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Article

Developing a Protection Design Framework for the Bajo Tribe's Living Space in Indonesia's Coastal Areas: An Adaptation from Funaya Japan

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Abstract: This study presents an adaptive, inclusive, and sustainable framework for the design protection and development of Bajo community living spaces in Indonesian waters, inspired by the Funaya model in Japan. The framework was developed using the Regulatory Impact Assessment (RIA) method, integrating the principles of rights, restrictions, and responsibilities (RRRs) to address challenges in coastal management, cultural preservation, and economic sustainability. Key strategies include design protection based on zonation and space, the application of RRRs principles, and adaptation of the Funaya model. This approach emphasizes participatory governance, legal certainty, and community empowerment through training and incentives. The Funaya adaptation integrates the preservation of traditional houses and tourism development to enhance cultural and economic resilience. While its implementation requires significant resources, the expected benefits include environmental sustainability, cultural preservation, and improved livelihoods for the Bajo people. This framework serves as a replicable model for integrated coastal management across Indonesia.

Keywords: adaptive design; Bajo Community; Funaya adaptation; inclusive development; Regulatory Impact Assessment (RIA); Rights Restrictions Responsibilities (RRRs); sustainable coastal management

1. Introduction

The Bajo community have a deep connection with marine ecosystem. This community is spread across various coastal regions of Indonesia, such as Sulawesi and Nusa Tenggara, with approximately 75% of their economic activities depending on the sea [1]. Prior to Indonesia's independence, indigenous, local, and traditional communities had long occupied coastal areas for generations. They shifted from one place to another in search of new food sources or to avoid seasonal and climatic changes [2]. With the development of industrialization, they started to settle for longer periods in coastal areas. As revealed in various coastal policy studies [3,4], however, the lack of integration between the needs of traditional communities and national frameworks has brought about significant challenges in coastal area management. This necessitates a more flexible and collaborative approach, especially in ensuring fair legal access for indigenous communities such as the Bajo people. National policy developments often fail to fully accommodate their needs, particularly regarding land ownership recognition in aquatic areas.

Indigenous communities comprise four essential elements: a group of people, a living territory, cultural traditions, and social structure. These elements are essential in understanding their history, identity, and challenges in contemporary society [5]. Hence, in the context of fulfilling the livelihood needs of indigenous communities inhabiting coastal waters, the state's commitment to guaranteeing the availability of habitable settlements is indispensable. This is in line with Article 33, paragraph (3) and Article 27, paragraph (2) of the 1945 Constitution, which state that natural resources belong to the state and must be utilized for the people's welfare, ensuring that every citizen has access to

employment and a decent livelihood [6]. Unlike terrestrial land, coastal waters and the sea are regarded as common rights or communal property [7]. If owned by an individual or by a legal entity, it would mean reducing the state's control over coastal waters. This issue has been a public concern, resulting in Constitutional Court ruling No. 3/PUU-VIII/2010, which declared that coastal water concession rights (HP3) are in contradiction to the 1945 Constitution, as they dwindle state control over coastal area management. In accordance with this, regulations have been established to administer coastal and marine areas, as outlined in Ministerial Regulation ATR/KBPN No. 17/2016, Article 4 [8], Government Regulation No. 18/2021, Article 65, paragraph 2 [9], and Ministerial Regulation ATR/KBPN No. 18/2021, Articles 197 and 198 [10].

Another requirement incumbent to be fulfilled is obtaining a permit for spatial utilization of marine areas (KKPRL) from the central government, which is responsible for marine and fisheries affairs, based on the local government proposals for settlements in coastal waters that have been inhabited for five to twenty consecutive years. This aims at anticipating the migration of local communities from land to coastal water settlements, requiring coordination, regulation, and strict requirements supported by oversight mechanisms [11]. However, due to the absence of standardized regulatory frameworks as a guiding principle for the Bajo people who have lived in aquatic environments for centuries, it creates various challenges in managing their living space. These complexities include legal aspects, resource governance, and the fulfillment of adequate housing needs. Therefore, a comprehensive approach is paramount to develop a protective framework for the Bajo people's living space in aquatic areas. This approach aspires to ensure ecosystem sustainability, equitable access for local communities, and simplified bureaucratic processes in managing their living space.

The need for an innovative approach is becoming increasingly urgent. Theoretical approaches such as Adaptive Governance and Co-Management provide a foundation for a more integrative policy framework. Adaptive Governance emphasizes flexibility in resource management through collaboration between the government, local communities, and the private sector. This approach is particularly relevant in addressing climate change challenges, such as the rising of sea levels and coastal habitat degradation, which necessitate dynamic and adaptive management [12]. Not only does this model enable quick responses to environmental changes but it also allows space for local innovation in resource management [3]. It has been successfully implemented in Australia to maintain the Great Barrier Reef, where cross-stakeholder collaboration balances ecosystem conservation with economic activities such as tourism and sustainable fisheries [13].

Co-Management, on the other hand, focuses on integrating active community participation with policy support from the government. This approach has proven effective in Canada, where indigenous communities have been granted legal rights to manage fisheries using their traditional knowledge. Additionally, co-management enables communities to take a more significant role in decision-making, improving resource management efficiency and reducing conflicts [14]. The outcome not only enhances the sustainability of marine resources but also strengthens local community independence [15]. This approach reduces conflicts between the government and local communities by establishing clear collaboration mechanisms. Both of these approaches serve as the foundation for the Regulatory Impact Assessment (RIA) framework, which is used to evaluate existing policies and formulate empirically based recommendations, providing a structured approach to developing comprehensive policy formulations. As outlined by the Organisation for Economic Co-operation and Development, RIA ensures that the impact of each policy option is thoroughly analyzed, leading to more effective and practically implementable policies [16].

This study is, therefore, very ideal in employing the RIA method to evaluate relevant existing policies and further design a protection framework based on RRRs. This approach involves thematic analysis of primary data from interviews and Focus Group Discussions (FGD) with stakeholders, NGOs, and academics, as well as secondary data analysis from literature studies related to coastal area management policies in Indonesia. Furthermore, this study employs a comparative analysis of the Funaya model in Japan. The Funaya model has demonstrated success in integrating coastal life

with legal recognition through exclusive zoning and collaboration between the government and local communities [17]. The protection framework developed in this study aims at ensuring the formal recognition of community rights, implementing necessary restrictions to protect ecosystems, and delegating management responsibilities to local communities. In addition to simplifying bureaucracy, this design supports marine ecosystem sustainability through exclusive zoning and community-based conservation. The proposed cross-stakeholder collaboration in this study is also expected to enhance community participation and ensure long-term sustainability. With these expected outcomes, this research not only offers practical solutions but also serves as an academic and policy reference for more adaptive and inclusive coastal area management.

