

## Logistics Infrastructure and Port Development at Apapa Port, Nigeria

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**Abstract:** Apapa port, Nigeria is perhaps the largest port in the country. However, the port is being saddled with inadequate transport infrastructure development that undermines its potentialities. The study, through qualitative and quantitative approaches, has proposed logistics infrastructure at which the congestion could be reduced, as well as, the port realizes its full potentialities within the framework of business investment for the country. The study recommends amongst many other that the concept could only be realized through Private Finance Initiatives (PFI) that incorporates societal marketing principle. This will promote the use of intermodality and offer an increasing range of services to prospective customers, consequently, encourages synergies between the ports and various industrial areas within geo-political zones in the country, which will equally be incorporated in policy making at both port and National level.

**Key words:** Logistics, infrastructure, development, intermodality, initiatives, societal and marketing

### INTRODUCTION

Nigerian seaports are perhaps one of the very few in the world that are majorly service ports. The port industry has over the year been responsible for over 90% of the physical carriage of Nigeria's external trade (Badejo, 2002). The importance of this mode of transportation derives not only from its fundamental overriding economics and untapped marketing, but also from the lack of a more efficient alternative to maritime transport in the carriage of the nation's bulky external trade items. Apapa port, which is the focus of this write-up is Nigeria's most important and largest port. It contains a number of wharfs and ranges of commodities are handled at this port. These include: Wheat, Cement, Oil and Petroleum products, Fish, Dry Cargo and general Containers.

**Statement of the problem:** Apapa port is faced with the problem of traffic congestion, as a result of predominance use of only road mode of transport system for movement of these cargoes. Indeed, road transport has been increasing its share of transport relative to other modes within Apapa port and its environ and consequently leads to environmental impact of transportation, such as noise and air pollution caused by traffic congestion and increase in Carbon-dioxide (CO<sub>2</sub>) and other vehicle emissions within the port and environment. Again, heavy vehicles used to transport cargo in and out of port are considered to be main source of these problems. These

concerns have created pressure to move freight off the roads towards environmental friendly transport system that will have a considerable effect on the design and operation of logistics systems in which intermodal plays a significant part.

In the light of this, incessant traffic congestion, awkward parking system of trucks and environmental pollution are part of the hardships occasioned around Apapa port. This is as a result of great intensity of use of road based transport system and inadequate planning of land uses, consequently increases the number of trucks that are loading and unloading at Apapa port.

A significant aspect of the traffic congestion lies in the cost to the average user, particularly the motorists and inhabitants of this area. In the recent study, conducted in most Nigerian cities, the following were computed as the cost of delay: the cost of fuel/h of delay, wear and tear of the vehicle/h and the stress/h. The estimate shows that it costs ₦ 1,200 or (\$10) for every 1 h of delay. Assuming there is 3 h of hold up per day and there are 22 working days month<sup>-1</sup>, the cost of delay will be about ₦ 950,400 or \$7920 in a year. In other words, almost \$8000 is the cost of delay per individual in 1 year in Nigerian cities in which Apapa port area is no exemption.

**Objectives of the study:** Sequel to the above, the study intends to contribute to Apapa port by:

Reducing burden from only existing road based of transportation through intermodal transport; reduction in

traffic congestion within port environment, as well as, promotion of sustainable transport in port environment.

## **MATERIALS AND METHODS**

The study adopted qualitative paradigm approach in its methodology. This stems from the fact that this type of research produces findings not only arrived by means of quantitiveness, but by Heuristic concept. Nevertheless, descriptive statistics like graphs, charts and tables were adopted to reflect pictorial representation of the situation as contained in data collected.

Suffice it to stress that mixed method procedures that constitute an expanding field within research design adopted (Creswell, 2003). They are often used in social and human sciences, especially the concurrent triangulation strategy that is best suited for this project. The original term triangulation refers to a surveying/nautical process in which 2 points (and their angles) are used to determine the unknown distance to a third point (Tashakkon and Teddlie, 1995).

