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Building economic resilience and addressing poverty through the blue economy model in the Nias Islands

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Abstract

Nias Island, comprising five administrative regions—one city and four regencies—faces significant challenges related to economic resilience and poverty alleviation despite its rich marine natural resources. The Blue Economy Model presents an innovative solution by promoting sustainable practices that optimize the use of marine resources while preserving the environment. This study explores the potential of the Blue Economy Model to improve economic resilience and reduce poverty across the regions of Nias Island. Each region has unique strengths and challenges that can be addressed through tailored strategies. Gunung Sitoli City, as the economic and administrative hub, can drive development through training centers and eco-tourism initiatives. Nias Regency can lead in sustainable fisheries and aquaculture by enhancing infrastructure and community skills. South Nias Regency has the potential for marine tourism, requiring investment in facilities and environmental education. West Nias Regency can pioneer sustainable rural tourism by promoting community involvement and improving market access. Lastly, North Nias Regency can focus on marine sector development by establishing research centers to foster innovation. Utilizing qualitative and quantitative methods, including surveys, in-depth interviews, and participant observation, the study finds that the implementation of the Blue Economy Model can significantly enhance local incomes, promote sustainable development, and empower communities. The study concludes that the Blue Economy Model is vital for building economic resilience and reducing poverty in Nias Island's diverse regions. Policy recommendations include strengthening cooperation among government, local communities, and the private sector, as well as increasing investments in environmentally friendly infrastructure and technology. The successful implementation of the Blue Economy Model is expected to yield long-term benefits for community welfare and environmental sustainability across Nias Island.

Keywords: Economic resilience, Environmental sustainability, Socioeconomic development.

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1. Introduction

Nias Island, located off the western coast of Sumatra, Indonesia, is divided into five administrative regions: Gunungsitoli City and four regencies Nias, South Nias, West Nias, and North Nias. Each region possesses unique characteristics, strengths, and challenges that influence its economic development and social dynamics. Despite the island's rich marine natural resources, Nias faces significant issues related to economic resilience, poverty, and environmental sustainability [1]. The economic conditions and poverty levels in the region present a complex picture, encompassing multiple sectors and interrelated causal factors. The majority of the Nias population relies on agriculture and fisheries as their primary sources of livelihood [2].

However, agricultural and fisheries practices here are still traditional with low productivity. The use of modern technology and more efficient practices is still limited, resulting in suboptimal production. In addition, the tourism sector in Nias has great potential, especially for marine and cultural tourism [3]. However, this sector has not developed optimally due to the lack of adequate infrastructure and effective promotion [4].

Industrial and trade activities in Nias are also still limited. Most of the existing industries are small and medium scale, such as processing agricultural and fishery products [5]. This low level of industrialization limits employment opportunities and income for local residents, so many remain dependent on the primary sector with high economic risks [6]. The poverty rate in Nias is relatively high compared to the national average. Many residents live below the poverty line with limited access to basic services such as health, education, and clean water. The distribution of poverty is evenly distributed across sub-districts, but is worse in remote rural and coastal areas, and this condition reflects the gap in access and opportunity between various regions in the Nias Islands [7].

Nias has limited health facilities and a lack of medical personnel also makes the population vulnerable to various diseases and poor health conditions [8]. These poor health conditions have a direct impact on the productivity and well-being of the community. In addition, many people do not have access to the capital and credit needed to develop businesses or other productive economic activities. These limitations hinder their ability to improve their standard of living. Various government programs have been implemented to reduce poverty, such as social assistance, infrastructure development, and local economic empowerment programs, however, the effectiveness of these programs still needs to be improved through better coordination and tighter monitoring [9]. In addition, non-governmental organizations (NGOs) are also active in providing assistance and training to communities to improve their skills and economic capacity and the involvement of these NGOs provides additional important support for poverty alleviation efforts [10].

Despite the challenges, the Nias Islands have great potential for improvement. Sustainable management and utilization of marine resources can be a solution to increase community income. The Blue Economy Model, which focuses on utilizing marine resources in an environmentally friendly and sustainable manner, can have a significant positive impact. In addition, investment in tourism infrastructure and promotion of tourist destinations can increase tourist visits and regional income from the potential of marine natural resources in the Nias Islands.

