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A study of community readiness for the implementation of the Merah Putih fishing village program based on the principles of the blue economy in Cikiruhwetan village, Banten province

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Abstract. This study evaluates the community readiness for the transfer of the Coastal Village Development Program (KNMP) assets in Cikiruhwetan Village from the perspective of Blue Economy principles. Using the Community Readiness Model (CRM), the research assessed two key dimensions: community knowledge of environmental issues and institutional readiness. Data were collected through in-depth interviews with key informants and analyzed using the anchored rating scale of the CRM. The findings indicate that both dimensions remain in the Not Ready category, with an average readiness score of 3.70, which is 1.30 points below the minimum threshold for conditional asset transfer and 2.30 points below the ideal readiness level. The results reveal that the readiness gap is driven not only by limited environmental knowledge but also by misconceptions regarding ecological impacts and the absence of formalized institutional mechanisms for managing KNMP facilities. Although strong social capital and peer enforcement exist within the community, these capacities have not yet been institutionalized into sustainable governance structures. The study concludes that transferring KNMP assets without addressing the identified readiness gap may compromise program sustainability and undermine the ecological, social, and economic objectives of the Blue Economy. Strengthening environmental literacy and institutional capacity should therefore be prioritized before full asset handover.

Keywords: *Community Readiness Model, Blue Economy, Coastal Community, Institutional Readiness, Environmental Awareness, KNMP Program, Sustainable Coastal Management.*

INTRODUCTION

Sustainable development has positioned the ocean as a strategic resource that provides not only economic value but also ecological and social benefits for millions of coastal communities. The global ocean economy contributes approximately USD 1.5 trillion annually and is projected to double by 2030 through the expansion of fisheries, marine renewable energy, and coastal tourism (World Bank, 2021). As the world's largest archipelagic country, Indonesia possesses enormous maritime potential, with two-thirds of its territory consisting of marine waters and an estimated marine economic value reaching thousands of trillions of rupiah. Consequently, the marine and fisheries sectors are expected to become major contributors to national economic growth (Bappenas, 2019). Nevertheless, despite these abundant resources, Indonesian fishers remain among the least prosperous occupational groups. Structural challenges, including seasonal dependence, limited access to capital, inadequate infrastructure, and unfavorable Fishermen's Terms of Trade (NTN), continue to hinder their welfare (Satria and Adhuri, 2010). This paradox has encouraged a transition from conventional extractive development toward a more sustainable and integrated development paradigm.

The Blue Economy has emerged as an alternative framework that promotes efficient, regenerative, and sustainable utilization of marine resources. Originally introduced by Gunter Pauli (2010), the concept advocates economic systems that imitate natural ecosystems by maximizing resource efficiency while maintaining environmental sustainability. The World Bank (2017) further defines the Blue Economy as the sustainable use of ocean resources to promote economic growth, improve livelihoods, create employment opportunities, and preserve marine ecosystem health. Likewise, Voyer et al. (2018) emphasize that the Blue Economy is

built upon three inseparable pillars: ecological sustainability, social inclusiveness, and economic innovation.

In response to the Sustainable Development Goals (SDGs), particularly SDG 14 (Life Below Water), Indonesia introduced the Kampung Nelayan Merah Putih (KNMP) Program in 2025 as one of its flagship Blue Economy initiatives (KKP, 2025). The program seeks to transform traditional fishing villages into productive, modern, and competitive coastal economic centers through the construction of integrated infrastructure, including fish landing shelters, portable ice plants, cold storage facilities, docking shelters, workshops, fishermen halls, training centers, management offices, supply kiosks, and sanitation facilities. Beyond physical development, KNMP is intended to strengthen local institutions, improve environmental management, and transform community mindsets toward sustainable fisheries (KKP, 2025). However, the successful implementation of such a comprehensive program depends not only on infrastructure availability but also on the readiness of local communities to manage and sustain these assets independently.

