SINTHOP: Media Kajian Pendidikan, Agama, Sosial dan Budaya
Volume 4, Issue 2, July-December 2025
E-ISSN: 2986-8475 | DOI: 10.69548/sinthop.v4.i2.71.388-398

MANGROVES IN THE NORTH RUPAT LANDSCAPE: COMMUNITY PERCEPTIONS OF EXISTENCE AND MANAGEMENT

[*]Gusniati[1], Yusmar Yusuf[2], Mita Rosaliza[3]
[1,2,3]Universitas Riau, Pekanbaru, Indonesia
[*]*Email: gusniati0481@student.unri.ac.id*

Abstract

Mangrove ecosystems play a critical role in coastal protection and the livelihoods of coastal communities, yet their sustainability is strongly influenced by how local people perceive mangrove existence and management. This study examines public perceptions of mangrove existence and management in Tanjung Medang and Teluk Rhu Villages, North Rupat District, and identifies factors shaping these perceptions. A quantitative descriptive approach was applied using a structured Likert-scale questionnaire. From a population of 1,514 households, 48 respondents were selected using Slovin's formula with a 10% margin of error and simple random sampling. Data were analyzed using descriptive statistics and a one-sample t-test with a benchmark value of 108 (75% of the maximum ideal score). The results show that public perception of mangrove existence is positive across all components (total score 2,493), with the highest score in mangrove condition/state (1,212). Perceptions of mangrove management are fairly good (total score 3,671), although supervision/monitoring is rated negative (938), indicating a key weakness in oversight. Most respondents demonstrate high perception (85.4%) and high knowledge (87.5%) regarding mangrove existence and management. Factor analysis indicates that knowledge is the dominant factor influencing perception (score 2,069), while social, economic, and cultural factors are not dominant. The one-sample t-test confirms that the overall perception score is significantly above the benchmark ($t = 9.342$; $p < .001$; mean difference = 20.708). These findings suggest that strengthening mangrove governance in North Rupat should prioritize improving supervision and monitoring mechanisms, while sustaining community education and outreach to reinforce knowledge-based support for conservation.

Keywords: *Mangrove; Public Perception; Coastal Communities; North Rupat*

***

A. Introduction

The mangrove ecosystem is a natural system that plays a vital role in maintaining environmental balance and supporting the lives of coastal communities. Mangroves protect coastlines from abrasion, storms, and seawater intrusion, while also acting as carbon sinks, natural waste filters, and breeding habitats for various marine life such as fish, crabs, and shrimp (Hasidu et al., 2022; Tokan, 2020). These ecological functions make mangroves a strategic natural barrier against the threat of climate change and help maintain sustainable coastal productivity (Fadhila et al., 2015; Titisari et al., 2023).

For coastal communities, mangroves not only provide ecological protection but also economic benefits through the provision of fish spawning areas and non-timber forest products such as firewood and building materials (Sirait et al., 2021). However, limited knowledge can lead some communities to view mangroves primarily as a source of direct use, resulting in ongoing logging and land conversion practices (Rosaliza, 2018; Yusuf et al., 2024). This situation aligns with findings that mangrove degradation in various coastal areas of Indonesia is generally driven by socio-economic pressures and weak governance (Febryano et al., 2015).

In North Rupat District, particularly in Tanjung Medang and Teluk Rhu Villages, mangrove conditions continue to be under pressure due to development, illegal logging, and changes in land use (Alfiah et al., 2023; Asriwandari et al., 2021). At the same time, local communities largely work as fishermen and farmers, making mangrove ecosystems closely linked to their livelihoods (Amri et al., 2022). Declining mangrove quality therefore poses risks to ecological and economic stability, as also reported in other coastal areas in Sumatra (Lisdayanti et al., 2024).

Community perception is a crucial factor in the effectiveness of mangrove management. Previous research indicates that ecological knowledge, cultural values, and perceived economic benefits can shape community participation in conservation programs (Rom Ali Fikri et al., 2023). In addition, communities involved in rehabilitation and environmental education activities often demonstrate measurable changes in perception, as direct involvement can strengthen understanding of mangroves as long-term assets through ecotourism development, fisheries support, and processed mangrove products (Suraimah et al., 2019). This suggests that perceptions are dynamic and can be reinforced through targeted educational interventions and community-based mentoring.

