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THE ROLE OF THE COMMUNITY IN ENVIRONMENTAL MANAGEMENT IN THE COASTAL AREA OF RUPAT DISTRICT

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ABSTRACT

Coastal environmental problems in Rupat District cannot be resolved solely through a top-down approach or government intervention. This study was conducted in 2025 with the intention of comprehensively analyzing the role of the community in environmental management in the coastal areas of Rupat District, particularly on Ketapang and Lancah beaches. Through a systematic research approach, this study aims to identify the forms of community roles in coastal environmental management efforts, analyze factors that influence the level of community participation, describe the various challenges faced in implementing community-based environmental management, and formulate strategies for strengthening community roles that can be implemented sustainably. The method used in this study was a survey method with a total of 31 respondents, consisting of fishermen, seaweed farmers, fish traders, community leaders, and people involved in marine tourism activities. The results of the study can be concluded that community-based coastal environmental management has enormous potential but faces complex structural challenges.

Keywords: Environmental Management, Community Role, Coastal Areas

1. INTRODUCTION

Coastal areas are complex ecosystems located in the transition zone between land and sea. They possess unique characteristics, high biological productivity, and provide a variety of ecosystem services vital to human life. Coastal ecosystems not only serve as habitats for diverse flora and fauna species but also serve as a primary source of livelihood for millions of people living in these areas. Economically, coastal areas make significant contributions through the fisheries, mariculture, marine tourism, and other maritime industries. Furthermore, coastal ecosystems play a crucial role in mitigating natural disasters such as tsunamis, storms, and coastal erosion through the natural protective functions of mangroves, coral reefs, and seagrass beds[1].

Sustainable coastal environmental management requires a holistic approach that encompasses not only technical aspects and government policies but also the active role of local communities as key stakeholders. Coastal communities possess local wisdom and traditional knowledge that have developed over centuries in managing coastal natural resources. This knowledge includes a deep understanding of seasonal patterns, marine biota behavior, environmentally friendly fishing techniques, and community-based resource management systems.

Community participation in coastal environmental management is not merely consultative but must include active involvement in the planning, implementation, monitoring, and evaluation

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of conservation programs. This participatory approach has proven more effective in achieving long-term conservation goals because it creates a sense of ownership and shared responsibility for environmental sustainability[2].

Rupat District, located in Bengkalis Regency, Riau Province, has unique coastal characteristics with beautiful beaches such as Ketapang Beach and Lancah Beach. This area has abundant coastal resource potential but faces increasingly complex environmental challenges. Coastal abrasion has caused significant shoreline loss, threatening residential areas and critical infrastructure. Marine pollution from domestic, industrial, and maritime transportation activities has degraded water quality and threatened the sustainability of coastal ecosystems.

Overexploitation of marine resources, particularly environmentally unfriendly fishing practices, has led to the depletion of fish stocks and the destruction of critical habitats such as coral reefs. Coastal land conversion for infrastructure development and land-use changes have also reduced the natural coastal ecosystem that serves as a buffer zone[3].

Coastal environmental issues in Rupat District cannot be resolved solely through a top-down approach or government intervention. Experience in various coastal areas in Indonesia shows that environmental management programs that do not actively involve communities tend to be unsustainable and even fail. This is because local communities are the primary actors who interact directly with the coastal environment in their daily activities. Without active community support and participation, coastal conservation and rehabilitation efforts will struggle to achieve optimal results. Therefore, a thorough understanding of the community's role in coastal environmental management, the factors influencing their level of participation, and identifying challenges and opportunities in implementing community-based management are crucial[4].

This research was conducted to comprehensively analyze the community's role in environmental management in the coastal area of Rupat District, specifically Ketapang Beach and Lancah Beach. Through a systematic research approach, this study aims to identify the forms of community roles in coastal environmental management efforts, analyze factors that influence the level of community participation, describe various challenges faced in implementing community-based environmental management, and formulate strategies for strengthening community roles that can be implemented sustainably.

The results of this study are expected to provide an important contribution to the development of a participatory and sustainable coastal environmental management model, not only in Rupat District but also can serve as a reference for other coastal areas in Indonesia.

