JBKL
Jurnal Bisnis Kehutanan dan Lingkungan
JBKL 4(1): 22–40
ISSN 3025-4833

Institute for Advanced Science, Social and Sustainable Future
MORALITY BEFORE KNOWLEDGE

The role of local wisdom and the tenure system of the Ammatoa Kajang indigenous community in forest sustainability

Amalya Reza Oktaviani[1,*]
[1] *Department of Environmental Science, Graduate School of Sustainable Development, Universitas Indonesia, Central Jakarta, Special Capital Region of Jakarta 10430, Indonesia.*
*Correspondence: amalya.reza@ui.ac.id

Received Date: May 21, 2026 Revised Date: June 19, 2026 Accepted Date: July 28, 2026

ABSTRACT

Background: The Ammatoa Kajang indigenous community in Bulukumba, South Sulawesi, exemplifies effective forest conservation through the integration of Pasang ri Kajang local wisdom and a distinctive tenure system. **Methods**: This study employs a systematic literature review using PRISMA 2020 methodology, with data analyzed through qualitative content analysis and thematic analysis, to examine how these traditional systems maintain forest ecosystem sustainability. Pasang ri Kajang embeds conservation within spiritual beliefs, viewing forests as sacred conduits where human spirits transit between earth and sky. **Findings:** This worldview mandates protection of four elements: trees, rattan, shrimp, and bees, establishing ethical frameworks that guide community behavior toward environmental stewardship. The tenure system operates through three functional zones with differentiated management protocols. Forbidden forests permit only traditional rituals, ensuring complete ecosystem protection. Border forests allow controlled timber harvesting under specific conditions, balancing resource use with conservation. Community forests accommodate agricultural activities while maintaining sustainability principles. This spatial differentiation contrasts with government land management approaches and enables adaptive resource governance. Analysis of forest cover change data reveals positive correlations between these traditional systems and ecosystem sustainability. The synergy between Pasang ri Kajang's ethical foundations and the tripartite tenure structure creates robust conservation outcomes while supporting community livelihoods. The systematic literature review indicates growing scholarly recognition of Ammatoa Kajang's conservation practices. **Conclusion**: The demonstrated correlation between local wisdom, tenure systems, and forest sustainability offers a replicable community-based conservation model. **Novelty/Originality of this article:** This indigenous approach provides valuable insights for sustainable forest management strategies, demonstrating how traditional ecological knowledge can effectively complement contemporary conservation objectives.

KEYWORDS: ammatoa kajang; indigenous communities; literature review.

1. Introduction

Climate change poses unprecedented global challenges, manifesting in significant hydrometeorological disasters. In 2024, such disasters constituted 99.4% of all disasters in Indonesia, totaling 3,449 incidents (National Disaster Management Authority, 2024). Climate change frequently triggers hydrometeorological disasters, while forests can mitigate climate change impacts. The United Nations recognizes indigenous peoples as key forest protectors, acknowledging that indigenous tribes and communities, along with their forests, are crucial to global and regional climate initiatives. Research on forests within

Cite This Article:
Oktaviani, A. R. (2026). The role of local wisdom and the tenure system of the Ammatoa Kajang indigenous community in forest sustainability. *Jurnal Bisnis Kehutanan dan Lingkungan, 4*(1), 22–40. https://doi.org/10.61511/jbkl.v4i1.2026.3788

Copyright: © 2026 by the authors. This article is distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

indigenous and aboriginal communities in Latin America and the Caribbean shows significantly lower deforestation and degradation rates than in other regional forests (Food and Agriculture Organization of the United Nations & Fund For The Development of the Indigenous Peoples of Latin America And The Caribbean, 2021).

Indigenous peoples and communities are groups, tribal entities, and nations that recognize themselves as native to the lands they inhabit. Their organizational structures are based in whole or in part on unique customs, traditions, and legal frameworks. Indigenous knowledge systems are deeply embedded in customary values and comprehensive worldviews that see humans as essential parts of nature (United Nations Framework Convention on Climate Change, 2024). Examining indigenous knowledge systems that adopt holistic perspectives is crucial to understanding forest conservation grounded in indigenous principles, expressed through local wisdom and land tenure systems.

Globally, at least 36% of the world's remaining intact forest landscapes lie on Indigenous Peoples' lands, making these areas critical to mitigation efforts needed to avert catastrophic climate change (Fa et al., 2020). As of August 2024, 1,499 indigenous territories totaling 30.1 million hectares across 32 provinces and 166 districts/cities throughout Indonesia have been registered, representing a potential 23.2 million hectares of indigenous forests (Indigenous Territory Registration Agency, 2024). With Indonesia's total natural forest area at 80 million hectares, the potential customary forest area represents about 29% of that total.

One exemplary customary forest area is the Kajang indigenous community in South Sulawesi, recognized as exceptional forest guardians. The Ammatoa Kajang community holds local wisdom called Pasang ri Kajang, which emphasizes environmental preservation and has positive impacts on forest conservation (Nur et al., 2022). The Ammatoa indigenous people of Bulukumba, South Sulawesi, manage forest resources sustainably through relationships that treat forests as mothers requiring respect and protection (Gunawan et al., 2022).

For the Ammatoa Kajang community, forests represent a fundamental philosophy: without forests, life ceases. The community refrains from digging wells, considering ground excavation equivalent to harming the earth. The Ammatoa Kajang community maintains forest management principles embodying environmental justice (Arif et al., 2025). Understanding the Kajang indigenous community's knowledge and tenure systems can inform Indonesian forest conservation policies, as recognizing and integrating traditional practices into formal conservation frameworks is essential for ecological sustainability and community empowerment (Nkansah-Dwamena, 2025).

Research demonstrates that primary services indigenous peoples obtain from forests include hunting, plant extraction, and grazing (Reddy et al., 2024). Indigenous communities across four Amazon regions indicated that forests are their most important livelihood strategy, with complex portfolios, diverse production systems, and seasonal activity variations. Beyond subsistence and income, communities value forests for identity, culture, territorial ties, conservation interests, and community health and well-being (Londres et al., 2023).

In Indonesia, aspirations for recognizing indigenous peoples' legal forest rights have increased. The Indonesian government has prioritized social forestry and customary forests as main policies. Implementation must be executed carefully to reinforce the unique characteristics and local identities of indigenous and local communities (Ungirwalu et al., 2025). Indigenous peoples' local wisdom practices play important roles in customary forest sustainability. Indigenous local knowledge (ILK) is dynamic and holistic, encompassing governance, social aspects, economic accounting, land tenure, family institutions, language, resource use practices, rituals, spirituality, and worldviews. ILK is highly diverse and managed by unique cultural institutions with distinct validation methods and knowledge-transmission protocols (Hill et al., 2020).

Indigenous peoples' local wisdom relies on specific transmission methods. Studies revealed that most communities possess extensive traditional knowledge, though dissemination varies significantly within families. The Ammatoa Kajang Indigenous

People's oral tradition, pasang, can increase or decrease depending on individual knowledge, which depends on Almighty grace and the narrating generation's ability (Annur, 2016).

Ichwan et al. (2021) highlight parents' significant role in instilling conservation values within family settings. Indigenous communities preserve conservation principles and deep environmental appreciation by teaching Pasang concepts to children from a young age. Ammatoa noted that the first lessons children learn as they begin speaking or walking focus on Pasang itself. Integrating indigenous local knowledge with contemporary conservation methods strengthens community resilience and yields economic advantages by fostering sustainable resource use, fortifying cultural heritage, and supporting sustainable development (Gitima et al., 2025). Research by Nkansah-Dwamena (2025) shows how traditional wisdom aligns with broader conservation objectives, offering insights into community-led conservation initiatives while critiquing traditional conservation methods that overlook local community involvement.

Local wisdom encompasses practices undertaken by indigenous communities, whereas tenure systems represent land management strategies employed to delineate territories. Indigenous peoples' land-management expertise helps shape local responses to global environmental crises. Research indicates securing land tenure proves crucial for indigenous communities to mitigate forest degradation (Camino et al., 2023). Studies show that forest reserves flourish under traditional leaders' guidance, which uses indigenous knowledge to develop conservation strategies (Sinthumule & Mashau, 2020).