This paper is the final chapter of a series of papers developed from a set of big ideas. Each paper contributes to a deeper understanding of legal and governance challenges faced by coastal communities, particularly the Bajo and Bajau peoples, and proposes solutions for sustainable and equitable resource management. First paper identifies critical weaknesses in the existing legal framework, emphasizing the lack of recognition for water-based settlements, conflicting regulations, and the socio-economic risks posed by coastal commercialization [18]. While, the second one is builds upon these findings by applying the Rights, Restrictions, and Responsibilities (RRRs) framework, demonstrating its potential to enhance compliance with resource management policies while balancing environmental sustainability and indigenous rights [19].

Building on these foundations, this paper employs the Regulatory Impact Assessment (RIA) method to evaluate current policies and design a protection framework rooted in the RRRs approach. By synthesizing empirical data, stakeholder insights, and comparative models, such as Japan's Funaya model, this study aims to establish a governance model that formalizes community rights, optimizes regulatory mechanisms, and strengthens community participation in conservation efforts. The proposed framework not only simplifies bureaucratic processes but also fosters long-term sustainability through exclusive zoning and community-based conservation. Through this approach, this paper provides both theoretical advancements and practical policy recommendations, serving as a comprehensive reference for more adaptive and inclusive coastal area management.

2. Materials and Methods

This research is designed based on an analysis of previous findings that highlight the importance of regulation as a policy tool to improve social and economic well-being while ensuring sustainable natural resource management [20]. The study claims that regulations play a vital role in supporting efficient and inclusive development and reducing poverty by ensuring a more equitable distribution of benefits. Hence, effective regulations must be designed to achieve strategic objectives efficiently, considering both positive and negative impacts, including social, economic, and environmental consequences. In this context, a qualitative descriptive approach is applied to integrate the regulatory framework as the foundation for developing a protection and management design for the Bajo community's living space in aquatic areas. Regulations are proposed as an instrument to strengthen the implementation of the protection design, according to the principles of transparency, accountability, and consistency in decision-making [16,21]. Consequently, this research is tested using the Regulatory Impact Assessment (RIA) approach, a systematic analysis method to critically evaluate the impact of proposed policy or regulatory options. This approach is designed to improve the quality of policy by providing relevant and accurate information to decision-makers. By evaluating the potential impacts of various policy options, RIA assists governments in selecting the best course of action to address specific issues [20–23].

The implementation of RIA (see Figure 1) involves collecting primary data through focus group discussions (FGD), in-depth interviews, and comparative studies of the Funaya model in Japan as a benchmarking reference for best practices. Additionally, secondary data is gathered from policy documents, government regulations, and relevant scientific articles, which serve as references in the first and second stages of RIA implementation, i.e.: (1) problem formulation, aimed at analyzing the fundamental issue, including identifying stakeholders involved and assessing its impact on various

aspects. The next stage is (2) objective formulation, to evaluate the appropriateness of policy goals or actions to be taken. At the stage of (3) alternative formulation, various solution alternatives, both regulatory and non-regulatory, are comprehensively considered. Then, the stage of (4) benefit and cost analysis is undertaken to evaluate all alternative actions to determine the option that provides the highest benefits relative to its costs. Lastly, (5) implementation strategy is formulated to determine strategic steps for executing the selected alternative action.

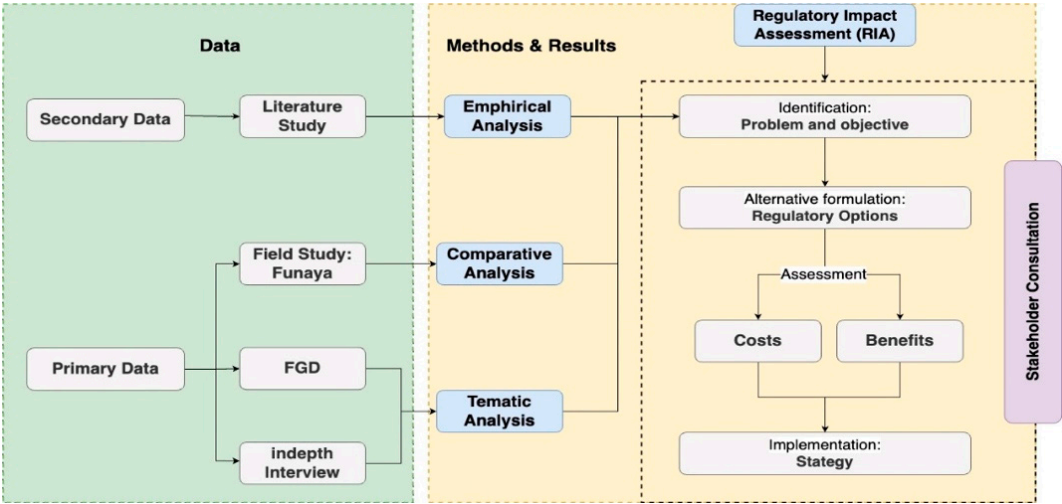


Figure 1. Conceptual Research Diagram.

3. Results and Discussion

Effective regulatory frameworks play a crucial role in ensuring sustainable coastal management, particularly for indigenous communities such as the Bajo people. This chapter explores the existing challenges and opportunities for regulatory improvements, aiming to develop policies that not only protect cultural heritage but also enhance environmental sustainability and economic resilience. The discussion begins by identifying key issues and objectives in coastal management before delving into specific regulatory improvements required for a more inclusive and effective governance framework.

3.1. Identification of Issues and Objectives

The effective governance of coastal areas requires a comprehensive understanding of the challenges faced by the Bajo people. These challenges stem from multiple dimensions, including socio-cultural preservation, disaster preparedness, economic empowerment, and participatory governance. This section highlights these critical issues, emphasizing the need for regulatory reform to ensure a more adaptive and inclusive management approach. Furthermore, the analysis extends to evaluating the current regulatory landscape and identifying areas for improvement to address the unique vulnerabilities of the Bajo community.

3.1.1. Potential for Improving Existing Regulations

The potential for regulatory improvements in managing coastal areas for the Bajo people encompasses various essential aspects requiring strategic attention and solutions. First, the preservation of the Bajo community’s cultural identity must be a priority in regulatory frameworks, as forced relocations and spatial planning changes threaten their cultural practices and communal harmony [24]. Additionally, disaster preparedness is a crucial issue, given the community’s vulnerability to natural risks such as flooding and rising sea levels. This issue is further exacerbated by limited access to disaster mitigation education and adaptive infrastructure [25]. Thus, protection strategies should integrate disaster risk education and the development of environmentally friendly infrastructure.

Economic empowerment must also be an integral part of protection policies. The Bajo people's dependence on traditional fishing methods makes them highly vulnerable to environmental changes and economic fluctuations. Therefore, diversifying livelihoods and promoting sustainable marine resource management practices are essential [26]. Moreover, existing regulations must promote community participation in decision-making processes. Policies that exclude the Bajo community lead to marginalization and conflicts with local governments [27,28]. By ensuring active participation, policies can become more inclusive and relevant.

