Assessment of the Contribution of Blue Economy on Sustainable Economic Development in Nigeria

PONDI JULIUS G[1], IBE C. CALISTUS[2], EJEM A. EJEM[3], ONYEMA HENRY[4]
[1,2,3]*Department of Transport Management Technology, Federal University of Technology Owerri, Nigeria*
[4]*Department of Maritime Transport and Nautical Science, Nigeria Maritime University Okerenkoko, Warri, Nigeria*

Abstract- ***This study evaluates assessment of the contribution of blue economy on sustainable economic development in Nigeria. 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 maritime shipping activities (cargo throughput) with 83.5%,coefficient of determination which is substantially high to affect the growth of maritime business in determing the contribution of blue economy on sustainable economic development (ii) an increase in the number of fishing and aquaculture production indicates a high contribution towards economic development of Nigeria, with a coefficient of determination (R^2) of 89.6% indicating a significant decrease in the number of vessels calling at our ports .The "blue economy" concept seeks to promote economic growth, social inclusion, and preservation or improvement of livelihoods while at the same time ensuring environmental sustainability. At its core it refers to the decoupling of socioeconomic development through oceans-related sectors and activities from environmental and ecosystems degradation.***

Keywords: Blue Economy, Shipping, Sustainable, Economy

I. INTRODUCTION

Nigeria has an 853-kilometer coastline that borders the Atlantic Ocean in the Gulf of Guinea. There are significant and diverse marine natural resources in Nigeria's 46,000 km2 maritime area. Although Nigeria has numerous economic activities, the majority of which rely on or derive from ocean resources, it is clear that the country's blue economy potentials are not being fully utilized, and a framework policy to address this issue is essential (NIMASA, 2018). The significance of blue economy in Nigeria can't be overemphasized, especially sea transport for exchange, with particularly maritime transport for trade, with over 95 percent of the country's trade by volume and more than 70 percent of its value being moved around aboard ships and handled by seaports, and offshore oil and gas industry (NIMASA, 2018). Finding the right balance between various and potentially competing economic, social, and environmental goals is necessary for promoting transportation sustainability. The objective is to increase value while making optimal use of resources, building on synergies and complementariness, and encouraging system coherence. The use of the manageability idea might shift relying upon the country, the partner, the area and the action. The ability to provide transportation infrastructure and services that are safe, socially inclusive, accessible, reliable, affordable, fuel-efficient, environmentally friendly, low-carbon, and resilient to shocks and disruptions, including those caused by climate change and natural disasters, is one aspect of sustainability in maritime transport that is not intended to be an exhaustive list. Nigeria imports more than 90% of its seafood, creating a unique opportunity for offshore and near-shore aquaculture, economic growth, and job creation. In many parts of the world, offshore aquaculture is not well developed, including Nigeria (Knapp and Rubino 2016; Johnson et al. 2017). Covering the effects of economic activities on the marine environment's health is especially important. The blue economy is about maintainability, meaning all endeavors should be made to decrease, control and lessen the adverse consequences of improvement on the marine area. Universally, roughly 3billion individuals depend on fish as an essential wellspring of creature protein (NOAA 2015), yet most catch fisheries overall are completely taken advantage of or overexploited (Ye and Gutierrez 2017). Notwithstanding fish for human utilization, marine items are fundamental to satisfying needs for creature feed and numerous modern synthetic compounds.

