Socioeconomic Characteristics and Perspectives on Cargo Handling: A Study of Tin Can Island Port, Apapa, Nigeria

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This research examines the socioeconomic and cargo handling characteristics of the Tin Can Island Port in Nigeria. The rise in global trade agreements has led to a cargo handling crisis in Nigeria. However, the perspectives of the socioeconomic characteristic have not yet been studied. The sampling method used was simple random sampling, with 100 questionnaires given to all the employees and consumers who use the terminal. However, the study was based on 93 respondents who completed the survey satisfactorily. In addition, it includes in-depth interviews with some of the port-terminal employees, a few customers, and neighborhood residents on the use of intelligent port systems. The data instruments' validity and reliability were checked with a Cronbach alpha reliability test of 0.80-0.89 and found to be accurate for all the parameters. The information was analyzed using descriptive, qualitative, and chi-square statistical methods. The study found that socioeconomic factors, especially the age of the cargo handling staff, impacted the port's capability. The level of port automation and the adoption of intelligent port systems are still relatively low, though remarkable since the reforms. The research shows a significant relationship between the perception of cargo traffic level and change in the cargo handling procedure at Tin Can Island Port. In addition, it reveals a substantial connection between policy adoption and cargo handling improvement at the port.

KEY WORDS

~ Cargo handling characteristics
~ Reforms
~ Port intelligence
~ Socio-economic
~ Tin Can Island port
~ Nigeria

1. INTRODUCTION

Socioeconomic characteristics can be thought of as a full measure of a person's work experience, income, and social standing in relation to other people (El Mahrsi et al., 2014). Socioeconomic features are essentially part of the cargo handling operations as cargo handling equipment often requires humans with diverse socioeconomic attributes to function (Chattopadhyay, 2012; Tsai et al., 2012). These factors affect socioeconomic perspectives in cargo handling. The socioeconomic characteristics and perspectives of cargo handling can prove valuable in evaluating port activities' performance and detecting how well a particular group is motivated.

Livable port networks are fundamental to global maritime exchanges, transnational trading ties and links. Because of dilapidated, fragile, and inefficient port infrastructure, many developed countries remain less competitive in international trade. (Tupy, 2005 and Ondiege et al., 2013). Established facilities have fallen short of expectations due to continuing indifference in the face of reform, globalization, and increased economic connectivity. As a result, many ports in developed economies, especially in Africa, are less competitive, even though effective and reliable port infrastructure is critical for most African countries to realize their economic potential.

The establishment of ports in Nigeria dates back to the colonial period. The colonial government established Nigeria's first commercial port as part of a plan to evacuate raw materials from the hinterland. This initiative aided in developing a railway connecting Lagos and Port Harcourt's ports. On the other hand, the port administration began enacting the port act in 1954. The government ran Lagos and Port Harcourt's ports, but a few ports were given to private companies. In the early and late 1970s, there was a vast need for port space, which resulted in much longer ship dwell times. The Tin Can Island Port's massive construction started in the late 1980s and finished in the late 1990s.

Port productivity is expressed as the speed to facilitate cargo movement through the port. Even though freight[1] is diverse, the terminal's specificity for unique cargo requirements depends on the terminal's facilities for successful cargo handling[2] and the requisite human and computer mechanisms to expedite the process of cargo distribution from the port (Kuzmicz & Pesch, 2019). Effective freight processing and distribution necessitate a range of procedures that are not limited to port machinery efficiency, but they also necessitate paperwork to aid in the cargo's travel. Effective port operations rely on the effective harmonization of the various phases of freight handling[3] to reduce the time it takes for delivery from when it arrives at the port (Linder, 2018).

The port reform was initiated to make cargo handling easier and improve port operations in Nigeria (Akinyemi, 2016). The concession of large terminals to an interested investor is one aspect of the transition. However, there is a lack of literature on the scope of such change, its effect on cargo handling and socioeconomic characteristics, port automation and intelligent technology adoption, and cargo handling difficulties at the Tin-can Island terminal.

