

Spatial Claiming through Keban LewaOLON: Local Wisdom, Coastal Zoning, and Spatial Justice in Solor Island

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Abstract: Formal coastal zoning in Indonesia is established through legal frameworks and spatial planning, yet in practice, it may diverge from community-based governance and local knowledge. This study analyzes how the keban lewa lolon in the villages of Bubu Atagamu and Lewogaran (Solor Island) functions as a local institution to manage access to marine space and negotiate recognition within state governance. Employing a qualitative-comparative case study design, the research utilizes in-depth interviews, participant observation, and document analysis. The concept of "institutional bricolage" is used to trace the processes of aggregation, alteration, and articulation. Findings reveal that the keban lewa lolon evolved from a concept inspired by terrestrial food granaries into a hybrid institution with regulatory, normative, and cognitive functions; it divides a 61.97-hectare area into a core zone (20.74 ha), a buffer zone (13.05 ha), and a utilization zone (28.18 ha). Claims of justice are primarily evident in the distribution of access, participation in rule-setting, and the recognition of local authority and knowledge. Indications of ecological recovery stem from community monitoring and are not treated as definitive causal evidence. Theoretically, this article demonstrates that local wisdom can be analyzed as a political arena and a hybrid institution, rather than merely as cultural capital or a conservation tool. More broadly, the Solor case enriches Global South debates regarding how communities negotiate the plurality of rules, scales of authority, and spatial justice in natural resource governance.

Keywords : keban lewa lolon; coastal zoning; local wisdom; spatial justice; RZWP3K.

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1. INTRODUCTION

Coastal areas serve as strategic arenas for archipelagic nations like Indonesia, where economic, ecological, social, and defense interests converge within a dynamic space. However, formal coastal zoning practices often operate based on technocratic and legalistic logics that fail to adequately accommodate histories of tenure, traditional usage practices, and governance systems rooted in local knowledge (Beaty et al., 2024; Ramadhan et al., 2022; Thorburn, 2002; Wedding et al., 2024). This issue is not unique to Indonesia. In Tanzania, "institutional bricolage" reveals a blending of modern and traditional institutions. Studies on irrigation in Ethiopia highlight the significance of power relations and negotiation, while in Brazil, changes in the governance of extractive zones demonstrate the interaction between bureaucratic institutions and socially constructed ones (Cleaver, 2001; Alemu, 2018; Prado et al., 2021). Consequently, the Global South is best understood not as a homogeneous category, but as a collection of contexts where formal institutions, local knowledge, power imbalances, and development imperatives interact in complex, layered ways. The critical question is not merely

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how space is partitioned, but rather who holds the authority to define that space and how local rules are translated into formal legal regimes.

The empirical and theoretical gap in this research lies in the limited explanation of how local wisdom transitions from mere conservation knowledge or practice into an authority capable of spatial governance and negotiation with the state. Studies on participatory mapping highlight the value of local knowledge as a data source but do not always elucidate the redistribution of authority. Governance studies further indicate that local recognition can remain constrained by elites and formal structures (Karnad, 2022; Rohe et al., 2018). Within the literature on institutional bricolage, Cleaver's framework explains how institutions emerge through the assembly of formal and informal elements. Subsequent studies caution that bricolage does not automatically yield collective benefits, as power relations shape who gains, who is excluded, and how institutions are sustained (Alemu, 2018; Prado et al., 2021). Previous research on *keban lewa lolon* (Tatu Sius et al., 2024) primarily addressed its potential to inspire coastal management policies. This article expands upon that work by examining the processes of institutionalization and the articulation of authority, while linking these aspects to distributive, procedural, and recognition justice.

Solor Island in East Flores Regency, East Nusa Tenggara, serves as a significant empirical context for understanding this contestation. On the island, the community developed *keban lewa lolon*, a coastal governance practice inspired by terrestrial food granaries. This traditional wisdom has been adapted to manage marine space collectively through the designation of core zones (*keban keniki/temude*), buffer zones (*mele wanan/keniki baku*), and utilization zones (*mele nekin*), all regulated by customary norms, community agreements, and social sanctions (Tatu Sius et al., 2024).