Brondízio et al. (2021) demonstrate that indigenous peoples' values, lifestyles, knowledge, resource management practices, governance frameworks, economies, and technologies play crucial roles in tackling ongoing environmental crises. Their contributions are anchored locally, manifest regionally, and hold global significance. These contributions are vital to achieving internationally established objectives in biodiversity conservation, climate change mitigation, the United Nations 2030 Sustainable Development Goals, and preserving livelihood opportunities for populations that rely on nature. Loivaranta's (2023) interviewees highlighted that, because of intimate forest relationships and ongoing observation, indigenous peoples have a superior understanding of forest conservation.

In Kajang, beyond limited village settlement areas, rural landscapes are segmented into three distinct sections: smallholder wet rice fields, commodity crop areas, and agroforestry gardens. Rice fields serve subsistence purposes, whereas remaining regions are utilized for smallholder plantations featuring mixed cropping systems, alongside small forests and sacred sites. For advocates of land rights recognition, Kajang exemplifies straightforward success (Fisher et al., 2023). Investigating how the Kajang community's tenure system gains government acknowledgment helps explain its significance for forest conservation.

Pasang ri Kajang is important for safeguarding forests within Kajang tribe regions (Ichwan et al., 2021). For the Ammatoa Kajang community, forest stewardship is integral to Pasang principles, as forests serve as conduits for human spirits connecting earth and sky (Arif et al., 2025). Research by Nur et al. (2022) identifies several factors that support effective customary forest management: regulations that limit activities to intended purposes, Pasang ri Kajang as management paradigms, strict penalties for all community members, and well-defined forest management procedures.

Research by Annur (2016) indicates that the Ammatoa Kajang Indigenous People possess a forest philosophy and life principles known as kamase-mase, which advocate consuming only essential needs and illustrate efforts to avoid overconsuming natural resources. Studies highlight that the Ammatoa Kajang tribe observes Pa'nganro ceremonies, rituals that invoke protection against calamities and beseech rainfall (Satrianegara et al., 2021). Studies have yet to comprehensively explore relationships between indigenous populations' tenure systems and local wisdom in environmental conservation contexts. To better integrate local wisdom with the Ammatoa Kajang Indigenous People's tenure system in forest conservation efforts, additional research is essential. This study's findings are anticipated to provide valuable scientific insights into community-based conservation

frameworks, demonstrating how indigenous knowledge systems and traditional land management practices contribute synergistically to sustainable forest ecosystem management.

2. Methods

The researcher used a qualitative methodology to examine how local wisdom and the tenure system of the Kajang Indigenous People affect forest sustainability. Qualitative research seeks to offer insights and a deep understanding of real-world challenges, and, unlike quantitative research, it does not involve introducing treatments, manipulating variables, or measuring pre-established variables (Moser & Korstjens, 2017). The qualitative approach utilized was designed to address the primary inquiry: In what ways do the principles of local wisdom and the tenure system of the Ammatoa Kajang indigenous community aid in the conservation of forests?

Systematic reviews of qualitative evidence have been used to synthesize Indigenous perspectives that quantitative measurement alone cannot capture. For example, Sinka et al. (2025) synthesized 13 qualitative studies involving 441 Indigenous young people in four countries and identified the transmission of traditional knowledge and the roles of elders and families as central themes. Such contextual insights complement quantitative data, ensuring that management strategies are informed not only by numerical indicators but also by environmental and social considerations.

This study uses a qualitative approach through a systematic literature review to examine how the tenure system and local wisdom of the Kajang indigenous community contribute to forest conservation in the Kajang Customary Forest in South Sulawesi, Indonesia. Systematic reviews are pivotal in various dimensions. They can summarize the current state of knowledge in a field, thereby identifying future research priorities; they can address questions that individual studies may not resolve; they can pinpoint issues in primary studies that require rectification in subsequent research; and they can aid in the development or evaluation of theories regarding the occurrence of phenomena (Page et al., 2021).

The systematic literature search outcomes were selected in accordance with PRISMA 2020 before determining the final number of studies to advance to the analysis phase. The systematic review will follow protocols for environmental science (Mengist et al., 2020) and forest conservation research (Sinthumule, 2023) and use PRISMA. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline, which was published in 2009, aims to assist systematic reviewers in transparently documenting the rationale for conducting the review, the actions taken by the authors, and the findings obtained. An updated version, PRISMA 2020, has now been introduced for application in systematic reviews that either include synthesis or do not include synthesis (Page et al., 2021).

2.1 Literature identification

Bramer et al. (2017) indicate that, to achieve optimal recall, systematic review searches should include a variety of databases. Using a multi-database strategy can reduce publication bias and improve retrieval of literature relevant to protecting indigenous forests. The 2020 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were used to identify literature appropriate for analysis. This systematic review encompassed scientific articles published in academic journals. The literature search for this study was conducted using academic platforms available through the Universitas Indonesia's subscription: 1. Scopus; 2. ScienceDirect; 3. Google Scholar.

Scopus was selected as a data source because it includes over 39,100 journal titles, 120,000 conference proceedings, and 206,000 books from more than 5,000 publishers worldwide. As a curated database, Scopus ensures that the content included is chosen through a stringent selection process (Sizo et al., 2025). Additionally, Google Scholar data supplements the database acquired through other sources by capturing additional

publications and ensuring comprehensive coverage, particularly for Indonesian studies that may not yet be represented in international databases.

2.2 Inclusion and exclusion criteria

The inclusion criteria for the literature search consist of research articles or scientific works that have been published in journals. These articles will concentrate on sources from Indonesia and internationally, in both Indonesian and English. The time frame for the scientific articles used is 2020 to 2025. The inclusion criteria emphasize journals indexed in Scopus Quartile 1 (Q1) or 2 (Q2), as well as Indonesian journals indexed in Sinta 1 or 2, to ensure high academic quality. Articles must specifically address the Ammatoa Kajang Indigenous Community. They must also discuss at least 2 of the 3 variables, namely local wisdom, tenure systems, and forest conservation. Furthermore, articles must be based on empirical data or comprehensive conceptual studies. This data search excludes opinion articles lacking a research foundation, duplicate publications, and articles that do not provide in-depth analysis.

The search keywords combine variations of "Kajang local wisdom," "Kajang customary forest," "Kajang customary knowledge," "Kajang tenure system," and "forest sustainability." The search keywords are standardized in English across all data sources. ("Ammatoa Kajang" OR "Kajang" OR "Kajang indigenous") AND ("traditional knowledge" OR "indigenous knowledge" OR "pasang ri kajang") AND ("tenure system" OR "customary rights" OR "customary land" OR "land rights") AND ("forest conservation" OR "forest management" OR "forest preservation" OR "forest governance"). These keywords were selected to capture the integration of local wisdom, local knowledge, and indigenous tenure systems in forest management.

2.3 Thematic analysis

Qualitative content analysis identifies and classifies forms of local wisdom and tenure systems within the Ammatoa Kajang Indigenous Community. Thematic analysis elucidates how the Ammatoa Kajang Indigenous Community's local wisdom and tenure systems shape the spiritual, ecological, and social dynamics between indigenous peoples and forests. This analysis aims to synthesize evidence regarding the interconnected impacts of integrating local wisdom and tenure systems on forest conservation. The thematic analysis process is designed to uncover themes, or patterns, within a dataset. These themes may be overtly articulated in the data or may be subtly embedded and discerned by the researcher (Preiser et al., 2021). According to Braun & Clarke (2006), the thematic analysis method comprises six stages: understanding the data, compiling codes, searching for themes, reviewing themes, naming themes, and ultimately composing reports or comprehensive analyses based on the identified themes.

In this study, the authors used thematic analysis to examine each theme more thoroughly and illustrate the relationship between local wisdom, tenure systems, and forest conservation. This data analysis approach is particularly suitable for investigations aimed at understanding a phenomenon's realities. Specifically, thematic analysis is used to identify patterns in the research focus (Heriyanto, 2018). The application of thematic analysis is anticipated to uncover relational patterns between local wisdom, tenure systems, and forest conservation within the Ammatoa Kajang customary area.