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[1] Freight is the term for all merchandise, goods, products, or commodities shipped by rail, air, road, or water, other than baggage, express mail, or regular mail.
[2] Cargo handling on ships requires the use of lifting equipment like wire ropes, wire rope slings, hooks, forklifts, cranes etc. As somebody working with such equipment, you need to be able to make sure that the equipment has been tested and maintained according to the relevant rules and regulations.
[3] Freight handling is the management, movement, and storage of incoming and outgoing freight. It involves loading and unloading of materials, ensuring the safe delivery of goods, and maintaining of freight records.

The primary motivation for increased port operations stems from greater efficacy and reliability of cargo handling to reduce traffic congestion[4] at the terminal. The bane of effective and profitable port operations in Nigeria are cargo handling delays resulting in congestion, spoilage, and financial losses. Nigeria emphasizes cargo passing through this port for commercial purposes and foreign trade exchange as a big importing country.

Given the above, increasing Nigeria's foreign trade competitiveness necessitates maintaining port livability, and successful and reliable cargo handling at the port to reduce spoilage caused by cargo handling challenges. To a large degree, such an issue has been a worrying bottleneck in the freight movement at Tin Can Island terminal. As a result, this research aims to look into the cargo handling and socioeconomic characteristics at Tin Can Island Port.

2. LITERATURE REVIEW

2.1. Socioeconomic attributes

Socioeconomic factors influence the maritime industry's day-to-day operations, particularly in cargo handling concerns (Meersman and Van de Voorde, 2013). Its position is multifaceted and different in terms of contribution, regardless of the technology paradigm shift that is rapidly engulfing the cargo handling subsector of the maritime industry (Briesen, 2017). The theoretical elucidation of the link may help us comprehend the present work and contribute to the literature. The idea of socioeconomic dynamics in cargo handling refers to the socioeconomic variables relevant to cargo handling at the port. In terms of the effects on total cargo inputs, the dynamical influence of socioeconomic consequences might be both individual and collective. Although several studies have frequently questioned the inclusion of socioeconomic factors in cargo handling research (Turner, 2000), the dynamics of socioeconomic repercussions are frequently overlooked in the management and execution of freight handling operations. The emphasis has always been on implementing appropriate technology and gadgets to expedite cargo servicing and delivery operations at the port (Ojadi & Walters 2015). In this regard, socioeconomic factors are important in the cargo handling management subsector. Vanelslander (2008), on the other hand, defines cargo handling as a procedure that encompasses loading and unloading freight, warehousing, and shipping or receiving it from the hinterland. Furthermore, it is categorized into outbound freight handling, inbound cargo handling, and transhipment cargo. The cargo handling subsector plays a critical role in the transportation supplies chain, especially in the maritime sector, which serves as a fulcrum for international trade and commerce. The stakeholders' theory, which explains the interconnected relationship between port and its customers, employees, suppliers, investors, communities and others, was adopted into the study to help understand the importance of the stakeholders in port management, especially as it concerns the socioeconomic attributes.

2.2. Cargo handling

The cargo handling literature is rife with solutions to boost performance and solve terminal issues. Some ports utilize an autonomous driving vehicle to relieve delays and increase port performance (Kavakeb et al., 2015). Yadav and Sharma (2016) employ a case study modeling technique to select the next generation of harsh terrain handlers for the US Army. The analytic hierarchy approach selects and ranks the discovered alternatives (AHP). Furthermore, the multiple cable robotic crane was assessed using a statistical model and computer simulation to arrive at the best trajectory for maximum cable capacity as part of the automation deployed to improve cargo handling operations (Shiang, Cannon and Gorman, 2000).

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[4] Traffic congestion occurs when the transport demand exceeds the transport supply in a specific section of the transport system. Under such circumstances, each vehicle impairs the mobility of others. Urban congestion mainly concerns two domains of circulation, private and public, often sharing the same infrastructure.