This study differs from Tatu Sius et al. (2024) in three respects. First, regarding the research question: the previous study addressed how *keban lewa lolon* could inspire area management policies, whereas this study examines the specific ways in which *keban lewa lolon* functions as a political-policy instrument for reclaiming community living space. Second, regarding the theoretical framework: this study explicitly operationalizes institutional bricolage (Cleaver, 2012) and three-dimensional spatial justice (Soja, 2010; Schlosberg, 2009) as analytical tools, rather than merely as background references. Third, regarding data and the unit of analysis: this study traces the step-by-step institutionalization process and compares it with other customary marine tenure systems in Indonesia and the Pacific (Cinner et al., 2012; Halim et al., 2020; Ramenzoni, 2021). Consequently, the argument concerning spatial claims can be tested for generalizability, rather than being described merely as an isolated case.

Institutional bricolage views institutions as the products of social processes that are embedded and adaptive, rather than fully designed from the top down. Cleaver (2001, 2012) and subsequent scholarship identify three processes useful for interpreting institutional change: aggregation, alteration, and articulation. A key critique of this approach is not that bricolage lacks utility, but rather that its outcomes must be examined in the context of power relations, inequalities, and the potential for elite capture, given that hybrid institutions are not inherently equitable or effective (Alemu, 2018; Prado et al., 2021; Calzada et al., 2025). This article adopts that critique as an analytical principle. Each bricolage process is examined not merely in terms of the resulting rules, but also regarding the actors controlling the process, the sources of legitimacy employed, and the consequences for access and recognition.

It is this opening that prompts the current research to ask: in what form does *keban lewa lolon* function as a political-policy instrument for asserting community claims to living space, and to what extent does this process yield formal state recognition? Theoretically, this study contributes to debates regarding the interplay of state power, institutional bricolage, and spatial justice within the coastal governance of small islands. The research examines the applicability of the frameworks proposed by Cleaver (2012) and Soja (2010) to the context of East Nusa

Tenggara (NTT). Practically, the study targets two audiences. For the NTT Provincial Government and the East Flores Regency Marine and Fisheries Agency, it provides an evidentiary basis for integrating *keban lewa lolon* into the revision of the Zoning Plan for Coastal Areas and Small Islands (RZWP3K). For the Tanah Ile Boleng Foundation (YTIB) and civil society organizations, it offers a model for facilitating the institutionalization of local wisdom, a model that can be replicated on other small islands.

Normatively, the relationship between *keban lewa lolon* and the state should be viewed within a more concrete legal framework. Law No. 27 of 2007 concerning the Management of Coastal Areas and Small Islands (as amended, notably by Law No. 1 of 2014) positions planning, utilization, supervision, and control as integral components of coastal area management. This regulation creates opportunities for communities to propose management plans and governs utilization by customary law communities, local communities, and traditional communities. At the provincial level, East Nusa Tenggara (NTT) Provincial Regulation No. 4 of 2017 establishes the 2017-2037 Zoning Plan for Coastal Areas and Small Islands (RZWP3K) for NTT, incorporating provisions on spatial allocation, utilization, supervision, control, and community rights and participation. Subsequently, Regulation of the Minister of Marine Affairs and Fisheries No. 28 of 2021 provides the framework for implementing marine spatial planning. Thus, *keban lewa lolon* need not be regarded as a regime existing entirely outside the RZWP3K framework; rather, it can be understood as a local practice requiring translation into mechanisms for recognition, mapping, co-management, and supervision that are compatible with state authority.

The theoretical contribution of this article lies in positioning *keban lewa lolon* as a hybrid political institution that enables the community to transform local knowledge into claims of authority over space. Its novelty lies not in the introduction of "institutional bricolage" itself, but in the integration of three analytical lenses: power, bricolage, and spatial justice. These lenses are employed to explain how local wisdom acquires regulatory force through a combination of customary norms, village decisions, participatory mapping, and the language of state policy. Thus, the article posits that spatial claims are not merely acts of resistance against the state but also processes of institutional production and negotiations for recognition. These findings expand the Global South literature by demonstrating that a plurality of rules can serve as both a source of governance capacity and an arena of contestation, given that the process of articulation remains shaped by disparities in resources and authority

2. LITERATURE REVIEW

Power Theory in Coastal Policy

Public policy is never entirely a neutral, technocratic process; rather, it is an arena where various actors vie to define problems, space, and the legitimacy of state action (Archibald, 2020). From the perspective of critical policy analysis, policy is understood as the outcome of asymmetrical relations among the state, the market, and communities (Foucault, 1981; Lukes, 2005). Archibald (2020) emphasizes that the way the state defines a problem determines the direction of intervention and identifies who will be affected. In the context of coastal zoning, the key question is not merely how space is divided, but who has the authority to define that space, for whose benefit, and on what grounds of legitimacy (Soja, 2010).