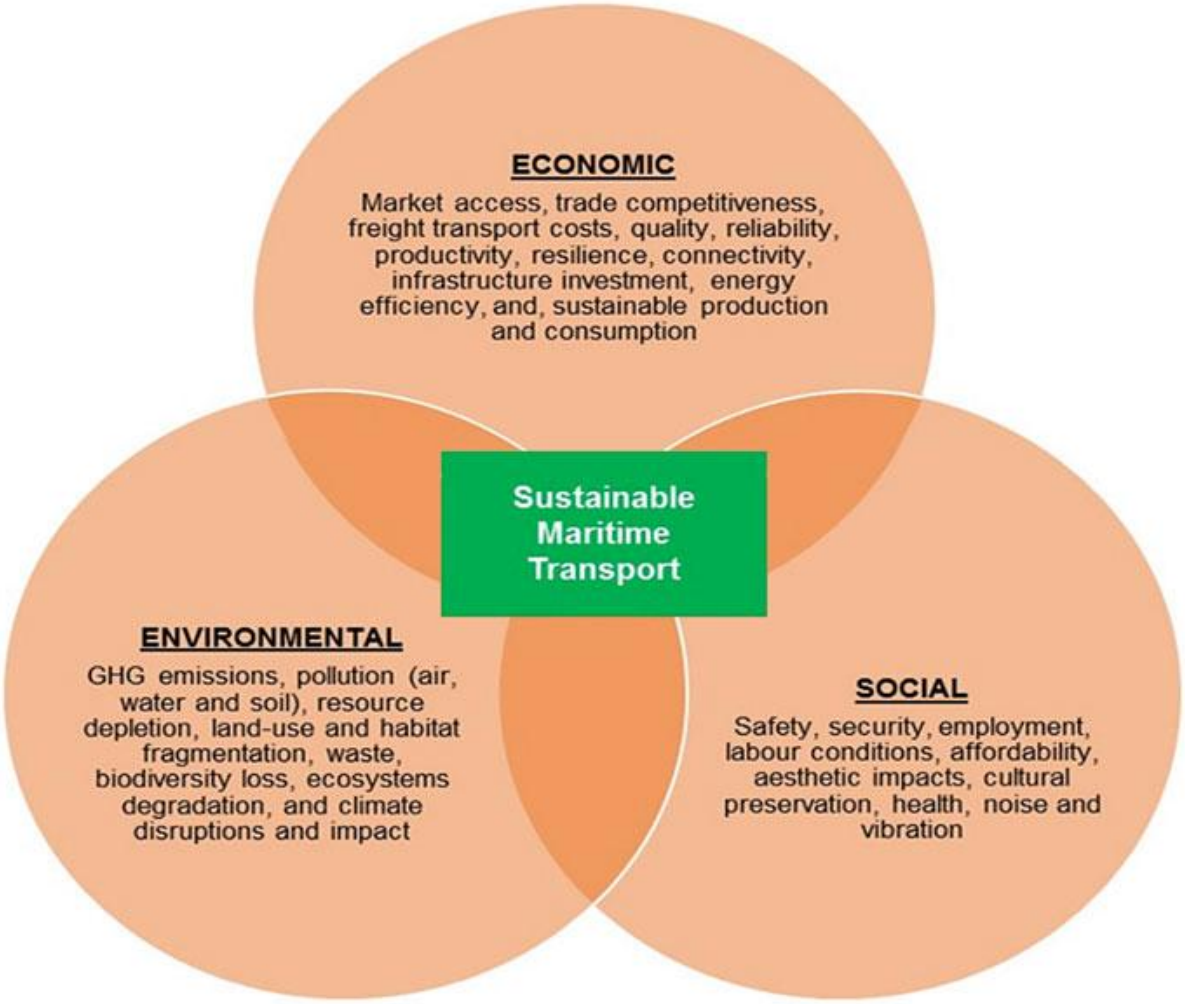

Figure 1 Defining sustainable maritime transport. (Source: UNCTAD, 2020)