The literature has studied the influence of regulatory changes on cargo handling (Fu, Song, and Guo, 2009; Lozano, 2009; Haralambides, Hussain, and Barros, 2010). First and foremost, some works investigate efficiency improvements in cargo handling operations at a Spanish airport (Hernandez-Diaz, Martinez-Budria, and Jara-Diaz, 2007). It utilizes data envelopment analysis and Malmquist indices to partition the improvements into performance and transition results. According to the study, output has increased since the regime reform attained maturity in 1998, which can be attributed fully to technical transformation. Some reports using related approaches have shown that regulatory reform has increased port efficiency (Nunez-Sanchez and Coto-Milan, 2012; Fu, Song and Guo, 2009; Lozano, 2009; Haralambides, Hussain and Barros, 2010). Khan (2000) wants to use the business model to reengineer the air cargo handling process as part of a strategic policy option. The complex changing nature of modern maritime ports creates significant cargo evacuation and transfer obstacles. The new problem has eroded the port's traditional function, resulting in a vast network of commercial institutions that use the port. The aggregation of such business transactions necessitated the development of a one-of-a-kind model of strategic collaboration and business consideration in the strategic plans of port authorities. Divergent demands of expanding network linkages exceed port cargo handling capacity. The competitiveness and reliability of port operations are affected by looming obstacles (Notteboom, 2006; Notteboom and Rodrigue, 2006; Verhoeven, 2010; Parola and Musso, 2007).

Regulation, legal amendments, and institutional improvements often affect cargo handling dynamics. These modifications are intended to promote technological advancement in cargo handling. Investment promotion and attraction are integral to this advancement to spur the technical and institutional transformations needed to support the economy. The degree of responsiveness of economic operations is determined by the speed at which freight is cleared and transferred. Systemic creativity boosts institutional productivity. These efficiencies are seen as attractive outputs.

The previous literature addressed the various dimensions of cargo handling procedures and their effect on port operations. The efficacy and efficiency of cargo handling characterize total port capacity and the ability to manage in the face of increased throughput. The globalization and liberalization policy pattern has resulted in freight networks' proliferation. However, the literature on cargo handling issues seems skewed against port activities in the United States, Europe, and intermediate countries.

3. METHODOLOGY

3.1. Research design

This research looks at cargo handling characteristics at Tin Can Island Port. This port is the city of Lagos and Nigeria's second busiest port. The port consolidated with other ports that handled specialized freight, such as lift-on/lift-off containers LoLo). The port handles cargoes similar to those taken by the Port of Apapa. This distinction distinguishes Tin Can Island terminal, and the study's analysis style is quasi-experimental. The case study approach combines with the quasi-experimental test method. The dimension of analysis, on the other hand, is cross-sectional. The main stakeholders that use the port are part of the study's population. Since Tin Can Island Port is an essential part of the Nigerian economy, it serves as a gateway to the rest of the country.

Given that the Lagos seaport has two major terminals, this study aims to look at the socioeconomic aspects and views on cargo handling and forwarding at the port. The terminal was chosen to use port intelligent technology devices due to the massive amounts of goods handled and the traffic impediments to and from the port. The study employs qualitative and inferential approaches to analyze the port's cargo handling issues and difficulties.

3.2. Types and sources of data

This study makes use of both primary and secondary data. This information is necessary to provide background information on the selected respondent using the terminal.

The questionnaire's other parts elicited data on the terminal cargo-handling characteristics. In addition, it includes in-depth interviews with some of the port-terminal employees, a few customers, and neighborhood residents on the use of intelligent port systems. The sampling method used was simple random sampling, with 100 questionnaires given to all the employees and consumers who use the terminal. The sample size was determined from the sampling frame of the target population unit using a sample size form. However, the study was based on 93 respondents who completed the survey satisfactorily. The questionnaire was developed, validated using face validity, and graded on the Likert scale. The data instruments' validity and reliability were checked with a Cronbach alpha reliability test of 0.80-0.89 and found to be accurate for all parameters.

