

FORENSIC ACCOUNTING AND SUSTAINABILITY OF SEAPORTS IN NIGERIA

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ABSTRACT

This study examined the relationship between forensic accounting and sustainability of seaports in Nigeria. The population of the study consisted of six (6) seaports. The study obtained primary data using structured questionnaire whose reliability was ascertained using Cronbach's Alpha. The sample elements of the study consist 20 management staff from each of the 6 seaports. Thus a total of 120 respondents participated in the study. However, data elicited from 112 respondents representing 93% of the sample elements was used in the final analysis. The study used descriptive statistical tools to present and analyze data, while the Pearson Product Moment Correlation was used to test the hypotheses with the aid of SPSS version 25.0. The study found that forensic accounting relates positively and significantly to seaport sustainability in Nigeria. The study specifically revealed that forensic accounting assist seaports to attain economic, social and environmental orientation. The study concluded that there is a positive and significant relationship between forensic accounting and economic; social and environmental sustainability. Thus, the study recommends that government should create and encourage conducive forensic accounting environment so that seaports and other stakeholders in the maritime sector can benefit from economic, social and environmental gains arising from seaport sustainability in Nigeria. The study also recommended that seaports in Nigeria should adopt forensic accounting system in various forms to effectively prevent frauds.

Keywords: Accounting skills, economic orientation, environmental orientation, forensic accounting, social orientation

INTRODUCTION

Seaports are pivotal to global and national economies by providing jobs (Okpara & Okpara, 2022). However, lack of adequate information affects significant decision-making for planning profitable engagement and sustainable port investments (Okpara & Okpara, 2022). The challenges of integrated decision-making information on seaport activities affect the inputs of seaports in Nigeria. Thus, there is a developing unanimity to fulfill sustainability objectives inside seaports based on the triple bottom line (TBL). The operations of seaports' in Nigeria have not been properly aligned to such specific sustainability framework as economic, social and environmental sustainability. Lack of implementation of sustainable seaport policies is a problem in Nigeria, and forensic accounting may be a remedy to the problem.

Globally, there has been an increase in demand for forensic accounting due to mounting cases of fraud and technical errors of accountants. Forensic accountants are relied upon to skillfully investigate cases of financial fraud and furnish management with substantial evidence with which to prosecute suspects in the court of law. Arokiasamy and Cristal (2009) opine that forensic accountants apply financial skills and investigative mentality to unsettled issues, conducted within the context of the rules of evidence.

Forensic accountants adhere to ethical conducts and utilizes accounting, auditing and investigative skills (Zysman, 2004) to detect corrupt or fraudulent financial practices (Enyi, 2009). The phrase "forensic accounting" was coined by Puloubet (1946). Since Nigeria's independence in 1960, forensic accounting has existed due to increase in fraud, money laundering and other forms of economic and financial crimes (Enyi 2009); and companies' realization that the services of forensic accountants are needed to curb cases of fraud.

The purpose of this study was to examine the relationship between forensic accounting and sustainability of seaports in Nigeria. The study specifically investigated:

- a) The relationship between forensic accounting and economic orientation of seaports in Nigeria.
- b) The relationship between forensic accounting and social orientation of seaports in Nigeria.
- c) The relationship between forensic accounting and environmental orientation of seaports in Nigeria.

LITERATURE REVIEW

Theoretical Foundation (Stakeholder's Theory)

This study is founded on stakeholder theory which recognizes the multiplicity of stakeholders (Jensen, 2001). The theory holds that certain actions of management might have conflicting effects on various classes of stakeholders. This implies that managers have multiple objective to optimize. Jensen (2001) sees this as a weakness of stakeholder theory “because it violates the proposition that a single-value objective is a prerequisite to purposeful behaviour (Jensen, 2001).

In search of a single-value objective that conforms to rationality, Jensen (2001) suggests a refinement of stakeholder theory – the enlightened stakeholder theory. Consequently, the highly competitive environment of seaports dictates an ongoing process of keeping up with updating and improving implemented methods, in accordance with what leaders of the industry are conducting (Gholami & Salimi, 2014). The causal relationship between implemented methods, their development and expansions are viewed through the scope of competitive advantage and serve as differentiating factors for the enhancement of the maritime logistics performance.

