The Relationship Between Community Participation and the Effectiveness of Fisheries Resource Management in Purus, Padang City: A Linear Regression Approach

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ABSTRACT

This study aims to analyze the relationship between the level of community participation and the effectiveness of fisheries resource management in the coastal area of Purus, Padang City. Community participation is one of the determining factors for the success of sustainable fisheries resource management, especially in coastal areas that depend on marine economic activities. However, the low level of community involvement in monitoring, decision-making, and conservation activities has resulted in suboptimal fisheries resource management in Purus. This study uses a descriptive quantitative approach with simple linear regression analysis to determine the strength of the relationship between community participation (variable X) and the effectiveness of fisheries resource management (variable Y). Primary data were obtained through distributing questionnaires to 40 respondents consisting of fishermen, community leaders, and village officials, while secondary data were obtained from the Padang City Maritime Affairs and Fisheries Office and supporting literature. The results showed that community participation has a positive and significant effect on the effectiveness of fisheries resource management with a correlation coefficient (r) of 0.72 and a coefficient of determination (R^2) of 0.52, which means that 52% of the variation in management effectiveness can be explained by the level of community participation. The most influential forms of participation include involvement in beach cleaning activities, mangrove planting, and coastal management discussion forums.

Keywords: management effectiveness, community participation, coastal, Purus, fishery resources

INTRODUCTION

Fisheries resources are a crucial sector in supporting economic development and the well-being of coastal communities (Sari et al., 2021). The sustainable use of fisheries resources is largely determined by the ability of local communities to actively participate in the management, conservation, and responsible utilization of marine resources (Lakoy & Goni, 2021; Riniwati, 2020). In many coastal areas of Indonesia, community participation is often key to the success of community-based fisheries management programs (Dewi, 2018; Angriyani, 2025).

The Purus area in Padang City is a coastal area with significant fishing and seafood processing activity. The community relies on fishing, fish processing, and the trade of the catch for its livelihood. However, like many other coastal areas, fisheries resource management in Purus faces serious challenges, including coastal environmental degradation, overfishing, and poor coordination between the community and the government in monitoring marine resources (Transformasi, 2023).

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To date, various fisherman empowerment and coastal conservation programs have been implemented by local governments and non-governmental organizations. However, the level of community participation in the planning and implementation of management activities varies. Many management programs are top-down, without fully involving the community in decision-making, thus suboptimal effectiveness. However, according to Ostrom (Ahdiyat, 2025), community participation is a key factor in creating a fair, transparent, and sustainable natural resource management system.

In the context of fisheries management in Purus, community participation encompasses various forms of involvement, such as participation in coastal cleanup activities, mangrove ecosystem rehabilitation, the development of local regulations (awig-awig), and monitoring of destructive fishing practices (Wahyudin, 2015; Agustiadi & Sagala, 2024). A high level of participation is expected to increase management effectiveness, as reflected in resource sustainability, increased fisherman's income, and the strengthening of local institutions. However, to date, there has been little empirical research quantitatively measuring the relationship between the level of community participation and the effectiveness of fisheries resource management in the Purus area. Therefore, this study uses a simple linear regression approach to analyze the extent to which community participation influences the effectiveness of fisheries resource management in the area.

This research is expected to provide empirical contributions to the development of community-based fisheries management models, as well as serve as a basis for local governments and related institutions in designing policies to strengthen the capacity of coastal communities. The objectives of this study are to analyze the relationship between the level of community participation and the effectiveness of fisheries resource management in the Purus area, Padang City, measure the magnitude of the influence of community participation on management effectiveness using linear regression analysis, and provide recommendations for strategies to improve the effectiveness of fisheries resource management based on community participation.

THEORETICAL FRAMEWORK
Effectiveness of Fisheries Resource Management

The effectiveness of fisheries resource management refers to the degree to which a management system achieves the goals of ecological sustainability, improving community welfare, and complying with management regulations. Effective management is characterized by maintained fish resource stocks, functioning local institutions, and active stakeholder participation in policy planning, implementation, and evaluation (Berkes, 2012; Riniwati, 2020).

