

HARNESSING NIGERIA'S BLUE ECONOMY PROSPECTS FOR SUSTAINABLE DEVELOPMENT

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Abstract

This paper examines the blue economic frameworks with a view to unearthing strategies for Nigeria's adoption or adaption in the process of commencing its blue economy development process. The paper investigates how the blue economy models developed in China, Europe, Asia, and the Americas can be adapted and/or adopted to leapfrog the steady development of the ocean economy of Nigeria. The methodology involved desk top exploration on blue economy policy, journal reviews and other scholarly publications, especially the implementation of the blue economy development process in China, Europe, Asia and America. The findings identified key challenges facing full and sustainable development of Nigeria's blue economy potentials. These included insecurity, pollution and habitat degradation, poor governance, inadequate infrastructure, inactive participation of the private sector, and climate change vulnerability. Based on these findings, the paper proposed actionable strategies including curbing threats and challenges outlined in the study to unlock Nigeria's blue economy potential.

Key words: Blue economy, Economic diversification, Sustainable development

Résumé

Cet article examine les cadres de l'économie bleue afin d'identifier des stratégies d'adoption ou d'adaptation pour le Nigéria dans le cadre de son processus de développement de l'économie bleue. Il analyse comment les modèles d'économie bleue développés en Chine, en Europe, en Asie et dans les Amériques peuvent être adaptés et/ou adoptés pour accélérer le développement de l'économie océanique nigériane. La méthodologie employée repose sur une analyse documentaire des politiques relatives à l'économie bleue, des revues de presse et d'autres publications scientifiques, notamment sur la mise en œuvre du processus de développement de l'économie bleue en Chine, en Europe, en Asie et dans les Amériques. Les résultats mettent en évidence les principaux défis qui entravent le développement complet et durable du potentiel de l'économie bleue du Nigéria. Parmi ces défis figurent l'insécurité, la pollution et la dégradation des habitats, la mauvaise gouvernance, les infrastructures inadéquates, la faible participation du secteur privé et la vulnérabilité au changement climatique. Sur la base de ces constats, l'article propose des stratégies concrètes visant à atténuer les menaces et les défis identifiés dans l'étude afin de libérer le potentiel de l'économie bleue du Nigéria.

Mots-clés : Économie bleue, Diversification économique, Développement durable

Introduction

Prior to the emergence of the blue economy paradigm, the green economy had been heavily touted as the aspect of the economy which could save and sustain the earth environment with technology and industrialization that would not hurt its future. In this context, sustainable use of the green economy was believed to be the only asset that may save the world from

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extinction in the nearest future. Resulting from this observation, serious cases had been made for reduction or zero use of fossil fuels, zero emission of effluents from gas and aluminum processes, elimination of indiscriminate waste disposal, among others. Recent economic development theorizing revolved around the green economy. Environmentalists had seen the green economy as the only means to the sustainable existence of the world. This conception informed the Sustainable Development Goals, SDGs, (United Nation). The key argument supporting the green economy has always been that the unsustainable use of green resources, mostly through industrialization and harmful human activities for economic gains, may destroy the equilibrium of the world's ecosystem, which would eventually result in serious negative consequences. To buttress the point and conviction of these pro-green activists, the climate change mantra has been widely agreed upon as resulting from the unsustainable use of the environment (ILO, 2025)).

Interestingly, before the announcement by scientists of the grave misuse of the green economy and its damaging consequences, which is currently manifesting in confusing climate change scenario: earthquakes, flooding, air pollution, and other natural disasters; the world had already gone deep into technology and industrialization that did not consider the life of its ecosystem. While grappling to re-calibrate and return the world's ecosystem to its natural equilibrium, heavily constrained by economic growth demands of nations of the world, the Blue Economy emerged. The Blue Economy, which offers similar or even better opportunities as the Green Economy for the sustainable use of earth's resources and an option for easy adjustment to its equilibrium, had come at a time when knowledge had abounded for sustainability in the development drive of world economies.

A sustainable ocean economy seeks to foster sustainable economic growth by enhancing inclusive growth and green economy. This is the key focus of the 2050 Africa's Integrated Maritime Strategy (Agunsoye, Okoye and Sankey 2025). As Nigeria seeks sustainable pathways to economic diversification, the blue economy emerges as a viable option. With over 850 kilometers of coastline and rich marine resources, Nigeria's maritime domain presents untapped opportunities for economic growth, innovation, and environmental sustainability (Elias, 2020).

Conceptual Framework

The blue economy

In this paper we adopt the blue economy definition of the Lomé Charter, the World Bank, and the African Union (AU). The Lomé Charter defines the blue economy to include all ocean and marine-based activities - ranging from ocean to sea and coastal areas. This charter goes on to conclude that the African governments are increasingly aligning with the blue economy concept (Agunsoye, Okoye, and Sankey 2025).