The results of collaborative relationship with regulators are further exploited and induced in the relationships with forensic accounting and sustainability of seaports become the focal point that affects maritime sector performance (Hussein *et al.*, 2017). The development of normative behaviour in the competitive environment of firms is one that aid the formation of appropriate green supply chain management. The importance of which lies in the fact that seaports are key to maintaining and sustaining the economy, society and environment (Zis *et al.*2020).

Concept of Forensic Accounting

Forensic accounting has witnessed a gradual entrance into mainstream contemporary accounting literature and has been defined both conceptually and operationally by a considerable number of scholars. In the views of Kim and Song (2019) forensic accounting is simply the process of interpreting, summarizing and presenting complex financial issues clearly, succinctly and factually often in a court of law as an expert witness. Bolgna and Linqvist (1995) defined forensic accounting as the application of financial skills and an investigative mentality to unresolved issues, conducted within the context of the rules of evidence.

In the view of Martin (2019), forensic accounting is the application of financial accounting and investigative skills, to a standard acceptable by the courts, to address issues in dispute in the context of civil and criminal litigation. Damilola and Olofinsola (2007) viewed it as the application of criminalities methods and integration of accounting investigative activities and law procedures to detect and investigate financial crimes and related economic misdeeds. In this conceptualization, forensic accounting is a highly technical and specialized area of practice within the principles and ethics of accounting profession. Also, it is not every forensic accounting engagement that ends up in the court of law.

The American Institute of Certified Accountants (AICPA, 2005) defined forensic accounting as “the application of accounting principles, theories and discipline to facts or hypotheses at issue in a legal dispute and encompasses every branch of accounting knowledge. AICPA (2005) further classify forensic accounting into two broad categories: investigative services and litigation services. The application of specialized knowledge and investigative skills, collecting, analyzing and evaluating evidential matter,

interpreting and communicating findings in the courtroom, or boardroom. Crumbley (2006) defined Forensic accounting as the application of specialized knowledge and specific skill to stumble up on the evidence of economic transactions.

Seaport sustainability

The ever-changing nature and role of seaport ownership has led to establishment of seaports as service centers that coordinate the transport network and introduce many value-added services, particularly in shipping operations (such as consolidation services, cross-docking operations, and one-stop center for meetings among the stakeholders) (Berseney et al., 2020). Seaport sustainability according to Gunawan *et al.* (2020) includes three main perspectives: i) economic perspective including return on investment, efficiency of use of port area, and provision of facilities for companies to maximize performance; ii) social scope such as direct contribution to employment in port companies and activities connecting to the port (indirect employment, interaction and relationship between port and city, contribution to knowledge development and education, and livability of the area surrounding the port); and iii) environmental performance and management, including noise pollution, air quality, dredging operations, and disposal.

Economic Orientation

Economic orientation measures the economic impact of factors that have the potential to affect the market based on their performance and productivity. It explain factors that lead to increase in economic value. Economic sustainability enhances port economic performance (Park *et al.*, 2019). While port economic orientation facilitate trade, it goes without saying that such actions uphold environmental and social sustainability.

Economic environment refers to external factors that impact commercial aspects of an economy, such as buying behavior and taste of consumers and organizations (Aziz *et al.*, 2020). Economic orientations and measures are diverse (internal and external). Although they are interconnected, an attempt is made to aggregate them into social orientation, trade and logistics facilitation, and digitalisation actions. According to Ferrari *et al.* (2021) one way to achieve economic orientation is by collaborating with the financial system to fix value chain problems in the maritime sector, since economic development is about enhancing the productive capacity of an economy by using available resources and reducing risks and impediments which could hinder investment.

Social Orientation

Social orientation is the contribution made by organizations to support the development of society (Kim & Song, 2019). It looks at what the entity has to offer to the society as a whole. It is the entities' obligation to the society, which ensure balance in the economy and the ecosystem. Social orientations in seaports are important. While being socially sustainable, seaports take action (internal and external) to improve issues regarding employees, community, supply chain members and stakeholders. Social orientations have been aggregated to encompass employees' rights, safety and security, community and seafarers.