3. Results and Discussion

Findings were derived from keyword coding to address the research inquiries. Preliminary searches used keywords in scientific articles, refined by reviewing titles and abstracts to exclude irrelevant studies. We downloaded articles meeting the criteria and classified them using Mendeley. Inclusion criteria specified publications in Scopus Q1-Q2 or Sinta 1-2 indexed journals.

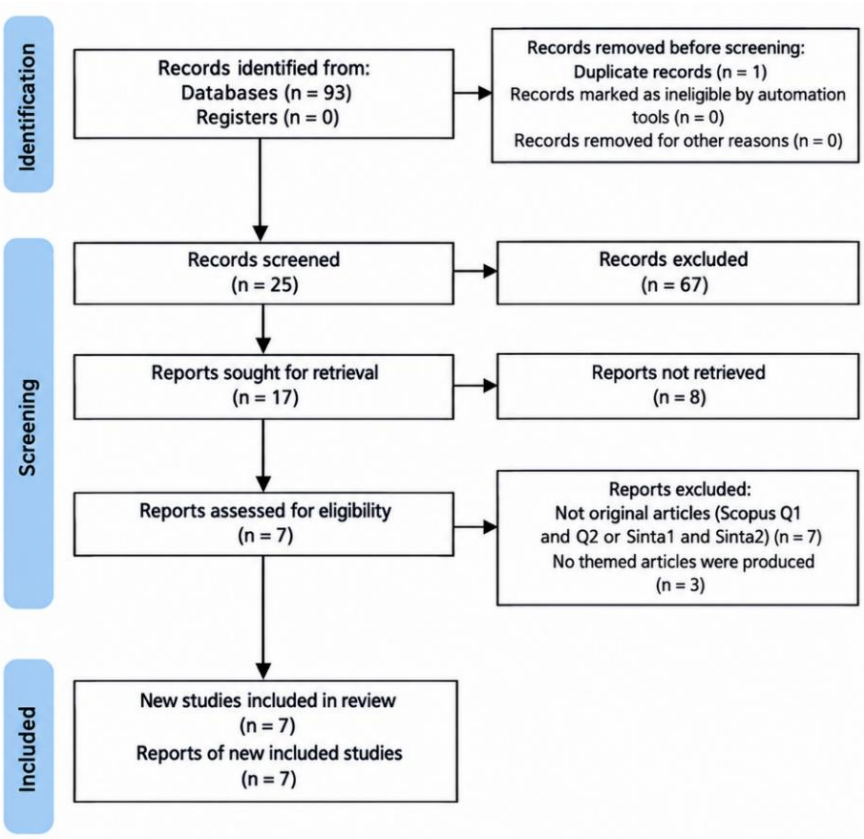


Fig. 1. PRISMA 2020 flow diagram of the literature selection process (Adapted from Page, 2021)

This research will focus on analyzing seven studies, treating them as the core literature. Of the seven studies classified as primary literature, three were published in Q2-indexed journals, two in Q1, and three in Sinta2. No studies were found in journals indexed as Sinta1 (Fig. 2).

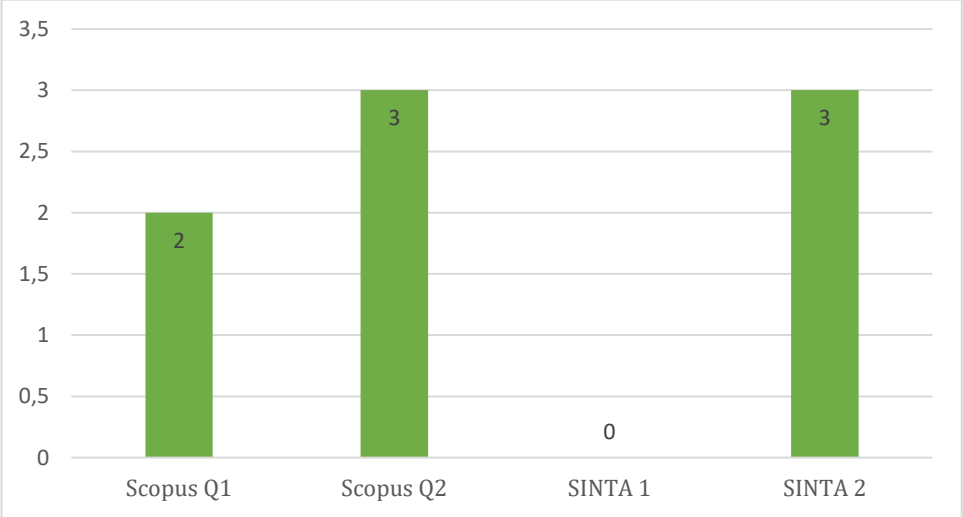


Fig. 2. Journal index distribution of the core literature

The limited literature identified at the outset suggests minimal research on the Kajang indigenous community, particularly regarding local wisdom and tenure systems that affect forest conservation. While a substantial body of research exists on the local wisdom of the Kajang Indigenous People, only a small fraction has been published in international journals indexed by Scopus or Sinta. The seven core studies analyzed in this review are listed in Table 1.

Table 1. Core literature included in the review (n = 7)

Authors (year)	Title	Journal
Nurmiati et al. (2020)	Reflection of Al-Hima in the "Kinship Awareness" of the Indigenous Customary System Ammatoan for Nature Conservation Through Simplicity of Life	*Journal al-'Abqari*
Daniel et al. (2022)	To What Extent Does Indigenous Local Knowledge Support the Social–Ecological System? A Case Study of the Ammatoa Community, Indonesia	*Resources*
Dassir (2022)	"Pasang", Knowledge and Implementation of Local Wisdom in The Kajang Traditional Forest Area, South Sulawesi	*Journal of Tourism, Hospitality, Travel and Business Event*
Tahir et al. (2025)	Eco-Sufism in the Ammatoa Community: Harmonizing Islamic Values and Local Traditions for Environmental Conservation in Kajang Bulukumba	*Journal of Islamic Thought and Civilization*
Kambo (2021)	Local wisdom Pasang ri Kajang as a political power in maintaining indigenous people's rights	*ETNOSIA: Jurnal Etnografi Indonesia*
Kolopaking et al. (2025)	Problems and prospects of recognition of the Ammatoa Kajang Indigenous community in Indonesia	*Development in Practice*
Fisher & van der Muur (2020)	Misleading Icons of Communal Lands in Indonesia: Implications of Adat Forest Recognition From a Model Site in Kajang, Sulawesi	*The Asia Pacific Journal of Anthropology*

The analysis of documents acquired through a Systematic Literature Review, using the PRISMA 2020 framework, was conducted using thematic analysis. As Dawadi (2020) notes, thematic analysis is theoretically adaptable, allowing the identification, description, and detailed interpretation of patterns (themes) within datasets. Naeem et al. (2023) clarify that in the third phase, coding, brief phrases or terms called codes are assigned to data segments that capture the essential message, significance, or theme. This phase streamlines complex textual data by transforming it into a theoretical format, making it easier to identify elements pertinent to the research question. The coding process for thematic analysis is conducted using Taguette. This application has been utilized in numerous research publications and is also independently hosted by research institutions on behalf of their communities (Rampin & Rampin, 2021).

According to the coding process, researchers categorized the themes into three primary themes as follows. Indigenous community governance and indigenous legal systems: this theme encompasses customary law (130 highlights) and the land ownership system (86 highlights). Local knowledge and environmental conservation: this theme encompasses indigenous local knowledge (226 highlights), forest & biodiversity conservation (172 highlights), and indigenous forests and land (126 highlights). Recognition and struggle for rights: this theme encompasses indigenous peoples' rights (85 highlights) and issues and challenges facing indigenous peoples (66 highlights).

3.1 Indigenous community governance and customary legal systems

Through the examination of seven documents, it was determined that the Ammatoa Kajang indigenous community possesses a governance system deeply rooted in traditional knowledge, known as Pasang ri Kajang, which acts as a guiding principle for everyday life and social conduct. Pasang ri Kajang also serves as a legal framework, specifically customary law that governs land ownership, forest management, and conflict resolution. Additionally, the Ammatoa Kajang indigenous community has a customary institutional structure that

implements the legal framework established in Pasang ri Kajang, led by an individual referred to as Ammatoa and supported by Galla (ministers). This governance system functions through three tiers of sanctions, namely, *cappa ba'bala* (light punishment), *tangnga ba'bala* (moderate punishment), and *poko ba'bala* (severe punishment), illustrating a formal mechanism for law enforcement.