Economic diversification

Economic diversification has to do with the process by which a country reduces its dependence on one or very few sectors of the economy. This is achievable by expanding the range of economic activities. Economic diversification aims to create a more resilient economy by spreading risk and fostering sustainable growth (IMF, 2024). The following forms of economic diversification are discernible: (a) Horizontal diversification; which

entails expanding into new companies or markets that are less related to the previous ones; (b) Vertical diversification, which includes moving up or down the supply chain within a particular industry, and (c) Geographic diversification, which entails expanding trade and investment across different regions or countries.

Economic diversification is crucial for resource-rich economies to reduce vulnerability to commodity price shocks and ensure long-term stability. Successful strategies often involve investing in education, innovation, infrastructure, and entrepreneurship to support new and emerging sectors. Ultimately, economic diversification strengthens economies by fostering innovation, creating jobs, and ensuring sustainable development (Etudaiye-Muhtar, Etudaiye-Muhtar, Haliru, 2025)

Sustainable development

Sustainable development is a framework that focuses on fulfilling current needs without hindering future generations' ability to meet their needs. This approach to development gained widespread recognition from the Brundtland Report, released by the United Nations in 1987 World Bank (2020). The core pillars of sustainable development are: (a) Economic sustainability — fostering inclusive growth that accommodate the poor and does not degrade the environment; (b) sustainable social sector — fostering social equity, access to resources, and human rights. and (c) sustainability environment— ameliorating pollution and preserving the environment

Blue economy and sustainability

To develop the Blue Economy sustainably, Agunsoye , Okoye. and Sankey (2025) noted four pillars of sustainability:

(a) Ecological integrity: Maintaining ecological integrity requires a holistic approach involving preservation efforts, responsible management, biodiversity protection, and mitigation of harmful activities to sustain life-dependent environmental services. In this context, strict adherence to Environmental Impact Assessments (EIAs) before projects are executed is intentionally emphasized to maintain the ecological integrity and balance. The development of today, for economic or any other purpose to serve humans, must not destroy the environment for generations yet unborn.

(b) Social equity: Social equity involves a comprehensive approach that integrates human rights, ensures social justice, and provides equitable access to resources to empower every member of society.

(c) Economic efficiency: This is attained when waste is reduced or minimized by ensuring that resources are allocated to the most efficient use. If an economy is efficient, consumers will face lower general price levels for goods and services. This would reduce from efficiency of firms, economies of scale and higher levels of productivity. And the result will be enhancement of economic growth. In this context, economic efficiency is achieved when economic prosperity is attained without jeopardizing the environment. It seeks to ensure balanced economic growth over the short term, medium term and even the long-term periods.

(d) Inter-generational equity: This concerned with production in current period that is responsible. It also encompasses production that is friendly to the environment and which does not foreclose the capacity of the future to maintain the environment in a balance state (United Nation 2024). Sustainability is, therefore, emphasized in the use of blue economy resources to correct what was not emphasized in the use of green economy resources. It could be recalled that the strong clamour for the blue economy came when the world was seeking alternatives to the fast-depleting resources of the green economy due to abuse and unsustainable use. Advocates of the blue economy contend seriously that the blue economy must be managed sustainably to avoid outcomes that are associated with the unsustainable management of the green economy.

(v) Economy and the environment: Thinking sustainability: In the environment, raw material are converted into finished goods. The waste products that go into the raw environment are converted back into finished goods such that matter and energy remains inter-convertible. Figure 1 shows how economic agents (households and firms) converts inputs from the environment to outputs into the same environment while producing wastes. In the process, energy is converted from one form to another and waste are produced into the environment. As noted, the main agents of the economy include firms and households. The firms produce goods for the consumption of the household. The firms mainly use energy, air, heat, water, and raw materials (inputs) for the production of goods.