Mudronja *et al.* (2020) stressed that social orientation reflects an entities' commitment to do "the right thing" for the society. The entity here could be an individual or an organization. If all entities adopt social orientation in the country, it will be easy to drive strategic priorities, involving provision of basic amenities like stable power supply, good roads, water supply and education. If power supply is stable, it will aid the lifestyle of the people and reduce running cost of businesses, especially small and medium scale businesses that generate their own power in the absence of public power supply.

Environmental Orientation

Environmental orientation refers to the recognition by managers of the importance of issues of the physical environment that face their firms (Pu & Lam, 2020). It can be conceived as a firm's strategic

orientation to operate in a sustainable manner and constitute an integral part of its overall strategic stance that guides its strategy development and business operations (Psaraftis & Kontovas, 2021). In addition, environmentally friendly services (e.g., ships’ hull and propeller cleaning) can be delivered, while, on the other hand, care should be taken to observe the standard of ship’s sanitation equipment (Martin, 2019).

Oil and chemical spills from liquid bulk ships are common within and around seaports. In this manner, oil spill contingency plans cover measures that should be taken to prevent, control, and respond to any spill. Spillages can be secured by deploying booms and skimmers (Gani, 2017). Environmental orientation means protecting the environment, an individual, an organization from harm. Due to advances in technology, new industries continuously emerge, and these cause both temporary and permanent degradation to our built environment and natural environment (Jović *et al.*, 2022).

Forensic accounting and Seaport Sustainability

Seaports connects cities and accommodate human activities, coupling social, economic and environmental systems with urbanization (Okoye & Gbegi, 2013). Efficient forensic accounting deploy the capacity to use investigative skills of accounting experts who operate with impeccable evidence to achieve needs of a society in a manner that is least damaging to the environment and does not impair the needs of future generations (Bersenev *et al.*, 2020). According to Serra *et al.* (2020), among auditing functions, forensic accounting introduces high clarity and evidence-based options that impact on economic, social and environmental issues in our society.

Kurniawan *et al.* (2022) argue that the importance of incorporating sustainable forensic accounting practices for logistics service providers, especially in port operations cannot be over emphasized. Proper practice on sustainable logistics reduces carbon footprint, travel time and increases truck load utilization and proper planning on resource usage.

Zang *et al.* (2020) examined the impact of supply chain security practices on operational performance among logistics service providers in an emerging economy. The study found that sustainable logistics performance is a function of sustainability approach to transport services and service delivery to clients. To measure sustainable logistics practices, the study formulated logistics service execution to measure environmental aspects, pricing and service offerings to gauge the economic measure and labor as part of social aspect and found all to be significantly related to port performance.

Based on the foregoing, we hypothesize that:

- Ho₁: There is no significant relationship between forensic accounting and economic orientation of seaports in Nigeria.
- Ho₂: There is no significant relationship between forensic accounting and societal orientation of seaports in Nigeria.
- Ho₃: There is no significant relationship between forensic accounting and environmental orientation of seaports in Nigeria.

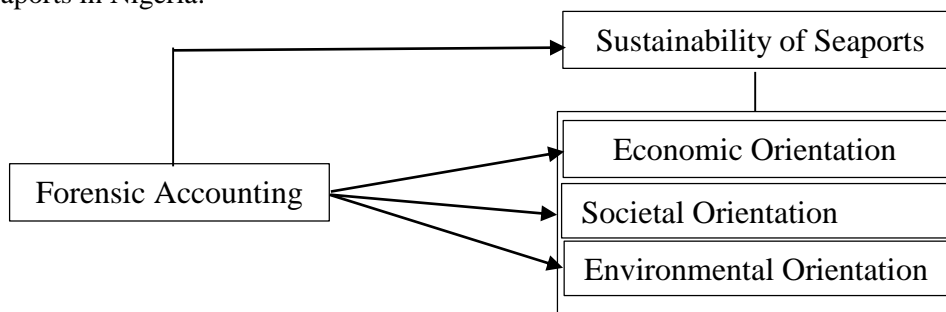


Fig. 1: Operational framework of relationship between forensic and sustainability of seaports in Nigeria
 Source: Adapted from Okpara and Enyioko (2022); Xie *et al.* (2021).