2. Problem Statement

The Nias Islands, located off the western coast of Sumatra in Indonesia, face significant socioeconomic challenges, including high levels of poverty and limited economic opportunities. Traditional economic activities, primarily reliant on small-scale agriculture and fisheries, have proven insufficient in providing sustainable livelihoods for the local population. Environmental degradation and climate change further exacerbate these vulnerabilities, threatening the natural resources on which many islanders depend. The Blue Economy Model presents a potential solution to these pressing issues. By promoting the sustainable use of ocean resources for economic growth, improved livelihoods, and job creation, the Blue Economy Model aims to balance economic development with environmental sustainability. However, the successful implementation of this model in the Nias Islands requires a nuanced understanding of local conditions, challenges, and opportunities. This model takes into account the unique geographical, social, economic, and cultural conditions of the region.

3. Research Objectives

By addressing these objectives, the research aims to provide a comprehensive analysis of how the Blue Economy Model can be effectively applied in the Nias Islands to enhance economic resilience and address poverty, contributing to the region's sustainable development. This research combines various aspects of the Blue Economy, such as sustainable fisheries, marine tourism, and mariculture, to create a comprehensive solution for economic resilience and poverty alleviation by considering the interconnectivity between Blue Economy sectors and maximizing economic, social, and environmental benefits holistically. This further research emphasizes the importance of integrating local wisdom in the implementation of the Blue Economy. Local wisdom, such as the traditions and maritime knowledge of the Nias community, will be optimized to support the desirability and effectiveness of the Blue Economy model.

1. Exploring the potential and implementation of the Blue Economy Model
2. Identifying the positive impacts of implementing this model on economic resilience and poverty reduction

4. Literature Review

4.1. Definition and Concept of Blue Economy Model

The Blue Economy model is an economic paradigm that emphasizes the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystems. This concept integrates

environmental, economic, and social dimensions to ensure that ocean-based activities contribute positively to sustainable development.

The Blue Economy model emphasizes the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystems. Key principles include sustainability, equity, innovation, resilience, and integrated management. Major sectors encompass fisheries, marine biotechnology, renewable energy, tourism, maritime transport, and ecosystem services. Challenges such as overfishing, pollution, and climate change are addressed through opportunities in scientific research, sustainable investment, policy improvement, and community engagement. The model aims to balance economic development with environmental sustainability, fostering a harmonious relationship between humans and the ocean for a sustainable future.

The Blue Economy faces challenges including overfishing, pollution, climate change impacts, habitat destruction, and regulatory issues. However, it also presents opportunities through advancing scientific research, promoting sustainable investment, enhancing policy frameworks, fostering public-private partnerships, and improving data collection for informed decision-making. Addressing these challenges and seizing these opportunities is crucial for achieving a sustainable and equitable use of ocean resources.

4.2. Economic Resilience in the Island Region

The Blue Economy model faces significant challenges, including overfishing, pollution, climate change impacts such as ocean acidification and sea-level rise, habitat destruction, and regulatory and governance issues. However, it also presents substantial opportunities to enhance economic resilience, especially in island regions. Advancing scientific research and innovation can lead to sustainable practices in fisheries, aquaculture, and marine biotechnology, contributing to food security and new economic avenues [11]. Promoting sustainable investment and financing mechanisms can support renewable energy projects and eco-friendly maritime transport, reducing environmental impacts and fostering economic stability [12].

Enhancing policy and regulatory frameworks is vital for effective governance and international cooperation, ensuring sustainable resource management. Fostering public-private partnerships and community engagement empowers local populations, particularly in island regions, to benefit equitably from ocean resources [13]. Improving data collection and monitoring enables better decision-making, ensuring that economic activities are environmentally sustainable and socially inclusive [14]. By addressing these challenges and leveraging these opportunities, the Blue Economy can significantly enhance economic resilience in island regions, balancing development with environmental preservation and social equity [15].