This issue is commonly described as the readiness gap, referring to the discrepancy between the assumptions embedded in program design and the actual preparedness of beneficiary communities. According to the Community Readiness Model developed by Plested et al. (2006), community readiness represents a continuum of knowledge, leadership, and resource capacity rather than a simple ready-or-not condition. Previous studies demonstrate that structured community assistance significantly improves readiness before project implementation (Nugraha, 2018), while differences in readiness among stakeholders may reduce program effectiveness if left unmanaged (Safira et al., 2022). Furthermore, Purwanti et al. (2022) argue that many government assistance programs for small-scale fishers fail because they prioritize infrastructure over human capacity development. Without adequate preparedness, Blue Economy initiatives may generate unintended environmental and institutional consequences, such as poorly managed hazardous waste, underutilized public facilities, and ineffective training programs (Bennett et al., 2021).

Previous studies have consistently demonstrated the importance of community readiness in ensuring the success of development programs. Kurniati et al. (2024) found that the readiness level of the Teluk Awur community for mangrove ecotourism development remained low due to limited community participation, inadequate dissemination of information, insufficient training, and the absence of local management institutions. Similarly, Nugraha et al. (2017) reported that community readiness during the pre-construction phase of a floating hall was at the preplanning stage and only progressed to the initiation stage after the facility was constructed, highlighting the importance of structured assistance before project implementation. Safira et al. (2022) further revealed disparities in readiness between local communities and village governments during the Patimban Port development, indicating that differences in stakeholder preparedness must be managed to ensure equitable program outcomes. However, these studies primarily assessed readiness in general community development, ecotourism, or infrastructure projects without explicitly examining readiness from a Blue Economy perspective or measuring the readiness gap between actual community capacity and the assumptions embedded in program design. Moreover, no previous study has investigated the pre-operational phase of the Kampung Nelayan Merah Putih (KNMP) Program, when all infrastructure has been completed but has not yet been officially transferred to the community.

Therefore, this study offers a significant novelty by integrating Blue Economy principles with the Community Readiness Model (CRM) to diagnose community knowledge and institutional readiness, quantify the readiness gap, and provide baseline evidence for designing

targeted interventions before full program implementation, thereby reducing the risk of long-term program failure.

This study was conducted in Cikiruhwetan Village, Cikeusik District, Pandeglang Regency, Banten Province, the only village in Banten selected to receive the complete KNMP infrastructure package. At the time of the research, all eleven facilities had been completed but had not yet been officially transferred or operated, providing a unique opportunity to conduct a pre-operational diagnostic assessment. Therefore, this research aims to analyze the implementation of the KNMP Program from the perspective of Blue Economy principles, evaluate the knowledge and institutional readiness of the fishing community, identify the readiness gap between actual community capacity and the assumptions underlying the program design, and formulate strategic recommendations using the Community Readiness Model (CRM) and readiness gap analysis before the program enters full operational implementation.

