Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.15, No.7, 2024

Blue Economy Sustainability: An Imperative for Nigeria's Economic Development

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Abstract
This study evaluates Blue Economy Sustainability: An Imperative for Nigeria's Economic Development. To achieve the objectives of the study, secondary data were sourced from CBN Statistical Bulletin, FAO, Clarkson Statistics and NPA Annual Report. The data collected were subjected to multiple regression analysis using statistical package for social science (SPSS V.23). The results shows (i) an increase in the environmental shipping index enhances sustainable economic development with an R^2 of 79.8%, will lead to a significant decrease on the sustainable environmental practice, (ii) As connectivity in trade increases, the liner shipping connecting index on also increases with a coefficient of determination (R^2) of 76.8%. Based on these findings, from the test of hypothesis, there is a statistical, significant relationship between environmental shipping index and liner shipping index, the study concludes that, the effect of enhanced blue economy practice, is substantial and significant.to sustainable economic development.
Keywords: *Blue Economy, sustainable, shipping, coastal*
DOI: 10.7176/JESD/15-7-01
Publication date: July 30th 2024

1. Introduction

Maritime activities and administration has been in presence in the region presently known as Nigeria some time before her contact with European travelers and ensuing pioneer rule. In the pre-colonial era, traditional institutions appointed coastal households to oversee the use and conservation of marine resources, such as search and rescue operations, boat driver education, and marine pollution regulation. As secretariats for the coastal communities, the palaces of the heads of traditional institutions allowed divisional heads of communities to report on activities within their domain in order to analyze current issues and create maritime policies to address the challenges that arose (NIMASA, 2018).

Auad and Fath (2022) emphasized a portion of the critical discussions on the need to create an economical BE to help compelling relief and transformation estimates in a period of quick environmental change. However, the discussion still lacks fundamental and concrete principles that shed light on the socioeconomic processes that are required for sustainable development across all sectors and levels. In addition, Louey's approach to the role of sustainable blue economic policy (Louey, 2022) identifies the necessity of anticipating the emergence of various feasible innovations in the business environment of shipping and maritime organizations. Implementing the principles of sustainable development in the shipping industry is essential to sustainable shipping. This is accomplished by assigning monetary, ecological, and social obligations to firms in the delivery business (Ouertani, 2022). It is essential to establish the statistical features of the LSCI in order to ascertain how well the index responds to sustainability in the context of the blue economy. This further indicates the extent to which

international trade will be affected, particularly in regard to the degree to which the merchandise trade of countries is proportionate to their connection, as shown through the LSCI (Lin et al., 2020). Given how important shipping connectivity is to determine export (seker, 2020), According to numerous studies, businesses should adopt a management style that prioritizes sustainable development through social and environmental responsibility in addition to profit (Dmytriyev et al., 2021). For instance, Shin et al. (2017) investigated how customers perceived the shipping industry's responses to sustainable activity. They contended that ecological and social obligation could upgrade consumer loyalty and repurchase goals, prompting an organization's superior monetary presentation and supportability. The impact of sea perception on the exercises of marine businesses additionally has suggestions for supply chains and ports. As indicated by Marcelli et al. (2021), most worldwide marine perception hardware is trying to send, costly to work, and requires specific specialized information. This is despite the fact that there has not yet been developed a coordinated observation program for the 41 coastal waters of the world. To manage safe and sustainable maritime activities in developing economies like Nigeria, coastal ocean observing and modeling systems should improve information forecast accuracy (Franz et al., 2021).

1.1 Aim and Objectives of the Study

The aim of this study is to assess blue economy sustainability: an imperative for Nigeria's economic development. The specific objectives of the research are:

1. To assess the contribution of the environmental shipping index on sustainable economic development of Nigeria
2. To determine the contribution of liner shipping connecting index on sustainable economic development of Nigeria

1.1.2 Hypotheses

Ho1**:** There is no significant relationship between sustainable economic development and environmental ship index

Ho2: There is no significant relationship between sustainable economic development and liner shipping connectivity index

2. Methodology

This study is concerned with assessing Blue Economy Sustainability: An Imperative for Nigeria's Economic Development**.** Hence, the study requires the specification of the dependent and independent variable in order to encourage effective analysis of the data collected.