Environmental conservation must also be balanced with the economic needs of the community. Current conservation policies often restrict community interactions with their environment, creating socioeconomic challenges [29]. Therefore, a balanced approach integrating conservation and economic sustainability should be adopted. Lastly, the development of infrastructure and accessibility in coastal areas must be improved. Issues related to accessibility and settlement quality require strategic interventions, including infrastructure development to support the livelihoods and well-being of the Bajo people [30].

By addressing these key points, the development of an adaptive protection framework will ensure that the economic, social, cultural, and environmental needs of the Bajo people are holistically met. A regulatory reform based on principles of equity, sustainability, and community participation is expected to provide an effective solution to the challenges faced by the Bajo community.

3.1.2. Regulations That Need to Be Enhanced, Developed, and Established

To improve coastal management for the Bajo people, regulatory developments must be categorized into three key clusters: applicative, reformative, and revolutionary approaches. The applicative cluster includes policies that have proven effective and relevant, such as the legal recognition of land rights through the issuance of Land Ownership Certificates (Hak Atas Tanah/HAT). These policies provide legal security and legitimacy to the Bajo community, fostering compliance with existing regulations.

The reformative cluster addresses existing policies that remain ineffective and require restructuring to become more participatory and applicable. For instance, restrictive policies that do not accommodate local wisdom create barriers to sustainable marine resource management by the Bajo people. Revisions to these policies should incorporate traditional knowledge in resource utilization and address operational constraints, such as the lack of supporting infrastructure. Additionally, more inclusive dialogue between policymakers and the Bajo community must be facilitated to ensure that the implemented policies are both acceptable and practical.

The revolutionary cluster involves the development of entirely new policies that are essential for creating a more inclusive and sustainable management framework. Certain issues, such as exclusion and marine resource management, remain unaddressed in existing regulations. Consequently, policies must be established to provide the Bajo people with greater roles in resource governance, reduce conflicts, and foster a responsive and measurable governance framework. These policies must also integrate sustainability principles to balance environmental conservation with the community's economic needs [29].

By developing regulations based on these three clusters, coastal management strategies can not only meet the holistic needs of the Bajo community but also support marine ecosystem sustainability and promote equity in natural resource governance.

3.1.3. Respondents' Perspectives on Environmental and Settlement Policies for the Bajo Community

1. Exclusive Zoning

Survey results indicate diverse perspectives on environmental and settlement policies for the Bajo community, reflecting the urgent need for protection design which will serve as a common reference. Among the total 20 respondents comprising policy makers, NGOs, and academics, the majority have contrastive opinions regarding access and control over resources around Bajo community settlements (Figure 2).

The respondents’ perception on the environment and settlements of the Bajo community indicate a significant polarization, especially on the implementation of exclusive zoning policy. This policy was designed to limit external access to Bajo settlement resources while ensuring cultural preservation and environmental sustainability. The responses revealed a sharp divide in opinions: 25% of the respondents strongly disagree (1) with equal opposite of 25% respondents who strongly agree (5); 20% of them disagree (2) while 15% agree (4), and the rest 15% were neutral (3).

This distribution highlights significant differences in opinion about the exclusive zoning policy's effectiveness and relevance. Those strongly in favor (5) emphasize zoning as a protective measure from external threats, including excessive resource exploitation and environmental pollution. On the other hand, those strongly disagree (1) apprehend that zoning policy may restrict access as the ocean is a common right. Neutral or moderate responses (2, 3, 4) indicate a lack of consensus or uncertainty regarding the policy’s design.

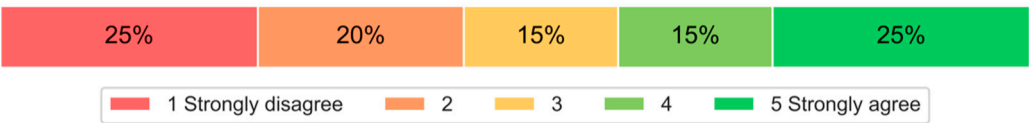


Figure 2. Perspectives on the Bajo Community’s Exclusive Zoning Policy.

The absence of a protection design is one of the main reasons why perspectives differ on this issue. Stakeholders emphasize the need for a participatory approach in designing zoning policies that not only protect natural resources but also respect the local wisdom of the Bajo people. By creating empirical-based policies, it is hoped that the polarization of views can be minimized so that inclusive and sustainable solutions may be obtained.

2. Local Wisdom and Integral Relationship with the Sea

The Bajo people possess local wisdom that reflects their identity as a community that lives on and depends on the sea. The sea is not only a source of livelihood but also a cultural and social space that shapes their way of life. Based on a survey (Figure 3), 90 out of 131 Bajo respondents refused to move to the mainland, even if the government offered subsidies. This reflects the fact that the sea is an integral part of their lives. Houses built on water serve not only as residences but also symbolize cultural heritage that is deeply rooted in their identity as a maritime community. As for those who agreed to move to the mainland, they would do so only if the government provided housing subsidies on land but still requested to retain a residence in the waters.

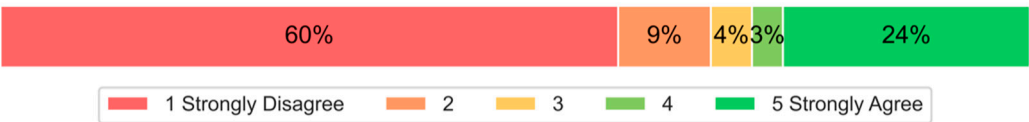


Figure 3. Bajo Community’s views on relocation to the Mainland.

In addition, a survey of policymakers, NGOs, and academics revealed that only 55% of respondents supported allowing the Bajo people to remain in the waters (Figure 4). This percentage reflects significant concerns regarding environmental issues, such as marine ecosystem degradation and its impact on the sustainability of natural resources. Nevertheless, most stakeholders also recognize the importance of maintaining the Bajo people in their maritime environment as an effort to preserve Indonesia’s unique and valuable cultural heritage.

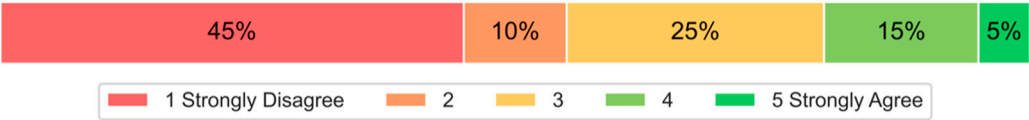


Figure 4. Government, NGOs, and Academics view on Bajo relocation to the Mainland.

