Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 1, 719-727
2025
Publisher: Learning Gate
DOI: 10.55214/25768484.v9i1.4236

Inland water transportation attributes and marketing performance of micro-businesses

Joseph A. Anyadighibe[1*], Peter Kekung Bessong[2], John Oyong Ogar-Abang[3], Alphonsus Kechi Kankpang[4], Joseph Enyam Nkiri[5], Egu Usang Inah[6], Iwara Okoi Etim[7], Christiana Chukwu Nwobodo[8]
[1,8]Department of Marketing, Faculty of Management Sciences, University of Calabar, Nigeria; janyadighibe@yahoo.com (J.A.A.) Christiananwobodo95@gmail.com (C.C.N.).
[2,3,4,5,6,7]Department of Accounting, Faculty of Management Sciences, University of Calabar, Nigeria; Bessongkekung61@gmail.com (P.K.B.) ogarabang@unical.edu.ng (J.O.O.A.) drkechi@gmail.com (A.K.K.) Joseph.nkiri@yahoo.com (J.E.N.) eguinah@yahoo.com (E.U.I.) iwaraetim@unical.edu.ng (I.O.E.).

Abstract: The study explored inland water transportation attributes (cost, safety, security, multiple taxation, and climate change) and marketing performance of micro agricultural businesses in Cross River State. Cross-sectional survey research design and structured questionnaire were used for the study. The population of the study was micro agricultural businesses and 160 owners of micro agricultural businesses constituted the sample size. Multiple linear regression analysis was used to test the hypotheses of the study. The findings revealed that transportation cost, safety, security and climate change had significant positive effects on the marketing performance of micro agricultural businesses, while multiple taxation was significantly negative. Therefore, the study recommended that regulators of inland water transportation channels should make transportation fares more affordable, provide more safety accessories, security architecture in the waterways to be consistently reviewed and improved in order to guard against and eliminate potential threats, multiple and disproportional tax rates levied on micro agricultural businesses should be made fairer and more closely proportional to the volume of merchandise they carry in order to shore up the performance of these businesses.

Keywords: *Climate change, Cost, Inland water transportation, Marketing performance, Multiple taxation, Safety, Security.*

1. Introduction

The effective and efficient movement of people and goods are essential tools for every country's economic success, whether developing or developed. Consequently, transportation modes such as; cars, trains, ships, aeroplanes, and many more have been created to facilitate the movement of people and products. Among these, the most dominant modes as advanced by literature are water (marine and inland waters), road, rail, air, cable, and pipeline [1]. Due to the need to uphold the principles of social marketing, many scholars and business practitioners are increasingly advocating for the use of transportation modes with minimal environmental pollution, bad roads, congestion and kidnapping. Among the most common transportation modes, inland transportation stands out as the most environmentally friendly, as it causes minimum environmental pollution such as Carbon dioxide emissions (CO_2 emission) and noise pollution when compared to other modes of transportation [1].

Inland water transportation (IWT) refers to the movement of products or people by means of a watercraft (such as boats, river ferries, pontoon) over a body of water, such as a lake, river or canal [1-6], whereas marine transport uses cargo ships, passenger ships, boats, etc. In maritime transport service delivery, the inland waterway transportation makes use of pontoons, river ferries, wooden boats and others to transport goods such as cargo solid (agricultural products, manufactured goods, building

History: Received: 16 December 2024; Revised: 1 January 2025; Accepted: 6 January 2025; Published: 13 January 2025
* Correspondence: janyadighibe@yahoo.com

materials, raw materials, cultural items, chemicals, scrap, tools, oil and gas) as well as movements of passengers [7]. As advocated by Kurup [8]; Roger [9] and Kuteyi and Winkler [10] inland waterway transportation is an indispensable catalyst for activating and boosting the pace of economic, social, political, and sustainable development in any socio-economic system. Among all the transport modes, it is the least capital-intensive, environment-friendly, can supplement rail and road transport, help in the decongestion of roads, is best suited to carry over-dimensional cargo, requires minimum land acquisition and has low infrastructure costs. To add to this, many communities in Nigeria are currently witnessing natural disasters like floods. This further underscores the need for inland water transportation. Despite its benefits and potentials, inland water transportation constitutes less than 1 per cent of the total inland cargo movement in many developing countries such as Nigeria [8]. With these economic, safety and environmental benefits accrued to inland water transportation, it is important to examine how this mode of transportation would affect the marketing performance of micro businesses in developing countries like Nigeria; a direction this paper takes.