Figure 1 illustrates the intersection between the economic, social and environmental dimensions of sustainable maritime transport. Access to markets, connectivity, infrastructure capacity, trade competitiveness, and transportation costs are all examples of economic parameters. Regarding the social aspect, pertinent contemplations incorporate, for instance, wellbeing, wellbeing, security, business and working circumstances. Air emissions (pollutants and greenhouse gases), waste management, spills and pollution (such as oil and other substances), the effects of climate change, biodiversity loss, and resource and energy depletion are all common environmental concerns. The blue economy traverses over a large number of financial, social and ecological exercises. They are straightforwardly or by implication associated with the seaside, marine and sea space and assets. Through innovation in established traditional marine economic sectors and diversification in new subsectors and niches, the majority of these economic activities present numerous opportunities for the socioeconomic development of coastal states and Small Island developing State (SIDS). The blue economy is perplexing and it cuts across a large number of financial areas, a considerable lot of which are reliant (UNDP,2023). The improvement of an economical blue economy will depend generally on the accessibility of important ranges of abilities to answer the requirements of the market. In any case, an absence of qualified and experienced work force is compelling the capacity of numerous SIDS to plan and execute powerful blue economy structures. The absence of sufficient schooling and preparing valuable open doors in numerous SIDS has plainly prompted constant holes in the specialized ability to help key areas, as well as more extensively for marine exploration, arranging and navigation. Overhauling the abilities and comprehension of chiefs and experts in all areas will accordingly be fundamental to completely understand the advantages of the blue economy,

however requires solid public administration (UNDP, 2023).

Tugcu (2014) investigated the connection between the travel industry development and monetary development in numerous Asian, African and European nations. They observed that European nations are better ready to create wealth from the travel industry Attri (2016), posits that rapid expansion of ocean economic activities is being fueled by global population growth, economic expansion, technological advancement, climate change, and trade. Looking to 2030, different sea based ventures have the planned to out-play out the development of the entire world economy as far as work and worth added.

A conceptual framework for the blue economy that can be used to evaluate sustainable marine management was developed by Keen et al. (2018). Additionally, Sarker et al. (2018) developed a blue growth management framework that emphasizes the need for collaborative efforts to promote blue growth and accomplish sustainable development goals (SDGs).

Howard (2018) discussed the significance of stakeholders to sustainable development in great detail. The combination of the blue economy and marine environment, biological system bookkeeping is firmly connected to blue development (Häyhä and Franzese, 2014; Lillebø et al., 2017). The concept of blue growth can be traced back to sustainable development; more profound connotations are emerging as a result of increased international communication and in-depth study of the blue economy concept. When studying cases of the blue economy, interdisciplinary and multidisciplinary research is very important, and one of the biggest challenges is figuring out how to integrate the various disciplines involved.

II. AIM AND OBJECTIVES OF THE STUDY

The aim of this study is to assess the contribution of blue economy on sustainable economic development in Nigeria. The specific objectives of the research are:

1. To assess the contribution of maritime on sustainable economic development in Nigeria
2. To evaluate the contribution of fishing and aquaculture on sustainable economic development in Nigeria
3. To ascertain the contribution of coastal tourism on sustainable economic development in Nigeria

III. MATERIALS AND METHODS

This study is concerned with the assessing the contribution of blue economy on sustainable economic development in Nigeria. 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:

$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 \ldots\ldots B_nX_n + u\ldots\ldots\ldots\ldots\ldots\ldots$ (1)

Where;

Dependent variable (Y)

Y = GDP

Independent variables (X)

X_1 = maritime shipping contribution

X_2 = number of fishes affected

X_3 = tourism development (number of tourist affected)

U = Error term

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

The parameters B_o, B_1, B_2, and B_3 are coefficients of regression parameters of the equation and are obtained by making use of the values obtained to run regression analysis on SPSS, chosen for its simplicity and accuracy.