Again, mixed method, triangulation is selected when a researcher uses 2 different methods in an attempt to confirm cross-validate, or corroborate findings within a single study (Creswell, 2003). It is interesting to note that the results are usually integrated during the interpretation phase, as reflected in the course of this write-up.

Moreover, the qualitative data was intentionally given slightly higher priority, due to the nature and conduct of the research, as well as the fact that the data did not only bring forward new topics that were not mentioned in the literature; but also, explained how the issues from the literature were treated in reality.

The scope of the study will be Apapa port, which is the largest port in Nigeria and with emphasis on congestion reduction through rail and inland water ways revitalisation within and around the port. Again, the study is predicated on development of Apapa Port through Port Reform within the context of logistics/intermodal infrastructure provision, such that water, rail and road modes of transportation will function in an integrative manner that will ultimately provide solutions to the aforementioned problem. This will equally enhance on going port concession programme of public-private initiatives, by which government will provide enabling environment for private enterprise to run business, thereby assisting government from spending from limited resources that could have been diverted to more societal objectives.

It is pertinent to stress that the purpose of this research, is to examine the potentials of available logistics infrastructure within the context of intermodal handling (transportation) of container transport; consequently,

there will not be measurement of intermodal parameters in monetary terms. This is based on the fact that such information requires adequate and accurate data in all modes of transportation. However, presently, Nigeria, indeed, Apapa port only emphasizes on road transportation, with absolute negligence of rail infrastructure and untapped, unexplored and unharnessed inland water ways infrastructure. Suffice it to stress that data are only available in road and rail based modes of transportation, with virtually nothing in inland waterways. Nevertheless, descriptive and qualitative analysis in terms of likely benefits will be emphasized.

### **Conceptual understanding**

**Intermodality:** Intermodal transport in basic terms is about utilizing more than one mode of transport in the transport chain that is, combining truck, rail and sea transport in one chain from the point or origin to the point of delivery. Hence, intermodal transport can be defined as the combination of various modes to form a transportation movement (Coyle *et al.*, 2000).

Although, there is no general accepted definition of the terms intermodal or combined transport, however, a general agreement in all definitions that intermodal transport constitutes a transport process in which the following conditions must be fulfilled:

- Two or more different transport modes (lorry, train, barges, ship and plane) are deployed
- The goods remain in one and the same transport load unit for the entire journey

Sequel to the above, it is rationale to understand that intermodal transport is part of a supply demand chain; the transport company supplies the demand by offering transportation resources. For example, trucks to enable movement of goods. The quality requirements are set by shippers and by transport companies and in some cases the forwarders working on behalf of shippers. These requirements often differ, for instance, the shipper may focus on maximum safety and reliability but may be less demanding as regards transport speed, while the transport company might add additional requirements of its own above the requirements set by the shipper, such as high transport speed in order for its equipment to be available for the next shipment as soon as possible. In order to reach success, it is essential to satisfy all sets of requirements.

**Shortsea shipping: an impetus for intermodality:** As earlier stated, there is no sufficiently reliable and detailed statistics inland shipping in Nigeria, however, there have been sporadic increase in the use of road based transport.

This is predicated on the fact that much emphasis has been placed on the use of road with less attention to inland shipping, in spite of available infrastructure, coupled with the fact that the situation looks promising for the integration of this mode of transport.

Inland shipping should be fully integrated into door-to-door transport services. The further development of freight intermodality should have beneficial effects on the mode. However, integration of this type is only possible when the individual modes, such as shipping, are constantly developing to meet the service requirements of the customers.

More importantly, inland shipping should become part of comprehensive intermodal approaches, create networks to attract cargo volumes and actively look for cooperation with other modes and other parties in the supply chain (European Commission, 2000).