The comparison of these two graphs highlights the need for a protection design to guide the living space of the Bajo people to address current concerns while preserving their cultural heritage. Furthermore, based on interview analysis, researchers summarized the local wisdom of the Bajo people into three main characteristics, i.e.:

- a. Preference for a traditional lifestyle: They prefer approaches according to traditional customs to adopting new technology.
- b. Resistance to technological change: For example, they prefer traditional wooden boats to modern boats once provided by the government.
- c. Attachment to the environment: Their houses on water are a physical manifestation of their local wisdom and a way of life passed down through generations.

The experience of transmigration in the early 1990s further reinforced this attachment, as efforts to relocate the Bajo people to the mainland failed for they chose to return to the sea. This fact attested that the sea is not only a source of livelihood but also holds irreplaceable spiritual and cultural value for the Bajo people. Consequently, policies supporting their sustainable maritime life while protecting the marine ecosystem from damage are indispensable.

3.1.4. Integration of Land Rights Regulations in Maritime Areas: Stakeholder Perspectives and Local Wisdom

To generate stakeholders’ perspectives, a Focus Group Discussion (FGD) was held on Friday, August 29, 2024, involving various relevant stakeholders to explore maritime land rights regulations in-depth. FGD is a qualitative research method designed to gain insights from participants through guided group interaction. This method is highly effective in exploring complex issues, capturing diverse perspectives, and generating varied data (Kitzinger, 1995). As part of the research, FGD involved specifically selected participants relevant to the study goal to discuss the topic in-depth (Powell & Single, 1996). It focuses on qualitative analysis instead of applying mathematical transformation, highlighting the intertwined and complex qualitative research characteristics, built within frameworks of various terms, concepts, and assumptions (Silverman 2006). Despite being outwardly resembling standard interviews where questions and responses are recorded, FGD requires significant effort and skill from the facilitator which demand concentration, insights, and discipline to ensure discussions remain organized and productive (Kitzinger, 1995). This discussion provided a platform for participants to share experiences, perspectives, and input on the issue.

The regulation of land rights in maritime areas is one of the aspects which requires serious attention from stakeholders. The FGD discussions revealed that these regulations need specialization in determining the subjects and objects being regulated. One major challenge is the lack of a comprehensive and inclusive regulatory framework, often leading to overlapping authorities across sectors. This has created obstacles in field implementation, particularly regarding permits and land management in maritime areas. For example, up until today, obtaining permits from the Ministry of Marine Affairs and Fisheries remains challenging due to the absence of specific licensing instruments. Therefore, cross-sector coordination is crucial to ensuring that regulations can be effectively implemented. The resulting regulations must reflect community dynamics, including the differing local needs across regions.

Environmental sustainability and the reciprocal relationship between humans and nature were also central concerns in this discussion. In the context of Bajo community, local wisdom teaches that maintaining harmony with nature will provide long-term benefits, whereas exploitative activities

that damage the environment will lead to ecological and social losses (Suhartini, 2009). This indicates that regulations must accommodate local values while incorporating modern sustainability principles. Prof. Dr. Nurhasan Ismail and Dr. Ricardo Simarmata, who participated in the FGD, emphasized the need for policies that integrate various aspects of philosophical, sociological, and legal aspects to provide holistic and integrated solutions for regulating land rights in maritime areas.

A responsive and accommodative regulatory approach is necessary to bridge modernization-oriented ideas with the community’s social realities that uphold traditional values. As Ismail (2007) pointed out, policies focused solely on modernity without considering local wisdom tend to create inequality and disadvantage communities reliant on traditional values. Thus, integrating modern scientific policies with socio-cultural needs is key to formulating inclusive and equitable regulations.

3.1.5. The Need to Adapt Japan’s Funaya Protection Design as a Benchmark

The Funaya protection design in Japan, particularly in the Ine area, demonstrates a model of integration between cultural preservation, environmental protection, and sustainable economic development. This area has been recognized as one of Japan’s national cultural heritage sites, with regulations supporting a balance between traditional functions, conservation, and modern activities. The Funaya approach provides valuable lessons for implementation in Indonesia, particularly for the Bajo community, which shares similar socio-cultural characteristics.

Funaya refers to traditional wooden buildings that function as both residences and boat garage on the ground floor. These structures are located along Ine Bay’s coastline, designed to harmonize maritime activities with coastal life. The Japanese government supports the preservation of this area through regulations such as the Act on Protection of Cultural Properties, zoning laws, and financial subsidies to maintain the authenticity of the buildings. This approach prioritizes the RRRs (Rights, Restrictions, Responsibilities) concept, which includes land ownership rights, usage restrictions aligned with conservation goals, and community’s responsibility for preserving cultural heritage

Similarly, the Bajo people in Indonesia live on water in stilt houses that reflect their maritime-based local wisdom. However, there is currently no specific policy to protect the cultural identity of the Bajo people. Challenges such as environmental degradation and pressures from modern development threaten the survival of this community. Thus, benchmarking from Funaya can provide a relevant framework for designing a protection model that supports the cultural and environmental sustainability of the Bajo people (see Table 1).

Table 1. Comparison of Funaya and the Bajo Tribe community.

Aspects	Funaya	Bajo Tribe
Location & Characteristics	Located along Ine Bay, traditional wooden structures built over water, serving as residences and boat garage.	Located in coastal waters, stilt houses built over water, serving as residences and maritime activity hubs.
Protection Regulations	Governed by the Act on Protection of Cultural Properties and local zoning regulations.	No specific protection regulations, subject to general policies such as the Agrarian Law and KKPRL (Coastal and Small Islands Spatial Planning).
Land Ownership	Perpetual ownership with cultural zone protection granted to building owners	Ownership is time-limited, such as right of use or building use rights, with no automatic renewal guarantees.
Renovation & Conservation	Renovation must use natural materials (wood) and requires local government approval; renovation subsidies up to 70%.	Renovations are self-managed with no specific standards, minimal government support or incentives.

Building Function	Used as residences, restaurants, museums, and cultural tourism accommodations.	Mostly used as residences, with little diversification for economic or tourism purposes.
Government Support	Financial subsidies, cultural conservation training programs, and promotion as a tourism destination.	Minimal financial or policy support for cultural and environmental preservation of the Bajo community.
Environmental Management	Exclusive zoning system to control access and protect coastal ecosystems.	No specific zoning or ecosystem management in Bajo community areas.
Community Participation	Local communities are involved in planning and management, with clear responsibilities in conservation.	Limited community participation in policy-making or management, often only as policy objects.
RRRs Approach	Rights: Land ownership; Restrictions: Forbiddance on new constructions in preservation zones; Responsibilities: Cultural and environmental preservation.	Rights: Time-limited rights such as right of use or building use rights; Restrictions: No clear limitations; Responsibilities: Collective responsibilities remain undefined.

