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EPISTEMIC EXCLUSION AND MARINE RESOURCE GOVERNANCE: THE CASE OF THE BAJO COMMUNITY IN TOROSIAJE, INDONESIA

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Abstract

This study investigated the exclusion of local ecological knowledge in marine resource governance by examining the case of the Bajo community in Torosiaje, Gorontalo Province, Indonesia. Using a qualitative ethnographic approach, data were collected through in-depth interviews, participatory observation, and document analysis. The findings revealed that the exclusion of traditional ecological knowledge was not merely incidental, but it was rooted in structural power asymmetries, institutional neglect, and epistemological bias. This exclusion undermined ecological sustainability, disrupts cultural practices, and weakened the role of Indigenous communities as environmental stewards. By employing the frameworks of Traditional Ecological Knowledge (TEK) and Political Ecology, the study provided a critical analysis of how state-led, technocratic policies marginalize Indigenous knowledge systems. The research contributes to global discourses on ecological justice and inclusive governance by demonstrating the need to re-centre Indigenous epistemologies in environmental decision-making. This study offers a novel perspective by linking epistemic exclusion to the broader challenges of marine policy reform and sustainability in the Global South.

Keywords: *Marine Resources; Cultural Heritage; Political Ecology; Epistemic Exclusion; Bajo Community.*

A. Introduction

Marine resource governance under national policy frameworks often excludes both the welfare and traditional wisdom of local communities (Cinner & Aswani, 2007). Sari and Latifah (2021) emphasize that this exclusion extends beyond formal policy, positioning local communities as peripheral entities within marine governance. Further, Parsaulian et al. (2024) highlights the mismatch between state-driven approaches and local ideological frameworks, risking exploitative practices and undermining community well-being, as evidenced by the Bajo people. This indicates that marine governance excluding local ecological knowledge poses a fundamental threat to ecological sustainability in Bajo communities.

The exclusion of local ecological knowledge in marine resource governance, as experienced by the Bajo community, reflects a fundamental epistemological tension between technocratic approaches promoted by state authorities and locally embedded knowledge grounded in generations of lived experience. Thu and Ha (2023) argue that governance led by state actors is often exploitative and economically driven in orientation. This mode of governance stands in stark contrast to the worldview of local communities, who tend to perceive the sea as a living space—one whose sustainability must be safeguarded for the collective good (Aburto et al., 2017; Imamah et al., 2024; Fernando et al., 2025).

Over the past decade, scholarships on ecological issues within Bajo communities have predominantly addressed three main themes. First, studies have focused on the marine potential of Bajo areas for tourism development (Akmalia et al., 2024; Marlina et al., 2020; Sukran et al., 2025). Second, researchers have investigated the Bajo community's participation in ecological rituals that highlight their spiritual connection to the environment (Chanifah et al., 2024; Lagarde, 2024; Sulaiman et al., 2023). Third, scholars have examined the resilience practices of Bajo communities aimed at preserving marine environmental sustainability (Glaser et al., 2015; La Ola et al., 2020; Wianti et al., 2021). Collectively, these studies remain limited to cultural and environmental dimensions, leaving

comprehensive analyses of local ecological knowledge exclusion within marine governance largely unexplored.

While these studies offer valuable insights into the socio-cultural dynamics of the Bajo people, they often remain descriptive and celebratory in tone, lacking critical engagement with structural power relations that shape knowledge inclusion in governance. This study addresses this gap by examining not only what is excluded, but how and why exclusion occurs. By framing local ecological knowledge as a living, adaptive epistemology, this research departs from static views of tradition and explores how knowledge systems are shaped by interaction, conflict, and resistance within governance regimes.

This analysis draws on two interrelated theoretical frameworks: Traditional Ecological Knowledge (TEK) and Political Ecology. TEK is not simply a repository of inherited wisdom, but an evolving knowledge system that integrates ecological observation, cultural values, and spiritual relationships with nature (Berkes, 2017; Nursey-Bray & Jacobson, 2014). Political Ecology, on the other hand, interrogates the dynamics of power, access, and legitimacy in resource governance, enabling a critical lens to understand how state policies privilege scientific modernity while marginalizing Indigenous perspectives (Blaikie, 2008; Escobar, 1998). The synthesis of these frameworks allows this study to move beyond the binaries of local versus global, or tradition versus modernity and instead focuses on the negotiation of knowledge and authority within institutional settings.