**Apapa ports complex at glance:** This is Nigeria's largest and most important port with 9.0 depth and quay length of 2459 m. It comprises of the following:

- Apapa Quays predominantly handles wheat and bulk cement, utilizing pneumatic elevators and grab-bucket equipment. Silo storage capacity up to 90,000 tone. The quay also handles passengers' traffic for West African ferry services. Similarly, third Apapa Wharf extension provides berths, which can accommodate 4-6 container ships at the same time
- Over 500 m of multi-purpose berths, which can handle 3 RoRo vessels at once, 4 jetties for service craft and tugs and covered storage space of 6.400 m<sup>2</sup>
- Bulk vegetable oil Wharf is mainly used for the discharge of vegetable oil. Vessels up to 152 m long and 7.9 m draught can use it
- Atlas Cove oil terminal handles discharge via 2 berths. Berth 1 is 70×12 m and can handle up to 35,000 dwt vessels. Berth 2 is 35×14 m and can accommodate up to 5000 dwt vessels.
- The terminal can store up to 100,000 ton of product in eleven fully automatic storage tanks activated from a central control room. The pumping station is fully metered and has automatic interface detectors. Bunkering facilities are available
- Ijora Wharf is 122 m long and equipped with conveyor belts for handling dry cargo, capacity: 71 ton h<sup>-1</sup>. Handles coal, bulk cement, clinker/gypsum, gravel, frozen fish/meat, fertilizer and general cargo.
- Fish Wharf is a 115 m quay with transit cold store of 1.500 ton, used for frozen fish, shrimp and meat.

- Apapa petroleum wharves comprise of 2 wharves: One over 1000 m of container for ocean going tankers (quay length 177 m and one for coastal tankers (quay length 76 m)). They provide facilities for the discharge and loading of petroleum products marketing companies and wharves.

**Intermodal and sustainable freight transport:** Road freight has increased dramatically at Apapa port due to the significant importance of the port, while the modal share of rail has not only decreased, but extremely underutilized. This in turn exacerbates the problems of road transport, particularly congestion. Indeed, the demand for alternatives to road freight is not only necessary, but urgent, especially as a result of policy on sustainable transport. Again, intermodal freight transport would equally make the port to achieve a competitive advantage over other ports in Sub-Saharan Africa. However, introducing intermodal is critical, since road transport is likely to remain the first choice and last leg of most freight journeys to Geo-political zones in the country. This is based on the fact that not all these places are connected with rail network or water for inland shipping. Nevertheless, those areas that are connected with rail and/or water ways should be developed such that considerable impact will be lifted from road based mode of transport.

**Intermodal transport and logistics management:** Intermodal transportation is defined as: the concept of transporting passenger and freight on 2 or more different modes in an integrative manner such that all parts of the transportation process, including the exchange of information, are efficiently connected and coordinated.

Equally, important is the fact that intermodal freight transportation is not just about the hardware or equipment involved with the freight movement, but the process by which they are all connected in a systematic and sustained way. Intermodality, therefore, becomes a major component of the system approach to business, which is an integral part of what is commonly called logistics management.

Logistics management requires all components of the intermodal freight transportation process to be reliable, offer connectivity with other modes and have the flexibility to make changes when alternative business opportunities develop, while the freight is still in transit. In particular, increased international trade requires logistics services of ever-higher quality with regard to the reliability, safety, security and frequency of deliveries.

**Logistics management as a panacea to congestion:** Logistics management means providing a service that allows a customer to gain a competitive advantage over

its competition. This involves transportation, distribution, communications and, in some cases, value-added services to enhance the customer's satisfaction. Logistics management is customer driven, requires reduction in cycle time of parts and services and develops partnership with other companies that complement or supplement companies existing capabilities. Implementing logistics management requires suppliers and customers to work together in defining the strategic direction when dealing with certain markets. Customers expect consistent quality of products and services worldwide.

Transport tends to be the main component of logistics service and its share in overall logistics cost has actually been increasing in recent years. In particular, the growth of containerized transport, together with technological developments improving the systems for transferring cargo between different modes, has considerably affected modern transport patterns and practices. For instance, shippers and consignees often prefer to deal with 1 party, who arranges for the transportation of goods from door to door and assumes responsibility throughout, irrespective of whether this is also the party that actually carries out the different stages of the transport.

