

Issues And Challenges
Of Cargo Handling
In A Developing
Economy' A Study Of
Tin Can Island Port,
Apapa, Nigeria

Dr Adeniyi O Oluwakoya, PhD CMILT RFF
Department of Transport and Tourism Studies
Redeemer's University, Ede, Osun State, Nigeria

Mr Seun Ogundipe
Department of Transport and Tourism Studies,
Redeemer's University, Ede, Osun State. Nigeria

ABSTRACT

Global trade agreements have fueled a positive drastic changes in cargo tonnage handled at the ports in most developing economies. Remarkably, in the case of Nigeria, the Tin Can Island Port has witnessed a significant rise in cargo, largely due to the reforms in port management in the country. In this regards, most related studies seems to be biased towards the developed economics. However, with the increasing threat of cargo spoilage and delay coupled with numerous issues relating to cargo handling at the Tin Can Island Port in Nigeria. This study seeks to examine both socio-economic and cargo handling characteristics at the Tin Can Island Port in Nigeria. The methodology involves both the qualitative and the quantitative methods. The data is analysed with descriptive and chi-square statistical analytical techniques. The study reveals that socio economic characteristics especially age of workers in cargo handling activities still influenced the capacity at the port. The study shows there is a significant relationship between perception of cargo traffic level and change in cargo handling procedure at the Tin Can Island port. In addition, it shows there is a significant relationship between policy adoption and cargo handling improvement at the port.

Keyword: Port; Challenges; Cargo Handling; Tin Can Island; Nigeria

1. INTRODUCTION

The global maritime interactions, transnational trade relationships and connections are strongly tied to livable port systems. Many developing countries remain less competitive in global trade as a result of dilapidated, weak and inefficient port structures (Tupy, 2005 and Ondiege et al., 2013). The existing facilities have failed to live up to expectations in the realities of the continued neglect in the face of reform, globalised and intensified economic connectivity. Therefore many ports in the developing economy, especially in Africa, remain less competitive. Even as effective and efficient port infrastructure is vital to unlocking the economic potential of most African states.

In Nigeria, the port development dates back to the colonial era. The colonial government built the first commercial port in Nigeria as part of the strategy to evacuate raw materials from the hinterland. This development supports the construction of the railway to the ports in Lagos and Port Harcourt. However, the port administration started with the passage of the port act in 1954. Both the Lagos and Port-Harcourt ports were under the public authority while some few ports were given out to private firms to manage. The period between the early and late 1970s place huge capacity need on the port that lengthens the dwell time of ships dramatically. Sequel to this, the massive development of Tin Can Island Port initiated, and completed toward the late 80s.

The centrality of port efficiency may be described by the promptness of the cargo handling at the port. Even as cargo comes in variety, the terminal specificity for particular cargo needs depends on the facilities at the

terminal for effective cargo handling, supported by underlying mechanism, both human and machine to hasten the process of cargo delivery from the port. Not only efficient cargo handling and delivery involve a series of processes, not restricted alone to port equipment efficiency, but also entail documentation to help facilitate the movement of the cargo in the process. Efficient port operations hinge on harmonisation of the different stages of cargo processing efficiently to lessen the time of cargo delivery from arrival at the port.

The port reform has been implemented to facilitate the cargo handling procedure and enhance port operations in Nigeria. Part of the change involves the concessions of major terminals to an interested investor. However, the extent of such reform impact on the issues and the challenges of cargo handling at the Tin-can Island port is lacking in the literature. Moreover, the port plays a significant role in the development of the nation's economy as the port is the second busiest port in Nigeria. The range of cargo stocks includes the Ro-Ro, container and another form of generalised cargo. The reform still leaves much open its effectiveness in addressing the difficulties of cargo handling at Tin-Can Port in Lagos.

The primary concern for improved port operation is borne out of the concern for effectiveness and efficiency in cargo handling to avoid the congestion of cargo at the terminal. The bane of port operation in Nigeria has often been associated with delaying in cargo handling, which often leads to congestion, spoilage and economic losses. Nigeria, mainly an importing nation, rely more on cargo going through this port for an economic transaction and international trade exchange.

In light of the preceding, increasing the Nigeria global trade competitiveness require adopting measure that would sustain port livability, effective and efficient cargo handling at the port to reduce spoilage from cargo handling challenges. Like this in no small extent has become an increasingly worrisome bottleneck of cargo movement at the Tin Can Island port. Therefore, this study seeks to examine the cargo handling characteristics at Tin Can Island port. Moreover, it aims to describe if there is a relationship between the perception of cargo traffic level and change in cargo handling procedures. Also, it intends to examine the relationship between the understanding of policy adoption and level of cargo handling improvement at the Tin Can Island Port.

2. CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

This section examines the relevant conceptual underpinning in the cargo handling procedure at the port. As port efficiency hinges on the ability to transit cargo promptly without encumbrances. It discusses the concept of cargo and cargo handling. Also, it reviews relevant literature on the subject matter.