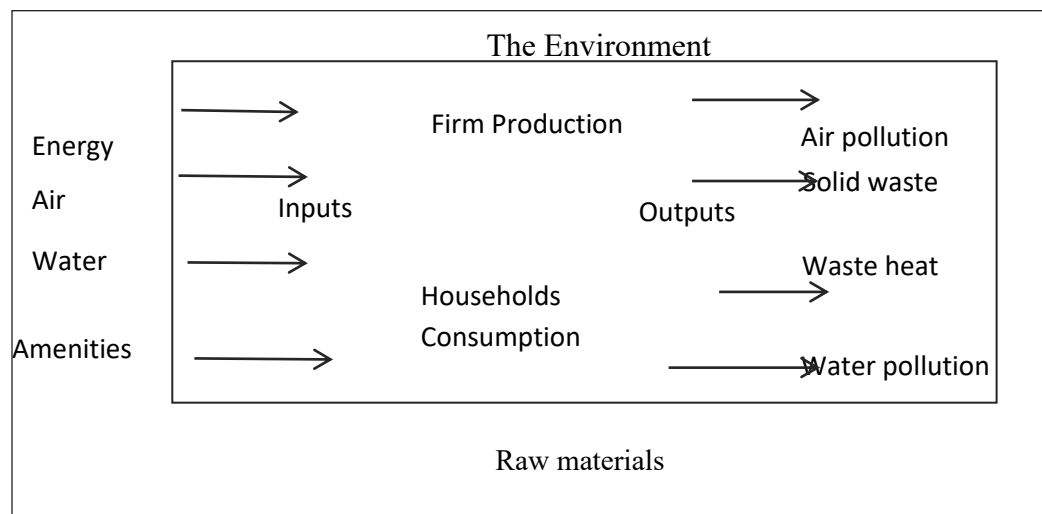


Figure 1: Nexus between state of the environment and the economy

The households consume the goods. In the process of production, the firms produce unwanted products, including air pollution, solid and liquid waste. Similarly, in the process of consumption, the household produces waste (solid and liquid), heat, water, and air pollutants. Notice that energy in the model is from within the Earth's environment and the solar energy from outside the Earth's environment. We, however, assume that the sun's energy is from the Earth's environment. Other energy sources from the Earth's environment are non-renewable. However, solar energy is renewable. Also, if waste and pollution arising

from the agents' use of environmental resources are not managed, it can disrupt or damage the environment. This would leave no room for the sustenance of the economy.

The nexus between the economy and the environment is indeed a closed system. For a closed system, no inputs such as energy or material can be obtained from outside. We treat our planet as a closed system because we assume that even the heat energy from the sun is from our planet's environment. And that very negligible part of raw material (only heat from the sun) is from space outside our environment. The treatment of our planet as a closed system aligns with the law of thermodynamics which states that energy can only be converted from one form to another. A good understanding of the second law of thermodynamics is vital for the analysis of how households (humans) interact with the environment and influence the environment. In particular, this is critical for understanding energy usage and sustainability. Certain amount of energy is always lost during conversion. The second law also implies that in the absence of new energy inputs, any closed system must eventually use up its energy (Agunsoye, Okoye & Sankey, 2025).

Our planet receives a constant inflow of energy from the sun, underscoring that it is not a closed system concerning energy. This solar energy influx sets an ultimate limit on sustainable energy flow. Our capacity to sustain growth is linked to the solar energy we can access and exploit efficiently over the long term. This model shows that if resources are not sustainably used, their waste by-product could be damaging to the sustenance of the environment and the economy that the environment holds. Thus, the model provides –a framework for sustainable blue economy and environmental conservation.

Sectors of the Blue Economy

Fisheries

Fishery is a fundamental activity aimed at harvesting fish, and it encompasses capturing wild fish and fish farming through aquaculture (FAO, 2024). The detailed overview of fishery showcases its significance in providing food resources, economic opportunities, and sustainability practices, highlighting its comprehensive nature and role in ecosystem management. While the coastal areas remain key to marine fisheries, significant fishing activities also occur in other marine and inland environments. Approximately 90% of global fishery catches originate from marine environments, with quantities stable between 80 to 86 million tons since the mid-1990s. Most marine fisheries operate near coastal areas due to easier access and higher fish abundance, attributed to nutrient availability from coastal upsurges and land runoff. Despite coastal dominance, productive fisheries also exist in open oceans around seamounts and in inland waters such as lakes and rivers (GreenFact, 2009).

Maritime transportation

Transport by water is cheaper than transport by air or ground, but significantly slower for longer distances. Maritime transport accounts for roughly 80% of international trade (UNCTAD, 2024). Containerization has transformed maritime transport by enabling multiple cargo shipments to be consolidated in a standardized ocean container and transported as a single unit. This innovation began in 1926 with the introduction of purpose-built vessels to carry containers for the luxury passenger train between London and Paris; (Lewandowski, 2016).

Blue tourism

Blue tourism is concerned with tourism linked to coastal areas and beaches. It also covers ocean cruising/navigation and other related activities around water bodies and rivers. Blue tourism is a major contributor to economic growth in countries where the coastline (and the sea or ocean itself in some cases) is both attractive and accessible to the general population. Blue tourism activities include, (a) Beach-based tourism such as sun bathing, (b) Coastal walks or hikes; (c) Coastal wildlife watching, (d) Sailing and/or yachting, (e) Watersports such as water-skiing, surfing, wakeboarding, parasailing, beach soccer, and paddle-boarding (f) Fishing, either from the land or a boat, and (g) Scuba diving.

Desalination for freshwater generation

Desalination is concerned with the process of removing the mineral content from salt water. (The American Heritage Dictionary, 2023). The main goal of desalination efforts today is ensuring sustainable and affordable access to fresh water from seawater. It is crucial for human consumption and agricultural needs. The document type is identified as informative text regarding desalination (Panagopoulous, Haralambous and Loizidou, 2019).

Deep sea mining

Deep-sea mining has to do with the extraction of minerals from the sea at depths covering 200 to 6,500 meters. As of 2021, most marine mining activities have been concentrated in shallow waters where resources like sand, tin, and diamonds are easily accessible. There are at least three core areas of deep-sea mining: poly-metallic nodule mining, poly-metallic sulfide mining, and cobalt-rich ferromagnetism crusts. These methods focus on different types of minerals found on the ocean floor: (United Nations Human Right Commission 2024).