By addressing its challenges and leveraging the opportunities provided by the Blue Economy model, it can enhance its economic resilience [16]. This approach aims to create a balanced and sustainable development pathway, ensuring that the island's natural resources are managed responsibly and that local communities benefit equitably. Through integrated management, innovation, and community engagement, Nias Island can build a resilient economy that harmonizes with its unique marine and coastal environments.

4.3. Poverty in the Island Regions

Poverty in island regions is a multifaceted issue that requires integrated and sustainable solutions. By addressing the unique challenges posed by geographic isolation, environmental vulnerabilities, inadequate infrastructure, and social inequities, it is possible to improve the livelihoods and economic prospects of island communities [17, 18]. Sustainable development strategies that enhance economic opportunities, improve infrastructure and services, promote social equity, and build environmental resilience are essential for breaking the cycle of poverty and ensuring a prosperous future for island regions [19].

One of the primary causes of poverty in island regions is geographic isolation [20]. The remoteness of many islands restricts access to larger markets, limiting economic opportunities and increasing the cost of goods and services [21, 22]. This isolation often results in limited job prospects, forcing many inhabitants to rely on subsistence activities such as fishing and small-scale agriculture, which are vulnerable to environmental changes and market fluctuations. The lack of diversified economic activities makes island economies highly dependent on external factors, further exacerbating poverty [23].

5. Methods

This research is a qualitative descriptive study. This type of research is based on the assumption of positivist philosophy and an objectivist perspective or hypothetical deductive methodology that helps build or develop hypotheses, choose variables and measurements, and design research strategies to test the formulated theory (46) (47). Data collection for the study used Focus Group Discussions (FGDs), interviews, and questionnaires. The informants numbered 100, consisting of the Marine and Fisheries Service of South Nias Regency, Village Governments in the Nias Islands, fishermen and fish farmers, small and medium entrepreneurs (SMEs) in the marine and fisheries sector, and Indigenous communities in the Nias Islands. Interviews and questionnaires were conducted with research informants, and FGDs were carried out to produce evaluations and strategy recommendations. The data analysis technique used was SWOT Analysis. The research procedure consists of observation, problem formulation, data collection, data analysis, formulation of strategy models, and strategy models with the following descriptions:

- a. Observation, identifying potential problems that arise.
- b. Problem formulation, determination of research problems based on phenomena found in observation activities c.

- c. Data collection for this study uses Focus Group Discussions (FGDs), interviews, and questionnaires. Interviews and questionnaires were conducted with research informants, and FGDs were held to produce evaluations and strategy recommendations.
- d. Data analysis, this research analysis technique uses SWOT Analysis with the consideration that SWOT Analysis helps identify internal strengths and weaknesses of a business, while exploring opportunities and threats from its external environment [24].

6. Result and Discussion

SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis is a very important tool for strategic planning and implementation of the Blue Economy Model in the Nias Islands. This analysis offers a structured approach to understanding and addressing the various factors that influence the success of the model. SWOT analysis helps create a strategic, informed, and responsive plan by identifying strengths, weaknesses, opportunities, and threats. The Blue Economy Model can increase economic resilience, reduce poverty, and ensure environmental sustainability through this holistic approach [25]. To increase economic resilience and reduce poverty, strategies can be developed by identifying regional strengths, such as marine resource wealth, and weaknesses, such as a lack of skills [26]. Furthermore, SWOT analysis allows for the creation of adaptive strategies that can evolve with changing circumstances, ensuring long-term sustainability.

6.1. SWOT Analysis

Strengths

1. The abundance of marine resources provides a strong foundation for sustainable fisheries, tourism, and aquaculture.
2. Local communities are involved and can benefit directly from increased income and employment opportunities.
3. Focusing on environmental sustainability ensures the long-term viability and health of marine ecosystems.

Weaknesses

1. Limited infrastructure to support sustainable economic activities.
2. Local communities may lack the necessary skills and training to fully exploit blue economy opportunities.
3. High initial costs for establishing environmentally friendly infrastructure and technology.

Opportunities

1. Untapped potential for ecotourism and marine-based tourism.
2. Opportunities for public-private partnerships and increased investment.
3. Increasing global focus on sustainability can attract international support and funding.