2.1 CARGO

Cargo represents a generic term for items for merchandise often refer to as goods. They are often conveyed through modal transport. Initially, the word cargo is formerly known to confer shipload. However, in recent time, cargo is an umbrella term for all form of freights that are carried by ship, van, truck, and train or enclosed

in the container. Also, the categories and definition of cargo vary across the different terminals of transport. For instance, at the seaport, we have the roll-on/roll-off ships for cargo that move on the wheel. Also, we have the break-bulk which is stacked on the pallets and move with cranes. Also, there is also the bulk cargo such as salt, oil, urea and other examples of not enclosed on the pallet and the container. Other forms of categories also include the neo-bulk, containers, project vehicle and heavy lift cargoes that characterise manufacture moveable pieces of equipment which may too big to fit into the containers. The air cargo characteristic differs from the sea in terms of the carriage device to move the cargo. For instance, the use of the containers varies in the application to air and sea mode. The air containers employ an easy to load containers often refers to as unit load devices (ULDs) which resemble the containers used in the ship to an extent. The aircraft ULDs are situated in the front half of the aircraft hull. There are different forms of use of aircraft cargo needs, which may range from the commercial, military and humanitarian purposes. The train cargo characteristics may be compatible with the other modal transport cargo form. The multimodal cargo concept is often fulfilled with the complementary linkage with the rail segment. As the rail cargo beds are often compatible with other modes offering a seamless transfer of cargoes with other modes of transport. Lastly, the road cargo fulfils a higher level of complementary support, as it is the most flexible mode, supporting a door to door service. The road cargo makes use of trailer, truck, van, car with specialised functionality to move cargo anywhere road access permits.

The literature offers a diverse perspective to the understanding of the cargo. It has a diverse connotation among the different transport modes as already depicted in the preceding narrative. However, the scope of application covers the wide range of cargo transport characteristics which include the air, road, passenger, shipping, bulk and oversized (Agarwal and Ergum, 2008; Tan, Yan & Chen 2008; Fisher & Rosenwin 1989; Arnold, .Peeters & Thomas,2004; Palsaitis & Petraska,2012 and Oktal and Ozger, 2013).

2.2 CARGO HANDLING

Cargo handling has now become an integral part of the transport system. The quintessence of all transport infrastructures is to move cargo between the different terminals where such cargo are being processed for movement and also facilitate for delivery. Therefore cargo handling process is very critical to the transport and logistics chain as it serves as the sorting, distribution and packaging point for the eventual transfer to the final destination through the transport infrastructure. In the modern time, the speeds of cargo handling at the terminal influence the effectiveness and efficiency of cargo turnaround at the terminal. As a result, modern terminal requires a huge investment in the procurement of equipment and devices to fast track cargo processing for shipment. Even in some terminal, the work of cargo handling activities is outsourced to cargo handling companies who have long established themselves in cargo processing and facilitation business.

Moreover, cargo handling operations may vary with the transport mode. The specificity of transport mode influences the choice of cargo handling equipment and facilities that would be deployed. The nature of cargo processed at the different cargo shed located within the transport terminal varies with the modes. For instance,

the seaport cargo handling procedures require a huge investment in equipment because of the huge tonnage of cargo handled compared to other modes of transport. Largely, this has also been influenced through globalization and trade liberalisation being propagated through multinational liberalisation treaties.

The literature is replete with a diverse dimension of cargo handling conceptual clarification in understanding the different nature and procedure of cargo handling intervention. However, for conceptual clarification, this may be scarce, but Vanelslander (2008) describes cargo handling as a process involving loading and unloading cargo, warehousing it and delivering it to or receiving it from the hinterland. He establishes three distinguished cargo handling products which are outbound cargo handling, inbound cargo handling and transshipment cargo.

2.3 LITERATURE REVIEW

This section reviews the relevant literature on cargo handling procedures by examining the relevant studies in cargo handling challenges and issues.

Studies on the cargo handling procedures have been on the rise since the propagation of globalisation and trade liberalisation agenda. This has necessitated a paradigm shift in global manufacturing and production centre from the developed economies to the developing world. As this initiative led to the setting up of free trade zone, exempted from custom tariff, duties and taxes, empowering and enhancing local manufacturing and production drive is significant to port development in those developing economies. They are generating diverse socio-economic benefits to those nations who have benefited from the initiative such as employment creation, capacity building and technology transfer. The significance of cargo handling as a nexus of a wide range of complex integration of socio-economic, transportation and services abound in the literature. This includes activities such as logistics, supply chain management, warehousing which are very germane to packaging, manufacturing, sorting, distribution and delivery. Therefore, a relevant literature review on cargo handling seeks to enhance the framework of this study.

The literature on cargo handling is replete with all manners of innovation to enhance efficiency and mitigate against challenges at the port. Part of this strategy adopted at some port is the use of the autonomous guided vehicle to overcome delay and enhance the speed at the ports (Wilcox, Litwin, Biesiadeck, Matthews, Heverly, Morrison, & Cooper 2007 and Durrant-Whyte, 1996). Bard and Souk (1990) adopt a case study design method to select the next generation of rough terrain handler for the US Army. The alternatives identified were selected and ranked using the analytic hierarchy process (AHP). Moreover, part of the automation that has been applied to improve cargo handling process includes the multiple cables robotic crane calculated using mathematical model and computer simulation to arrive at the the desired trajectory for optimal cable capability (Shiang, Cannon and Gorman, 2000).