And a multi-linear regression analysis would be performed using the regression function of the software. The exact relationship obtained is of the form:

$Y = B_0 + B_1X_1 + B_2X_2 + \ldots\ldots\ldots B_nX_n + u$

Where;

Dependent variable (Y)

Y = GDP

Independent variables (X)

X_1 = Environmental Ship Index (renewable energy& emission)

X_2 = liner shipping connectivity index`

U = Error term

Where GDP is the dependent variable, while, maritime shipping, number of fishes affected, tourism development, Volume of Emission and liner shipping connectivity index are independent variables.

The parameters B_o, B_1, and B_2 are coefficients of regression parameters of the equation and are obtained by making use of the values of table 4.0 to run regression analysis on SPSS, chosen for its simplicity and accuracy

3. Analysis of Results and Discussion

3.1 The contribution of the environmental shipping index on sustainable economic development

Table 1: Contribution of the environmental shipping index on sustainable economic development

Variable	Model
ESI (X_4)	**-978.423 [.119]**
LSI (X_5)	**-568.781[.861]**
Constant	**18819.259[.211]**
R^2	*0.798*
Adjusted R^2	*0.843*
F	*52.35*

Source: SPSS Output

1. Model: Dependent variable = GDP; 2. Standard errors in brackets are robust to heteroskedasticity and serial correlation; 3. * p < 0.05, ** p < 0.01, *** p < 0.001; Statistics of the first stage.

Log (Y) =18819.259 --978 Log(X_1)-568 Log(X_2) + ut ……(4.4)

The F-statistic of 52.35 indicates that our study's model is well-fitted. The coefficient of connection (R) = 76.4%, The coefficient of assurance (R-square), which estimates the decency of attack of the model, shows that 79.8% of the varieties saw in the reliant variable were made sense of by the free factors. This was directed by the Changed R-squared to 84.3%, showing that there are different factors other than our informative factors that could likewise affect on the reliant variable. The ESI coefficient is -978.41, p is 0.020, 0.05, and the t-value is 3.82, indicating that the environmental shipping index has a positive and significant impact on sustainable economic development. The point of ESI is to accomplish a veritable decrease in emanations of NOx, SOx and particulates, as well as CO_2 in the more drawn out term, by advancing conduct change among transport proprietors/administrators and ports. Port motivator suppliers offer port due decreases and different advantages to qualified vessels, with transport proprietors paying for each vessel membership to join the record proficiency improvement measures. For instance, a ship owner may be discouraged from implementing a CO_2 reduction measure if the financial investment required to improve a ship's fuel efficiency is prohibitively high and there is no apparent direct financial benefit comparable to the investment. All the more thus, assuming there are no drivers (like monetary motivating forces) that transform take-up of measure into advantageous business case, or administrative commitments to diminish air contamination, many boat proprietors or port administrators can presumably not carry out the boat emanation decrease or Operations innovation measure. For instance, the executions of the administrative measure on ECA and SECA, and the new IMO conversation on future NECAs have a significant monetary outcome on transport proprietors/administrators. Additionally, the 2020 worldwide sulfur-cap, has cost/benefit suggestions on future venture choices in Nigeria. As a result, the majority of shipowners, port investors, and equipment manufacturers held the belief that the absence of a business case, drivers, or regulatory constraints posed significant obstacles to the implementation of energy efficiency in Nigeria's shipping sector.

3.2 Test for Hypothesis One

Ho1: There is no significant link between environmental ship index and sustainable economic development. The significant – value environmental ship index (X1) is 0.001, since this sig-value is less than 0.05 and the calculated t-value (4.445) is greater than the tabulated t-value (3.82) at (9) degrees of freedom (df), then the null hypothesis was rejected, which means that there is no significant relationship between GDP and environmental ship index, which promotes sustainable economic development. The coefficient of number of ships attacked (X1) is 978.494 and the standard error is 2 Choice Rule: We thusly reason that there is a 'high' commitment by factor natural boat file (X1) to the reliant variable (Gross domestic product). Since the p-esteem (0.001 < 0.05), hence X1 has a factual huge connection among Gross domestic product and natural boat record each year under

concentrate on in tackling blue economy for maintainable financial improvement of Nigeria. The alternative hypothesis was therefore accepted. In any case, as the negative connection among Gross domestic product and natural boat list factors builds, Gross domestic product diminishes too. This is consistent with the findings of Chang & Dunao (2017) and Lam & Lai (2015), which reported that companies with maritime shipping policies are likely to reduce the amount of carbon emissions released into the environment. This indicates that there is a strong positive and significant relationship between blue economy shipping policies and carbon emission reductions of maritime companies operating in Nigeria. The proportionate relationship with environmental ship index in harnessing the blue economy for sustainable economic development of Nigeria

3.3 To determine the contribution of liner shipping index on sustainable economic development of Nigeria

Table 2.Contribution of liner shipping index on sustainable economic development

Variable	Model
ESI(X_1)	-978.423 [.119]
LSI (X_2)	-568.781 [.861]
Constant	18819.259 [.211]
R^2	*0.768*
Adjusted R^2	*0.705*
F	*30.55*

Source: SPSS Output

1. Model: Dependent variable = GDP;
2. Standard errors in brackets are robust to heteroskedasticity and serial correlation;
3. * p < 0.05, ** p < 0.01, *** p < 0.001; Statistics of the first stage.