Based on the land ownership framework in Indonesia, the government ultimately enacted Regional Regulation No. 9 of 2015, which acknowledged the authority of Ammatoa Kajang over a customary territory of approximately 22,000 hectares, after specifically emphasizing how this traditional governance system has sustained its legitimacy for centuries (Daniel et al., 2022; Kambo, 2021; Kolopaking et al., 2025). Nevertheless, formalizing customary land ownership has also created considerable tension within the Kajang indigenous community, a phenomenon known as the paradox of recognition. Fisher & van der Muur (2020) critically highlight that formal recognition under Law No. 6 of 2014 concerning Villages imposes stringent administrative requirements that clash with traditional governance, marginalizing or excluding indigenous leaders from serving as village heads because they lack formal qualifications and dismissing culturally relevant development proposals.

Kolopaking et al. (2025) and Fisher & van der Muur (2020) show how bureaucratic requirements, such as diploma prerequisites, age restrictions, and administrative competencies, have marginalized esteemed elders with deep traditional wisdom. The tenure system that regulates land use (*Rabbang Seppang* for narrow/sacred boundaries and *Rabbang Luara* for wider boundaries) struggles to align with state mapping standards, as customary boundaries recorded through oral traditions and collective memory go unacknowledged without state-sanctioned maps. This situation results in land conflicts and undermines the autonomy that ought to be safeguarded through such acknowledgment.

3.2 Local knowledge and environmental conservation

The Ammatoa community's indigenous knowledge exemplifies a comprehensive ecological management framework that harmonizes forest conservation, biodiversity preservation, and sustainable resource use across multiple dimensions, as detailed in the seven articles. Pasang ri Kajang includes specific environmental teachings, such as Punna nitabbangngi kajua riborongnga, nunipappirangnga (if trees are felled in the forest, rainfall will diminish and springs will vanish), reflecting an advanced understanding of the hydrological cycle and ecosystem services. The forest zoning system categorizes the customary territory into three management zones: *Borong Karama* (sacred forest/core zone spanning 331 hectares), *Borong Batasayya* (buffer zone with regulated resource extraction), and *Borong Luarayya* (utilization zone for community necessities). Nurmiati et al. (2020), Dassir (2022), and Tahir et al. (2025) meticulously document how this framework forbids four principal infractions: *tabbang kaju* (logging), *tattakang uhe* (cutting rattan), *tunuang bani* (burning bee hives), and *rao doang* (catching fish/shrimp), which collectively safeguard biodiversity while facilitating sustainable harvesting. This knowledge system underscores preventive measures: using traditional tools (machetes instead of chainsaws) to reduce extraction rates, mandating the replanting of two trees for each tree removed, and banning forest clearing through burning.

The traditional knowledge system of the Ammatoa Kajang indigenous community aligns closely with modern Sustainable Development Goals (SDGs), particularly SDG 15 (Life on Land) and SDG 12 (Sustainable Consumption), as Nurmiati et al. (2020) and Tahir et al. (2025) examine. The Ammatoa conservation ethic is rooted in the conviction that the forest is the center of life and that harming nature breaches divine and ancestral law, creating a spiritual-ecological framework that has preserved 63.77% forest cover in their region despite external pressures. Azis et al. (2020) enumerate 104 species of medicinal plants from 50 families that the community cultivates and safeguards, illustrating a form of biodiversity management known as ethnophytomedicine.

Nonetheless, research conducted by Fisher & van der Muur (2020) and Kolopaking et al. (2025) highlights difficulties in the transmission of knowledge: the oral tradition of Pasang renders it susceptible as younger generations participate in formal educational frameworks, the pressures of modernization diminish direct engagement with the forest, and shifts in language jeopardize Konjo terminology that encapsulates ecological wisdom. A notable paradox across the documents is that while state acknowledgment legally safeguards customary forests, it can inadvertently undermine traditional management practices by displacing forest guards who previously worked alongside Ammatoa to oversee violations, ironically exacerbating illegal encroachment along sacred forest boundaries post-2016.

3.3 Recognition and struggle for rights

The fight to acknowledge indigenous peoples' rights in the Kajang case highlights significant structural disparities between indigenous communities and state/corporate entities, especially in land disputes involving PT London Sumatra (Lonsum) (Kambo, 2021). Since 1979, PT Lonsum has taken approximately 3,518 hectares of Kajang customary land from various villages (Balong, Bonto Biraeng, Jo'jolo, Tugondeng) without consent, displacing over 800 families and transforming communal forests and agricultural areas into rubber plantations. Kambo (2021) elucidates how agreements made between the company, the community, and the Bulukumba Regency Government have been consistently breached, with PT Lonsum extending its operations even prior to the issuance of a court ruling, exemplifying what experts describe as the inadequate role of the regency government in regulating the activities of foreign corporations.

The Constitutional Court Decision No. 35/PUU-X/2012 on Customary Forests, which asserts that customary forests are the property of indigenous communities, not state forests, marks a pivotal moment. This ruling led to Bulukumba Regency Regulation No. 09 of 2015 on the Confirmation, Recognition, and Protection of the Rights of the Ammatoa Kajang Customary Law Community, which formally acknowledged the Kajang's customary rights for the first time. Nevertheless, Kambo's (2021) research critically observes that this acknowledgment did not resolve the conflict with PT Lonsum, as the regulation meticulously excluded areas under the company's control from being classified as customary territories, thereby effectively legitimizing the appropriation of ancestral lands while providing only symbolic recognition of the remaining forests.

The obstacles indigenous peoples face extend beyond land disputes; they include exclusion from political and economic decision-making at every level of government. Fisher & van der Muur (2020) highlight systemic issues: the lack of specific implementing regulations for indigenous peoples' provisions within the Village Law, cultural disparities that hinder access to public services (such as health and education), and economic challenges that compel community members to seek employment as plantation laborers or to migrate. Kolopaking et al. (2025) illustrate how development planning routinely dismisses proposals that align with the priorities of indigenous peoples (for instance, the use of traditional building materials like wood and stone) in favor of state-led infrastructure initiatives (such as concrete roads and bridges) that contravene indigenous values, including land sealing that disrupts water absorption. The contradiction of recognition is most pronounced in the inability to establish even a single formal indigenous village (desa adat) under the Village Law, despite a decade having passed since its implementation, as detailed in the document by Kolopaking et al. (2025): bureaucratic organizational demands, written administration, and territorial documentation fundamentally clash with the oral, kinship-based, and spiritual governance that characterizes the Ammatoa institution. Consequently, formal recognition has produced what Fisher & van der Muur (2020) describe as a misleading icon portraying Kajang as a paradigm of successful indigenous recognition for global audiences while the local community grapples with land insecurity, development pressures, and the erosion of traditional authority.

3.4 Area of the Ammatoa Kajang indigenous forest

The traditional forest belonging to the Ammatoa Kajang Indigenous Community spans approximately 314 hectares (Fig. 3). Of this total, 91% (285 hectares) remained natural forest in 2024 (MapBiomas Project, 2025). Data from MapBiomas Indonesia indicate that forest cover in the Ammatoa Kajang customary forest increased from 269 hectares in 2016 to 285 hectares in 2024 (Fig. 4). Since 2011, year-to-year decreases have been small, with the largest being 7 hectares between 2012 and 2013. The forest area in the Ammatoa Kajang Customary Forest region supports the notion that the Ammatoa Kajang Indigenous People's local wisdom and tenure system effectively conserve the forest in their customary territory.