Furthermore, the epistemic exclusion experienced by the Bajo people is not an isolated phenomenon. Across the Pacific Islands, Latin America, and parts of Africa, Indigenous coastal communities face similar patterns of marginalization where their marine knowledge is undervalued or erased in state-led conservation agendas. This study situates the Bajo case within this global discourse, highlighting how the Indonesian context reflects broader international trends of technocratic governance that undermine pluralism in knowledge systems. Recognizing these parallels not only enhances the theoretical relevance of this research but also contributes to a growing international call for more inclusive and participatory environmental governance.

Addressing this research gap, this study critically investigates the forms, causes, and implications of the systematic exclusion of Bajo ecological knowledge from marine governance. Tamu et al. (2017) highlight that disregarding local interests in natural resource management can lead to lasting ecological disruptions, necessitating careful evaluation. Yet, existing research on ecological matters concerning the Bajo people tends to remain descriptive and normative rather than analytical or critical. The present study addresses these gaps by critically examining the patterns and drivers of exclusion, as well as their ecological and social consequences, specifically recognizing the Bajo as a coastal community whose extensive traditional knowledge remains profoundly relevant for sustainable marine resource management.

The exclusion of Bajo ecological knowledge from marine governance involves diverse forms and drivers with significant consequences for local ecological sustainability. Thus, thorough analysis is imperative. To guide this inquiry, this research poses the following three questions: First, what forms of exclusion characterize Bajo ecological knowledge in marine governance? Second, what ecological and social consequences arise from this exclusion? Third, how committed are stakeholders to reintegrating local ecological knowledge into inclusive marine governance frameworks? This study proceeds from the assumption that exclusion stems not only from weak institutional commitments to ecological sustainability but also from profound epistemological tensions between technocratic modernity and traditional ecological practices in coastal governance.

B. Method

This study investigates the marginalization of local ecological knowledge within marine resource governance among the Bajo community in Torosiaje Village, Pohuwato Regency, Gorontalo Province. Understanding how traditional ecological knowledge (TEK) is systematically excluded by contemporary governance structures and assessing its impact on ecological sustainability and cultural resilience, are

central aims of this research. Additionally, the study seeks to contribute toward advocating for inclusive marine governance models that respect and integrate customary practices. Applying the frameworks of Traditional Ecological Knowledge and Political Ecology is crucial for grasping the structural dynamics weakening traditional marine management practices. Three primary considerations informed the ethnographic approach. Firstly, the Bajo community possesses profound traditional knowledge essential for sustainable marine resource management. Secondly, modern marine governance policies frequently overlook this knowledge, exacerbating ecological vulnerabilities and sociocultural risks. Lastly, examining this issue offers broader insights into the systemic marginalization of Indigenous communities within environmental governance.

The research adopted a qualitative case study design to facilitate an in-depth, context-sensitive exploration of the phenomenon. Data collection methods included in-depth interviews, participant observation, and document analysis. A purposive sampling approach was employed to select 15 informants, including community elders, active fishers, youth representatives, and local marine governance stakeholders. Informants were chosen based on their extensive knowledge of traditional marine practices and their active engagement in community decision-making processes. Interviews were conducted over three months of fieldwork, each lasting approximately 45 to 60 minutes, guided by semi-structured questions focused on traditional marine practices, community perceptions of government policies, and adaptive strategies. Daily participant observations took place during fishing activities, ritual practices, and community meetings, aimed at capturing authentic interactions and marine management behaviors.

In addition to interviews, document analysis was carried out on local and national marine resource governance policies to identify their alignment or misalignment with traditional Bajo practices. A systematic reading-note technique was applied to capture ecological knowledge, policy impacts, and community responses. Data collection particularly emphasized conservation

strategies, policy-driven changes, and mechanisms underlying the resilience of local knowledge.

The data analysis followed an ethnographic interpretive approach, consisting of three main phases: (1) data reduction, in which raw data were coded and thematically organized; (2) data display, involving the systematic presentation of emerging patterns through tables and narrative excerpts; and (3) conclusion drawing and verification, during which identified themes were interpreted through the conceptual lenses of Traditional Ecological Knowledge and Political Ecology. The analysis specifically addressed how power dynamics influence the recognition or marginalization of local knowledge. Interpretations remained closely linked to empirical findings and theoretical perspectives to maintain contextual accuracy. This methodological structure ensured transparency, strengthened the validity of findings, and facilitated a coherent narrative connecting traditional Bajo practices with broader sociopolitical dynamics shaping marine resource governance.