The purpose of developing this protection design is to create a comprehensive and adaptive framework for safeguarding and managing the living spaces of the Bajo people in Indonesia’s coastal waters. By adopting key elements from Japan’s Funaya protection model, this approach aims to maintain a balance between preserving local cultural heritage and ensuring environmental sustainability. Through this adaptation, the primary goals are to provide legal certainty regarding the Bajo people's land rights, encourage active participation in territorial management, and enhance their quality of life through inclusive infrastructure and regulations. In addition, this design is expected to minimize land-use conflicts, protect their unique cultural identity, and promote coastal areas as cultural and eco-tourism destinations.

The proposed approach integrates the RRRs concept - granting rights, establishing usage restrictions, and defining responsibilities for maintaining coastal areas. As a result, this protection design will not only serve as a sustainable spatial management guideline but also offer an inclusive solution to address the challenges faced by the Bajo community today.

3.2. Formulation of Policy Alternatives

The purpose of formulation of policy alternatives is to offer relevant, inclusive, and sustainable solutions for coastal area management and the protection of the Bajo community in Indonesia. These policy alternatives are designed based on an analysis of the Bajo community's needs, benchmarking from Funaya in Japan, literature reviews, and survey results involving various stakeholders. The proposed policy alternatives are as follows:

3.2.1. Establishment of the Bajo Community Living Space Zone

The establishment of the Bajo Community Living Space Zone considers spatial dimensions, community aspects, ecological living space, physical space, and policy space, as illustrated in Figure 5. This zoning system is designed to accommodate the ecological, social, cultural, and economic needs of the Bajo people, who are spread across different settlement types: Land-Based Bajo, Transitional Bajo, and Maritime Bajo. The following is an explanation of each zone:

1. Conservation Zone (Zone A)
- This zone focuses on ecosystem and biodiversity protection. It is designed to support the preservation of natural resources essential to the Bajo community’s livelihood. Permitted activities in this zone include educational programs, research, and community-based ecotourism.

- 2. Vulnerable Zone (Zone B)
The Vulnerable Zone consists of areas at high risk of natural disasters such as abrasion, floods, or tsunamis. Infrastructure development in this zone must include risk mitigation measures, such as the provision of evacuation facilities and designated shelter areas for the Bajo people.
- 3. Economic Activity Zone (Zone C)
This zone is designed to support community-based economic activities sustainably. It includes Maritime Bajo settlements, where the Bajo people manage marine resources following their local traditions. The zone is also supported with market infrastructure, ports, and marine product processing facilities.
- 4. Exclusive Zone (Zone D)
The Exclusive Zone is reserved for the exclusive use of the Bajo community. Within this zone, the Bajo people have the right to manage natural resources without the threat of exploitation by external parties. Traditional regulations, such as *bapongka*, are enforced to ensure the sustainability of marine ecosystems.
- 5. Open Zone (Zone E)
This zone is designated for public access for general purposes, such as transportation routes and traditional fishing areas. The management of this zone must prevent privatization or any violations that could harm the ecosystem.

The establishment of these zones also involves the Bajo community as the primary actors in spatial management. The community dimension includes historical and cultural aspects, local wisdom, economic activities, and shared ancestral origins, which serve as a strong foundation for sustaining their way of life.

- This zoning system is designed to accommodate the needs of the three types of Bajo settlements:
- 1. Land-Based Bajo (Settlement A)
Entirely land-based settlements, focused on access to basic facilities such as electricity and clean water.
 - 2. Transitional Bajo (Settlement B)
Partially land-based and water-based settlements, requiring proper sanitation facilities such as bio septic tanks to protect the environment.
 - 3. Maritime Bajo (Settlement C)
Entirely water-based settlements, where residency is permitted only in Zone C with additional requirements, including mandatory household waste management.
- To better understanding please see Figure 5.

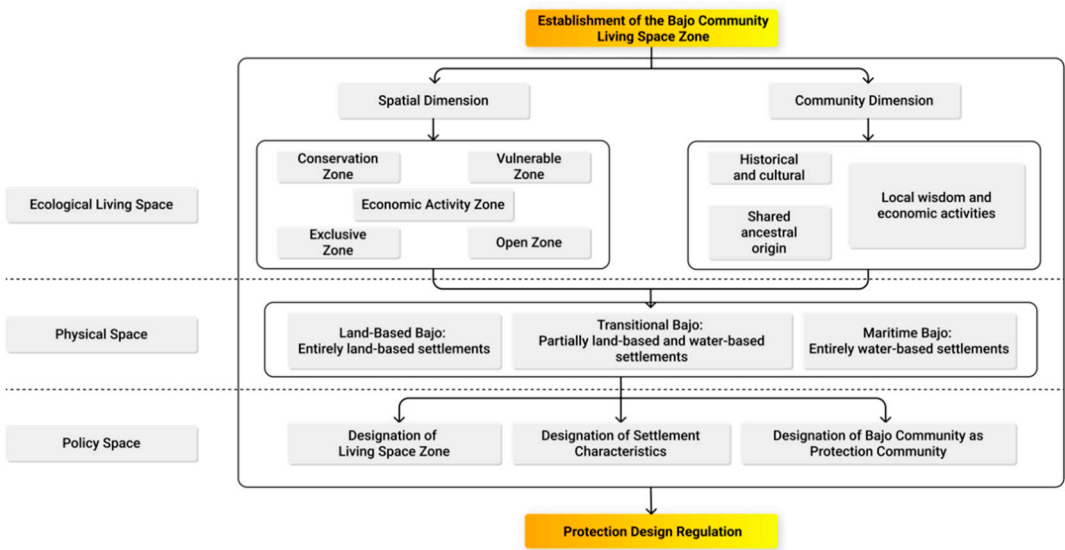


Figure 5. Designation of the Bajo Community Living Space Zones.

3.2.2. Protection Design Regulation

The Protection Design Regulation for the Bajo Community aims at establishing a holistic protection system that balances environmental conservation, economic sustainability, and socio-cultural protection. This design follows the RRRs (Rights, Restrictions, Responsibilities) approach, supporting sustainable resource management, local wisdom, and spatial planning within the Bajo community. Figure 5 above and Table 2 below provides a visual representation of the relationship between rights, restrictions, and responsibilities as applied to different zones and aspects of Bajo life.

Rights of the Bajo people are defined to safeguard their access to resources, cultural recognition, and active participation in territorial management. The main recognized rights include:

1. Rights to Natural Resources
 - a. Conservation Zone (Zone A): Right to sustainably utilize this zone for education, research, and community-based ecotourism.
 - b. Economic Activity Zone (Zone C): Right to manage marine resources traditionally while considering ecosystem regeneration.
 - c. Exclusive Zone (Zone D): Exclusive right to protect the area and its marine resources from external exploitation.
2. Rights to Settlements and Basic Infrastructure
 - a. Bajo Daratan (Land-Based Settlements): Right to basic facilities such as clean water, sanitation, electricity, and road access.
 - b. Bajo Peralihan (Transitional Settlements): Right to sanitation infrastructure, such as bio septic tanks, to ensure environmental sustainability.
 - c. Bajo Maritim (Maritime Settlements): Right to establish residences in designated areas within Zone C with legal recognition.
3. Rights to Cultural Recognition
 - a. Right to preserve customs, cultural rituals, and traditions that define the Bajo community identity.
 - b. Right to legal protection for traditional practices such as *bapongka* (seasonal fishing restrictions based on customary laws).