Moreover, the role of regulatory reforms on cargo handling has been discussed in the literature. Foremost, (Hernandez-Diaz, Martinez-Budria and Jara-Diaz 2007), in their study, measures the productivity changes in

cargo handling operations in a Spanish airport. It makes use of the data envelopment analysis and the Malmquist indices to decompose the changes into efficiency and change effects. The study reveals that since the regime reform maturity in 1998, there had been an improvement in productivity imputable totally to technical change. Other studies which have also adopted similar methods have proven that port productivity has been enhanced through regulatory reform (Nunez-sanchez and Coto-Milan, 2012; Fu, Song and Guo, 2009; Lozano, 2009 and Haralambides, Hussain and Barros 2010). Khan 2000 seeks to deploy the business model as part of the strategic policy option to re-engineer the air cargo handling process.

The complex changing nature of modern maritime ports poses huge challenges to the rapid evacuation and transfer of cargo. The emerging challenge has eroded the traditional function of the port, creating an extensive network to the institution making use of the port. The agglomerations of such business transaction necessitated the development of the unique model of strategic partnership and business consideration in the port authorities' strategic plans. The different demands of growing networks linkages outstrip the port cargo handling capacities. The looming challenges often affect the productivity and efficiency in port operations (Notteboom, 2006; Notteboom & Rodrigue, 2006; Verhoeven, 2010 and Parola & Musso 2007).

Cargo handling dynamics is often a by-product of policy, regulatory reforms and structural changes. These reforms are carefully crafted to benefit technological innovation in cargo handling activities. Intrinsic to this innovation is the promotion and attraction of investment to spur the technological and operational transformation needed to help the economy. The degree of responsiveness of the economic activities is marked by promptness in cargo clearance and transfer. Institutional structural innovation promotes institutional efficiency. These efficiencies are seen as desirable output which may be concomitant to manufacturing, commercial and economy progress (Biondal and Pilat, 1997, Hall, 1997; Fountain, 2004 and Harris, 1997).

The literature above discussed the varied dimensionality of cargo handling procedure and its influence on the port operations. The effectiveness and efficiency of cargo handling is a vivid description of the overall port capability and the potential to cope in the face of an enhanced throughput. Even, in the light of the trend, globalization and liberalisation policy has engendered an increased network of cargo proliferation amongst countries. However, the focus in the literature on cargo handling challenges seems to be biased towards the US, Europe and intermediate countries ports operations. The reform in the Nigeria maritime sector spurs increased activities necessitating both infrastructure and capacity improvement. Therefore, this study intends to add to the literature on the port reforms and the challenges of cargo handling in port operations at the Tin can Island Port in Nigeria.

3. METHODOLOGY

3.1 RESEARCH DESIGN

The focus of this study comprises examining the cargo handling at the Tin Can Island Port. This is the second busiest port in the city of Lagos and Nigeria. The port was merged with other port with specialized cargo handling such as the roll-on/roll off (RoRo). The port also handles similar cargoes with the Apapa port. This makes the Tin Can Island port very unique. This research design for this study is quasi-experimental. In using the quasi-experimental research design, the case study approach was adopted. However, the dimension of research is cross-sectional. The population in the study includes the major stakeholders making use of the port. As the Tin Can Island port is a vital terminal supporting the Nigerian economy, it provides the linkage to other states of the federation.

Even though we have two major terminals at the Lagos seaport, this study seeks to examine the major difficulties among the stakeholders on issues relating to cargo handling and forwarding at the port. The terminal chooses to combine the different nature of cargoes handled and the emerging challenges facing the movement to and from the port. Both quantitative and descriptive method of analysis employed to examine the issues and the challenges were facing cargo handling at the Tin Can Island port.

3.2 TYPES AND SOURCES OF DATA

This study examines the issues and the challenges relating to cargo handling at the Tin Can Island port in Lagos, Nigeria. The primary data was obtained through a validated questionnaire. A reconnaissance study was first carried out on a pre-tested population sample. The selected samples are the dummy of the actual population selected. The primary data include relevant information on the socioeconomic characteristics of port users. These are considered important to give a hint on the background information on the selected respondent making use of the terminal. The other sections of the questionnaire elicited information on the Tin Can port Cargo handling characteristics. In-depth interview was also conducted on some of the terminal staff at the port and few clients as well. The sampling technique adopted was the simple random sampling. A total of 100 questionnaires were distributed to passengers at the international departure hall. However, 93 respondents who filled in satisfactorily used for the analysis.