C. Results and Discussion

The following section presents the key findings derived from in-depth interviews, participant observation, and document analysis conducted within the Bajo community in Torosiaje. The results are organized thematically to illuminate the forms and consequences of epistemic exclusion experienced by the community in the context of marine resource governance. Each theme is substantiated with empirical evidence and serves as a foundation for the subsequent critical discussion that draws upon the frameworks of Traditional Ecological Knowledge and Political Ecology.

1. Results

This study investigates how the local ecological knowledge of the Bajo community in Torosiaje has been excluded within contemporary marine resource governance. Analysis of in-depth interviews, participant observation, and document review yielded three core thematic areas: (1) forms of local knowledge exclusion, (2) socio-environmental impacts, and (3) roles of government and external stakeholders.

a. Forms of marginalization of local knowledge

Several interconnected forms of marginalization of Bajo local ecological knowledge emerged prominently in this study. Through a process of thematic coding, five major themes were identified: (1) Structural Marginalization, (2) Epistemological Exclusion, (3) Resource Alienation, (4) Policy Disregard for Conservation, and (5) Cultural Marginalization. These themes emerged from iterative coding procedures applied to interview transcripts, initially employing open coding to identify primary issues, followed by axial coding to refine broader thematic patterns.

Table 1. Themes and examples of exclusion of local knowledge

Theme	Coding Pattern	Informant	Statement
Structural Marginalization	Lack of participation in decision-making	YH	"Marine resource management policies are often formulated without involving the Bajo community. Decisions made by the government and relevant authorities frequently overlook the local knowledge and experiences of the Bajo people, thus excluding their traditional practices from policy-making processes".
Epistemological Exclusion	Adoption of modern fishing gear	KL	"Fishery policies that promote the use of modern technology and advanced fishing equipment tend to disregard the environmentally sustainable fishing methods traditionally practiced by the Bajo. This approach not only damages marine habitats but also threatens the continuity of their traditional practices, which have historically been effective in preserving ecological balance".
Resource	Inadequate	DI	"The zoning policies for

Theme	Coding Pattern	Informant	Statement
Alienation	zoning of fishing areas		fishing areas often fail to account for locations of significant cultural and economic value to the Bajo. Consequently, the community has lost access to traditional fishing grounds they have utilized for generations, undermining their ability to sustain their families and community livelihoods".
Policy Disregard for Conservation	Lack of support for local conservation practices	PA	"Local ecological wisdom in marine conservation—such as sustainable fishing techniques and ecosystem preservation practices—is rarely acknowledged within official policies. Instead, there is a stronger emphasis on resource exploitation without adequate consideration for conservation, aggravating environmental damage and threatening the sustainability of resources that the Bajo community relies upon".
Cultural Marginalization	Cultural stigma and marginalizatio n	NL	"Local knowledge within the Bajo community is often perceived as outdated or ineffective compared to modern approaches, leading to cultural marginalization. This situation creates a gap between traditional practices and newer methodologies, leaving the Bajo community feeling sidelined and their cultural identity increasingly threatened".

Source: Interviews

Table 1 illustrates various forms of exclusion of the Bajo community's local ecological knowledge in the context of marine resource governance.

These forms of exclusion range from structural marginalization in policy processes and the dismissal of ecologically grounded traditional methods to cultural exclusion weakening community identity. Marine governance activities, ideally designed to incorporate local community participation and experience, instead tend to be dominated by technocratic approaches that marginalize local values. Zoning practices that neglect culturally significant marine areas and policies promoting environmentally damaging fishing gear exemplify this exclusion. Such non-participatory policymaking not only undermines environmental sustainability but also exacerbates social injustice. In line with this, Table 1 highlights three significant contexts through which the Bajo community's local knowledge has been systematically excluded in marine resource governance policies.

First, the exclusion of local community participation in policy processes. As Table 1 demonstrates, the Bajo community is frequently excluded from decision-making processes related to marine resource management. Informant YH emphasizes that *"marine resource management policies are often formulated without involving the Bajo community"*. This condition exemplifies structural marginalization, reflecting the state's prioritization of bureaucratic methods without considering Indigenous communities' direct experiences. Despite their crucial role—rooted in proven, sustainable ecological practices accumulated over generations—the Bajo community's exclusion diminishes their capacity to influence policies directly affecting their lives.

