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Blue Economy and the Strategic Survival of Nigeria's Maritime Sub-Sector (2000 - 2026)

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ABSTRACT

This study examined the blue economy and the strategic survival of Nigeria's maritime sub-sector. Specifically, the study assessed maritime transport development, port infrastructure development, and fisheries and aquaculture development contributions to GDP in Nigeria. The ex-post facto research design was adopted and utilised annual secondary time-series data covering thirty-two years, 1994–2025, compiled from maritime, national-accounts and fisheries statistical sources. Descriptive statistics, Pearson correlation analysis and simple ordinary least-squares regressions were employed with the help of E-views 10.0. The findings revealed that maritime transport development has a positive but statistically insignificant effect on maritime-sector contribution to GDP, port infrastructure development has a positive and significant effect and fisheries and aquaculture development also had a positive and significant effect. It was concluded that productive port capacity and fisheries development provide stronger measurable support for the strategic survival of Nigeria's maritime sub-sector than vessel traffic alone. It was recommended that port-capacity efficiency should be strengthened, maritime transport policy should emphasise productive vessel utilisation, and fisheries and aquaculture value chains should be deepened.

Keywords: *Blue economy, maritime sub-sector, GDP, maritime transport development, port infrastructure development and fisheries and aquaculture development*

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1.1 INTRODUCTION

Maritime economies now occupy a central place in national development because oceans, ports, inland waterways, fisheries, offshore services and coastal tourism have become more than physical spaces for movement and extraction. They form a productive system through which countries organise trade, generate employment, protect food supply, support energy logistics and build non-oil sources of revenue. The blue economy joins economic value with ecological care and shows that the maritime domain cannot be treated merely as an isolated transport route (Bennett *et al.,* 2019). The connection between ocean activity and sustainable development has also become stronger because marine resources support several development goals when they are governed with social and environmental discipline (Lee *et al.,* 2020). This makes the blue economy a practical development idea through which countries with active coastlines and ports can convert marine resources into resilient economic activities without exhausting the ecological base on which those activities depend.

Nigeria stands within this conversation with a maritime geography that is too strategic to remain marginal in national planning. The country has access to the Atlantic Ocean, several seaports, extensive inland waterways, offshore energy corridors, coastal settlements, fisheries resources and a growing logistics market linked to regional trade. The Gulf of Guinea contains strong blue-economy possibilities, although weak governance, insecurity and poor coordination can limit the conversion of these possibilities into stable outcomes (Popoola and Olajuyigbe, 2023). Maritime opportunities in the Gulf are also closely tied to the quality of enforcement, surveillance and institutional cooperation because insecurity can undermine shipping, fishing and investment activity (Okafor-Yarwood *et al.,* 2020). Nigeria therefore carries both opportunity and burden: it has the natural and commercial foundations required for maritime transformation, but strategic survival depends on how effectively those foundations are organised into productive, secure and sustainable activities.

The Nigerian maritime sub-sector has long been expected to support trade facilitation, foreign-exchange earnings, port revenue, coastal employment and national diversification. Cargo movement through Lagos, Rivers, Delta, Calabar and emerging port corridors influences production costs, import supply chains, export competitiveness and the speed with which firms connect to global markets. Modern ports function as logistics platforms whose relevance depends on infrastructure, connectivity, governance and reliable service delivery (Notteboom *et al.,* 2022). Maritime transport also creates economic value not simply by moving cargo but by shaping the spatial organisation of trade, distribution and industrial activity (Rodrigue, 2020). In Nigeria, the maritime sub-sector cannot therefore be judged only by the existence of ports or agencies. Its strategic survival must be reflected in measurable contribution to national output and in the productive capacity of the maritime activities that sustain trade, food systems and related economic services.

The blue economy gives Nigeria a wider lens for rethinking the maritime sub-sector beyond shipping and port charges. Maritime transport development can raise cargo flow and vessel activity, port infrastructure development can reduce delays and improve competitiveness, while fisheries and aquaculture development can strengthen food security, livelihoods and domestic value creation. An equitable blue economy requires enabling conditions such as institutions, finance, participation and benefit sharing before marine resources can produce durable economic outcomes (Cisneros-Montemayor *et al.*, 2021). Rapid ocean-based expansion without effective governance may instead concentrate benefits and increase ecological pressure (Jouffray *et al.*, 2020). These insights are important for Nigeria because maritime expansion will not automatically guarantee strategic survival. The sub-sector becomes stronger when transport development, functional port infrastructure and productive fisheries are deliberately connected to measurable output and the wider national diversification objective.

