



To cite this article: Itepu Stefan Osemudiamen (2022). THE PROSPECTS OF INTERMODAL RAIL FREIGHT TRANSPORT OF CARGOES FROM APAPA LAGOS SEAPORT TO HINTERLAND TOWNS IN NIGERIA, International Journal of Research in Commerce and Management Studies (IJRCMS) 4 (5): 81-95

THE PROSPECTS OF INTERMODAL RAIL FREIGHT TRANSPORT OF CARGOES FROM APAPA LAGOS SEAPORT TO HINTERLAND TOWNS IN NIGERIA

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DOI: <http://dx.doi.org/10.38193/IJRCMS.2022.4505>

ABSTRACT

Efficient and effective movement of goods is very crucial in today's competitive environment especially for developing countries like Nigeria, suffering from the growing challenges of inland freight transportation and crippling logistics costs which limit her competitive ability in the global economy. The development of 'combined transport', intermodal transport' and 'multimodal transport' could provide new opportunities for the transport industry in Nigeria as a viable alternative to tackle the challenges associated with lengthy delays in cargo movement, increased cost of transport logistics and the negative environmental impacts of carbon emissions. This paper aims at evaluating the prospects of rail freight transport of cargoes from Apapa Lagos seaport to hinterland towns in Nigeria. Both primary data and Secondary data were retrieved from National Bureau of Statistics, Nigerian Railway Corporation, Nigeria Shipper's Council, Lagos state Transport statistics and Nigerian Ports Authority and some other selected materials on the subject matter. The findings of this paper reveal a huge differential cost from Apapa seaport to the 7 different hinterland towns in Nigeria that could save importers and exporters when rail transport is used as an alternative mode of transport instead of road transport mode. This study shows that an increase in the usage of rail to haul goods in and out of the Lagos seaport hub would bring relief to the Apapa metropolis if adequate attention is given to it by the government.

KEYWORDS: Rail transport, intermodal transport; multimodal transport; hinterlands; Apapa Lagos seaport.

INTRODUCTION

In the first half of the last century, railways enjoyed unchallenged domination of both freight and passenger traffic movement in Nigeria while road transport, now a competitive threat to the railways, was initially developed to feed them (Olanrewaju, 1986). Nigerian railways have played an immense role in the country's socio-economic development, helping to open up the hinterland, providing impetus for foreign and domestic trade, agricultural and industrial development as well as stimulating rapid urbanization. Through two World Wars and one Civil War, the Nigerian Railway System



sustained the sovereignty and security of the fatherland. In the days of the Marketing Boards, Nigerian Railway was responsible for clearing the groundnut pyramids and facilitated the export of hides and skin, tin, bauxite, etc. as well as the import of hardware and general goods into the country. Prior to the era of transportation through pipelines, railway was pre-eminent in fuel distribution (Nigerian Railway Corporation, 1998).

Prior independence in 1960, key sectors of the Nigerian economy were in the efficient and prudent hands of skilled colonial managers, who ran the entire gamut of the economic landscape with every articulate managerial zeal, agility and competence and thereafter, laid enduring and strategic economic foundations that elicited structural growth poles and developmental strides that were second to none, thereby producing strong cash-cows that saw us then, as growing into a formidable strong economic block of envy, within the then west and central African economic zones (Adesanya, 2002, Nikom, 2008).

The post-independent era saw massive growth in the population of Nigeria and the springing up of more unplanned urban and suburban centres to accommodate the rising population, which subsequently induced the need for more resources and freight and passenger transport infrastructure to service the emerging trade centres developed as a result of rising population demands. The post-colonial administration has over the years consistently failed to provide more transport infrastructure to meet rising demand, nor has it shown the capacity to efficiently manage what was put in place by the colonials. Thus, the operational performance of both the railway corporation and port authority witnessed immediate system decay. The neglect of the transport systems and infrastructure got to a bad level of the eventual removal of rail track facilities built over the years to link the hub seaports to the trade centres, thereby signalling the very death of the intermodalism concept in the ports, a situation which later reflected in the overcrowding of Nigeria's road by haulage trucks which gained the freight shipments lost by the rail system and the continued traffic gridlocks in many trade centres and cities, such as Apapa in Lagos (Ihenancho, 2010).

