International Journal of Maritime and Interdisciplinary Research
©2025 IJMIR/Volume 7(3) SE (1) | ISSN: 2734-3286.
Journal homepage: www.ijmir.edu.ng

ENHANCING COASTAL COMMUNITY EDUCATION FOR SUSTAINABLE BLUE ECONOMY PRACTICES IN BAYELSA STATE

[1]Berezi, Okpoebi Kenneth, [2]Berezi, Irene Uzezi

[1]Nigeria Maritime University, Okerenkoko, Delta State. Nigeria.

[2]Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria.

Corresponding Author's Email:okpoebiberezi@gmail.com

ABSTRACT

This study looks at enhancing coastal community education for sustainable blue economy practices in Bayelsa state. The state, known for its heavy dependence on marine and coastal resources, faces environmental challenges such as overfishing, coastal erosion, and pollution. Coastal community education, aimed at promoting sustainable practices in fishing, aquaculture, and coastal farming, has been identified as a key tool for fostering environmental conservation and economic resilience. Using a descriptive survey research design, the study gathered data from 280 fishermen and farmers across selected local government areas of Nembe and Ogbia. and 90 educators from tertiary institutions in Bayelsa State. Data were collected using structured questionnaires and analyzed using both descriptive and inferential statistics. The findings suggest that there is a significant gap in the awareness of sustainable blue economy practices among coastal community members in Bayelsa State. However, community-based and locally relevant educational strategies are considered more impactful for raising awareness and encouraging the adoption of sustainable practices. Hence, it was recommended that improving internet access and digital literacy could enhance the effectiveness of awareness among coastal community members. Investing in technology and training programs to build digital skills in coastal communities would enable greater use of online learning tools.

Keywords: Coastal Community Education, Sustainable Blue Economy, Practices

1.0 INTRODUCTION

Coastal regions, where land meets the ocean, have long been centers of human settlement, economic activity, and cultural development. These areas provide abundant resources, transportation routes, and recreational opportunities, making them ideal for habitation. As a result, coastal communities have thrived, developing unique lifestyles deeply connected to the maritime environment. A coastal region, often referred to as a coastal zone, is defined as the interface where land meets the ocean, encompassing both terrestrial and marine environments that directly influence each other. Ketchum (2007) describes it as the strip of dry land and adjacent ocean space (water and submerged land) where terrestrial processes and land uses directly affect oceanic processes and vice versa. Coastal regions are not just characterized by their geographical location, but also by the communities inhabiting them, who have forged intricate relationships with their surrounding environment. Coastal communities are deeply reliant on the maritime ecosystem for their livelihoods, culture, and survival. These communities depend heavily on marine resources such as fishing, tourism, and shipping, all of which are influenced by the characteristics of their coastal environment. According to Kumar and Agrawal (2021), they significantly contribute to the global economy by supporting industries such as fishing, tourism, and shipping. However, the escalating pressure on these resources due to overexploitation, climate change, and pollution threatens long-term sustainability. For instance, small-scale fisheries are critical for food security and employment for millions of coastal inhabitants worldwide. Nonetheless, overfishing, combined with the effects of climate change, has put increasing pressure on these communities. Rising sea levels, frequent storms, and coastal erosion are directly threatening both the physical environment and livelihoods. Aziz et al. (2021) note that coastal communities, including those in Bayelsa State within the Niger Delta region of Nigeria, are marked by their strong dependence on marine and coastal resources for livelihood, cultural practices, and social wellbeing. These communities rely heavily on sectors such as fishing, agriculture, and oil extraction, all of which are closely tied to the health and sustainability of the coastal ecosystem. Artisanal fishing, in particular, has been integral to Bayelsa's food security and employment. However, the region faces significant environmental challenges, including oil pollution, overfishing, and climate change, which threaten local ecosystems and livelihoods. Nzeadibe et al. (2020) highlight that Bayelsa's