3.3 DATA ANALYSIS PROCEDURE

Both the quantitative and the qualitative were employed in the analysis. The qualitative analysis employs the use of descriptive statistics to explain the analysis of the variable characteristics. Meanwhile, the quantitative makes use of the regression coefficient to analysis the relationship between the dependent and the independent variable. In this study, two hypotheses are tested. The first hypothesis states there is no significant relationship between perception of cargo traffic level and change in cargo handling procedure. While the second hypothesis states there is no significant relationship between the perception of policy adoption and level of cargo handling improvements at the Tin can Island Port. Both the hypotheses were tested using the chi-square statistical analytical techniques. For the first hypothesis, the variable of interest is the perception of cargo traffic level and

change in cargo handling procedure. In the second hypothesis, the variables of interest are the perception of policy adoption and the level of cargo handling improvement.

4. RESULTS AND DATA ANALYSIS

This section describes and analyses the primary data obtained for the study. The analyses are both descriptive and inferential and are based on the characteristics of the customers' sample and relationship between the variables that describe cargo handling relationships at the Tin Can Island port. In addition, relevant relationships among the variables are also tested.

4.1 SOCIO-ECONOMIC CHARACTERISTICS

This section discusses the socio-economic characteristics of customers/stakeholders making use of the Tin Can Island port. This is included to basically understand characteristics of users making use of the port. It supports the basic principle of stakeholders' dynamics profile and socio-economic characteristics of port clients. The distribution of the socioeconomic variable (see Table 1) for sex reveals that 60.6% for male and 39.4% are female. The gender distribution supports the growing insinuation that cargo forwarding and clearing business are male-dominated. As a result, more education and enlightenment on the potentials of the profession should be extended to the female to ensure that more women are actively involved. Although the nature of the job may be highly demanding, the majority of the women folk would still cope better.

Table 1: Demographic and the Socio-economic characteristics

S/No.	Characteristics	Status	Frequency	Percentage
1	Age	18 – 25	14	15.1
		26 – 33	27	29.0
		34 – 41	29	31.2
		42 Above years	23	24.7
2	Sex	Male	57	60.6
		Female	36	39.4
3	Employment	Part-time employed	16	17.2
		Full time employed	70	75.3
		Employer	4	4.3
		Employed	3	3.2
4	Marital Status	Single	36	38.7
		Married	46	49.5
		Others	11	11.8
5	Educational	SSCE	9	9.7
		OND/NCE	23	24.7
		HND/B.ED/B.Sc.	32	34.4
		M.Sc./MPhil/PhD	19	20.4
		Others	10	10.8
6	Occupation	Cargo Handler	31	33.3
		Port Worker	46	49.5
		Management Staff	6	6.5
		Other	10	10.8

Source: Author's Analysis (2016)

The age component of the stakeholder distribution shows the age group classification. The highest was in the range 34-41 which is 31.2%. This is closely followed by the age group 26-33 which is 29.0%. Remarkably, these age group ranges are seen to be in their active working ages. The subsector relies more on age grouping category as the level of automation for cargo handling is still very low in Nigeria compared to what is obtainable in the advanced economy of the world. Many of the youth in this age category were engaged as both as freight forwarders and stevedoring in the Nigerian maritime subsector. Thus, they are perceived as a Nigerian maritime working tool as majorly the maritime greatly rely on them to complement the fair automation available presently.

Moreover, the distribution on the occupations of the respondents reveals that port workers had 49.5%, which is the highest, follows by cargo handlers, 33.3%, management staff 6.5% and others 10.8%. The others constitute the other stakeholders in the Nigerian maritime industry who are also actively involved in cargo handling related activities. Noteworthy, the port workers constitute all the workers directly involved in cargo processing activities at the port. It includes those that are directly employed by the port authorities or those who are stationed within the port by the different stakeholder that does business with the port.

4.2 CARGO AND CARGO HANDLING CHARACTERISTICS AT TIN CAN ISLAND PORT

The key characteristic feature of a buoyant and sustainable economy lies on an effective port system where cargoes are processed and transfer promptly. This section presents the results of cargo handling characteristics at the Tin Can Island Port. In analysing the different attributes of cargo handling at the Tin Can Island port shows varied assessment outcomes among the key variable used in the analysis of this study.

4.2.1 CARGO HANDLING ASSESSMENT CHARACTERISTICS

Ports all over the world remain a significant infrastructure, supporting the economy and enabling an international linkage for trade and commerce. Central to this important function remains the ability to process and discharge cargo promptly. The level of cargo handling efficiency at the port determines the capacity of the port to meet the growing economic need and expansion for the national development. The study reveals the salient issues and characteristics of cargo handling at the Tin Can Island Port. For instance, the study reveals that 73.1% agrees that the port is heavily congested, and 26.9% feel otherwise. On the cargo handling capacity, 82.8% of the respondents believe that Tin Can Island Port has the potential for handling the cargo going through it, while 17.2% did not agree. Taking a look into the performance of shipping activities as compared with other ports in terms of cargo forwarding and clearing, 50.5% of respondent ranked Tin Can Port high, and 34.4% ranked it medium, and lastly, 15.1% rated the port low. In terms of other critical elements such as warehousing development, which is very germane to supporting the cargo handling function of the port, 41.9% ranked the port high, 51.6% medium and 6.5% low (see Table 2). The implication of this distribution might first suggest incapacity on the part of the port; however, other factors that may have influenced the distribution may be more administrative rather than technical. For instance, cargo clearance procedure at Tin Can Island port seems to be

subjected to rigid bureaucratic procedures. Too many document clearance desks have often been reported to have slowed cargo clearance time. All in all, the overall impacts of such encumbrance on the port facilities and the environment is worrisome.

