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NIGERIA'S EVOLVING BLUE ECONOMY AND THE SUSTAINABILITY OF ARTISANAL FISHERFOLKS LIVELIHOOD

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ABSTRACT

Nigeria's evolving blue economy and its potential in increasing the Gross Domestic Product (GDP) and livelihood status of artisanal fisherfolks in the littoral states along the Exclusive Economic Zone (EEZ) is underscored. Benefits derived from the resources in the EEZ to the nation's economy are highlighted, including the advantages and disadvantages of harnessing resources within the EEZ if Maritime Spatial Planning (MSP) is implemented. The vital role of fisheries extension professionals, is emphasized through advocacy, training, and skill acquisition for artisanal fisherfolk inhabitants in the management and conservation of aquatic resources because development interventions would alter the migration, breeding, nursery, and spawning grounds of marine species that transit or inhabit the EEZ. The paper recommends an alignment of policies, linkages, and interagency cooperation by government, non-governmental agencies, professionals, scientists, artisanal fisherfolks, and all stakeholders for the rapid development of Nigeria's Blue Economy. The coordination and collaboration of all agencies is vital in MSP to achieve the Ministry of Blue Economy mandate. Extension, specifically fisheries extension professional's role in Nigeria's Evolving Blue Economy, is emphasized in MSP and policy formulation because of fisherfolk livelihoods and the sustainability of aquatic organisms in the EEZ.

Keywords: Blue Economy, Maritime Spatial Planning, Artisanal Fisherfolks, Fisheries Extension and Exclusive Economic Zone

INTRODUCTION

Artisanal fisherfolks are women, youths and men who fish close to the shore along the Exclusive Economic Zone (EEZ) and in inland waters (ponds, rivers, streams and lakes) at a subsistence level for their livelihoods sharing an intimate relationship between the operator (fisherfolks) and the fish (Umehai *et al.;* 2024; Kumar and Jain, 2021). O'Meara *et al.;* (2021) averred that fish is an important nutrient-rich animal-source of food for everyone, especially pregnant and lactating mothers, not forgetting children, for the first 1000 days of their lives, for growth. Fish and other edible aquatic organisms like crustaceans, bivalves, and mollusks found in the EEZ and its adjourning wetland environments is a vital source of food, income and employment for artisanal fisherfolks in addition to the ancillary occupations associated with fishing that makes substantial contributions to the livelihood of fisherfolks in many coastal and inland fishing communities globally. Artisanal fisherfolks' livelihoods and income-generating activities depend on aquatic organisms, so government policies must be aligned and formulated to integrate fisherfolks into developmental plans in Nigeria's Evolving Blue Economy because of the vital role of the artisanal fishing subsector to the nation's economy. Subasinghe *et al.;* (2021) documented that, artisanal fisherfolks produced over 74.09 % of Nigeria's total domestic fish production from mainly coastal, inshore creeks of the Niger Delta, lagoons, inland rivers, and lakes while aquaculture and industrial fishing contributed only 24.91 % and 1% respectively of the total fish produced in Nigeria. Odioko and Becer (2022) maintained that the importance of the fishery sector to the nation's development cannot be overemphasized because the industry provides employment, foreign exchange, food security, and recreation, noting that fish diets improve the nutritional and health status of the nation's population. When planning for developing Nigeria's Evolving Blue Economy, relevant government agencies and development partners should plan holistically by involving all stakeholders in the Blue Economy master plan of Nigeria because of the vital role of fisheries and aquaculture in the nation economy. The livelihoods of fisherfolk should also be considered because development projects and interventions within Nigeria's Evolving Blue Economy would displace fisherfolk inhabitants in littoral states, including the ancillary occupations in the upstream and downstream sectors of artisanal fishing. This paper highlights the need for the Federal Ministry of Blue Economy to partner with various agencies with expertise in the MSP of the EEZ during development interventions in the EEZ. The sustainability of aquatic resources in the EEZ must be the focus of all development partners because artisanal fisherfolks livelihoods depends on these resources.