METHODOLOGY

The research design applied in this study was the survey research design. The consensus opinion emanating from scholars is that population of the study consists of a complete group of entities sharing some common characteristics (Akujuru & Enyioko, 2018). The population of the study consist six seaports in Nigeria. The sample size of the study was the same as the population. Questionnaire was the major research instrument used to elicit data from respondents. The study utilized face validity determine the validity of the research instrument. The reliability of the instrument was verified by conducting a confirmatory test of internal consistency, using the Cronbach's (1970). Hence, only result of 0.7 and above was considered acceptable while any result below 0.7 was discarded. In this study, percentages, ratios, frequency distribution, scaling, ranking and other statistical tools were used to analyse and achieve research objectives. Also, Pearson's Product Moment Correlation Coefficient (r) was used to test the hypotheses formulated in the study as they test relationships.

RESULTS AND DISCUSSION

Table 2: Responses on Forensic accounting

	Question Items on Forensic accounting	Mean	STD
1	Forensic accounting actualizes skillful investigations for significant decisions directed toward reducing cost in seaports	4.062	0.571
2	Forensic accounting assists seaports to grow and maintain their roles in changes as well as helping them to initiate cooperation of sustainability.	3.981	0.757
3	Seaports have policies in place to ensure there are many forensic accountants that consummate extensive skillful investigations for port sustainability	4.552	0.634
4	The forensic accounting processes are closely related to seaports performance and sustainability	4.112	0.930
5	Forensic accounting facilitates the formation of a wider variety of economic, social, and environmental sustainability in seaports	4.333	0.734
	Valid N listwise	112	

Source: SPSS Window Output, Version 25.

Table 2 shows the rate at which forensic accounting relate to sustainability. The results from the five items on the 5 points scale show a distribution that reflects affirmation to the inquiries. The first item on the Table has the mean and standard deviation scores of 4.062 ± 0.571 , showing that the respondents generally agreed that forensic accounting actualizes skillful investigations for significant decisions directed toward reducing cost in seaports.

The second item on the Table; the results indicate that forensic accounting assists seaports to grow and maintain their roles in changes as well as helping them to initiate cooperation of sustainability; this was shown by the mean and standard deviation scores of 3.981 ± 0.757 . For the third item, the respondents were also more inclined to the agree range with the mean and standard deviation scores of 4.552 ± 0.634 which revealed that seaports have policies in place to ensure there are forensic accountants that consummate extensive skillful investigations for port sustainability.

In the case of the fourth item, the mean and standard deviation scores of 4.112 ± 0.930 , implies that respondents were more favorable to the agree option that forensic accounting processes are closely related to seaports performance and sustainability. The fifth item showed the mean and standard deviation scores of 4.333 ± 0.734 , indicate that forensic accounting facilitates the formation of a wider variety of economic, social, and environmental sustainability in seaports.

Table 3: Responses on Economic Orientation

Question Items on Economic orientation	Mean	STD
1 Economic orientation impacts on factors that have the potential to affect the stakeholders on their performance and productivity of seaports	4.848	0.373
2 Economic orientation accentuates the factors that lead to higher increase in economic values in the seaports.	4.190	0.588
3 Economic orientation is achieved in seaports after giving bundles of satisfaction to clients through effective and efficient services	4.352	0.770
4 Seaports economic orientations maintain and facilitate trade, it goes without saying that such actions uphold environmental and social sustainability.	4.281	0.808
5 Economic orientation is linked to trade facilitation measures, improve the economic advantages of supply chains and stakeholders, and thus renders its operation cost efficient in seaports.	4.214	0.576
Valid N listwise		112

Source: SPSS Window Output, Version 25.0

Table 3 shows descriptive results on economic orientation which is measured with five items on the 5-point scale. The first item had the mean and standard deviation scores of 4.848 ± 0.373 meaning that the respondents agreed that economic orientation impacts factors that have the potential to affect the stakeholders on their performance and productivity of seaports. The second item showed the mean and standard deviation scores of 4.190 ± 0.588 indicating positive agreement from the respondents.