**Service choice:** The user of transport has a wide range of services at their disposal, all-revolving around the 4 basic modes (water, rail, truck and air). A transport service is set of performance characteristics purchased at a given price.

To aid in solving the problem of transportation service choice, transportation service may be viewed in terms of characteristics that are basic to all services. Those are:

- Price
- Average transit time
- Transit time variability
- Loss and damage

#### **Transportation modes**

**Rail:** The rail is basically a long hauler and slow mover of raw materials (coal, iron ore, etc.) and of low-valued manufactured products (food, paper and wood products) and prefers to move shipment sizes of at least a full carload. Rail service in Nigeria is the sole responsibility of Nigerian railways corporation. They are majorly common carrier. A common carrier sells its transportation service to all shippers and is guided by the economic and safety regulations of the appropriate government agencies

Ideally, rail offer a diversity of special services to the shipper, ranging from the movement of bulk commodities such as coal and grain to refrigerated products and new

automobiles, which require special equipment. Other services include expedited service to guarantee arrival within a certain number of hours; various stop-off privileges, which permit partial loading and unloading between origin and destination points. However, in Nigerian context, rail system has been saddled with, structural, financial and management problems that constrained the corporation to be efficient.

**Truck:** In contrast with rail, trucking is a transportation service of semi finished and finished products in most Nigerian roads. Also, trucking moves freight with smaller average shipment sizes than rail. The inherent advantages of trucking are its door-to-door service such that no loading and unloading is required between origin and destination, as is often true of rail and air modes; its frequency and availability of service and its door-to-door speed and convenience. Like rail, there are problems of poor roads and frequents mechanical problems as a result of inability to make periodic maintenance, due to poor economic situation, there by, leading to traffic congestion along the road.

**Water:** This mode of transport has very large carrying capacity and is permissive to ecology of the environment. However, the situation in Nigeria is only been used for passengers transport. There are many navigable Rivers in Nigeria that includes: Rivers Niger, Benue, Hadejia and many others. They are linked to one another with little technology; water transport if well explored will make the country to realize their dream of hearth of Africa.

**Comparison of Apapa port with other ports:** Empirical research revealed that under certain conditions, combined transport can be viable over long distance of 300 km (Eurostat Working Group, 2002). This is more important, especially when one considers issues such as congestion and environmental effects (External effects and impact of road based Transportation). It is more obvious that rail and water transportation when it comes to external effects and congestion.

The above solution is favourable compared to sea/rail/road alternative when considering serving Inland container depots in the country. This alternative gives a fast and flexible transportation service, but when considering distances longer than 300 km, the trade-off between these advantages and the increased transportation costs is more feasible. Perhaps of interest to this study is development and consequent implementation at highest government level, the proposed logistics infrastructure, which will enhance successful operation of the transit corridor chain as it has been done in most ports of the world.

For instance, port of Klaipeda that has handling capacity up to 22 m ton of cargo. Fast cargo handling procedures, an accommodating railway and the Highway, running from Klaipeda-Kaunas-Vilnius-Minsk-Moscow (corridor 9) form a reliable transportation Sea/Rail/Road links between Western Europe and other countries of the world, particularly the Baltic Republics, Ukraine, Kazakhstan and Russia (Quoc, 2005).

Again, ports in Mekong Delta-Hochiminh city (Cantho port and New port) Vietnam Transporting container by truck is more expensive than by barge about 16%. However, the time is faster than barges. Vietnam has tropical climate such that the weather is very hot such that it can affect the contents of containers, especially by road in case of any delay. Nevertheless, barges have electricity system for reefer containers, the cargo will not be affected by outside climate. In the area of service, it is more convenient for shipper when they can complete the custom procedure for cargo clearance in Cantho port instead of doing it in Hochiminh city (Quoc Hien, 2005).

