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EXPLORATORY STUDY OF COASTAL COMMUNITY PERCEPTIONS OF CORAL REEF ECOSYSTEMS IN THE WATERS OF PANGALASIANG ISLAND, DONGGALA REGENCY

Studi Eksploratif Persepsi Masyarakat Pesisir terhadap Ekosistem Terumbu Karang di Perairan Pulau Pangalasiang, Kabupaten Donggala

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ABSTRACT

Coral reefs are essential habitats that support marine biodiversity and serve several ecological functions, such as protecting coastlines from erosion and providing fishery resources that enhance the livelihoods of coastal communities. However, these ecosystems face significant threats from human activities and natural factors. Therefore, a comprehensive understanding of community perspectives is crucial for supporting conservation efforts. This study aims to explore the community's knowledge of coral reef ecosystems in the waters surrounding Pangalasiang Island, Donggala Regency, and analyze the factors influencing these perceptions. A purposive sampling method was employed, involving 25 respondents, including fishermen, fishery entrepreneurs, and residents of Pangalasiang Island. Data were collected through questionnaires, structured interviews, and field observations, and analyzed using a Likert scale to gauge respondents' perceptions of various aspects. The results indicated that most respondents had a positive perception of coral reefs. They recognized the ecosystem's role in maintaining fish stocks, protecting coastlines, and creating economic opportunities through the fisheries and marine tourism sectors. Key factors influencing these perceptions included education level, type of livelihood, experience interacting with the sea, and knowledge of ecological benefits. This positive perception may contribute valuable social capital to community-based management initiatives, emphasizing active community participation. Therefore, the findings of this study are expected to serve as a foundation for developing conservation and empowerment strategies for coastal communities, promoting sustainable management of coral reefs.

Keywords: Coral Reef Ecosystem, Community Perception, Donggala Regency, Pangalasiang Island

ABSTRAK

Terumbu karang merupakan habitat penting yang mendukung keanekaragaman hayati laut dan memiliki fungsi ekologis seperti pelindung pantai dari abrasi serta penyedia sumber daya perikanan yang mendukung kesejahteraan masyarakat pesisir. Akan tetapi, keberadaan ekosistem ini menghadapi ancaman serius akibat aktivitas manusia maupun faktor alami sehingga pemahaman komprehensif mengenai cara pandang masyarakat menjadi penting dalam mendukung upaya konservasi. Penelitian ini bertujuan mengeksplorasi pengetahuan masyarakat terhadap ekosistem terumbu karang di perairan Pulau Pangalasiang, Kabupaten Donggala, serta menganalisis faktor-faktor yang memengaruhi pembentukan pandangan tersebut. Penelitian menggunakan metode purposive sampling dengan jumlah responden 25 orang yang terdiri atas nelayan, pengusaha perikanan, dan masyarakat pesisir yang bermukim di pulau pangalasiang. Data diperoleh melalui kuesioner, wawancara terstruktur, serta observasi lapangan, kemudian dianalisis dengan skala Likert untuk mengukur persepsi responden pada berbagai aspek. Hasil penelitian menunjukkan bahwa mayoritas responden memiliki persepsi positif terhadap terumbu karang. Mereka menilai ekosistem ini berperan dalam menjaga ketersediaan ikan, melindungi pantai, sekaligus menciptakan peluang ekonomi melalui sektor perikanan dan pariwisata bahari. Faktor yang paling berpengaruh terhadap pembentukan persepsi adalah tingkat pendidikan, jenis mata pencaharian, pengalaman berinteraksi dengan laut, serta pengetahuan tentang manfaat ekologis. Persepsi positif tersebut dapat menjadi modal sosial penting dalam pengelolaan berbasis komunitas yang menekankan partisipasi aktif masyarakat. Oleh karena itu, temuan penelitian ini diharapkan menjadi dasar dalam merancang strategi konservasi dan pemberdayaan masyarakat pesisir guna mendukung pengelolaan terumbu karang yang berkelanjutan.

