Accessing the Impact of Blue Inland Waterways in Sub-Saharan Economy

Dr. Adeyemi Omolade Sunday[*]
Dr. Adeyemi Oluwatoyin Damilola[**]
Dr. Akindele Iyiola Tomilayo[***]
Dr. Adedoyin Adewuni Ramat[****]

Abstract

This study assesses the impact of the blue economy in sub-Saharan inland waterways. The study adopted a descriptive quantitative survey research design. We collected primary data online using a structured, closed-ended questionnaire. The population of the study, which also serves as the sample size, includes 282 individuals involved in fishing and water transport. We adopted the stratified random sampling technique and conducted a multiple regression analysis of the data. The demographic findings revealed that a greater proportion of respondents lived in urban areas, and their primary occupations are transportation and fishing. The analysis showed a strong positive link between the blue economy (which includes infrastructure quality, fishing revenue, transport revenue, and governance) and GDP per capita, with a high R-value of 0.968 and a 97% correlation. This study concluded that the blue economy significantly impacts GDP per capita. The study also recommends that enhancing governance frameworks and investing heavily in dependable infrastructure significantly boosts access to economic prospects. This study contributes to the growing discussion on the subject and highlights the need for deliberate governance interventions to fully exploit the blue economy's promise in sub-Saharan inland waterways.

Key Words: Blue Economy, Inland Waterways, Fishing Revenue, Transport Revenue, GDP per Capital.

[*] Senior Lecturer, Department of Business administration, Christopher University, Ogun State, Nigeria. He can be reached at: adeyemimld@gmail.com.

[**] Lecturer, Department of Economics and Business Administration, Aletheia University, Ago-Iwoye, Ogun State, Nigeria. He can be reached at: Oluwatoyin.adeyemi@aletheiauniversity.edu.ng.

[***] Senior Lecturer, Department of Public Administration, University of Ilorin, Kwara State, Nigeria. He can be reached at: akindele.it@unilorin.edu.ng.

[****] Senior Lecturer, Department of Accounting, Oduduwa University Ipetumodu, Ile-Ife, Osun State, Nigeria. He can be reached at: ifead2002@yahoo.com.

Introduction

Inland water bodies are essential to many economic activities, including farming, fishing, tourism, and transportation. It guarantees food and a livelihood for millions of people in sub-Saharan Africa. Aquaculture and fishing are major drivers of the economies of many of the countries in this region. The estimated value of inland fish production in Africa was $25 billion in 2018 alone, with substantial expansion potential, given that only a small percentage of these waters are used for aquaculture (Annane, 2024). Additionally, inland water body-focused tourism is expanding, attracting foreign visitors to destinations (Mutschinski & Coles, 2021). Despite its economic significance, research on inland waterways remains limited compared to studies of the coastal blue economy. The African Development Bank estimates that the blue economy might contribute up to $1.5 trillion to GDP by 2030 and help alleviate poverty and create jobs. To maintain this promise, governments and stakeholders must collaborate to fund sustainable practices and infrastructure development (World Bank, 2022). The blue economy in Sub-Saharan Africa faces numerous challenges, including overfishing, poor leadership, and toxicity, despite its potential advantages.

The underlying reason for these challenges is often a lack of awareness of the importance of maritime habitats and the advantages they offer (Sungkawati, 2024). Furthermore, inadequate knowledge of inland water habitats has a big impact on economic growth and societal development in many ways. The absence of essential data fundamentally hinders the formulation of efficient plans for sustainable resource management. Inland water resources and coastal habitats are often poorly managed as a result of short-term economic goals (Ivanova et al., 2024). One fundamental issue that underlies these challenges is the general lack of understanding regarding the ecological and economic importance of inland water ecosystems (Gesami & Nunoo, 2024). Another issue is that many programmes' short-term economic focus has led to poor resource management and disregard for long-term sustainability objectives (Sanusi et al., 2023).