2. Theory and Hypotheses

2.1. Theory of Dynamic Capabilities

The theory of dynamic capabilities was conceptualized by Teece, et al. [11] in their study "Dynamic Capabilities and Strategic Management". The theory holds that the ability of an organization to actively adapt its resource base is known as dynamic capability. In order words, it is the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments. Dynamic capabilities should be considered as the primary sources of value creation, which enable firms to identify opportunities/threats in the market and to exploit/neutralize them by firms' resources and capabilities [12-14].

Small and Medium Enterprises (SMEs) ability to create value lies in their ability to pass through the four processes of the dynamic capability's framework, which are sensing, learning, integrating and coordinating capabilities Teece [13]. Firms' sensing capability lies in the dynamic search for opportunities and threats in order to shape and interpret opportunities in the market. This helps SMEs to monitor the changing environment, analyze information and take timely and effective decisions. Learning capability is the ability of firms to address the opportunities identified by sensing capability through proposing new products/services or processes (such as means of transportation in the case of this research). Integrating capability enables firms to combine individual knowledge, acquired by learning capability, into a firm's operational capabilities by creating shared understanding and collective sense-making. Coordinating aims to sustain a firm's competitiveness through dynamic redirecting and realigning the resource base [15]. The dynamic capabilities theory is applicable to this study as it considers logistic decisions taken by the micro-businesses in the aspect of transportation.

2.1.1. Integrated Performance Measurement for Small Firms

The integrated performance measurement for small firms also known as the framework for small business performance measurement was propounded by Laitinan [16]. This theory emphasizes customer satisfaction and advocates for a purely bottom-up perspective on performance. The performance measurement for small firms is based on seven main dimension measures, classified as two external dimensions (financial performance and competitiveness), and five internal dimensions comprising; costs, production factors, activities, products and revenues [17]. The internal dimensions are used to monitor the entire production process and the external dimensions are used to monitor the company's competitive position. Conceptually, this model is easy to implement by small businesses [18]. Hence, its suitability for this study aimed at examining the influence of inland waterway transportation on the marketing performance of micro-businesses.

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 1: 719-727, 2025
DOI: 10.55214/25768484.v9i1.4236

2.2. Inland Waterways Cost

Inland waterways cost are issues related to transactional purposes such as; fees, product cost, and high transportation expenses. Globally, economic concerns are inevitable in inland water transportation. For example, the majority of countries in the Nile region experience exorbitant transportation costs when it comes to accessing global markets. Their transportation and insurance costs are high, especially when compared to developing countries on continents like Asia and South America. Although all countries have high transportation expenses, the landlocked riparian countries — Burundi, Ethiopia, Rwanda, South Sudan, Uganda, and the eastern section of the Democratic Republic of Congo – face greater difficulties [19]. Water transport is the cheapest means of transportation for bulk goods and enables countries to reduce transport costs for bulk imports and exports. If properly developed, water transport could play a vital role in unlocking the economic potential, and increasing competitiveness and integration, of countries that share waterways. In the views of Nwoye, et al. [20]. Inland water transportation is a cost-effective, logistically efficient, and environmentally friendly mode of transportation that, if developed as a supplementary mode, would allow traffic to be diverted away from congested roads and railways, while also contributing to economic and social development.

Thus, this study hypothesizes that:

H_{01}: IWT cost does not significantly affect the marketing performance of micro agricultural businesses.

2.2.1. Inland Waterways Safety

In terms of safety, when compared to other modes of transportation, the risks of accidents and breakdowns are minimal in inland water transportation. According to House [21] navigational safety simply means that vessels can navigate and operate safely, prevent collisions, groundings, and minimize navigational errors to preserve human life, the environment, and neighbouring properties. The International Maritime Organisation (IMO) has been working to attain the goal of safety in the maritime industry since 1959. Some steps have involved introducing a variety of measures in the form of conventions, recommendations, and other instruments that its members continue to implement and enforce [22]. The instruments include a series of codes, resolutions, guidelines and performance standards. For instance, in Kenya, under the State Government (ACT 419, 1920), the local authority has jurisdiction in the area to determine how to implement safety regulations in inland waterways [23].