coastal communities are suffering from the combined effects of rising sea levels and oil spills, which degrade water quality and soil health, thereby jeopardizing vital fishing and farming activities. The region's heavy reliance on oil extraction has created economic instability as the environmental degradation from oil spills undermines traditional livelihoods like fishing. Okoye et al. (2021) argue that oil pollution and gas flaring have notably reduced fish populations, which directly impacts local fishing activities. Furthermore, the absence of alternative livelihoods and adequate support systems for sustainable development has left these communities vulnerable. Given these challenges, integrating educational systems is essential for better equipping coastal populations to manage environmental changes. Education programs focusing on sustainable practices and climate resilience are crucial for empowering communities to mitigate risks, adapt to changes, and safeguard their way of life. Education plays a vital role in empowering coastal communities to adopt sustainable practices. When communities are provided with the necessary knowledge and skills, they can make informed decisions regarding resource management, conservation, and alternative livelihoods that are both economically and environmentally viable. Education serves as a tool to raise awareness about the importance of preserving marine ecosystems while enabling communities to embrace sustainable practices that enhance both environmental protection and economic stability. Coastal education programs typically aim to enhance knowledge on resource management, climate adaptation strategies, and alternative livelihood options that reduce dependency on over-exploited marine resources. Coastal community education refers to the process of disseminating knowledge, skills, and values to coastal populations to promote the sustainable use and management of marine and coastal resources. Its goal is to empower individuals and groups within these communities to understand the environmental, social, and economic dynamics of their surroundings, thereby improving their capacity to make informed decisions about resource management and adaptation to environmental changes. Mangubhai et al. (2020) argue that coastal community education is an approach to building environmental literacy that encourages stewardship of marine ecosystems and the adoption of sustainable practices in coastal livelihoods such as sustainable fishing, tourism, and agriculture. This educational framework focuses not only on environmental sustainability but also on social and economic empowerment. By offering education on alternative livelihoods, climate change adaptation, and disaster risk reduction, coastal community education aims to enhance the adaptive capacity of these populations in the face of threats such as climate change, natural

disasters, and resource depletion. As Sanchis et al. (2021) point out, coastal education is a critical tool for building resilience in coastal communities, helping them mitigate environmental risks, diversify income sources, and contribute to the long-term sustainability of coastal ecosystems. Mangubhai et al. (2020) assert that fostering environmental literacy in coastal communities can lead to more informed decision-making, essential for achieving the objectives of a sustainable blue economy. Education promotes a deep understanding of the interconnectedness between the marine environment and the economy, enabling communities to better navigate the challenges of overfishing, pollution, and climate change while ensuring their long-term sustainability. The integration of education with sustainable practices is pivotal, as it prepares communities to tackle future challenges while balancing human development with environmental stewardship. Okpara et al. (2021) emphasize that fostering innovation in coastal economies through education and capacity-building can help communities transition toward more diversified and sustainable economic activities. A significant shift that could contribute to a sustainable economy is the blue economy, which not only contributes to economic stability but also strengthens the resilience of coastal populations in the face of environmental challenges. The blue economy refers to the sustainable use of ocean resources for economic growth, livelihoods, and jobs. It is a crucial aspect of coastal community development. Integrating sustainable blue economy practices into the broader governance framework of coastal regions amplifies the impact of educational initiatives. The blue economy focuses on responsible economic growth while preserving marine ecosystems. According to the World Bank (2021), a sustainable blue economy prioritizes ecological preservation, marine biodiversity protection, and the resilience of coastal and marine ecosystems, while simultaneously fostering economic opportunities, particularly in fisheries, tourism, shipping, and renewable marine energy. The sustainable blue economy represents a paradigm shift in how coastal resources are used, emphasizing responsible growth alongside ecological preservation. In Bayelsa State, the blue economy offers a unique opportunity to harness the rich marine biodiversity sustainably. Ogbomida (2021) highlights that sustainable blue economy practices can significantly contribute to local economies by promoting sustainable fisheries, aquaculture, and tourism while protecting marine habitats. Integrating sustainable practices into the blue economy framework is crucial for mitigating the effects of overfishing, pollution, and habitat destruction. Moreover, the blue economy not only enhances economic resilience but also aims to strike a balance between economic activities and environmental sustainability. This balance is key for the long-term health

