport economically and socially most acceptable and most attractive transport means. Port connectivity with its hinterland should be in focus of port strategies for the development of intermodal connections, as well as terminal operators, shipping companies and port authorities [9]. Mentioned the importance of linking ports with corresponding hinterland as a significant factor in economic progress of the port and competitiveness in the transport network. He also mentioned that a mixture of port container capacity expansion with a flexible and innovative hinterland links can contribute to transport network development. Moreover, he identified the objectives of strategic alliances, joint ventures or acquisitions in inland terminals from the port authorities and port operators' perspective:

- The expansion of port operations to the hinterland.
- Improvement of port logistic services through the development of flexible.
- Reliable and frequent connections with the hinterland by different transport modes; reduction of total costs through simplification of customs procedures which are completed on inland terminals and the expansion of ports transit function through optimum use of space and cargo handling. In this way ports can concentrate on their main activity.
- Containers loading/unloading, which will primarily reduce containers trans-shipment time, and thus the total cost.

Reference [3] Opined that an ICD is basically a dry port equipped with necessary equipment for handling and temporary storage of containerized cargo as well as empties. ICDs are designed to help importers and exporters

handle their shipments near their place of location, hence they are located in the hinterland of a country. In the case of Nigeria, with functional ICDs, the shipper resident in Sokoto (Northern part of Nigeria) does not have to come all the way to Lagos (southern part of Nigeria) to receive a cargo if there is a functional ICD close to him. A proper ICD has all the necessary loading and off-loading equipment needed to handle containers with all necessary customs services and officials. In essence, ICDs are meant to bring shipping services to the door step of shippers across the nation and aid the decongestion of the seaports, thereby making them user-friendly. An ICD is generally recognized and operated as an extension of the seaport. Inland dry ports are otherwise known as Inland Container Depots (ICD's) or Containers Freight Stations (CFs). An ICD is equivalent of a sea port located in the hinterland. It receives containers by rail or road from the seaport for examination and clearance by customs and other competent authorities. It has all the Loading and off-loading equipment needed to handle containers [10]. The ICDs/CFs are expected to achieve the following among others:

- Bring shipping services to the door step of shippers across the nation.
- Assist in decongesting the seaports and make them more user friendly.
- Provides the impetus to revive and modernize the railway as a primary mode for long distance haulage.
- Assists in the over-all costs of cargo to hinterland locations as well as transit cargoes to landlocked countries.
- The Council promoted and facilitated the establishment of Inland Container Depots (ICDs) in Nigeria on the basis of Public Private Partnership (PPP).

There are seven approved locations for the Inland Container Depots (ICDs) / Container Freight Stations (CFs), which were concessioned to private sector operators by the ICD Implementation Committee of the Federal Ministry of Transport as follows:

- IsialaNgwa, Aba
- Erunmu, Ibadan
- Heipang, Jos
- Zawachiki, Kano
- Zamfarawa, Funtua
- Jauri, Maiduguri
- ICNL, Kaduna

In addition to the seven gazette ICDs, there have been proposals from the private sector to establish ICDs at Dagbolu in Osun State, Lolo in Kebbi State, Onitsha in Anambra State and Ogwashi-Uku in Delta State [10].

2.1 Functions of ICDs

ICDs perform the same functions as a port except for the loading and unloading of ships (the Stevedoring Operations). In this way, a container will bypass the port container Depot and be processed nearer to the consignee/ shipper. Therefore the primary functions of ICD according to "the guidelines for the setting up Inland Container Depot in India" may be summed up as under:

- Receipt and dispatch/delivery of cargo
- Stuffing and un-stripping of container
- Transit operations by rail/road to and from serving ports.
- Customs clearance.
- Consolidation and desegregation of LCL
- Cargo.
- Temporary storage of cargo and container
- Reworking of container.
- Maintenance and repair of container units. [4]

2.2 Benefits of ICDs

The benefits as envisaged from an ICD include; Concentration point for long distance cargo audits unitization, services are a transit facility, reduces level of demurrage and pilferage, Reduces transport cost, lower congestion, Possible reduction of marine insurance, reduces inventory cost, reduces overall level of empty container movement [4]. Reference [10] Suggests that given the preceding discussion, the Nigerian Ports Authority is aware of the benefits accruable from a well-planned and implemented ICD project in Nigeria which also include;

- Creation of employment opportunities and other related socio economic services in the ICD location.
- The ICD could also be used as a strategy for regional development and population redistribution.
- Redevelopment of the road and rail transport systems in the country.
- Boosting of export activities

2.3 Challenges of ICS and Cargo Facilitation through the Ports

Reference [14] Reported that the Nigerian Ports Authority has enumerated the challenges posed by the development and successful implementation of ICD throughout the country. Some of the basic challenges are itemized below:

- Facilities for speedy and efficient discharge of the consignment at the seaports.
- Provision of functional transport infrastructure especially rail network to cope with the volume of cargo to be transformed from the port to the ICD sites.
- Favorably disposed security and safety operative are vital for the success of the ICD operation.
- Management information system capable of guaranteeing cargo facilitation thereby eliminating the loss of cargo while in transit.