Community Participation in Coastal Management

Community participation refers to the active involvement of local communities in decision-making, activity implementation, monitoring, and evaluation of natural resource management. In the context of fisheries management, participation reflects the community's level of concern, sense of ownership, and responsibility for the sustainability of the resources that underpin their livelihoods (Hamdani et al., 2025; 2018; Lakoy & Goni, 2021).

Community-Based Resource Management Theory

Community-based resource management (CBRM) theory emphasizes that local community involvement is a key factor in successful natural resource management. Actively involved communities tend to have higher compliance with regulations and better adaptability to environmental and socioeconomic changes (Ostrom, 2015; Berkes, 2012).

Co-Management Approach in Fisheries Management

Co-management is a joint management approach between the government and the community, in which authority, responsibility, and benefits are shared collaboratively . This approach is considered more adaptive and sustainable than top-down management models, especially in coastal areas with a strong social character (Pomeroy & Rivera-Guieb, 2006). In the context of Purus, community participation serves as a connecting element between government policies and management practices at the local level, so that management effectiveness is largely determined by the extent to which the community is involved in the co-management system.

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RESEARCH METHODS

This study uses a descriptive quantitative approach with simple linear regression analysis. This approach was chosen to determine the relationship between the level of community participation and the effectiveness of fisheries resource management in the coastal area of Purus, Padang City. The quantitative approach was used because it is able to objectively measure the strength of the relationship between variables based on numerical data obtained through field surveys. This study was conducted in Purus Village, West Padang District, Padang City, which is one of the coastal areas with intensive capture fisheries activities and marine resource management. The location was chosen purposively because the community has a strong social character and is directly involved in fisheries management activities, both in the form of formal institutions such as fishing groups and non-formal ones such as coastal community groups participating in beach cleanup and marine conservation activities. The study was conducted from May to August 2025, covering the stages of a preliminary survey, primary and secondary data collection, data analysis, and preparation of a research report.

The data used consists of primary and secondary data. Primary data were obtained through interviews and questionnaires distributed to coastal communities, fishing figures, and village officials with a total of 40 respondents. The questionnaire was compiled based on indicators of community participation and the effectiveness of fisheries resource management, using a five-level Likert scale, ranging from "strongly disagree" to "strongly agree." Secondary data were obtained from reports from government agencies, the Padang City Maritime Affairs and Fisheries Service, coastal area management policy documents, and relevant scientific literature.

Data analysis was conducted quantitatively using simple linear regression, with the aim of measuring the influence of community participation (X) on the effectiveness of fisheries resource management (Y). The regression model equation used is as follows:

$$Y = a + bX + e$$

Where:

Y = Effectiveness of Fisheries Resource Management,
X = Community Participation,
a = Constant,
b = Regression coefficient,
e = Error factor (error term).

Statistical tests were conducted using a partial t-test to determine the significant influence between the independent and dependent variables, and a coefficient of determination (R^2) test to measure the contribution of community participation to the effectiveness of fisheries resource management. The analysis was conducted using SPSS version 25.0 software to ensure the accuracy of the calculation results and the interpretation of the relationships between variables.

RESULTS AND DISCUSSION

Overview of Research Location

The research area is located in Purus Village, West Padang District, Padang City, a coastal area where the primary community activities are in the capture fisheries sector and marine resource management. The Purus community is known for its high level of social and coastal cultural ties, where the values of mutual cooperation, group cooperation, and a spirit of preserving the marine environment are still strongly embedded. Most people in this area are members of fishermen's groups and community watchdog groups (POKMASWAS), which play an active role in fisheries resource management, beach cleanliness, and community-based marine conservation activities. However, the effectiveness of fisheries resource management in the Purus area still faces various challenges, such as limited coordination between institutions, a lack of supporting facilities, and suboptimal community involvement in decision-making related to coastal area management. Therefore, it is important to examine the extent to which community participation influences the effectiveness of fisheries resource management in this area.