Nevertheless, perception gaps may persist among community groups. Some groups may prioritize immediate economic use of mangrove resources due to limited access to alternative livelihoods, household economic instability, and low awareness of long-term ecological benefits. Such divergence between conservation-oriented groups and direct-use-oriented groups remains a practical challenge for sustainable mangrove management.

As a natural barrier in North Rupat, mangroves not only protect coastal areas from wave action and climate change, but also shape how communities perceive their environment. The relationship between communities and mangroves is reciprocal and influenced by ecological, economic, social, and cultural aspects. Therefore, understanding community perceptions is not merely an academic exercise but a crucial foundation for formulating adaptive, sustainable, and participatory mangrove management approaches.

Based on the background above, this study aims to answer two questions: (1) what are public perceptions of the existence and management of mangrove forests in North Rupat District? and (2) what factors influence these perceptions? The findings are expected to serve as a scientific reference and provide recommendations for local

governments, area managers, and local communities in formulating effective and participatory mangrove management strategies.

B. Methods

This study employed a quantitative descriptive approach to examine community perceptions of mangrove ecosystems and their management in the research area. The quantitative design was selected to systematically capture and analyze respondents' assessments using measurable indicators, allowing the results to be summarized statistically and interpreted in relation to predefined evaluation criteria.

The population of this study consisted of 1,514 households residing in the research location. The sample size was determined using Slovin's formula with a margin of error of 10%, resulting in 48 respondents. This margin of error was considered appropriate for an exploratory and descriptive community-based study with limited population size.

A simple random sampling technique was applied to ensure that each household had an equal opportunity to be selected as a respondent. The sampling frame was derived from the official list of households in the study area. Respondents were selected randomly from this list, and replacement was conducted when selected households were unavailable or declined to participate, in order to maintain the predetermined sample size.

Data were collected using a structured questionnaire developed to measure community perceptions across several dimensions, including knowledge of mangrove ecosystems, attitudes toward mangrove conservation, and perceptions of mangrove management practices. The instrument employed a Likert-scale format with five response categories ranging from strongly disagree to strongly agree.

To ensure content validity, the questionnaire items were reviewed through expert judgment involving academics and practitioners with expertise in coastal management and environmental studies. A pilot test was conducted prior to data collection to assess the clarity and relevance of the items. Based on the feedback obtained, minor revisions were made to improve the comprehensibility of the questionnaire. Primary data were collected through direct distribution of questionnaires to selected respondents. Respondents were provided with explanations regarding the purpose of the study and were asked to complete the questionnaire voluntarily. Secondary data were obtained from relevant documents and literature to support the interpretation of findings.

The collected data were analyzed using descriptive and inferential statistical techniques. Descriptive statistics were employed to summarize respondents' characteristics and to present mean scores for each perception dimension. To evaluate whether community perceptions reached a predefined level, a one-sample t-test was applied. The test value was set at 75% of the maximum possible score, which was operationally defined as the minimum threshold representing a "good" or expected level of perception. This threshold was adopted as an evaluative benchmark commonly used in perception-based studies to distinguish between low and satisfactory assessment levels.

The one-sample t-test was conducted using a two-tailed significance level of 0.05 to examine whether the observed mean score differed significantly from the

Vol. 4, No. 2, July-December 2025
DOI: 10.69548/sinthop.v4.i2.71.388-398

predetermined benchmark. Prior to analysis, the aggregated perception scores were treated as interval data, following common practice in social science research using Likert-scale composites. The results of the statistical test were interpreted cautiously, considering the descriptive nature of the study and its contextual limitations.

C. Results and Discussion

1. Results

Respondent Characteristics

This study involved 48 respondents who reside in Tanjung Medang Village and Teluk Rhu Village, North Rupat District. The characteristics of respondents were analyzed to provide a general description of the socio-demographic background of the community involved in the study. These characteristics include gender, age, education level, occupation, and length of residence in the study area. The distribution of respondent characteristics is presented in Table 1.