Second, the exclusion of established traditional ecological practices. Table 1 further reveals that Bajo's local ecological knowledge, particularly regarding traditional fisheries and conservation practices, is often neglected by formal policies. Informant KL articulates this clearly, stating, *"Fishery policies that promote the use of modern technology … disregard the environmentally sustainable fishing methods"*. This reflects a form of epistemological violence[1],

[1]*Epistemological violence* is a form of symbolic violence in which local or traditional knowledge is excluded or deemed illegitimate by dominant knowledge systems, such as modern science or state policies.

dismissing traditional knowledge as unscientific or irrelevant. One example is the promotion of destructive modern fishing gear that damages marine ecosystems and disrupts fish life cycles, contrasting sharply with traditional methods that are more selective and sustainable.

Third, cultural identity through zoning policies and social stigma. Another critical context identified is cultural exclusion resulting from marine zoning policies that fail to recognize local cultural significance. Informant DI explains, *"The zoning policies for fishing areas often fail to account for locations of significant cultural … value"*. Informant NL adds that Bajo local knowledge is often perceived as outdated and incompatible with modern standards. This perception generates cultural stigma and diminishes the community's confidence in preserving their heritage. Formerly sacred and productive marine areas, now inaccessible, disconnect the community from their historical legacy, living space, and collective identity. This exclusion is not merely symbolic but has tangible impacts on community welfare and long-term sustainability.

These three contexts indicate that policy opacity, exploitative technology, and cultural weakening represent expressions of exclusion of local ecological knowledge—practices often perceived as acceptable within modern developmental paradigms, yet bearing substantial consequences for the survival, cultural values, and ecological justice of the Bajo community. Such patterns illustrate how top-down governance systematically marginalizes Bajo ecological knowledge, underscoring the imperative for more inclusive marine resource governance that formally integrates local practices.

b. Impacts of excluding local ecological knowledge

Excluding the local ecological knowledge of the Bajo community in marine resource governance generates interconnected ecological, economic, and social consequences. In this context, local knowledge encompasses not only intergenerational ecological wisdom but also serves as a crucial ethical and practical foundation for balancing human activity and marine

environmental sustainability. When this knowledge is set aside in favor of technocratic approaches prioritizing market efficiency, environmental degradation and social disintegration become inevitable. This point is articulated clearly by OG (59), who states.

> "*Excluding local knowledge often leads to unsustainable fishing practices, such as using modern fishing gear that damages marine habitats. Destruction of coral reefs, loss of mangrove forests, and deterioration in water quality can occur, creating ecosystem imbalances affecting diverse marine species*" (OG, personal communication, June 12, 2024).

OG's statement highlights significant ecological harm stemming from the disregard for traditional Bajo fishing practices. The introduction of environmentally harmful fishing gear replaces sustainable, locally evolved methods that historically preserve coral reefs, mangrove ecosystems, and coastal water quality. From the perspective of Traditional Ecological Knowledge (TEK), community-based observational management aligned with natural cycles facilitates ecological balance. However, the exclusion of local knowledge by short-term productivity-oriented policies significantly increases ecological stress. This is further elaborated by IR (54), who states.

> "*Aggressive and uncontrolled fishing practices can drastically reduce fish populations. This not only jeopardizes the sustainability of marine resources but also threatens the livelihoods of Bajo community members reliant on fishing*" (IR, personal communication, June 13, 2024).

IR's observation underscores the critical decline in fish populations directly attributable to resource exploitation devoid of ecological considerations. Aggressive fishing methods, ignoring spawning seasons and fish migration patterns, lead to rapid population declines. This situation illustrates failure of contemporary management systems to grasp local ecological dynamics traditionally maintained by Bajo TEK-based practices. Additionally, from a political ecology perspective, this phenomenon exemplifies the dominance of state-driven epistemic systems that undervalue local capacities essential for ecological sustainability. This context is further supported by TL (59), who states.

> *"With declining fish catches, the Bajo community is experiencing a significant drop in income. This economic instability may lead to increased poverty and difficulties in meeting basic needs, such as food, education, and healthcare"* (TL, personal communication, June 20, 2024)

TL's statement highlights how ecological damage reverberates into economic hardship within the Bajo community. When declining fish populations are not addressed through adaptive governance, the incomes of sea-dependent households inevitably shrink. This demonstrates the deep interconnection between ecology and economy in Indigenous livelihoods. TEK not only guides fishing practices but also sustains coastal communities through an embedded ecological ethic. When this framework is excluded, economic crises and poverty emerge as inevitable downstream consequences. This connection is further illustrated by ZA (63), who notes.