of marine ecosystems, which directly affects coastal livelihoods. As Eze et al. (2020) point out, there is an urgent need for communities to adopt sustainable practices that ensure their livelihoods and protect the marine environment. This shift requires a comprehensive understanding of local ecosystems and the implementation of practices that promote biodiversity and resource conservation. Engaging communities in sustainable practices leads to improved fish stocks, healthier ecosystems, and enhanced food security. The transition to sustainable practices is not only beneficial for the environment but also crucial for the socio-economic stability of coastal communities, setting the stage for further exploration of educational strategies that can facilitate this transition.

1.1 STATEMENT OF THE PROBLEM

Coastal communities in Bayelsa State rely heavily on marine and coastal resources for their livelihoods. These resources, such as fish, aquatic plants, and coastal agricultural products, are integral to the economy, culture, and food security of the people. However, over the years, these communities have faced increasing challenges related to environmental degradation, including overfishing, coastal erosion, pollution, and the depletion of marine resources. Additionally, unsustainable agricultural practices and climate change have exacerbated the vulnerability of these communities, making the need for sustainable development practices more urgent. Despite the critical importance of these resources, the awareness and knowledge regarding sustainable blue economy practices, including sustainable fishing, aquaculture, and coastal agriculture, remain limited in many coastal areas. Education plays a crucial role in equipping individuals with the knowledge, skills, and attitudes necessary to engage in sustainable resource management and conservation. However, the educational infrastructure and outreach in these coastal communities often fall short, particularly in terms of integrating blue economy principles into local educational programs. The gap in education, awareness, and implementation of sustainable practices presents a significant barrier to the adoption of blue economy principles, which could enhance the long-term viability of coastal resources and improve the livelihoods of local communities. Farmers, fishermen, and educators are at the heart of this challenge. While these groups directly interact with coastal resources, their capacity to apply sustainable practices is limited by the lack of formal education, technical training, and exposure to modern blue economy principles. This study aims to investigate how education in coastal communities influences the adoption of sustainable blue

economy practices in Bayelsa State by focusing on farmers, fishermen, and educators in the Nembe and Ogbia LGAs.

1.2 AIM AND OBJECTIVES OF THE STUDY

The aim of the study is to examine coastal community education for sustainable blue economy practices in Bayelsa state. The objectives are to:

1. **Assess the level of awareness** of sustainable blue economy practices among coastal community members in Bayelsa State.
2. **Identify coastal community education innovative strategies** to enhance awareness and adoption of sustainable blue economy practices in Bayelsa State.

1.3 RESEARCH QUESTIONS

The following research questions guided the study

1. To what extent are coastal community members in Bayelsa State aware of sustainable blue economy practices?
2. What **coastal community education innovative strategies** can enhance awareness and adoption of sustainable blue economy practices in coastal communities of Bayelsa State?

2.0 METHODOLOGY

This study adopted a descriptive survey research design to examine the influence of coastal community education on sustainable blue economy practices in Bayelsa State. This design was appropriate as it facilitated the systematic collection and analysis of data on participants' knowledge, attitudes, and practices regarding sustainable coastal resource management. The research was conducted in Bayelsa State, a region known for its extensive involvement in marine and coastal economic activities, particularly artisanal fishing and small-scale farming. The state faced significant environmental challenges such as coastal erosion, pollution, and overfishing, making sustainable education essential for promoting economic resilience and ecological stability.