Table 1.
Characteristics of Respondents in North Rupat District (N = 48)

Characteristics	Category	Frequency (n)	Percentage (%)
Gender	Male	26	54.2
	Female	22	45.8
Age (years)	17–26	8	16.7
	27–34	12	25.0
	35–42	11	22.9
	> 42	17	35.4
Education Level	Elementary School	23	47.9
	Junior High School	14	29.2
	Senior High School	11	22.9
Occupation	Fishermen	18	37.5
	Farmers	12	25.0
	Laborers	10	20.8
	Others	8	16.7
Length of Residence (years)	< 10	6	12.5
	10–26	14	29.2
	> 27	28	58.3

Source: Primary data, processed (2025)

Table 1 shows that the respondents are dominated by male participants (54.2%), most of whom are in the productive age group, particularly those aged over 42 years (35.4%) and 27–34 years (25.0%). In terms of education, the majority of respondents have completed elementary school (47.9%), followed by junior and senior high school graduates. Regarding occupation, most respondents work in the coastal and marine sector, particularly as fishermen and farmers. In addition, more than half of the respondents (58.3%) have lived in the study area for over 27 years, indicating long-term residence in the coastal environment.

Vol. 4, No. 2, July-December 2025
DOI: 10.69548/sinthop.v4.i2.71.388-398

Public Perception of the Existence of Mangroves

This section presents the results of community perceptions regarding the existence of mangrove ecosystems in North Rupat District. Public perception of mangrove existence was measured through three main components, namely mangrove condition/state, benefits of mangroves, and ecological functions of mangroves. The results of respondents' assessments for each component are summarized in Table 2.

Table 2.
Public Perception of the Existence of Mangroves in North Rupat District (N = 48)

Perception Component	Total Score	Category
Mangrove condition/state	1,212	Positive
Benefits of mangroves	622	Positive
Ecological functions of mangroves	659	Positive
Total	2,493	Positive

Source: Primary data, processed (2025)

Table 2 shows that the community's perception of the existence of mangroves in North Rupat District falls within the positive category across all assessed components. The mangrove condition/state component obtained the highest total score (1,212), indicating that respondents generally perceive mangroves as well maintained and still present in their surrounding environment. The perception of mangrove benefits (622) and ecological functions (659) is also categorized as positive, reflecting respondents' recognition of the role of mangroves in supporting coastal ecosystems. The total perception score of 2,493 indicates a positive public perception of mangrove existence in the study area.

Public Perception of Mangrove Management

This section presents the results of community perceptions regarding mangrove management in North Rupat District. Mangrove management in this study was assessed through four components, namely management activities, utilization, preservation, and supervision/monitoring. The total scores and categories for each component are presented in Table 3.

Table 3.
Public Perception of Mangrove Management in North Rupat District (N = 48)

Management Component	Total Score	Category
Activity	651	Positive
Utilization	1,293	Positive
Preservation	789	Positive
Supervision/monitoring	938	Negative
Total	3,671	Pretty good

Source: Primary data, processed (2025)

Table 3 shows that public perceptions of mangrove management vary across components. Respondents' assessments are categorized as positive for activity (651), utilization (1,293), and preservation (789). In contrast, the supervision/monitoring component (938) is categorized as negative, indicating lower community assessment in

Vol. 4, No. 2, July-December 2025
DOI: 10.69548/sinthop.v4.i2.71.388-398

this aspect. Overall, the total score of mangrove management perception is 3,671, which is categorized as pretty good.

Level of Perception Regarding the Existence and Management of Mangroves

The overall level of community perception regarding the existence and management of mangroves in North Rupat District is classified into three categories: high, moderate, and low, as presented in Table 4.

Table 4.
Level of Community Perception Regarding the Existence and Management of Mangroves in North Rupat District (N = 48)

Perception Level	Frequency (n)	Percentage (%)
High	41	85.4
Moderate	5	10.4
Low	2	4.2
Total	48	100.0

Source: Primary data, processed (2025)

Table 4 shows that the majority of respondents have a high level of perception regarding the existence and management of mangroves, with 41 respondents (85.4%) classified in the high category. Meanwhile, 5 respondents (10.4%) fall into the moderate category and 2 respondents (4.2%) are categorized as having a low level of perception.