In Nigeria, according to Section 216 of the Merchant Shipping Act of 2007 (MSA) Nigerian maritime law on marine safety is largely based on the different agreements and protocols established by the International Maritime Association's various Member States. The MSA establishes the office of Surveyor of Ships, which is appointed by the Minister for any reason or occasion, and whose statutory function is to inspect a vessel to determine its seaworthiness. Section 219(4) of the MSA requires the owner of a Nigerian ship or coastal trade and inland watercraft to have the ship surveyed at least once a year in accordance with the Act's procedures [24]. This circumstance highlights the need for people to take inland waterway safety seriously, as well as safety in the creeks and rivers where many of our people work as fishermen and women or as passenger boat operators. Thus, this study conjectures that:

H_{02}: The marketing performance of micro agricultural businesses is not significantly affected by IWT safety.

2.2.2. Inland Waterways Security

Inland waterways security refers to the protection of navigable rivers, lakes, and canals from acts of terrorism, theft, smuggling, piracy, and other criminal activities [25]. The rise of global terrorism, transnational organized crime, and increased trafficking of illegal goods have highlighted the vulnerability of inland waterways [26]. As such, the need for robust security measures to safeguard the smooth flow of trade and commerce, as well as the safety of vessels and their crews, has become imperative. The provision of adequate equipment and resources, such as high-speed patrol boats, firearms, police, coast guard, intelligence agencies, fencing, lighting, surveillance cameras, access controls, biometric identification (facial recognition and iris scanning), real-time monitoring systems

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 1: 719-727, 2025
DOI: 10.55214/25768484.v9i1.4236

(vessel tracking and surveillance systems) are crucial in ensuring an effective response to security incidents [4, 27-31]. Thus, this study conjectures that:
Ho_3: IWT security does not significantly affect the marketing performance of micro agricultural businesses.

2.2.3. Inland Waterways Taxation

Inland waterways have become a vital mode of transportation in Nigeria, contributing to the country's economic development and providing alternative means of mobility for both goods and people. Despite its significance, the taxation system for inland waterways has been a major challenge for the Nigerian government, with several issues arising that impede the growth of the sector [32]. The taxation system for inland waterways in Nigeria is primarily based on the taxes levied on vessels, freight charges, and import and export duties. However, the high cost of these taxes and charges has been identified as one of the major challenges facing the inland waterway sector [20, 33, 34]. The taxes and charges levied on vessels and freight charges have been described as exorbitant, leading to an increase in the cost of transportation by water, which in turn negatively affects the competitiveness of the sector. With continued efforts to address these challenges, it is hoped that the inland waterway sector in Nigeria will address the issue of multiple taxation to encourage the use of water transportation by micro agricultural businesses. Thus, this study hypothesizes:

Ho_4: The marketing performance of micro agricultural businesses is not significantly affected by IWT taxation.

2.2.4. Inland Waterways Climate Change

Climate change (or environmental) factors have been identified as affecting the decision to use inland transportation by individuals and businesses. On broad environmental grounds, inland waterways transport produces little noise, a relatively low level of atmospheric pollution and vibration, it also serves to reduce heavy vehicular traffic on roads system which in many places are already congested or costly to maintain. The climate change including unusually prolonged droughts and recurrent flooding, have been experienced in the recent past and this has serious implications for water security and agricultural areas adjacent to rivers and fishing on which millions of Nigerians depend for their food. These changes are also affecting Nigerian's demography with more and more formerly rural Nigerians moving from the coastal regions and cities in search of employment. These have the potential to place stress on urban economics and ultimately affect marketing activities along the inland waterways. Negative weather condition factors pointed out by Adesina, et al. [35] are drought and flood. Droughts cause water levels to become critically low, thereby imposing limitations to navigation services. On the other hand, flood causes an increase in water level. This can increase the likelihood of accidents currents and travel times, thereby affecting the marketing performance of the firm. Thus, this study hypothesizes that:

Ho_5: Climate change has no significant influence on the marketing performance of micro agricultural businesses.