Synopsis of the Nigerian Blue Economy

Nigeria is a coastal state with a vast shoreline and enormous unexploited marine natural resources, such as offshore oil and gas in the open seas, which play a major role in the economic sustenance and development of the country, especially in areas like crude oil drilling, fishing, and hydro-energy

generation (Anammah and Ezenyimulu, 2024). The Federal Ministry of Marine and Blue Economy was established in August 2023 by the administration of President Bola Ahmed Tinubu, with the following clear mandates: to institutionalize the marine and blue economy for economic growth; responsibly utilize Nigeria's marine resources; foster and encourage the maritime industry; diversify the marine economy; and address emerging issues arising under the Ministry's mandate, with a focus on the sustainability of the ecosystem and its natural resources (NIMASA, 2024). The blue economy legal framework entails legislative enactments for the establishment of the blue economy under a balanced three-dimensional development plan that encompasses the economy, environment, and society, not forgetting the vital role of Maritime Spatial Planning (MSP). MSP aims to manage human activities in marine spaces to achieve ecological, economic, and social objectives within the blue economy institutional framework, as it integrates the effective and judicious utilization of the national maritime space by all maritime stakeholders through professional coordination (NHA, 2024). The Federal Ministry of Marine and Blue Economy oversees the following agencies: the Nigerian Maritime Administration and Safety Agency (NIMASA), Nigerian Ports Authority (NPA), National Inland Waterways Authority (NIWA), Maritime Academy of Nigeria, Nigerian Institute for Oceanography and Marine Research (NIOMR), and the Council for Regulation of Freight Forwarding of Nigeria. Additional government and non-governmental agencies include the Federal Ministry of Transport, Federal Ministry of Culture and Tourism, the Nigerian Navy, Nigerian Maritime Universities and Institutes (NMUI), Federal Ministry of Agriculture and Rural Development, Federal Ministry of Environment, and the National Biotechnology Development Agency (NABDA). Some non-governmental bodies are the Nigerian Trawler Owners Association (NITOA), the Maritime Writers Association of Nigeria, the Manufacturers Association of Nigeria (MAN), the Ship Owners Association of Nigeria (SOAN), and the Council for the Regulation of Freight Forwarders of Nigeria (CRFFN). The Ministry of Blue Economy in Nigeria is focused on transforming and diversifying the marine and ocean economy through research and development, innovation, building local capacity in the blue economy, and fostering partnerships for technical cooperation with all stakeholders for the holistic development of the evolving blue economy (FMMBE, 2025). The extent to which Nigeria can harness its Blue Economy potential is documented in international law (customary international law and treaty rules) and domestic maritime legislation (Anammah and Ezenyimulu, 2024).