Level of Knowledge of the Existence and Management of Mangroves

The level of community knowledge regarding the existence and management of mangroves in North Rupat District is classified into three categories: high, moderate, and low. The distribution of respondents based on their knowledge level is presented in Table below:

Table 5.
Level of Community Knowledge of the Existence and Management of Mangroves in North Rupat District (N = 48)

Knowledge Level	Frequency (n)	Percentage (%)
High	42	87.5
Moderate	4	8.3
Low	2	4.2
Total	48	100.0

Source: Primary data, processed (2025)

Table 5 shows that the majority of respondents have a high level of knowledge regarding the existence and management of mangroves, with 42 respondents (87.5%) categorized in the high knowledge group. Meanwhile, 4 respondents (8.3%) are classified as having a moderate level of knowledge, and 2 respondents (4.2%) fall into the low knowledge category.

Factors Influencing Community Perception of Mangroves

The factors influencing community perception of mangroves in North Rupat District were analyzed based on four dimensions, namely knowledge, social, economic, and cultural factors. The results of the analysis for each factor are presented in Table 6.

Vol. 4, No. 2, July-December 2025
DOI: 10.69548/sinthop.v4.i2.71.388-398

Table 6.
Factors Influencing Community Perception of Mangroves in North Rupat District (N = 48)

Influencing Factor	Total Score	Category
Knowledge	2,069	Dominant
Social	294	Not dominant
Economic	192	Not dominant
Cultural	253	Not dominant

Source: Primary data, processed (2025)

Table 6 shows that knowledge is the dominant factor influencing community perception of mangroves, with a total score of 2,069. In contrast, social, economic, and cultural factors obtain lower scores—294, 192, and 253, respectively—and are categorized as not dominant.

Hypothesis Testing (One-Sample t-Test)

The one-sample t-test was used to test whether the average public perception of the existence and management of mangroves differs from a predefined benchmark. The benchmark (test value) was set at 108, representing 75% of the maximum ideal score. The results are presented in Table 7.

Table 7.
Public Perception of the Existence and Management of Mangroves (N = 48)

Test Value	t	df	Sig. (2-tailed)	Mean Difference	75% Confidence Interval of the Difference (Lower)	75% Confidence Interval of the Difference (Upper)
108	9.342	47	.000	20.708	18.13	23.29

Source: Primary data, processed with SPSS (2025)

Table 7 shows that the one-sample t-test yields t = 9.342, df = 47, and Sig. (2-tailed) = .000, indicating that the mean perception score differs significantly from the benchmark value (108). The mean difference is 20.708, which is positive, meaning that the observed mean perception score is higher than the test value. Therefore, the average public perception of the existence and management of mangroves is significantly above the benchmark used in this study.

2. Discussion

A notable finding in this study is the gap between strong appreciation of mangrove existence and weaker confidence in management oversight. Respondents largely recognize mangroves as beneficial and ecologically important, yet supervision and monitoring are perceived as inadequate, pointing to governance capacity rather than ecological awareness as the most critical area for improvement.

The findings indicate that the community in North Rupat District holds a generally positive perception of mangrove existence. The highest score is observed in the indicator of mangrove condition, suggesting that respondents perceive mangroves as still present, identifiable, and functioning as part of their coastal environment. Positive assessments are also reflected in perceptions of mangrove benefits and ecological functions, implying that respondents recognize mangroves' role in supporting coastal stability and ecological

balance. This pattern is consistent with studies emphasizing mangroves as critical coastal buffers and ecosystem support systems in Indonesian coastal settings (Hasidu et al., 2022; Fadhila et al., 2015).

Perceptions of mangrove management, however, are more varied across indicators. Respondents assess management activities, utilization, and preservation positively, indicating acknowledgement of maintenance and rehabilitation efforts and the perceived usefulness of mangroves for local needs. At the same time, supervision and monitoring emerge as the weakest component. This suggests that, from the community's perspective, oversight of utilization practices and protection against potential violations has not been sufficiently effective. Similar challenges have been reported in other coastal areas where weak enforcement capacity and limited local oversight undermine mangrove conservation outcomes (Febryano et al., 2015). In the North Rupat context, this gap plausibly reflects limitations in operational coordination and the absence of consistent monitoring arrangements that involve local stakeholders, which can reduce deterrence and early detection of damaging activities. Therefore, strengthening supervision should be prioritized through clearer governance roles and practical, community-supported monitoring mechanisms.