Kata Kunci: Ekosistem Terumbu Karang, Kabupaten Donggala, Persepsi Masyarakat, Pulau Pangalasiang

INTRODUCTION

Coral reef ecosystems are tropical marine environments with high biodiversity and significant ecological, social, and economic benefits (Sahetapy *et al.,* 2021). They serve as habitats for various marine species, protect coastlines from erosion, and provide fishery resources that support the livelihoods of coastal communities (Triwibowo, 2023). However, coral reefs in many regions of Indonesia, including Central Sulawesi, face threats from human activities and natural factors. This highlights the need for a comprehensive understanding of public perceptions regarding these ecosystems. The waters around Pangalasiang Island in Donggala Regency have a rich coral reef ecosystem and are vital for the sustainability of local community livelihoods. These waters not only support capture fisheries and aquaculture but also have potential for marine ecotourism, which can add economic value. Unfortunately, the use of marine resources is often not balanced with public knowledge and awareness of the importance of preserving coral reef ecosystems. An initial exploration of community perceptions is essential for understanding how local groups assess and interact with coral reef ecosystems. Such perceptions influence behaviors related to the sustainable management and utilization of marine resources.

Communities with positive views support conservation efforts, while negative perceptions may lead to destructive practices like using explosives, poisons, or overfishing. Studying community perceptions is also relevant to the concept of community-based resource management, which emphasizes the active participation of locals in maintaining ecosystems. By understanding initial perceptions, local governments, research institutions, and non-governmental organizations can develop more targeted educational, outreach, and empowerment programs (Widaningsih *et al.,* 2024). This aligns with sustainable development,

prioritizing communities as key actors in balancing resource use and conservation. Previous research has shown that community perceptions of coastal ecosystems are influenced by factors such as education level, livelihood, experience with the marine environment, and access to information (Katti *et al*., 2025). However, specific research on community perceptions of coral reefs in the waters around Pangalasiang Island, Donggala Regency, is limited. Local studies are essential because each community has distinct socio-cultural perspectives regarding its natural resources.

The expected results of this research are to provide a baseline overview of community knowledge, attitudes, and perspectives on coral reefs. This information can then serve as a reference for developing participatory coral reef management strategies. Thus, the research aims to contribute to scientific knowledge and practical benefits for sustainable coastal resource management. Community perspectives are critical as they influence interactions concerning utilization and conservation efforts with the marine environment. Therefore, a preliminary study is necessary to explore the factors influencing these perceptions and their implications for the management and sustainability of coral reef ecosystems. This study aims to assess initial community perceptions of coral reefs in the waters around Pangalasiang Island, Donggala Regency, and analyze the social, economic, and cultural factors shaping these views. The findings are expected to inform sustainable coral reef management and preservation strategies, as a reference for policy formulation and coastal community empowerment programs.

RESEARCH METHODS

The research was conducted in July 2025 on Pangalasiang Island in Denpasar Regency. This site was chosen due to the presence of a coral reef ecosystem, which serves as a vital resource for the local community. Additionally, the area is home to coastal communities that interact directly with the marine environment. The research location is illustrated in Figure 1.

Figure 1. Research location map

Tools and Materials

The tools used in this study included writing instruments, a clipboard, and a camera. The materials consisted of a questionnaire that served as a research instrument and a poster depicting coral reefs.

Sampling Determination

A purposive sampling technique was employed to select a group based on specific criteria relevant to the research objectives. The chosen community characteristics included residential locations in the local coastal area, specifically targeting homemakers, fishermen, and fisheries entrepreneurs around Pangalasiang Island. A quota sampling method was utilized to select samples from the population, ensuring that each category was adequately represented (Sugiyono, 2010). Twenty-five respondents were selected, and structured interviews were conducted to serve as key informants (Kurniawan & Triswiyana, 2019).

Type of Data Collection

Primary data collection involved distributing questionnaires and conducting observations. In-depth interviews were carried out with respondents based on predetermined variables. The questionnaire aimed to assess community perceptions regarding their knowledge of coral reefs, the presence of these reefs in their surrounding waters, the direct benefits they provide, and local conservation efforts. Secondary data were obtained from supporting literature, encompassing population demographics, organizational structures, and other relevant aspects of the research scope (Sugiyono, 2015).

Data Analysis

The data analysis utilized a Likert scale to provide an overview of the phenomenon, measuring assessments from various relevant questions. These included respondent characteristics, initial awareness of coral reefs, participation in conservation activities, and the perceived value of coral reef ecosystem services in surrounding waters. Respondent perceptions were quantified on a scale from 1 to 5 and categorized into five levels: strongly agree, agree, neutral, disagree, and strongly disagree (Siregar *et al.* 2023). Descriptive quantitative methods were then applied to explain empirical conditions based on numerical data (Daysa *et al.* 2025). Descriptive statistics were employed to illustrate the distribution of respondents' responses through frequency presentations, tables, percentages, and average calculations.