Local Institutions and Institutional Bricolage

From an institutional analysis perspective, *keban lewa lolon* can be understood as a local institution that operates through a set of norms, rules, practices, and social sanctions to regulate the collective behavior of coastal communities. Drawing on North (2008), Ostrom (1990), and Scott (1985), institutions are not merely formal organizations but rather the "rules of the game"

that shape social interactions and mediate relationships between people, resources, and the environment. In *Governing the Commons: The Evolution of Institutions for Collective Action*, Ostrom (1990) demonstrates that local communities are capable of establishing effective common-pool resource management systems when they possess clear rules, monitoring mechanisms, recognized sanctions, and the capacity to adapt rules to local conditions. This framework is relevant for interpreting *keban lewa lolon* as a form of local common-pool resource governance. It is also consistent with the comparative findings of Cinner et al. (2012), which indicate that customary fisheries institutions in Indonesia, Papua New Guinea, and Mexico generally feature clear boundaries and membership as well as the capacity for adaptive rule modification, yet tend to have limited linkages with organizations at broader scales.

Cleaver (2012) developed the concept of institutional bricolage to explain how local institutions are formed through the combination of available norms, rules, symbols, social relationships, and resources. In this study, bricolage is treated not merely as a descriptive label but as a process observable through three mechanisms. First, *aggregation*: the combining of customary norms with formal village procedures. Second, *alteration*: the changing of the meaning and function of existing norms—specifically, the transformation of a land-based food granary into a sea-based one. Third, *articulation*: the effort to link or maintain local legitimacy when contending with formal rules. Critical literature indicates that bricolage must be analyzed in conjunction with power relations, as actors with greater access to knowledge, resources, positions, or networks are better able to shape the outcomes of institutional assembly (Alemu, 2018; Prado et al., 2021; Calzada et al., 2025). Consequently, this article examines (at each stage) who is involved, which institutional elements are assembled, what sources of legitimacy are employed, and who gains or loses access. This approach avoids the romanticization of local wisdom and enables an analysis of potential internal inequalities

Spatial Justice and Environmental Justice

Spatial justice and environmental justice are used to assess the consequences of institutionalizing marine areas. The distributive dimension refers to changes in access, benefits, and burdens. The procedural dimension concerns who is involved in determining boundaries, rules, and sanctions. Meanwhile, the recognition dimension refers to the extent to which local knowledge, identities, and authority are acknowledged within formal governance. The "blue justice" literature expands on this perspective by emphasizing that marine economic development can lead to unequal distributions of benefits and costs, as well as the marginalization of certain groups (Bennett et al., 2021). Consequently, in this study, recognition is not automatically equated with justice. Recognition may remain partial if community involvement is limited to mere consultation or if authority ultimately reverts to being monopolized by formal institutions.