2. RESEARCH METHOD

Time and Place

This research was conducted from May to July 2025 in the coastal area of Rupat District, Bengkalis Regency, Riau Province, with a primary focus on Ketapang and Lancah beaches. The research locations were selected purposively based on the consideration that both beaches are coastal areas with intensive community activities and face various complex environmental problems. These locations were also chosen because the local community is highly dependent on coastal resources for their economic activities, making their role in environmental management crucial for an in-depth study.

Method

The method used in this research is a survey with a mixed method approach, combining qualitative and quantitative approaches. Sugiyono[5] explains that the survey method is conducted to obtain facts from existing phenomena and seek factual information from a group or region. The qualitative approach is used to gain an in-

depth understanding of the forms of community roles, challenges faced, and environmental management strategies implemented by the community. Meanwhile, the quantitative approach is used to analyze factors influencing the level of community participation in coastal environmental management. The use of this mixed method approach aims to obtain comprehensive and complementary data, so that the research results can provide a holistic picture of the community's role in coastal environmental management.

Procedures

Determination of Respondents

The population in this study was all people who live and work in the coastal areas of Ketapang and Lancah beaches, Rupat District. The number of respondents in this study was 31 people, consisting of fishermen, seaweed farmers, fish traders, community leaders, and people involved in marine tourism activities. The determination of respondents was carried out using a purposive sampling technique, where respondents were selected based on certain criteria, namely: at least 18 years old, have lived in coastal areas for at least 5 years, have economic dependence on coastal resources, and have knowledge of local coastal environmental conditions.

Data Collection Techniques.

Data collection in this study was conducted through several techniques, namely field observation, in- depth interviews, structured questionnaires, and documentation studies. Field observations were conducted to observe coastal environmental conditions, community activities directly, and implement environmental management practices. In-depth interviews were conducted with key informants to obtain in-depth information about community roles, challenges faced, and implemented management strategies. Structured questionnaires were used to collect quantitative data on respondent characteristics and factors influencing community participation. Documentation studies were conducted to collect secondary data from various sources such as local government reports, statistical data, and relevant previous research.

Data Analysis

To address the research objectives related to the forms of community roles, factors influencing community involvement, challenges in maintaining coastal environments, and strategies for strengthening community roles, a likert scale was used. According to Sugiyono[5] the Likert scale is used to measure the attitudes, opinions, and perceptions of individuals or groups regarding social phenomena. The likert scale used in this study is a modified likert scale with five levels.

The form of community role, factors that influence community involvement, challenges in maintaining the coastal environment, and strategies for strengthening the role of the community in the coastal area of Rupat District are assessed through the provision of a Scale. The Scale for the statements is strongly agree (5), agree (4), quite agree (3), disagree (2), strongly disagree (1). The total number of statements to determine the form of community role, factors that influence community involvement, challenges in maintaining the coastal environment, strategies for strengthening the role of the community in the coastal area of Rupat District for each research objective totaling 10 statements, then grouped into five responses, namely: very good, good, quite good, not good, very not good.

The range provisions used for the form of community role, factors that influence community involvement, challenges in maintaining the coastal environment, and strategies for strengthening the role of the community in the coastal area of Rupat District are based on the total number of respondents from each research objective, totaling 10 statements, then using the following formula:

Maximum Score = Number of Respondents x Maximum Scale x Number of Statements = 31 x 5 x 10 = 1,550
Minimum Score = Number of Respondents x Minimum Scale x Number of Statements = 31 x 1 x 10 = 310

Based on the maximum and minimum scores, the range for each response can be calculated using the formula: = "Maximum Score - Minimum Score" / "Number of Categories" -1 = "1,550-310" / "5" – 1 = 247

Table 1. Likert scale assignment

No	Alternative forms of community roles, factors influencing community involvement, challenges in maintaining the coastal environment, and strategies for strengthening community roles in the coastal areas of Rupat District	Scale
1	Strongly Agree (SS)	5
2	Agree (S)	4
3	Somewhat Agree (CS)	3
4	Disagree (TS)	2
5	Strongly Disagree (STS)	1

Table 2. Forms of community roles, factors influencing community involvement, challenges in maintaining the coastal environment, and strategies for strengthening community roles in the coastal area of Rupat District, based on all respondents

No	Forms	Score
1	Very poor	310-557
2	Poor	558-805
3	Fairly good	806-1.053
4	Good	1.054-1.301
5	Very good	1.302-1.549

Therefore, the variable values for each research objective, totaling 10 statements across five responses, are determined as follows: very poor: A score of 310-557 indicates that the form of community involvement, factors influencing community involvement, challenges in maintaining the coastal environment, and strategies for strengthening community participation in the coastal areas of Rupat District are very poor.