Most studies concentrate on coastal areas, ignoring the economic value of inland waterways in supporting local communities in some form. Effective coordination between communities, corporations, and governments is impeded by the lack of empirical data on sustainable resource management (Hafidh & Sharif, 2022; Ujianti et al., 2024). Inadequate research on biodiversity and habitat health has resulted in a lack of studies on how water quality affects economic activities like fishing. Most governments make poor use of their precious inland water resources by prioritising land development over wise water management strategies (Onyena & Sam, 2025). Existing studies fail to examine the important connections fully between aquatic ecosystems and economic results. In murky conditions, experts investigate the substantial effects of water quality changes on economic activities such as fishing (Annane, 2024). MSP's ability to manage maritime resources sustainably is well known, but its use in inland rivers is still relatively underused. Managing inland water resources is typically

subordinated to land-based planning, which over time seems to result in less-than-optimal resource usage (Geng et al., 2024).

The importance of inclusive policies that guarantee fair access for all parties involved, particularly groups that are in some way vulnerable. Socio-economic disparity sometimes complicates the equitable distribution of the blue economy's benefits within the existing power structures. Decision-making processes rarely include small-scale fishermen and other marginalised groups, significantly limiting their access in today's unpredictable climate (Popoola & Olajuyigbe, 2023). Inland waterways must be managed effectively if the effects of climate change are significantly reduced. When vulnerable individuals receive assistance during extremely severe weather conditions, efficient governance significantly increases resilience against disasters (Ofori et al., 2021). This study aims to explore the relationship between blue inland waterways and GDP per capita, in addition to addressing economic and social disparities. The objective is to examine the relationship that exists between blue inland waterways and GDP per capita. The null hypothesis states that there is no significant relationship between blue inland waterways and GDP per capita.

Conceptual Review

The blue economy is defined as the sustainable use of ocean resources to promote economic growth, employment opportunities, and improved standards of living while safeguarding the vitality of the ocean's ecosystems (Geng et al., 2024). The blue economy comprises numerous inland waterways in addition to coastal regions; freshwater ecosystems are crucial to the well-being of indigenous residents, and shipping, tourism, aquaculture, fisheries, and renewable energy are just a few of the industries it encompasses (Muringai et al., 2022). Inland waterways are crucial to the blue economy because they provide resources that are necessary for both revenue generation and food security. Sustainable fisheries management is crucial since fish is the main source of protein for about one billion people in developing nations (Annane, 2024). Furthermore, inland water transport is crucial for trade and mobility; it reduces transit costs and increases market accessibility (Onyena & Sam, 2025). In spite of their significance, environmental pressures and issues related to governance usually lead to the inefficient use or inadequate management of these resources.

More so, pollution from soil erosion and industrial waste poses a major threat to aquatic ecosystems. Overfishing and habitat damage exacerbate these issues (Apeh & Nwulu, 2024). In many Sub-Saharan African nations, ineffective governance schemes result in extensive resource exploitation and significant environmental damage, which in turn leads to a lack of compliance with regulation (Mutanda & Nhamo, 2024). Also, marginalised groups, such as women and young people, are frequently left out of decision-making processes related to resource management, which restricts their capacity to benefit from business activities (Guerreiro, 2022). Despite these challenges, the blue economy has a lot of promise. The African Union estimates that the blue economy creates over $300 billion in revenue yearly and sustains

roughly 49 million jobs (World Bank, 2022). Communities can enhance their nutritional outcomes and provide more food security for vulnerable populations by supporting aquaculture, implementing ethical fishing methods and encouraging ecosystem-based solutions that boost resilience against environmental changes; the blue economy can aid in plans for adapting to climate change (Global Centre on Adaptation, 2023).

Empirical Review

Ivanova et al. (2024), investigated the blue economy's importance in the Asia-Pacific Economic Cooperation (APEC) area, highlighting its contribution to climate crisis mitigation and sustainability. The PRISMA approach examined women's involvement in the blue economy through case studies from member nations, APEC initiatives, and global blue economy policy. Results indicate that the ocean is essential to aquaculture, sustainable fisheries, and food security. According to the study's findings, tackling climate change and advancing inclusive development require the blue economy. Annane (2024), looked at how Algeria's aquaculture and fisheries industry has grown quickly, especially after 2018 and in 2022. The research evaluated contributing elements by examining production data, investment trends, and sectoral policies. Results indicated that government incentives, capital rerouting, and technological adoption drove a 149.5% increase in exports, a 21.43% growth in aquaculture, and more jobs. Problems like finite fish stocks necessitate sustainable management due to their strategic significance. According to the study's findings, sustained investment and prudent resource management are essential for sustained growth.