2.3. Marketing Performance

Marketing performance is the ability of micro agricultural businesses to deliver social, economic and environmental value to customers in order to enhance sustainable financial and non-financial outcomes. Marketing performance is the performance of a firm that can be measured through availability of goods, market share, sales revenue, competitive advantage, and profitability.

3. Methodology

The study adopted a cross-sectional survey research design. This research design helps to capture, describe the characteristics of the study population and enhances the collection of primary data directly from the respondents devoid of intentional manipulation by the researcher. The area of the study was

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 1: 719-727, 2025
DOI: 10.55214/25768484.v9i1.4236

Calabar, Cross River State, Nigeria**.** The target population for this study comprise all micro agricultural business owners in Cross River State that make use of inland water transportation for their business.

The purposive sampling technique and structured questionnaire were adopted for this study. Inland water transportation attributes were measured by cost, safety, security, multiple taxation and climate change concerns. Five (5) point Likert scale of strongly agree, agree, neutral, disagree and strongly disagree were used in measuring respondents' responses to the research statement in the questionnaire. Marketing performance was measured by availability of goods, profitability, sales revenue and competitive advantage. Furthermore, the instrument was divided into two sections, A and B. Section A captured the demographic information such as sex, age, academic qualification, marital status, length of experience with using inland waterway transportation. Section B, contained statements drawn from the study variables (cost, safety, security, multiple taxation, climate change and marketing performance). On the questionnaire, statements 1-5 measured personal data, statement 6-9 were adapted to measure cost concern. Statements 10-13 were adapted to measure safety concern; statements 14-17 were adapted to measure security concern; statements 18-21 were adapted to measure multiple taxation; statement 22-25 were adapted to measure climate change and statements 26-29 were adapted to measure marketing performance. Content and construct validity were utilized to confirm the validity of the structured questionnaire that was used to gather data in this study. The reliability of the research instrument was tested through the use of Cronbach alpha reliability procedure. A pilot survey was conducted by the researcher among small and micro agricultural businesses that use inland water transport in the nearby Odukpani Local Government Area that is not part of the study population. The reliability result ranged from 0.742 to 0.795

Table 1.
Model summary of the effect of inland water transportation attributes on the marketing performance of micro agricultural businesses.

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.779[a]	0.606	0.593	0.53824

Note: a. Predictors: (Constant), Transportation cost, transportation safety, transportation security, multiple taxation and climate change.
b. Dependent Variable: Marketing performance.

Table 2.
ANOVA[a] of the effect of inland water transportation attributes on the marketing performance of micro agricultural businesses.

Model		Sum of squares	Df	Mean square	F	Sig.
1	Regression	68.695	5	13.739	47.424	0.000[b]
	Residual	44.614	154	.290		
	Total	113.309	159			

Note: a. Dependent Variable: Marketing performance.
b. Predictors: (Constant), Transportation cost, transportation safety, transportation security, multiple taxation and climate change.

Table 3.
Coefficients[a] of the effect of inland water transportation attributes on the marketing performance of micro agricultural businesses.

Model		Unstandardized coefficients		Standardized coefficients	T	Sig.
		B	Std. error	Beta		
1	(Constant)	0.031	0.199		18.157	0.000
	Transportation cost	0.399	0.092	0.356	4.332	0.000
	Transportation safety	0.252	0.099	0.658	2.531	0.002
	Transportation security	0.213	0.106	0.423	2.013	0.006
	Multiple taxation	-0.097	0.090	-0.103	-1.079	0.000
	Climate change	0.268	0.072	0.226	3.727	0.000

Note: a. Dependent Variable: Marketing performance.