Not good: A score of 558-805 indicates that the community's role, factors influencing community involvement, challenges in maintaining the coastal environment, and strategies for strengthening community roles in the coastal areas of Rupat District are not good. Fairly good: A score of 806-1,053 indicates that the community's role, factors influencing community involvement, challenges in maintaining the coastal environment, and strategies for strengthening community roles in the coastal areas of Rupat District are quite good.

Good: A score of 1,054-1,301 indicates that the community's role, factors influencing community involvement, challenges in maintaining the coastal environment, and strategies for strengthening community roles in the coastal areas of Rupat District are good. Very good: A score of 1,302-1,549 indicates that the community's role, factors influencing community involvement, challenges in maintaining the coastal environment, and strategies for strengthening community roles in the coastal areas of Rupat District are very good.

3. RESULT AND DISCUSSION

Forms of Community Role in Environmental Management on Ketapang Beach and Lencah Beach

Communities play a crucial role in environmental management through various forms of participation. The first role is as

conservationists by taking concrete actions such as reducing the use of single-use plastics, conserving water and energy, and sorting waste for recycling. Second, communities act as environmental watchdogs by reporting environmentally damaging activities to authorities and monitoring the condition of their surroundings. Third, communities can participate in environmental programs such as tree planting, river cleanups, and environmental awareness campaigns. Fourth, communities act as responsible consumers by choosing environmentally friendly products and supporting businesses that implement sustainable practices.

Finally, communities play a role in environmental education by raising awareness among families and communities about the importance of preserving the environment. Through these roles, communities become strategic partners with the government and the private sector in realizing sustainable environmental management for future generations[6]. The forms of community roles in environmental management at Ketapang Beach and Lencah Beach are shown in Table 3.

Table 3. Forms of community roles in environmental management at Ketapang Beach and Lencah Beach

No	Forms	Total Score
1	Participate in community beach cleanup activities	105
2	Participate in planting or caring for mangroves	99
3	Dispose of trash in designated areas	131
4	Join community groups that care about the environment	114
5	Set a good example for others in protecting the beach	124
6	Participate in voicing or proposing environmental ideas to village officials	99
7	Participate in training or outreach on environmental management	90
8	Know the rules and regulations regarding protecting the coastal environment	105
9	Invite family or children to help keep the beach clean	111
10	Feel a sense of responsibility for protecting the coastal environment in the area	135
Total Score		1.113
Category		Fairly good

Table 3 provides a comprehensive empirical overview of the forms of community roles in environmental management in the coastal areas of Ketapang Beach and Lencah Beach, involving 31 community respondents. Primary data obtained directly from the local community showed a total score of 1,113, categorized as "fairly good," indicating that overall, the community has demonstrated adequate participation in coastal environmental management efforts. However, there is still room for further improvement.

The indicator with the highest score was "Feeling responsible for maintaining the coastal environment in the area," with a score of 135, reflecting a high level of community awareness and ownership of their coastal environment. Optimal achievement in this responsibility aspect is highly relevant to the characteristics of coastal communities whose livelihoods depend directly on the sustainability of coastal ecosystems, both for their livelihoods as fishermen and for protection from abrasion and natural disasters. This high sense of responsibility also reflects the community's understanding of the importance of maintaining the balance of coastal ecosystems as their source of life.

The role of "Disposing of waste in the designated bins" received a score of 131, categorized as good, indicating a high level of community awareness in maintaining a clean coastal environment. However, the suboptimal score indicates that some communities are still inconsistent in practicing proper waste management. This is crucial, considering that waste pollution is a

major threat to coastal ecosystems, damaging marine habitats and disrupting fishing activities, which are the primary source of livelihood for local communities.

The indicator "Setting a good example for others in protecting the coast," with a score of 124 (in the "good" category), demonstrates the community's role as agents of change within their communities. This role reflects informal leadership in disseminating good environmental management practices through role models. Meanwhile, "Joining an environmentally conscious community group" with a score of 114 and "Encouraging family or children to keep the beach clean" with a score of 111 demonstrate community participation in environmental organizations and the transfer of knowledge between generations, which are essential foundations for the sustainability of coastal environmental management programs.