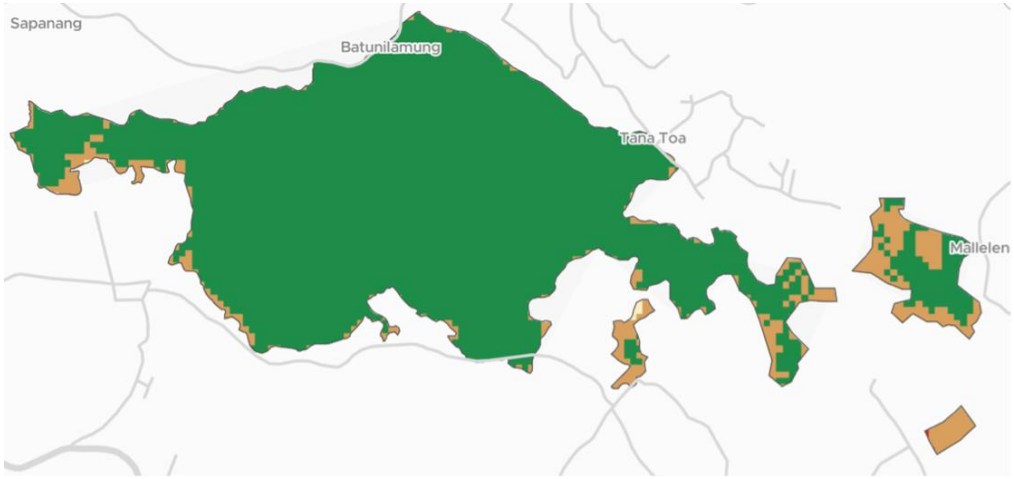
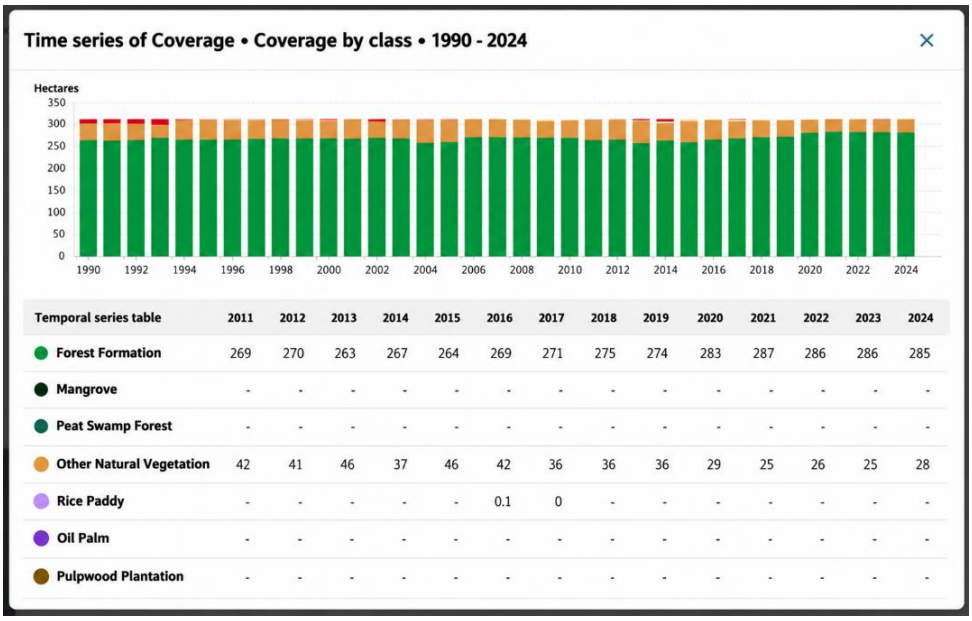


Fig. 3. Area of the Ammatoa Kajang indigenous forest
(MapBiomas Project, 2025)

Analysis of the Ammatoa Kajang forest zoning system, categorized into Borong Karamaka, Borong Batasayya, and Borong Luarayya, corroborates Nur et al. (2022) and shows that the Ammatoa community enforces classification-based regulations that limit customary forest activities.



Temporal series table	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Forest Formation	269	270	263	267	264	269	271	275	274	283	287	286	286	285
Mangrove	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peat Swamp Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Natural Vegetation	42	41	46	37	46	42	36	36	36	29	25	26	25	28
Rice Paddy	-	-	-	-	-	0.1	0	-	-	-	-	-	-	-
Oil Palm	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pulpwood Plantation	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fig. 4. Natural forest cover area in the Ammatoa Kajang customary forest
(MapBiomas Project, 2025)

This study supports these assertions by showing that zoning is not merely spatial delineation but reflects the indigenous community's local knowledge framework,

inherently linked to ecological management practices. However, this research identifies conflicts emerging when indigenous tenure-based zoning must be transcribed onto maps for state acknowledgment. Unlike Nur et al. (2022), which focuses exclusively on local wisdom-informed forest management, this study examines the complex dynamics between indigenous knowledge and contemporary administrative frameworks. Supporting Gunawan et al. (2022), it demonstrates that local wisdom and understanding of the Kajang Indigenous People facilitated the establishment of regional regulations at the regency level, recognizing and affirming Ammatoa Kajang rights.

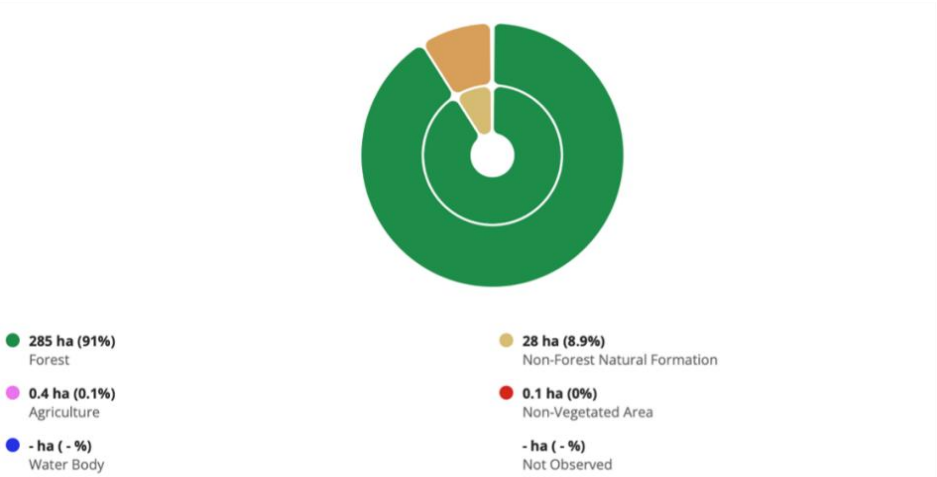


Fig. 5. Land cover composition of the Ammatoa Kajang customary forest in 2024 (MapBiomas Project, 2025)

Results on knowledge transmission through Pasang ri Kajang align with Annur (2016), showing that Pasang knowledge transmission depends on narrating generation capabilities. This research corroborates difficulties in knowledge transmission while identifying additional factors: threats from formal education systems and language shifts that may undermine Konjo language terms that encapsulate ecological knowledge. This contrasts with the more optimistic conclusions of Ichwan et al. (2021), highlighting parents' significant role in nurturing conservation-oriented mindsets by effectively conveying Pasang ri Kajang knowledge to offspring. Furthermore, findings resonate with Gitima et al. (2025) in Goba District, Ethiopia, who found that customary institutions play a crucial role in equipping younger generations with local wisdom and scientific knowledge essential for preservation and adaptation. Gitima et al. (2025) argue that formal educational institutions can help incorporate traditional knowledge into contemporary frameworks. Nevertheless, external influences such as modernization and evolving interaction patterns between younger generations and forests further challenge knowledge transmission. Gani et al. (2023) highlight potential generational divides in knowledge transfer, particularly if younger generations show greater inclination towards modern economic prospects.

Regarding rights recognition, this research's findings on the recognition paradox offer significant insights that earlier literature has not adequately explored. While Gunawan et al. (2022) focus on the Kajang Indigenous People's achievements in sustainably managing forests, grounded in beliefs that forests are essential to life, this study uncovers alternative aspects of formal recognition that may undermine traditional governance structures. Observations that state recognition, articulated in Bulukumba Regency Regulation No. 09 of 2015 concerning Confirmation, Recognition of Rights, and Protection of Ammatoa Kajang Customary Law Community Rights, has generated tensions due to stringent administrative demands introduce fresh dimensions to discourse on indigenous rights formalization. This paradox reinforces Ungirwalu et al.'s (2025) insights, underscoring the need for caution in formal recognition applications to prevent the erosion of distinctive local characteristics and identities.