In the case of the third option, the mean and standard deviation scores of 4.352 ± 0.770 revealed that the respondents agreed that economic orientation is achieved in seaports after giving bundles of satisfaction to clients and customers through effective and efficient services that enhance seaports sustainability. Also, the fourth items had the mean and standard deviation scores of 4.281 ± 0.808 as agreed by the respondents. The fifth item has the mean and standard deviation scores of 4.214 ± 0.576 which reflects that the respondents agreed that economic orientation is linked to trade facilitation measures, improve economic advantage of supply chains and stakeholders, thus renders seaports operations more cost efficient.

Table 4: Responses on Social Orientation

Question Items on Social Orientation	Mean	STD
1 Social orientations in seaports are of paramount importance for socially sustainable seaports to take action—internally and externally—to improve issues regarding employees, community, supply chain members and stakeholders.	4.338	0.709
2 Seaports' actions to minimise environmental externalities are overarching and highly covered in the seaports.	3.933	0.872
3 Social orientation is the contribution made by seaports to support the development of the environment	4.295	0.823
4 Social orientation uses various measures to realize relevant actions, thereby improving the welfare of employees, decreasing accidents and socially engaging and supporting the community to enhance sustainability in seaports.	4.262	0.832
5 A major way of achieving social orientation is by collaborating and enhancing the capacity of the society by using available resources to reduce risks and remove impediments.	4.757	0.556
Valid N listwise		112

Source: SPSS Window Output, Version 25.0

Social orientation as a measure of sustainability of seaports was examined and expressed in Table 4, in the studied seaports and 5 items were raised. For the first item, the result indicated that social orientations in seaports are critical to socially sustainable seaports to take action -internally and externally - to improve issues regarding employees, community, supply chain members and stakeholders. The mean and standard deviation scores of 4.338 ± 0.709 prove that. The second item with the mean and standard

deviation scores of 3.933 ± 0.872 is an indication that the respondents agreed that seaports' actions to minimise environmental externalities are overarching and highly covered in the seaports.

The third item has the mean and standard deviation scores of 4.295 ± 0.823 revealed that the respondents agreed that social orientation is the contribution made by seaports to support the development of the environment. The fourth item had mean and standard deviation scores of 4.262 ± 0.832 indicating that social orientation uses various measures to realize relevant actions, thereby improving the welfare of employees, decreasing accidents and socially engaging and supporting the community to enhance sustainability in seaports. The fifth item had mean and standard deviation scores of 4.757 ± 0.556 indicate that a major way of achieving social orientation is by collaborating and enhancing the capacity of the society by using available resources to reduce risks and remove impediments.

Table 5: Responses Environmental Orientation

Question Items on Environmental Orientation	Mean	STD
1 Social orientations in seaports are of paramount importance for socially sustainable ports to improve issues regarding employees, community and stakeholders	4.605	0.765
2 Seaports actions to minimise environmental externalities are overarching and highly covered in the ports.	4.605	0.699
3 Social orientation is the contribution made by seaports to support the development of the environment	4.457	0.771
4 Environmental orientation is essential for the development of its eco-capability to transform corporate resources into creating value	4.576	0.495
5 Environmental orientation is collaborating with the social system to fix the value chain problems in seaports.	3.957	1.159
Valid N listwise	112	

Source: SPSS Window Output, Version 25.0

Environmental orientation as a measure of sustainability of seaports was examined and empirically expressed in Table 5 in the studied seaports. 5 items were raised on it. For the first item, the result indicated that the mean and standard deviation scores of 4.605 ± 0.765 were the evidence that environmental orientation uses various measures to realize relevant actions, thereby improving the welfare of employees, decreasing accidents and socially engaging and supporting the community to enhance sustainability in seaports. The second item with the mean and standard deviation scores of 4.605 ± 0.699 indicate that the respondents agreed that seaports' actions to minimise environmental externalities are overarching and highly covered in the seaports. The third item has the mean and standard deviation scores of 4.457 ± 0.771 indicating that respondents agreed that seaports support the preservation of the environment. The mean and standard deviation scores of 4.576 ± 0.495 indicate that forensic accounting assists seaports to grow and maintain their roles in changes as well as helping them to initiate cooperation of sustainability. The fifth item had the mean and standard deviation scores of 3.957 ± 1.159 indicating that environmental orientation recognizes the managers of the importance of environmental issues facing seaports.