1.2 Statement of the Problem

Nigeria possesses a maritime space that should ordinarily strengthen trade, output, job creation and economic diversification, yet the performance of the maritime sub-sector has not consistently reflected the scale of its potential. The country has seaports, coastal waters, fisheries resources, inland waterways and a growing logistics market, but these assets are frequently constrained by infrastructure deficits, fragmented regulation, operational delays and inadequate integration of blue-economy activities. The problem is therefore not the absence of maritime resources, but the inability to transform those resources into sustained strategic-survival outcomes. Port congestion, cargo delays, weak multimodal connectivity and limited domestic shipping capacity can reduce the economic value generated from maritime transport. In the same way, inadequate port facilities and weak fisheries modernisation can prevent available maritime assets from producing their expected contribution to national output. The survival of the sub-sector should be visible in its contribution to GDP, yet the connection between available blue-economy resources and this output remains uneven.

The expectation from a blue-economy framework is that maritime transport development, port infrastructure development, and fisheries and aquaculture development should strengthen the productive relevance of Nigeria’s maritime sub-sector. In practice, however, the country continues to experience uneven port performance, limited indigenous shipping capacity, infrastructure bottlenecks, inadequate cold-chain systems and constraints affecting fisheries and aquaculture value chains. Existing studies have discussed shipping, ports, fisheries and blue-economy potential, but many treat these issues separately, use shorter periods or examine broad economic growth rather than maritime-sector contribution to GDP. This creates a need to establish, over a common long period, whether each of the three selected blue-economy dimensions has significantly supported the strategic survival of the maritime sub-sector. The present study therefore examines the separate effects of maritime transport development, port infrastructure development, and fisheries and aquaculture development on maritime-sector contribution to GDP in Nigeria from 1994 to 2025.

1.3 Objectives of the Study

The main objective of the study is to examine the blue economy and the strategic survival of Nigeria's maritime sub-sector. The specific objectives are to:

i. Examine the maritime transport development contribution to GDP in Nigeria.
ii. Determine the port infrastructure development contribution to GDP in Nigeria.
iii. Assess the fisheries and aquaculture development contribution to GDP in Nigeria.

1.4 Research Hypotheses

The following null hypotheses were tested at the 5% level of significance:

$H_0$1: Maritime transport development has no significant effect on maritime-sector contribution to GDP in Nigeria.

$H_0$2: Port infrastructure development has no significant effect on maritime-sector contribution to GDP in Nigeria.

$H_0$3: Fisheries and aquaculture development has no significant effect on maritime-sector contribution to GDP in Nigeria.

2.1 Conceptual Review

The conceptual review explains the major variables and the relationship between the dimensions of blue economy and the indicators of strategic survival.

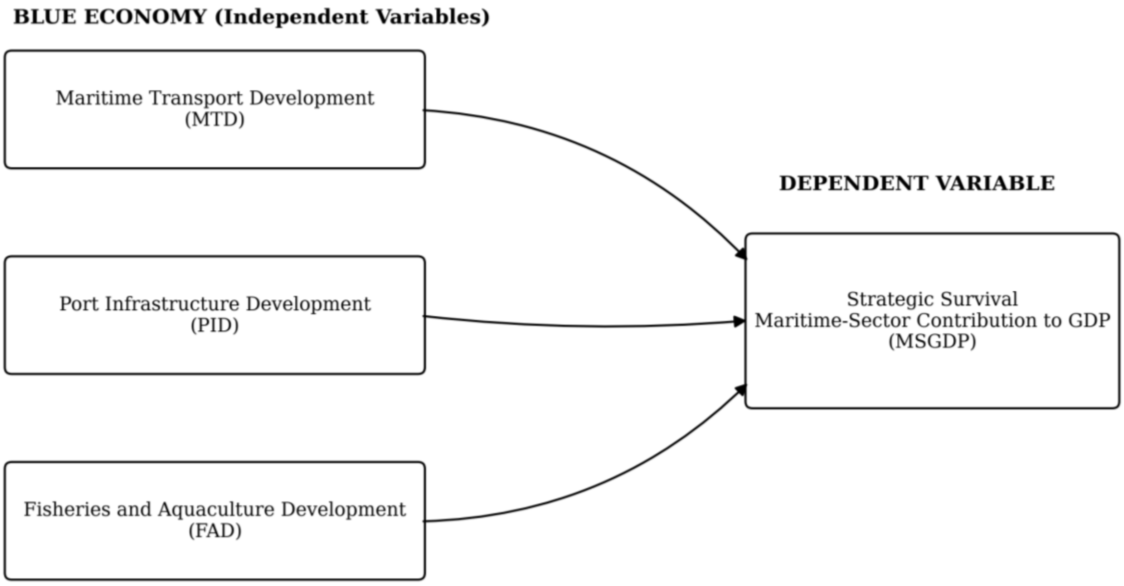

Figure 1: Conceptual Model of Blue Economy and Strategic Survival
Source: Researchers' conceptualisation (2026).