This research aligns with global literature regarding indigenous communities as forest protectors. The Kajang region's 63.77% forest cover corroborates FAO and FILAC (2021), indicating indigenous peoples' territories experience significantly lower deforestation and degradation rates. This study deepens understanding by identifying specific mechanisms, prohibitions against four major infractions, and tiered sanction systems, showing how conservation practices are effectively upheld. Furthermore, documenting 104 medicinal plant species across 50 families (Azis et al., 2020) builds on Reddy et al. (2024) in Eastern India and highlights the ecosystem services indigenous communities derive from forests.

Findings on land disputes involving PT Lonsum corroborate trends identified by Camino et al. (2023), which assert that securing land rights is crucial for indigenous communities to mitigate forest degradation. This research shows that formal acknowledgment does not always provide genuine certainty, especially when regulations exclude regions under corporate control. This observation aligns with Sinthumule and Mashau (2020) in South Africa, highlighting the importance of traditional leadership oversight and local expertise in developing conservation initiatives. This research underscores the need to incorporate indigenous knowledge and tenure frameworks into forest conservation efforts, as Brondízio et al. (2021) highlight, while critically addressing the complexities and obstacles that emerge during formalization and modernization processes.

The findings indicate a paradox: forest conservation can be achieved through the local expertise of the Ammatoa Kajang indigenous community and their tenurial framework. Nevertheless, a contradiction emerges when the Indonesian government acknowledges the Ammatoa Kajang's customary territory only in a formal capacity, creating tensions and undermining inclusivity. This inadequate inclusiveness is evident in the exclusion of the Ammatoa from opportunities to officially assume roles as village leaders and in the failure to incorporate the Ammatoa Kajang's forest and land management practices into regional development strategies. The Ammatoa Kajang indigenous community's knowledge and tenure system are integral to affirming their identity as an indigenous group. Sartika et al. (2024) assert that, as social beings, the Ammatoa community engages with their environment in ways that sustain their way of life. Consequently, formal acknowledgment through regional regulations concerning customary forests paradoxically undermines their existence.

Research by Mahaswa & Syaja (2025) indicates that latent ethno-nationalist sentiments challenge the application of local wisdom within the broader context of decolonizing knowledge production in Indonesia. Despite the Ammatoa Kajang's comprehensive understanding of forest ecosystem preservation, they face significant implementation barriers, including prevailing sentiments and legal frameworks such as industrial permits. This observation is noteworthy, as numerous academic investigations, including those by Samad et al. (2021) and Sahabuddin & Hildayanti (2023), have highlighted valuable insights regarding environmental conservation derived from the Ammatoa Kajang indigenous community. Consequently, opinions on applying traditional knowledge and tenure systems remain mixed, largely because of ongoing scientific skepticism about this body of knowledge (Mahaswa & Syaja, 2025).

This research indicates that significant studies have addressed the formal acknowledgment of the Ammatoa Kajang indigenous community. Findings by Fisher & van der Muur (2020) highlight that formal recognition processes are largely controlled by local elites in both formal and informal institutions, who reinterpret customary authority through the formal roles they occupy, particularly after successful commodity crop harvests. This recognition spurred initiatives led by those who gained new authority to distribute development funds and collaborate with farmers' associations to expand land control for commodity crops. In practice, formal acknowledgment of customary territories does not inherently address challenges of unequal access to land and forests faced by the Ammatoa Kajang indigenous community, as land tenure issues are intricate and multifaceted. Within forest ecosystem conservation frameworks, these challenges undoubtedly obstruct conservation efforts. The path to forest conservation through

integrating traditional knowledge and tenure systems is complex and may impede conservation.

Examining PT Lonsum's presence has revealed two significant outcomes: the failure to acknowledge the Ammatoa Kajang community's customary territory within the PT Lonsum concession, and the resulting lack of protection for the forest ecosystem in that region. Kennedy et al. (2023) found that nearly 60% of indigenous peoples' territories face threats, with 37 countries showing the highest risk of conversion. To mitigate or prevent risks to both human populations and natural environments, upholding the autonomy, rights, and leadership of indigenous communities is crucial. Nevertheless, policy deregulation designed to protect forests and indigenous peoples, which Kambo (2021) describes as the government's inadequate response to foreign corporations, indicates that Indonesian forests situated within indigenous territories, particularly those not yet state-recognized, continue to face significant conversion risk.

Research by Rodd et al. (2022) across multiple nations on forest governance reform found that Indonesia and Peru, which emphasize land rights reform grounded in customary rights, faced greater community discord than other nations, particularly at the national level. This is primarily because the legal framework governing forest administration in Indonesia is based on systems instituted during the colonial period, which focus on delineating 'ownerless' forests as state forest zones, distinctly separating them from private property, and consolidating exclusive control over forest resources within the central government. This colonial legacy continues to shape contemporary forest governance challenges, complicating efforts to recognize and integrate indigenous knowledge and tenure systems into formal conservation frameworks.

This research revealed that the local knowledge and land tenure system of the Ammatoa Kajang indigenous community play significant roles in safeguarding the Kajang customary forest spanning approximately 314 hectares, with natural forest cover comprising 285 hectares, accounting for 91 percent of total customary forest (Fig. 5). Deforestation was recorded only between 1990 and 1994, during which 30 hectares were cleared from 1990 to 1993, and an additional 3 hectares in 1994 (MapBiomas Project, 2025). Following 1994, no notable deforestation altered the customary forest area. The ongoing sustainability of the Kajang customary forest can be attributed to local wisdom and land tenure systems practiced by the Ammatoa Kajang indigenous community.

Local wisdom serves as a highly effective means of preserving forest ecosystem sustainability. The principle of Pasang ri Kajang, which guides the Ammatoa Kajang community's life, has proven effective as a robust social control mechanism that averts excessive forest exploitation. The land tenure system, which categorizes the area into sacred forest (*Borong Karama*), border forest (*Borong Batasayya*), and community forest (*Borong Luarayya*), reflects a deep ecological understanding of the need for zoning to sustain ecosystem equilibrium. This management approach shows that indigenous peoples' traditional knowledge aligns with contemporary conservation principles.

Minimal post-1994 deforestation data suggest that ongoing enforcement of customary regulations and social penalties has preserved forest cover over the long term successfully. This contrasts sharply with widespread deforestation in various Indonesian regions, where traditional forest management often fails to curb forest degradation. The Ammatoa Kajang Indigenous Community's achievements offer empirical support for acknowledging indigenous populations' land rights and honoring traditional management practices as viable approaches within national forest conservation initiatives. This research illustrates that spiritual and ritual aspects of Pasang ri Kajang foster profound emotional connections between the community and the forest. The forest is perceived not merely as an economic asset but as a sacred entity safeguarded for future generations. This viewpoint cultivates sustainable environmental ethics and deters short-term exploitation driven solely by economic interests.

The research identified complexities in implementing local wisdom and the tenure system of the Ammatoa Kajang indigenous community. These complexities are evident in limitations emerging when the government acknowledges indigenous forest existence

through regional regulations. Limitations manifest in challenges incorporating the Ammatoa Kajang tenure system into regional development plans. Additionally, significant issues exist regarding indigenous elder elections as village heads, as established qualifications render it unfeasible. Furthermore, industrial forestry concession permits pose conflicts with indigenous peoples' rights, which the Indonesian government defends legally, resulting in recognized territory being significantly smaller than territory they are entitled to control.

This research enhances comprehension of local wisdom roles in forest conservation but has several limitations. First, the single case study methodology centered on the Ammatoa Kajang Indigenous Community allows profound understanding of unique contexts but results cannot be extrapolated to other indigenous groups. Second, deforestation data from MapBiomas presents spatial and temporal resolution limitations. More comprehensive analysis utilizing high-resolution satellite imagery or extensive field surveys could yield more precise understanding of forest cover change dynamics.

Third, although this research addressed challenges following governmental recognition, it did not thoroughly investigate external challenges such as climate change, economic pressures, and modernization impacts threatening local wisdom and tenure system sustainability. Fourth, the systematic literature review method is contingent upon published literature availability, meaning undocumented local knowledge may be excluded. This research is constrained to publications meeting specific inclusion criteria, omitting relevant studies. Lastly, this study lacks comparative analysis with alternative forest management systems, complicating quantitative assessment of Ammatoa Kajang system effectiveness.