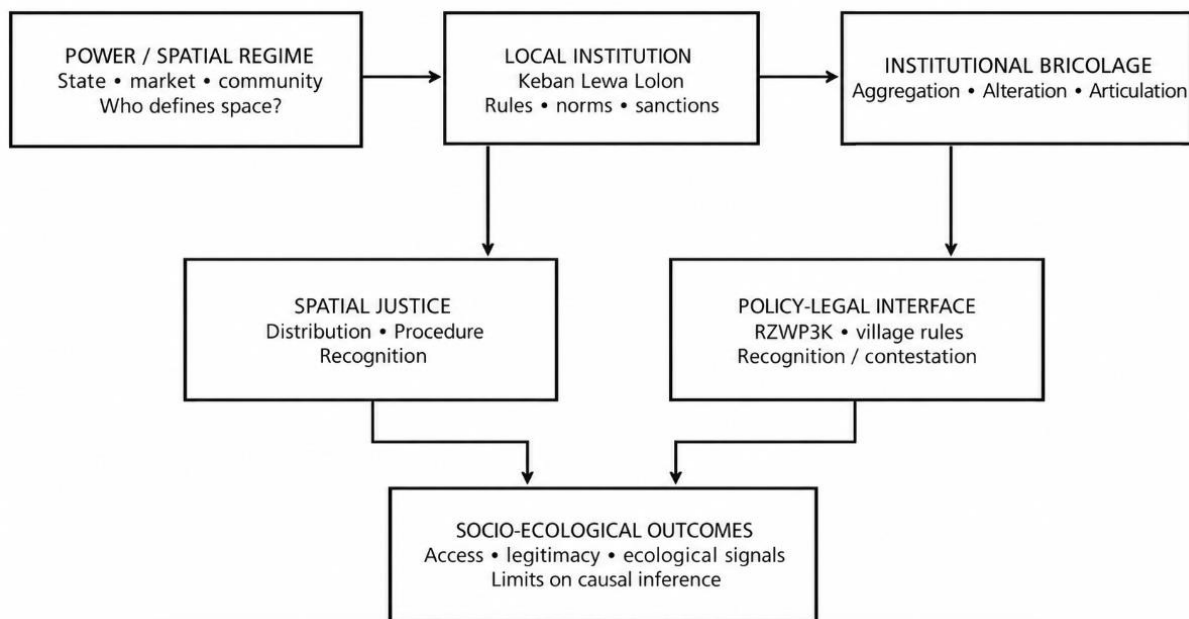
Theoretical Synthesis

These three perspectives provide complementary foundations for understanding *keban lewa lolon* as both a site of contestation and a process of shaping community-based coastal governance. Power theory is employed to identify the differing capacities of the state, the market, and the community to define space, determine which interests are deemed legitimate, and influence the direction of coastal policy. Perspectives on local institutions and common-pool resource governance are used to analyze how norms, rules, oversight mechanisms, and sanctions shape the community's collective capacity to manage shared resources. Meanwhile, the concept of institutional bricolage is used to explain that the *keban lewa lolon* does not exist as a customary institution entirely separate from the state; rather, it is formed through the blending, adaptation, and articulation of customary norms, formal village procedures, and the language of state policy.

Perspectives on spatial and environmental justice are then employed to assess the consequences of these power configurations and institutional processes—particularly regarding the distribution of access and benefits, community involvement in decision-making, and the recognition of local knowledge, identity, and authority. Thus, justice is not viewed as an outcome separate from governance processes, but rather as a dimension shaped by power relations and institutionalization processes. This perspective aligns with the view that coastal zoning conflicts are issues involving distribution, procedure, and recognition simultaneously.

These various perspectives are synthesized into an analytical framework for interpreting field findings through multiple layers. First, it identifies who holds power and how that power operates in defining space and rules. Second, it examines how local institutions regulate the relationship between the community and resources. Third, it traces how customary norms and formal rules are negotiated and assembled into hybrid institutions. Fourth, it assesses the implications of these processes for distributive justice, procedural justice, and the politics of recognition. This framework allows the research to move beyond the question of whether *keban lewa lolon* is effective as a conservation institution; instead, it analyzes the interplay of power, institutions, processes of bricolage, and justice in shaping the legitimacy and governance of marine space at the local level. Consequently, empirical findings regarding the formation, rules, management practices, conflicts, and legitimacy of *keban lewa lolon* can be understood as socio-political and institutional processes, rather than merely as community-based conservation practices.

Figure 1. Research analytical framework: power, local institutions, bricolage, and spatial justice.



Source: Prepared by the researcher, 2026

3. METHODOLOGY

This research employs a qualitative-comparative case study design across two purposively selected villages to capture variations in the institutionalization process: Bubu Atagamu, serving as a pilot site with intensive support from YTIB, and Lewoggaran, acting as an adoption or replication site. This design enables a comparison of aggregation and articulation processes without claiming statistical generalizability. Institutional bricolage serves as the analytical strategy. This concept guides the selection of cases with distinct formation trajectories, the collection of data regarding changes in rules and sources of

legitimacy, and the coding of aggregation, alteration, articulation, regulative-normative-cognitive functions, and the three dimensions of spatial justice. Consequently, bricolage is treated as a mechanism to be traced within the data, rather than as a synonym for hybrid institutions.

Data collection took place between 2024 and 2025. Informants included village heads, customary or community leaders, village government officials, traditional fishers, local residents, and YTIB administrators. The inclusion criteria required direct involvement in the formulation, monitoring, or utilization of the *keban lewa lolon* zone for at least one zone opening-closing cycle. Purposive sampling was employed to ensure representation of relevant roles, followed by snowball sampling to identify actors involved in the rule-making and conflict resolution processes.