Several indicators showed relatively low scores, including "Participating in training or outreach on environmental management" with a score of 90, "Participating in planting or caring for mangroves," and "Participating in voicing or proposing environmental ideas to village officials" with a score of 99 each. Low participation in training indicates the need to improve the accessibility and relevance of outreach programs to community needs. Similarly, low participation in mangrove planting indicates the need for more intensive education about the importance of mangrove ecosystems as a natural barrier against abrasion and a vital habitat for marine life.

Overall, the results of this study indicate that the communities of Ketapang Beach and Lencah Beach have a relatively good level of awareness and participation in coastal environmental management. The dominant aspects of high awareness and responsibility indicate significant potential for developing community-based environmental management programs. However, there are still opportunities to increase active participation in technical activities such as training, mangrove planting, and involvement in decision-making processes. These results indicate that the coastal environmental management program in the region has a strong social foundation, with the caveat that ongoing efforts are needed to increase community capacity through environmental education and strengthening community institutions in coastal resource management.

Factors Influencing the Level of Community Participation in Coastal Environmental Management

Several key factors influence the level of community participation in coastal environmental management. Economic factors are the most dominant, as communities dependent on coastal resources, such as fishermen, fish farmers, and fish traders, tend to participate more because they directly experience the impact of environmental damage on their livelihoods. Education and environmental awareness also play a significant role, as communities with a better understanding of coastal ecosystems are more motivated to participate in conservation efforts. Sociocultural factors such as local traditions, the cooperation system, and leadership from community leaders significantly influence collective participation. Furthermore, government support through clear policies, the provision of infrastructure, and community empowerment programs are significant motivating factors.

Accessibility to information and communication about coastal environmental management programs also determines the extent to which communities are willing to participate. Finally, past experiences with natural disasters or coastal environmental damage can increase community awareness and motivation to participate in conservation efforts actively[7]. The factors influencing the level of community participation in coastal environmental management in the coastal areas of Rupat District are shown in Table 4.

Table 4. Factors influencing the level of community participation in coastal environmental management in the coastal areas of Rupat District

No	Factors Influencing the Level of Community Participation	Total Score
1	Having sufficient knowledge about the importance of protecting the coastal environment	126
2	Education will help us understand coastal environmental issues	117
3	Feeling they have the time and energy to participate in protecting the coastal environment	124
4	Economic factors support involvement in environmental activities	115
5	Feeling involved in environmental decisions made by the village or group	118
6	Social environment supports coastal conservation activities	132
7	Training or outreach makes them more willing to participate in environmental activities	139
8	Participation is beneficial for the environment and the community	130
9	Government support encourages active participation	128
10	Having received awards or recognition for their role in environmental activities	114
Total Score		1.243
Category		Good

Table 4 provides a comprehensive empirical overview of the factors influencing the level of community participation in coastal environmental management in Rupat District, involving 31 community respondents. Primary data obtained directly from the local community showed a total score of 1,243, categorized as "good," indicating that overall, there are factors supporting adequate levels of community participation in coastal environmental management. However, there is still room for optimization of various aspects to maximize community involvement.

The factor with the highest score was "Training or outreach makes people more willing to participate in environmental activities," with a score of 139, reflecting the important role of education and knowledge transfer in encouraging community participation. Optimal achievement in this training aspect is highly relevant to the characteristics of coastal communities that require technical understanding of environmental management, ranging from mangrove planting techniques and waste management to marine biota conservation strategies. The high response to the training demonstrates the community's enthusiasm for learning and increasing their capacity in environmental management, which is a crucial foundation for the sustainability of coastal conservation programs.

The factor "Social environment supports coastal conservation activities" received a score of 132, categorized as good, indicating that community support and prevailing social norms are important factors in encouraging individual participation. This social support creates a conducive environment for sustainable environmental management practices. Meanwhile, the factors "Participation benefits the environment and society" (130) and "Government support encourages active participation" (128) indicate that the community has a high awareness of the collective benefits of conservation activities and appreciates the government's role in facilitating environmental programs.