2.1.1 Strategic Survival

Strategic survival was understood in this study as the capacity of a sector to remain relevant, productive, competitive and adaptable while absorbing operational, policy, economic and environmental shocks. Wanke *et al.* (2018) located the African maritime debate within the practical challenge of converting ocean opportunities into broadly shared development rather than measuring progress only by the volume of extraction or trade. Lim *et al.* (2019) explained that sustainable maritime development requires economic performance to operate together with social legitimacy and long-term stewardship. Strategic survival therefore goes beyond temporary output expansion; it reflects the ability of maritime resources, institutions, technology and labour to produce durable value while preserving the conditions that support future activity.

Ports, shipping services, fisheries, coastal enterprises, regulatory agencies and maritime logistics chains jointly determine whether the maritime sub-sector can remain productive and relevant over time. Ibeh *et al.* (2025) observed that governance quality, local participation, infrastructure and coordination between public and private actors shape maritime outcomes in the Gulf of Guinea. Alamoush *et al.* (2022) showed that the benefits of ocean-based activity depend on enabling conditions that allow maritime resources to be converted into sustained economic value. Strategic survival therefore rests on reliable services, investment discipline, institutional capacity and effective implementation rather than on the mere existence of maritime assets.

2.1.2 Maritime-Sector Contribution to GDP

Maritime-sector contribution to gross domestic product was understood in this study as the value added created by shipping, ports, fisheries, logistics and related maritime services within national production. Danladi *et al.* (2025) emphasised that maritime development should be assessed by the extent to which ocean opportunities are converted into productive and broadly shared economic value. Tijan *et al.* (2021) explained that maritime systems operate through interacting economic, technological and institutional pathways rather than isolated activities. The concept therefore captures the productive value generated when maritime assets, labour, infrastructure and services are organised efficiently, while recognising that a temporary rise in activity does not necessarily represent a durable increase in the sector's contribution to national output.

Maritime-sector contribution to GDP reflects the value generated by transport, trade, fisheries, offshore support, port services and the productive linkages created around them. Okomoda *et al.* (2025) demonstrated that expansion in marine aquaculture depends on enabling conditions that determine whether increased activity can create durable economic benefits. Naylor *et al.* (2021) showed that sustained aquatic production requires productive capacity and supporting systems that can maintain output over time.

2.1.3 Blue Economy

The blue economy is the coordinated and sustainable use of ocean, coastal and inland-water assets for economic production, social welfare and ecological continuity. Popoola and Olajuyigbe (2023) explained that the Gulf of Guinea possesses strong blue-economy opportunities, but converting those opportunities into durable benefits requires coordinated governance and effective implementation. Bennett *et al.* (2021) argued that blue growth must incorporate social equity and responsible resource use so that economic expansion does not undermine the communities and ecosystems on which it depends. The concept therefore treats maritime resources as a productive system whose value comes from the organised interaction of economic activity, institutions, technology, people and environmental safeguards.

Shipping, ports, inland waterways, fisheries, offshore services and coastal economic activities provide the principal channels through which blue-economy resources can generate output and livelihoods. Okafor-Yarwood *et al.* (2020) explained that African blue-economy outcomes depend on the interaction of economic opportunity, cultural livelihoods and ecosystem conservation. Cisneros-Montemayor *et al.* (2021) further identified finance, institutions, participation and benefit sharing as conditions required for ocean resources to

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produce equitable development outcomes. The study therefore concentrates on maritime transport development, port infrastructure development, and fisheries and aquaculture development as observable time-series dimensions of the blue economy.

2.1.4 Maritime Transport Development

Maritime transport development is the improvement of shipping capacity, vessel connectivity, cargo movement and the interfaces that link seaports with domestic and international markets. Elegbede *et al.* (2025) explained that maritime development depends on the ability to convert ocean opportunities into organised economic benefits through workable institutions and productive participation. Gephart *et al.* (2021) showed that resilience in interconnected aquatic systems requires planning that can respond to changing production and demand conditions. Maritime transport development therefore reflects more than the movement of ships; it includes the ability of shipping services and port-linked logistics to maintain reliable connectivity, facilitate trade and support sustained economic activity within the maritime sub-sector.