Table 1. Operationalization of analytical concepts

Concept	Operational definition	Empirical indicators/data
<i>Keban lewa lolon</i>	Local marine spatial management institutions that combine customary norms, community agreements, and formal village procedures	Zone boundaries, opening and closing regulations, sanctions, rituals, management groups, village decisions
Aggregation	The integration of customary elements and formal procedures within a single regulatory framework	Village deliberations, village head decisions, and customary rituals or sanctions
Alteration	Modification of the meaning or function of an old rule to suit a new context	Transforming the concept of a land-based food granary into a marine granary
Articulation	Liaison or defense of local legitimacy when dealing with formal regimes	Zoning mapping, policy language, integration with conservation areas/RZWP3K, government negotiations
Institutional function	How institutions operate in regulative, normative, and cognitive ways	Rules/sanctions; moral obligations; conceptualizing the sea as a living space
Spatial justice	Governance consequences for the distribution of access, participation, and recognition	Who gains access/benefits; who is involved; whether local knowledge/authority is recognized
Ecological restoration	Ecological changes reported/observed by the community, not a measure of causality	Reports on the decline in bombing, reef condition, and fish populations; lacking standardized longitudinal surveys

Source: Prepared by the researcher, 2026

Data were collected using three techniques. First, semi-structured, in-depth interviews were conducted. The interview guide covered four thematic areas: the history of and changes in access, rule-making, negotiations with the government, and experiences regarding distributive, procedural, and recognition justice. Interviews took place following the acquisition of informed consent, and groups of informants holding different positions of power were interviewed separately. Second, participant observation involved village deliberations and joint zone patrols with management groups. Third, document analysis encompassed YTIB reports, the NTT RZWP3K Regional Regulation, Village Regulations, Village Budgets (APBDes), and national regulations. Documents were selected based on their direct relevance to zone designation, financing, monitoring, or management. The process of zone determination was traced through socio-ecological studies, village deliberations, participatory mapping, formal village decisions, customary ratification, and the establishment of sanctions. Ecological recovery was not measured using experimental or longitudinal designs; consequently, ecological outcomes are treated as indications based on community monitoring.

Data analysis followed the interactive model proposed by Miles et al. (2014), encompassing data condensation, data display, and conclusion drawing/verification. Coding was conducted using a deductive-inductive approach. Deductive codes were derived from institutional functions (regulative, normative, cognitive), *bricolage* processes (aggregation, alteration, articulation), and spatial justice (distributive, procedural, recognition). Inductive

codes were developed from the data itself, such as the rejection of external fishing gear and customary validation rituals. Validity was reinforced through source and method triangulation.

4. RESULTS

State Dominance in Coastal and Marine Management on Solor Island

Field findings reveal a gap between formal authority and management practices at the village level. East Nusa Tenggara (NTT) Provincial Regulation No. 4 of 2017 establishes the 2017–2037 Coastal and Small Islands Zoning Plan (RZWP3K) as the framework for the allocation, utilization, supervision, and control of coastal space, while the national framework—Law No. 27/2007, as amended by Law No. 1/2014—provides scope for community participation and input. In practice at the study sites, residents report limited dissemination of information regarding formal spatial boundaries; consequently, state regulations do not always serve as the reference for daily operations. Residents state that government-established marine boundaries were never directly communicated to them, leaving them unaware of which areas are permissible for use and which are not. The most palpable tensions arise from the exploitation of coastal resources by external parties and the use of destructive fishing gear—including blast fishing that damages coral reefs and seagrass beds, as noted in resident reports and community monitoring. This situation demonstrates that state dominance through regulation does not automatically result in ecosystem protection. When oversight is weak, formal zoning fails to prevent environmental degradation and conflict. The *keban lewa lolon* system fills this institutional void through participatory mapping, village-level agreements, and customary sanctions. Therefore, the relationship between *keban* and the RZWP3K is best understood as complementary, albeit not yet fully institutionalized; *keban* generates operational local rules, whereas formal legal recognition remains the prerogative of the government. When oversight is weak, formal zoning fails to prevent environmental damage and conflict.

Institutionalization of Keban Lewa Lolon as Local Wisdom

The *keban lewa lolon* evolved from the cultural concept of a terrestrial food granary into a local institution with relatively clear structures, norms, and implementation mechanisms. *Keban* refers to a storage place or structure, *lewa* means sea, and *lolon* means above or within. Literally, *keban lewa lolon* is a granary at sea, an ecological metaphor representing the ocean as a source of life that must be managed collectively and sustainably (Tatu Sius et al., 2024).