The knowledge and personal capacity factors also showed a significant influence, with "Having sufficient knowledge about the importance of protecting the coastal environment" achieving a score of 126, and "Feeling I have the time and energy to participate in protecting the coastal environment" scoring 124. This indicates that the community has a basic understanding of the importance of coastal conservation and feels they have the capacity to contribute. However, the factor "Feeling involved in environmental decisions made by the village or group"

(118) indicates that there is still a need to improve community participation in decision-making processes concerning coastal environmental management.

Several factors showed relatively low scores, including "Education will help understand coastal environmental issues" with a score of 117, "Economic factors support involvement in environmental activities" with a score of 115, and "Ever received awards or recognition for roles in environmental activities" with a score of 114. The low economic factor indicates that financial constraints remain a barrier for some communities to actively participate, especially in activities that require an investment of time and resources. Meanwhile, the low recognition factor indicates the need for a better incentive and appreciation system to motivate long-term community participation.

Overall, the results of this study indicate that the factors influencing community participation in coastal environmental management in Rupat District are at a good level, with education and social support being the dominant drivers. The high response to training and social environmental support demonstrates great potential for developing sustainable community-based environmental management programs. However, challenges remain in the economic and participation aspects of decision-making that require special attention. These results indicate that strategies for strengthening community participation must be holistic, not only focusing on education but also encompassing aspects of economic empowerment, strengthening local institutions, and developing incentive systems that can motivate sustainable community involvement in coastal environmental management.

Challenges Faced by Communities in Coastal Environmental Management

Coastal communities face various complex challenges in environmental management efforts. Economic challenges are the most fundamental, as communities often face a dilemma between meeting short-term economic needs and long-term environmental preservation, such as fishermen forced to use destructive fishing gear due to economic pressures. Technical and knowledge challenges are also significant, as a limited understanding of environmentally friendly technologies and sustainable management practices makes it difficult for communities to implement appropriate methods. Institutional challenges include weak coordination between stakeholders, overlapping authority, and a lack of consistent policy support from the government.

Conflicting interests between various coastal area users, such as fishermen, tourism developers, and industry, often hamper integrated management efforts. Natural challenges such as climate change, sea level rise, and natural disasters make management efforts more complex and require continuous adaptation. Furthermore, limited access to capital, technology, and information, as well as weak law enforcement against environmental violations, are additional challenges that hinder effective community participation in coastal environmental management[8]. Challenges faced by communities in coastal environmental management in Rupat District are shown in Table 5.

Comprehensive empirical overview of the various challenges faced by communities in coastal environmental management in Rupat District, involving 31 community respondents. Primary data obtained directly from the local community showed a total score of 1,253, categorized as "Good," indicating that overall, the community faces significant challenges in coastal environmental management efforts, requiring serious attention from various parties to optimize the effectiveness of conservation and environmental preservation programs in the area.

Table 5. Challenges faced by communities in coastal environmental management in Rupat District

No	Challenges Faced by Communities in Coastal Environmental Management in Rupat District	Total Score
1	Lack of public knowledge about the importance of protecting the coastal environment	135
2	Lack of sanitation facilities and infrastructure around the beach	125
3	Lack of trash bins or adequate waste management systems	123
4	Lack of support and attention from local governments	118
5	Lack of incentives or rewards for people who actively protect the environment	120
6	Limited time and energy due to busy livelihoods	136
7	People still litter despite repeated warnings	126
8	Lack of cooperation between residents in environmental activities	130
9	Lack of regular environmental training or outreach	133
10	Conflicts of interest in coastal land use	107
Total Score		1.253
Category		Good

The highest-scoring challenge was "Limited time and energy due to busy livelihoods," with a score of 136, reflecting the classic dilemma faced by coastal communities between economic needs and participation in environmental activities. Achieving the highest score in this aspect of limited time is highly relevant to the characteristics of coastal communities, most of whom earn a living as fishermen and farmers, requiring full-time and energy to meet their families' economic needs. This high level of challenge indicates the need for environmental management strategies integrated with community economic activities, so that participation in conservation is not seen as an additional burden but as part of daily productive activities.

The challenge "Lack of public knowledge about the importance of protecting the coastal environment" received a score of 135, indicating that education and awareness-raising remain fundamental issues in coastal environmental management. This lack of knowledge contributes to a low public understanding of the long-term impacts of coastal environmental degradation on their lives. Meanwhile, the challenges "Lack of regular environmental training or outreach" (133) and "Lack of cooperation among residents in environmental activities" (130) indicate weaknesses in the capacity building and social capital necessary for effective environmental management.