Another notable example is the port of Lille, which is one of the main inland ports in France that can handle large flows with its sizeable storage capacity. The port is a multimodal hub, combining rail, waterways and road, thereby enhancing environmental friendliness. The port develops logistics projects in partnership with major industrial group. Indeed, the port is managed by corporate body-chamber of commerce. This is a worthy emulated idea of port management and development.

No doubt, all the above mentioned ports played similar roles with Apapa port, especially in the area of Geographical locations, however, the only leverage they are having over and above Apapa port predicates on the presence of all these logistics infrastructure that enhance their relative roles and responsibilities in the creation of value added functions and activities that subsequently made them to create a market niche for themselves.

**RESULTS AND DISCUSSION**

**Transportation of containers at apapa port:** There is no generally accepted definition of the terms Intermodal or Combined Transport. There is however, a general agreement in all definitions that intermodal transport constitutes a transport process in which the following conditions must be fulfilled:

- Two or more different modes (lorry, train, barge, ship, plane) are deployed
- The goods remain in one and the same transport load unit for the entire journey (Coyle *et al.*, 2000)

Table 1: Percentages of cargo throughput (general cargo, dry and liquid bulk) at apapa port and transportation modes

Year	Apapa port (%)	Modes of Transportation		
		Road (%)	Rail (%)	Barge (%)
2000	31.67	97.00	3.00	0
2001	31.89	99.00	1.00	0
2002	31.78	100.00	0.00	0
2003	29.86	100.00	0.00	0
2004	29.79	100.00	0.00	0
2005	29.52	100.00	0.00	0
Total	184.51	97.83	2.17	0

Source: Nigerian Ports Authority (2006)

Relating this to the area under study, it is estimated that there are 4 exit gates at Apapa port and the total number of trucks coming in/out daily from the port with containers and general cargoes are estimated to be 1070 trucks on the average. It is estimated that 75% of this number are outgoing Trucks. This makes the figure to be 803. The port works 5 full days in a week. This makes the figure to be 4015 trucks. Suffice to acknowledge that the number of trucks leaves the port in a week, equally contributing to the level of congestion in the area. However, the percentage of cargoes handled at the port relatively to other port and percentage transported by various modes are reflected Table 1.

Based on the Table 1, it can be deduced that substantial proportion of these cargoes are handled by road based transportation that contributes to traffic congestion around the port. Indeed, it further confirms the increasing rate at which trucks will be made use at the port for transportation of these cargoes. The implication of this had earlier been highlighted and need not be repeated here. However, the flow of these trucks will be discussed at the next subsection of this study.

**Geo-political and industrial zones:** Nigeria is divided into 6 Geo-Political zones for efficient and effective administrative governance. The division is based on similarities in the cultural and socio-economic believes, as well as proximity of 6 states that make up each of the zones. The rivers Niger-Benue trough that divided the country into Southern and Northern parts made it easy to further divide the country into the said zones. In other words, there are three zones in Northern and southern part of the country, respectively. It is interesting to mention that each of these zones has Inland Container Depots (ICDs) as a measure to decongest existing ports and to balance industrial development in the country. This is further depicted in the Table 2.

**State of infrastructure:** Port infrastructure facilities that will enhance intermodal and logistics activities are at lowest ebb. Apart from Road based, Railways is still based on technology at its inception in the century that

**Table 2: Flow of trucks from apapa port to geo-political zones and industrial locations**

Geo political zones	Geog. location	Inland container depot locations	Number of trucks (flow from apapa)	Industrial areas within the Geo-Political zones
North-Western	North	Kano	73	Kano, Sokoto, Katsina and Kaduna, Sokoto
North-central	North	Jos	80	Nassarawa, Ilorin, Minna, Lokoja, Jos and Markurdi
North-Eastern	North	Bauchi	75	Adamawa, Bauchi, Gombe and Maiduguri, Jalingo
South-Western	South	Ibadan	265	Lagos, Ibadan, Ifo, ota Abeokuta, Osogbo and Akure
South-Eastern	South	Aba	150	Umuahia, Akwa, Enugu, Owerri, Abakaliki and Onitsha
South-South	South	Calabar	160	Uyo, Yenagoa, Calabar, Asaba, Warri, Benin and Port-Harcourt