Artisanal Fisherfolk's Livelihood Activities in Fishing Communities

Artisanal fisherfolks' livelihood activities include fish processing, drying, smoking, value addition, marketing, distribution, storage, trading, gleaning, boat building and maintenance, net making and repair, along with conservation and protection of aquatic resources for sustainability through closed seasons, off-seasons, adhering to fishing norms, fishing festivals, and restricted fishing areas within fishing communities (Akintola *et al.;* 2022). Development projects aimed at the global Blue Economy have raised concerns about the livelihoods of small-scale artisanal fisherfolks, emphasizing risks related to resource depletion, sustainability of fisheries, and the general well-being of fisherfolks dependent on the EEZ (Fabinyi *et al.;* 2022; Bennett *et al.;* 2021). Buana (2023) stressed that community engagement in fishing communities is essential for supporting sustainable fishing efforts in the maritime sector, including the Blue Economy. Mareta *et al.;* (2024) also recommended community-based approaches that consider the social, economic, and environmental complexities of coastal fishing communities. Extension education targeted at artisanal fisherfolks would help them remain in fishing communities and enjoy better socioeconomic conditions that enhance their quality of life through improved fishing and aquaculture practices, leading to increased incomes for fisherfolks. Nigeria's evolving blue economy emphasizes the sustainable use of the oceans, seas, the Exclusive Economic Zone (EEZ), and the adjoining wetland habitats in Nigeria's littoral states. This vision aligns with the global Blue Economy, encompassing various sectors, such as maritime transport and shipping, cruise tourism, fisheries and offshore aquaculture, renewable energy, oil and gas exploration, mineral resources, recreation and sporting, biotechnology and pharmaceuticals, and coastal protection and infrastructure, including ocean governance and management (Osuji and Agbakwuru, 2024). To develop the Blue Economy in Nigeria, which covers various sectors, the alignment and synergy of all agencies, non-governmental organizations, and government parastatals is crucial, along with the much-needed enlightenment (advocacy) campaigns among artisanal fisherfolk populations that depend on the EEZ and the adjoining wetland environment for their livelihoods. Extension education should be carried out in fisherfolk communities through knowledge sharing and utilizing fisherfolk indigenous knowledge about the migration patterns of existing aquatic resources in Nigeria's littoral states for sustainability. The knowledge about existing aquatic resources gathered should be shared among all stakeholders for sustainability through enlightenment campaigns, awareness, advocacy, training, skill acquisition, and workshops for fisherfolk inhabitants, enabling them to integrate and adjust their livelihood occupations and income-generating activities while adapting to the evolving blue economy of Nigeria. Umehai *et al.;* (2023) documented that estuarine wetland mangrove habitats adjacent to the EEZ are among the most productive aquatic habitats globally due to continuous tidal mixing and the availability of nutrients from fresh and salt waters, evidenced by the various species of fishes, crustaceans, and bivalves in estuarine mangrove wetland habitats. Numerous marine organisms serve as food for diadromous (*Mugil cephalus*), catadromous (*Anguilla bicolor*), and anadromous (*Tilapia Oreochromis spp*.) fishes, which utilize wetland habitats for breeding and spawning, along with the millions of artisanal fisherfolks that derive food, fuel, and income from this habitat. Trained fisheries extension professionals should be mandated to disseminate knowledge on various species of aquatic organisms that breed, migrate, and spawn in the EEZ and its adjacent wetland habitats for conservation. Wade *et al.;* (2023) posited that information-sharing networks in fishing communities would enhance the adaptive capacity of fisherfolks amid social and environmental changes, which would arise when developing blue economies globally due to increased knowledge and information that is critical to the success of fisherfolk inhabitants in fishing communities.

Economic Potentials and Activities within the Blue Economy

The Blue Economy encompasses a broad array of economic activities (Table 1) with the potential to boost the Gross Domestic Product (GDP) of the country and the livelihood status of artisanal fisherfolk in the littoral states along the Exclusive Economic Zone (EEZ), provided its potential is fully harnessed to generate income and foreign exchange for

the nation. Fish inhabit freshwater, brackish water, and saltwater ecosystems in inland and coastal waters within the EEZ, characterized by a unique interconnection of rivers that continuously flow with nutrients, supporting various fish species that breed, migrate, and reside in these ecosystems at different stages of their life cycles for growth and productivity (Akintola *et al.;* 2022). The global ocean economy amounts to $1.5 trillion per annum, and as the seventh largest in rankings, 80% of goods by volume are transported by sea. This indicates that the Blue Economy, if properly harnessed for present and future generations, possesses the potential to generate economic growth through employment, food security, and the social well-being of coastal wetland inhabitants, without degrading the marine ecosystem (Commonwealth, 2023). Juneja *et al.;* (2021) reported that rich biodiversity and an abundance of mineral and ocean-based resources have led many countries (e.g., China, India, South Korea, Japan, Thailand, Vietnam, and Australia) to explore and develop seabed minerals and marine resources for high-technology sectors and pharmaceutical industries. Thus, harnessing blue biotechnology represents a technological and innovative area that is expanding within the blue economy of these nations. All stakeholders, policymakers, and development partners in Nigeria's evolving blue economy should study some of these countries and draw lessons from them to develop a sustainable blue economy that balances rapid development across all sectors of the blue economy with the livelihoods of artisanal fisherfolk in the adjacent wetlands along the EEZ. Blue Economy Sectors that generate income for countries globally is shown in Table One (1) and these sectors include Fishing, Marine Biotechnology, Marine Renewable Energy, Marine Manufacturing, Marine Commerce, Marine ICT, Minerals, Education/Research including Shipping, Port and Marine Logistics (Jacob and Umoh 2022).