The exploration of marine minerals is in its early stages, with a focus on evaluating potential sites for future extraction. Additionally, the Cook Islands Seabed Minerals Authority granted three exploration licenses for polymetallic nodules within their Exclusive Economic Zone (EEZ)(UNCTAD, 2022; UNCTAD, 2024). However, the recent development of intensifying seabed mining in the world is strongly fought against by environmental activists and NGOs who see these as attempts at compromising the key and basic sustainability principle of the blue economy UNCTAD, 2024).

Repairs and building of ships

Shipbuilding is concerned with the actual construction of new ships. On the other hand, ship repair refers to the amendment and upgrading of old and/or existing ships in ship yards. Historically, ship repairs and building dates back to recorded human history. As Adams (2013) documented, a ship has historically been among the most complex structures that societies were capable of constructing, with various industrial advancements emerging to support shipbuilding endeavour. While technological advances in ship building relied on timber exploitation, building and repairs of depended on advanced Naval engineering and hence the encompasses both the building and repair of ships in commercial and military contexts.

Carbon sequestration

Carbon sequestration has to do with the process of eliminating carbon dioxide at the atmosphere (Adedoya, Adegboyega and Fakpor, 2025). Two key types are discernible: geologic and biologic. The former involves storing carbondioxide (CO₂) into the underground. The CO₂ is put into a liquid form before injecting it into porous rock formations. In some cases, the method integrated into enhanced oil recovery, known as tertiary recovery. Enhanced oil recovery uses liquid CO₂ to lower oil viscosity, and facilitates its flow to the well. Understanding and implementing carbon sequestration techniques are vital steps in reducing atmospheric CO₂ levels and combating global warming (Thölix, Backman, Havu, Karvinen, Soininen, Trémeau, Nevalainen, Ahongshangbam, Järvi, and Kulmala 2025). Carbon sequestration had been the option mooted by many fossils fuel-producing countries of the world at the recently held Environmental Conference, COP 28 (30 Nov – 13 Dec 2023) to ameliorate the harmful effect of fossil fuel on the earth until they can devise alternative revenue sources.

Coastal protection

Coastal protection is the defense against erosion, and strategies that prevent erosion from claiming the lands bounding the waters (rivers, seas, oceans). Recent issues of climate change that have led to rising river, sea, and ocean levels have led to serious concerns about coastal management to protect the coast and the hinterland from erosion. According to Agbonaye (2024), coastal areas, while comprising less than 15% of the Earth's land, are home to over 40% of the global population. Before the 1950s, the primary method for mitigating beach erosion and storm damage involved hard structures like seawalls, revetments, and groynes. These methods, though initially effective, were often costly and visually disruptive. The transition from rigid structures to adaptive, nature-inspired solutions marked a significant evolution in coastal engineering, reflecting a growing awareness of environmental impacts and economic considerations. However, unreliability of physical structures in totally protecting the coasts has led countries to consider electronic monitoring. This helps to compensate for error and uncertainty in the information regarding the erosive processes. Such monitoring methodologies include:

(i) Event warning systems: Storm surge and tsunami warnings, are generally useful for reducing the effect of harmful events. This is important to reduce human casualties and damage to the earth.

(ii) Shoreline mapping: A shoreline has to do with the boundary where various water bodies meet the land, often irregular in shape, and may include features such as headlands, which are narrow landforms extending into the water. This is the process of collecting, analyzing, and interpreting geospatial data to understand changes in coastlines. It aids in enhancing coastal resilience and informs decisions related to coastal management and resources.

Shoreline is mainly affected by two factors, namely, sea waves and tides. Thus, if knowledge of actual shoreline is not known, there will be a tendency for land to be eroded without the knowledge of the authority. For instance, many settlements in Nigeria had been wiped off by erosion in the recent past without the knowledge of the authority. Attention had only been drawn when the damage had already been done, and communities cried out concerning such disasters.

Maritime security

The import of the security of the marine sector in the blue economy is critical especially with the growing interest in the blue economy products, including, tourism, transportation (logistics), industrial and deep-water fishing, deep sea mineral exploration and extraction, among others. It is naturally expected that there will be increase incidences of security breaches as people compete for livelihood. If maritime security is therefore not taken seriously, international trade and world economic growth may be compromised (Pajak and Leatherman, 2002). Maritime security is therefore an enabler of the Blue Economy, for example, through safeguarding navigation routes, providing important oceanographic data to marine industries and protecting rights over valuable marine resources and activities within claimed zones of maritime jurisdiction (Agbonaye, 2024).

Ocean development

Ocean development is a broad concept encompassing human activities at sea, the utilization of ocean resources, and ocean governance. It is a pivotal topic in the law of the sea, addressing the oversight and regulation of maritime activities. It includes diverse activities such as shipping, fishing, energy extraction, and tourism. These activities are integral to economies globally and require coordination and regulation to ensure sustainable use of ocean resources (Agbonaye, 2024).