Sources: Nigerian Ports Authority (2006); Author's Field Work (2007)

**Table 3: Degree of transport facilities at geo-political zones**

Zones	Modes (Potentialities of facility) available			What needs to be done
	Road	Rail	Water	
N-W	High	Medium	Medium	Rail Service to be improved to complement water
N-C	High	Medium	Medium	Rail Service to be improved to complement water
N-E	High	Medium	Medium	Rail Service to be improved to complement water
S-W	High	Medium	High	Rail and Inland Services to be Improved
S-E	High	Medium	High	Rail and Inland Services to be Improved
S-S	High	Medium	High	Rail and Inland Services to be Improved

Source: Author's Field Survey (2007)

is the 3-6 (1067 mm) gauge and equally been neglected, while inland waterways has only been used minimally for passenger traffic and consequently has not been developed for inland shipping. Although, the provision of these public infrastructure that are meant for general aim, is the responsibilities of Nigerian Railways Corporation and National Inland Waterways for Rail and Inland transportation, respectively. This is presented in Table 3.

The import of Table 3 revolves around the fact that it serves as pointers to areas as well as type of logistics infrastructure that must be developed. Although, there exist some of these infrastructures, but they are obsolete and they do not conform to the modern specifications. For instance, Rail infrastructure is not only narrow, but also a single lane. Again, water transport needs to be developed with some areas to be dredged and Barges to be introduced.

However, in line with on going port development within the context of port reform through port concessioning programme and joint venturing, it is an opportunity for private investors and corporate bodies or organization to invest in these facilities like it has been in terminal operations (Somuyiwa, 2007). Hence, a veritable avenue for investment is offered by the policy shift to liberalize these port facilities. It is pertinent to stress that requirements in this regard involve detail proposals, including technical, financial on economic feasibilities as well as environmental impact assessment. On the other hand, it will accelerate enabling environment opportunities for private enterprise to run business, consequently assisting the government from limiting its spending from limited resources that could have been diverted to more societal objectives.

In the light of this, while Road and Inland water Transport service should be improved upon, Rail

transportation that had been in the state of negligence should be rehabilitated and run frequently. Consequent upon these, there should be agreement between NPA (2006), Nigerian Railways Corporation (NRC), National Inland Waterways and preferred bidder (s). More importantly, customers need to be reoriented towards the use of rail and Inland water modes of transport.

Furthermore, these ICDs at each Geo-political zones are centrally located and accessible from other states that make up each zone. Hence, they will serve as NODES, where the respective owners can come to claim their cargoes and make use of Road based mode of transport. Again, the choice of these dry ports predicates on the fact that there will have been location of handling equipments/facilities that will enhance loading and discharging of cargoes, hence need not be sited somewhere else within the Geo-political zones.

Based on this Table, if Six Inland Barges of 1500 ton dead weight carrying capacity (2 to the North and 4 to the South) can be incorporated, this will handle 75 ton. Twenty Feet Equivalent Units (TEUS) each. This will indirectly means that 450 trucks are off the road at a particular time. If similar thing is adopted where Rail has a relative advantage or to complement inland shipping as mode of transport to be used, the impact will be positive in relation to congestion and environmental friendliness at Apapa Port area.

Perhaps of importance in logistics infrastructure is the an untapped waterway or River Niger that can assist in decongestion of Apapa Port area, as well as playing HUB port role to all neighboring countries. It is interesting to note that the River Niger begins in Guinea and flows about 4.180 km (2.600 miles) through the nations of Mali, Niger and Nigeria, emptying into the Gulf of Guinea. The River Benue is the Niger's chief tributary that can also be

used for Inland waterways. Indeed, much of the Niger and Benue are navigable, making it useful for transportation of freight and passengers, as well as for fishing.