Analysis of Results and Discussion

Test for Hypothesis

To assess the contribution of maritime on sustainable economic development in Nigeria

Table 1 contribution of maritime on sustainable economic development in Nigeria

Variable	Model
MAS(X_1)	-.567.41** [.003]

FISH(X_2)	-607.124 [.000]
COT (X_3)	-678.324** [.000]
Constant	18819.259 [.211]
R^2	*0.896*
Adjusted R^2	*0.692*
F	*33.62*

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 -567 Log(X_1)- 607Log(X_2) – 678Log(X_3) + ut …….(2)

The result from Table 4.7 reveals that the model for our study is well fitted (F-statistic= 33.62).The coefficient of correlation (R) = 84.4%, The coefficient of determination (R-square) 83.5%, which measures the goodness of fit of the model, indicates that 69.2% of the variations observed in the dependent variable were explained by the independent variables. This was moderated by the Adjusted R-squared to 69.2%, indicating that there are other variables other than our explanatory variables that might also impact on the dependent variable. The result shows that maritime shipping has a positive and significant influence on harnessing blue economy for sustainable economic development (MAS coefficient = -567.41, p = 0.014 < 0.05, t-value = 3.81).

Access to regular shipping services will continue to be an important aspect of Nigeria's trade competitiveness. A shift to sustainable transport becomes crucial for sustainable growth in the future, as reflected by ongoing efforts by Federal Ministry of Marine and Blue Economy, industry and the international community to comply with sustainability imperatives. Sustainability in freight transport entails the ability to provide fuel-efficient, cost-effective, environmentally friendly, low-carbon and climate-resilient transport systems.

Cargo throughput is a key port performance indicator of productivity in maritime shipping. It entails the average quantity of cargo that can pass through a port on a daily basis from arrival at the port to loading onto a ship or from the discharge from a ship to the exit (clearance) from the port complex. Throughput is usually expressed in measurement tons, short tons, metric tons.

Test for Hypothesis One
Ho1: There is no significant relationship between sustainable economic development and maritime shipping
This test was conducted using the Statistical Student t-test from the coefficient table of the regression analysis. The t-test measures the individual contribution of the independent variable on the dependent variable. From Table 1 and regression output, the coefficient of maritime shipping (X_1) is -576.494 and the standard error is 120, This value corresponds with the number of ships visiting Nigeria (X_1) 't-stat' value of the regression output; the significant – value of (X_1) is 0.001, since this sig-value is less than 0.05 and the calculated t-value (4.728) is greater than the tabulated t value (3.82) at (9) degrees of freedom (df) , then the null hypothesis was rejected, that is; There is no significant relationship between sustainable economic development and maritime shipping(cargo throughput).

Decision Rule:
It is therefore concluded that there is a 'high' contribution by variable maritime shipping (number of ships call at the ports) to the dependent variable

(GDP). Since the p-value (0.001 < 0.05), therefore X_1 has a statistical significant relationship between maritime shipping and GDP per year under study in harnessing blue economy for sustainable economic development. Thus, the alternate hypothesis was accepted. However, there is positive relationship between maritime shipping and GDP for sustainable economic development, increase in maritime shipping activities results to increased sustainable economic development as well.

To evaluate the contribution of fishing and aquaculture (FISH) on economic development in Nigeria

Table 2 The contribution of fishing and aquaculture on economic development of Nigeria

Variable	Model
MAS(X_1)	-.567.41** [.003]
FISH(X_2)	-607.124 [.000]
COT (X_3)	-678.324** [.000]
Constant	18819.259 [.211]
R^2	*0.896*
Adjusted R^2	*0.843*
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.

$$\text{Log}(Y) = 18819.259 - 567\ \text{Log}(X_1) - 607\text{Log}(X_2) - 678\ \text{Log}(X_3) + ut \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

The result in regression output reveals that the model for our study is well fitted (F-statistic= 30.55). From table 2, the coefficient of correlation (R) = 94.4%, The coefficient of determination (R-square), which measures the goodness of fit of the model, indicates that 89.6% of the variations observed in the dependent variable were explained by the independent variables. This was moderated by the Adjusted R-squared to 84.3%, indicating that there are other variables other than our explanatory variables that might also impact on the dependent variable. The result shows that number of fishes lost has a positive and significant effect in harnessing blue economy for sustainable economic development in Nigeria (FISH coefficient = 607.412, p = 0.032 < 0.05, t-value = 3.55)