> *"As marine resources become increasingly scarce, many members of the Bajo community are forced to abandon their traditions and seek employment outside the community, resulting in the erosion of cultural identity and traditional knowledge. This weakens social cohesion and erodes a cultural heritage that has endured for centuries"* (ZA, personal communication, June 23, 2024).

ZA's observation reflects the cultural disruption caused by ecological and economic pressures that compel Bajo community members to forsake traditional livelihoods. Out-migration for work leads not only to the loss of ancestral practices but also to weakened social bonds and the breakdown of intergenerational value transmission. From a cultural anthropology perspective, the collective identity once maintained through fishing and sea rituals faces rupture. The disappearance of TEK from daily life underscores the vulnerability of local cultures in the face of dominant external economic systems. This concern is echoed by NN (57), who states.

> *"Unstable fish catches and the ongoing depletion of marine resources create economic uncertainty for the Bajo community. This situation drives them to pursue alternative economic activities that are often less sustainable, reinforcing a cycle of dependence on environmentally destructive practices"* (NN, personal communication, June 21, 2024).

NN's account captures the structural economic insecurity stemming from the exclusion of sustainable traditional economic practices. As marine yields become unpredictable, communities are driven toward alternatives that may conflict with local values and harm the environment. This condition illustrates a vulnerability cycle: the erosion of TEK intensifies economic crisis, which in turn fosters uncontrolled resource exploitation. The absence of institutional support for local economic models further marginalizes the Bajo within national economic systems. This is further demonstrated by TY (60), who explains:

> *"As resources become increasingly scarce, tensions between the Bajo community and local or external fishers may rise. Competition for access to dwindling resources can trigger social conflict, undermining inter-community relations and fostering an atmosphere of uncertainty"* (TY, personal communication, June 25, 2024).

TY's statement illustrates the emergence of horizontal conflict triggered by unequal access to scarce marine resources. As competition intensifies, local social structures begin to fracture—not only between the Bajo and outsiders but also among community members themselves. From a political ecology perspective, such conflict reflects imbalanced power relations in which Indigenous communities are relegated to the margins of resource governance they once collectively stewarded. The resulting social fragmentation threatens local peace and weakens the collective capacity for long-term sustainability.

The six contexts discussed above demonstrate that the impacts of excluding local ecological knowledge extend beyond ecological degradation—they also produce a chain of dependencies leading to social, economic, and cultural crises. Phrases such as "modern fishing gear that damages marine habitats," "significant income decline," and "abandoning their traditions" illustrate how the exclusion of local knowledge generates conditions of structural injustice. Through the frameworks of TEK and Political Ecology, it becomes clear that power asymmetries and the marginalization of local knowledge are the root causes of both ecological destruction and social vulnerability in Torosiaje. Thus, the active involvement of the Bajo community

in policymaking must be recognized as both an ethical and ecological imperative for marine conservation and community resilience.

Viewed through the theoretical lenses of TEK and Political Ecology, these findings underscore how knowledge hierarchies and power relations contribute to the marginalization of Indigenous communities. Addressing these challenges requires collaborative governance involving state authorities, local communities, and other stakeholders to develop more equitable and sustainable resource management models—ones that honour the Bajo community's cultural heritage while ensuring the preservation of marine ecosystems for future generations.

c. Roles of government and stakeholders

The roles of government and relevant stakeholders are critical in integrating the local ecological knowledge of the Bajo community into marine resource governance in Torosiaje. These actors bear the responsibility of ensuring that implemented policies are not only inclusive but also respectful of, and grounded in, the traditional knowledge held by local communities. The government must involve the Bajo in policy-making processes by creating forums for dialogue that enable them to articulate their perspectives and long-standing management practices. Furthermore, stakeholders such as non-governmental organizations and academic institutions can contribute by conducting research that documents local knowledge and by offering education and training programs that strengthen the community's capacity for active participation. Through this collaborative approach, marine resource governance policies can strike a balance between exploitation and conservation, ensuring the sustainability of resources vital to both the livelihoods of the Bajo and the health of marine ecosystems.

Institutional support is essential for the successful integration of local knowledge into marine governance. This study identifies six core roles that government and stakeholders must fulfil to ensure that the knowledge and practices of the Bajo community are preserved, respected, and formally included in policy-making processes: inclusive policy formulation,

community participation, capacity building, collaborative research, legal protection, and public advocacy.