4. Conclusions

This research employs Systematic Literature Review (SLR) methodology to examine indigenous populations' roles in forest conservation, particularly the Ammatoa Kajang Indigenous Community in South Sulawesi. Findings indicate that institutionalized local knowledge and indigenous land tenure systems are crucial for effective forest conservation. The Ammatoa Kajang Indigenous Community has demonstrated successful forest management through the Pasang ri Kajang principle and customary land categorization into zones. This tenure system functions as a conservation strategy, curtailing overexploitation of forest resources, providing tangible evidence that local wisdom and customary land tenure systems contribute substantially to forest conservation.

This research identified ongoing structural challenges that impede this management model's sustainability, especially regarding legal recognition of indigenous peoples' rights. Despite constitutional recognition established by Constitutional Court Decision No. 35/PUU-X/2012, affirming that customary forests do not belong to state forests, practical application continues to encounter bureaucratic and political hurdles. The legal dispute involving PT Lonsum exemplifies how insufficient legal protection jeopardizes indigenous peoples' existence and forest sustainability. Persistent agrarian conflicts highlight the urgent need to strengthen comprehensive legal frameworks.

Another significant challenge is incorporating the Ammatoa Kajang tenure system into regional development strategies. Merging indigenous knowledge with government forestry policies is essential to establish sustainable and equitable conservation models. The author recognizes this study's limitations, relying solely on literature reviews or secondary data. While SLR and thematic analysis help clarify interconnections between studies, local wisdom and the Ammatoa Kajang tenure system's role warrant further investigation through field studies with primary data collection.

Several recommendations can be articulated. First, SLR and thematic analysis have proven effective in recognizing indigenous peoples' contributions to forest conservation and can be replicated for studies of other Indonesian indigenous communities. Second, indigenous peoples' acknowledgment must be paired with inclusive processes that consider social structures and tenure systems, ensuring effective application of local wisdom for

forest conservation. Third, additional research employing participatory approaches and primary data collection is required to document other Indonesian indigenous communities' local wisdom practices, enriching the knowledge base for more inclusive and evidence-based forest conservation policies.

Acknowledgement

The author thanks Dr. Herdis Herdiansyah, S.Fil.I., M.Hum., lecturer of the Human Life Systems and the Environment (*Sistem Kehidupan Manusia dan Lingkungan*) course, Environmental Science Study Program, Universitas Indonesia, for his guidance and constructive feedback during the development of this manuscript, which originated as an assignment for that course. The author also gratefully acknowledges the Sheep Institute for the scholarship that supports the author's master's study at Universitas Indonesia. In addition, the author thanks Universitas Indonesia for providing access to the Scopus and ScienceDirect databases through its institutional subscription, the MapBiomas Indonesia initiative for making its annual land cover data openly available, and the editors and reviewers of *Jurnal Bisnis Kehutanan dan Lingkungan* for their constructive comments, which improved the clarity of this article. This research received no external funding. The author did not receive any additional funding from any individual, institution, or organization for the preparation or publication of this article.

Author Contribution

Conceptualization, A.R.O.; Methodology, A.R.O.; Investigation, A.R.O.; Data Curation, A.R.O.; Formal Analysis, A.R.O.; Visualization, A.R.O.; Writing – Original Draft, A.R.O.; Writing – Review & Editing, A.R.O. The author has read and agreed to the published version of the manuscript.

Funding

This research received no external funding.

Ethical Review Board Statement

Not available.

Informed Consent Statement

Not available.

Data Availability Statement

Not available.

Conflicts of Interest

The author declares no conflicts of interest.

Declaration of Generative AI Use

During the preparation of this manuscript, the author used Claude (Anthropic) solely to check the manuscript for writing errors. Generative artificial intelligence (AI) was not used to write the manuscript, analyze the data, or generate the findings of this study. The author reviewed all AI-assisted output and takes full responsibility for the content of this article.

Open Access

©2026. The author. This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other third-party material in this article are included in the article's

Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit: http://creativecommons.org/licenses/by/4.0/

References

Annur, A. (2016). *Model konservasi lingkungan untuk pengembangan ekonomi kreatif pada masyarakat adat* [Unpublished master's thesis]. Program Studi Ilmu Lingkungan, Universitas Indonesia.

Arif, M., Zainuddin, Z., Salle, S., & Aini, S. N. (2025). Pasang ri Kajang: Legal instruments of environmental justice for the Ammatoa Kajang community. *Petita: Jurnal Kajian Ilmu Hukum dan Syariah, 10*(1), 146–163. https://doi.org/10.22373/petita.v10i1.516

Azis, S., Zubaidah, S., Mahanal, S., Batoro, J., & Sumitro, S. B. (2020). Local knowledge of traditional medicinal plants use and education system on their young of Ammatoa Kajang tribe in South Sulawesi, Indonesia. *Biodiversitas Journal of Biological Diversity, 21*(9), 3989–4002. https://doi.org/10.13057/biodiv/d210909

National Disaster Management Authority. (2024). *Data Informasi Bencana Indonesia (DIBI)* [Data set]. https://dibi.bnpb.go.id

Indigenous Territory Registration Agency. (2024). *Status pengakuan wilayah adat di Indonesia* [Data set]. https://brwa.or.id

Bramer, W. M., Rethlefsen, M. L., Kleijnen, J., & Franco, O. H. (2017). Optimal database combinations for literature searches in systematic reviews: A prospective exploratory study. *Systematic Reviews, 6*(1), 245. https://doi.org/10.1186/s13643-017-0644-y

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Brondízio, E. S., Aumeeruddy-Thomas, Y., Bates, P., Carino, J., Fernández-Llamazares, Á., Ferrari, M. F., Galvin, K., Reyes-García, V., McElwee, P., Molnár, Z., Samakov, A., & Shrestha, U. B. (2021). Locally based, regionally manifested, and globally relevant: Indigenous and local knowledge, values, and practices for nature. *Annual Review of Environment and Resources, 46*, 481–509. https://doi.org/10.1146/annurev-environ-012220-012127

Camino, M., Aceves, P. A. V., Alvarez, A., Chianetta, P., de la Cruz, L. M., Alonzo, K., Vallejos, M., Zamora, L., Neme, A., Altrichter, M., & Cortez, S. (2023). Indigenous lands with secure land tenure can reduce forest loss in deforestation hotspots. *Global Environmental Change*, 81. https://doi.org/10.1016/j.gloenvcha.2023.102678

Daniel, D., Satriani, S., Zudi, S. L., & Ekka, A. (2022). To what extent does indigenous local knowledge support the social–ecological system? A case study of the Ammatoa community, Indonesia. *Resources, 11*(12). https://doi.org/10.3390/resources11120106

Dassir, M. (2022). Pasang: Knowledge and implementation of local wisdom in the Kajang traditional forest area, South Sulawesi. *Journal of Tourism, Hospitality, Travel and Business Event, 4*(1), 40–47. https://doi.org/10.33649/pusaka.v4i1.151

Dawadi, S. (2020). Thematic analysis approach: A step-by-step guide for ELT research practitioners. *Journal of NELTA, 25*(1–2), 62–71. https://doi.org/10.3126/nelta.v25i1-2.49731

Fa, J. E., Watson, J. E. M., Leiper, I., Potapov, P., Evans, T. D., Burgess, N. D., Molnár, Z., Fernández-Llamazares, Á., Duncan, T., Wang, S., Austin, B. J., Jonas, H., Robinson, C. J., Malmer, P., Zander, K. K., Jackson, M. V., Ellis, E., Brondizio, E. S., & Garnett, S. T. (2020). Importance of Indigenous Peoples' lands for the conservation of Intact Forest Landscapes. *Frontiers in Ecology and the Environment, 18*(3), 135–140. https://doi.org/10.1002/fee.2148

Food And Agriculture Organization Of The United Nations & Fund For The Development Of The Indigenous Peoples Of Latin America And The Caribbean. (2021). Forest

governance by indigenous and tribal peoples: An opportunity for climate action in Latin America and the Caribbean. *FAO*. https://doi.org/10.4060/cb2953en