3.3. Data analysis procedure

The qualitative analysis uses descriptive statistics. In this study, two hypotheses were investigated. According to the first hypothesis, there is no significant association between container-traffic perception and changes in cargo handling procedures. According to the second hypothesis, there is no significant association between policy implementation expertise and the extent of cargo handling changes at Tin Can Island Port. The chi-square predictive analytical methods were used to evaluate all propositions. The chi-square was chosen because it was a prospective analysis of parameter indicators and not a ratio differentiation of variables. This method supported this nature of research (Norzaidi et al., 2008). The first hypothesis variables are the interpretation of freight-traffic level and improvement in cargo-handling practice. The variables of concern in the second hypothesis understand policy acceptance and the degree of cargo handling change.

4. RESULTS AND DATA ANALYSIS

The primary data for the analysis is defined and analyzed in this section. The studies are descriptive and inferential and focus on the consumer sample's characteristics and the relationship between the variables that characterize cargo handling relationships at Tin Can Island terminal. Furthermore, there are meaningful connections among the variables examined.

4.1. Socioeconomic characteristics

The socioeconomic characteristics of customers/stakeholders using Tin Can Island Port terminal provide an understanding of the characteristics of users of the port. It backs up the stakeholder theory of stakeholders' dynamics profiles and port clients' socioeconomic factors (Tromaras et.al. 2016). The distribution of the socioeconomic indicator for gender (see Table 1) shows that 60.6 % of the population is male and 39.4 % is female. The gender distribution backs up the growing perception that men dominate the freight forwarding and clearing industry, with only 6% of the females occupying a managerial position in the port (Ofuani et al., 2018). As a result, more knowledge and enlightenment about the profession's potential should be extended to women to ensure that more women participate actively. Even though the essence of the work is complicated, most women will be able to make it more manageable.

S/No.	Characteristics	Status	Frequency	Percentage
1	Age	18 – 25	14	15.1
		26 – 33	27	29.0
		34 – 41	29	31.2
		42 or more years	23	24.7
2	Gender	Male	57	60.6
		Female	36	39.4
3	Employment Status	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
		Other	11	11.8
5	Educational	High School	9	9.7
		Diploma	23	24.7
		Degree.	32	34.4
		Master's/Doctorate	19	20.4
		Other	10	10.8
6	Occupation	Cargo Handler	31	33.3
		Port Worker	46	49.5
		Management Staff	6	6.5
		Other	10	10.8

Table 1. Demographic and Socioeconomic characteristics of Tin Can Island Port

(Source: the Authors' analysis (2018))

The stakeholders' age distribution reveals the age group classification. The highest percentage was 31.2 % in the 34-41 range. The age range 26-33, which accounts for 29.0 % of the total, is closely followed by the figures. Surprisingly, these age groups seem to be in their prime working years. Since the automation for cargo handling in Nigeria is still very poor relative to what is available in industrialized economies worldwide, the subsector focuses mainly on age grouping. In the Nigerian maritime subsector, the youth in this group work as freight forwarders[5] and stevedores[6]. As a result, they are regarded as Nigerian maritime working weapons since the maritime industry relies heavily on them to supplement the current level of automation.

[5] Freight Forwarder is an individual or company that prepares the documentation and coordinates the movement and storage of export cargoes. See also Customs house broker

[6] Stevedores are labor management companies that provide equipment and hire workers to transfer cargo between ships and docks. Stevedore companies may also serve as terminal operators. The laborers hired by the stevedoring companies are called stevedores or longshoremen

Furthermore, the distribution of respondents' occupations reveals that port workers had 49.5 % of the total, followed by cargo handlers with 33.3 %, management staff with 6.5 %, and others with 10.8 %. Other stakeholders in the Nigerian maritime sector engaged in cargo handling operations are referred to as "others." It's worth noting that the port workers represent all the workers directly involved in cargo processing. This group comprises employees of the port authority and those stationed inside the port by various stakeholders who do business with the port.