The study population consisted of farmers, fishermen, and educators from coastal communities in Bayelsa State. A multi-stage sampling technique was employed to select participants. Purposive sampling was used to identify the Nembe and Ogbia Local Government Areas due to their critical role in blue economy practices. Within these local government areas, stratified sampling was applied to categorize respondents into the three key groups: farmers, fishermen, and educators. Finally, simple random sampling was used within each stratum to ensure an equitable representation of participants, thereby minimizing selection bias. The sample size was determined using Yamane's (1967) formula:

$$n = \frac{N}{1 + \mathrm{N(e)}^2}$$

where N represents the estimated population of farmers, fishermen, and educators in the two local government area (4,800), and e is the margin of error (5%). Based on this calculation, the required sample size for the study is 370 respondents. The distribution of this sample includes 180 participants from Nembe and 190 from Ogbia local government area, ensuring adequate representation of all three groups. Specifically, the sample consisted of 150 fishermen, 130 farmers, while 90 educators were randomly selected from three institutions in Bayelsa state. To ensure comprehensive data collection, structured questionnaires was used as the primary instrument. These questionnaires were designed to gather quantitative data on respondents' knowledge, attitudes, and practices concerning sustainable blue economy initiatives. The questionnaire was divided into two; the first aspect was presented to farmers and fishermen while the second aspect was based on the research questions. The questionnaire was based on a 4-point Likert rating scale of very high extent, high extent, low extent and very low extent. The questionnaire was administered both face-to-face and digitally to respondents. The study ensures validity and reliability through various measures. Content validity was established by subjecting the research instruments to expert review from professionals in environmental science and research methodology. A pilot study was conducted in a non-study coastal community to refine the questionnaire and interview guides based on feedback and preliminary results. The reliability of the questionnaire was tested using Cronbach's Alpha, with an acceptable coefficient of 0.7 indicating strong internal consistency. Data analysis involves quantitative techniques. Quantitative data obtained from structured questionnaires was utilized in analyzing the data. Descriptive

statistics, including frequencies, percentages, means, and standard deviations, were used to analyze the research questions, while inferential statistics of chi-square were employed to examine the relationships between community education and sustainable blue economy practices.

3.0 RESULTS

3.1 RESEARCH QUESTION ONE

To what extent are coastal community members in Bayelsa State aware of sustainable blue economy practices?

Table 1: Mean and standard deviation of respondents on the extent coastal community members are aware of sustainable blue economy practices.

S/N	Item Statement	X	Std. Dev.	Decision
1	Awareness of the concept of a sustainable blue economy and its importance	2.48	1.13	Low extent
2	Understanding the impact of overfishing and unsustainable fishing practices on marine ecosystems	2.49	1.10	Low extent
3	Awareness of climate-smart aquaculture and its role in improving fish production while protecting the environment	2.46	1.14	Low extent
4	Knowledge of the effects of marine pollution on livelihoods and biodiversity	2.54	1.10	High extent
5	Awareness of government policies and regulations supporting sustainable fishing and coastal resource management	2.41	1.12	Low extent
6	Understanding the benefits of mangrove conservation in preventing coastal erosion and sustaining fisheries	2.50	1.11	High extent

7	Informed about renewable marine energy sources as alternatives to fossil fuels	2.45	1.12	Low extent
8	Awareness of eco-tourism opportunities promoting environmental conservation and generating income for coastal communities	2.41	1.15	Low extent

Key: N-280

The data in Table 1 presents the extent to which coastal community members in Bayelsa State are aware of sustainable blue economy practices. For items 1 to 3, respondents show **low extent of awareness**, with mean scores ranging from **2.41 to 2.49, which are below the criterion mean of 2.50**. These results suggest that respondents generally have a low level of awareness. The standard deviations, ranging from **1.10 to 1.14**, indicate that low knowledge in these areas remains limited. These topics include understanding the concept of a sustainable blue economy, the impact of overfishing, and climate-smart aquaculture. Items 4 and 6, on the other hand, show a **high level of awareness**, with mean scores of **2.54** and **2.50**, respectively. This suggests a relatively higher awareness of the effects of marine pollution and the benefits of mangrove conservation. The standard deviations of **1.10** and **1.11** indicate low variability, with a consensus among respondents regarding these topics, but still some degree of individual differences in awareness. For items 5, 7, and 8, which also reflect **low extent of awareness,** the mean scores range from **2.41 to 2.45**. These findings point to a general lack of awareness about government policies, renewable marine energy sources, and eco-tourism opportunities. The standard deviations, ranging from **1.12 to 1.15,** suggest that while some individuals are more informed, the majority of respondents show limited knowledge of these critical areas. This implies that coastal community members in Bayelsa State are not aware of sustainable blue economy practices in Bayelsa State.