Statement of Problem

Crisis in the Nigerian maritime sector is a popular and well-reported phenomenon. Terminal congestion and traffic gridlock have become a long-running crisis at the Apapa and Tin Can Island ports, which are the main commercial entry points into Nigeria, Africa's largest economy. In the last few years, the container throughput in the Nigerian ports has grown significantly, unfortunately, the persistent challenges in cargo movement from the Lagos seaport to the hinterland continues to grow. This can be attributed to even more factors that include ageing state of the country's transport infrastructure which has forced around 90% of freight movement is transported by road. All of these challenges have led to the high cost of transporting containers out of the Lagos ports which is an



important issue that requires the express attention of the government as the high cost of transport logistics is presently impacting on the price of goods in the market locally adding to inflationary pressures that are already a huge burden on Nigerians. The impact of the gridlock extends beyond monetary costs, as shipping companies and operators must wait more than a month off the coast before vessels can berth to discharge the cargoes she is bearing in the port – roughly the same amount of time they spend in transit to Lagos from China. This situation has compelled some shipping lines to divert Nigeria-bound cargoes to neighboring ports in Cotonou and Cote D’Ivoire according to Nigerian Port Consultative Council.

The importance of carrying out cutting-edge research in search of the optimal solution to the persistent problem experienced in the movement of freight from the seaport to the hinterland and from the hinterland to the seaport cannot be overemphasized. This study seeks to help identify ways of shifting freight volumes from road to rail which is cost-effective compared to road haulage and is a more energy-efficient traffic mode that is less harmful to the environment, relieve seaport hub and cities from congestion and facilitate improved logistics solutions for shippers in the port’s hinterland.

Objectives of the Study

The general aim of this study is to investigate the prospects of intermodal rail freight transport of cargoes from Apapa Lagos seaport to hinterland towns in Nigeria.

The specific objectives of this study will be to:

1. To analyse freight traffic carried by the Nigerian Railway Corporation from 1970-2020 in order to evaluate the performance of rail transport in freight movement.
2. To analyse the yearly container throughput at the Lagos seaport in comparison with rail freight traffic flow from the Lagos seaport with a view to assessing the usage and its future potential.
3. To evaluate the differences in cost of freight per 40ft container between road and rail transport modes from Lagos seaport Apapa to hinterland towns in Nigeria.

Research Questions

The following are the questions that this study will be providing answers to.

1. What is the performance of rail transport in freight movement carried by the Nigerian Railway Corporation from 1970-2020?
2. What is the yearly container throughput at the Lagos seaport in comparison with rail freight traffic flow from the Lagos seaport?
3. What is the difference in cost of freight per 40ft container between road and rail transport modes from Lagos seaport Apapa to hinterland towns in Nigeria?



LITERATURE REVIEW

The concept of an intermodal transport system

Intermodal freight transport is the movement of goods in a single loading unit or vehicle that successively uses two or more modes of transport without handling the goods themselves in changing modes. The main idea behind intermodal transport is to utilize the strengths of different transport modes in one integrated transport chain (Flodén, 2007), thereby improving the economic performance (Rodrigue et al., 2009). It has been argued that economic performance is improved because the most suitable transport mode is used on each part of a trip (OECD, 2001).