Table 2. Roles of government and stakeholders in integrating bajo local knowledge

No.	Coding	Statement	Informant
1.	Inclusive policy formulation	"The government must formulate marine resource management policies that incorporate the perspectives and knowledge of the Bajo community. This includes recognizing traditional practices proven effective in preserving the environment".	LP
2.	Facilitating community participation	"The government needs to provide platforms and mechanisms that enable the Bajo community to participate in decision-making processes related to marine resource governance. This can be achieved through forums, community meetings, or public consultations".	SA
3.	Education and training	"The government can offer education and training programs focused on enhancing the capacity of the Bajo community. These should include training on sustainable resource management and environmentally friendly fishing techniques".	KP
4.	Support for research and development	"By collaborating with academics and researchers, the government can support studies that document local knowledge and assess the impact of traditional management practices. Such research can inform more effective policies".	MB
5.	Legal protection and access rights	"The government must ensure legal protection for the rights of the Bajo community to access marine resources. This includes recognition of traditional fishing grounds that have been used for generations".	DT
6.	Implementation of sustainable management practices	"The government should promote the adoption of sustainable marine resource management practices, incorporating local knowledge as part of broader ecosystem balance strategies".	TY
7.	Awareness	"The government can lead campaigns to	LA

	campaigns and advocacy	raise awareness among the public and stakeholders about the importance of local knowledge in marine governance and its impact on ecosystem sustainability".	
8.	Monitoring and evaluation	"The government needs to conduct monitoring and evaluation of policies that integrate local knowledge to ensure their effectiveness and responsiveness to the needs of the Bajo community".	TA

Source: Interviews

Table 2 outlines the key roles played by the government and stakeholders in integrating the local ecological knowledge of the Bajo community into marine resource management. These roles encompass inclusive policy formulation, facilitation of community participation, and support for education, research, and public advocacy. Ideally, marine governance should serve as a collaborative space between the state and Indigenous communities. In practice, however, it often remains top-down, disregarding the long-standing traditional practices of the Bajo. Their exclusion from decision-making processes risk undermining the overall effectiveness of marine resource governance.

In this light, Table 2 also highlights three essential contexts for evaluating how institutional actors contribute to the recognition and preservation of the Bajo community's ecological knowledge. First, recognizing the participation of the Bajo community in decision-making. One of the most significant insights from Table 2 is the importance of involving the Bajo community in the formulation of marine governance policies. Multiple informants stress that such involvement should occur through public forums or open meetings that allow community members to express their time-tested management practices. One informant noted, for instance, that "*the government needs to provide platforms … that enable the Bajo community to participate*", reflecting a pressing need for equitable dialogue spaces. Without this participation, policies risk ignoring critical local knowledge, such as seasonal fish migration patterns or customary fishing zones. Consequently, the Bajo not only lose control over their resources but also face exclusion from the governance systems they once stewarded.

Second, supporting education and research collaboration as strategies to build community capacity. Table 2 underscores the need to strengthen the Bajo community through education, training, and research initiatives that center the value of local knowledge. Several informants emphasize that training programs should align with local ecological conditions and incorporate traditional, environmentally friendly techniques. One highlighted the necessity of *"education[al] … programs … on sustainable resource management"*. In addition, government support for collaboration with scholars is vital to document local practices such as star-based marine navigation or customary no-take zones. Without such documentation, local knowledge risks erasure and cannot be formally integrated into policy frameworks. Thus, research collaboration serves as a bridge between academic inquiry and community-based practice.

Third, the importance of legal protection and public awareness campaigns. The third context presented in Table 2 is the need for legal protections that guarantee the Bajo community's rights to marine territories they have managed through customary systems. Several informants stress that the lack of formal recognition renders the community vulnerable to conflict with external actors, including large corporations and industrial-scale fishing vessels. One informant asserted that *"the government must ensure legal protection for the rights of the Bajo community to access marine resources."* In addition, public awareness campaigns aimed at educating both broader society and other stakeholders are viewed as essential for fostering wider acceptance of the ecological and social values embedded in local knowledge. Without legal recognition and public outreach, the Bajo community will continue to face structural pressures that obstruct their ability to maintain cultural and ecological sovereignty.

These three contexts—community participation, capacity strengthening, and legal protection—are fundamental to ensuring that Bajo ecological knowledge is not merely acknowledged symbolically but implemented meaningfully in policy. Government and stakeholder roles cited in statements such as "participatory forums," "research collaboration," and "protection of customary marine territories" reflect the necessity of a just, structurally grounded approach attuned to local practice.