METHOD

Research Type, Location, and Time

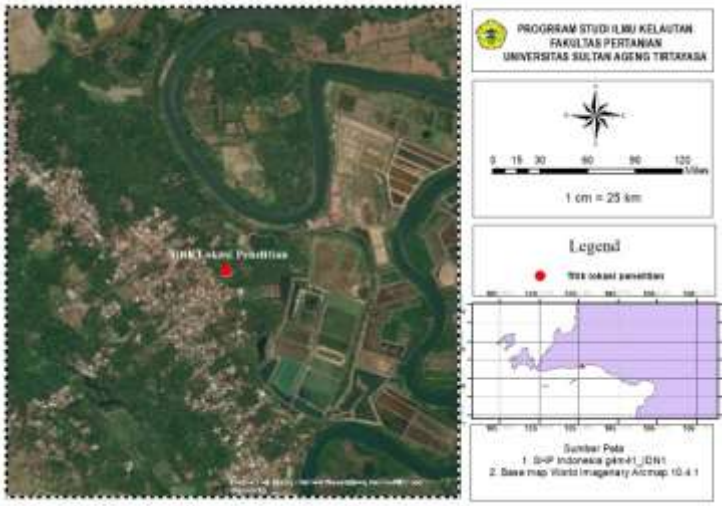


Figure 1. Map of the Location of Cikiruhwetan Village

This study was conducted in Cikiruhwetan Village, Cikeusik District, Pandeglang Regency, Banten Province, the only village in Banten selected to receive the complete Kampung Nelayan Merah Putih (KNMP) Program package. Data collection was carried out from December 2025 to February 2026, coinciding with the completion of all physical infrastructure and the pre-handover phase before the facilities became operational, making this research a highly relevant pre-operational diagnostic study. A qualitative descriptive-diagnostic approach was employed because it enables a holistic understanding of community readiness in its natural setting (Moha, 2019). Although qualitative in nature, this study applies the Community Readiness Model (CRM), which produces standardized readiness scores ranging from 1 to 9 through Anchored Rating Scales. These scores serve as coding tools that summarize qualitative interview data into comparable readiness levels rather than replacing the qualitative narratives.

Readiness Gap Measurement Procedure

The readiness gap analysis was developed by comparing the ideal assumptions underlying the KNMP Program with the actual readiness of the community measured using an adapted Community Readiness Model (CRM) (Plested et al., 2006). The assessment focuses on

two critical dimensions: knowledge readiness, which evaluates community understanding of ecological assets, environmental risks, and proper operational procedures, and institutional readiness, which measures the capacity of local organizations (KUB/KDMP) to establish regulations, assign responsibilities, enforce ecological sanctions, and manage KNMP assets independently. Readiness was assessed using Anchored Rating Scales with scores ranging from 1 (No Awareness) to 9 (High Level of Community Ownership). Considering that this research was conducted during the pre-operational stage, CRM was conceptually adapted by establishing a minimum readiness threshold of 5 (Pre-Planning) and an ideal threshold of 6 (Initiation) before asset handover. The readiness gap was calculated using the formula Gap = Ideal Threshold (Score 6) – Actual Community Score, with results categorized into four levels: Optimal Readiness (≥6.0), Transition Zone (5.0–5.9), Moderate Gap (3.0–4.9), and High Gap (<3.0), each accompanied by corresponding recommendations regarding asset handover and community assistance.

Research Informants

Informants were selected through purposive sampling based on the Community Readiness Model protocol (Plested et al., 2006) and previous readiness studies (Safira et al., 2022; Nugraha, 2018). Three key categories of informants were included: village government representatives (1–2 persons) to provide information on program implementation and institutional readiness from the administrative perspective; KNMP management representatives or KDMP administrators (2–3 persons) to assess institutional capacity, technical knowledge, and asset management readiness; and senior active fishers (1–2 persons) with at least five years of fishing experience to evaluate ecological knowledge and community perspectives regarding environmental management. The limited number of informants reflects the qualitative principle of prioritizing data depth over quantity, while data collection continued until data saturation was achieved (Miles et al., 2020).

Data Collection and Trustworthiness

Primary data were collected through semi-structured in-depth interviews, non-participant observation, and document analysis using purposive sampling. Interviews explored participants' perceptions, experiences, and understanding of the Blue Economy principles and KNMP implementation, while observations focused on ecological infrastructure, including docking shelters, portable ice plants, workshops, and environmental management practices (Cheek et al., 2021). Document analysis was conducted to compare the intended program design with actual field conditions (O'Brien & Møller, 2022). To ensure research trustworthiness, this study adopted the qualitative trustworthiness criteria proposed by Korstjens and Moser (2018) by applying source triangulation, technique triangulation, and theory triangulation, allowing information from multiple informants and different data collection methods to be systematically compared and verified.