The rise of intermodal transport has resulted in dramatic changes in the pattern of freight transport and port competition in worldwide shipping (Hayuth, 1987). The intermodal system affords exporters and importers impressive opportunities for saving money, expanding markets, and increasing the value added related to distribution, but by far the greatest benefit they afford is the minimization of intermodal transfers. There has been a renewed focus on intermodal freight transportation driven by the changing requirement of global supply chains. Because intermodal freight transport is less energy intensive than freight transport by road (Woodburn et al., 2007), it is considered to be an important contribution to achieve a sustainable European transport sector (European Commission, 2009). Intermodal freight transport has therefore been promoted by policy makers on all levels (Macharis et al., 2011). However, the market share of intermodal freight transport has not developed as positively as expected (Janic, 2007).

Intermodal/Multimodal Transport Development in Nigeria

Over the years, intermodal transportation has been adopted by nations around the world as the means of moving goods from the port to the consignee's destination. The reason being that intermodal is considered secure, efficient cheap, environmentally friendly and the fastest way of evacuating cargoes. Ironically Nigeria is still being known for running a single mode of cargo evacuation, which is the road, and it is killing her roads as about 6,000 heavy duty vehicles invade the ports access roads daily, vying to lift petroleum products, imported goods or drop goods/empty containers at the congested holding bays.

Very little attention if any appears to have been given to an integrated intermodal pattern of port hinterland interactions in Nigeria despite the changing phases of global freight transport trend (Ubogu, 2001). Given the perceived importance of the port-hinterland relationship, goods oscillating between the port and its hinterland regions should be an integral part of transport planning in the country (Badejo, 1998). However, a look at the freight transport system in Nigeria clearly falls short of this expectation as goods are hauled in a manner not consistent with efficient best practices (MITI, 2002). The development of intermodal transport system in Nigeria is still in embryo form. According to



(Odeleye, 2015) the multimodal transport operation in Nigeria is still largely impaired and underdeveloped, because of the following factors;

- i. Lack of guaranteed scheduled services
- ii. Lack of cargo information systems
- iii. Lack of modern cargo handling equipment and methods
- iv. Poor road / rail links to ports
- v. Poor state of transport infrastructure

RESEARCH METHODOLOGY

The research methodology covers the study and sampling techniques, method of data collection, and method of data analysis

Study Samples and Sampling Techniques

This research work made use of the non-probabilistic sampling method. This research targeted specifically officials that are well informed on the research topic. The major limitation encountered was how respondents tended to restrict some of their responses due to their official positions in the agencies.

Method Of Data Collection

Primary data was obtained through interviews to gather information on the cost, distance covered to deliver container cargo to the different hinterland towns in Nigeria considered in this study. The respondents that were sampled systematically for this study were transport managers of truck Haulage Company and staff of the Nigerian Railway Corporation Ebute Metta Junction Lagos. The secondary source of information for this study consists of data collected on a rail system, freight traffic carried by the Nigerian Railway Corporation from 1970-2020, Cargo Throughput at Lagos Apapa Sea Port: 2012-2017, and Rail Freight Traffic carried by NRC Lagos District 2011 - 2016. Secondary data was retrieved from operational records of the National Bureau of Statistics, Nigerian Railway Corporation, Lagos state Transport statistics, and Nigerian Ports Authority. Other sources used for this study include textbooks, research reports, journals, the internet, and some other selected materials on the subject matter. In analysing the information that was gathered in this study, descriptive statistics such as tabulation, averages and percentages, inferential statistics, and independent t-test sample for testing the differences in cost of freight per 40ft container between road and rail transport modes from Lagos seaport Apapa to hinterland towns in Nigeria. This was done in order to present the deductions and conclusions in a way that is easy to understand and comprehend.