Restrictions are enforced to prevent environmental degradation, resource exploitation, and threats to the Bajo people's way of life. The main prohibitions include:

1. Prohibition of Destructive Activities
 - a. Zone A (Conservation Zone): Destructive activities such as using non-eco-friendly fishing gear or waste dumping are prohibited.
 - b. Zone B (Vulnerable Zone): Building constructions that increase disaster risks without mitigation measures are prohibited.
 - c. Zone C (Economic Activity Zone): Unsustainable resource extraction methods are prohibited.
2. Prohibition of Privatization and Land Use Conversion
 - a. Zone E (Open Zone): Privatization or exclusive claims over public-use areas are prohibited.
 - b. Bajo Settlements: Unauthorized land use conversion is not allowed without government and local community approval.
3. Prohibition for External Parties: Zone D (Exclusive Zone): Outsiders are prohibited from exploiting resources or entering the area without Bajo community permission.

Responsibilities are divided between the Bajo community (C) and the government (G) to ensure the success of this protection design.

1. Responsibilities of the Bajo Community
 - a. Environmental Conservation: Actively maintaining ecological sustainability through traditional practices and participating in conservation efforts.

- b. Settlement Management: (i) Bajo Peralihan: Required to have bio septic tanks to prevent water pollution. (ii) Bajo Maritim: Obligated to protect exclusive territories by complying with traditional rules like bapongka.
2. Responsibilities of the Government
- a. Policy and Infrastructure Management: (i) Providing disaster mitigation training, disaster-resilient infrastructure, and early warning systems in Zone B. (ii) Ensuring economic infrastructure such as markets, ports, and marine product processing facilities in Zone C.
- b. Legal Protection: (i) Protecting Bajo community rights over their exclusive territories. (ii) Monitoring and preventing illegal activities that damage marine and terrestrial ecosystems.
- For better understanding see Table 2.

Table 2. Protection Design Regulation.

Living Space Zones	Zone A: Conservation	C: Utilizing zones for educational programs, research, and community-based ecotourism. G: Regulating policies and regulations to protect ecosystem.	C: Must not carry out destructive activity such as using non-environmentally friendly fishing gear or waste disposal. G: Must not give resource exploitation permit to any party.	C: Actively participating in preserving the sustainability of zones by complying with conservation regulation. G: Providing conservation training and critical zone monitoring facilities.
	Zone B: Vulnerable	C: Prioritizing the development of disaster-resistant infrastructure, such as evacuation sites and wave barriers.	C: Must not develop settlement which potentially increase the risk of disaster impact.	C: Participating in disaster mitigation training and utilizing the provided facilities. G: Providing early warning system and conducting regular evacuation simulation.
	Zone C: Economic Activities	C: (1) The right to legally reside in this area with security guarantees and recognized ownership under the law. (2) Access to basic facilities such as clean water, sanitation, and adequate electricity. G: Managing the zone by providing spatial planning that supports community needs	C: (1) Prohibited from engaging in activities that harm the environment, such as indiscriminate disposal of domestic or industrial waste. (2) Land use conversion is prohibited without community and government approval. G: External parties cannot be granted permission for	C: (1) Managing the area by balancing settlements and sustainable economic activities. (2) Participating in government programs to improve economic capacity and environmental management. G: (1) Providing subsidies or incentives for community-based economic development. (2) Ensuring the

		and ecosystem sustainability.	activities that threaten sustainability or the welfare of the Bajo community without consultation and approval from the Bajo community.	availability of supporting infrastructure, such as traditional markets, adequate ports, and seafood processing facilities. (3) Providing training for the community to improve economic skills and environmentally friendly resource management.
	Zone D: Exclusive	C: (1) Full rights to manage and sustainably utilize marine resources in accordance with the <i>bapongka</i> tradition. (2) Exclusive rights to protect the area from access and exploitation by external parties without permission. (3) The right to determine harvesting periods for marine resources to ensure ecosystem regeneration.		C: (1) Maintaining the exclusive area by involving indigenous communities for supervision and sustainable management. (2) Complying with <i>bapongka</i> traditional rules governing the timing and methods of marine resource utilization. (3) Reporting illegal activities, such as fishing by external parties, to the relevant authorities. G: (1) Providing legal protection for the exclusive territory of the Bajo community. (2) Establishing monitoring and law enforcement mechanisms against violations in the exclusive area.
	Zone E: Open	C: Free access to this area for public activities such as transportation, fishing, and waterways for transit by any party. G: To regulate and manage spatial planning in this	C & G: It is prohibited to claim or privatize this area as the property of any individual or specific group.	C: Using this zone responsibly, including maintaining cleanliness, avoiding environmental damage, and complying with applicable regulations.

		zone for public interests and environmental sustainability.		G: (1) Developing spatial planning that includes the utilization of public property for various needs. (2) Supervising activities in open zones to ensure no violations against the ecosystem.
Community	Historical and Cultural	C: The right to preserve cultural traditions, rituals, and customs that have been passed down through generations.	C: It is prohibited to commercialize traditions in ways that degrade their original cultural values.	C: Actively participating in cultural preservation activities through local communities or organizations. G: Providing education and awareness about the community's cultural history to younger generations.
	Common Ancestry	C: The right to official recognition of the community's origins and identity as part of local history.	C: It is prohibited to claim land ownership without legitimate legal grounds.	C: Supporting cooperation among community members to maintain unity and harmony. G: Providing legal mechanisms to regulate the recognition of community origins based on historical records.
	Local wisdom and economic activities	C: The right to utilize local natural resources sustainably according to community traditions.	C: It is prohibited to use exploitative methods that are environmentally unfriendly or damage the ecosystem. G: External parties shall not be granted exploitation rights that threaten the community's sustainability.	C: Participating in environmental conservation. G: Providing training and support for infrastructure to facilitate economic activities.
Community	Land-Base Bajo: Settlement A Entirely land-based	C: (1) The right to live and reside safely, legally, and sustainably in the community's	C: It is prohibited to convert land use without approval from the	C: Participating in environmental conservation. G: Providing training and support for

		territory in accordance with customary and national law. (2) The right to access basic facilities such as electricity, clean water, sanitation, and healthcare services.	community and government. G: Commercial exploitation permits that disrupt the land ecosystem's balance shall not be granted.	infrastructure to facilitate economic activities.
	Transitional Bajo: Settlement B partly land-based		C: Mandatory use of bio-septic tanks to prevent water pollution. G: Construction permits shall only be granted in Zone C areas.	C: (1) Actively contributing to environmental sustainability on land and at sea by ensuring sanitation facilities meet standards. (2) Mandatory use of bio-septic tanks to prevent water pollution. (3) Mandatory household waste management.
	Maritime Bajo: Settlement C entirely water-based		C: Establishing residences in Zone C, designated as a settlement zone over water.	G: Providing disaster mitigation facilities to prevent the impact of coastal erosion in transitional settlements.