The institutionalization process unfolded through stages that demonstrate strong social legitimacy (Figure 1). These stages included a socio-ecosystem study to determine the location, dissemination of study findings during village deliberations, participatory site mapping, the formation of a management group via a village head's decree, the drafting of a collective agreement, physical construction of the *keban* (traditional storage structure) through communal labor (*gotong royong*), formalization through customary rituals, and the establishment of mutually agreed-upon customary sanctions. This sequence of stages represents a concrete manifestation of the process of bricolage. Aggregation is evident in the combination of the village head's decree (a formal procedure) with customary rituals (traditional legitimacy). Alteration is seen in the transformation of the concept of a land-based granary into a sea-based granary. Articulation is demonstrated by how the management group linked the customary agreement with the RZWP3K framework to ensure the mapped area was recognized as part of the regency's marine conservation zone.

Figure 1. Stages of Institutionalization of *Keban Lewa Lolon*



Source: Process documentation by YTIB

Functionally, the *keban lewa lolon* divides the 61.97-hectare marine area in South Solor Bay, which has been integrated into the East Flores Regency marine conservation area, into three zones. The core zone (20.74 ha) is completely closed to fishing activities to allow for ecosystem recovery. The buffer zone (13.05 ha) serves as a transitional area that is reopened after a specific period. The utilization zone (28.18 ha) is designated for the consumption and marketing of marine products by traditional fishers.

Spatial Justice and Environmental Justice

Regarding the dimension of spatial justice, the *keban lewa lolon* practice demonstrates three changes supported by qualitative data. Distributively, zoning establishes areas for both conservation and utilization by traditional fishers. Procedurally, residents are involved in mapping, deliberation, rule-setting, and monitoring. In terms of recognition, local knowledge and customary legitimacy are incorporated into the formulation of rules. However, these findings indicate the presence of justice rather than providing a quantitative measure of impact. Furthermore, formal recognition across village or provincial boundaries has not yet been fully established.

Regarding the environmental dimension, informants and monitoring by traditional divers report that fish-bombing activities have decreased since around 2017. Coral reef conditions show signs of recovery, and fish populations in the core zone appear to be rebounding. The incomes of some traditional fishers are also reported to have improved during this same period. These claims are based on informant perceptions and community-based monitoring rather than standardized ecological surveys or longitudinal income data.

Nevertheless, this spatial and environmental justice still faces threats. The absence of inter-village regulations, weak protection at a broader landscape scale, and disruptions caused by fishers from outside the villages pose major obstacles to the sustainability of this model. The spatial justice achieved remains partial in nature and requires stronger legal-formal support to ensure that the recognition of local authority endures in the long term.

5. DISCUSSION

State Domination as the Regime of Spatial Definition

State dominance in coastal management on Solor Island operates primarily through a regime of spatial definition that is formal, top-down, and oriented toward administrative classification. From the perspective of power theory (Archibald, 2020; Lukes, 2005), the state not only regulates space but also monopolizes the legitimate definition of that space. This dominance manifests not through direct repression, but rather through policy language, formal procedures, and zoning practices that disregard local socio-ecological contexts. This situation

aligns with the argument made by Warren and Steenbergen (2021) that fisheries policies in Indonesia often generate tension when legal-administrative logic clashes with local governance systems that already regulate the communities' living spaces. The core issue is not merely a lack of regulation, but the unequal distribution of authority to define coastal space. The absence of adequate outreach and the failure of formal policies to prevent ecosystem degradation have driven Solor communities to seek alternative mechanisms.

Keban Lewa Lolon as a Hybrid Institution

The *keban lewa lolon* emerged as a hybrid institution combining customary norms, social agreements, and modern governance procedures. Its formation involved socio-ecological studies, village deliberations, participatory mapping, the establishment of management groups, and customary rituals. The enforcement of sanctions demonstrates that local institutions do not operate spontaneously but rather through institutionalization mechanisms that are dynamic and responsive to local conditions. Its three institutional functions; regulative, normative, and cognitive, mutually reinforce one another (Ostrom, 1990; Scott, 1985). The regulative function is evident in the division into three zones. The normative function is reflected in the internalization of customary proprieties and prohibitions that shape the residents' moral obligations. The cognitive function is apparent in how the community perceives the sea as a living space that must be restored, preserved, and passed on to future generations.