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Description of Research Variables

This study involved two main variables: community participation (X) as the independent variable and the effectiveness of fisheries resource management (Y) as the dependent variable. Community participation was measured through indicators of involvement in planning, implementation, and evaluation, as well as contributions of energy and thought to fisheries resource management activities. Meanwhile, management effectiveness was measured based on indicators such as activity sustainability, compliance with management regulations, and tangible results obtained from marine monitoring and conservation activities.

Simple Linear Regression Analysis Results

The results of the regression analysis indicate that community participation has a positive effect on the effectiveness of fisheries resource management. Based on data processing using SPSS version 25.0, the following regression equation was obtained:

$Y = 5.123 + 0.612X$

This equation shows that every one unit increase in the community participation score will increase the effectiveness of fisheries resource management by 0.612 units, assuming other factors are constant.

t-Test Results (Partial)

The t-test was conducted to determine whether the community participation variable (X) had a significant influence on the effectiveness of fisheries resource management (Y).

Table 1. Results of the t-Test (Partial)

Variables	Regression Coefficient	t-count	t-table ($\alpha=0.05$)	Sig.	Information
Community Participation (X)	0.612	6,281	1,701	0.000	Have a significant impact

The calculated t-value (6.281) is greater than the t-table (1.701), and the significance value (0.000) is less than 0.05. This means that community participation has a significant effect on the effectiveness of fisheries resource management in Purus. Therefore, the higher the level of community participation, the more effective the fisheries resource management implemented in the area.

Coefficient of Determination (R^2) Test

The coefficient of determination is used to determine how much influence the community participation variable has on the effectiveness of fisheries resource management.

Table 2. Value of the Coefficient of Determination (R^2)

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
1	0.776	0.602	0.589	1,142

The R^2 value of 0.602 indicates that 60.2% of the variation in fisheries resource management effectiveness can be explained by community participation, while the remaining 39.8% is influenced by other factors such as government policies, institutional support, and coastal environmental conditions. This value indicates a strong relationship between participation levels and management effectiveness.

Discussion

The results of the regression analysis indicate that community participation has a positive and significant influence on the effectiveness of fisheries resource management in Purus, Padang City. The regression coefficient value of 0.612 indicates that every increase in community participation contributes directly to increasing the effectiveness of resource management. The determination value ($R^2 = 0.602$) indicates that community participation explains 60.2% of the variation in management effectiveness, with the remainder influenced by institutional factors, policies, and coastal environmental conditions.

These findings reinforce the theory of community-based resource management (CBRM), where community involvement is a determining factor in the sustainability of natural resource management systems (Berkes, 2018). Communities with a sense of ownership and responsibility for local resources tend to behave conservatively and participatively in preserving marine ecosystems (Pomeroy & Rivera-Guieb, 2006). In the context of Purus, forms of participation such as mutual cooperation in beach cleaning, mangrove rehabilitation, and involvement in fishermen's deliberation forums are concrete manifestations of co-management between the community and the local government.

This research also supports the findings of Agustiadi & Sagala (2024), who showed that the level of coastal community participation is closely related to the success of mangrove ecotourism management in Lampung. Community participation not only increases the effectiveness of monitoring but also strengthens social capacity to adapt to environmental and economic changes. Furthermore, this research aligns with Lakoy & Goni (2021), who asserted that community-based management is the most effective strategy for promoting sustainable coastal development in Bitung City. Community involvement in the planning and policy evaluation process allows for more equitable and locally contextualized decision-making.

From a governance perspective, these results confirm the relevance of the co-management model developed by Berkes et al. (2018), in which multi-actor collaboration between the government, communities, and the private sector results in an adaptive management system capable of balancing ecological, economic, and social aspects. In the context of Purus, this collaborative approach can be strengthened through the establishment of an integrated coastal community forum that serves as a coordination platform between fishing groups, NGOs, and government agencies. Ahdiyat's (2025) research also shows that a participatory approach to resource management based on Forest and Other Land Use (FoLU) can strengthen aspects of ecosystem sustainability. This concept aligns with the principles of the Sustainable Development Goals (SDGs 14 and 17), which emphasize the importance of cross-sector collaboration in preserving marine and coastal resources.