Sungkawati (2024) looked at Indonesia's attempts to use the blue-green economic model to attain sustainable development. The study sought to evaluate the nation's ability to use this paradigm, as well as its obstacles and possible solutions. It investigated the connection between sustainable development indicators and economic growth between 2014 and 2024 using time series analysis and the ARDL model. According to the findings, Indonesia's wealth of marine resources offers chances to accomplish the SDGs, but there are obstacles in the areas of economic management, governance, and legislation. The study came to the conclusion that international alliances, stakeholder collaboration, technical developments, and efficient policy coordination are crucial.

Uchenna et al. (2024) investigated the connection between Nigeria's blue economy growth and marine security, with a particular emphasis on the Niger Delta and the Gulf of Guinea. The research employed a quantitative methodology and structural equation modelling to examine 33 years (1990–2022) of secondary data from organisations such as the Nigerian Ports Authority and the International Maritime Bureau. The results indicated that crew kidnappings (56%), pirate attacks (55%), and crude oil theft (92%) had a major impact on maritime security risks. These threats impede trade, investment, and economic progress. According to the study's findings,

the growth of the blue economy depends on enhancing marine security. Geng et al. (2024) studied the effects of social, economic, and environmental factors on inclusive growth in 19 Asian Cooperation Dialogue member nations between 1995 and 2021. The study discovered that these characteristics have varying effects on inclusive growth in lower-middle, upper-middle, and high-income nations using the Driscoll–Kraay standard error regression technique.

The study addressed the trade-offs between environmental sustainability and economic growth by emphasising the role of fisheries and aquaculture in economic inclusion. It came to the conclusion that implementing renewable energy, diversifying economies, and enhancing fisheries management can all contribute to inclusive growth. Ujianti et al. (2024) investigated the elements affecting fishing operations in Indonesia's blue economy, with a particular emphasis on marine capture and aquaculture in Semarang City, Demak Regency, and Kendal Regency. GDP, capital, labour, fisheries production, and water quality were all examined in the study using secondary data from 2018–2023 from the Central Bureau of Statistics and the Ministry of Maritime Affairs and Fisheries. The results indicated that GRDP has a significant impact on fisheries growth, with yearly increases in Semarang at 5.24%, Kendal at 4.95%, and Demak at 2.09%. The study came to the conclusion that fisheries support employment development and economic expansion.

Dare (2023), focused on fishing and water transportation earnings to analyse how the Blue Economy affected Nigeria's sustainable development from 1981 to 2022. The study examined data from the Central Bank of Nigeria using the Fully Modified Ordinary Least Squares (FMOLS) regression. The findings showed that, whereas water transportation revenue had a favourable but negligible impact, fishing revenue dramatically increased life expectancy and per capita income. Furthermore, water transport revenue showed a unidirectional causal relationship with life expectancy, while fishing revenue showed a bidirectional causal relationship. According to the study's findings, improving the fishing and water transportation industries could promote long-term growth.

With Nigeria as a case study, Michael 2023), investigated how the blue economy affected economic growth in sub-Saharan Africa. Its goal was to investigate sources of income apart from oil and gas. The study used the Autoregressive Distributed Lags (ARDL) regression technique to examine data from 1982 to 2020. The independent variables were fishing, water sanitation, waste management, and water transportation, whereas the dependent variable was real GDP growth. The results indicated that whereas water cleanliness, waste management, and water transportation harmed GDP growth, fishing had a favourable impact. Gesami and Nunoo (2024), investigated the use of artificial intelligence (AI) in the monitoring and management of marine ecosystems in Kenya's Blue Economy, with an emphasis on adaptation to climate change. Assessing climate change concerns and investigating AI's potential to improve resilience were the goals of the study. The study used secondary data to scrutinise scholarly works, reports, and literature related to AI in maritime

management. Climate change negatively impacts Kenya's marine ecosystems, leading to rising sea levels, ocean acidification, and coral bleaching, according to the results.