Data Analysis

Data were analyzed continuously throughout the research using the Interactive Model of Miles, Huberman, and Saldaña (2020), consisting of four stages: data collection, data condensation, data display, and conclusion drawing/verification. During data condensation, thematic analysis was conducted following Braun and Clarke (2021) through a hybrid coding approach combining deductive coding based on the Community Readiness Model dimensions (e.g., knowledge readiness and institutional readiness) with inductive coding that allowed new themes to emerge from the field data. The condensed findings were subsequently presented in matrices, structured narratives, and comparative displays to facilitate interpretation before

conclusions were continuously verified against additional evidence until robust findings capable of addressing the research objectives were achieved..

RESULTS AND DISCUSSION

Result

Summary of CRM Scores by Respondent

Before addressing each research question, an overall summary of community readiness is presented based on the CRM scores of the eight respondents. This overview provides an initial picture of readiness levels across respondent groups, highlights variations within each group, and identifies general patterns that are discussed in greater detail in the following sections.

Table 1. CRM Scores of Informants

Guideline	Code	Name	Experience	Knowledge	Institutional	Average
A	INF-A1	Riki Repangga	Village Secretary, 10 yrs	3.33	3.5	3.41
B	INF-B1	Yusup	KDMP Chairperson, 1 yr	3.75	3.83	3.79
B	INF-B2	Teti	KDMP Treasurer, 1 yr	3.88	4.33	4.11
C	INF-C1	Casmi	Fisherman, 35 yrs, KUB	2.83	3.75	3.29
C	INF-C2	Rismon	Fisherman, 30 yrs, KUB+KDMP	4.0	4.75	4.38
C	INF-C3	Joko	Fisherman, 28 yrs, KUB	2.83	4.0	3.42
C	INF-C4	Risman	Fisherman, 20 yrs, Non-KUB	3.0	3.5	3.25
C	INF-C5	Surni	Fisherman, 26 yrs, KUB+KDMP	3.5	4.5	4.0

Table 1 presents several important patterns emerge from the findings. First, none of the respondents achieved an average ecological knowledge score above the minimum readiness threshold of 5.0, indicating that the community lacks sufficient technical understanding to manage KNMP infrastructure in an environmentally responsible manner. Second, only Rismon (INF-C2) exceeded the institutional readiness threshold due to strong local norms and effective peer enforcement. Third, the notable difference between Yusup (3.79) and Teti (4.11), despite serving within the same management organization, suggests that institutional capacity and knowledge are unevenly distributed among committee members. Finally, although Guideline C recorded the lowest ecological knowledge score (3.23), it achieved a relatively high institutional readiness score (4.10), reflecting the strong influence of informal social norms and peer enforcement among fishermen despite limited technical understanding.

The KNMP Program from the Blue Economy Perspective

The first research question examined how the implementation of the Coastal Fishing Village Development Program (KNMP) in Cikiruhwetan Village aligns with the principles of the Blue Economy, particularly its ecological, economic, and social dimensions. To address this question, the implementation of the program was compared with the three Blue Economy pillars proposed by Voyer et al. (2018).

The physical design of the KNMP Program incorporates infrastructure representing all three Blue Economy pillars. The ecological pillar is reflected in the boat repair workshop, docking shelter, fish landing shelter, and public sanitation facilities, which are intended to reduce environmental pollution associated with fishing activities. The economic pillar is

represented by the portable ice plant, portable cold storage, cool-box shelter, and fisheries supply kiosk, which aim to strengthen the fisheries value chain. Meanwhile, the management office, fishermen's hall, and training center represent the social pillar by supporting community organization and institutional development (KKP, 2025).

Although the program design encompasses all three Blue Economy dimensions, field findings indicate that implementation has not yet achieved balanced realization across these pillars.

Within the ecological pillar, all interviewed fishermen reported that they had never received technical information regarding the environmental functions or waste management procedures associated with the newly constructed infrastructure. This finding was confirmed by the Village Secretary, who stated:

"*Formal socialization was conducted three times by the Provincial Marine Affairs Office, but it only introduced the planned KNMP development in general terms. No detailed explanation of the program was provided. Technical information regarding the function of each facility was delivered only to the Village Head at the central meeting and was never disseminated to the wider community*."