Lessons From Successful Blue Economy Models Across Countries

In this section, the paper reviews extant frameworks that will help Nigeria as blue economy models. The frameworks here are founded on successful experiments which could be replicated and adapted for Nigeria.

Shandong blue economic zone

This is China's first provincial growth planning to devote effort to scientific utilization of marine resources. The initiative was elevated to a national strategy by China's State Council in 2011. The calculated standing of Shandong Peninsula Blue Economic Zone include the followings:

- (a) a new sea technical cluster accompanying somewhat powerful worldwide competitiveness;
- (b) a globe-chief instruction center of sea wisdom;
- (c) ship district for internal sea business-related ventures and
- (d) marine science and technology, marine manufacturing, marine fisheries and aquaculture, and emerging industries.

Blue growth in the European Union and the innovation strategy

In the year 2012, the European Union projected the "Blue Growth" procedure. The Union noted in particular that the Blue Growth will be the gist of sea procedures, asserting key happening extents and distinguishing measures for the future.

Equitable growth of blue region in Indonesia

Indonesia projected the law of expanding sea and fishing activities to plan a comprehensive business-related and preservation of natural resources procedures. The model helps to boost territorial financial growth, to accomplish sustainable growth by advancing clean result

plans, and to help imaginative and creative investment. The focal points of expanding sea saving in Indonesia include expand sea fishery, sea conveyance, and travel.

The Potentials of Nigeria's Ocean/Blue Economy

Nigeria's marine economy is endowed enormously: from the coastal boundary with the Atlantic Ocean, extending for about 853km to the inland rivers, lakes, streams, deltas, and swamps. For instance, The South (below Latitude 8°N) has an annual rainfall ranging between 1,500 and 4,000 mm, and the extreme North between 500 and 1000 mm (Oladimeji, 2018; Akpan, Assian, Akpan 2024; Pajak and Leatherman, 2002). The Nigeria's coastline lies between latitude 4° 10' to 6° 20' N and longitude 2° 45' to 8° 35' E. The coast is composed of four distinct geomorphology units namely the Barrier-Lagoon Complex; the Mud Coast; the Arcuate Niger Delta and the Strand Coast (World Bank Group, 2020; UNCTAD, 2024). The marine region of Nigeria is among the most populated. This cuts across Lagos to Delta states. On this basis, Nigeria's coastal zone is classified into Lagos coastal region and Delta Coastal region (World Bank Group, 2020).

Hydrology of Nigeria and marine fisheries regulation

Hydrology can easily be described as the scientific study of water, surrounding its manifestation, distribution, movement, and properties. It also includes its interactions with the environment and living organisms (USA.gov). The hydrology of Nigeria indicates how the hinterland of Nigeria is so endowed with the blue economy, in terms of rivers, lakes, flood plains, streams, deltas, and swamps. According to FAO (2024), Nigeria's hydrology is largely shaped by the Niger-Benue and Chad river systems, with only a few rivers directly draining into the Atlantic Ocean. These river systems define the country's significant inland water distribution. Figure 5.1 shows that the two main river systems are the Niger-Benue and Chad. Most of Nigeria's flowing waters eventually converge into these systems, except for several rivers like the Cross River and Ogun that directly discharge into the Atlantic Ocean.

Overall, Nigeria's hydrology is intricately linked to its major river systems and geographical features, which define the flow of rivers and the distribution of water bodies across the country. Only a portion of Lake Chad is within Nigeria's borders, where it mainly consists of extensive swamps rather than open water. Lake Chad river came from Cameroon indicating that the rivers have diverse source of origin. As shown in Figure 2, Nigeria has a diverse network of rivers fed by various watersheds both within and outside its borders. These rivers significantly contribute to the geographical and ecological landscape of the country. The River Niger receives water from multiple sources within Nigeria, including headwaters from the central plateau, Yoruba highlands, Benin Republic, and eastern highlands. It is interesting to note that although Nigeria is fully aware of the huge advantages of the blue economy, as well as being adequately endowed with the blue economy and its resources, the country is yet to optimize its advantage in attracting such incentives and benefits.

As regards marine fisheries regulation, the Sea Fisheries Act of 1971 was implemented by the federal government of Nigeria to regulate coastal fisheries. This legislative framework aims to ensure the sustainable management of fisheries in Nigerian waters. The Act begins with the requirement to license fishing boats, detailing the application process, criteria for

issuance, and license renewal in Sections 1-4. Sections 5 and 6 of the Act cover the process for appeals and the submission of returns, while Section 7 emphasizes the enforcement mechanisms for the Act's provisions (Issa, Aderinoye-AbdulWahab, Kagbu, and Adisa 2022).