Compared to other customary marine tenure systems in Indonesia and the Pacific, this pattern is not an isolated case. Cinner et al. (2012) found that customary fisheries institutions in Indonesia, Papua New Guinea, and Mexico share a flexibility to alter rules but generally lack cross-scale connectivity. This same pattern of limited coordination is evident in the *keban lewa lolon* system. Halim et al. (2020) demonstrated that *petuanan laut* (customary marine territories) and *sasi laut* (customary marine closures) in Maluku and West Papua could be transformed into state-recognized, area-based fisheries management rights, offering a concrete, legal-formal pathway relevant for adaptation to the *keban lewa lolon* system. Meanwhile, cases involving taboos and protected marine areas in Vanuatu (Love, 2021) show that local terms for marine closures are often translated by external conservation programs into the state's "Marine Protected Area" (MPA) category. This process of articulation can either strengthen or erode customary authority, depending on who controls the translation. Such risks also warrant attention regarding the integration of *keban lewa lolon* into the RZWP3K (Zoning Plan for Coastal Areas and Small Islands). These findings reinforce the argument that institutional bricolage in marine resource governance is neither uniform nor linearly predictable (Saunders et al., 2025). Grassroots governance innovations that combine modern and traditional elements can yield effective solutions, yet the outcome hinges on who controls the process of articulation with the state.

Spatial Justice as Outcome and Prerequisite

Viewed through the frameworks of spatial justice and environmental justice (Agyeman, 2014; Soja, 2010), the *keban lewa lolon* practice fosters justice across three levels (Tafon et al., 2024). At the distributive level, the spatial allocation facilitated by the *keban* curbs the dominance of unrestricted access, prioritizing ecosystem restoration and the needs of local communities. At the procedural level, residents are not merely passive recipients of rules but actively participate in defining boundaries, agreements, and sanctions. At the level of recognition, the *keban* elevates customary authority and local knowledge to a more equitable standing within spatial governance. However, this recognition remains partial, as it has yet to be formalized into binding legal instruments at the inter-village or provincial levels.

These findings confirm that coastal zoning conflicts cannot be explained merely as technical mapping issues; rather, they are best understood as conflicts over justice (Cavallo et

al., 2023; He et al., 2024). When the state establishes zones without adequately recognizing historical rights and local governance systems, the result is unequal access and the devaluation of community knowledge. Conversely, the *keban lewa lolon* demonstrates that spatial justice can be fostered by integrating ecological protection with social recognition. Nevertheless, this justice remains vulnerable as long as the basis for recognition is informal, relying on positive relationships among management groups, village authorities, and YTIB, rather than on legally guaranteed rights.

Negotiation of Power and Socio-Ecological Sustainability

Keban lewa lolon can be understood as a practice of power negotiation that transforms the relationships between the state, the community, and coastal space. The state retains formal legal authority over RZWP3K zoning, while the community establishes local authority grounded in social legitimacy, customary mechanisms, and ecological effectiveness as perceived by residents. Empirically, this negotiation is most evident in the process of integrating *keban* zone maps into a form of district-level administrative recognition, even though this has not yet reached the level of a binding local regulation. This aligns with the co-management literature, which asserts that community involvement is not merely supplementary but a prerequisite for the effectiveness of coastal policies (Cinner et al., 2012; Paramita et al., 2023; Steenbergen, 2016). This is consistent with the broader context of East Nusa Tenggara, where Ramenzoni (2021) demonstrates that maritime networks and cross-regional navigation conventions in Ende, Flores, help sustain local tenure institutions amidst limited formal state control over marine space.

At the outcome level, the *keban lewa lolon* demonstrates indications of positive ecological and social impacts, as evidenced by community accounts and monitoring. However, a key limitation identified is the lack of cross-village recognition and adequate landscape-scale protection. If left unaddressed, this situation risks perpetuating the kind of cross-scale coordination weaknesses noted by Cinner et al. (2012) in similar cases. Consequently, this study asserts that socio-ecological sustainability can only be achieved if state policy shifts from spatial domination toward formal recognition, and from administrative control toward equitable, collaborative governance (Li et al., 2020; Muhl et al., 2023).