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 1: 719-727, 2025
DOI: 10.55214/25768484.v9i1.4236

4. Data Analysis and Results

4.1. Results and Hypotheses Testing

The results on Tables 1, 2 and 3 demonstrate the effects of inland water transportation attributes on the marketing performance of micro agricultural businesses in Cross River State. The correlation coefficient (R = 0.779) in Table 1 reveals that the relationship between inland water transportation attributes and marketing performance of micro agricultural businesses is 77.9 per cent. This indicates a very high degree of relationship between the variables in the context of this study. The coefficient of determination (R^2 = 0.606) indicates that inland water transportation attributes account for up to 60.6 per cent of the variation in the marketing performance of micro agricultural businesses. This implies that if other factors remain unchanged, inland water transportation attributes will affect the marketing performance of micro agricultural businesses by up to 60.6 per cent. Given that F= 47.424 and p= 0.000 as shown in Table 2, it indicates that the effect of inland water transportation attributes on the marketing performance of micro agricultural businesses is statistically significant. As such, from the standardized coefficients column in Table 3, it has been revealed that with a beta coefficient of 0.658 or 65.8 per cent, transportation safety had the highest contribution to the regression model. The second-highest contributor to the model is transportation security, with a beta coefficient of 0.423 or 42.3 per cent. The third-highest contributor to the model is transportation cost, with a beta coefficient of 0.356 or 35.6 per cent, while weather condition had the least contribution to the model, with a beta coefficient of 0.226 or 22.6 per cent. However, the results show that multiple taxation had a negative contribution to the model, with a beta coefficient of -0.103 or -10.3 per cent. This means that a unit increase in multiple taxation would result in a 10.3 per cent decrease in the marketing performance of micro agricultural businesses, if other factors remain unchanged. In addition, Table 3 shows that the p-values of all the variables tested were less than the error margin of 0.05, with positive t-test values except one variable: [(transportation cost: p-value = 0.000, t = 4.332); (transportation safety: p-value = 0.002, t = 2.531); (transportation security: p-value = 0.006, t = 2.013); (multiple taxation: p-value = 0.000, t = -1.079); and (climate change: p-value = 0.000, t = 3.727)]. This implies that while transportation cost, safety, security and climate change had significant positive effects on the marketing performance of micro agricultural businesses, multiple taxation had a significant negative effect on marketing performance in this regard. Hence, all null hypotheses were rejected and the corresponding alternative hypotheses were accepted, leading to the conclusion that transportation cost, safety, security and climate change had significant positive effects on the marketing performance of micro agricultural businesses, while the effect of multiple taxation in this respect is significantly negative.

4.2. Discussion of Findings

In hypothesis one, it was revealed that IWT cost has a significant positive effect on the marketing performance of micro agricultural businesses. This finding aligns with the study of Nwoye, et al. [20] on prevalent safety hazards and safety practices in maritime transportation in selected states in southern Nigeria. The study revealed that inland water transportation is a cost-effective, logistically efficient, and environmentally friendly mode of transportation with the capacity to serve as a supplementary mode to lessen the pressures from congested roads and railways, while also contributing to economic and social development. In the context of this study, the implication of this finding is that changes in inland water transportation costs can have significant effects on the marketing of micro agricultural businesses in Cross River State. As such, for the marketing performance of these businesses to be improved, an effective approach would be to ensure that inland water transportation costs are kept low and affordable for micro agricultural firms. The test of hypothesis two revealed that transportation safety has a significant positive effect on the marketing performance of micro agricultural businesses. This finding is backed by the studies of Osnin and Rahman [23] on assessment of inland navigation at Kenyir Lake to safeguard societal wellbeing. The study revealed that with the local authorities exercising their jurisdiction in safeguarding the waterways, vessels will navigate and operate safely. This will also prevent collisions, groundings, and minimize navigational errors to preserve human life, the

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 1: 719-727, 2025
DOI: 10.55214/25768484.v9i1.4236