Absent these elements, efforts to integrate local knowledge risk becoming rhetorical gestures with little substantive effect on equitable marine resource governance.

2. Discussion

The exclusion of Bajo local ecological knowledge in the governance of marine resources in Torosiaje cannot be separated from the broader social, cultural, and political context shaping governance practices in Indonesia. Although local knowledge has long served as the foundation for sustainable marine management, government policies in recent decades have favoured technocratic, centralized approaches that systematically marginalize such knowledge (Siberian & Imron, 2020; Utina, 2011, 2013). This situation reflects a deeper epistemological-social conflict—between holistic, experience-based traditional knowledge and state-endorsed scientific paradigms (Escobar, 1998; Hilmawan & Nurhidayah, 2021). From the perspective of Traditional Ecological Knowledge (TEK), Bajo practices such as seasonal fishing restrictions and ecosystem-based monitoring exemplify adaptive systems that underpin ecological resilience (Berkes, 2017). However, these practices are often disregarded in formal policies not due to inefficacy, but because they fall outside dominant epistemological frameworks.

This exclusion also reflects unequal power relations in marine governance. Political Ecology suggests that natural resource management is not a neutral or purely technical endeavor, but an arena of contested access, authority, and legitimacy (Blaikie, 2008; Blaikie & Brookfield, 1987). The Bajo have lost autonomy over customary marine territories due to zoning regulations and licensing schemes that fail to recognize traditional use rights (Prabowo et al., 2017; Risamasu, 2023). Their limited involvement in policy formulation further exacerbates this marginalization. As a result, marine governance in Torosiaje remains dominated by top-down approaches that reproduce exclusion—not intentionally, but through structural and systemic mechanisms.

The consequences of the exclusion are evident in field findings. Coral reef degradation, declining fish stocks, and the spread of destructive fishing practices are not solely ecological issues; they have social consequences that threaten Bajo's livelihoods and cultural survival. As reported in the findings section, community members are compelled to migrate or abandon their traditional occupations, leading to a loss of cultural identity. This reflects a policy failure to support community-based management paradigms that emphasize local participation, adaptive capacity, and the integration of cultural values in decision-making (Nursey-Bray & Jacobson, 2014; Baranyanan et al., 2024). Instead, externally imposed models tend to prioritize resource extraction and marketisation over ecological sustainability.

However, the Bajo experience is not unique. Across the globe, Indigenous and coastal communities face similar pressures when centralized policies and industrial interests transform their traditional living spaces. As such, this study contributes to broader discourses on ecological justice and Indigenous knowledge systems at the global level. The Bajo case demonstrates the risks of excluding local actors from decision-making processes and highlights the importance of designing environmental policies collaboratively with communities that have long acted as stewards of ecosystems. This global relevance aligns with international consensus frameworks such as the Convention on Biological Diversity (CBD) and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) (United Nations, 2007), both of which emphasize the role of local knowledge in achieving sustainable development goals. The Bajo experience, therefore, serves as a critical lens for shaping more inclusive, equitable, and effective environmental governance—not only in Indonesia but in other developing countries as well.

The exclusion of Bajo local ecological knowledge has significant global implications, both theoretical and practical, particularly concerning the Sustainable Development Goals (SDGs). This exclusion reflects a persistent failure to integrate local knowledge with modern science-based policymaking, exposing epistemological gaps in natural resource governance. The result is marine ecosystem degradation, the erosion of

local cultural values, and weakened community participation in holistic, inclusive policymaking processes. Moreover, this exclusion diminishes the adaptive capacity of coastal communities in the face of climate change. In this context, recognizing and accommodating local knowledge becomes essential as part of a holistic, inclusive approach (Salleh et al., 2024; Nugroho et al., 2024). Such an approach is vital for achieving socio-ecological sustainability aligned with SDG targets—especially in marine ecosystem conservation, climate change adaptation, and the strengthening of local institutions on a global scale.