The factor analysis further indicates that knowledge is the dominant element shaping community perception. This suggests that understanding of mangrove functions, conservation importance, and environmental impacts plays a decisive role in forming positive attitudes toward mangrove existence and management. Meanwhile, social, economic, and cultural factors are not dominant in this study setting. A reasonable reading of this pattern is that mangroves are primarily interpreted through an environmental-function lens rather than as a social institution, cultural asset, or diversified livelihood resource. The relatively low economic contribution may indicate that sustainable livelihood opportunities linked to mangroves (e.g., ecotourism, value-added products, or organized community enterprises) have not been widely recognized or developed, which can limit incentives to shift from extraction-oriented practices toward conservation-based utilization (Rosaliza, 2018).

The one-sample t-test supports the descriptive results by confirming that the overall perception score differs significantly from the operational benchmark used in this study (75% of the maximum ideal score). The positive direction of the difference indicates that the observed mean perception is above the benchmark, suggesting that overall perception has met or exceeded the minimum expected level. Importantly, this inferential result should be interpreted alongside the indicator-level findings, which show that management performance is not uniform across components. Substantively, the results imply that while general perception is favorable, targeted improvement remains necessary in the weakest management dimension, particularly supervision and monitoring.

Several limitations should be noted. The sample is limited to two villages, which restricts generalization beyond the immediate study area. In addition, perception-based measures rely on self-reported responses that may be influenced by social desirability.

Despite these limitations, the findings imply that strengthening education and outreach—given the dominance of knowledge as a shaping factor—should remain a priority, while management improvement should focus on strengthening monitoring, enforcement, and community-based governance arrangements to address the weakest component identified in this study.

D. Conclusion

This study examined public perceptions of mangrove existence and management in Tanjung Medang and Teluk Rhu Villages, North Rupat District, and identified key factors shaping those perceptions. The results show that community perception of mangrove existence is generally positive, reflected in favorable assessments of mangrove condition/state, perceived benefits, and ecological functions. Perceptions of mangrove management are also fairly good, with positive evaluations of management activities, utilization, and preservation. However, supervision/monitoring is perceived as the weakest component, indicating that governance and oversight remain the most critical area requiring improvement.

The level of perception and knowledge among respondents is predominantly high, indicating that awareness and understanding of mangroves are already strong within the study communities. Factor analysis further confirms that knowledge is the dominant factor influencing community perception, while social, economic, and cultural factors are not dominant in this study setting. The one-sample t-test supports these descriptive findings by showing that the overall perception score is significantly above the operational benchmark (75% of the maximum ideal score), suggesting that public perception meets or exceeds the minimum expected level.

Based on these findings, efforts to strengthen mangrove management in North Rupat District should prioritize improving supervision and monitoring mechanisms, alongside sustained education and outreach to maintain and expand community knowledge. Future studies are recommended to include a larger sample and broader geographic coverage to enhance generalizability, and to incorporate additional variables that can better capture the social and economic dynamics shaping participation in mangrove governance.

***

References

Alfiah, F., & Susanti, R. (2023). Modal sosial kelompok dalam pengembangan ekowisata mangrove di Desa Kayu Ara Permai Kecamatan Sungai Apit Kabupaten Siak. *Etnoreflika: Jurnal Sosial dan Budaya, 12*(2), 262–277. https://doi.org/10.33772/etnoreflika.v12i2.2165

Asriwandari, H., et al. (2021). Securing the Zamrud National Park based on the traditional fisherman community. *Sosiohumaniora: Jurnal Ilmu-Ilmu Sosial dan Humaniora, 23*(2), 280–289. https://doi.org/10.24198/sosiohumaniora.v23i2.31933