Vessel activity, cargo movement, shipping connectivity and port-linked logistics are practical indicators of how maritime transport supports trade and production. Rodrigue (2020) explained that maritime transport creates economic value by connecting production, distribution and market systems rather than by ship movement alone. Saeed *et al.* (2021) showed that changes in maritime networks can alter trade flows and the strength of transport connections between economies.

2.1.5 Port Infrastructure Development

Port infrastructure development was understood in this study as the expansion, renewal and effective use of physical, digital and intermodal facilities required for safe and efficient port operations. Okafor-Yarwood *et al.* (2022) explained that maritime development is weakened when infrastructure, governance and coastal participation are not effectively coordinated. Mtapuri and Giampiccoli (2020) stressed that sustainable development requires infrastructure and economic activity to generate benefits that are practically accessible to the communities and users connected to them. Port infrastructure development therefore covers terminal space, berth capacity, channels, equipment, access connections and digital systems whose quality determines whether ports can process cargo reliably, lower delays and sustain their competitiveness within national and international trade networks.

Berths, terminals, access channels, cargo-handling equipment, storage facilities, digital systems and hinterland connections determine how effectively port capacity can be converted into usable services. Notteboom *et al.* (2022) explained that port competitiveness depends on infrastructure, connectivity, governance and the reliability of logistics services.

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Sunitiyoso *et al.* (2022) showed that port performance is shaped by interacting operational factors rather than by physical capacity in isolation.

2.1.6 Fisheries and Aquaculture Development

Fisheries and aquaculture development was understood in this study as the sustainable expansion of capture fisheries, fish farming, mariculture and associated value chains that convert aquatic resources into food, income and employment. Asua and Nwangwu (2026) explained that Nigeria's blue-economy development is constrained when maritime insecurity and environmental degradation weaken productive use of coastal resources. Walker (2021) argued that a sustainable blue economy requires resource use that can preserve ecological capacity while supporting long-term economic benefits. Fisheries and aquaculture development therefore involves increasing aquatic production together with the systems needed to protect stocks, support producers, reduce losses and ensure that higher physical output is converted into sustained economic value.

Capture fisheries, aquaculture farms, mariculture, processing, storage and marketing form a connected production chain through which aquatic resources create food, income and economic value. Okomoda *et al.* (2025) found that marine aquaculture development in south-western Nigeria is influenced by infrastructure, finance, stakeholder participation and other enabling conditions that affect expansion. Tigchelaar *et al.* (2022) explained that aquatic food systems are also exposed to compound climate risks capable of weakening production and its wider benefits.

2.2 Theoretical Framework

The study is anchored on one theory that explains how strategic resources can be organised to support the survival and competitiveness of a sector.

2.2.1 Resource-Based View Theory

The Resource-Based View Theory was propounded by Barney in 1991. The theory explains that organisations and sectors achieve sustained survival and competitive advantage when they possess resources that are valuable, rare, difficult to imitate and properly organised for productive use. Barney (1991) argued that strategic value does not come merely from possessing resources, but from the way those resources are combined, protected and deployed to produce superior outcomes. Teece (2018) extended this resource-capability position by explaining that organisations require dynamic capabilities and workable business models to reconfigure strategic assets as conditions change. The theory has also attracted criticism. Priem and Butler (2001) criticised the Resource-Based View for possible tautology because valuable resources may be identified only after superior performance has already occurred. Kraaijenbrink, Spender and Groen (2010) argued that the theory can become excessively broad when almost every organisational asset is classified as a strategic resource. These criticisms are relevant to the maritime setting because resources may fail to create survival outcomes where governance, regulation or operating conditions are weak. This study is anchored on the Resource-Based View because Nigeria's maritime transport routes, port infrastructure, fisheries and aquaculture resources constitute strategic assets whose effective development should translate into measurable productive value. The theory therefore explains the expected effects of maritime transport development, port infrastructure development, and fisheries and aquaculture development on strategic survival measured by maritime-sector contribution to GDP.