RESULTS AND DISCUSSION

Table 1: Freight traffic carried by the Nigerian Railway Corporation from 1970-2020

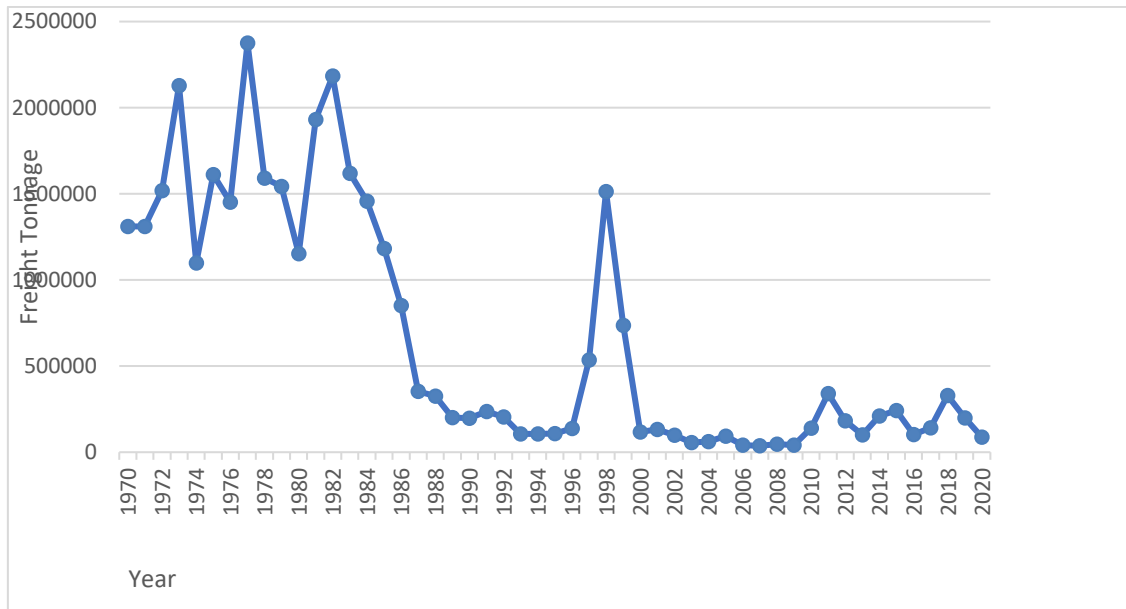
Year	Freight Carried (Metric Ton)	Year	Freight Carried (Metric Ton)
1970	1,311,000	1999	737,239
1971	1,311,000	2000	116,837
1972	1,519,000	2001	132,813
1973	2,129,000	2002	98,192
1974	1,098,000	2003	56,178
1975	1,612,000	2004	62,575
1976	1,452,000	2005	93,762
1977	2,375,000	2006	41,495
1978	1,592,000	2007	36,758
1979	1,543,000	2008	47,409
1980	1,153,000	2009	40,624
1981	1,932,000	2010	139,377
1982	2,185,000	2011	341,394
1983	1,619,000	2012	182,465



1984	1,458,000	2013	101,326
1985	1,182,000	2014	210,646
1986	852,000	2015	242,677
1987	353,000	2016	103,183
1988	326,000	2017	141,186
1989	202,000	2018	328,634
1990	198,000	2019	200,113
1991	237,000	2020	87,440
1992	204,000		
1993	106,000		
1994	106,000		
1995	107,878		
1996	137,661		
1997	535,000		
1998	1,513,077		

Source: Bureau of Statistics & Nigerian Railway Corporation

Figure 1: Rail Freight traffic carried from 1970-2020



Source: Nigerian Railway Corporation and Nigerian Bureau of Statistics

As seen in the table 1 and figure 1, over the years, rail freight traffic has been declining losing its patronage to road transportation. The highest volume of freight carried was 2,375,000 metric tonnes in 1977. From 1986 rail freight traffic began to decline from 852,000 metric tonnes of freight in 1986 to 535,000 metric tonnes of freight in 1997. A resurgence in freight carried increased to 1,513,007 in 1998 and since then till 2020 there has been a steady decline in the tonnage of freight carried by the Nigerian Railway Corporation. In the last 10 Years from 2011 - 2020 the total tonnage of freight carried is 1,939,004 metric tonnes which reveals a downward trend in the performance of rail freight distribution in Nigeria.