3.2 RESEARCH QUESTION TWO

What **coastal community education innovative strategies** can enhance awareness and adoption of sustainable blue economy practices in coastal communities of Bayelsa State?

Table 2: Mean and standard deviation of respondents on the extent coastal community education innovative strategies can be adopted to enhance awareness and adoption of sustainable blue economy practices in Bayelsa state.

S/N	Item Statement	X	Std. Dev.	Decision
9	Integrating blue economy concepts into school curricula	2.58	1.14	High extent
10	Community-based training programs on sustainable fishing and aquaculture	2.51	1.14	High extent
11	Deploying mobile education centres equipped with digital resources and demonstrations	2.21	1.17	Low extent
12	Public awareness campaigns through local media	2.66	1.16	High extent
13	Incorporating indigenous knowledge into blue economy education	2.51	1.12	High extent
14	Establishing blue economy knowledge hubs	2.51	1.16	High extent
15	Collaborating with universities and research institutions	2.49	1.14	Low extent
16	Peer-led education and mentorship programs	2.66	1.12	High extent
17	Field demonstrations and site visits	2.64	1.21	High extent
18	Providing incentives for adopting sustainable practices	2.56	1.06	High extent

Key: N= 90

The data presented in Table 2 reveals the extent to which various coastal community education innovative strategies can be adopted to enhance awareness and adoption of sustainable blue economy practices in Bayelsa State. Items that scored higher means, such as integrating blue economy concepts into school curricula, community-based training programs on sustainable fishing and aquaculture, public awareness campaigns through local media, incorporating indigenous knowledge into blue economy education, establishing blue economy knowledge hubs, peer-led education and mentorship programs, field demonstrations and site visits, and providing incentives for adopting sustainable practices, all had mean scores ranging from **2.51 to 2.66 which are above the criterion mean of 2.50.** These results suggest that these strategies can be adopted

to a **high extent** to increase awareness and adoption of sustainable practices. The standard deviations for these items, ranging from **1.06 to 1.21**, indicate moderate variability in responses, meaning that while the general sentiment favors these strategies, individual opinions on their effectiveness vary.

However, **using digital learning platforms for education** and **collaborating with universities and research institutions** scored lower, with means of **2.21** and **2.49,** respectively. These items fall under the **low extent** category, suggesting that respondents perceive these strategies as less impactful or less feasible for enhancing awareness and adoption of blue economy practices. The standard deviations for these items, both above **1.14**, further suggest that there is considerable variation in the responses for these strategies, with some individuals recognizing their potential while others do not. This implies that **coastal community education innovative strategies** can enhance awareness and adoption of sustainable blue economy practices in coastal communities of Bayelsa State.

4.0 DISCUSSION

The findings in research question 1 indicate that there is generally low awareness of sustainable blue economy practices among coastal community members in Bayelsa State. While some environmental issues directly affecting the communities, such as marine pollution, are recognized, the broader concepts and practices associated with the blue economy remain largely unacknowledged. This suggests that while the local population is aware of certain environmental concerns, they lack a deeper understanding of integrated sustainable practices that could promote long-term ecological and economic benefits. The limited awareness of the sustainable blue economy is in line with similar studies, such as those by Mwangi et al. (2020), which highlight that many coastal communities, despite their direct dependence on marine resources, are often unaware of the full scope of sustainable practices and policies that can improve their livelihoods and the environment. The knowledge gap may be due to inadequate exposure to information on sustainable practices, limited educational resources, and the absence of comprehensive training programs targeting sustainable blue economy practices. The findings in research question 2 shows the perceived effectiveness of various coastal community education, innovative educational strategies for enhancing awareness and adoption of sustainable blue economy practices in Bayelsa