Mwaijande (2025), looked at Tanzania's 1,424 km of coastline along the Indian Ocean and its potential to create a vibrant blue economy. In addition to identifying important socio-economic sectors and highlighting the importance of the blue economy, the study sought to suggest a framework of policies for the sustainable management of marine resources. Utilising an exploratory and descriptive research approach, the study used purposive sampling, bibliometric analysis, interviews, and desk research to gather qualitative and quantitative data from the maritime transportation, energy, tourism, and fishing sectors. Tanzania has abundant marine resources, but there isn't a national policy that supports the blue economy, according to the findings. Muringai et al. (2022), examined the literature to understand the impact of climate change on fisheries, including increased water temperatures, altered hydrology, and pollution, which adversely affect fish populations and dependent communities. The study focused on the effects, adaptation strategies, and management efforts of climate change on freshwater fisheries in Sub-Saharan Africa. By targeting new species, altering fishing gear, and diversifying their sources of income, fishermen have adjusted. To improve resilience, the study found that inclusive policymaking that involves local people is crucial.

Theoretical Review

The sustainable development theory states that economic advancement must coexist with environmental protection and social fairness. One particularly relevant application of this strategy is the blue economy, which emphasises the sustainable use of aquatic resources to foster economic growth without compromising ecosystem health (World Bank, 2022). Inland rivers are vital for locals in sub-Saharan Africa who rely on fishing and transportation for a living. Sustainable fishing practices can strengthen the economy and increase food security. According to Muringai et al. (2022) sustainable fisheries management contributes to the stability of long-term ecosystems by maintaining biodiversity and supporting local economies and livelihoods. The theory practically emphasises the need to somehow directly incorporate social factors into economic strategies. In sub-Saharan Africa, marginalised groups rely largely on aquatic resources to survive under extremely difficult conditions. According to Annane (2024), promoting equitable access to fishing and transportation earnings enhances the resilience of rural communities and significantly reduces ingrained poverty. This theory therefore provides a framework for assessing how profits from fishing and transportation can increase GDP per capita (GDPCI) without compromising sustainability. This theory offers a framework for assessing blue economy activities that contribute to a fairly sustainable increase in GDP per capita, such as fishing (Annane, 2024).

The economic growth theory looks at ways in which different factors affect a nation's economic performance, which is usually determined by GDP growth or GDP

per capita. According to this theory, specific investments in important industries can boost productivity and encourage economic growth (Dare, 2023). Under murky waters, Sub-Saharan Africa's blue economy is largely driven by water transportation and fishing. Empirical research indicates that fishing earnings and GDP per capita are significantly correlated. Scholars such as Ujianti et al. (2024) found that a rise in fishing activity was a major factor in Nigeria's GDP development, showing how well managed fisheries may boost local economies by creating jobs and revenue. Effective water transportation facilities are inevitably significant in increasing trade market accessibility. Although fisheries have a significant impact on GDPCI, Dare (2023) makes a compelling case that investing in transport infrastructure promotes growth in some way. Governance, technical developments, and infrastructure development all have a substantial impact on economic outcomes. In Sub-Saharan Africa, maximising the advantages of blue economy endeavours necessitates addressing governance issues amid widespread environmental deterioration (Guerreiro, 2022).

This theoretical framework looks at how GDPCI, which depends on other factors, is related to fishing and transportation revenue, the quality of infrastructure, and governance in sub-Saharan inland waterways. As a strategic framework for encouraging sustainable economic development through the prudent use of aquatic resources, the blue economy concept has grown in popularity. Fishing is one of the most important parts of the blue economy, particularly in Sub-Saharan Africa, where it is the primary source of protein and a source of income for millions of people. Empirical research has shown a positive correlation between fishing earnings and economic growth. Annane, (2024) found that higher GDP growth rates were associated with higher fishing activity, underscoring the importance of sustainable fisheries management. In a similar vein, inland water transport is crucial to trade and economic mobility. Even though it would require additional funding to contribute to GDPCI, transport revenue is still crucial for trade facilitation and market opening (Muringai et al., 2022). Environmental degradation, overfishing, poor governance, and social inequality impede the growth of the blue economy, despite its benefits (Sungkawati, 2024). Therefore, to maximise economic gains while maintaining sustainability, well-coordinated policies are required.