Table 2: Cargo Throughput at Apapa Port: 2012-2017 (in Tons)

Year	Inward	Outward	Total
2012	19,124,906	832,799	19,957,705
2013	19,501,467	842,651	20,344,118
2014	19,807,263	815,541	20,622,804
2015	19,110,564	1,140,207	20,250,771
2016	17,714,959	1,340,426	19,055,385
2017	17,523,313	1,385,925	18,909,238

Source: Nigerian Bureau of Statistics and Nigerian Port Authority

Table 2 shows the volume of cargo throughput at Apapa Lagos port from 2012 to 2017. In the last 5 years of consideration, there has been a steady increase in the volume of cargo outward (export) from 2015 to 2017. There has also been a slight decline in cargo import into Apapa sea port from 19,110,564 tons in 2015 to 17,714,959 tons and 17,523,313 tons in 2017 respectively. It is also important to note that 90% of these cargos are hauled both in and out of the Apapa port complex via road transport.

Table 3: Rail Freight Traffic carried by NRC Lagos District 2011 – 2016

Year	Freight (Tonnes)
2011	30,120
2012	13,702
2013	33,363

2014	62,275
2015	15,162
2016	31,250

Source: Lagos State Transport Statistics 2017

Table 2 shows the volume of cargo handled at the Apapa port by import, export and total cargo throughput from 2012 - 2017, while table 3 shows the total number of rail freight traffic carried by the Lagos district of the Nigerian Railway Corporation from 2011 - 2016. From the table above we can see that rail transport system accounts for 185,872 tons out of a total 100,230,783 tons of cargo throughput from 2012 - 2016. The freight share of rail in cargo distribution inward and outward of Apapa port is worrisome as available statistics show that rail freight only carried very little proportion of cargo from year 2012 - 2016. This shows that both inward and outward moving cargoes are distributed using mainly road transport system. From the tables above rail transport accounted for 2.73% of carriage of cargo throughput in Apapa port in 2012, 6.78% in 2013, 1.28% in 2014, 3% in 2015 and 5.95% in 2016. From 2012 to 2016 out of the 100,230,783 tons which was the total volume of cargo throughput in Apapa port, rail transport accounted for only 155,752 tons in carriage which shows freight share of rail only accounted for 1.56%.

Table 4: The cost of 40ft container (30 tonnes) freight haulage From Apapa Lagos Port Complex to Hinterland Towns in Nigeria

Town	Distance by Road (Km)	Distance by Rail (Km)	Cost by Rail (₦)	Cost by Road (₦)	Cost Difference (₦)
Wasimi	69	68	75,000	480,000	405,000
Ibadan	142	193	75,000	480,000	405,000
Osogbo	240	293	75,000	600,000	525,000
Ilorin	303	391	83,238	700,000	616,762
Minna	633	743	158,259	1,000,000	841,741
Kaduna	868	903	210,018	1,300,000	1,089,983

Kano	1004	1126	239,838	1,500,000	1,260,162
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Source: Field Survey

Nigerian Railway Corporation container freight rate from one point to another is N7.10k per ton per km subject to a minimum distance of 350km. As shown in the table 5 above, the study further reveals that, the estimated costs of freight haulage per 40ft container by freight by rail from the Apapa seaport port hub to Wasimi, Ibadan, Osogbo, Ilorin, Minna, Kaduna, Kano are N75,000, N75,000, N75,000, N83,238, N158,259, N210,018, N239,838 respectively. While the alternative estimated cost of transporting 40ft container freight from Apapa Lagos seaport hub to hinterland towns of Wasimi, Ibadan, Osogbo, Ilorin, Minna, Kaduna, Kano are N480,000, N480,000, N600,000, N700,000, N1,000,000, N1,300,000, N1,500,000 respectively. A comparison of these costs between rail and road freight transport reveals a huge significant difference in the cost of freighting by rail than road. The cost difference between road and rail transport from Apapa seaport to the 7 different hinterland towns in Nigeria considered in this study is as follows: From Apapa seaport to Ibadan and wasimi is N405,000 respectively. While from Apapa seaport to osogbo is N525,000. Apapa to Ilorin is N616,762, while from Apapa seaport to Minna is N841,741, and from Apapa to Kaduna and Kano is N1,089,983 and N1,260,162 respectively. The above reveals a huge differential cost from apapa seaport to the 7 different hinterland towns in Nigeria that could save importers and exporters when rail transport is used in freight distribution.