### CONCLUSION

Apart from congestion around Apapa port that often lead to longer road transportation time, intermodal transportation system through development of Rail and Inland waterways at Apapa ports in particular and in Nigeria as whole linking mostly ICDs at all Geo-political zones for onward transshipment to various industrial areas will equally provided environmentally friendly opportunity.

In other words, Apapa port will enable the major industrial groups and the leading distribution chains to optimize their logistics through effective distribution of cargoes.

In order to achieve efficient logistics systems at Apapa Port, extensive cooperation and collaboration among private establishments and Government is essential. Government need to prepare for the framework for the development of Logistics infrastructure by providing enabling environment that will facilitate the provision of these infrastructures. Suffice it to stress that government has no business in business, but rather a framework for rules and regulation governing the operations of the infrastructure. For instance, this can be done through the concept of Private Finance Initiative (PFI) that incorporates societal marketing principle (Somuyiwa, 2007). The concept of PFI has created new opportunities for both the public and private sectors. Private sector financing of transport infrastructure like Rail and inland waterways, as it is done by Independent Marketer for oil products, by providing liquid carrier Barges for transport of oil product. This should be considered a partnership between the public and private sectors. The potentials for raising private capital for rail and water ways infrastructure can be enhanced by making policy reforms that create clear rules allowing investors to form reasonably firm expectations about cash flows generated through investment in transport infrastructure like rail and inland waterways at Apapa port, as revealed in the preceding section. Again, since all the regions are important, relatively to their respective socio-economic roles and responsibilities, it is hoped that if this collaboration is initiated, congestion will not only be significantly reduced, but also ushers ample opportunities for transport infrastructure development (rail and waterways) that will ultimately enhance overall development of all these Geo-Political zones, relatively to captive cargo concept as a result of catchments' advantages as revealed in chapter 3.

### RECOMMENDATIONS

There are several indications that expressed political will to realize a shift from road to Intermodal transport is not always translated into concrete action, especially in cases where policy measures would directly have an impact on road transport.

This is particularly true in the case of Apapa port, however, in achieving a modal shift away from roads at the port's environment to rail and inland waterway, cultural, management and ownership issues in non-road modes must be addressed, as identified as gap in chapter three. In line with this, government need to formulate a clear set of common objectives for intermodal transport, integrating transport policies influencing individual modes and non-transport policies, such as spatial development, economic development and environmental issues. Hence, there is a need to monitor the progress made in achieving the objectives.

### REFERENCES

- Badejo, B.A., 2002. Challenges of Nigeria Port Activities: Maritime Industry in Nigeria Fairweather Publishing, Lagos, Nigeria.
- Coyle, A., C. Bardi and F. Novack, 2000. Transportation. 5th Edn. South-Western College Publishing, pp: 489.
- Creswell, D.W., 2003. Research design, qualitative, quantitative and mixed methods approaches. 2nd Edn. Sage Publication Inc. Thousand Oaks, California.
- European Commission, 2000. Intermodal quality final report for publication. Brussels Eurostart Working Group (2002). Intermodal Statistics Documents IM/2002/ROM2, Luxemburg.
- NPA, 2006. Statistical Handbook, Nigerian Ports Authority, Lagos Nigeria.
- Quoc Hien, P., 2005. Intermodal transport mekong Delta-Hochiminh city Vice Versa: A Dream or a real Possibility. Being an Unpublished final project submitted to STC/IMTA for the award of Diploma in Management.
- Somuyiwa, A.O., 2007. Logistics infrastructure and port development at Apapa Port, Nigeria. Being an unpublished final project written and presented for the award of Postgraduate Diploma in Port, Shipping and Transport Management at IMTA/STC Rotterdam, Netherlands.
- Tashakkon, A. and C. Teddlie, 1995. Mixed Methodology. Combining Qualitative and Quantitative approaches. Applied Soc. Res. Series, Vol. 46. Sage Publication Inc. Thousand Oaks California.