Implications for the Global South

The findings from Solor hold comparative relevance for the Global South, though not because all these regions share identical institutional forms. The analytical commonality lies in how state rules intersect with socially embedded institutions. In Tanzania, *bricolage* manifests as a blend of modern and traditional rules. Research on irrigation in Ethiopia highlights the significance of power relations in rule-making. Findings from Brazil regarding changes in extractive zones reveal the interaction between bureaucratic and social institutions, while in Laos, *bricolage* illustrates how state and donor interventions are negotiated alongside communal rules (Cleaver, 2001; Alemu, 2018; Prado et al., 2021). The Solor case introduces a maritime dimension. Acknowledging local wisdom requires considering it not merely as a technical input, but as a matter of scale, authority, and representation. The policy implication for the Global South is the need for governance designs that enable local institutions to negotiate with formal regimes without eroding local capacity through the formalization process. This aligns with the "blue justice" agenda, which emphasizes distribution, procedure, and recognition within ocean economies and governance (Bennett et al., 2021).

6. CONCLUSION

This study presents three key findings that should be interpreted by distinguishing between results supported by direct field evidence and their normative implications. First, *keban lewa lolon* functions as a hybrid coastal governance institution, integrating customary norms, social agreements, and modern procedures through a bricolage mechanism that can be traced step-by-step. This finding is directly supported by data on the institutionalization process and documentation from YTIB. Second, *keban lewa lolon* is associated with indications of spatial justice across three dimensions: distributive, procedural, and recognition. The recognition dimension remains administrative-informal in nature and has not yet taken the form of binding legal rights. Third, state dominance in coastal zoning on Solor Island operates through a technocratic and top-down regime of spatial definition. The limited dissemination and implementation of formal policies have created space for the community to develop alternative governance mechanisms driven by YTIB.

Based on these findings and the legal framework, policy recommendations focus on operational mechanisms for recognition. First, the NTT Provincial Government could establish protocols for participatory mapping and spatial overlay to incorporate community-managed areas as recognized data when reviewing or amending existing marine spatial planning instruments. Second, provincial and regency governments could form cross-village co-management forums bringing together management groups, village governments, the Marine and Fisheries Agency (DKP), and area management units to agree on rules, monitoring indicators, and dispute resolution mechanisms. Third, any formal integration must be preceded by socio-legal verification of rights, boundaries, membership, and local decision-making processes, while ensuring that women and underrepresented groups have a voice in decision-making. Fourth, Village Regulations and Village Budgets (APBDes) can be utilized to clarify management institutions and financing, while regency and provincial governments provide support for monitoring and cross-village networking. Fifth, integration into the Marine Spatial Plan (RZWP3K) or other applicable instruments requires the inclusion of clauses protecting local authority to ensure that formalization does not reduce the community to mere implementers or objects of consultation. These mechanisms position *keban lewa lolon* not as a substitute for the state, but as part of a pluralistic governance system where authorities mutually recognize one another.

This study has several limitations. First, it covers only two villages, both within the scope of YTIB's support; thus, the findings are not intended for statistical generalization to other islands. Transferability should be assessed through contextual comparison. Second, one of the authors is affiliated with YTIB, creating a potential conflict of interest and risk of interpretive bias, particularly regarding positive findings. This risk was managed through separate group interviews, triangulation of sources and methods, and team discussions on interpretation. Third, indications of reef and fish recovery were not derived from standardized longitudinal ecological surveys and should not be interpreted as causal evidence of the intervention's impact. Fourth, gender dynamics and the potential for internal elite capture have not been explored in depth. Future research agendas include longitudinal ecological studies, analyses of gender and internal power dynamics, and comparative studies involving *sasi/petuanan laut* (customary marine tenure) and other indigenous institutions in Indonesia and the Global South.

Author Contribution

Conceptualization and research design, Karolus T. Sius; data collection, Veronika Lamahoda and Hendrikus L. Kaha; analysis design, Paulus Adrianus K.L. Ratumakin; initial draft writing and editing, Karolus T. Sius, Paulus A.K.L. Ratumakin, Yasinta P. Peten;

literature management, Hendrikus L. Kaha; supervision, Paulus A.K.L. Ratumakin. All authors have read and approved the published version of the manuscript.

Data Availability Statement

Data access requests may be submitted to the corresponding author via official institutional email.

Declaration of Generative AI and AI-Assisted Technologies

The authors also disclose the use of an AI language assistant.

Conflict of Interest Declaration

The authors declare that there is no conflict of interest with any party in this study.

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