Other cargo handling assessment characteristic includes the poor service delivery ratings, which the 78.5% of the respondents decry the level of poor services rendered by the port authority. Contrary to the perception that reforms would heighten the level of service delivery, however, since the reforms the service delivery has not kept pace with expectation of the port clients. Some of the customers interviewed regrettably opined the level of services the operator of Tin Can port put up with them as:

It has been very difficult getting through our complaint to the management of Tin Can Island Port. Their customer representatives were not always available to get our complaint across to the management most of the time. Doing business with port has always been very cumbersome (IDI/Tin Can Island Clients/2016).

So it is quite unfortunate that the government oversight functions on the operators of the port since the reform seem to be wanting as some of the complaints on the services of the operators have often entered into the deaf ears. This may be counterproductive to the economy, bearing in mind the significance of Tin Can Port in handling cargo met to support the economy.

Although, there had been the impact of government port reform policy on the cargo handling regime at the port, as more investment in cargo handling capacity has been enhanced, but lack of sustainable managerial acumen on the part of the port authorities could endanger all the benefits that have been accrued. For instance, the study reveals that 78.5% agrees the port has acquired modern cargo processing technology to facilitate cargo transfer; however, 21.5% feels otherwise (see Table 2). And on the importance of the policy change, 84.9% believes the reform has influenced significant change on the cargo handling procedure at the Tin Can Island port while 15.1% do not see so much difference due to the impact of the policy. Moreover, what is evident now is the huge time delay which has affected all manners of cargo handled at the port, which often leads demurrage and other charges which customers often frown at. The study shows that 72% of the respondents expressed concern for the timing and the delay the cargo going through the port often encountered, while 28% of the respondent feel less concern on the timing and the delay of cargo. Part of the reasons responsible for the delay at the port is the lack of loading bay for the trucks coming in to discharge and load cargo at the port. Also, most of the access roads to the port are in a deplorable condition. This has exacerbated the traffic condition around the port environment, as a long queue of trucks is formed along different access roads leading to the port. These queues are worrisome as they extend beyond the port environment to the adjoining metropolis bordering the port. And in most cases worsen the traffic situation by narrowing the road corridor leading to the port.

Privatisation of port services has often been considered as an alternative solution to ineffective and sluggish service witnessed in the hand of public ownership. Part of the gains of privatization of port services includes the investment in modern cargo handling equipment and efficient service. This study agrees to the positive

impact of privatisation in attracting reliable equipment to enhanced port operations. As 75.3% of the respondents confirm that since privatisation the level of port cargo handling equipment has been heightened, 24.7% of the respondents do not agree. In terms of the rating of the government policy of privatisation on the perception of success, 49.5% rated high, 39% rated medium and 8.6% rated low. Also on the strictness of government, on the rules and laws relating to the activities of the oversight function of government, 71% of the respondents see rules and oversight function of the government as having a positive influence on the cargo handling operation of the port, while 29% of the population noted otherwise.

4.2.2 CHALLENGES OF PORT SECURITY AND SAFETY PROCEDURES

This study reveals the challenges customers and shippers face while carrying out daily activities at the Tin Can Island port. The dominant challenge centres on the adequate and effective security of cargoes going through the port. One of the major difficulties identified by this study is pilfering and smuggling of cargoes by illegal port infiltrators. The reveals that 49.5% of the respondents strongly agree that the port is vulnerable to pilfering and smuggling of cargo, 35.5% agree, 8.6% strongly disagree and 6.5% disagree. In light of the preceding, there is a need to invest more in the security and safety of the port. This is further exacerbated by the perception of the security of life and property of the port as revealed by the study. The study reveals that 48.4% strongly agree that the port exhibits some lapses on the security of life, 38.7% agree, while 8.6% strongly disagree and 4.3% disagree. However, there is a need to achieve more in terms of security of life and property within and outside the port environment.