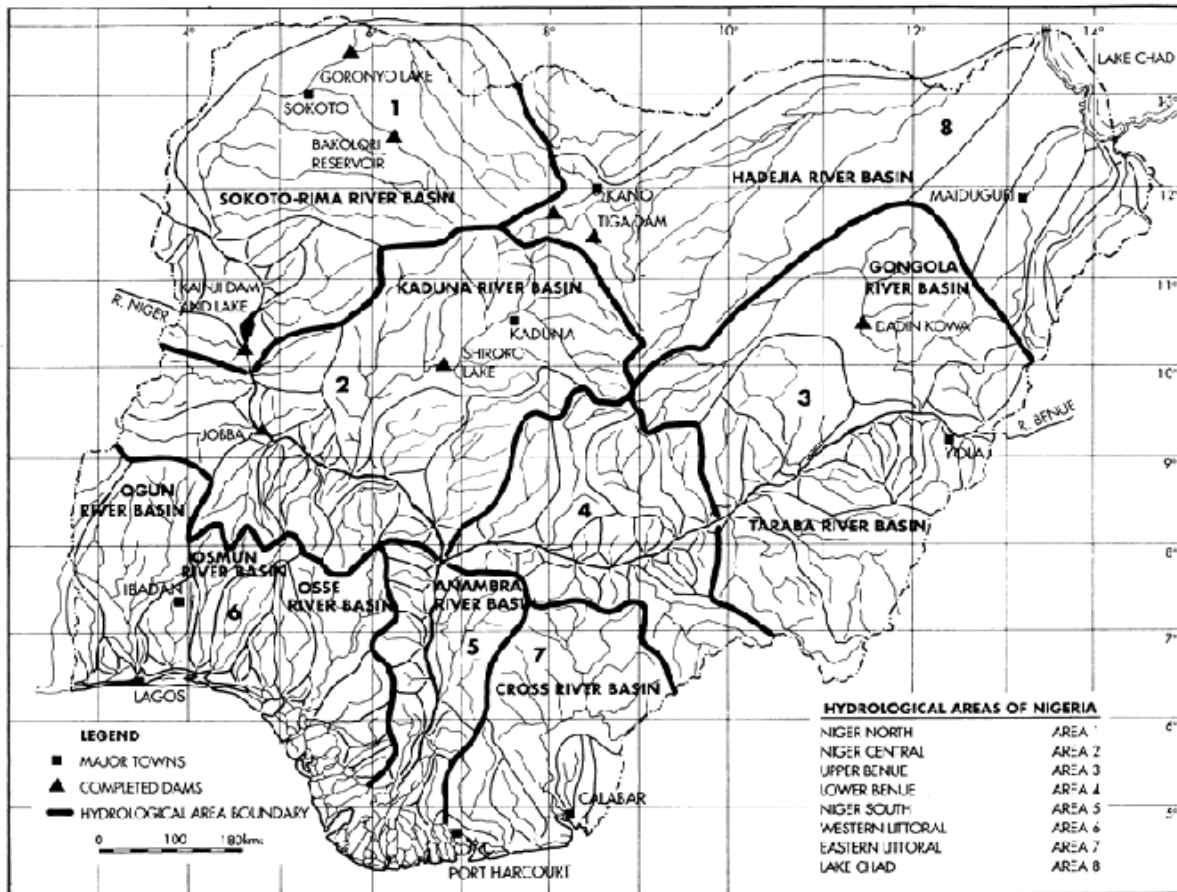


Fig. 2: Nigeria's map showing its hydrology. Source: Oladimeji (2018).

Other fisheries regulations include the 1972 Sea Fisheries regulations, now known and called, The Fisheries Act, 1972. The Act represents an effort to balance the interests of industrial and artisanal fisheries, ensuring that local fishers can operate without interference from larger commercial entities. This structured approach reflects the need to address socioeconomic and environmental concerns within the Nigerian fishing industry (UNCTAD, 2024; Etim, *et al* 2015). Overall, it can be seen that these laws guiding the Blue economy operation in Nigeria are old and need serious review to capture current trends in the country's blue economy operational jurisdiction. For instance, jurisdiction concerning artisanal fishing should be immediately legislated upon to protect the country's fishery sector.

Nigeria's Blue Economy and Economic Diversification for Sustainable Development

Fishery resources

Nigeria is richly endowed with fishery resources both in its inland waters and maritime coastal waters. Fishery had been a long-time occupation of many rural communities in Nigeria. From the hydrology of Nigeria in Fig. 5.1, fishery resources can be found in all the States of Nigeria. The country is adorned with three regimes of fishery resources: freshwater fishes, brackish water fishes, and salt water fishes (Issa, Aderinoye-AbdulWahab, Kagbu, and Adisa, (2022). Exploring the total value chain of the fisheries sector, including inboard and outboard fishing, fish processing, fish nursery development, can hugely help reduce the unemployment pressure on the Nigerian economy. Specific employment activities in the sector include: processing and handling, distribution and logistics, marketing and sales, retail and consumption, as well as waste Management and sustainability.

