BLUE ECONOMY AND SUSTAINABLE USE OF WATER RESOURCES FOR ECONOMIC GROWTH IN COASTAL AREA OF CALABAR, CROSS RIVERSTATE, NIGERIA

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Abstract

This study investigated the relationship between blue economy and sustainable use of water resources for economic growth in coastal area of Calabar, Cross River State, Nigeria. Survey research design was adopted for this study. The population of the study was made up of three hundred and eighty-six (386) fishermen and periwinkle harvesters in Calabar. Accidental sampling technique was used for the selection of respondents who were available during three days of data collection. A total of eighty-one (81) fishermen and periwinkle harvesters were sampled for the study. Structured interview and questionnaire were the instruments used for data collection. Pearson Product Moment Correlation Co-efficient Analysis was the statistical tool adopted to test the hypotheses at .05 level of significance. The result of the analysis revealed a significant relationship between blue economy and sustainable fishing and periwinkle exploitation for economic growth in coastal area of Calabar, Cross River State, Nigeria. Based on the result, it was recommended that; the fishermen should adopt fishing methods that can ensure the safety under matured fish, the periwinkle exploiters should also pick/harvest the matured periwinkle for the small ones to mature for future us, the government should make laws against indiscriminate fishing in the area, the government should also reduce the rate of tax imposed on such resources to make it possible for average inhabitants to afford the resources since they are the major sources of food nutrient in the study area.

Keywords: Blue Economy, Sustainable Use, Water Resources, Economic Growth, Coastal Area



Introduction

Blue economy initiatives and applications are emerging around the world and are proving to be diverse, dynamic and wide-ranging. Cases are emerging in estuarine and marine habitats that link social, economic and environmental progress. As such, blue economy initiatives support the creation of a low-carbon, resource-efficient and socially- inclusive society. The achievement of global sustainability goals to feed local objectives and conversely, global successes are built on effective local implementation of blue economy (UNEP, 2023). As such, the services, benefits and values documented by initial blue economy efforts were and are seen as crucial not only for local communities and coastal states, but also the world as a whole.

Blue economy' refers to the range of economic activities that promote the sustainable use of ocean/water resources for economic growth, improved livelihoods and jobs while preserving the health of ocean ecosystem. To be considered part of the blue economy, maritime/water activities need to: "1) provide social and economic benefits for current and future generations; 2) restore, protect and maintain the diversity, productivity, resilience, core functions and intrinsic value of marine ecosystems and 3) be based on clean technologies, renewable energy and circular material flows that will reduce waste and promote recycling of materials (World Bank, 2017; *Bessong et al, 2024*). According to FAO (2022) blue economy sectors include traditional maritime industries and emerging new ones. Traditional sectors involve activities like fisheries, tourism and maritime transport, while emerging ones, cover ocean renewable energy, marine biotechnology and offshore renewable energy.

Blue economy relies heavily on fisheries and other water resources 17% of global animal proteins are supplied by fisheries and other water resources (Cohen, Allison & Andrew, 2019). According to Ababouch and Fipi (2022), in developing countries, over 90% of livelihoods are directly dependent on fisheries and aquaculture, usually in small-scale operations. The growing demand for fish and periwinkles as sources of food nutrient has been on increase in Calabar. Consequently, the average annual contribution of fish and periwinkle for human intake has expanded seven-fold from 7% in 1970 to around 50% in 2024.

Furthermore, periwinkles serve as a source of biofuels that do not compete for resources with agriculture, as they do not need arable land, fertilizer, herbicides, or pesticides. Thus, in several ways, they are more environmentally sustainable than current biofuels made from land crops (Duarte, Wu & Xiao, 2017; *Olofu et al*, 2024; Igyu et al, 2022). Thorsnes, Christensen and Fossa (2018) opined that there are substantial overarching commonalities the blue economy supports to broaden the definition of water resources to acknowledge the fundamental, life-supporting benefits and services that are provided by these resources in the coastal ecosystems. These include the ecosystem services that provide, regulate, support and enrich the cultural uses of coastal and marine ecosystems.

Olsen, Fluharty, Hoel, Hostens and Maes (2024) observed that these ecosystem services are inextricably linked with the sustainability and prosperity of key individuals within the blue economy. Therefore, the blue economy approach is the need to deal effectively with key issues affecting the sustainability of marine ecosystem services and benefits, such as over-fishing, climate change, ocean acidification, loss of habitats and biodiversity, invasive species, pollution and waste (Knol, 2020; Oroka 2024 et al, 2024; Meremikwu et al, 2022, Adie et al, 2019; Patrick, 2024).