- Definition of role expected to be played major stakeholders of the maritime industry under the ICD Project: NPA, NRC, NACFA, NSC and shipping companies.
- Advertisement and education of shippers on the utilization of the ICDs nearest to their places of business.
- Reduction of agencies in the seaport to discharge the creation of bottlenecks.

2.4 Processing of ICD Cargoes through the Ports

Some ports handle transit cargoes for neighboring landlocked container such as Niger republic and occasionally Chad Republic. The ICDs are expected to operate under similar conditions with regard to the procedure and facilities applicable to transit cargoes. In order to ensure efficient interface activities, Nigerian Ports Authority expects that;

- Shipment for the ICDs should be covered by through bills of lading which shall state the destination depot. This should be replicated on the ship manifest.
- Release of any cargo for transfer to the ICD is by transit manifest approved by the customs [11].

The lifting of international sections had reinvigorated the nation's port sector. One such effort aimed at mitigating the effect of space constraint in the Port is the development of the Hinterland link to whereby the Inland Container Depot performs the role of a port. Hence Inland container depot is often described as a dry port i.e. a port interface devoid of water front or channel or quay. However, it is necessary to examine the implications of space constraints in the overall port operations to warrant the need for alternative options [13].

2.6 Implications of Space Challenges in Port Operations

It is important to emphasis the implication of space constraints on the overall performance of port operations which justifies the importance of ICD. The negative implications include:

- Ship delay and prolonged ship turn around
- Delay in cargo discharge and delivery operations.
- Safety and security challenges imposed on the port.
- Increasing cost in port operation
- Decline in expected revenue
- Cargo diversion to neighboring countries.

These implications have social, economic and environmental consequences as cited in the examples below;

Social implications for example include job losses and strenuous work environment. Economic implications include increasing cost of operation, loss of revenue and overall decline in shipping activities while political consequences may include international withdrawal in shipping activities, policy reappraisal and even making government of the day unpopular. Environmentally, the level of marine pollution will obviously increase as a result of ship delays encountered along the channel or harbor.

2.7 Other Challenges of Inland Container Depots

The author corroborates that while the concept of ICD presents significant development and economic benefits, certain factors may constitute cogs in the wheel of its efficiency and effectiveness. These factors are however not peculiar to the ICD. They are in fact similar to those that could constrain and/or compromise the effectiveness and productivity of a seaport or marine container terminal as well.

These challenges may include among others:

- Inadequate investment in the provision and maintenance of equipment and infrastructure, such as container-handling equipment.
- The absence of a well-developed integrated inter-modal facility.
- The absence of requisite infrastructural support such as good road networks, functional railway system with other modern carrying units like piggy-back and double-stacking wagons can indeed undermine the effectiveness of inland container depot.
- Similarly, poor managerial capability, low labour productivity and unstable government policies and actions can cause problems and distributions for the ICD sustainability.

The foregoing implications have social, economic and environmental consequences which could include job losses and strenuous work environment, increasing cost of operation, loss of revenue and overall decline in shipping activities which will result in a poor scorecard for government appraisal.

2.8 Research Method

“This is a general framework for conducting research” [15]. “It is a blue print for data collection to enable the research text relevant hypotheses and answer research questions” [16]. The typical research design used in this study is the survey research in which a cross sectional method was involved in observing the sample variable/characteristics of the population. The data used in this study were collected from primary and secondary sources. However, due to financial constraints, responses from this research were limited to operators/agencies in Lagos that mostly deal with cargo from the Lagos seaports to other parts of Nigeria. The sample from this population was used to find out the general issues affecting ICDs in Nigeria.

2.9 The Study Population

The study population includes port operators; importers, exporters, freight forwarder and Maritime Government staff with a total sample size of 120 respondents selected at random at Ikorodu Lighter Terminal and Lagos

seaports.

2.10 Statistical Tool

Descriptive statistics and online chi-square calculator at <https://www.socscistatistics.com/tests/chisquare2/default2.aspx> were used to analyze collected data. The calculated values were compared with the table values to test relevant hypothesis.