Fish processing and handling

When fish are caught, they are made to go through some processes and handling to preserve them for distribution. Particularly in this stage are processes like cleaning, gutting, filleting, and freezing. Every process in the activity chart in this activity stage can generate employment. People could secure sustainable employment in the sector by undertaking any of the activities in processing and handling (cleaning, gutting, filleting, and freeing)

Distribution and logistics

After processing the fish products, they are then transported from fishing ports or processing plants to distribution centers and markets. This stage involves enormous logistics management to make sure that items are delivered on time while maintaining product quality and freshness. Distribution channels may include wholesalers, retailers, and exporters.

Marketing and sales

For fish products to reach the people who seek them, marketing plays a crucial role, especially in creating demand among consumers. This stage involves branding, packaging, advertising, and sales strategies to differentiate products and attract customers. Market segmentation based on factors like species, quality, and sustainability is common in the fishery industry. These activities open the opportunities for job creation and employment in the sector.

Retail and consumption

Fish products finally reach consumers through retail outlets such as open fish markets, supermarkets, restaurants, and online platforms. Consumers may purchase fresh, frozen, canned, or processed fish products for home consumption, or eating out, as well as for catering purposes by catering companies. This stage opens bounty employment opportunities.

Waste management and sustainability

Waste management and sustainability practices are increasingly considered very important in blue economy studies and practices. Efforts to minimize by catch, reduce environmental impact, and promote responsible fishing practices are parts of long run effectiveness of the fishery industry. Setting of activities by regulatory agencies to properly monitor waste management and sustainable practices in the fishery industry opens up employment opportunities for the people.

Tourism

Blue tourism, encompassing activities such as coastal and marine tourism, diving, snorkeling, and wildlife watching, represents a significant economic opportunity for coastal communities worldwide. Beyond its potential for revenue generation and economic growth, blue tourism also can create employment opportunities, particularly in regions where coastal and marine resources are abundant. The employment capacity of blue tourism include.

Job creation potential

Blue tourism has a considerable job creation potential, offering employment opportunities across various sectors such as hospitality, transportation, recreation, and conservation. Coastal destinations with thriving blue tourism industries often see an increase in demand for services such as accommodation, restaurants, tour operations, and marine guiding, leading to the creation of jobs for residents (Agunsoye, Okoye and Sankey 2025).

Multiplier effects

The employment impact of blue tourism extends beyond direct jobs in the tourism sector, with significant multiplier effects on the local economy. Investments in tourism infrastructure and services stimulate demand for goods and services from other sectors, such as agriculture, construction, retail, and transportation, thereby creating indirect and induced employment opportunities.

Sustainable employment practices

To maximize the employment capacity of blue tourism, it is essential to adopt sustainable employment practices that prioritize social inclusion, gender equality, and environmental stewardship. Investing in training and capacity-building programmes promoting fair labour practices, and engaging local communities in decision-making processes are critical to ensuring that tourism benefits are equitably distributed and contribute to long-term socio-economic development (Agunsoye, Okoye & Sankey 2025). While blue tourism holds significant promise for job creation and economic development in coastal regions, it is essential to balance tourism growth with environmental conservation and community well-being. Sustainable tourism planning and management strategies that prioritize local empowerment, cultural preservation, and environmental sustainability are drivers to harnessing the full employment capacity of blue tourism while safeguarding marine ecosystems and coastal livelihoods.

Deep Sea Mining

This entails the following:

Specialized workforce requirements

Mining at deep sea requires specialized workforce that are expert of marine engineering, geology, robotics, and environmental science. Employment opportunities primarily exist in research and development, engineering design, vessel operation, underwater robotics, and mineral processing. However, the demand for such specialized skills may limit the overall employment capacity of the industry (Agbonaye, 2024).

Supporting industries and services

While direct employment in deep-sea mining may be limited, there are opportunities for job creation in supporting industries and services. These include shipbuilding and maintenance, equipment manufacturing, logistics, supply chain management, and environmental monitoring. The development of a deep-sea mining industry could stimulate employment in related sectors, particularly in coastal regions with proximity to mining sites (IFC, 2024).

Local and indigenous employment

Deep-sea mining projects often take place in areas near coastal communities and indigenous territories. Ensuring meaningful engagement, consultation, and participation of local communities and indigenous peoples is essential to address socio-economic impacts and maximize local employment benefits (UNCTAD, 2024).

Environmental and social considerations

The employment capacity of deep-sea mining is intricately linked to environmental and social considerations. Balancing economic development with environmental protection and social welfare requires robust regulatory frameworks, community engagement mechanisms, and mitigation measures to safeguard marine ecosystems and livelihoods (UNCTAD 2024). While deep-sea mining can create employment and foster economic growth, its long-term viability depends on addressing environmental, social, and governance challenges in a manner that ensures sustainable development and equitable benefits for all stakeholders.

Water Transportation

The water transport is known to play a major role in the fostering of trade, commerce, and mobility, particularly in the coastal and riverine regions of a country. This sector has significant employment capacity, offering opportunities for job creation and economic development. They include the following:

Diverse employment opportunities

The water transportation sector in Nigeria, for instance, offers a wide range of employment opportunities across various sub-sectors, including maritime logistics, ferry services, shipbuilding and repair, port operations, and marine tourism. Jobs in this sector encompass diverse roles such as seafarers, port workers, vessel operators, maritime engineers and technicians, as well as administrative staff (UNCTAD, 2024).