Log (Y) = 18819.259 -978 Log (ESI)-568 Log (LSI) + ut ……..(2.2)

The result reveals that the model for our study is well fitted (F-statistic=61.352). The coefficient of correlation (R) = 74.4%, The coefficient of determination (R-square), which measures the goodness of fit of the model, indicates that 76.8% of the variations observed in the dependent variable were explained by the independent variables. This was moderated by the Adjusted R-squared to 70.5%, indicating that there are other variables other than our explanatory variables that might also impact on the dependent variable. The result shows that liner shipping connecting index impact on shipping activities in sustainable development of Nigeria.(LSI coefficient =568.781, p = 0.019< 0.05, t-value = 3.52,).

The LSI is meant to reflect specifically the liner shipping connectivity between pairs of countries. In that context other aspects of connectivity such as distance are excluded. Distance between countries, and the level of overall connectivity of individual countries are of course also relevant for bilateral trade or trade costs. The maritime connectivity structure and its service supply are tracked by different indicators. Large numbers of potential determinants in the liner shipping rates resembling availability and port framework have been intently corresponded to one another. The Liner Shipping Connectivity Index (LSCI) targets to catch the degree of integration into the current liner shipping network by estimating the liner ship transporting connectivity. The distribution of the port's LSCI uncovers a high concentration level among the highly connected ports, and it contributes the biggest impact towards the global trade. It is well perceived that the countries are effectively associated with worldwide trade when there is a high connectivity with respect to the LSCI value. The higher the LSI lower the cost of shipping and Nigeria should take benefit from marine transportation by taking steps to increase the Liner Shipping Connectivity Index.

3.3.1 Test for Hypothesis Two

Ho2: There is no significant relationship between sustainable economic development and liner shipping connectivity index

From Table 4.20 and regression output , the coefficient of liner shipping connectivity index (X_2) is 568.494 and the standard error is 156, This value corresponds with the liner shipping connectivity index (X_2) 't-stat' value of the regression output; the significant – value of (X_2) is 0.001, since this sig-value is less than 0.05 and the calculated t-value (3.644) is greater than the tabulated t value (3.52) at (9) degrees of freedom (df) , then the null hypothesis was rejected, that is; There is no significant relationship between sustainable economic development and liner shipping connectivity index

Decision Rule:

We therefore conclude that there is a high contribution by variable Liner Shipping Connectivity (X_2) to the dependent variable (GDP per Capita). Since the p-value (0.001 < 0.05), therefore X_3 has a statistical significant relationship on GDP per capita per year under study in the Nigerian economy. Thus, the alternate hypothesis was accepted. However, the positive relationship between GDP per Capita and Liner Shipping Connectivity (X_2) variables indicate that as Liner Shipping Connectivity at ports increases, GDP per Capita increases. Liner shipping" means the transport of goods in containers. In return tramping, this is the transport of goods in bulk. LSCI focuses exclusively on liner shipping. Increased LSCI indicates reduction of cost of shipping, which in return enhances the market competiveness and increase container traffic (ESCAP, 2012).

The Liner Shipping Connectivity Index (LSCI) was developed by the United Nations Conference on Trade and Development (UNCTAD). This Index Measures how well a country is integrated into the liner shipping network. Transport by sea is by far the Most Important mode of transport for international trade: volume-wise 90% or goods are transported by sea. Therefore, this index is a good approach to access a country in international trade. A country with a good "liner shipping connectivity" has good access to the global market. A good "LSC" also has many positive indirect effects: it reduces the negative effect of distance (spatial interaction) on the economy of a country. It increases the economies of scale, thus it lowers the transportation costs and so has a positive effect on trade costs. The coefficient of liner shipping index (X_2), variable, indicates a direct proportionate relationship with GDP in harnessing blue economy for sustainable economic development of Nigeria. This agrees with the findings of Varbanova, (2017) which showed that having a high value on liner shipping connectivity index represents better access to port and hinterland facilities and requires necessary frequent connection between ports. Liner shipping connectivity index indicates both level of network connectivity in transportation and level of ease on international trade. Connecting to transportation network allows achieving higher market shares which translates to higher GDP as well as strategical goals to reach wider geographical regions. After all, countries with high liner shipping connectivity index score deal with international trade actively and better standard of living which Nigeria can adopt.