Consequently, all fishermen respondents confirmed that they had never received explanations regarding the ecological purpose of the KNMP facilities despite their direct involvement as future users (all INF-C, D2 = No).

Within the social pillar, the Fishermen's Hall and Training Center had been utilized only once for an engine maintenance training session conducted by an external equipment manufacturer (Yamaha). No environmental management training had been organized, and at the time of data collection, the Management Office had not yet appointed permanent operational personnel. These findings indicate that institutional capacity-building activities remained limited despite the availability of supporting facilities.

Within the economic pillar, respondents identified several technical constraints affecting infrastructure readiness. According to the Village Secretary, the portable ice plant experienced mechanical failure during its initial operational trial, while the ice blocks produced (10 × 70 cm) did not meet market requirements. In addition, two senior fishermen, Casmi and Rismon, independently questioned the quality of construction materials used in several facilities.

"*Why weren't the construction materials adjusted to coastal conditions? Steel structures rust quickly in coastal environments. We live here, so we understand these conditions better*."

The same concern was also expressed by the Village Secretary. The consistency of these observations across both government representatives and fishermen indicates that concerns regarding infrastructure quality were shared among different respondent groups.

Field findings further revealed limited community participation throughout program planning and implementation. None of the eight respondents reported meaningful involvement during the planning stage. Village officials indicated that they were not provided with detailed construction plans by contractors (Q7 Riki). Management committee members explained that organizational appointments were determined through directives from the central government rather than through community-based selection processes (Q1 Yusup and Teti). Fishermen also stated that most information regarding the program was obtained informally through word-of-mouth communication rather than official consultation processes.

Overall, the findings demonstrate that while the KNMP Program incorporates the three core dimensions of the Blue Economy at the design level, implementation in Cikiruhwetan Village has primarily focused on infrastructure development, with relatively limited

dissemination of ecological knowledge, institutional capacity-building, and community participation.

Community Ecological Knowledge Readiness

The second research question examined the level of ecological knowledge readiness among fishermen in Cikiruhwetan Village for implementing the KNMP Program based on Blue Economy principles. The Community Readiness Model (CRM) assessment produced an average ecological knowledge score of 3.51, corresponding to the Vague Awareness stage, with a readiness gap of 2.49 compared with the ideal readiness score of 6 (Initiation).

The assessment revealed that ecological misconceptions were consistently observed across several ecological knowledge indicators. Four of the seven assessed sub-dimensions received a score of 3 (Denial), indicating that respondents generally perceived environmentally harmful practices as acceptable or normal.

The most consistent finding concerned the management of organic waste generated from the Fish Landing Shelter. With the exception of Rismon, all respondents stated that disposing of fish entrails, blood, and wastewater directly into the sea was considered a common and acceptable practice. One KDMP management member explained:

"*Even before the KNMP Program, the community always disposed of fish entrails into the sea. We don't think it is a problem because it also becomes food for marine animals*."

Similar responses were reported by nearly all interviewed fishermen. This practice contrasts with scientific evidence showing that continuous discharge of large quantities of organic waste into enclosed or semi-enclosed coastal waters contributes to eutrophication, reduces dissolved oxygen concentrations, and may eventually threaten fish populations (UNEP, 2022).

Comparable perceptions were also identified regarding the disposal of packaging waste from the Fisheries Supply Kiosk. All fishermen respondents reported that burning used packaging materials was the usual disposal method. Similar findings emerged regarding the use of the public sanitation facility located close to the shoreline. Casmi (INF-C1, 35 years of fishing experience) stated:

"*I don't think it's a problem because people have always defecated along the shoreline. As for the environmental impact, I have never seen any*."