environment, and neighbouring properties. In the context of this study, the implication of this finding is that the degree of inland water transportation safety can have significant influences on the marketing performance of micro agricultural businesses. This entails that if inland water transportation is generally perceived as safe by micro agricultural businesses, then more businesses will intensify their activities on the waterways, which will enhance marketing performance in the long run. However, if inland waterways are considered unsafe by micro agricultural businesses, then more of such businesses will avoid transporting merchandize through the waterways, which might cost them more money and business opportunities. The test of hypothesis three revealed that transportation security has a significant positive effect on the marketing performance of micro agricultural businesses. This finding is reinforced by the study of Christodoulou, et al. [36] on analysis of inter-city water transportation in Lagos State. It was revealed that the business performance of African businesses can be significantly enhanced by improving the security and safety of inland water transportation systems. In the context of this study, the implication of this finding is that if the security of passengers and merchandize being transported through the waterways can be guaranteed, then the marketing performance of micro agricultural businesses in will be greatly improved. In such a scenario, micro agricultural businesses can transport their goods with increased confidence through the waterways with adequate assurance that they will arrive the intended market to be sold for profit. In addition, the test of hypothesis four revealed that multiple taxation has a significant negative effect on the marketing performance of micro agricultural businesses. This finding is backed by the study of Ademiluyi, et al. [37] which revealed that multiple taxation significantly degraded the performance of micro, small and medium enterprises in Kenya. In the context of this study, the implication of this finding is that the performance and business prospects of micro agricultural businesses in Cross River State will be stifled and impeded if they continue to be suppressed with multiple taxation. By imposing multiple taxes on micro agricultural businesses, the sales revenue and profitability of these enterprises will be greatly diminished, thereby depleting their return on investment and competitiveness. Furthermore, the test of hypothesis five revealed that climate change has a significant positive effect on the marketing performance of micro agricultural businesses. This finding is backed by the study of Adesina, et al. [35] on identifying the main opportunities and challenges from the implementation of a port energy management system: A SWOT/PESTLE analysis which revealed that environmental factors such as climate change can have far-reaching and wide-ranging impacts on the business performance of firms relying on inland water transportation for their operations. In the context of this study, this finding implies that weather condition is an important inland water transportation attribute which should be considered priority in order to guard against transportation disruptions and preventable losses, capable of undermining the marketing performance of micro agricultural businesses.

5. Conclusion and Recommendations

5.1. Conclusion

Given the rising costs, poor state of road networks, high rate of road accidents and perceived dangers on the highways, micro and small-scale agricultural businesses, especially in rural areas tend to prefer transporting their merchandise by water to the marketplace. Through descriptive and inferential data analytical techniques, the study found that transportation cost, safety, security and climate condition had significant positive effects on the marketing performance of micro agricultural businesses, while the effect of multiple taxation in this respect was significantly negative. Therefore, the study concluded that there is need for a concerted effort to regulate and coordinate these inland water transportation attributes to ensure that they sustain and enhance the performance of micro agricultural businesses in order to reinforce their contributions to economic growth in Nigeria.

5.2. Recommendations

1. Regulators of inland water transportation channels should deliberately review the transportation fares for micro agricultural businesses to make them more affordable and consistent to

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 1: 719-727, 2025
DOI: 10.55214/25768484.v9i1.4236

enable them generate profit from their marketing activities, thereby improving food availability, and improve sales revenue, which ultimately translates into increased profitability.

2. Inland water transportation authorities should provide more safety accessories such as life jackets, throwable floatation devices, fire extinguishers, sound signaling and visual signaling devices to facilitate the smooth transportation of people and goods without potentially lethal accidents on the waterways.

3. There is need for the security architecture in the waterways to be consistently reviewed and improved in order to guard against and eliminate potential threats (such as piracy, kidnapping, militancy, among others) to the life and merchandise of micro agricultural businesses traveling by water.

4. The tax rates levied on micro agricultural businesses should be made fairer and more closely proportional to the volume of merchandise they hold so that multiple and disproportional taxes can be eliminated in order to shore up the performance of these businesses.

5. It is critical for vessel owners to update themselves with latest local weather forecasts in order to know what routes to ply to minimize the possibilities of accidents on the waterways. Inland water transportation authorities should mandate that every vessel owner or operator should be able to understand local weather reports and use them on a consistent basis before being granted the license to operate commercially on the waterways.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Copyright:

References

[1] M. I. Hamakareem, "'What are the inland waterways, its types, advantages and applications?'. The constructor," Retrieved: https://theconstructor.org/transportation/inland-waterways-types-advantages-applications/20962/. [Accessed 2018.