Fadhila, H., et al. (2015). Nilai manfaat ekonomi ekosistem mangrove di Desa Kartika Jaya Kecamatan Patebon Kabupaten Kendal Jawa Tengah. *Diponegoro Journal of Maquares, 4*(3), 180–187. https://ejournal3.undip.ac.id/index.php/maquares/article/view/9396

Febryano, I. G., Suharjito, D., Darusman, D., Kusmana, C., & Hidayat, A. (2015). Aktor dan relasi kekuasaan dalam pengelolaan mangrove di Kabupaten Pesawaran, Provinsi Lampung, Indonesia. *Jurnal Analisis Kebijakan Kehutanan, 12*(2), 125–142. https://doi.org/10.20886/jakk.2015.12.2.125-142

Hasidu, L. O. A. F., et al. (2022). Struktur komunitas, biomassa permukaan dan status simpanan karbon biru di kawasan mangrove terdegradasi Kabupaten Kolaka. *Journal of Marine Research, 11*(4), 667–675. https://doi.org/10.14710/jmr.v11i4.35058

Amri, K., et al. (2022). Kapasitas kelembagaan dalam pengembangan Kawasan Strategis Pariwisata Nasional (KSPN) di Desa Teluk Rhu Kecamatan Rupat Utara Kabupaten Bengkalis. *Jurnal Niara, 15*(2), 379–387. https://doi.org/10.31849/niara.v15i2.10852

Lisdayanti, E., et al. (2024). Peningkatan peran kelompok perempuan melalui pembibitan mangrove untuk mendukung keberlanjutan ekonomi lokal masyarakat pesisir. *JPM (Jurnal Pemberdayaan Masyarakat), 9*(2), 270–277. https://ejournal.unikama.ac.id/index.php/jpm/article/view/10651

Rom Ali Fikri, M., Sam'un, M., Lestari, Z. A., Rahmawati, T. D., & Triadi. (2023). Pemanfaatan hutan mangrove sebagai sumber pendapatan alternatif bagi masyarakat pesisir di Desa Sukakerta Karawang. *Jurnal Abditani, 6*(1), 6–10. https://abditani.jurnalpertanianunisapalu.com/index.php/abditani/article/view/182

Rosaliza, M. (2018). Akit Tribe and existence of mangrove forest in Berancah Village, Bengkalis, Indonesia. *IOP Conference Series: Earth and Environmental Science, 175*(1), 012060. https://doi.org/10.1088/1755-1315/175/1/012060

Sirait, G., Silaban, I. J. A., & Paiman. (2021). Pengelolaan konservasi hutan mangrove dalam menjaga kelangsungan hidup ekosistem hutan mangrove di Indonesia. Dalam *Prosiding Sixth Postgraduate Bio Expo 2021: Webinar Nasional VII Biologi dan Pembelajarannya* (pp. 213–219).

Suraimah, et al. (2019). Persepsi masyarakat terhadap keberadaan hutan mangrove di Dusun Setingga Asin Desa Sebubus Kecamatan Paloh Kabupaten Sambas. *Jurnal Hutan Lestari, 7*(1), 482–491. https://doi.org/10.26418/jhl.v7i1.32195

Titisari, P. W., Elfis, Hidayat, F., et al. (2024). Bimbingan teknis pengelolaan wisata mangrove berbasis kearifan lokal di Pulau Rupat, Riau. *To Maega: Jurnal Pengabdian Masyarakat, 7*(1), 77–91.

Tokan, K. (2020). Pemanfaatan kawasan hutan bakau sebagai lokasi perumahan di Kabupaten Kotabaru ditinjau dari aspek yuridis. *Al-Adl: Jurnal Hukum, 12*(1), 12. https://doi.org/10.31602/al-adl.v12i1.2597

Yusuf, Y., et al. (2024). Resiliensi usaha makanan olahan berbasis bahan baku lansekap mangrove (Moda souvenir alternatif masyarakat aquatik di Desa Pangkalan Jambi Kecamatan Bukit Batu Kabupaten Bengkalis). *JIIP – Jurnal Ilmiah Ilmu Pendidikan, 7*(1), 297–303. https://doi.org/10.54371/jiip.v7i1.3645