4.2. Cargo and cargo-handling characteristics at Tin Can Island Port

An efficient port system, where cargoes are handled and transferred quickly is an integral feature of a thriving and sustainable economy. The findings of cargo handling characteristics at Tin Can Island Port are presented in this section. Different evaluation outcomes emerge among the crucial variables used in this study's research when examining the various aspects of cargo handling at Tin Can Island terminal.

4.2.1. Cargo-handling assessment characteristics

Ports are an essential infrastructure worldwide, boosting the economy and facilitating international exchange and commerce. The ability to handle and discharge cargo quickly remains critical to this crucial role. Its cargo handling quality determines its capacity to meet the increasing economic need and expansion for national growth. The research shows the most critical problems and features of cargo handling at Tin Can Island Port. For example, 73.1 % of the respondents agree that the port is heavily congested, while 26.9 % disagree.

Regarding cargo handling capability, 82.8 % of the respondents think that Tin Can Island Port can handle the cargo that passes through it, while 17.2 % disagree. When comparing the success of shipping operations in container forwarding and clearing to other ports, 50.5 % of the respondents rated Tin Can Island Port as high, and 34.4 % rated it as a medium. Finally, 15.1 % gave the port a poor rating. Other crucial elements, such as warehousing growth, which is critical to supporting the port's cargo handling operation, were rated high by 41.9 %, medium by 51.6 %, and low by 6.5 % (see Table 2). The implications of this distribution may seem to indicate port incapacity; however, other considerations influencing the distribution may have been more managerial than technological. The container clearance process at Tin Can Island terminal, for example, seems to be subjected to strict bureaucratic procedures. Too many paper clearance desks have often stated that cargo clearance times slowed. Overall, the adverse effects of such a burden on port infrastructure and the community are concerning.

Other cargo handling evaluation characteristics include inadequate service delivery scores, with 78.5 % of the respondents criticizing the port authority's poor service level. Since the changes, the widespread belief that improvements will improve service quality and delivery has not kept up with the port clients' expectations. Unfortunately, some of the customers interviewed described the quality of service provided by Tin Can Island Port's operator as follows:

> " *It's been challenging to get our concerns to the Tin Can Island Port's management. Their customer service agents could not relay our complaint to the management much of the time. It has always been challenging to do business with the port.* "

(IDI/Tin Can Island Clients/2018)

The government's oversight powers over the port owners have been lost. As a result, concerns about the operators' facilities abound after the reform. Given the importance of Tin Can Island Port in handling cargo needed to sustain the economy, this ignorance may be harmful.

However, since spending on cargo handling capability increased, the government's port reform[7] agenda has significantly affected the port's cargo handling regime. Nonetheless, the port authorities' lack of long-term managerial awareness could jeopardize all of the accrued advantages. For example, 78.5 % of the respondents agree that the port has advanced cargo processing equipment to enable cargo transfer; however, 21.5 % disagree (see Table 2). Regarding the policy change's relevance, 84.9 % agree it has had a significant impact on Tin Can Island terminal's cargo-handling process. In contrast, 15.1 % do not see a substantial change due to the policy's effect.

Furthermore, what is now apparent is the significant time delay that has plagued all types of freight handled at the terminal, which often results in demurrage and other charges that consumers dislike. According to the findings, 72 % of the respondents are concerned about the scheduling and delays that freight passing through the port often encounters. In comparison, 28 % are less worried about the shipping schedule and delays. The shortage of docking bays for trucks coming in to discharge and load freight at the port is one reason for its delays. In addition, most of the port's entry roads were in poor repair. This road condition has worsened the port's traffic situation, as a long line of trucks has emerged along the various access roads leading to the port. These lines are concerning since they stretch beyond the port environment to the adjacent metropolis on the harbor's outskirts. In most cases, narrowing the road corridor leading to the port would exacerbate traffic congestion.