Sustainability refers to creating and maintaining the conditions under which humans and nature can exist in productive harmony to support present and future generations (Adams, 2016;

Bessong et al, 2024). Sustainable development refers to development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Airoldi, Turon, Perkol-finkel & Rius, 2021). This concept seeks to foster sustainability by promoting environmental protection, economic development and social progress. It has been adopted as the global blueprint for sustainability as envisioned under the United Nation's 2030 agenda for Sustainable Development which represents a shared blue print for peace and prosperity for people and the planet in the quest towards the ideal of sustainable development. The agenda envisions attainment of the ideal of Sustainable Development through Sustainable Development Goals (SDGs) which seek to strike a balance between social, economic and environmental facets of sustainability (Aldridge, Mooney, Dabrowski & Capuzzo, 2021; Inyang, 2022' Inyang et al, 2022). Blue economy is vital in the sustainability agenda. Bannister, Sievers, Bush and Bloecher (2019) argued that sustainable utilization of the blue economy can unlock development in areas such as smart shipping, ports, transportation and global connectivity, job creation and poverty eradication, tourism, resilient coasts and infrastructure; sustainable energy, mineral resources and innovative industries, managing and sustaining marine life, conservation and sustainable economic activities, ending hunger, securing food supplies and promoting good health and sustainable fisheries, climate action, agriculture, waste management and pollutionfree oceans, maritime security, safety and regulatory enforcement and people, culture, communities and societies.

According to the Bergström, Durland and Lindegarth (2020), freshwater ecosystems play a significant contribution in achieving sustainability in areas such as food security, nutrition and health, tourism, climate change mitigation, provisions of homes and shelter, sustainable economic growth and trade. Ortega, Geraldi and Duarte (2020) observed that the fisheries and aquaculture sector is a vital source of livelihoods, nutritious food and economic opportunities and has a key role to play in meeting one of the world's greatest challenge of feeding the population.

Fishing has been crucial to mankind right from the palaeolithic period. At the beginning, it was a passive exercise, but nowadays, it has taken the form as an enterprise, in particular because of the motorization of crafts, which in turn has brought about the evolution of energetic fishing strategies which include trawling (Yellen, Brooks, Cornelissen, Mehlman & Stewart, 2019). The diverse fishing strategies have progressed step by step over time. Fishing play a crucial role in Nigeria's economy. The industry gives employment and profits to almost a million people. The boom in fisheries has led to most of the commercially important species that are being exploited, displaying symptoms of overexploitation, the demand for sea food is growing day by day (Jacob, McClatchie, Probert & Hurst, 2018).

Sreedhar (2022) observed that the current level of fish production from the exploited zone has to be sustained by closely monitoring the landings and the fishing effort and by strictly implementing scientific management measures and strategies. Fishing efforts in coastal areas of Calabar have increased over the years, primarily due to increased demand and the introduction of new technologies. This eventually reduced the catch per boat. According to Bhathal (2019), the extent of sustainable exploitation of water resources is doubtful, since the marine ecosystem is very fragile when compared to the coastal zone. Exploitation of offshore resources will have to be reconsidered in terms of not only the resources available, but also in terms of infrastructure (Olofu et al, 2017).

More so, periwinkle exploitation contributes to changes in the socio-economics structure of coastal communities in Calabar. Periwinkle exploitation is also a form of aquaculture that has particularly benefited women and has contributed to government- sponsored poverty alleviation programmes, beneficial effect on ecology and climate change and periwinkle exploitation is crucial to the implementation of a system of sustainable ecosystem management (Czyrnek-Delêtre, Rocca, Agostini, Giuntoli & Murphy, 2017).

Duarte, Wu, Xiao, Bruhn and Krause-Jensen (2017) stated that the development of a viable fishing industry can support the national programme for job creation, reducing unemployment and contributing to economic growth. Zamroni (2021) explored sustainable periwinkle exploitation and its contribution to livelihoods in Eastern Indonesia. The survey

study used structured and semi-structured questionnaires as qualitative approach and interviews were conducted with 294 respondents in South Sulawesi and West Nusa Tenggara Provinces. The data was analyzed used descriptive statistics and supply chain analysis. The finding showed that periwinkle exploitation is a primary source of household support in small-scale level.

Statement of the problem

The rate at which water resources especially fish and periwinkle are exploited is alarming; as people in the study area hardly cook without fish or periwinkle. The quest for acquisition of wealth and living a life of immense comfort has forced people to ignore the need to use marine/water resources sustainably. This has caused widespread endangerment and even extinction of fish and other water species in the coastal areas of Calabar where inhabitants are exposed to various forms of fishing practices for survival. The protracted nature of extracting marine/water resources at a rate greater than natural regeneration and growth has caused rapid depletion of such resources. Despite government efforts in regulating fishing activities in the study area has not yielded a sustainable result. This unfortunate situation may be attributed to ignorance of local fishermen and periwinkle harvesters about the sustainable use of the resources for continued human survival. Therefore, this study examined between the relationship blue economy and sustainable use of water resources for economic growth in Calabar.