2.3 Empirical Review

Onah *et al.* (2026) examined whether shipping performance, port productivity and inland-waterway infrastructure improved sustainable agricultural supply-chain efficiency in Apapa, Tin Can Island, Onne and selected inland-waterway logistics corridors in Nigeria. On the strength of the evidence, it was concluded that integrated improvements in ports, shipping and inland waterways can substantially strengthen logistics efficiency in Nigeria. Al-Adayleh (2026) examined how blue-economy activities affected economic growth in Jordan from 1982 to 2023. A census of the complete annual series was used. The study established that total fish production exerted a negative effect, suggesting that higher physical output did not automatically create higher value added. The fish-production coefficient was negative and significant at $p < 0.05$. Arlı *et al.* (2025) investigated whether fisheries exports and maritime-freight exports promoted economic growth in Türkiye. Their study established that maritime-freight exports also positively affected growth and generated one-way causality toward GDP. Maritime-freight exports were significant at $p = 0.01$ and explained 18.3% of GDP forecast variance by year nineteen.

Liza *et al.* (2025) revealed that fisheries and aquaculture production positively influenced economic growth in the long run. Both blue-economy variables were statistically significant at $p < 0.05$. These results suggest that productive blue-economy expansion worked jointly with conventional capital and labour accumulation. Ayesu and Boateng (2024) estimated the effect of container-port throughput on employment in twenty-seven African seaport countries. Their results suggest that container activity generated direct and induced labour demand while employment capacity also supported port growth. Accordingly, African port policy should connect throughput growth with industrial and service-sector development. Marwa *et al.* (2024) examined the determinants of blue-economy growth across eight archipelagic provinces in Indonesia. The findings revealed that information technology, capture fisheries and aquaculture positively increased blue-economy growth. Their coefficients were positive and statistically significant at $p < 0.05$. The study further established that trade openness and electricity showed negative effects, while investment was not statistically significant. Trade openness and electricity were significant at $p < 0.05$, whereas investment recorded $p > 0.05$.

Adenigbo *et al.* (2023) examined the effect of shipping trade on economic growth in Nigeria. Census sampling of the complete annual series was used. Their findings revealed that cargo imports and exports significantly affected GDP in the short run. Cargo imports recorded $p = 0.028$ and cargo exports $p = 0.032$. The study further established that the exchange-rate effect was not significant in the short run, although long-run adjustment existed. Ayesu *et al.* (2023) examined how seaport efficiency and port throughput affected economic growth in twenty-eight African seaport countries. The findings revealed that higher seaport efficiency significantly increased economic growth. A 1% efficiency increase raised GDP by approximately 0.014%–0.038%, depending on specification. The study further established that greater port throughput also significantly increased GDP. A 1% throughput increase raised GDP by approximately 0.028%–0.043%. They suggest that port productivity and cargo scale provided distinct but complementary growth channels.

Fratila *et al.* (2021) analysed the relationship among maritime transport, port investment, emissions and GDP per capita in twenty EU countries and revealed that maritime transport had a positive and significant relationship with GDP per capita. The study further established that lagged port investment improved GDP but increased some environmental pressures. These results suggest that maritime expansion supported growth but created environmental trade-offs that could threaten long-term sustainability. Accordingly, port investment should be combined with cleaner technology and emissions controls. Munim and Schramm (2018) examined how port infrastructure and logistics performance affected economic growth across ninety-one seaport countries. Confirmatory measurement assessment and correlation analysis were undertaken. In addition, structural-equation modelling, mediation analysis and developed-versus-developing-country multi-group comparisons were applied. The findings revealed that port infrastructure significantly improved logistics performance and seaborne trade. Overall model fit was acceptable, $\chi^2/df = 132.33/68 = 1.95$. The study further established that logistics performance and seaborne trade transmitted positive effects to economic growth, especially in developing countries.

METHOD

3.1 Research Design

The *ex-post facto* longitudinal time-series research design was adopted in this study. This design is appropriate because the study relies on already existing annual observations on the blue-economy indicators and the strategic survival of Nigeria's maritime sub-sector from 1994 to 2025. The researchers do not manipulate the variables; instead, the study examines how changes in each explanatory series are associated with changes in maritime-

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sector contribution to GDP over time. The longitudinal time-series approach is suitable because the thirty-two annual observations are ordered chronologically and are analysed as historical economic and maritime data.

3.2 Nature and Sources of Data

The annual secondary time-series data was used covering 1994–2025, giving thirty-two chronological observations for each variable. Maritime transport and port data are drawn from Nigerian port statistical records, maritime-sector output data from national-account series, and fisheries and aquaculture data from recognised fisheries statistical series.