Privatization of port facilities is seen as a viable option to public control's inefficient and slow infrastructure. The investment in new cargo handling facilities and reliable operation benefits from privatizing port facilities. This research acknowledges that privatization positively affects securing reliable equipment for improved port operations. Although 75.3 % of respondents believe that the amount of port cargo handling facilities has increased since privatization, 24.7 % of respondents disagree. In terms of understanding the government's privatization program's performance, 49.5 % gave it a high rating, 39 % gave it a medium rating, and 8.6 % gave it a poor rating. Aside from the government's strictness on regulations and laws about government oversight, 71 % of the respondents believe that the government's rules and oversight function positively impact the port's cargo handling activity.

In contrast, 29 % of the population stated the same. However, the characteristics of cargo handling, the extent of port automation, and the introduction of port intelligent technologies to enable port turnaround are lacking. The preceding are the results of the in-depth interview's review:

> " *The level of complete port automation by the management is relatively slow and affects the cargo throughput in the port. The need to acquire new cranes to speed up the turnaround times at the port.* "

(IDI/Tin Can staff/2018)

Also, another staff who had occupied a managerial position with the port shed more light on the cargo handling characteristics and the adoption of intelligent systems as:

> " *There is a need for more investment in acquiring modern intelligent port systems devices to optimize operations. Most of the delays in cargo clearance at the port result from not adopting complete port intelligent systems.* "

(IDI/Tin can Port / Management Staff/2018)

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[7] Port reform is characterized by decentralization, privatization, and competition in the port system.

However, for the port environs, the level of gridlock often encountered on the port premises also poses a huge hazard potential to the residents. When asked about the challenges faced by the lack of port automation in the community, they shared the following:

> " *We are exposed to dangers every day as mobility within the community has become an enigma. We advocate for system overhaul and total adoption of a new port technology system for environmental livability.* "

(IDI/Tin Can Port / Residents/2018)

> " *The level of port automation for cargo clearance is rather low.* "

(IDI/Tin Can Port / Clients /2018)

4.2.2. Port Characteristics and Challenges of Port Security and Safety Procedures

This research shows consumers and shippers' difficulties regularly encounter at the Tin Can Island terminal, a container terminal. The most pressing issue is ensuring that cargoes passing through the port are adequately and effectively secured. Theft and diversion of shipments by illicit port infiltrators are the major problems found in this report. According to the survey, 49.5 % strongly agree that the port is open to freight pilfering and theft, 35.5 % agree, 8.6 % strongly disagree, and 6.5 % disagree. As a result, the time has come to invest more in the protection and safety of port facilities. According to the report, it exacerbates the impression of the port's defense of life and property. According to the report, 48.4 % strongly agree that the port has certain flaws in terms of life protection, 38.7 % agree, 8.6 % strongly disagree, and 4.3 % disagree. On the other hand, the country should protect life and property within and outside the port environment.

S/No.	Variable	Status	Frequency	Percentage
1	Is there port congestion?	Yes	68	73.1
		No	25	26.9
2	High cargo-handling capacity?	Yes	77	82.8
		No	16	17.2
3	Level of performance in shipping activities In Nigeria	High	47	50.5
		Medium	32	34.4
		Low	14	15.1
4	Level of 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 handling	Yes	73	78.5
		No	20	21.5
7	Level of change in cargo handling after deregulation	High	42	45.2
		Medium	40	43.0
		Low	11	11.2

No	Question	Response	Frequency	Percentage
8	Is there a policy change in the port?	Yes	79	84.9
		No	14	15.1
9	Is there a delay of goods?	Yes	67	72.0
		No	26	28.0
10	Impact of Government policy through privatization	High	46	49.5
		Medium	39	39
		Low	8	18.5
11	High-level equipment at the Port since privatization	Yes	70	75.3
		No	23	24.7
12	Are there laws and rules of government in cargo 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	Adequate handling equipment since privatization?	Yes	76	81.7
		No	17	18.3
15	Is there a perception of development in cargo operation?	Strongly Agree	41	44.1
		Agree	32	34.4
		Strongly Disagree	12	12.9
		Disagree	8	8.6
16	Implementation of policies	Strongly Agree	41	44.1
		Agree	40	43.0
		Strongly Disagree	6	6.5
		Disagree	6	6.5
17	Modern transport systems influence cargo throughput?	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	Insecurity of lives and properties	Strongly Agree	45	48.4
		Agree	36	38.7
		Strongly Disagree	8	8.6
		Disagree	4	4.3