[2] J. Aderemo and S. A. Mogaji, "Rural transportation of public facilities in Nigeria: A case study of Edu Local Government Area of Kwara State," *Journal of Human Ecology*, vol. 29, no. 3, pp. 171-179, 2010. https://doi.org/10.1080/09709274.2010.11906260

[3] O. M. Chukwuma, "The characteristics of inland water transport in Nigeria," *IOSR Journal of Humanities and Social Science*, vol. 19, no. 3, pp. 119-126, 2014. https://doi.org/10.9790/0837-1934119126

[4] E. S. Nsan-Awaji, "The challenges and prospect of maritime industry in Nigeria," *Danubius Working Papers*, vol. 1, no. 1, pp. 42-57, 2019.

[5] A. Udechukwu and S. Mobolaji, "Operational characteristics and supply of inland waterway transportation service in the coastal area of Anambra State, Nigeria," *African Journal of Science Policy and Innovation Management*, vol. 1, no. 2, pp. 38-49, 2020.

[6] B. Solomon, E. Otoo, A. Boateng, and D. A. Koomson, "Inland waterway transportation (IWT) in Ghana: A case study of Volta Lake transport," *International Journal of Transportation Science and Technology*, vol. 10, no. 1, pp. 20-33, 2021. https://doi.org/10.1016/j.ijtst.2020.05.002

[7] A. Deja, A. Kopeć, and P. Michałowski, "Analysis of the status of Inland Waterway Transport in Poland," *AUTOBUSY–Technika, Eksploatacja, Systemy Transportowe*, vol. 19, no. 9, pp. 83-88, 2018. https://doi.org/10.24136/atest.2018.289

[8] V. Kurup, "The economic benefits of inland waterways', Financial Express," Retrieved: https://www.financialexpress.com/archive/the-economic-benefits-of-inland-waterways/965231/. [Accessed 2012.

[9] T. Roger, "Assessing the need for a sustainable inland water transport system in Liberia," Master's Thesis, Regional Maritime University, Accra, Ghana, 2013.

[10] D. Kuteyi and H. Winkler, "Logistics challenges in sub-Saharan Africa and opportunities for digitalization," *Sustainability*, vol. 14, no. 4, pp. 2399-2401, 2022. https://doi.org/10.3390/su14042399

[11] D. J. Teece, G. Pisano, and A. Shuen, "Dynamic capabilities and strategic management," *Strategic Management Journal*, vol. 18, no. 7, pp. 509-533, 1997.

[12] G. P. Pisano, "Toward a prescriptive theory of dynamic capabilities: Connecting strategic choice, learning, and competition," *Industrial and Corporate Change*, vol. 26, no. 5, pp. 747-762, 2017. https://doi.org/10.1093/icc/dtx026

[13] D. J. Teece, "Business models and dynamic capabilities," *Long Range Planning*, vol. 51, no. 1, pp. 40-49, 2018. https://doi.org/10.1016/j.lrp.2017.06.007

[14] O. Schilke, S. Hu, and C. E. Helfat, "Quo vadis, dynamic capabilities? A content-analytic review of the current state of knowledge and recommendations for future research," *Academy of Management Annals*, vol. 12, no. 1, pp. 390-439, 2018. https://doi.org/10.5465/annals.2016.0014

[15] U. Lichtenthaler, ""The performance implications of dynamic capabilities: The case of product innovation," *Journal of Product Innovation Management*, vol. 28, no. 2, pp. 1-16,, 2012.

[16] E. Laitinan, *Frame work for small business performance measurements*. University of Vaasa, Vaasan Yliopisto, 1996.

[17] Jamil and R. Mohammed, "Performance measurement system (PMS) in small medium enterprises (SMEs): A practical modified framework," *World Journal of Social Sciences*, vol. 1, no. 3, pp. 200-213, 2011. https://doi.org/10.14738/abr.23.320

[18] E. F. Langwerden, "Performance measurement system development in SMEs: Testing & refining the circular methodology," Retrieved: http://essay.utwente.nl/67492/1/Langwerden_BA_faculty.pdf. [Accessed 2015.

[19] B. Nile, "The role of inland water transport in support of further regional integration," Retrieved: http://www.nilebasin.org/sob/pdf/Chapter%207%20Transport.pdf. [Accessed 2012.