Challenges related to infrastructure and institutional support also showed significant scores, with "Lack of sanitation facilities and infrastructure around the beach" scoring 125, "Lack of trash bins or adequate waste management systems" scoring 123, and "Lack of incentives or rewards for communities actively protecting the environment" scoring 120. These infrastructure challenges indicate weak support from the government and relevant stakeholders in providing the basic facilities necessary to support good environmental management practices. The absence of an incentive system also highlights the need for a reward mechanism that can motivate active community participation in the long term.

The challenges of "People still litter despite repeated warnings" (scored 126) and "Lack of support and attention from local government" (scored 118) reflect the complexity of the problem, involving both community behavior and government commitment. The low effectiveness of warnings in changing behavior indicates the need for a more comprehensive approach to environmental education, not only through outreach but also through the provision of practical and easily implemented alternative solutions. Meanwhile, the challenge with the lowest score was "Conflicts of interest in coastal land use" (scored 107), indicating

that despite differing interests, this has not yet become a major obstacle to coastal environmental management.

Overall, the results of this study indicate that the challenges faced by communities in coastal environmental management in Rupat District are multidimensional, dominated by issues related to economics, education, and supporting infrastructure. The significant challenges related to limited time and knowledge demonstrate the need for a holistic approach that integrates economic empowerment with environmental conservation programs.

Challenges related to infrastructure and institutional support indicate the need for a stronger commitment from the government and relevant stakeholders in providing facilities and systems that support community participation. These results indicate that sustainable coastal environmental management strategies must simultaneously address structural, capacity, and behavioral challenges through an integrated approach between government, communities, and the private sector to create an ecosystem conducive to effective and sustainable coastal environmental management.

Strategy for Strengthening the Role of Communities in Sustainable Coastal Environmental Management

Strengthening the role of communities in sustainable coastal environmental management requires a comprehensive and integrated strategy. Economic empowerment strategies are key through the development of environmentally friendly alternative livelihoods such as ecotourism, seaweed cultivation, and high-value fishery processing, eliminating communities' reliance on exploitative practices. Educational and capacity-building strategies are implemented through technical training, environmental outreach, and technology transfer tailored to local conditions to enhance community knowledge and skills.

Institutional strategies include strengthening local community organizations, establishing multi-stakeholder forums, and developing participatory governance systems that involve communities in decision-making. Incentive and disincentive strategies are implemented through rewarding sustainable management practices and imposing strict sanctions for environmental violations. Multi-stakeholder partnership strategies integrate the roles of government, the private sector, NGOs, and academics to create synergy in supporting management programs. Finally, strategies for developing appropriate technology and participatory monitoring systems enable communities to independently monitor environmental conditions and implement innovative solutions tailored to the characteristics of local coastal areas[7].

Table 6 provides a comprehensive empirical overview of various strategies for strengthening community participation in sustainable coastal environmental management in Rupat District, involving 31 community respondents. Primary data obtained directly from the local community showed a total score of 1,429, categorized as "Very Good," indicating that the community overall has a very positive perception of various strategies that can be implemented to increase their participation in coastal environmental management, demonstrating high community support and readiness to engage in sustainable environmental management programs.

The strategies with the highest scores were "Financial support or equipment assistance from the government will encourage community involvement" and "Environmental education from an early age is important for sustainability," each of which received a score of 150, reflecting the community's top priority for financial support and long-term investment through education. Achieving the maximum score in this aspect of government support is highly relevant to the characteristics of coastal communities with limited economic

resources, and requires capital assistance to participate in conservation activities actively. Meanwhile, the high score for early childhood education demonstrates community awareness that changes in behavior and mindset toward the environment must begin with the younger generation to create a strong foundation for sustainable coastal environmental management.