Table 1: Measurement and Description of Variables

Variable	Symbol	Type	Measurement	A priori
Maritime-Sector Contribution to GDP	MSGDP	Dependent	Harmonised real water-transport value added, ₦ billion	–
Maritime Transport Development	MTD	Independent	Annual vessel/ship calls, number	Positive
Port Infrastructure Development	PID	Independent	Cargo throughput, million metric tonnes	Positive
Fisheries and Aquaculture Development	FAD	Independent	Total fisheries production, thousand metric tonnes	Positive

Source: Researchers' compilation (2026).

Table 2: Empirical Specification of Model

The functional relationships for the three specific objectives are stated as follows:

MSGDP = f(MTD) Model 3.1
MSGDP = f(PID) Model 3.2
MSGDP = f(FAD) Model 3.3

The functional relationships are transformed into the following simple econometric models:

$MSGDP_t = \beta_0 + \beta_1 MTD_t + \mu_t$ Equation 3.1
$MSGDP_t = \beta_0 + \beta_1 PID_t + \mu_t$ Equation 3.2
$MSGDP_t = \beta_0 + \beta_1 FAD_t + \mu_t$ Equation 3.3

Where: MSGDP = maritime-sector contribution to gross domestic product; MTD = maritime transport development; PID = port infrastructure development; FAD = fisheries and aquaculture development; β_0 = constant or intercept; β_1 = coefficient of the relevant independent variable; μ_t = stochastic error term; and t = annual time period.

3.3 Method of Data Analysis

The descriptive statistics, Pearson correlation analysis and simple ordinary least-squares regression was employed with the aid of Eviews 10.0. The data used for the study are presented in Tables.

3.4 Decision Rule

At the 5% level of significance, the null hypothesis is rejected where the probability value of the relevant regression coefficient is less than or equal to 0.05; otherwise, the null hypothesis is not rejected. The coefficient sign shows the direction of the effect, while its magnitude indicates the estimated change in maritime-sector contribution to GDP associated with a one-unit change in the explanatory variable.

4. RESULTS AND DISCUSSION

Table 2: Descriptive Statistics

Statistic	MSGDP	MTD	PID	FAD
Mean	3.926572	4261.156250	58.696330	787.553897
Median	3.804690	4303.500000	68.070273	784.261000
Maximum	7.106000	5369.000000	129.300000	1400.000000
Minimum	2.586040	2638.000000	11.347845	281.232000
Std. Dev.	1.075944	638.835943	28.885197	310.504938
Skewness	0.967170	-0.435416	0.024631	0.055125
Kurtosis	3.719587	3.080499	2.521756	1.689591
Jarque-Bera	5.679304	1.019772	0.308192	2.305770

Probability	0.058446	0.600564	0.857190	0.315725
Sum	125.650300	136357.000	1878.282547	25201.725
Sum Sq. Dev.	35.887311	12651452.219	25864.993	2988812.807
Observations	32	32	32	32

Source: Researchers' computation (2026).

Table 2 shows that maritime-sector contribution to GDP (MSGDP) recorded a mean of 3.926572 billion naira, a median of 3.804690 billion naira, a maximum of 7.106000 billion naira and a minimum of 2.586040 billion naira, with a standard deviation of 1.075944. Maritime transport development (MTD) averaged 4,261.156 vessel calls, ranging from 2,638 to 5,369, with a standard deviation of 638.835943. Port infrastructure development (PID), represented by cargo throughput, averaged 58.696330 million metric tonnes, with a maximum of 129.300000, a minimum of 11.347845 and a standard deviation of 28.885197. Fisheries and aquaculture development (FAD) averaged 787.553897 thousand metric tonnes, ranging from 281.232000 to 1,400.000000, with a standard deviation of 310.504938. The distribution statistics further show the extent of asymmetry and peakedness in each series, while the Jarque-Bera probability values reported in the table provide the formal indication of normality for the individual variables over the thirty-two observations.

Table 3: Pearson Correlation Matrix

Variable	**MSGDP**	**MTD**	**PID**	**FAD**
MSGDP	1.000000			
MTD	0.218998	1.000000		
PID	0.893261	0.536848	1.000000	
FAD	0.909152	0.394480	0.932221	1.000000

Source: Researchers' computation (2026).