Abba (2024) also reported that women constitute an estimated 21% of those involved in the fisheries and aquaculture sector, which made up 1.16% of Nigeria's Gross Domestic Product in 2021. This sector employs more than 1.48 million people, with 653,000 working in inland fisheries and aquaculture, highlighting the vital role the fisheries sector plays in Nigeria's evolving Blue Economy. Eremi *et al.;* (2023) examined the impact of women's participation in artisanal fishing on their socio-economic well-being in coastal communities in Cross River State, Nigeria, and identified areas of participation include unloading fish from canoes, catching and marketing small fish, smoking and drying fish, washing fishing gear, making decisions on where to fish, and assisting in carrying fishing gear. This illustrates how the livelihoods of artisanal fisherfolk, particularly women, rely on resources from the EEZ and its adjoining wetlands, noting that many women in coastal communities generate income through these activities. Adepoju *et al.;* (2023) explored maritime-related activities by the Nigerian Ports Authority and the GDP generated from communities; the study revealed no correlation between the revenue where the blue economy is practiced and the GDP of the country. The study recommended exploring the blue economy while ensuring the marine ecosystem remains protected for the sustainability of resources. Ella and Indrajaya (2022) posited that the blue economy contributes to increased sustainable fisheries development and production in Indonesia, while Michael (2023) asserted that fishing activities positively impact the growth rate of the blue economy, suggesting that efforts should be made to increase fishing activities, provided such initiatives do not lead to overfishing, and emphasizing the need for improved water sanitation including waste management to reduce pollution in the EEZ.

Table 1: Taxonomy of Blue Economy Sectors and Activities

Sector	Activity
Fishing	Capture fishery, aquaculture, and seafood processing.
Marine Biotechnology	Pharmaceuticals, chemicals, seaweed harvesting, seaweed products, and marine-derived bio-products.
Minerals	Oil and gas, deep-sea mining (exploration of rare minerals and hydrocarbons).
Marine Renewable Energy	Offshore wind energy production, wave energy production, and tidal energy production.
Marine Manufacturing	Boat manufacturing, sail making, net manufacturing, boat and ship repair, marine instrumentation, aquaculture technology, water construction, and marine industrial engineering.
Shipping, Port, and Marine Logistics	Ship-building and repairing, ship owners and operators, shipping agents and brokers, ship management, liner and port agents, port companies, ship suppliers, container shipping services, stevedores, roll-on-roll-off operators, customs clearance, freight forwarders, safety and training.
Marine Construction	Marine construction and engineering.
Marine Commerce	Marine financial services, marine legal services, marine insurance, ship finance and related services, charterers, media, and publishing.
Marine ICT	Marine engineering consultancy, meteorological consultancy, environmental consultancy, hydro-survey consultancy, project management consultancy, ICT solutions, geo-informatics services, yacht design, submarine telecom.
Education research	Education and training, research, and development.

Source: RIS (2015) Cited in Juneja *et al.;* (2021).

Nigeria's Evolving Blue Economy and Artisanal Fisherfolks

The concept of Blue Economy emphasizes the sustainable utilization and conservation of the marine environment to promote growth, recognizing the inherent value of the oceans, including the adjoining coastal areas, not just economically, but also as crucial ecosystems that support various life forms providing essential benefits to humanity (Youssef, 2023). The Commonwealth (2023) defines the concept of Blue Economy as an emerging focus on the sustainable exploration and exploitation of ocean resources. Odey (2023) contributed that the blue economy encompasses a wide range of economic