A different response was observed from Rismon (INF-C2), who was the only fisherman respondent demonstrating higher ecological awareness across several indicators. Unlike the other respondents, he stated that fish waste should first be collected before disposal and emphasized that used engine oil should never be discharged into the sea. Instead, he reported storing used oil in plastic containers before selling it to licensed waste collectors.

"*Used engine oil should never be disposed of carelessly, especially into the sea. I collect it in jerry cans and sell it to waste collectors*."

Rismon obtained the highest individual ecological knowledge score (4.00) among all fishermen respondents, whereas the remaining respondents consistently demonstrated lower levels of ecological knowledge across multiple assessment indicators.

Community Institutional Readiness

The third research question examined the readiness of local institutions to independently and sustainably manage KNMP Program assets. Based on the Community Readiness Model (CRM), the institutional readiness score was 3.89, corresponding to the Vague Awareness stage

and approaching Pre-Planning, with a readiness gap of 2.11 from the ideal score of 6. One notable finding was the variation in institutional capacity between two members of the same KDMP management team. Yusup, the KDMP Chairperson, obtained an institutional readiness score of 3.83, whereas Teti, the Treasurer, achieved a higher score of 4.33, indicating differences in institutional knowledge and management capacity within the organization, as presented in Table 2.

Table 2. Comparison of Institutional Scores: Yusup (INF-B1) and Teti (INF-B2)

Sub-dimension	Yusup	Teti	Diff.	Interpretation
KNMP-specific Written Rules (D1)	4.0	5.0	+1.0	Teti knows the bylaws and planned KNMP rules.
Role Allocation / PIC (D2)	3.0	5.0	+2.0	PICs identified; Yusup unaware.
Fishermen Hall Forum (D3)	5.0	4.0	-1.0	Yusup gave more concrete details.
Ecological Sanctions (D4)	3.0	3.0	0	No formal sanctions.
Fees / Financial Independence (D5)	5.0	6.0	+1.0	Teti gave more complete information.
Decision Independence (D6)	3.0	3.0	0	Still dependent on MMAF.
Institutional Average	3.83	4.33	+0.50	Teti showed stronger institutional capacity.

The most notable institutional difference was observed in the role allocation sub-dimension (D2). Yusup stated that "*the role distribution has not yet been established; there are only prospective members and nothing has been officially assigned*," whereas Teti explained that "*a person in charge (PIC) has already been designated for each KNMP infrastructure, although the arrangement is still managed internally by KDMP and will only be formally legalized after the official handover.*" This discrepancy indicates that institutional knowledge and management capacity are unevenly distributed within the KDMP management team. A further inconsistency was found in the E3 checklist. Yusup answered "Yes" when asked whether he understood that organic waste could reduce dissolved oxygen (DO), yet during the interview he stated that disposing of fish waste directly into the sea "*is not a problem*." In contrast, Teti answered "No" on the checklist, and her response was consistent with her interview, suggesting greater internal consistency in her understanding.

An interesting finding was that the average institutional readiness score of the fishermen group (Guideline C = 4.10) exceeded that of the village government officials (Guideline A = 3.50), despite fishermen having more limited access to official program information. This higher score was primarily associated with strong local norms (average 4.3) and peer enforcement (average 5.7). All five fishermen stated that they would remind fellow fishermen not to dispose of waste improperly within the KNMP area, while three respondents—Casmi, Rismon, and Joko—achieved a score of 6 (Initiation) for this sub-dimension. Casmi explained, "We *usually remind each other whenever someone throws garbage carelessly, especially used engine oil*.". These findings indicate the presence of strong informal social control within the fishing community, consistent with the importance of local social capital highlighted by Adnan et al. (2023).

Despite these positive findings, several fundamental institutional limitations remain. KDMP was established only one year ago through a central government initiative, without an organic community formation process, previous experience in collective asset management, or established institutional regulations. At present, all major management decisions remain fully dependent on the Ministry of Marine Affairs and Fisheries because the KNMP assets have not

yet been officially transferred. Financial independence is also still limited, relying only on a monthly membership contribution of IDR 10,000 and a one-time registration fee of IDR 100,000. Although these contributions are insufficient to support the operation of major facilities such as the Portable Cold Storage and Portable Ice Plant, they represent an initial foundation for developing a sustainable community-based financing mechanism.