Threats

1. Potential for environmental degradation if not properly managed.
2. Vulnerability to economic fluctuations and external shocks.
3. Possible regulatory hurdles and bureaucratic delays in implementing new policies.

6.2. TOWS Matrix

By utilizing the abundant marine resources in the Nias Islands, the implementation of the Blue Economy Model is a promising way to increase economic resilience and reduce poverty. TOWS analysis, which assesses how internal strengths and weaknesses interact with external opportunities and threats, is essential to creating effective strategies for this model. This essay outlines the TOWS analysis for the Blue Economy Model in the Nias Islands and provides strategies and suggestions that can be followed by Strengths-Opportunities (SO).

1. Develop sustainable tourism packages (S1, O1): Leverage the rich marine resources to create eco-friendly tourism packages that attract visitors.
2. Promote public-private partnerships (S2, O2): Use community engagement to attract investment from private entities and international donors.
3. Capitalize on global sustainability trends (S3, O3): Position the Nias Islands as a model for sustainable development to attract global support and funding.

Strengths-Threats (ST)

1. Implement strict environmental management plans (S3, T1): Develop and enforce environmental regulations to mitigate risks and ensure sustainability.
2. Diversify economic activities (S1, S2, T2): Utilize the diverse marine resources and community engagement to create multiple income streams, thereby reducing vulnerability to economic instability.
3. Proactively engage in regulatory compliance (S2, T3): Work closely with regulatory bodies to streamline processes and ensure the smooth implementation of sustainable practices.

Weaknesses-Opportunities (WO)

1. Seek funding for infrastructure development (W1, O2): Collaborate with the government and private sector to secure investments in the necessary infrastructure.
2. Implement training programs (W2, O2): Enhance local communities' skills through targeted training programs to fully exploit Blue Economy opportunities.
3. Leverage global sustainability trends for funding (W3, O3): Attract investment by showcasing the Nias Islands' commitment to sustainability.

Weaknesses-Threats (WT)

1. Develop comprehensive risk management strategies (W1, T1): Address environmental and economic threats with well-planned risk management.
2. Focus on cost-effective sustainable solutions (W3, T2): Optimize investment costs by adopting cost-effective and scalable sustainable technologies.
3. Streamline regulatory processes (W1, W2, T3): Work on simplifying and accelerating regulatory approvals to facilitate timely project implementation.

TOWS analysis offers a structured approach to understanding and addressing the various components that influence the success of the Blue Economy Model in the Nias Islands. The Nias Islands can improve economic resilience, reduce poverty, and ensure sustainable development by leveraging strengths and opportunities while addressing weaknesses and mitigating threats. This comprehensive method will enhance the welfare and environmental sustainability of the area and provide long-term benefits to the community.

Several key recommendations emerge from the TOWS analysis. First, it is critical to foster stronger collaboration between the private sector, local communities, and government to pool resources and expertise. Investments in environmentally friendly technologies and infrastructure will support sustainable economic activities. Focusing on education and training programs can help local communities acquire the skills and knowledge needed to participate effectively in the Blue Economy. In addition, developing and marketing ecotourism packages that highlight the island's natural beauty and biodiversity can attract tourists and generate revenue. The sustainability of marine resources can be ensured by implementing a rigorous environmental management plan and developing a comprehensive risk management strategy. Finally, working closely with government agencies to streamline regulatory processes will reduce bureaucratic delays and facilitate smooth project implementation.

7. Recommendations for Each District in Nias Island

With the implementation of the Blue Economy Model, Nias Island has a lot of potential for sustainable development and economic resilience in its various regions. We make targeted recommendations for each of the four administrative regions of Nias Island: Nias Regency, South Nias Regency, West Nias Regency, and North Nias Regency. We do this using information obtained from the Nias Island SWOT analysis. Utilizing this strategic approach will allow each sector to address its unique strengths, weaknesses, opportunities, and threats. Nias Island has great potential to implement the Blue Economy Model. The following recommendations are tailored to the characteristics and needs of each administrative region:

7.1. Gunung Sitoli City

As the main administrative and economic center of Nias Island, Gunung Sitoli City plays a key role in driving blue economy-based development.