Table 2: Tin Can Port Cargo Handling Characteristics

S/No.	Characteristics	Status	Frequency	Percentage
1	Port Congestion	Yes	68	73.1
		No	25	26.9
2	Cargo Handling Capacity	Yes	77	82.8
		No	16	17.2
3	Performance In Shipping Activities In Nigeria	High	47	50.5
		Medium	32	34.4
		Low	14	15.1
4	Warehousing Development	High	39	41.9
		Medium	48	51.6
		Low	6	6.5
5	Poor Service Delivery	Yes	26	78.5
		No	67	21.5
6	Modern Technologies Used In Cargo Processing	Yes	73	78.5
		No	20	21.5
7	Change In Cargo Handling After Deregulation	High	42	45.2
		Medium	40	43.0
		Low	11	11.2
8	Policy Change	Yes	79	84.9
		No	14	15.1
9	Timing of the Delay of Goods	Yes	67	72.0
		No	26	28.0
10	Government Policy through Privatization	High	46	49.5
		Medium	39	39

		Low	8	8.6
11	Equipment at the Port since Privatization	Yes	70	75.3
		No	23	24.7
12	Laws and rules of government in cargo operation Operations	Yes	66	71.0
		No	27	29.0
13	Cargo Efficiency level	High	51	54.8
		Medium	30	32.3
		Low	12	12.9
14	Handling Equipment Since Privatization	Yes	76	81.7
		No	17	18.3
15	Perception of Development in Operation	Strongly Agree	41	44.1
		Agree	32	34.4
		Strongly Disagree	12	12.9
		Disagree	8	8.6
16	Full or Non-Implementation of Policies	Strongly Agree	41	44.1
		Agree	40	43.0
		Strongly Disagree	6	6.5
		Disagree	6	6.5
17	Modern Transport System Influence Cargo	Strongly Agree	28	30.1
		Agree	43	46.2
		Strongly Disagree	15	16.1
		Disagree	7	7.5
18	Smuggling Activities in the Port	Strongly Agree	46	49.5
		Agree	33	35.5
		Strongly Disagree	8	8.6
		Disagree	6	6.5
19	The insecurity of Lives and Properties	Strongly Agree	45	48.4
		Agree	36	38.7
		Strongly Disagree	8	8.6
		Disagree	4	4..3
20	Professionals to handle Cargo Operations Issues	Strongly Agree	32	34.4
		Agree	46	49.5
		Strongly Disagree	7	7.5
		Disagree	8	8.6

Source: Author's Analysis (2016)

4.2.3 THE RELATIONSHIP BETWEEN THE PERCEPTION OF CARGO TRAFFIC LEVEL AND CHANGE IN CARGO HANDLING PROCEDURE

Invalidating the relationship between the perception of cargo traffic and change in cargo handling procedure, the hypothesis which states “There is no significant relationship between perception of cargo traffic level and change in cargo handling procedure” is tested. Both variables are a linear assessment to determine how strong the relationship between the variable is. This chi-square was used to test this hypothesis. Table 3 shows the chi-square coefficient summary. The dependent variable is the perception of cargo traffic level, and the independent variable is changed in cargo handling procedure. Table 3 reveals that there is a strong relationship between perception of cargo traffic and a change in cargo handling procedures. The chi-square value is 43.820 and the p-value of 0.000, which is less than 0.005. The likelihood ratio, which reflects the maximum likelihood estimation has the value of 53.315 and p-value of 0.000. The linear-by-linear association of the variable is also

significant (see Table 3). Based on this analysis, there is a need for more investment in cargo handling pieces of equipment and also heightens the level of security and safety of the port.

Table 3: Perception of cargo traffic level and change in cargo handling

Chi-Square Tests				
	Value	df	Assymp. Sig. (2-sided)	Remark
Pearson Chi-Square	43.820 ^a	4	.000	Retain H ₁
Likelihood Ratio	53.315	4	.000	
Linear-by-Linear Association	41.389	1	.000	
N of Valid Cases	93			

Source: Author's Analysis (2016)

4.2.4 RELATIONSHIP BETWEEN THE PERCEPTION OF POLICY ADOPTION AND LEVEL OF CARGO HANDLING IMPROVEMENT

Another very key relationship this study seeks to examine is the perception of policy adoption and level of cargo handling improvements. The hypothesis which states "There is no significant relationship between the perception of policy adoption and level of cargo handling improvements" is tested. Both variables are a linear assessment to determine how strong the relationship between the variable is. This chi-square was used to test this hypothesis. Table 4 shows the chi-square coefficient summary. The dependent variable is the perception of policy adoption and level of cargo handling improvement. Table 4 reveals that there is a strong relationship between perception of policy adoption and level of cargo handling improvements. The chi-square value is 60.153 and the p-value of 0.000, which is less than 0.005. The likelihood ratio, which reflects the maximum likelihood estimation has the value of 42.584 and p-value of 0.000. The linear-by-linear association of the variable is also significant (see Table 4). Based on this analysis, there is a need for more investment in cargo handling pieces of equipment and also heighten the level of security and safety of the port

Table 4: Perception of policy adoption and level of cargo handling improvement

Chi-Square Tests				
	Value	df	Assymp. Sig. (2-sided)	Remark
Pearson Chi-Square	60.153 ^a	6	.000	Retain H ₁
Likelihood Ratio	42.584	6	.000	
Linear-by-Linear Association	18.704	1	.000	
N of Valid Cases	93			

Source: Author's Analysis (2016)