State. Overall, the data suggests a strong preference for strategies that directly engage communities and utilize locally relevant resources. Several strategies scored above 2.50, indicating a high level of agreement among respondents that these strategies could be adapted to a significant extent. These findings align with the notion that educational initiatives grounded in local knowledge, community participation, and widespread communication are seen as effective for fostering awareness and encouraging the adoption of sustainable practices. This is consistent with the findings of Ahmed et al. (2021), who noted that community-based education approaches and local knowledge integration were more successful in raising awareness of sustainable practices in coastal communities. Overall, community-based and locally relevant approaches are considered more impactful for raising awareness and encouraging the adoption of sustainable practices.

5.0 CONCLUSION

The findings highlight a significant gap in the awareness of sustainable blue economy practices among coastal community members in Bayelsa State. While the local population is cognizant of environmental issues like marine pollution, they lack a broader understanding of the integrated, sustainable practices that the blue economy promotes. The absence of widespread training programs, inadequate exposure to relevant information and limited educational resources contribute to this knowledge gap. In contrast, the perceived effectiveness of coastal community education strategies for enhancing awareness and promoting the adoption of sustainable blue economy practices is promising. Strategies that directly engage communities received strong support from respondents.

5.1 RECOMMENDATIONS

Based on the findings, the following recommendations are offered:

1. Education initiatives should focus on engaging coastal communities directly through locally relevant strategies such as training, awareness campaigns, and integrating indigenous knowledge into educational curricula.
2. Improving internet access and digital literacy could enhance the effectiveness of awareness among coastal community members. Investing in technology and training programs to build digital skills in coastal communities would enable greater use of online learning tools.

3. Public awareness campaigns through local media should be expanded. Radio, television, and social media can be used more effectively to reach broader audiences, especially in rural coastal areas, to promote sustainable practices and the importance of the blue economy.
4. Universities should focus on conducting applied research and creating partnerships that provide practical solutions for the challenges faced by coastal communities.
5. Providing incentives for adopting sustainable practices should be implemented. These practical, hands-on approaches allow community members to see the benefits firsthand, increasing their willingness to adopt new practices.

REFERENCES

Aziz, A., Musa, J., and Wala, I. (2021). Coastal communities and sustainable livelihoods in Bayelsa state. *environmental Management, 38(2):* 123-134.

Eze, O., Okoro, C., and Uzochukwu, S. (2020). Sustainable practices for coastal communities. *Sustainable Development, 28(3):* 160-171.

Ketchum, B. H. (2007). Coastal and Estuarine Ecosystems. *Elsevier.*

Kumar, R., and Agrawal, A. (2021). Sustainability of coastal resources and communities. *Marine Policy, 135:* 104889.

Mangubhai, S., Silva, J. P., and James, S. (2020). Building environmental literacy in coastal communities: a pathway to sustainability. *ocean and coastal management, 193,* 105198.

Nzeadibe, T. C., Okoro, C., and Ezeh, C. A. (2020). Climate change and coastal communities: impacts and adaptation in Bayelsa state, Nigeria. *Climate Risk Management, 28:* 100-110.

Ogbomida, M. O. (2021). The Potential of a blue economy in Bayelsa State, Nigeria. *Environmental Sustainability, 9(4):* 77-85.

Okoye, I. C., Onyejekwe, M. P., and Ugwu, I. (2021). Oil pollution and its impact on coastal livelihoods in Bayelsa State. *Environmental Pollution, 258:* 113870.

Okpara, U., Anadu, O., and Okoronkwo, A. (2021). Coastal education and economic resilience in coastal regions. *Ocean and Coastal Management, 215:* 105935.

Sanchis, D. A., Navarro, I., and Espinoza, A. (2021). The role of coastal education in promoting resilience. *Sustainability Science, 16:* 1125.

Tiller, R., Edwards, J., and Bergstrom, T. (2022). the role of education in advancing a sustainable blue economy. *Marine Policy, 132:* 104656.

World Bank. (2021). The blue economy: a sustainable future. *World Bank Group.*