1. Training and Education Center: Establish maritime and tourism training and education centers to enhance the skills of the local population.
2. Infrastructure Development: Improve port and transportation infrastructure to support the fisheries and tourism sectors.
3. Eco-Tourism Hub: Develop environmentally friendly tourism packages that combine cultural and natural attractions, attracting both domestic and international tourists.

7.2. Nias Regency

Nias Regency can focus on developing sustainable fisheries and aquaculture.

1. Sustainable Fisheries: Promote sustainable fishing practices by providing training and technical assistance to fishermen.
2. Aquaculture Development: Develop environmentally friendly aquaculture to increase fish production and the economic welfare of the community.
3. Marine Conservation: Conduct marine conservation efforts to protect habitats and ensure the sustainability of fishery resources.

7.3. South Nias Regency

South Nias Regency, with its beautiful beaches and seas, can focus on marine tourism and environmental conservation.

1. Marine Tourism: Develop marine tourism such as snorkeling, diving, and boat tours that utilize the natural beauty of the sea.
2. Environmental Education: Establish environmental education centers to raise awareness and community participation in marine conservation.
3. Cultural tourism: Integrate cultural tourism with natural attractions to offer unique and appealing tourism packages.

7.4. West Nias Regency

West Nias Regency can become a pioneer in developing sustainable rural tourism.

1. Community-Based Tourism: Promote community-based tourism that involves locals in all aspects of tourism, from accommodation to tour guides.
2. Agro-Tourism: Develop agrotourism that combines agriculture and tourism, such as coffee or coconut plantations that tourists can visit.

3. Infrastructure Development: Improve road infrastructure and transportation access to support tourist accessibility to remote areas.

7.5. North Nias Regency

North Nias Regency can focus on economic diversification and marine sector development.

1. Diversified Marine Economy: Increase economic diversification by developing various marine sectors such as fisheries, marine cultivation, and marine biotechnology.
2. Marine Research Center: Establish a marine research center for the research and development of technologies that support sustainable marine practices.
3. Eco-Friendly Practices: Promote environmentally friendly practices in all economic sectors, from fisheries to tourism, to maintain the balance of marine ecosystems.

8. Conclusion

8.1. Gunungsitoli City

Gunungsitoli City, as the administrative and economic hub of Nias Island, has the potential to drive the overall development of the Blue Economy Model. By establishing training and education centers, improving infrastructure, and developing eco-tourism hubs, Gunungsitoli can enhance the skills of its residents, attract tourists, and support sustainable economic growth. The city's central role will facilitate coordination and collaboration among the various stakeholders involved in the Blue Economy initiatives.

8.2. Nias Regency

Nias Regency can become a leader in sustainable fisheries and aquaculture development. By promoting sustainable fishing practices, developing environmentally friendly aquaculture, and conducting marine conservation efforts, the region can ensure the long-term sustainability of its marine resources. These initiatives will not only increase fish production but also improve the economic welfare of the local communities, making Nias Regency a model for sustainable marine resource management.

8.3. South Nias Regency

South Nias Regency, with its pristine beaches and marine attractions, is well-positioned to focus on marine tourism and environmental conservation. Developing marine tourism activities such as snorkeling, diving, and boat tours can attract tourists while promoting the preservation of natural beauty. Establishing environmental education centers will raise awareness and encourage community participation in conservation efforts, ensuring the sustainability of the region's natural resources and cultural heritage.

8.4. West Nias Regency

West Nias Regency has the potential to pioneer sustainable rural tourism through community-based and agro-tourism initiatives. By involving local communities in tourism activities and integrating agriculture with tourism, the region can create unique and attractive tourist experiences. Improving road infrastructure and transportation access will support these initiatives, making West Nias Regency a destination for tourists seeking authentic rural and agricultural experiences, thereby boosting local economies.

8.5. North Nias Regency

North Nias Regency can focus on economic diversification and marine sector development. By developing various marine sectors such as fisheries, marine cultivation, and marine biotechnology, the region can create multiple income streams and reduce economic vulnerability. Establishing a marine research center will support the development of sustainable marine practices and technologies. Promoting eco-friendly practices across all economic sectors will ensure the preservation of marine ecosystems, positioning North Nias as a leader in sustainable development.

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