activities associated with oceans, seas, and coasts, including established and emerging sectors, while also acknowledging its non-marketable economic benefits such as carbon storage, coastal protection, cultural values, and diversity. This demonstrates that the blue economy represents an innovative approach to the economic exploitation of oceans, lakes, rivers, and other bodies of water. This further illustrates the potential of Nigeria's evolving Blue Economy to diversify the nation's economy and drive positive growth for the country and its citizens if properly harnessed. Magego *et al.;* (2021) documented that artisanal fisheries globally contribute to the socio-economic development of rural communities by offering employment and nutrition to inhabitants. Magego *et al.;* (2021) further posited that the greatest challenge to fisheries has been resource sustainability due to diversity among fisherfolk, making it critical to understand the social dynamics of fisherfolk regarding their norms, values, and cultures within various fishing communities. Thus while evaluating fisherfolks contributions to livelihoods it should be noted that socio-economic characteristics determine how households' access resources noting that households with more assets are in a better position to utilize resources adequately compared to those with limited assets (Magego *et al.;* 2021). Many species of shellfish, prawns, shrimps, bivalves, crustaceans, mollusks, and undersized fish are harvested in brackish water locations along most coastal communities, and gleaning occurs during closed seasons when these aquatic resources are abundant, indicating opportunities to culture aquatic organisms for substantial financial returns on investments (Elezuo *et al.;* 2024; Matsuoka *et al.;* 2021). Omogbemi *et al.;* (2021) reported that Nigeria has a variety of shellfish resources, including tiger prawn (*Penaeus monodon*), *Palaemonidae* (shrimp), mollusks like bloody cockle (*Senila senilis*) and cockles (*Cardium costatum*), *Pontunidae* (swimming crab), *Palinuridae* (spiny lobster), dog winkle (*Thais haemastoma*), periwinkles (*Tympanotonus fuscatus*), and oysters (*Crassostrea tulipa*). Major fish species caught in Nigeria and along the Gulf of Guinea include *Cynoglossis* species (soles), *Aurius* species (marine catfish), *Sphyraena* species (barracudas), *Polydactylus quadrifilis* (shiny nose), *Tarpon atlantica* (ten pounder), *Hemirhamphus* species (half beak), *Lutjanus* species (snapper), *Pomadasys* species (grunters), sharks (*Hexanchus griseus*), bonga (*Ethmalosa fimbriata*), sardine (*Sardinella* species), jacks (*Caranx* species), atlantic plumber (*Chloroscombrus chrysurus*), and longneck croakers (*Pseudotolithus elongatus; Pseudotolithus typus*) (Olaoye; Ojebiyi, 2018 cited in Akintola *et al.;* 2022). Recently, fisherfolk have experienced dwindling catches from artisanal fishing in Nigeria, with these challenges attributed to unregulated fishing practices, failure to observe closed seasons, inadequate storage facilities, the use of destructive fishing methods, climate change, and environmental degradation (George *et al.;* 2021). The livelihoods of artisanal fisherfolk depend on the availability and accessibility of fish harvested from oceans, seas, lakes, streams, and rivers for their wellbeing. Moreover, their livelihoods comprise the capabilities, assets (material and social resources), and activities necessary for a means of living, making the sustainability of their livelihoods vital in the evolving Blue Economy. Targeted interventions through policies and result-oriented extension education or enlightenment programs are needed at this formative stage of Nigeria's evolving blue economy to achieve the benefits of investment opportunities from private and public sector entrepreneurs in this economic sector.

The Role of Extension Services in the Evolving Blue Economy of Nigeria

Agwu *et al.;* (2023) posited that agricultural extension is a system that facilitates access for farmers or their organizations to new knowledge, information, and technologies while promoting interaction with research, education, agri-business, and other relevant institutions to assist in developing their technical, organizational, and management skills and practices. Umehai *et al.;* (2023) averred that fisheries extension is a system that assists people in the fish farming and fishing industry through educational procedures aimed at improving fishing and aquaculture, including fish processing and preservation methods. Furthermore, fisheries and aquaculture extension agents enhance the knowledge, attitudes, and skills (KAS) of fisherfolks in the upstream (boat building/repair, fishing gear supply, input supplies, training, and capacity building) and downstream (fish processing, marketing, trading, value addition, quality control, fish export, and import) sectors of artisanal fishing, including fisheries management and conservation practices. This increases production efficiency and income for fishers, ultimately improving the socio-economic conditions of all actors in the fisheries and aquaculture sector. Extension education provides useful information and knowledge to clientele, helping them develop informed, result-oriented solutions to the everyday problems they encounter in activities like artisanal fishing. Extension services play a major role in Nigeria's evolving Blue Economy by assisting all actors with policy alignment, linkages, and interagency cooperation with government, non-governmental agencies, key stakeholders, professionals, and scientists to enhance development in the evolving Blue Economy. Extension agencies should stimulate dialogue, campaigns, advocacy, and coordination among government agencies, development partners, researchers, scientists, and artisanal fisherfolks so that a needs assessment can be done to ascertain the felt needs of artisanal fisherfolks who are the main inhabitants of the adjoining wetlands off the EEZ. Umehai *et al.;* (2023) recommended that fisheries and aquaculture extension programs and interventions aimed at improving the socio-economic conditions and livelihood coping strategies of wetland inhabitants should be organized and implemented by relevant agencies to disseminate information on cost-effective extension delivery programs. This would ensure that conservation laws are enforced by government and locals while penalties are imposed on defaulters, allowing the pristine aquatic wetland habitats adjoining the EEZs to be conserved for present and future generations. The EEZ and its adjoining wetland habitat is an environment rich in biodiversity; thus, fisheries extension professionals are mandated to educate all stakeholders in Nigeria's evolving Blue Economy on the need to conserve this environment because of its unique role as nursery, breeding, and spawning grounds for various aquatic organisms, considering that the livelihoods of millions of fisherfolks depend on this habitat. Mustapha *et al;* (2024) also asserted that extension services today are viewed from a broad system perspective, focusing on the roles and capacities needed at the individual, organizational, and systemic levels to tackle myriad challenges. Extension education is an applied science comprising subject matter derived from research findings, applying the principles of behavioral sciences to educate and implement appropriate technology, embodying philosophy, principles, and methods of out-of-school education for youths and adults, including artisanal fisherfolks. Therefore, extension agents should discuss problems with rural individuals, assist them in gaining clearer interpretations of