In comparative international contexts, the exclusion of Indigenous ecological knowledge in marine governance has been well-documented in communities across the Pacific, Latin America, and Southeast Asia. Similar patterns of marginalization are evident in the Easter Island case, where local fishers' ecological wisdom was systematically sidelined by external conservation agendas, leading to increased ecological vulnerability and local distrust toward state authorities (Aburto et al., 2017; Aidonojie et al., 2025). These similarities show that the Bajo experience is not unique but part of a worldwide issue where technical knowledge is favoured over local knowledge. As Escobar (1998) and Blaikie (2008) argue, environmental governance is not value-neutral—it is shaped by power relations, institutional interests, and knowledge hierarchies that often marginalize Indigenous voices. From a Political Ecology viewpoint, these exclusions should not just be seen as missing voices, but as signs of a deeper power imbalance that strengthens environmental inequality while pretending to be based on scientific facts.

This study contributes to the theoretical enrichment of Political Ecology by illustrating that exclusion does not solely arise from extractive industry or neoliberal policy regimes, but also from conservationist interventions that overlook the lived realities and adaptive capabilities of local communities. The Bajo case exemplifies how environmental policy—although framed around sustainability—can undermine socio-cultural resilience when it fails to accommodate Indigenous epistemologies and governance traditions.

Moreover, the findings reinforce the concept of Traditional Ecological Knowledge (TEK) not as a relic of the past, but as a dynamic, adaptive, and context-responsive system. Practices such as seasonal restrictions, spiritual taboos, and community-based monitoring reflect sophisticated environmental ethics that align closely with modern sustainability principles (Berkes, 2017; Nursey-Bray & Jacobson, 2014; Qadafy & Yunita, 2025).

The implications of this are significant: without proper institutional recognition and integration, TEK remains vulnerable to erasure, and with it, the cultural identity and ecological stewardship of Indigenous communities. In this way, the Bajo experience is important for rethinking how we manage marine resources by using shared management methods that focus on respecting different legal systems, ensuring equal participation, and encouraging communication between cultures. This resonates with global frameworks such as the Convention on Biological Diversity and the United Nations Declaration on the Rights of Indigenous Peoples, which call for the inclusion of traditional knowledge in environmental decision-making processes (United Nations, 2007). Hence, the Bajo case deepens academic discourse on ecological justice and offers concrete pathways for policy transformation in marine resource management, particularly in the Global South where similar exclusionary dynamics persist.

Furthermore, governments and stakeholders must design policies grounded not only in technical rationale but also in the social and cultural realities of affected communities. This entails active public participation, legal recognition of customary fishing territories, and educational support that bridges traditional and scientific knowledge systems. As Suhardono (2023) argues, inclusive marine management must begin with the recognition that communities like the Bajo are not merely policy subjects, but active agents of knowledge production and ecosystem stewardship. With appropriate recognition and support, the Bajo can continue to play a central role in safeguarding their marine environment, cultural identity, and way of life (Ibrahim et al., 2013; Katili et al., 2018; Tamu et al., 2017).

D. Conclusion

This study shows that leaving out the Bajo community's local ecological knowledge from managing marine resources is not just a simple mistake, but a serious problem caused by deep-rooted inequality, biased ways of knowing, and imbalances of power. Using ideas from Political Ecology and Traditional Ecological Knowledge (TEK), the research shows that top-down policies have overlooked local practices that have protected marine ecosystems for many years. The exclusion of these community-based knowledge systems has contributed to ecological degradation, disrupted livelihoods, cultural erosion, and weakened community autonomy in managing local resources.

Theoretically, this study affirms the relevance of integrating local epistemologies into environmental governance frameworks. It strengthens the understanding that Indigenous ecological practices are dynamic, adaptive, and capable of addressing contemporary sustainability challenges. Using both ethnographic research and critical ecological analysis creates a useful approach for examining similar governance problems in other coastal communities.

In practical terms, the findings call for a fundamental transformation in marine governance—away from top-down management toward inclusive, participatory, and culturally sensitive approaches. This includes ensuring the meaningful involvement of Indigenous communities in policymaking, legally recognizing traditional marine territories, and promoting knowledge sharing between scientific institutions and local actors. Empowering communities such as the Bajo is essential not only for restoring ecological balance but also for reinforcing cultural resilience and long-term sustainability.

Although this study focuses on a specific locality, the issues it addresses reflect broader patterns of exclusion experienced by Indigenous coastal populations worldwide. As such, the findings contribute to global conversations on ecological justice and equitable governance. Future research should build on this foundation by conducting comparative analyses across regions, exploring the effectiveness of co-management strategies, and identifying pathways for integrating traditional knowledge systems into national and international

policy frameworks. Ultimately, genuine sustainability requires reimagining governance through collaborative, pluralistic models that honor and elevate the voices of those most intimately connected to the ecosystems they protect.

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