20	Available professionals to handle cargo operations issues	Strongly Agree	32	34.4
		Agree	46	49.5
		Strongly Disagree	7	7.5
		Disagree	8	8.6

Table 2. Tin Can Port cargo-handling characteristics (Source: the Authors' analysis (2018))

4.2.3. Relationship between perception of cargo-traffic level and change in cargo-handling procedure

They are invalidating the connection between freight-traffic experience and changes in cargo-handling procedures. "There is no important association between understanding cargo-traffic level and improvement in the cargo-handling procedure," according to the hypothesis. Both variables are evaluated linearly to see how deep the relationship is. This hypothesis was tested using the chi-square. The chi-square coefficient description is shown in Table 3. The dependent variable is container-traffic awareness, and the independent variable is cargo-handling process adjustment. Table 3 shows a clear connection between container-traffic experience and changes in cargo-handling procedures. The p-value is 0.000, which is less than 0.005. The chi-square value is 43.820, and the p-value is 0.000, less than 0.005. The maximum likelihood estimate is represented by the likelihood ratio, which has a value of 53.315 and a p-value of 0.000. The variable's linear-by-linear relationship is also meaningful (see Table 3). Based on this review, further investment in cargo-handling equipment to enhance handling procedures and container traffic experience is necessary.

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			

Table 3. Perception of cargo-traffic level and change in cargo handling (Source: the Authors' analysis (2018))

4.2.4. Relationship between perception of policy adoption and level of cargo-handling improvement

Understanding policy implementation and the extent of cargo handling change is another meaningful relationship that this research investigates. The theory "There is no substantial association between policy acceptance interpretation and degree of cargo handling changes" is checked. Both variables are evaluated linearly to see how deep the relationship is. This hypothesis was tested using the chi-square. The chi-square coefficient description is shown in Table 4. The dependent variable is the perception of policy adoption and the level of cargo handling improvement. Thus, it reveals a strong relationship between the perception of policy adoption and the scale of cargo handling improvements. The chi-square value is 60.153, and the p-value of 0.000 is less than 0.005. The likelihood ratio, which reflects the maximum likelihood estimation, has a value of 42.584 and a 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 heightened the port's security and safety.

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			

Table 4. Perception of policy adoption and level of cargo-handling improvement

(Source: the Authors' analysis (2018))

5. DISCUSSION

The container-handling problems and difficulties at Tin Can Island Port in Nigeria are investigated in this report. It evaluates cargo-handling practices in the light of the Nigerian government's support of port privatization. In addition, it examines the interaction between container-traffic experience and changes in the cargo-handling procedures at Tin Can Island terminal. Moreover, it investigates the links between policy-adoption awareness and cargo-handling improvement requirements. The perspective of socioeconomic characteristics in cargo-handling procedures at Tin Can Island Port is shown to have various implications. Notably, respondents' age characteristics compared to the superiority of labor participation in cargo-handling at the port show that the age range 26-33 accounts for 29 % of labor participation in cargo handling at the port, while 34-41 accounts for 31.2 %, while the Port's freight-processing and stevedoring assignments are dominated by port laborers in the other age groups. The explanation for this is that the older age bracket has experienced severe health and ailment issues, limiting their suitability for the difficult job of cargo handling (de Zwart, Bras, Van Dormolen, Frings-Dresen and Meijman, 1993). This research emphasizes the role of these age groups in supporting cargo handling assignments at the port in this light. The socioeconomic component has influenced freight movement into and out of the harbor. However, technology has reduced their numbers (Vigarie, 1999). These changes may be valid in intermediate and developing countries, where machines and machinery have nearly replaced human labor in freight handling.