Readiness Gap Analysis

The fourth research question examined the magnitude of the readiness gap between the community's actual readiness and the ideal readiness assumed in the KNMP Program design, as well as its implications for program sustainability. Table 3 presents a comprehensive calculation of the readiness gap based on the community's observed CRM scores.

Table 3. Overall Readiness Gap

Dimension	Ideal	Actual A	Actual B	Actual C	Community	Gap	Category
Ecological Knowledge	6.0	3.5	3.81	3.23	3.51	2.49	Not Ready
Institutional Readiness	6.0	3.5	4.08	4.1	3.89	2.11	Not Ready
Overall Average	6.0	3.5	3.95	3.67	3.7	2.3	Not Ready

Both dimensions fell into the Not Ready category (gap of 1.1–3.0), indicating that the community's readiness remained below the minimum threshold (5.0) required for conditional asset transfer. With an average readiness score of 3.70, Cikiruhwetan Village was 1.30 points below the minimum threshold and 2.30 points below the ideal score. This suggests that transferring KNMP assets under current conditions could result in underutilized infrastructure, inadequate maintenance leading to premature asset deterioration, or conflicts over asset management.

The identified readiness gap reflects more than an information deficit. As discussed previously, most knowledge gaps stemmed from active misconceptions rather than a lack of information, indicating that effective interventions should focus on changing entrenched beliefs rather than simply providing additional information. Similarly, the institutional gap was not caused by weak social capacity, as peer enforcement was already strong, but by the absence of formal institutional structures capable of sustaining collective management independently of external facilitators. Because this social foundation already exists, strengthening institutional formalization is likely to be more feasible than building new capacity from the ground up.

The 2.30-point readiness gap has direct implications for the sustainability of the KNMP Program. From a Blue Economy perspective, sustainable outcomes require the simultaneous integration of economic, ecological, and social pillars. If assets are transferred before the readiness gap is reduced, ecological infrastructure may fail to achieve its intended environmental benefits. For example, repair workshops and docking shelters without hazardous waste management procedures could create new pollution sources, fish landing shelters without proper organic waste management could intensify eutrophication, and public toilets without corresponding behavioral change may remain underutilized. Consequently, insufficient community readiness risks undermining the long-term sustainability of the KNMP Program despite substantial infrastructure investment.

Discussion

The findings demonstrate that the implementation readiness of the Cikiruhwetan fishing community remains insufficient for independent management of the Coastal Fishing Village

Development Program (KNMP). Although the government has successfully delivered physical infrastructure, both ecological knowledge and institutional readiness remain below the minimum threshold required for sustainable program implementation.

The ecological readiness findings support previous studies emphasizing that environmental infrastructure cannot produce meaningful ecological outcomes without adequate environmental literacy among local communities. As argued by Voyer et al. (2018), the Blue Economy requires the simultaneous integration of economic, environmental, and social dimensions. Investment in infrastructure alone is insufficient when ecological understanding among beneficiaries remains limited. The present findings reinforce this perspective by demonstrating that misconceptions regarding marine pollution and coastal ecosystems continue to influence fishermen's environmental behavior despite the existence of supporting facilities.

Furthermore, the study indicates that the observed ecological readiness gap reflects active denial rather than simple information deficiency. This distinction is theoretically important because communities holding incorrect but strongly established beliefs require different intervention strategies than communities lacking information altogether. Educational programs should therefore prioritize participatory learning, practical demonstrations, and experiential activities that encourage fishermen to reconsider existing assumptions instead of relying solely on conventional information dissemination.