5. DISCUSSIONS

This study examines the cargo handling issues and challenges at the Tin Can Island port in Nigeria. It assesses the cargo handling procedures in the light of port privatisation embraced by the government of Nigeria. Moreover, it seeks to examine relationships between the perception of cargo traffic level and change in cargo handling procedure at the Tin can Island port. Also, it examines the relationships between the perception of policy adoption and levels in cargo handling improvements. This study reveals a diverse implication from the perceptive of socio-economic characteristics in the engagement of cargo handling procedure at Tin Can Island

port. Particularly, the age characteristics of respondents when related to the dominance of labour participation in cargo handling at the port, for labour participation in cargo handling involvement at the port, the age group 26-33 is 29%, and 34-41 constitutes 31.2%. The preceding age brackets have the preponderance of port labour in cargo handling and stevedoring assignment at the port. The reason being that older age bracket has exhibited severe health and ailment challenges which have affected their suitability for the arduous task of cargo handling (de Zwart, Bras, Van Dormolen, Frings-Dresen & Meijman, 1993). In this light, this study emphasises the importance of these age group as essential to support cargo handling assignment at the port. It is important to note that the socio-economic dimension has its influence in the flow of cargo in and out of the port but have been greatly reduced by technology (Vigarie, 1999). Though, this may true of the intermediate and the developed countries, who have nearly replaced human labour in cargo handling with machine and equipment. However, this study shows the prevalence of the socioeconomic characteristics is still in force in Tin Can Island Port, Nigeria. In spite of the privatisation gains in port reforms, yet the level of investment in cargo handling equipment is minuscule compared to the global average.

In terms of the cargo handling capabilities, this study reveals a positive improvement in cargo handling capabilities as 82.8% of respondents attests to the increasing level of cargo handling ratings. But there is still a need for improvement, as the cargo tonnage handled by the Tin Can Island port continues to increase every year. In trying to manage the soaring cargo tonnage, there is a need to heighten investment in the warehouse. As 51.6% of the respondent, reported that an intermediate level in warehouse investment at the Tin Can Island Port was noticed.

The growing nature of port competition has necessitated the need to improve upon the service delivery at the port (Okeudo, 2013). In this light, the study observes the abysmal level of poor services by the customers of the port. The study reveals that 78.5% of respondents attested that the service delivery by the port is rather low than expected even in the face of delivery reform initiated by the management of the port. In contrast, to a study that attests to the fact that privatisation engenders improved service delivery (Trujillo and Nombela, 2000). Probably, the Nigeria government should step their level of oversight function to improve the level of service delivery.

Moreover, this study seeks to establish the relationship between the perception in cargo traffic level and change in cargo handling procedure. Also, the study examines the relationship between the perception of policy adoption and level of cargo handling improvement at the port. Results show a significant relationship between the hypothesized variables. Implicitly, the reform improved the port managerial acumen and the cargo handling investment drive and opportunities.

6. CONCLUSIONS

The growing interdependencies and interrelationships among nations have continued to fuel trade liberalisation, manufacturing and production centres across the developing countries. Nigeria has benefitted immensely from numerous trade treaties and signatory. The effect is evident on the increasing cargo tonnage across the Nigeria port. The nature and category of cargo coming into the country make Tin Can Port very significant in Nigeria. Therefore, the resultant effect of this has created issues relating to managing the cargo handling activities at the Tin Can Island port.

This paper has been able to add to the literature on the perspectives of managing cargo handling challenges at the Tin Can port of Nigeria. It discusses the narrative of cargo handling problems on the dimensions of both socio-economic and cargo handling rating characteristics. The study reveals that socio-economic characteristics such as age have been very substantial in cargo handling characteristics at the Tin Can Island port. But this may not be enough as the cargo throughput is increasing there is a need for more investment in cargo handling equipment at the port. Also, the study identifies a positive relationship between the cargo traffic level and change in cargo handling procedure at the port. Sequel to this should be the determination to achieve zero labour input fully substituted with modern cargo handling equipment and massive infrastructure within the port and its environs. Coupled with the removal of plexus of the bureaucratic bottleneck, is the cargo document clearance which incessantly impinges the quick process of effective cargo handling procedure at the terminal.

Moreover, the study identifies a positive relationship between the perception of policy adoption and the level of cargo handling improvement at the port. In spite of the policy gains leading to increased cargo level, the lacks of regulatory oversight have been identified as the rationale for customer poor delivery services at the Tin Can Island port. Therefore the government should set up monitoring agencies to enforce compliance among all the operators managing the cargo handling business at the port.

7. REFERENCES

- Agarwal, R., & Ergun, Ö. (2008). Ship scheduling and network design for cargo routing in liner shipping. *Transportation Science*, 42(2), 175-196.
- Arnold, P., Peeters, D., & Thomas, I. (2004). Modelling a rail/road intermodal transportation system. *Transportation Research Part E: Logistics and Transportation Review*, 40(3), 255-270.
- Blöndal, S., & Pilat, D. (1997). The economic benefits of regulatory reform. *OECD Economic Studies*, 28(1), 7-48.
- Bard, J. F., & Sousk, S. F. (1990). A tradeoff analysis for rough terrain cargo handlers using the AHP: an example of group decision making. *IEEE Transactions on Engineering Management*, 37(3), 222-228.
- Cooper, B. (2007). ATHLETE: A cargo handling and manipulation robot for the moon. *Journal of Field Robotics*, 24(5), 421-434.
- De Zwart, B. C., Bras, V. M., van Dormolen, M., Frings-Dresen, M. H., & Meijman, T. F. (1993). After-effects of night work on physical performance capacity and sleep quality in relation to age. *International archives of occupational and environmental health*, 65(4), 259-262.