3. Results

3.1 Respondents' Characteristics

Table 1: Frequency Table on Respondents Characteristics

Characteristics	Classification	Frequency	Percent
Sex	Male	98	81.67
	Female	22	18.33
	Total	120	100.00
Age (Years)	Below 20	2	1.67
	20-29	19	15.84
	30-39	41	44.10
	40 and above	58	48.33
	Total	120	100.00
Management	Senior Management	30	25.00
	Middle Management	40	33.33
	Junior Management	50	41.67
	Total	120	100.00
Marital Status	Married	72	60.00
	Single	36	33.00
	Divorced	12	10.00
	Total	120	100.00
Category of	Port Operator	90	75.00
	Maritime Govt. Staff	30	25.00
	Total	120	100.00

The study assessed responses of the Lagos State Maritime Sector especially Ikorodu Lighter Terminal and operators that have operations frequently in the container Terminal including some Government Agencies. The results in table 1 is a frequency table showing the bio data and social characteristics of the respondents in order to understand the characteristics of the sample on which the instrument was administered using frequency table.

- 98 respondents are male, 22 are female
- 2 respondents are below 20 years, 19 are between 20-29 years, 41 are between 30-39 years while 58 are 40 and above.
- 30 respondents work as senior management, 40 work as middle management while 50 work as junior management.
- 72 respondents are married, 36 are single while 22 are divorced.
- 90 respondents are Port Operators while 30 are Maritime Staff.

3.2 Testing of Hypotheses

The statistical tool used to test hypothesis is the chi- square. This research seeks to validate the challenges of Inland Container Depots in Nigeria with the hypotheses below;

Ho: There is no significant challenge of Inland Container Depots in Nigeria

H₁: There is significant challenge of Inland Container Depots in Nigeria

Table 2: Chi-square calculated values

Challenges of Inland Container Depots in Nigeria		Responses		Total
		Agree	Disagree	
1	Inadequate Container Handling Equipment	18 69.00 (37.70)	102 51.00 (51.00)	120
2	Absence of a well-integrated intermodal transport infrastructure	89 69.00 (5.80)	31 51.00 (7.84)	120
3	Unstable Government Policies	94 69.00 (9.06)	26 51.00 (12.25)	120
4	Absence of modern carrying units like piggy-back and double-stacking wagons	70 69.00 (0.01)	50 51.00 (0.02)	120
5	Poor Management Information Systems to monitor transit cargo from Seaport to ICD centers	74 69.00 (0.36)	46 51.00 (0.49)	120
TOTAL		345	255	480

$$\chi^2 = 124.535, \quad df = 4, \quad \chi^2/df = 31.13, \quad P(\chi^2 > 124.535) = 0.00001$$

Expected values are displayed in italics

Individual χ^2 values are displayed in (parentheses)

- The chi-square statistic is 122.7395.
- The p -value is < 0.00001 .
- The result is significant at $p < .05$.

Decision

There are significant challenges facing Inland Container Depots in Nigeria. $X^2 (4, N=120) = 124.5, p < .05$. The H_0 is rejected.

3.3 Interpretation of Result

Rejecting H_0 means Inland Container Depots are facing significant challenges that affects their efficient and economic operations in Nigeria. Without addressing the major issues relating to container handling equipment, a well-integrated intermodal transport, stable policies, information management systems, amongst others, ICDs in Nigeria cannot achieve its main economic purpose.

4. Conclusion

ICDs are similar to seaports but are not the same. They provide for handling, temporary storage and space for customs clearance of containers and other cargoes in areas or regions that are not accessible through seaports thereby helping to decongest the main seaports and facilitate vessel turnaround. Results from data analysis revealed that; inadequate investment in container handling equipment, absence of a well-integrated intermodal facility, unstable government interests and policies, poor management information systems and absence of modern carrying units like piggy-back and double-stacking wagons are challenges to ICD in Nigeria.

4.1 Recommendation

The researcher finds it very necessary to proffer a practicable and sustainable recommendation for the efficient and effective operation of ICDs in Nigeria. The Nigerian Government should encourage more investment in container handling equipment to boost the productivity of ICDs. Long term policies should ensure the channeling of consignment for different regions from the seaports to respective ICDs and further pickup or delivery to consignees. The intermodal facilities (rail, road, ocean/inland water ways, pipelines) needs to be well integrated in order to improve ICD productivity and efficiency leading to easy accessible, less costly and timely transportation of goods from seaport to ICD and from ICD to point of delivery. Priority should also be given to upcountry shipments that are meant to be processed at ICDs to encourage and make shippers enjoy the benefits of the existing ICDs in the country that are underutilized. This will ultimately reduce the dependence on road transport for inland haulage as well as the numerous hazard and accidents that have bedeviled container-trucking on the already overstretched road infrastructure.

4.2 Suggestions for Further Studies

Although this research was limited to the problems of Inland Container Depots in Nigeria, further research is recommended on the process optimization of ICD cargoes through the ports as well as a sustainable design and location for the optimal operation of ICDs across Nigeria with respect to the triple bottom line; social (people) and environmental (planet) and economic (profit) benefits.

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