Purpose of the study

The purpose of this study was to examine the relationship between blue economy and sustainable use of water resources for economic growth in coastal area of Calabar, Cross River State, Nigeria. Specifically, the study sought to;

- 1. Examine the relationship between blue economy and sustainable fishing for economic growth in coastal area of Calabar.
- 2. Ascertain the relationship between blue economy and sustainable periwinkle exploitation for economic growth in coastal area of Calabar.

Hypotheses

The following hypotheses were formulated to guide the study;

- 1. There is no significant relationship between blue economy and sustainable fishing for economic growth in coastal area of Calabar.
- 2. There is no significant relationship between blue economy and sustainable periwinkle exploitation for economic growth

Method

Survey research design was adopted for this study. The population of the study was made up of three hundred and eighty-six (386) fishermen and periwinkle harvesters in Calabar. Accidental sampling technique was used for the selection of respondents who were available during three days of data collection. A total of eighty-one (81) respondents were sampled for the study. Structured interview and questionnaire were the instruments used for data collection. Pearson Product Moment Correlation Co-Efficient analysis was the statistical techniques adopted to test the hypotheses at .05 level of significance.

Result

There is no significant relationship between blue economy and sustainable fishery for economic growth in coastal area of Calabar.

Table 1 Pearson Product Moment Correlation analysis of the relationship between blue economy and sustainable fishing (N=81).

Variables	X	SD	r-value
Sustainable fishing	22.0169	1.34543	
Blue economy	17.7631	2.65240	0.38*

*Significant at .05 level, critical r = .195, df = 79

To test the hypothesis, PPMCC was used. Data showed that the t-value was 0.38 while the critical r-values was 0195. The decision rule states that if the t-value is greater than the critical r-value, the null hypothesis should be rejected while accepting the alternative. Thus, since the t-value of 0.38 was greater than critical r-value of .198, the null hypothesis which states that there is no significant relationship between blue economy and sustainable fishery for economic growth in coastal area of Calabar was rejected. The result off the study revealed that there is significant relationship between blue economy and sustainable fishery for economic growth in coastal area of Calabar.

Hypothesis two

There is no significant relationship between blue economy and sustainable periwinkle exploitation for economic growth in coastal area of Calabar.

Table 2; Pearson product moment correlation analysis of the relationship between blue economy and sustainable periwinkle exploitation (N=81)

Variables	X	SD	r-value
Sustainable periwinkle exploitation	18.4123	3.11997	
Blue economy	17.7631	2.65240	
			0.42*

^{*}Significant at .05 level, critical r = .195, df = 79

To test the hypothesis, PPMCC was used. Data showed that the t-value was 0.42 while the critical r-values was .195. The decision rule states that if the t-value is greater than the critical r-value, the null hypothesis should be rejected while accepting the alternative. Thus, since the t-value of 0.42 was greater than critical r-value of .198, the null hypothesis which states that there is no significant relationship between blue economy and sustainable periwinkle exploitation for economic growth in coastal area of Calabar was rejected. The result off the study revealed that there is significant relationship between blue economy and sustainable periwinkle exploitation for economic growth in coastal area of Calabar.

Discussion of findings

The result of hypothesis one indicated that, blue economy significantly relate with sustainable fishing for economic growth in coastal area of Calabar, Cross River State, Nigeria. The researcher observed that there is no market in the study area where the two resources are not sold in a large quantity. This means, the people in the study area largely depend on the fish for food nutrient. The result of this study is in line with the opinion of Bergström, Durland and Lindegarth (2020) who stated that freshwater ecosystems play a significant contribution in achieving sustainability in areas such as food security, nutrition and health, tourism, climate change mitigation, provisions of homes and shelter, sustainable economic growth and trade. Also, Sreedhar (2022) observed that the current level of fish production from the exploited zone has to be sustained by closely monitoring the landings and the fishing effort and by strictly implementing scientific management measures and strategies.

Furthermore, the result of hypothesis two indicated that, blue economy significantly relate with sustainable periwinkle exploitation for economic growth in coastal area of Calabar, Cross River State, Nigeria. The finding is related to the findings of Zamroni (2021) who explored

sustainable periwinkle exploitation and its contribution to livelihoods in Eastern Indonesia. The survey study used structured and semi-structured questionnaires as qualitative approach and interviews were conducted with 294 respondents in South Sulawesi and West Nusa Tenggara Provinces. The data was analyzed used descriptive statistics and

supply chain analysis. The finding showed that periwinkle exploitation is a primary source of household support in small-scale level.

Conclusion

Based on the findings, it is concluded that blue economy significantly relate with sustainable use of water resources for economic growth in coastal area of Calabar, Cross River State, Nigeria. The harvest of fish and periwinkles in the study area has helped to sustain the families of those involved in the activities and has contributed to economic growth of the area through provision of income to families and government.

Recommendations

Based on the result, it was recommended that;

- 1. The fishermen should adopt fishing methods that can ensure the safety of under matured fish.
- 2. The periwinkle exploiters should also pick/harvest the matured periwinkle for the small ones to mature for future us.

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