these issues, and determine how to resolve them using the most efficient communication models and technology packages in extension service delivery (Umehai *et al.;* 2024). The role of fisheries extension professionals in the evolving Blue Economy is vital in species identification for export and foreign exchange earnings, alongside advocating for species conservation and enlightening fisherfolks about alternative sources of income. Emphasis should be placed on skill acquisition and training in tourism, management, and conservation of aquatic resources, in addition to sustainable livelihood activities for artisanal fisherfolk in communities due to the evolving Blue Economy. Fisheries extension professionals who understand the ecology and the behavioral patterns or dynamics of artisanal fisherfolks should coordinate all agencies to achieve the vision and mandate of the Ministry of Blue Economy in Nigeria, recognizing that the holistic development of all stakeholders is essential for the sustainable exploitation of resources and the development of Nigeria's evolving Blue Economy. Eriegha *et al.;* (2024) affirmed that sustainable exploitation and conservation of fisheries resources in the adjacent Gulf of Guinea off the coast of Nigeria depend on vital information regarding stock composition and characteristics, making this the first step in any fish conservation and management program, as accurate identification of all species in the EEZs is crucial. Kaleem and Sabi (2021) reported that fisherfolks' engagement in freshwater cultivation (mariculture) accounts for 80% of the world's fish produced through aquaculture but despite the 729,000 hectares suitable for mariculture, its potential remains untapped in Nigeria. Adeleke *et al.;* (2020) documented that mariculture in Nigeria has faced numerous setbacks and has not advanced due to inadequate expertise and the Nigerian government's total neglect of this sector in aquaculture. Appropriate locations for offshore aquaculture especially mariculture should be identified through MSP to implement effective offshore aquaculture techniques in collaboration with the Federal Department of Fisheries (FDF), the Nigerian Institute for Oceanography and Marine Research (NIOMR), and the Nigerian Navy, focusing on the management, development, and preservation of the Nigerian Exclusive Economic Zone (EEZ). Generally, the absence of enabling laws and regulatory policies, along with the lack of enforcement of the few existing laws, hinders the development of the Blue Economy in Nigeria, particularly since the proposed National Fisheries Policy has yet to be fully implemented six years after it was first introduced at a National Fisheries Development Committee (NFDC) meeting in Lokoja, Kogi State, Nigeria (Olorunyomi, 2022). Additionally, inadequate documentation of the activities of formal and informal actors in the evolving Blue Economy sector renders some data and information unavailable for substantial research efforts, presenting a significant limitation to development (Osuji and Agbakwuru, 2024).