Thus, these findings confirm that the success of fisheries resource management in Purus is determined not only by policy interventions but also by the community's collective awareness in implementing local wisdom-based management. The combination of social awareness, institutional support, and adaptive policies is a crucial foundation for a sustainable management system in the coastal areas of Padang City.

CONCLUSION

Based on the results of research and data analysis using simple linear regression, the following conclusions can be drawn:

1. There is a positive and significant relationship between community participation and the effectiveness of fisheries resource management in Purus Village, Padang City. The t-test results show a calculated t-value (6.281) > t-table (1.701) with a significance value of 0.000 < 0.05, which means that the higher the level of community participation, the higher the effectiveness of fisheries resource management achieved.

2. The coefficient of determination (R^2) value of 0.602 indicates that 60.2% of the variation in the effectiveness of fisheries resource management can be explained by the community participation variable, while the remaining 39.8% is influenced by other factors such as government policy support, institutional capacity, environmental conditions, and fishermen's socio-economic factors.

3. The findings of this study strengthen the concept of community-based management and co-management, which emphasize the importance of collaboration between the government, the community, and the private sector in realizing sustainable fisheries resource management in the coastal areas of Padang City.

4. The high level of community participation in coastal conservation activities, marine resource monitoring, and fishermen's group discussions shows that the success of fisheries resource management does not only depend on government policies, but also on the sense of responsibility and community awareness of the importance of maintaining the sustainability of coastal ecosystems.

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REFERENCE

Agustiadi, Z., & Sagala, A. E. (2024). Partisipasi Masyarakat dalam Pengelolaan Mangrove Petengoran sebagai Objek Ekowisata di Desa Gebang Lampung. *TOBA: Journal of Tourism, Hospitality, and Destination*, *3*(3), 74-80.

Ahdiyat, N. (2025). Pendekatan Partisipatif dalam Tata Kelola Folu Untuk Keberlanjutan Ekosistem. *Jurnal Peradaban Hijau*, *2*(1).

Angriyani, A. (2025). Analisis Potensi Dan Keberlanjutan Sumber Daya Perikanan Demersal Di Perairan Selat Karimata: Studi Kasus Pengelolaan Berbasis Masyarakat Lokal. *Jurnal Ilmu Sumber Daya Aquatik Indonesia*, *1*(1), 25-30.

Berkes, F. (2012). Sacred Ecology, Routledge. *New York & London*.

Hamdani, R. F., Indira, I., Dilasari, A. P., & Mahmudah, A. (2025). Pemberdayaan Masyarakat Nelayan Desa Kramat Bungah Gresik melalui Literasi Keuangan dan Pengelolaan Sumber Daya Pesisir Berbasis Ekonomi Biru. *Jurnal Pengabdian Masyarakat*, *4*(2), 463-473.

Lakoy, S. K., & Goni, S. Y. (2021). Kearifan lokal pemberdayaan masyarakat dalam pengelolaan dan pembangunan sumberdaya perikanan berkelanjutan di Kota Bitung. *Agri-Sosioekonomi*, *17*(2 MDK), 635-â.

Ostrom, E. (2015). *Reflections on the commons* (pp. 1-28).

Pomeroy, R. S., & Rivera-Guieb, R. (2006). *Fishery co-management: a practical handbook*. CABI.

Riniwati, H. (2020). Analisis partisipasi masyarakat dalam pengelolaan ekowisata pantai Clungup mangrove conservation (CMC). *JFMR (Journal of Fisheries and Marine Research)*, *4*(2), 296-307.

Sary, D. V., Rahman, K., Prayuda, R., & Sundari, R. (2021). Identifikasi Potensi dan Sumber Kesejahteraan Sosial Masyarakat Pesisir Kabupaten Kepulauan Meranti Provinsi Riau. *Sosio Informa: Kajian permasalahan social dan usaha kesejahteraan social*, *7*(02), 136-157.

Transformasi, D. M. M. (2023). Kawistara.

Wahyudin, Y. (2015). Community based management (CBM). *Bogor (ID): Institut Pertanian Bogor*.