[20] S. M. Nwoye, C. Oyegun, and J. N. Ugbebor, "Prevalent safety hazards and safety practices in maritime transportation in selected states in southern Nigeria," *Open Journal of Safety Science and Technology*, vol. 9, no. 3, pp. 83-92, 2019. https://doi.org/10.4236/ojsst.2019.93006

[21] J. House, *Ship handling theory and practice*. Routledge, 2017.

[22] International Maritime Organisation, "IMO and the safety of navigation'. Imo Organization," Retrieved: http://www.imo.org/en/OurWork/Safety/Navigation/Pages/Default.aspx. [Accessed 2017.

[23] N. A. Osnin and N. S. F. A. Rahman, "Assessment and ranking of inland navigation practices in Malaysia: The case of Kenyir Lake," *The Asian Journal of Shipping and Logistics*, vol. 34, no. 4, pp. 289-296, 2018. https://doi.org/10.1016/j.ajsl.2018.12.002

[24] G. Ukwuoma and O. Ogungbe, "Safety at Sea and Collision Regulation in Nigeria," Retrieved: https://www.ibanet.org/article/51EE5497-3AD8-46C9-AE52. [Accessed 2022.

[25] T. Walker, *The successes and struggles of multilateralism: African maritime security and strategy. In: Otto, L. (Eds.), Global challenges in maritime security, advanced sciences and technologies for security applications*. Cham: Springer, 2020.

[26] B. Gesami, "A brief guide to Africa's maritime security," Retrieved: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4319050. [Accessed 2023.

[27] M. Silva, *Security measures. Strategic security management: A risk assessment guide for decision makers*. Taylor & Francis, 2019.

[28] S. Fatima, K. C. Desouza, and G. S. Dawson, "National strategic artificial intelligence plans: A multi-dimensional analysis," *Economic Analysis and Policy*, vol. 67, pp. 178-194, 2020. https://doi.org/10.1016/j.eap.2020.07.008

[29] J. Wagner, "The European Union's model of integrated border management: Preventing transnational threats, cross-border crime and irregular migration in the context of the EU's security policies and strategies," *Commonwealth & Comparative Politics*, vol. 59, no. 4, pp. 424-448, 2021. https://doi.org/10.1080/14662043.2021.1999650

[30] Y. Shan, X. Zhou, S. Liu, Y. Zhang, and K. Huang, "SiamFPN: A deep learning method for accurate and real-time maritime ship tracking," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 31, no. 1, pp. 315-325, 2020. https://doi.org/10.1109/tcsvt.2020.2978194

[31] G. A. Gordon and B. C. Abrams, *Physical and technological considerations," In Intermodal Maritime Security*. Elsevier, 2021.

[32] O. J. Borch and E. Roud, "Emergency management competence needs: Education and training for key emergency management personnel in a maritime Arctic environment MARPART2-(MAN), Project Report 2," 2021.

[33] U. B. Abdulkadir and A. K. Halimat, "Inland water transport and urban mobility in Ikorodu-Ebutte Ero Route, Lagos, Nigeria," *Geosfera Indonesia*, vol. 5, no. 1, pp. 127-146, 2020. https://doi.org/10.19184/geosi.v5i1.14714

[34] S. Dike and P. G. Giniwa, "An appraisal of the Nigerian legislation and institutions governing maritime environment," Retrieved: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3514479. [Accessed 2019.

[35] K. I. Adesina, O. O. Pelumi, and E. Awodire Olamide, "Effect of taxation on the productivity of tourism and hospitality firms," *American Journal of Tourism Management*, vol. 11, no. 1, pp. 1-6, 2022.

[36] A. Christodoulou, P. Christidis, and B. Bisselink, "Forecasting the impacts of climate change on inland waterways," *Transportation Research Part D: Transport and Environment*, vol. 82, p. 102159, 2020. https://doi.org/10.1016/j.trd.2019.10.012

[37] I. Ademiluyi, O. Afolabi, and O. Fashola, "Analysis of intra-city water transportation in Lagos State," *International Journal of Innovative Research and Advanced Studies*, vol. 3, pp. 246-254, 2016. https://doi.org/10.5901/mjss.2015.v6n2s1p624