- Durrant-Whyte, H. F. (1996). An autonomous guided vehicle for cargo handling applications. *The International Journal of Robotics Research*, 15(5), 407-440.
- Fisher, M. L., & Rosenwein, M. B. (1989). An interactive optimization system for bulk-cargo ship scheduling. *Naval Research Logistics (NRL)*, 36(1), 27-42.
- Fountain, J. E. (2004). *Building the virtual state: Information technology and institutional change*. Brookings Institution Press.
- Fu, B. X., Song, X. Q., & Guo, Z. J. (2009). DEA-based malmquist productivity index measure of operating efficiencies: New insights with an application to container ports. *Journal of Shanghai Jiaotong University (Science)*, 14(4), 490-496.
- Hall, P. V. (2007). Seaports, urban sustainability, and paradigm shift. *Journal of Urban Technology*, 14(2), 87-101.
- Haralambides, H., Hussain, M., Barros, C. P., & Peypoch, N. (2010). A new approach in benchmarking seaport efficiency and technological change. *International Journal of Transport Economics/Rivista internazionale di economia dei trasporti*, 77-96.
- Harris, N. (1997). Cities in a global economy: Structural change and policy reactions. *Urban Studies*, 34(10), 1693-1703.
- Khan, M. R. (2000). Business process reengineering of an air cargo handling process. *International journal of production economics*, 63(1), 99-108.
- Lozano, S. (2009). Estimating productivity growth of Spanish ports using a non-radial, non-oriented Malmquist index. *International Journal of Shipping and Transport Logistics*, 1(3), 227-248.
- Notteboom, T. (2006). Strategic challenges to container ports in a changing market environment. *Research in Transportation Economics*, 17, 29-52.
- Notteboom, T., & Rodrigue, J. P. (2006). Challenges in the maritime-land interface: Maritime freight and logistics. *Report prepared for the Korean Government, Ministry of Maritime Affairs & Fisheries, The Master Development Plan for Port Logistics Parks in Korea*.
- Núñez-Sánchez, R., & Coto-Millán, P. (2012). The impact of public reforms on the productivity of Spanish ports: A parametric distance function approach. *Transport Policy*, 24, 99-108.
- Okeudo, G. N. (2013). Effect of Port Reform on Cargo Throughput Level at Onne Seaport Nigeria. A Comparative Study Before and After Reform Policy Implementation. *Journal of Business and Management (IOSR-JBM) e-ISSN*, 71-78.
- Oktal, H., & Ozger, A. (2013). Hub location in air cargo transportation: A case study. *Journal of Air Transport Management*, 27, 1-4.
- Ondiege, P. E. T. E. R., Moyo, J. M., & Verdier-Chouchane, A. U. D. R. E. Y. (2013). Developing Africa's infrastructure for enhanced competitiveness. In *World Economic Forum, the African Competitiveness Report* (Vol. 2013, pp. 69-92).
- Palšaitis, R., & Petraška, A. (2012). Heavyweight and oversized cargo transportation risk management. *Transport and Telecommunication*, 13(1), 51-56.
- Parola, F., & Musso, E. (2007). Market structures and competitive strategies: the carrier-stevedore arm-wrestling in northern European ports. *Maritime Policy & Management*, 34(3), 259-278.
- Shiang, W. J., Cannon, D., & Gorman, J. (2000). Optimal force distribution applied to a robotic crane with flexible cables. In *Robotics and Automation, 2000. Proceedings. ICRA'00. IEEE International Conference on* (Vol. 2, pp. 1948-1954). IEEE.
- Tang, C. H., Yan, S., & Chen, Y. H. (2008). An integrated model and solution algorithms for passenger, cargo, and combi flight scheduling. *Transportation Research Part E: Logistics and Transportation Review*, 44(6), 1004-1024.
- Tupy, M. L. (2005). *Trade liberalization and poverty reduction in sub-Saharan Africa*. Cato Institute.
- Trujillo, L., & Nombela, G. (2000). Multiservice infrastructure: Privatizing port services
- Vanelslander, T. (2008). Expansion in cargo handling: Geographical and functional issues. *Maritime Policy & Management*, 35(2), 193-214.
- Verhoeven, P. (2010). A review of port authority functions: towards a renaissance?. *Maritime Policy & Management*, 37(3), 247-270.
- Vigarié, A. (1999). From break-bulk to containers: the transformation of general cargo handling and trade. *GeoJournal*, 48(1), 3-7.
- Wilcox, B. H., Litwin, T., Biesiadecki, J., Matthews, J., Heverly, M., Morrison, J., ... &