Institutionally, the findings present a more optimistic picture. Despite the overall institutional readiness score remaining below the required threshold, fishermen demonstrated remarkably strong informal social control through peer enforcement. Every interviewed fisherman expressed willingness to remind fellow community members not to dispose of waste improperly, including hazardous waste generated from boat maintenance. One participant explained:

"We usually remind each other. It has become normal for us to warn anyone who throws garbage carelessly, especially used engine oil."

This quotation illustrates that environmental responsibility has already begun to develop as an informal community norm. Such findings are consistent with Adnan et al. (2023), who argue that locally embedded social capital represents one of the strongest determinants of successful community empowerment programs in coastal areas. Rather than creating institutional capacity from the beginning, policymakers can build upon these existing informal norms by formalizing them into community regulations, monitoring mechanisms, and locally agreed sanctions.

Nevertheless, the study also highlights an important structural weakness. KDMP remains a newly established organization formed primarily through a top-down governmental initiative. Consequently, the organization has not yet accumulated sufficient experience in collective asset management, rule enforcement, financial administration, or independent decision-making. Current operations continue to rely heavily on guidance from the Ministry of Marine Affairs and Fisheries, indicating limited institutional autonomy.

The readiness gap identified in this study therefore represents not only a measurement of current capacity but also a practical indicator of implementation risk. If infrastructure management responsibilities are transferred before the identified gaps are reduced, program sustainability may be compromised through infrastructure underutilization, accelerated facility deterioration due to inadequate maintenance, or the emergence of conflicts over asset management. These risks are consistent with the implementation failures described by Pratiwi (2020) concerning community-based infrastructure programs lacking adequate institutional readiness.

Overall, the findings emphasize that achieving sustainable Blue Economy outcomes requires more than infrastructure investment. Successful implementation depends equally on strengthening ecological literacy, institutional governance, and community capacity before transferring program ownership. Closing the readiness gap through environmental education, institutional strengthening, and gradual capacity-building should therefore become a strategic priority to ensure that the KNMP Program delivers its intended ecological, economic, and social benefits over the long term.

CONCLUSIONS AND SUGGESTIONS

Conclusion

The Kampung Nelayan Merah Putih (KNMP) Program in Cikiruhwetan Village has successfully established 11 integrated infrastructures that structurally support the economic, ecological, and social pillars of the Blue Economy. However, during the pre-operational phase, these pillars have not yet been effectively integrated because local governance capacity remains insufficient. Community knowledge readiness is still low, with an average dimension score below 4.5, particularly regarding ecological management practices such as hazardous (B3) waste management in workshop and docking shelter areas, which is further complicated by community denial of coastal pollution risks. Likewise, the Village Cooperative (KDMP) and Fishers' Business Groups (KUB) have not reached the minimum institutional readiness threshold, as strong informal social capital has not yet been translated into formal standard operating procedures, clear managerial responsibilities, or sustainable financial regulations. Overall, the community achieved an average readiness score of 3.70, indicating a Moderate Readiness Gap (Not Ready) that remains 1.30 points below the minimum readiness threshold of 5.0. These findings suggest that transferring KNMP assets without first strengthening community capacity could result in systemic program failure, rapid infrastructure deterioration, and unintended environmental externalities.

Suggestion

To reduce the identified readiness gap and improve the long-term sustainability of the KNMP Program, it is recommended that the Ministry of Marine Affairs and Fisheries and relevant provincial agencies postpone the full transfer of program assets and implement a guided transition period accompanied by technical training, particularly on hazardous (B3) waste management and environmental risk awareness. The KDMP and KUB should formalize existing informal social capital into legally recognized standard operating procedures, establish clear managerial roles, and develop transparent maintenance funding mechanisms. The Cikiruhwetan Village Government should strengthen institutional legitimacy by issuing a Village Regulation (Perdes) that formally authorizes the KDMP to manage KNMP assets and enforce community-agreed socio-ecological regulations. Future research is recommended to conduct a longitudinal post-operational study to evaluate changes in community readiness over time and assess the effectiveness of capacity-building interventions in closing the readiness gap.

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