Table 5: Significance difference in the costs of road and rail freight transport from Apapa Lagos seaport to hinterland towns in Nigeria

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
COST	Road	7	865714.29	409180.365	154655.641
	Rail	7	130907.57	71322.923	26957.531

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
COST Equal variances assumed	18.389	.001	4.681	12	.001	734806.714	156987.502	392760.330	1076853.098
Equal variances not assumed			4.681	6.364	.003	734806.714	156987.502	355939.162	1113674.267

An independent samples t-test was conducted to compare the cost difference analysis by road and rail from Apapa Lagos port to hinterland towns in Nigeria. There were significant difference $t(6.364) = 4.681, p = .001$ with mean score for road ($M = 865714.29, SD = 409180.37$) was higher than rail ($M = 130907.57, SD = 71322.92$). The magnitude of the differences in the mean (mean difference = 734806.714, 95% CI: 355939.162 to 1113674.267) was significant.

Table 5 explains the cost difference analysis by road and rail from Lagos seaports to hinterland towns in Nigeria. The cost of transporting per 40ft container of freight by road and rail from Apapa Lagos seaport across the hinterland towns in Nigeria was compared and it reveals a mean difference of N734806.72 which shows that the use of road transport in cargo haulage is far higher in transportation cost than rail. The implication of this huge difference in the cost of transport clearly between road and rail freight could provide an efficient and cost-effective alternative transport system for economic growth.



CONCLUSION

This study so far has revealed that participation in rail freight transport operations in Nigeria is still very low compared to road transportation in cargo distribution. This study has shown that rail transport from Apapa Lagos seaport to different hinterland towns would reduce freight costs and reduce the traffic congestion within the Lagos port and the over-reliance on road transport mode. An increase in the usage of rail to haul goods in and out of Apapa and Tin-can ports will bring relief to the Apapa metropolis if adequate attention is given to it by the government. The development of ‘combined transport’, intermodal transport’ and ‘multimodal transport’ could provide new opportunities for the transport industry in Nigeria as a viable alternative to tackle the challenges associated with lengthy delays in cargo movement, increased cost of transport logistics, and the negative environmental impacts of carbon emissions. Therefore, it has become necessary for railways to compete with road haulage in overland freight markets in Nigeria. For Nigeria to be able to achieve this, the intermodal transport system as a concept must be adapted into our national transportation system.

Based on the findings of this study, the following recommendation was suggested:

1. There is the need to increase public awareness on the economic advantages of using rail to transport cargo to and from the Apapa port as to attract more patronage from the users.
2. There is a need for further efforts to be made by the Nigerian Railway Corporation and the Federal Government in the area of deregulations and injection of capital to modernize the infrastructure and allow the private operators’ participation in the provision of rail transport service.
3. There is need to pay more attention on the operation of freight rail services as this seems to have a better prospect in terms of economic and commercial viability
4. The development of rail roads to our seaports, dry ports and hinterland towns yet to be linked with rail connection, is an important component of intermodal transport, which could play a major role in promoting intermodal transport in Nigeria.

REFERENCES

- [1] Adesanya, A. (1998). Transport Development, in Nigeria in 2010. Ibadan: Nigeria institute of social economic research (NISER), 181 – 193
- [2] Adesanya, A. (2002). Declining fortunes of rail transport in Nigeria: Response and direction of policy. NISER monograph series No. 8.
- [3] Badejo, D. 1998. Maritime transport in the Nigerian Economy, in Maritime Transportation in Nigeria. Rex Charles Publication, 2-14.