Women make up about one-third of those working in aquaculture and fisheries. As well as adding to Gross domestic product and giving jobs to fishers, ranchers and processors, the fish area is a wellspring of hard cash from commodities and lifts government income through fisheries arrangements and charges (FAO, 2014) According to the National Bureau of Statistics (NBS), the fishing industry accounts for 1.09 percent of the country's GDP in 2020 and 0.97 percent in the third quarter of 2021. According to the 2020 DARD-ECOWAS Commission report on the fisheries in Nigeria, 6,861,700 tonnes of fish were produced between 2015 and 2020. According to the same report, the fishery industry generally performed better in 2017 with approximately 1,212,480 tonnes of fish produced, which represents 17.67% of the total tonnes of fish produced over the course of the years under consideration. The second-highest tonnes of fish produced were recorded in 2020, while the lowest tonnes were recorded in 2015 (DARD-ECOWAS Commission, 2020). Nigeria is the world's fourth-biggest shipper of fish and fishery

items regarding volume (5.4% of worldwide imports) after China, Japan, and the US, however just 23rd in esteem terms or 0.8% (Trademap, 2018). Countries with a trade deficit in fish and fishery products include Nigeria, Egypt, Angola, the Democratic Republic of the Congo, Cameroon, Ghana, Côte d'Ivoire, and Egypt. Nigeria alone imports an average of US$ 1,245,394 and has a trade deficit of more than US$750 million (AU-IBAR, 2018). FAO appraises that fishers, fish ranchers and those providing administrations and products to related ventures guarantee the occupations of upwards of 660-820 million individuals around the world. In 2021 and 2022, 36% of all fish produced will be exported, making seafood the most highly valued food commodity worldwide. At US$139 billion out of 2021, the product worth of fish is over two times that of the following most exchanged ware - soybeans. The waters of developing nations account for more than half of the fish trade.

Test for Hypothesis Two

Ho2: There is no significant relationship between sustainable economic development policy in Nigeria and fishing

From Table 2 above and regression output, the coefficient of maritime security expenditure (X_2) is -607.412 and the standard error is 141, This value corresponds with the volume of fishes (X_2) 't-stat' value of the regression output in Table 2; the significant – value of volume of fishes (X_2) is 0.001, since this sig-value is less than 0.05 and the calculated t-value (4.490) is greater than the tabulated t value (3.55) at (9) degrees of freedom (df) , then the null hypothesis was rejected, that is; There is no significant relationship between GDP and volume of fishes needed for sustainable economic development.

Decision Rule:

We therefore conclude that there is a 'high' contribution by variable volume of fishes (X_2) to the dependent variable (GDP). Since the p-value (0.032 < 0.05), therefore X_2 has a statistical significant relationship between GDP and sustainable economic development per year under study in Nigeria. Thus, the alternate hypothesis was accepted. However, as the positive relationship between GDP and volume of fishes lost variables as the demand for increases as a result of a well-developed blue economy devoid of pollution on the sea.

The contribution of coastal tourism (COT) on sustainable economic development of Nigeria

Table 3: Contribution of coastal tourism on sustainable economic development

Variable	Model
MAS(X_1)	-.567.41** [.003]
FISH(X_2)	-607.124 [.000]
COT (X_3)	-568.781 [.861]
Constant	18819.259 [.211]
R^2	*0.814*
Adjusted R^2	*0.824*
F	*40.35*

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.

$$\text{Log (Y)} = 18819.259 - 567 \text{ Log}(X_1) - 607\text{Log}(X_2) - 678 \text{ Log}(X_1) - 978 \text{ Log}(X_3) + ut \quad \ldots\ldots\ldots\ldots (3)$$

The result in Table 3 reveals that the model for our study is well fitted (F-statistic= 40.35). From Table 3, the coefficient of correlation (R) = 81.4%, The coefficient of determination (R-square), which measures the goodness of fit of the model, indicates that 74.3% of the variations observed in the dependent variable were explained by the independent variables. This was moderated by the Adjusted R-squared to 82.4%, indicating that there are other variables other than our explanatory variables that might also impact on the dependent variable. The result shows that coastal tourism associated with the blue economy has a negative and significant impact on GDP (COT coefficient = -678.41, $p = 0.024 < 0.05$, t-value = 3.02).