Methodology

This study adopts a quantitative research approach to investigate the connection between Sub-Saharan Africa's economic growth and the revenue from fishing and water transportation. In order to gather primary data from stakeholders participating in inland waterway operations, such as fishermen, transportation operators, policymakers, and community members, a cross-sectional survey approach was adopted. According to Creswell and Creswell (2023), this design is appropriate for determining trends and connections between economic activity and GDPCI. The study's population of interest consists of up of individuals as well as organisations that engage in inland water transportation and fishing in Sub-Saharan Africa, especially in Nigeria. A sample size

of 282 respondents was chosen using Yamane's (1967) formula for sample size determination, which guarantees statistical representation and reliability with a margin of error of 5%. The choice of 282 respondents appeared to be justified based on the need to possibly achieve a statistically significant result within the study area (Adam, 2020). Using a stratified random sampling technique guarantees that various stakeholders are fairly represented in a given situation (Saleh & Ogunremi, 2025).

The study administered structured closed-ended online questionnaires to respondents to gather primary data. The questionnaire's design used a 5-point Likert scale method to measure attitudes, economic activity, and barriers in the blue economy sector. It featured sections on issues, governance systems, economic contributions, and demographic characteristics. Prior to complete deployment, the questionnaire underwent pre-testing with 30 respondents to verify its validity and reliability, and any necessary modifications were made (Bryman et al., 2021). The collected data was analysed using descriptive statistics (mean, standard deviation, and frequency distributions) and inferential statistics (regression analyses). We used regression analysis to determine the strength and direction of the relationship between GDPCI and fishing and transportation revenue, infrastructure quality, and governance. To increase the accuracy and robustness of the analysis, SPSS version 27 was employed. Participants received informed permission forms, which ensured their voluntary participation and anonymity. To protect respondents' identities, all data was anonymised in accordance with ethical research standards (Pasaribu et al., 2024). This study guarantees that the evaluation of the blue economy's impact on economic growth in Sub-Saharan Africa is transparent, accurate, and reliable. The model specification for this study can be specified as follows:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \epsilon$$

$$GDP = \beta_0 + \beta_1 IFQ_1 + \beta_2 FR_2 + \beta_3 TR_3 + \beta_4 GV_4 + \epsilon$$

Where:

Y = Dependent Variable

X = Independent Variable

x_1 = IFQ

x_2 = FR

x_3 = TR

x_4 = GV

GDP = Gross Domestic Product per Capital

IFQ = Infrastructure Quality

FR = Fishing Revenue

TR = Transport Revenue

GV = Governance

β_0 = Intercept

β_1, β_4 = Coefficients for independent variables

ϵ = Error Term

Characteristics	Categories	Frequency	Percent
Age	21-30	86	30.5
	31-40	96	34.0
	41-50	75	26.6
	51 and above	25	8.9
	Total	282	100.0
Gender	Male	152	53.9
	Female	130	46.1
	Total	282	100.0
Economic Activities	Fishing	151	53.5
	Transport	120	42.6
	Others	11	3.9
	Total	282	100.0
Primary Occupation	Fishing	107	37.9
	Transport	89	31.6
	Business	63	22.3
	Others	23	8.2
	Total	282	100.0
Geo Location	Urban	177	62.8
	Rural	105	37.2
	Total	282	100.0

Table 1: Demographic Information of Respondents

Table 1 shows the demographic information of respondents; there is a relatively even distribution of respondents across the age groups. The result revealed that (96, 34.0%) are between 31 and 40 years of age, (86, 30.5%) are between 21 and 30 years of age, (75, 26.6%) are between 41 and 50 years of age, and (25, 8.9%) are above 51 years of age. Furthermore, 152 (53.9%) of the respondents are male, while 130 (46.1%) are female respondents. In terms of economic activities, (151, 53.5%) have fishing as their primary economic activity, (120, 42.6%) have transport as their primary economic activity, (120, 42.6%) have business as their primary economic activity, and (11, 3.9%) have other economic activities. The distribution of respondents by primary occupation revealed that 107 (37.9%) are into fishing, 89 (31.6%) are into transport, 63 (22.3%) are into business, and 23 (8.2%) are in the other category. In terms of their geographical location, 177 (62.8%) are in urban locations, and 105 (37.2%) are in rural locations.