3.2.3. Developing Protection Design

The design of the Protection System for the Bajo community includes establishing a Living Space Zone that safeguards ecosystems, supports community-based economies, and ensures fair territorial access. This design also recognizes the Bajo Community as a Protected Community, granting legal recognition of their traditions, culture, and identity. Additionally, exclusive rights to sustainably utilize resources and responsibilities for environmental sustainability are regulated through collaboration between the community and the government.

1. Establishment of the Living Space Zones
 - a. Conservation Zone (Zone A): Designated for the protection of ecosystems and biodiversity.
 - b. Vulnerable Zone (Zone B): Established to mitigate disaster risks through resilient infrastructure.
 - c. Economic Activity Zone (Zone C): Supports sustainable, community-based economic activities.
 - d. Exclusive Zone (Zone D): Reserved for resource management exclusively by the Bajo community.
 - e. Open Zone (Zone E): Public-access areas governed by spatial regulations.
2. Establishment of the Community Designation:
 - a. The Bajo Community is designated as a Protected Community, ensuring legal recognition of their traditions, culture, and ancestral heritage.
 - b. Legal protection mechanisms are developed based on historical and cultural data to safeguard the community's territories.

3. Establishment of the Settlement Characteristics:
- a. Land-based Bajo (Settlement A): Fully land-based settlements with access to basic facilities such as clean water and electricity.

b. Transitional Bajo (Settlement B): Partially land- and water-based settlements that require bio septic tanks to prevent pollution.

c. Maritime Bajo (Settlement C): Fully water-based settlements, where residences can only be built in designated Zone C areas.
4. Environmental and Sustainability Norms:
- a. The Bajo community is responsible for maintaining ecosystem balance by adhering to local conservation regulations.

b. The government must provide training, disaster mitigation facilities, and eco-friendly infrastructure, such as early warning systems and evacuation shelters.

c. Resource exploitation by external parties is prohibited without community and governmental approval.
5. Security and Infrastructure Norms:
- a. Transitional and Maritime Bajo settlements must have sanitation systems like *bio septic tanks* for waste management.

b. Public infrastructure and settlements must be adapted to environmental risks, such as coastal erosion in transitional areas.
6. Exclusive Rights for the Bajo Community:
- a. The community has the right to sustainably utilize marine resources following local traditions such as *bapongka*.

b. The community has exclusive rights to protect their territories from external exploitation without permission.

3.3. Cost-Benefit Analysis

To determine the best policy for coastal area management and the development of the Bajo community’s living space, a cost-benefit analysis was conducted on two main alternatives: Alternative 1-Do Nothing and Alternative 2-Protection Design Implementation. This analysis evaluates the social, economic, and environmental impacts of each alternative.

Table 3 outlines the cost-benefit analysis where no specific interventions or regulations are applied to the Bajo community. From the benefit point of view, this approach requires no additional costs for zoning management or implementation, yet it poses significant consequences, including environmental degradation due to the absence of clear regulation on resource exploitation, loss of community-based economic potential, and threats to local traditions due to a lack of legal protection. Additionally, limited infrastructure, such as sanitation and disaster mitigation, remains an unresolved issue in this approach.

Table 3. Cost-Benefit Analysis for Alternative-1 (Do-Nothing).

Aspect	Costs	Benefits
Economy	No additional costs for zoning management or implementation.	Loss of community-based economic potential.
Environment	No major change or environmental interventions.	Risk of environmental damage due to unregulated resource exploitation.
Social & Culture	No immediate social structure changes.	Loss of local traditions and cultural identity due to lack of legal protection.
Infrastructure	No additional costs for infrastructure development.	Lack of infrastructure for disaster mitigation and sanitation in transitional settlements.

Alternative-2 Protection Design Implementation is represented in Table 4, presenting the cost-benefit analysis of implementing the Zoning and Spatial Management approach, which include zoning design to manage the living space of the Bajo community. This alternative provides economic benefits through community-based economic activities in Economic Activity Zone (Zone C), while also ensuring biodiversity conservation in Conservation Zone (Zone A). Additionally, local traditions such as *bapongka* are preserved through the Exclusive Zone (Zone D). However, this approach requires initial investments in infrastructure development, community training, and operational costs for zoning enforcement and prevention of illegal activities. Additional funding is needed for disaster-resilient infrastructure and modern sanitation facilities in Vulnerable Zone (Zone B).

Table 4. Cost-Benefit Analysis for Alternative 2 (Zoning and Spatial Management).

Aspect	Costs	Benefits
Economy	Initial investment in infrastructure and community training.	Increased community-based economic activities (Zone C).
Environment	Operational costs for zoning enforcement and monitoring illegal activities.	Ecosystem and biodiversity protection through Zone A.
Social & Culture	Community education costs and adaptation to new systems.	Protection of traditions (<i>bapongka</i>) and Bajo identity through Zone D.
Infrastructure	Costs for disaster-resilient infrastructure and modern sanitation maintenance.	Provision of sanitation facilities (bio septic tanks) and disaster risk mitigation (Zone B).

Figure 6 illustrates the framework for developing a protective design for the living space of the Bajo community, which is designed by adapting the approach from Funaya (MLIT, Japan). This approach emphasizes the establishment of cultural heritage status, conservation zoning regulations, and the management of property rights and area maintenance. The framework is adjusted to fit the Bajo community by considering regional and communal aspects, which are realized through the designation of Living Space Zones and the implementation of RRRs. This approach includes the regulation of protective design and integrated conservation zoning, culminating in the formulation of a protective design as a strategic guideline. The final outcome of this framework is the recognition of the Bajo community's living space rights, along with continuous supervision and maintenance to protect the ecosystem, culture, and identity of the Bajo community.