Table 3 indicates that maritime-sector contribution to GDP has a weak positive correlation with maritime transport development ($r = 0.218998$), a strong positive correlation with port infrastructure development ($r = 0.893261$), and a strong positive correlation with fisheries and aquaculture development ($r = 0.909152$). These coefficients show that PID and FAD moved more closely with maritime-sector output over the study

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period than MTD. The explanatory variables are also positively associated with one another: MTD and PID recorded r = 0.536848, MTD and FAD recorded r = 0.394480, while PID and FAD recorded r = 0.932221. The correlation results are preliminary and do not establish causation; the hypotheses are therefore decided from the separate simple-regression coefficients and their probability values.

Table 4: Regression Result for Maritime Transport Development and Maritime-Sector Contribution to GDP

Dependent Variable: MSGDP
Method: Least Squares
Sample: 1994–2025
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.354875	1.292326	1.822199	0.0784
MTD	0.000369	0.000300	1.229346	0.2285
R-squared	0.047960		Mean dependent var	3.926572
Adjusted R-squared	0.016226		S.D. dependent var	1.075944
S.E. of regression	1.067179		Akaike info criterion	3.028376
Sum squared resid	34.166145		Schwarz criterion	3.119985
Log likelihood	-46.454022		Hannan-Quinn criter.	3.058742
F-statistic	1.511292		Durbin-Watson stat	0.102484
Prob(F-statistic)	0.228497			

Source: Researchers' computation (2026).

Table 4 shows that maritime transport development has a positive coefficient of 0.000369, a standard error of 0.000300 and a t-statistic of 1.229346. Its probability value of 0.2285 is greater than 0.05, indicating that the positive effect is statistically insignificant. An additional vessel call is therefore associated with an estimated 0.000369 billion-naira increase in maritime-sector contribution to GDP, but the evidence is not strong enough to establish a significant effect. The R-squared of 0.047960 shows that MTD explains about

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4.80% of the variation in MSGDP, while the adjusted R-squared is 0.016226. The F-statistic is 1.511292 with p = 0.2285 and the Durbin-Watson statistic is 0.102484. Since p = 0.2285 > 0.05, the null hypothesis is not rejected; maritime transport development has no significant separate effect on MSGDP.

Table 5: Regression Result for Port Infrastructure Development and Maritime-Sector Contribution to GDP

Dependent Variable: MSGDP
Method: Least Squares
Sample: 1994–2025
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.973567	0.199387	9.898181	0.0000
PID	0.033273	0.003057	10.883570	0.0000
R-squared	0.797915		Mean dependent var	3.926572
Adjusted R-squared	0.791178		S.D. dependent var	1.075944
S.E. of regression	0.491674		Akaike info criterion	1.478460
Sum squared resid	7.252302		Schwarz criterion	1.570069
Log likelihood	-21.655360		Hannan-Quinn criter.	1.508826
F-statistic	118.452094		Durbin-Watson stat	0.422047
Prob(F-statistic)	0.000000			

Source: Researchers’ computation (2026).

Table 5 reports a positive port infrastructure development coefficient of 0.033273, with a standard error of 0.003057 and a t-statistic of 10.883570. The probability value of 0.0000 is below 0.05, showing a statistically significant positive effect. A one-million-metric-tonne increase in cargo throughput is associated with an estimated 0.033273 billion-naira increase in maritime-sector contribution to GDP. The R-squared of 0.797915 indicates that PID explains about 79.79% of the variation in MSGDP, while the F-statistic of 118.452094 with p = 0.0000 confirms the significance of the regression. Since p = 0.0000

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< 0.05, the null hypothesis is rejected; port infrastructure development has a positive and significant effect on MSGDP.

Table 6: Regression Result for Fisheries and Aquaculture Development and Maritime-Sector Contribution to GDP

Dependent Variable: MSGDP
Method: Least Squares
Sample: 1994–2025
Included observations: 32

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	1.445508	0.222576	6.494452	0.0000
FAD	0.003150	0.000263	11.956935	0.0000
R-squared	0.826558		Mean dependent var	3.926572
Adjusted R-squared	0.820776		S.D. dependent var	1.075944
S.E. of regression	0.455499		Akaike info criterion	1.325614
Sum squared resid	6.224374		Schwarz criterion	1.417222
Log likelihood	-19.209824		Hannan-Quinn criter.	1.355980
F-statistic	142.968304		Durbin-Watson stat	0.457613
Prob(F-statistic)	0.000000			

Source: Researchers' computation (2026).