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- [4] Chikere, C. (2013). The absence of a commercial regulator at the Nigerian ports has created a market monopoly at the ports instead of the competitiveness envisaged among the service providers. At a seminar organized by CILT stakeholder meeting in Lagos.
- [5] European Commission (2009) A sustainable future for transport: Towards an integrated, technology-led and user-friendly system. Luxembourg.
- [6] Flodén, J. (2007) Modelling Intermodal Freight Transport - The Potential of Combined Transport in Sweden. Department of Business Administration. Gøteborg, Gøteborg University
- [7] Hayuth, Y. 1987, Intermodality: Concepts and practice; structural changes in the ocean freight transport industry, London: Lloyds of London Press, 48 – 77.
- [8] Ihenancho, E, (2010) An appraisal of the operational limitations of the private terminal concessionaires in a landlord port modal. Continental Journal of social science 6(1):9-16.
- [9] Janic, M. (2007) Modelling the full costs of an intermodal and road freight transport network. Transportation Research Part D: Transport and Environment, 12, 33-44
- [10] Macharis, C., Caris, A., Jourquin, B. & Pekin, E. (2011) A decision support framework for intermodal transport policy. European Transport Research Review, 3, 167-178.
- [11] MITI. 2002. Masterplan for an Integrated Transportation Infrastructure. Federal Ministry of Transport. Abuja, 133-137.
- [12] Ndikom, O. B. (2008): Fundamentals of Transport Management. Bunmico Publishers, Lagos.
- [13] Ndikom (2010): A Fundamentals of freight forwarding management practice in Nigeria. University of Ibadan Press; Ibadan
- [14] Nigerian Railway Corporation (1998). Report of the Committee on the Problems of Operational Sustainability of the NRC, pp. 38-39. Nigerian Transport Profile, 1993.
- [15] Nigerian Port Authority Handbook, (2018)
- [16] Nigerian Shipper's Council website: www.shipperscouncil.gov.ng
- [17] Nigerian Bureau of Statistics website: www.nigerianstat.gov.ng
- [18] Odeleye, Joshua. (2015). The need for multimodal transport development in Nigeria. Journal of Geography and Regional Planning. 8. 239-243. 10.5897/JGRP2015.0508



- [19] OECD (2001) Intermodal freight transport: institutional aspects. Paris, Organisation for Economic Co -operation and Development (OECD).
- [20] Okoro, N.U.C (1996b), Rail mass transit in Nigeria: What future? Bolade Tunji & E.O. Adeyemi (Eds) Enhancing the Efficiency of Mass Transit Operations in Nigeria. Ibadan: Rex Charles and Connel Publications, 110-118.
- [21] Oni S. I., & Okanlawon, K. (2006). Nigeria's Transport Infrastructural Development: An Integral part of the National Economic Empowerment and Development Strategy (NEEDS) Journal of Society on Policy Issue, 3, (2), 7-13
- [22] Rodrigue, J.-P., Comtois, C. & Slack, B. (2009) The geography of transport systems, London, Routledge.
- [23] Ubogu, A. (2001), Multimodalism in Nigeria's maritime Industry: The need for Institutionalization. Unpublished Msc Dissertation, Department of Geography, University of Lagos, 52-57
- [24] Ubogu, A. (2011) The Potentials of Rail-Road Integration For Port-Hinterland Freight Transport In Nigeria International Journal For Traffic And Transport Engineering, 2011, 1(2): 89 – 107
- [25] UN/ECE (2001) Terminology on Combined Transport. New York and Geneva, United Nations (UN) & Economic Commission for Europe (ECE).
- [26] Woodburn, A., Browne, M., Piotrowska, M. & Allen, J. (2007) Literature Review WM7: Scope for modal shift through fiscal, regulatory and organisational change. University of Westminster and University of Leeds.