Tourism, and particularly nature-based tourism, also provides an important path towards the sustainable development of marine and coastal ecosystems. Coastal tourism is a key component of small island state economies likewise in Nigeria, if properly developed. The value of nature-based tourism is expected to increase over time as the supply of pristine natural assets declines while demand, which seems impervious to economic shocks, increases with rising GDPs.

Revenue generation from tourists' visits to coastal and marine tourism centers remains the most obvious economic benefit of coastal and marine tourism. Revenue generation can either be from domestic sources or earnings of foreign exchange, in which case it involves visits by nationals of other countries which is a key driver to sustainable economic development. Owing to poor tourism development and low awareness level, the middle and upper class prefer to travel overseas in search of various forms of tourism, coastal and marine tourism inclusive. Shunning of domestic coastal and marine tourism products has led to low patronage, poor investment, and low development of the domestic sector. This implies that if coastal tourism is properly developed, economic activities will thrives thereby increasing the GDP. Benefits obtainable from coastal and marine tourism cut across the national, regional, state, and local levels. Among these benefits are foreign exchange earnings, the creation of a large pool of skilled and unskilled jobs, infrastructure development, stimulation of recreational and educational values, display and exchange of sociocultural values, preservation of cultural heritage, and natural resource conservation.

Test for Hypothesis Three

Ho3: There is no significant relationship between sustainable economic development and coastal tourism

From Table 3 and regression output the coefficient of coastal tourism (X_3) is 678.41 and the standard error is 210, This value corresponds with the coastal tourism (X_3) 't-stat' value of the regression output ; the significant – value of failed state index (X_3) is 0.001, since this sig-value is less than 0.05 and the calculated t-value (3.228) is greater than the tabulated t value (3.02) at (9) degrees of freedom (df) , then the null hypothesis was rejected, that is; There is no significant relationship between sustainable economic development and coastal tourism in Nigeria

Decision Rule

We therefore conclude that there is a 'high' contribution by variable failed state index (X_3) to the dependent variable (GDP). Since the p-value ($0.004 < 0.05$), therefore X_2 has a statistical significant relationship between GDP and coastal tourism per year under study in Nigeria. Thus, the alternate hypothesis was accepted. However, as the positive relationship between coastal tourism and GDP contribution in sustainable economic development.

CONCLUSION

The main research objective was successfully achieved. It was to determine the contribution of blue economy on sustainable economic development in Nigeria. The development of the Blue Economy (BE) in Nigeria has gained prominence due to its potential to positively disrupt the many countries' current development paths. However, this potential to develop is currently limited by numerous challenges. The world Bank (2017) outlined the rapidly degrading ocean resources through unsustainable development, climate change, pollution, marine resource extraction and destruction of habitats as the biggest threats facing most BE nations. It also noted a second set of challenges existing around the need to invest in the human capital required to innovate BE sectors,

causing resulting job creation and development benefits.

Most important thing is, to directly incorporate Blue Economy concept with the pro-poor growth strategies, especially in the island nations, where the natural resources are to be considered as assets of the poor. With more quantitative research, it is necessary to formulate marine sector-wise national databases, as proposed in this study, in which the evidence-based decisions can be made upon. Nigeria national security could be enhanced through the development of advanced ocean sensors and charging stations for underwater vehicles. With the ability to stay on mission longer or increased range and duration for underwater vehicles, marine energy could indirectly provide better surveillance on contested sea areas while keeping more military personnel out of harm's way.

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