4. Conclusion

The result of the analysis revealed that air pollution (including NOx, SOx, PM and CO2), is the most challenging environmental issue in the Nigerian maritime industry. And among the many measures to mitigate the barriers to energy efficiency, operational instruments provide the strongest. However, the primary barriers that prevent effective implementations of energy efficiency includes no business case, financial and regulatory constraints, and lack of independent data. Other barriers identified are split incentives, lack of resources, drivers and awareness. The impact of climate change on pelagic fish living in open water, such as tuna, is expected to be less severe than it will be on bottom- or near bottom-dwelling demersal species because of the declining health of the coral-reef marine ecosystem. Pelagic fish can simply change location in reaction to changes in the marine environment brought about by climate change.

References

Auad, G., and D. B. Fath. 2022. “Towards a Flourishing Blue Economy: Identifying Obstacles and Pathways for It Sustainable Development.” *Current Research in Environmental Sustainability 4. doi:10.1016/j.crsust.2022.100193.*

Dmytriyev, S. D., Freeman, R. E., &Hörisch, J. (2021). The relationship between stakeholder theory and corporate social responsibility: Differences, similarities, and implications for social issues in management. *Journal of Management Studies, 58(6), 1441-1470*

Franz, G., Garcia, C. A. E., Pereira, J., de Freitas Assad, L. P., Rollnic, M., Garbossa, L. H. P., da Cunha, L. C., Lentini, C. A. D., Nobre, P., Turra, A., Trotte-Duhá, J. R., Cirano, M., Estefen, S. F., Lima, J. A. M., Paiva, A. M., Noernberg, M. A., Tanajura, C. A. S., 53 Moutinho, J. L., Campuzano, F., . . . Polejack, A. (2021, August 10). Coastal Ocean Observing and Modeling Systems in Brazil: Initiatives and Future Perspectives. Frontiers in Marine Science, 8. https://doi.org/10.3389/fmars.2021.681619

Lin, P. C., Kuo, S. Y., & Chang, J. H. (2020). The direct and spillover effects of liner shipping connectivity on merchandise trade. *Maritime Business Review, 5(2), 159–173. https://doi. org/10.1108/MABR-12-2019-0055*

Louey, P. (2022). The Pacific blue economy: an instrument of political maneuver. *Marine Policy 135, 104880. doi: 10.1016/j.marpol.2021.104880*

Marcelli et al. (2021): Toward the widespread application of low-cost technologies in coastal ocean observing (Internet of Things for the Ocean) *Mediterranean Marine Science*, 22/2 2021, 255-269

NIMASA (2018): Nigeria's Maritime Industry Forecast. Emerging opportunities and challenges Agency. Lagos

Ouertani, S. (2022). What You Need To Know About Sustainable Shipping. Retrieved from: https://www.ecomasteryproject.com/sustainable-shipping/ 3rd August, 2022.

Shin, Y., Thai Vinh, V., Grewal, D., & Kim, Y. (2017). Do corporate sustainable management activities improve customer satisfaction, word of mouth intention and repurchase intention? Empirical evidence from the shipping industry. *The International Journal of Logistics Management*, 28(2), 555–570. https://doi.org/10.1108/IJLM-11-2015-0220

Şeker, A. (2020). *The Impacts of Liner Shipping Connectivity and Economic Growth on International Trade Case of European Countries and Turkey.* In G. C. Ceyhun (Ed.), Handbook of Research on the Applications of International Transportation and Logistics for World Trade (Issue January, pp. 139–150). IGI Global. https://doi.org/10.4018/978-1-7998-1397-2.ch008

Tran T. M. T., Yuen K. F., Wang X. Q., Li K. X. (2020). The antecedents of sustainable shipping management and organisational performance: Resource accumulation and orientation perspectives. *Int. J. Phys. Distribution Logistics Manage.* 50, 833–854. doi: 10.1108/IJPDLM-03-2020-0066

Varbanova, A. (2017). Liner shipping networks and ports connectivity in the Black Sea region. *International Scientific Journal. Trans* Motauto World, 2(5), 192–19