RESULTS

The research results demonstrate public perception of coral reefs on Pangalasiang Island, Donggala Regency. Data obtained through questionnaires were then processed and tabulated. The respondents' answers are presented in Table 1.

Table 1. Results of Respondents from the Panggalasiang Island Community, Donggala Regency

Statement	N	Mean	Std. Dev.	Interpretation
P1. I understand the importance of coral reefs for the balance of marine ecosystems.	25	4	0.82	Agree
P2. The existence of coral reefs provides economic benefits (fisheries and tourism)	25	4.16	0.37	Agree
P3. I feel proud of the healthy condition of coral	25	4.28	0.54	Agree

reefs in the surrounding marine environment.				
P4. I believe that coral reef damage hurts coastal communities.	25	4.2	0.87	Agree
P5. I am willing to participate in coral reef conservation and protection activities.	25	3.92	0.49	Agree
P6. The government/institution has provided sufficient information about the importance of protecting coral reefs.	25	2.96	0.93	Neutral
P7. Current community activities are quite environmentally friendly and do not damage coral reefs.	25	3.88	0.67	Agree
P8. I support the ban on destructive fishing (bombing/poisoning)	25	4.36	0.95	Strongly agree
P9. I have seen/know about activities that damage coral reefs.	25	3.4	0.76	Neutral
P10. I feel that community involvement is significant in preserving coral reefs.	25	4.56	0.51	Strongly agree

Respondent characteristics are categorized by age, gender, education, and occupation. Presenting these characteristics provides an initial overview of the community being studied. The details regarding respondent characteristics can be found in Table 2. The perceptions of initial information, community roles, efforts to support conservation activities, and knowledge of the coral reef ecosystem services in the waters around Pangalasiang Island are illustrated in chart form in Figures 1, 2, 3, and 4.

Table 2. Respondent Characteristics

No	Variables	Amount	Percentage (%)
1	**Gender**		
	Man	12	48
	Woman	13	52
2	**Age**		
	20-30 years	6	24
	31-40 years	9	36
	41-50 years	10	40

3	**Level of education**		
	Elementary School	11	44
	Junior High School	10	40
	High School/Vocational School	3	12
	Bachelor	1	4
4	**Work**		
	Fisherman	10	40
	Trader	3	12
	Self-employed	1	4
	housewife	9	36
	Other	2	8

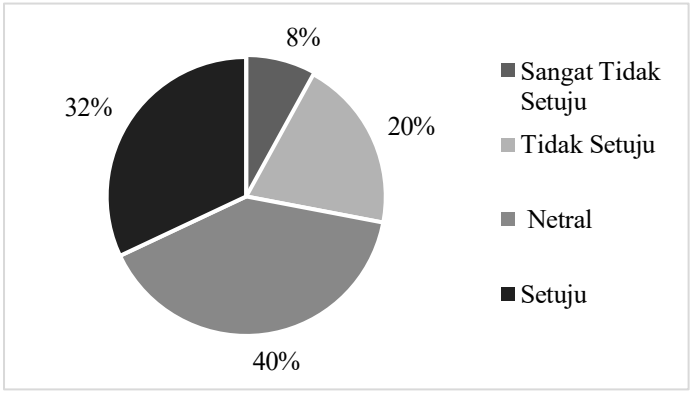

Figure 1. Public perception is based on initial information regarding the socialization of coral reef ecosystems.

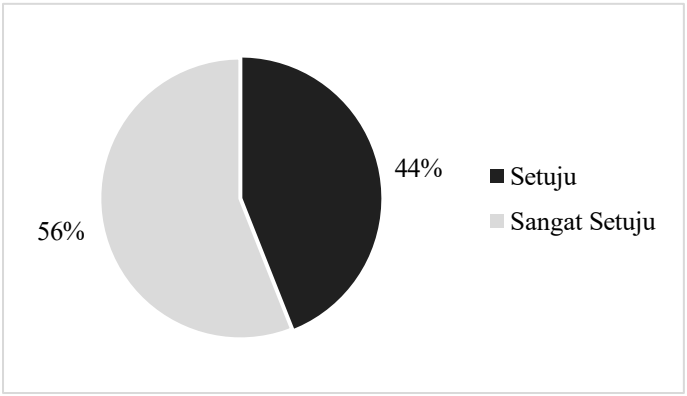

Figure 2. The role of the community in preserving the coral reef ecosystem on Pangalasiang Island