Contribution to livelihoods

Water transportation provides livelihoods for thousands of Nigerians, particularly in coastal communities and riverine areas where waterways serve as vital transportation arteries. Fishermen, boat operators, dockworkers, and marine artisans depend on the water transportation sector for their income, supporting household economies and rural livelihoods (UNCTAD, 2024).

Economic growth and trade facilitation

Efficient water transportation infrastructure is essential for facilitating domestic and international trade, promoting economic growth, and enhancing regional integration. Ports and inland waterways serve as gateways for the movement of goods and commodities, supporting industries such as agriculture, manufacturing, and commerce. The expansion and

modernization of water transportation infrastructure have the potential to create additional employment opportunities along the logistics value chain.

Capacity building and skills development

Investing in human capital and skills development is critical for unlocking the employment potential of the water transportation sector in Nigeria. Training programmes vocational education, and capacity-building initiatives aimed at enhancing the skills of maritime professionals, seafarers, and port personnel can improve job prospects, promote career advancement, and ensure safety and efficiency in maritime operations (UNCTAD 2020).

Sustainable development and governance

Promoting sustainable practices and good governance in the water transportation sector is essential for maximizing its employment capacity while safeguarding environmental integrity and ensuring social equity. Strengthening regulatory frameworks, enhancing safety standards, and promoting inclusive policies that prioritize the welfare of workers and communities are vital for sustainable development and inclusive growth (UNCTAD, 2020).

Challenges Facing Nigeria's Blue Economy

Despite its potential, Nigeria's blue economy faces several challenges as indicated in the literature (World Bank 2020). These include, but are not restricted to:

Insecurity

In recent years, insecurity in the maritime waters of Nigeria has emerged as a significant challenge, posing threats to economic growth and global maritime trade. Various factors contribute to this insecurity. The Gulf of Guinea has become one of the most dangerous maritime regions globally, with incidents of piracy and armed robbery at sea on the rise (World Bank 2020). Armed pirate gangs target vessels for hijacking, cargo theft, and ransom, posing a significant threat to maritime trade and crew safety.

Illegal oil bunkering

Criminal syndicates siphon off oil from pipelines, engage in illegal refining operations, and transport stolen oil via barges and small vessels, causing revenue losses for the government and environmental degradation.

Trafficking of drugs and arms

Nigeria's maritime domain serves as a conduit for the trafficking of illicit and hard drugs, as well as arms and ammunition. Transnational criminal networks exploit weak maritime security infrastructure to smuggle contraband goods, fueling violence, instability, and organized crime in the region (Agbonaye, 2024).

Challenges in law enforcement and governance

Inadequate maritime law enforcement capabilities, corruption, and institutional weaknesses hinder efforts to fight poor security in the coastal areas. The Nigerian Navy, tasked with safeguarding the country's maritime interests, faces resource constraints, limited operational capacity, and coordination challenges with other security agencies.

Overfishing and depletion of fisheries

According to a report by the Nigerian Conservation Foundation, over 70% of Nigeria's fish stocks are overexploited, with detrimental consequences for marine biodiversity and the livelihoods of artisanal fishers (FAO, 2024).

Pollution and habitat degradation

Industrial activities contribute to pollution in Nigeria's coastal waters, threatening marine ecosystems and biodiversity. Oil spills, waste discharge, and plastic pollution degrade habitats, disrupt marine food chains, and endanger marine species.

Poor governance and policy gaps

Weak governance structures, corruption, and inadequate enforcement of existing regulations hamper efforts to foster growth in Nigeria's blue economy sector. The lack of comprehensive fisheries management plans and monitoring systems allows illegal fishing activities to persist unchecked, undermining conservation efforts and exacerbating resource depletion (FAO, 2024).

Climate change vulnerability

Nigeria's coastal communities are prone to the negative effect of climate change. The problem of climate change has also triggered rapid environmental degradation, rising sea-level and ocean acidification, among others. These phenomena exacerbate existing challenges, threatening food security, displacing coastal populations, and disrupting economic activities reliant on marine resources (World Bank 2020). Enhancing regulatory frameworks, investing in sustainable fisheries management practices, promoting community-based conservation initiatives, and fostering international cooperation are essential steps towards sustainable use of blue resources.

Poor private sector participation

The private sector has to become more active in the drive towards more efficient utilization of the blue resources. This can be accomplished via proper private sector-friendly legislation and policies by the government. Private sector investment will open up the sector while addressing the issue of bureaucratic bottlenecks that are always associated with government.

Conclusion

Fostering Nigeria's blue economy and its sustainable use is critical to sustainable economic growth, inclusive development and economic transformation of Nigeria. An important way to achieving this is to address the threats or challenges outlined in this study and encourage the sustainable use of Nigeria's blue resources.

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