Table 6 shows that fisheries and aquaculture development has a positive coefficient of 0.003150, a standard error of 0.000263 and a t-statistic of 11.956935. The probability value of 0.0000 is below 0.05, establishing a statistically significant positive effect. An additional one thousand metric tonnes of fisheries production is associated with an estimated 0.003150 billion-naira increase in maritime-sector contribution to GDP. The R-squared of 0.826558 shows that FAD explains about 82.66% of the variation in MSGDP, while the F-statistic of 142.968304 with p = 0.0000 confirms the significance of the regression. Since p = 0.0000 < 0.05, the null hypothesis is rejected; fisheries and aquaculture development has a positive and significant effect on MSGDP.

4.1 Maritime Transport Development and Strategic Survival

The first finding shows that maritime transport development, represented by vessel calls, had a positive but statistically insignificant effect on maritime-sector contribution to GDP (Coeff. = 0.000369; p = 0.2285). This indicates that a higher number of vessel calls did not, by itself, guarantee a measurable increase in the productive survival of the maritime sub-sector during the study period. The result suggests that the economic value of maritime transport depends on the cargo carried, service efficiency, domestic participation and the strength of supporting logistics rather than the number of ship arrivals alone. Nigeria-specific evidence has shown that cargo imports and exports can significantly influence output when shipping trade is connected with wider economic activity (Adenigbo *et al.*, 2023). The finding also contrasts with European evidence where maritime transport recorded a significant positive relationship with GDP per capita (Fratila *et al.*, 2021). The difference supports the view that vessel activity must translate into productive domestic value before it can significantly strengthen maritime-sector contribution to GDP.

4.2 Port Infrastructure Development and Strategic Survival

The second finding establishes that port infrastructure development, represented by cargo throughput, had a positive and statistically significant effect on maritime-sector contribution to GDP (Coeff. = 0.033273; p = 0.0000). The high R-squared of 0.797915 further shows that realised port capacity moved closely with the productive output of the maritime sub-sector. This finding implies that functional berths, terminals, equipment, access systems and related port facilities support strategic survival when they enable ports to process more cargo efficiently and retain trade within the domestic maritime system. The result agrees with African evidence that improvements in seaport efficiency and throughput raise economic growth, with throughput producing positive and significant growth effects (Ayesu *et al.*, 2023). It is also consistent with the finding that port infrastructure strengthens logistics performance and seaborne trade, which in turn transmit positive effects to economic growth (Munim and Schramm, 2018). The evidence therefore supports continued attention to productive port capacity and operational infrastructure.

4.3 Fisheries and Aquaculture Development and Strategic Survival

The third finding shows that fisheries and aquaculture development had a positive and statistically significant effect on maritime-sector contribution to GDP (Coeff. = 0.003150; p = 0.0000), with the simple model explaining 82.66% of the observed variation in the maritime-sector output proxy. This suggests that expansion in fisheries production can strengthen strategic survival by broadening the productive base of the maritime economy beyond shipping and port services. The result is consistent with evidence that fisheries and aquaculture production have positive long-run effects on economic growth when they are supported by capital, labour and productive linkages (Liza *et al.*, 2025). It also agrees with findings that capture fisheries and aquaculture positively increase blue-economy growth when sectoral output is supported by appropriate productive conditions (Marwa *et al.*, 2024).

5.1 CONCLUSION

It was concluded that the selected blue-economy dimensions do not contribute equally to the strategic survival of Nigeria's maritime sub-sector. Port infrastructure development and fisheries and aquaculture development produced positive and statistically significant effects on maritime-sector contribution to GDP, while maritime transport development, measured by vessel calls, produced a positive but insignificant effect. Strategic survival therefore depends more on the productive value created from port capacity and fisheries activity than on the volume of vessel movements alone. Strengthening the maritime sub-sector requires policy and investment that convert available ocean and coastal resources into measurable domestic output.

5.2 Business Implications of Findings

i. Shipping and logistics firms should focus on cargo value, vessel utilisation and service efficiency rather than vessel-call growth alone.
ii. Terminal operators and investors can improve maritime value by prioritising throughput-enabling equipment, access and operational port capacity.
iii. Fisheries businesses should integrate production with processing, cold-chain, storage and market systems to retain more value within Nigeria.

5.3 Recommendations

The following recommendations are made:

i. Government and port authorities should prioritise functional port modernisation that improves cargo throughput and operating efficiency.
ii. Maritime agencies should strengthen indigenous shipping productivity, vessel utilisation and cargo-generating capacity rather than vessel counts alone.
iii. Government should deepen fisheries and aquaculture value chains through production support, cold-chain facilities, processing and market access.

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