Model	R	R Square	Adjusted R Square	Std. Error Estimate
1	.968[a]	.936	.935	.25914
a. Predictors: (Constant), Governance, Infrastructure Quality, Fishing Revenue and Transport Revenue				
b. Gross Domestic Product per Capital				

Table 2: Regression Analysis

Table 2 shows a summary of the regression analysis, which highlights how much the blue economy—like infrastructure quality, fishing revenue, transport revenue, and governance—affects the gross domestic product per capita. With an R value of .968 (54%), the result indicates a strong positive relationship between the blue economy (infrastructure quality, fishing revenue, transportation revenue, and governance) and gross domestic product per capita. This magnitude of direct association is statistically significant at the 5% level of significance. The R-squared value of 0.936 implies that 94% of changes in the level of gross domestic product per capita are explained by the blue economy (infrastructure quality, fishing revenue, transport revenue and governance). Other factors, separated under the stochastic error but not included in this model, account for the remaining 6% of variability.

Model		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
1	Regression	273.610	4	68.403	1018.586	.000[b]
	Residual	18.602	277	.067		
	Total	292.212	281			
a. Predictors: (Constant), Governance, Infrastructure Quality, Fishing Revenue and Transport Revenue						
b. Gross Domestic Product per Capital						

Table 3: Regression showing the significance of each predictor to Gross Domestic Product per Capital

Table 3 shows the F-statistics value for regression, which tests how well the independent variables, in explaining the criterion variable, blue economy such as infrastructure quality, fishing revenue, transport revenue and governance in this study area significantly predicted gross domestic product per capital, F (4, 277), 1018.586, p-value < 0.05 (Sig .000). This indicates strong evidence against the null hypothesis, as there is less than 5% probability that is correct. The F-statistics show that the overall regression model is very statistically significant in how well it fits the data because the value of F_{tab} (4, 277) > F_{cal} (1018.586).

Model		**Unstandardized Coefficient**		**Standardized Coefficient**	**T**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	-.124	.041		-3.045	.003
	Infrastructure Quality	.408	.021	.425	19.134	.000
	Fishing Revenue	.789	.037	.775	21.088	.000
	Transport Revenue	.339	.037	.350	9.157	.000
	Governance	-.508	.045	-.535	-11.261	.000

Table 4: Contribution of each predictor to Gross Domestic Product per Capital

Table 4 shows the regression coefficients for the contributions of each independent variable and the criterion variable. The result of the fishing revenue

standardised beta coefficient is 0.775. This means that fishing revenue makes the highest contribution in explaining gross domestic product per capita when the variance explained by all other variables in the study is controlled. The result shows that the infrastructure quality standardised beta coefficient is 0.425. This means that infrastructure quality also contributes uniquely to gross domestic product per capita. The results showed the transport revenue standardised beta coefficient is 0.350. This means that transport revenue also contributes to explaining gross domestic product per capita. The results showed the governance standardised beta coefficient is -0.535. This means that governance has a slight association and a slight decrease in explaining gross domestic product per capita. From the results obtained in Table 4, the p-value calculated for fishing revenue infrastructure quality is 0.000, for transport revenue is 0.000, and for governance are all less than 5% of the 0.05 critical value. Hence, the null hypothesis was rejected. The study therefore concluded that infrastructure quality, fishing revenue, transport revenue and governance have a significant impact on gross product per capita.

Discussion of Findings

Table 1 shows that respondents were fairly evenly distributed across age categories, with the majority (34%) being between the ages of 31 and 40, followed by those between the ages of 21 and 30 (30.5%) and 41 and 50 (26.6%), while just 8.9% were over the age of 51. Male respondents (53.9%) slightly outnumber female respondents (46.1%), according to the gender breakdown. 53.5% of respondents said that their main economic activity was fishing, followed by transportation (42.6%), with only 3.9% saying they engaged in other occupations. Similar trends can be seen in the main occupations, with fishing accounting for the largest share (37.9%), followed by transportation (31.6%) and business (22.3%). The majority of responders (62.8%) were based in cities, while 37.2% were based in rural areas. These results are consistent with Annane (2024), whose findings revealed that Algeria's fisheries industry saw tremendous expansion, with aquaculture fast growing by 21.43% and exports soaring by 149.5%.