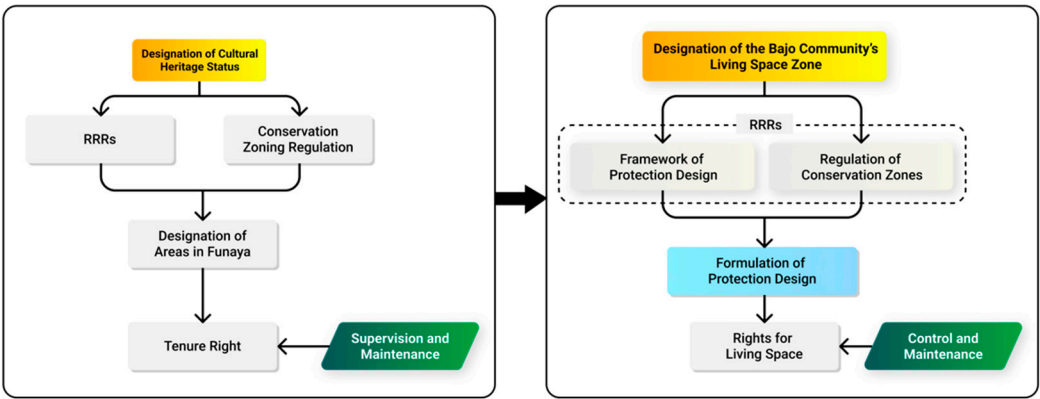


Figure 6. The framework of protection design development and living space for the Bajo community.

3.4. Implementation Strategy

The implementation strategy of the policy plays a crucial role in ensuring the success of the protection design and management of the Bajo community's living space. This approach involves three main elements: socialization mechanisms, monitoring implementation, and incentive and sanction systems. These three components are designed to complement each other and provide a strong operational foundation.

3.4.1. Dissemination Mechanism

The dissemination mechanism aims at increasing awareness, acceptance, and participation of the Bajo community and other stakeholders regarding the proposed policy. The stages of dissemination include:

1. Public Information Dissemination
 - a. Utilizing local media, such as radio and visual posters, to communicate the benefits of the policy.
 - b. Organizing discussion forums with the Bajo community to explain their rights, restrictions, and responsibilities related to protection design and living spaces in coastal areas.
2. Education and Training
 - a. Conducting training on the use of environmentally friendly fishing gear.
 - b. Enhancing the community's understanding of the importance of coastal ecosystem conservation and maritime culture.
3. Collaboration with Partners
 - a. Involving NGOs, community leaders, and academics in developing socialization modules based on local wisdom and culture.
 - b. Encouraging the Bajo community to be pioneers in spreading messages to their community and serving as role models for other coastal indigenous groups.

3.4.2. Monitoring Implementation

Monitoring aims to ensure that the policy is implemented in accordance with the intended objectives. An effective monitoring system will include:

1. Community-Based Supervision
 - a. Establishing local monitoring groups consisting of the Bajo community to oversee zoning implementation and area protection.
 - b. Providing training for these groups to identify violations, such as illegal exploitation by external parties.
2. Technology-Supported Monitoring
 - a. Utilizing drones and GIS-based applications for periodic mapping of areas.
 - b. Developing a digital reporting system that enables the community to report issues in real time.
3. Periodic Evaluation
 - a. Conducting quarterly evaluations involving all stakeholders to review policy effectiveness and identify areas for improvement.
 - b. Preparing monitoring reports as reference material for further decision-making processes.

3.4.3. Incentives and Sanctions

The Bajo communities in specific regions that adhere to the protection design guidelines will receive various benefits, including clearer exclusive zoning, easier and faster asset legalization processes, and access to government support programs aimed at improving their welfare. Additional benefits include:

1. Financial and Infrastructure Incentives: Support in the form of subsidies for the renovation or construction of eco-friendly traditional stilt houses, promoting cultural and environmental sustainability will be provided.
2. Involvement in Cultural-Based Tourism Programs: Communities following the protection design guidelines will be directly involved in cultural-based tourism programs, creating additional income opportunities through locally managed tourism.
3. Priority in Training and Assistance Programs: These communities will receive priority in sustainable coastal resource management training programs, strengthening their skills and knowledge in ecosystem conservation.
4. Security and Recognition of Protection Zones: The community will receive protection from external exploitation through the enforcement of exclusive zoning and official recognition of the Bajo Community Protection Zone. This ensures legal certainty and safeguards their living spaces and cultural identity.

Meanwhile, sanctions will be imposed on individuals or groups that fail to comply with the protection design guidelines, which may include:

1. Loss of Financial and Infrastructure Incentives: Communities that do not follow the guidelines will not receive subsidies for the renovation or construction of traditional stilt houses in coastal areas.
2. Exclusion from Training Programs Priority: Groups that fail to comply will not be included in training and mentoring programs for sustainable coastal resource management.
3. Exclusion from Cultural-Based Tourism Programs: Communities that do not adhere to the guidelines will not be included in cultural-based tourism programs that provide additional income opportunities.
4. Loss of Security and Protection Zone Recognition: Their community areas will not be recognized as protected zones, and their asset legalization process will become more complicated and prolonged, adding to their administrative burden.

With this system of incentives and sanctions, the Bajo community is expected to be more motivated to follow the protection design guidelines, achieving a balance between cultural preservation, environmental sustainability, and socioeconomic welfare.

4. Conclusion

This research offers an adaptive, inclusive, and sustainable framework for the protection design and development of the Bajo community's living space in Indonesia's coastal areas. This framework is designed to integrate the principles of Rights, Restrictions, and Responsibilities (RRRs) through the *Regulatory Impact Assessment* (RIA) method, adapting Japan's Funaya model as a reference. The principal conclusion of this study is that a protection design approach based on three main pillars: zoning and spatial planning, RRRs, and Funaya adaptation, can create adaptive solutions for cultural preservation, improving the welfare of the Bajo community, and ensuring coastal environmental sustainability. A zoning-based policy provides legal certainty to the Bajo community, protects coastal ecosystems from excessive exploitation, and enhances efficient area management. The application of RRRs principles ensures a balance between community rights, restrictions on destructive activities, and collective responsibilities for environmental conservation. Meanwhile, the adaptation of Funaya emphasizes the importance of protecting cultural identity through the preservation of traditional stilt houses and the development of cultural-based tourism.

5. Recommendation

The study's findings indicate that, although policy implementation requires significant investment in regulatory development, community training, and monitoring, the resulting benefits far outweigh the costs. These benefits include improved environmental quality, preservation of Bajo culture, and economic welfare enhancement. By actively involving the community in every stage of

policy planning, implementation, and evaluation, this protection design is also expected to serve as a replicable model for other coastal areas in Indonesia. This study recommends the need for cross-sector collaboration between the government, communities, and other stakeholders to ensure the successful implementation of the policy. With integrated national policy support and continuous evaluation, this protection design can serve as the foundation for a more inclusive and sustainable coastal area management strategy.

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Abbreviations

The following abbreviations are used in this manuscript:

Ministry of ATR/BPN	: Ministry of Agrarian Affair and Spatial Planning/National Land Agency
UUD 1945	: Basic Constitution year 1945
KKPRL	: Coastal and Small Islands Spatial Planning
RIA	: Regulatory Impact Assessment
RRR	: Rights, Restrictions, Responsibilities

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