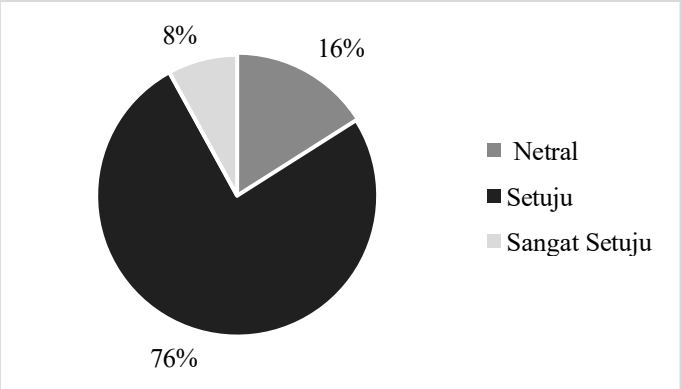

Figure 3. Community perceptions of support for coral reef ecosystem conservation and protection activities

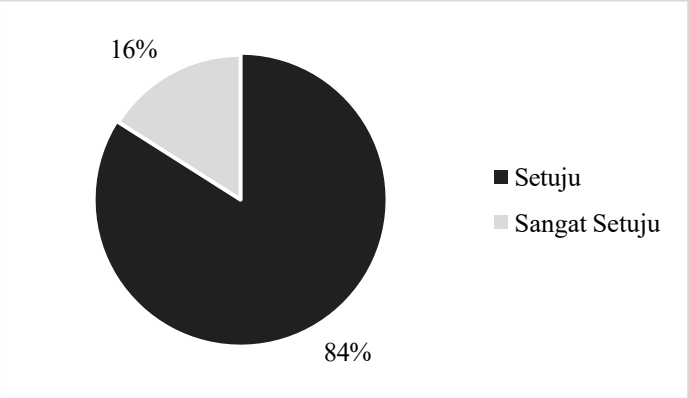

Figure 4. Coral reef ecosystems can provide economic service benefits for community life.

DISCUSSION

The study results reveal that most respondents positively perceive coral reef management and conservation. The highest score was attributed to the statement regarding the importance of community involvement (P10 = 4.56), underscoring the high collective awareness among coastal communities about their role in maintaining ecosystem sustainability. According to Campbell *et al*., (2013), community participation in managing marine conservation areas significantly depends on their perception of the importance of direct involvement in decision-making. Thus, the greater the awareness of their collective role, the higher the likelihood of success for conservation programs. Additionally, strong support for banning destructive fishing practices (P8 = 4.36) indicates that the community recognizes the negative impacts of such activities like using explosives or poisons on the health of coral reef ecosystems. Cinner *et al*. (2015) suggest that communities with a strong awareness of the ecological benefits of coral reefs are more likely to support conservation regulations. This reinforces the idea that the success of coastal area management hinges on social acceptance of these regulations. From a socio-economic standpoint, the community's reliance on marine resources is vital for sustaining fish populations, protecting the coastal environment, and generating economic opportunities in the fisheries and tourism (Ferdian *et al.,* 2019). Therefore, community support for coral reefs on Panggalasiang Island is crucial for sustainable coastal resource management. This backing not only aids in preserving marine ecosystems but also enhances the community's socio-economic role in maintaining coastal environmental sustainability. Despite this support, respondents rated government assistance or outreach efforts as low (P6 = 2.96), which indicates a communication gap between policymakers and coastal communities. Pomeroy *et al*., (2016) noted that inadequate policy outreach and communication often impede community-based

marine resource management. The role of government and institutions is essential in providing information, outreach programs, and facilitating activities that promote active community participation.