Table 6. Strategies for strengthening community roles in sustainable coastal environmental management in Rupat District

No	Strategies for strengthening community roles in sustainable coastal environmental management in Rupat District	Total Score
1	Regular environmental training will enhance community participation.	147
2	Financial support or equipment assistance from the government will encourage community involvement.	150
3	The existence of community groups concerned with the environment will strengthen therole of residents.	143
4	The community needs to be involved in village environmental planning and decision-making.	142
5	Regular community service activities can be an effective means of protecting the coastal environment.	136
6	Rewards or incentives will motivate the community to protect the environment.	139
7	Socialization through community, religious, or traditional leaders will be more effective in engaging residents.	140
8	Collaboration between the community, village government, and external parties (NGOs, universities) is important.	140
9	Implementing environmental regulations based on mutual agreement can strengthen collective awareness.	142
10	Environmental education from an early age is crucial for sustainability.	150
Total Score		1.429
Category		Very good

The strategy "Regular environmental training will enhance community participation" received a score of 147, categorized as very good, demonstrating the importance of ongoing capacity building in enhancing community knowledge and skills in coastal environmental management. High support for regular training indicates that communities recognize the limitations of their knowledge and have a strong desire to learn and improve their skills in effective environmental management practices. This strategy is crucial in the context of coastal management, which requires technical knowledge of ecosystems, conservation technology, and natural resource management.

The institutional empowerment and participation strategies consistently scored high, with "The existence of community groups concerned with the environment will strengthen the role of residents" achieving a score of 143, "Community involvement in village environmental planning and decision-making" scoring 142, and "Implementing environmental regulations based on mutual agreement can strengthen collective awareness" also scoring 142. High support for these institutional strategies indicates community understanding that effective environmental management requires strong organizations, participation in decision-making, and mutually agreed-upon rules to foster a sense of ownership and collective responsibility.

Communication and motivation strategies also showed strong support, with "Socialization through community, religious, or traditional leaders will be more effective in engaging residents" and "Collaboration between the community, village government, and external parties (NGOs, Campuses) is important" each receiving a score of 140, and "Awards or

incentives will motivate the community to protect the environment" with a score of 139. These strategies reflect the community's understanding of the importance of a communication approach that is appropriate to the local social structure and the need for a reward system to maintain long-term motivation. Meanwhile, the strategy with the lowest score was "Routine cooperation activities can be an effective means of protecting the coastal environment" with a score of 136, although still in the very good category, indicating that the community prioritizes structural and systemic strategies over traditional activities.

Overall, the results of this study indicate that the strategy of strengthening the role of the community in coastal environmental management in Rupat District has very strong support from the community, with a dominant strategy focusing on government support, long-term education, and sustainable capacity building. High scores on all strategy indicators indicate that the community has a clear and comprehensive vision of the holistic approach needed for sustainable coastal environmental management.

The highest priority on government financial support and early childhood education indicates that the community recognizes the importance of long-term investment and structural support to create sustainable change. These results indicate that the implementation of the community-based coastal environmental management strategy in Rupat District has a very solid foundation of support, with the note that effective coordination between various strategies is needed to create optimal synergy between financial, educational, institutional, and motivational aspects in achieving the goals of sustainable coastal environmental management. The research results are consistent with those of Lukito & Boediningsih[6], who explain that community participation in environmental management is a basic need for all people physically living in a changing environment, meaning that environmental quality continues to decline. Community participation is essential in creating a healthy environment.

4. CONCLUSION

Based on the results of a comprehensive study of 31 community respondents at Ketapang Beach and Lencah Beach in Rupat District, it can be concluded that community-based coastal environmental management has enormous potential but faces complex structural challenges. The analysis results indicate that the community has a high awareness and sense of responsibility for the coastal environment (quite good), supported by positive factors such as social environmental support, perceived benefits, and enthusiasm for training (good). However, active community participation is still hampered by fundamental challenges such as limited time and energy due to economic priorities, lack of technical knowledge, and minimal infrastructure and institutional support from the government (good). Nevertheless, this study revealed high community optimism regarding strategies to strengthen their role in coastal environmental management, as reflected in the "very good" rating.

The community strongly supports a holistic approach that integrates government financial support, environmental education from an early age, ongoing training, strengthening local institutions, and an adequate incentive system. The highest priority on government support and long-term education indicates the community's understanding that sustainable coastal environmental management requires structural investment and a generational mindset change.

These findings indicate that the success of the coastal environmental management program in Rupat District is highly dependent on the ability of stakeholders to overcome the dilemma between short-term economic needs and long-term environmental investments, through an approach that focuses not only on education and awareness, but also on economic empowerment, infrastructure

provision, and strengthening institutional capacity that can create synergy between environmental conservation and improving community welfare.

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