Advantages and Disadvantages of Harnessing Resources within the Exclusive Economic Zone (EEZ)

Nigeria has the sovereign right to explore and exploit its natural resources (living organisms, minerals, and non-living resources). Consequently, the United Nations Convention on the Law of the Sea (UNCLOS) granted approval in December 2023 to extend Nigeria's continental shelf by 20 nautical miles. Currently, Nigeria's continental shelf is 220 nautical miles, which means that all oil and gas resources, sedentary species, and harvestable organisms, including those found in the seabed or subsoil, cannot be exploited by any other state or entity without Nigeria's consent, which must first be sought and obtained (Anammah and Ezenyimulu, 2024). The advantages of harnessing resources in the EEZ are numerous and include the following:

i. Employment in labor-heavy industries such as fishing, aquaculture, shipping, marine tourism, marine transportation, fish processing, port operations, shipbuilding and repair, and offshore oil and gas, including shipping (FAO, 2022, and Juneja *et al.;* 2021). Trade
ii. Trade in fish and fish product exports includes dried fish, fresh fish, iced fish, canned fish products, salmon roll egg, sea urchin rolls, shrimps, prawns, leather products made from fish, and polishing materials like fish oil derived from cartilaginous fish (Odioko and Becer, 2022).
iii. Global trade in ornamental fish farming has contributed to international trade in ornamental fish valued at $322 million in 2020, with Japan being the highest exporter of ornamental fish (Trend Economy 2022)
iv. Food security, improved nutrition, and health status of citizens from consuming fish and fish products, which account for 40 % of the protein intake of Nigerians (World Fish, 2022).

Anammah and Ezenyimulu (2024) maintained that numerous challenges plague the actualization of the blue economy due to the perception by many that ocean resources are limitless. Consequently, obnoxious, illegal, and unsustainable fishing practices are often reported in the Gulf of Guinea, along with physical alterations and the destruction of marine coastal habitats, landscapes, and sea-level rise affecting the coastal region of the nation. Climate change, which influences the dynamics of coastal and oceanographic properties, particularly an increase in temperature, has also led to the vertical migration of some fish species to cooler waters outside the EEZ. This exposes artisanal fisherfolks to conflicts with industrial fishing trawlers, making them vulnerable (Akintola *et al.;* 2022). An increase in marine pollution and wastewater discharged into the EEZ through anthropogenic activities is also present (Michael, 2023). Furthermore, there is the destruction of the cultural and sacred waters in most fishing communities, along with the degradation of breeding, spawning, nursery, and migratory waters of various aquatic organisms resulting from anthropogenic activities (Umehai *et al.;* 2023; Akintola *et al.;* 2022). Illegal, unregulated, and unreported (IUU) fishing activities—including bottom trawling, blast fishing, and deactivation of vessel identification and monitoring systems, as well as moving fish catches from vessel to vessel—have contributed to threatening the fishery industry in Nigeria (Yonmo and Asanebi, 2022).

CONCLUSION

Nigeria's Blue Economy plays a vital role in the government's development initiative for the nation, keeping in mind that the livelihoods and income-generating activities of artisanal fisherfolks depend on aquatic organisms within the marine habitat. Therefore, government policies must align and be formulated to integrate fisherfolks into targeted interventions by public and private sector entrepreneurs intending to invest in the blue economy, especially within the EEZ. The essential role of fisheries extension professionals in the evolving blue economy includes actively participating in a needs assessment for artisanal fisherfolks, which would reveal their felt needs and stimulate dialogue among all actors and participants, as well as collecting data on marine species and fostering teamwork during the marine spatial planning of the EEZ. Targeted interventions through policies and result-oriented extension education enlightenment campaigns are needed

during this formative stage of Nigeria's evolving blue economy to sensitize artisanal fisherfolks about the benefits that could be derived from investment opportunities by private and public sector entrepreneurs in communities adjacent to the wetlands or within the EEZ. It is recommended that fisheries extension professionals be incorporated as stakeholders in the marine spatial planning of the EEZ to help generate income for entrepreneurs and investors to develop the nation. A comprehensive legal policy and framework should be developed in collaboration with the Ministry of Blue Economy to sustainably utilize marine resources in the EEZ, including improved monitoring and control of the EEZ through the Navy, Coast Guard, or drones to prevent illicit fishing activities or oil spills. Finally, the active participation and involvement of artisanal fisherfolks in community co-management activities should be enhanced through training, tourism activities, and the management of marine aquatic resources for employment and sustainability in fisherfolks habitats along the EEZ.

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