As a result, port automation and the introduction of port intelligent systems are both in their infancy. This research, however, indicates that the socioeconomic characteristics are still prevalent in Tin Can Island Port, Nigeria. Despite the gains of privatization in port reforms, cargo handling equipment spending is minuscule compared to the global average. This research shows a boost in cargo handling capabilities, with 82.8 % of the respondents attesting to an increase in cargo handling scores. However, there is still a need for expansion, as Tin Can Island Port's cargo tonnage rises year after year. However, further investment in the warehouse is needed to keep up with the rising freight tonnage. As indicated by 51.6 % of the respondents, Tin Can Island Port has seen an intermediate level of warehouse investment. Job motivation and appropriate management of cargo handling employees are critical factors and indicators of the port's overall stability. It is essential to understand the elements contributing to cargo handlers' work satisfaction and motivation in the port. It entails enacting quick public policy and management measures to establish a reliable port operation. An unstable port operation, a primary concern of researchers such as Belzer and Swan (2011) or Lu et al. (2016), is a factor of such problems as port security, cargo handler health and welfare (Williamson et al. 2009), management challenges resulting in poor port turnover (LeMay et al. 2013), and problems associated with wages and working conditions of port (Monaco 2010).

The increasingly competitive nature of port competition has necessitated increasing port service delivery (Okeudo, 2013). In this light, the analysis finds that the port's consumers have a high degree of substandard service. According to the report, even in the face of distribution reform implemented by the port's management, 78.5 % of the respondents stated that the port's service delivery was lower than predicted. According to a report, privatization improves service delivery (Truijillo and Nombela, 2000). The Nigerian government should most likely step up their oversight role to enhance service quality.

Furthermore, this research aims to determine whether there is a connection between cargo traffic understanding and changes in cargo handling procedures.

6. CONCLUSION

Trade liberalization, outsourcing, and development centers have improved due to ties between nations. Numerous trade deals and signatories have benefited Nigeria greatly. The impact is seen in the rising cargo tonnage in Nigeria's ports. Tin Can Port is essential to Nigeria because of the nature and type of freight handled. As a result, there are problems controlling cargo-handling operations at Tin Can Island Port.

This paper has contributed to the body of knowledge by identifying the specific socioeconomic factors that influence cargo-handling issues at Nigeria's Tin Can terminal. It examines the story of cargo handling issues from the socioeconomic and cargo-handling ranking factors. According to the findings, socioeconomic factors, such as age, significantly impact cargo-handling characteristics at Tin Can Island terminal. However, as freight throughput grows, further investment in cargo-handling equipment at the Port could be necessary. In addition, the analysis finds a connection between freight-traffic levels and changes in cargo-handling procedures at the Port. The commitment to reach zero labor supply, entirely replaced by new freight-handling machinery and extensive facilities inside the Port and its environs, should follow.

The authorization of freight documents and bureaucratic bottlenecks is constantly inhibiting the rapid process of effective cargo-handling procedures at the Port. As the employees do not fully understand the new clearance technique, some glitches in the smooth operation of port activities may gradually degrade the workers' motivational level after repeated contact with a bottleneck. Improving workers' working conditions and intensive training of Port workers on the new style of operations may improve the freight-clearing procedure. Therefore, the management needs to harmonize the processes toward effectiveness and efficiency in cargo handling and clearance.

Furthermore, the research finds a connection between the perception of policy acceptance and the Port's degree of cargo-handling change. However, the direction of this relationship is positive. Despite policy gains that have resulted in improved freight levels, the lack of regulations is described as the reason for Tin Can Island Port's inadequate customer distribution services. As a result, the government should establish inspection agencies to ensure enforcement among all the cargo-handling business operators at the port. Finally, this study reveals that the port intelligent-technology system's use is relatively low; therefore, more investment is required.

CONFLICT OF INTEREST

We declare that there is no conflict of interest in the process leading to the conduct of this research and no fund received from any organization.

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