Regarding demographics, women constituted 52% of the respondents, compared to 48% for men. This highlights women's significant role in sustaining coastal resources and their understanding of the importance of coral reefs for maintaining the marine ecosystem balance around Pangalasiang Island. Most respondents were in the productive age range of 31-40 years (36%) and 41-50 years (40%), suggesting that this age group is actively engaged in the community's social and economic activities. Regarding education, most respondents had only completed elementary school (44%), junior high school (40%), and a mere 4% held a college degree. This low educational attainment poses challenges for coastal communities, as education is crucial for developing their potential and understanding how to utilize marine and coastal resources better. Low education levels may also affect the community's understanding of coral reefs' ecological functions and economic benefits, as education is often linked to environmental awareness (Anisa & Waloyo, 2021). The primary livelihoods of the residents of Pangalasiang Island are fishermen (40%) and homemakers (36%), with a smaller number being entrepreneurs (4%) and those involved in other occupations (8%). This illustrates a significant dependence on marine resources, particularly coral reefs, which provide habitats for economically valuable marine organisms like fish. Damage to coral reef ecosystems is primarily caused by anthropogenic activities, such as illegal fishing practices, unsustainable tourism expansion, shipping activities, and poorly managed coastal urbanization. If these factors are not adequately managed, they could lead to severe ecological and socio-economic impacts on the lives of coastal communities (Pratama *et al.,* 2022). Coral reef ecosystems are crucial as habitats for various fish species and other marine organisms and as natural barriers protecting coastlines from waves and erosion (Najmi *et al.,* 2020). Coral reef degradation significantly impacts the welfare of local communities, especially fishing communities that rely heavily on sustainable fisheries resources for their livelihoods. According to the results presented in Figure 1, most respondents recognized the importance of outreach activities in enhancing their understanding of the ecological functions of coral reefs, with 56% agreeing and 28% strongly agreeing. Only 12% remained neutral, while 4% disagreed. These findings confirm that initial outreach efforts are crucial in building environmental awareness among coastal communities on Pangalasiang Island. As noted by Rahajeng *et al*., (2014), outreach initiatives can boost community participation in conservation efforts, and effective outreach can foster a positive perspective on aquatic resource management, as highlighted by Nizar *et al*., (2022). The data shown in Figure 2 indicate that 56% of respondents strongly agree that the community should contribute to preserving the coral reef ecosystem, with 76% expressing a willingness to participate actively in conservation activities. Figure 3 further illustrates that 76% support conservation and protection efforts for the coral reef ecosystem. This support can manifest through active engagement in conservation initiatives to maintain marine sustainability or backing community-based management policies. Padyawan *et al*., (2024) emphasized that local knowledge is vital for enhancing conservation practices and educational strategies for sustainable fisheries resource management. Moreover, utilizing digital platforms has proven effective in promoting conservation and environmental education, particularly in disseminating information about marine biodiversity. Adhian *et al*., (2014) and Najmi *et al*., (2020) noted that community involvement extends beyond fishermen to include women's groups in coastal households, which are valuable assets for sustainable conservation efforts. The results in Figure 4 reflect a positive trend in the Pangalasiang Island community's perception of the value of coral reef ecosystem services, with 16% agreeing and 84% strongly agreeing. This suggests that the community recognizes the ecological and economic importance of coral reefs as habitats for marine life and sources of livelihood. According to Sahetapy *et al*., (2021), this

positive awareness is social capital to strengthen community-based conservation strategies, pivotal in maintaining coastal ecosystems' sustainability and supporting community well-being (Triwibowo, 2023). There is also a strong correlation between community perceptions of coral reefs and their economic well-being. Communities that directly benefit from these ecosystems tend to show a greater commitment to their preservation. This illustrates a collective understanding of the importance of coral reefs as economic resources and protective factors for coastal areas. Conversely, a lack of knowledge and low education levels can lead to harmful fishing practices, such as using explosives or toxins, contributing to coral reef degradation (Cesar *et al.* 2023). Therefore, enhancing awareness and education among coastal communities is essential, allowing them to recognize that coral reefs hold significant ecological and economic value, both directly and indirectly (Kiptiah *et al.,* 2025).

CONCLUSION

The community of Pangalasiang Island in Donggala Regency holds a positive perception of the coral reef ecosystem. This perspective is closely linked to the community's reliance on marine resources for their socio-economic support, obtained through capture fisheries and marine ecotourism opportunities. A positive perception among the community is a vital asset in supporting sustainable coral reef management and conservation strategies. Efforts such as raising awareness, providing environmental education, and empowering coastal communities are essential to ensure the ongoing ecological and economic benefits of coral reefs for the well-being of the residents of Pangalasiang Island in Donggala Regency, Central Sulawesi Province.

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