The model summary (Table 2) indicates a positive association between GDP per capita and infrastructure quality, fishing revenue, transport revenue and governance, with an R-value of 0.968 (97%). The R-squared value (0.936) indicates that 94% of the variation in GDP per capita can be attributed to infrastructure quality, fishing revenue, transport revenue and governance. Although this value suggests a strong positive correlation, 6% of the variation in GDP per capita cannot be accounted for and is most likely caused by other variables that are not within the scope of this investigation. The regression analysis (Table 4) shows that infrastructure quality, fishing revenue, transport revenue and governance significantly contribute to GDP per capita, as indicated by their p-values (0.000 for infrastructure quality, 0.000 for fishing revenue, 0.000 for transport revenue and 0.000 for governance), which are less than the critical value of 0.05. Furthermore, fishing (0.775), infrastructure quality (0.425), and transport revenue (0.350) have positive relationships, according to the standard beta

coefficients. While governance (-0.535) has a negative relationship. These findings suggest that infrastructure quality, fishing revenue, transport revenue and governance have a significant impact as well as a strong positional relationship with GDP per capita. This outcome is in line with research findings of scholars. Dare (2023) found that fishing money fosters economic growth because it considerably raises per capita income and life expectancy rather quickly. The findings support the notion that the blue economy propels long-term development by demonstrating the beneficial effects of fisheries on economic growth.

Similarly, Michael (2023), found that fishing significantly increased GDP growth, which is in line with the findings of this study on the influence of inland fisheries quality on economic performance. The study emphasised the need to improve water transit systems in line with research showing that transport revenue has a major positive impact on economic growth. Furthermore, Ujianti et al. (2024), found that fishing greatly increases GDP growth and employment, which is consistent with findings that indicate a significantly high correlation between fishing revenue and GDP per capita. The study suggests that policy interventions that greatly increase the economic contributions to the blue economy. As findings indicated, Algeria's fisheries industry experienced tremendous expansion, with aquaculture rapidly growing by 21.43% and exports soaring by 149.5%. Despite recent research findings, fishing money does, in some way, significantly increase economic performance (Annane 2024). A positive connection between equitable development, sustainability, and economic growth in Asia articulated (Geng et al. 2024).

On the other hand, Ivanova et al. (2024), found that that fishing income and the quality of inland fisheries have a beneficial effect on GDP per capita. Prioritising the long-term sustainability of fisheries supposedly means forgoing immediate financial gains in favour of questionable environmental benefits. Sungkawati (2024), found that although Indonesia's blue-green economic model has enormous potential, its financial gains are severely constrained by bad governance. According to the findings, policy shortcomings frequently prevent fisheries and water transportation from producing significant financial benefits. Also, Muringai et al. 2022), found that habitat destruction and rising water temperatures have a detrimental effect on fish populations and local economies.

Contribution of the study

This study provides empirical evidence of a positive correlation between blue economy activities and GDPCI (gross domestic product per capita). The study demonstrates how employing sustainable fishing practices may boost the economic performance of inland waterways. This finding is important for policymakers who wish to promote economic growth through responsible resource management. Furthermore, the study makes clear how the blue economy (transport revenue) supports economic expansion. While previous research has often focused on fishing, this study shows that water transportation contributes to economic growth as well, albeit to a lesser extent.

This insight highlights the need to make targeted investments in infrastructure and transport services to maximise their potential benefits. The study offers a framework for incorporating sustainable practices into the transportation and fishing industries. The results of this study give stakeholders a roadmap for creating successful policies that strike a balance between environmental sustainability and economic growth by promoting improved governance and community involvement in resource management.

Conclusion

This study assessed the impact of the blue economy in Sub-Saharan inland waterways. The study examined the relationship between the blue economy and GDP per capita, particularly the infrastructure quality, fishing revenue, transport revenue and governance. The demographic research indicates that the most popular economic activities are still transportation and fishing, particularly among youth and middle-aged respondents who are disproportionately found in urban regions. The regression analysis's findings indicated a significant impact and a strong positive relationship between the blue economy and GDP per capita. The findings imply that governance is a major obstacle that could drastically lower the sector's overall economic potential. To exploit the advantages of the blue economy, policymakers must improve resource management, promote sustainable practices, and remove regulatory inefficiencies. Water transport can accelerate regional development quickly, but to reap the economic benefits of inland fishing, smart interventions are needed. According to this study, enhancing governance frameworks and investing heavily in dependable infrastructure significantly boosts access to economic prospects.

Disclosure Statement

No potential conflict of interest was reported by the authors.

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