Table 6: Test Result of forensic accounting and sustainability of seaports

Statistics	HO ₁ FA (ECONO)	HO ₂ FA (SOCO)	HO ₃ FA (ENVO)
Pearson correlation	0.753**	0.804**	0.658**
Sig(2-tailed)	.000	.000	.000
N	112	112	112

**correlation is significant at the 0.01level (2-tailed)

Source: Survey Data, 2023, and SPSS Window Output, Version 25.0

Table 6 shows the inferential test results on the relationships between forensic accounting and measures of seaport sustainability (economic orientation, social orientation and environmental orientation). These are also expressed in the research hypotheses H_{01} , H_{02} and H_{03} . In the case of H_{01} , the $P(r)$ value of 0.753 and PV of $0.000 < 0.01$ shows that a strong positive and significant relationship exists between forensic accounting and economic orientation. Thus, the null hypothesis was rejected

In the case of H_{02} which examined the relationship between forensic accounting and social orientation, it shows a strong positive and significant relationship. This is indicated with a $P(r)$ value of = 0.804 and a PV of $0.000 < 0.01$. The null hypothesis is also rejected in this instance. For H_{03} , the $P(r)$ value of 0.658 and PV of $0.000 < 0.01$ shows a moderate but significant relationship between forensic accounting and environmental orientation. The null hypothesis is also rejected. Thus, the study infers that there is a strong positive and significant relationship between forensic accounting and seaport sustainability in Nigeria.

DISCUSSION OF FINDINGS

The result associated with the relationship between forensic accounting and sustainability of seaports points to the fact that forensic accounting as a critical and evidence-based investigation relates positively and significantly to sustainability of seaports in Nigeria. A vivid examination of the finding reveals that a strong positive and significant relationship exists between forensic accounting and economic orientation as a measure of sustainability of seaports in Nigeria with a $P(r)$ value of 0.753. This finding agrees with the work of Ezenwa *et al.* (2020) that forensic accounting utilizes skillful investigations for significant decisions directed toward reducing cost in seaports.

A further critical analysis of the finding revealed that a strong, positive, and significant relationship exists between forensic accounting and social orientation as a measure of sustainability of seaports in Nigeria with r -value of 0.804. On the other hand, the costs associated with more forensic accounting would be related to more difficult communication and coordination (Bankole *et al.*, 2017). The study found that forensic accounting assists seaports to grow and maintain their roles in changes as well as helping them to initiate cooperation of sustainability.

Categorically, a critical analysis of the finding revealed that a moderate, positive, and significant relationship exists between forensic accounting and environmental orientation as a measure of sustainability of seaports in Nigeria with r -value of 0.658. The results agreed with Wong *et al.* (2017) where the results showed that engaging supplier with higher environmental management capabilities will help focal firm for a better performance environmentally and financially.

CONCLUSION AND RECOMMENDATIONS

This study has been embarked upon to examine the relationship between forensic accounting and sustainability of seaports in Nigeria. The conclusion of this study offers all-inclusive outcomes of the study. Conclusively, it is apparent in this study there is: positive significant relationship between forensic accounting and economic orientation ($r = 0.753$); positive and significant relationship between forensic accounting and social orientation ($r = 0.804$) strong positive and significant relationship between forensic accounting and environmental orientation ($r = 0.658$). Based on the findings and conclusion of the study, the following recommendations have been made:

- a) Government should create and encourage conducive forensic accounting environment so that seaports and other stakeholders can benefit from the economic, social and environmental gains arising from port sustainability in Nigeria.

- b) Seaports should design and evolve effective forensic accounting skills and investigative instruments, then implement and monitor them in collaboration with major strategic port operators for port sustainability initiatives.
- c) The development of forensic accounting by seaports in Nigeria should be based on knowledge, technologies and innovative research, which would help to build effective access to transport and integrate other sectors that align with seaports for sustainability objectives.
- d) Seaports in Nigeria should adapt forensic accounting system in various forms so that frauds could be effectively and efficiently prevented/detected for sustainability of the seaports in Nigeria

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