Fisher, M., Mulyana, A., Labarani, A., Kamaluddin, Yuliani, E. L., & Moeliono, M. (2023). The power of possibility in landscape governance: Multiple lives of participatory action research in Kajang, Sulawesi. In Responding to environmental issues through adaptive collaborative management: From forest communities to global actors (pp. 113–132). *Taylor & Francis*. https://doi.org/10.4324/9781003325932-9

Fisher, M. R., & van der Muur, W. (2020). Misleading icons of communal lands in Indonesia: Implications of adat forest recognition from a model site in Kajang, Sulawesi. *Asia Pacific Journal of Anthropology, 21*(1), 55–76. https://doi.org/10.1080/14442213.2019.1670244

Gani, I., Hufad, A., Komar, O., & Ardiwinata, J. S. (2023). Entrepreneurial ecology-based indigenous people learning model in utilizing the Ammatoa Kajang customary area. *Jurnal Penelitian Pendidikan IPA, 9*(12), 11846–11854. https://doi.org/10.29303/jppipa.v9i12.6863

Gitima, G., Gebre, A., Berhanu, Y., & Wato, T. (2025). Exploring indigenous wisdom: Ethnobotanical documentation and conservation of medicinal plants in Goba district, southwest Ethiopia. *Scientific African*, 27. https://doi.org/10.1016/j.sciaf.2025.e02571

Gunawan, S., Madiong, B., & Makkawaru, Z. (2022). Analisis hukum hak masyarakat hukum adat Ammatoa terhadap hutan adat di Kabupaten Bulukumba. *Indonesian Journal of Legality of Law, 5*(1), 69–74. https://doi.org/10.35965/ijlf.v5i1.1911

Heriyanto, H. (2018). Thematic analysis sebagai metode menganalisa data untuk penelitian kualitatif. *Anuva, 2*(3), 317–324. https://doi.org/10.14710/anuva.2.3.317-324

Hill, R., Adem, Ç., Alangui, W. V., Molnár, Z., Aumeeruddy-Thomas, Y., Bridgewater, P., Tengö, M., Thaman, R., Adou Yao, C. Y., Berkes, F., Carino, J., Carneiro da Cunha, M., Diaw, M. C., Díaz, S., Figueroa, V. E., Fisher, J., Hardison, P., Ichikawa, K., Kariuki, P., … Xue, D. (2020). Working with indigenous, local and scientific knowledge in assessments of nature and nature's linkages with people. *Current Opinion in Environmental Sustainability, 43*, 8–20. https://doi.org/10.1016/j.cosust.2019.12.006

Ichwan, M., Reskiani, U., Indah, A. L., Fitri Makmur, A. N. A., & Djafar, E. M. (2021). Pasang ri Kajang: Tradisi lisan masyarakat adat Ammatoa suku Kajang dalam pembentukan karakter konservasi. *Ideas: Jurnal Pendidikan, Sosial, dan Budaya, 7*(4), 133. https://doi.org/10.32884/ideas.v7i4.495

Kambo, G. A. (2021). Local wisdom Pasang ri Kajang as a political power in maintaining indigenous people's rights. *ETNOSIA: Jurnal Etnografi Indonesia, 6*(2), 265–280. https://doi.org/10.31947/etnosia.v6i2.10585

Kennedy, C. M., Fariss, B., Oakleaf, J. R., Garnett, S. T., Fernández-Llamazares, Á., Fa, J. E., Baruch-Mordo, S., & Kiesecker, J. (2023). Indigenous peoples' lands are threatened by industrial development; Conversion risk assessment reveals need to support indigenous stewardship. *One Earth, 6*(8), 1032–1049. https://doi.org/10.1016/j.oneear.2023.07.006

Kolopaking, L. M., Sjaf, S., & Sampean, S. (2025). Problems and prospects of recognition of the Ammatoa Kajang indigenous community in Indonesia. *Development in Practice*. https://doi.org/10.1080/09614524.2025.2562478

Loivaranta, T. (2023). Geographies of knowledge creation in forest rights claims-making processes among indigenous communities in central India. *Land Use Policy*, 131. https://doi.org/10.1016/j.landusepol.2023.106741

Londres, M., Schmink, M., Börner, J., Duchelle, A. E., & Frey, G. P. (2023). Multidimensional forests: Complexity of forest-based values and livelihoods across Amazonian socio-cultural and geopolitical contexts. *World Development*, 165. https://doi.org/10.1016/j.worlddev.2023.106200

Mahaswa, R. K., & Syaja, A. (2025). Questioning local wisdom in Indonesian indigenous research. *Studies in History and Philosophy of Science, 112*, 170–178. https://doi.org/10.1016/j.shpsa.2025.07.001

MapBiomas Project. (2025). *Indonesia annual land cover and land use map collection* [Data set]. https://indonesia.mapbiomas.org

Mengist, W., Soromessa, T., & Legese, G. (2020). Ecosystem services research in mountainous regions: A systematic literature review on current knowledge and research gaps. *Science of the Total Environment*, 702. https://doi.org/10.1016/j.scitotenv.2019.134581

Moser, A., & Korstjens, I. (2017). Series: Practical guidance to qualitative research. Part 1: Introduction. *European Journal of General Practice, 23*(1), 271–273. https://doi.org/10.1080/13814788.2017.1375093

Naeem, M., Ozuem, W., Howell, K., & Ranfagni, S. (2023). A step-by-step process of thematic analysis to develop a conceptual model in qualitative research. *International Journal of Qualitative Methods*, 22. https://doi.org/10.1177/16094069231205789

Nkansah-Dwamena, E. (2025). Aligning conservation goals with forest livelihood needs: Using local perspectives to inform policy and practice in Ghana. *Forest Policy and Economics*, 177. https://doi.org/10.1016/j.forpol.2025.103532

Nur, M. S., Zid, M., & Setiawan, C. (2022). Pengelolaan lahan dan ruang hutan dengan perspektif kearifan lokal komunitas Ammatoa Kajang sebagai usaha konservatif. *Jurnal Pengelolaan Lingkungan Berkelanjutan (Journal of Environmental Sustainability Management)*, *6*(2), 90–105. https://doi.org/10.36813/jplb.6.2.90-105

Nurmiati, N., Rokis, R., Ahmad, E., Engku, Z., & Al Aydarus, A. (2020). Cerminan Al-Hima pada kesedaran kekerabatan sistem adat pribumi Ammatoan demi kelestarian alam melalui kesederhanaan hidup. *Journal al-'Abqari, 22*(1), 35–50.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ,* 372. https://doi.org/10.1136/bmj.n71

Preiser, R., García, M. M., Hill, L., & Klein, L. (2021). *Qualitative content analysis*. In The Routledge handbook of research methods for social-ecological systems (pp. 270–281). Routledge. https://doi.org/10.4324/9781003021339-23

Rampin, R., & Rampin, V. (2021). Taguette: Open-source qualitative data analysis. *Journal of Open Source Software, 6*(68), 3522. https://doi.org/10.21105/joss.03522

Reddy, A. A., Maraseni, T., Lahiri, S., Karki, S., Koju, U., Shrestha, A., & Cadman, T. (2024). Perspectives on forest governance among the indigenous communities of India's Eastern Ghats. *Forest Policy and Economics*, 169. https://doi.org/10.1016/j.forpol.2024.103350

Rodd, M., Fisher, M., Monterroso, I., Liswanti, N., Maryudi, A., Larson, A. M., Mwangi, E., & Herawati, T. (2022). Coordinating forest tenure reform: Objectives, resources and relations in Indonesia, Kenya, Nepal, Peru, and Uganda. *Forest Policy and Economics*, 139. https://doi.org/10.1016/j.forpol.2022.102718

Sahabuddin, W., & Hildayanti, A. (2023). Influence of cosmology in life and architecture: Insights from the Kajang people of Indonesia. *ISVS e-Journal, 10*(6), 26–38.

Samad, I. D., Niswaty, R., Agus, A. A., & Arman, A. (2021). Learning environmental lessons from indigenous Ammatoa Kajang to preserve the forest. *Journal of Physics: Conference Series, 1899*(1). https://doi.org/10.1088/1742-6596/1899/1/012150

Sartika, S., Kamaruddin, S. A., Adam, A., Ihsan, A., & Samad, A. (2024). Existence of the indigenous community Ammatoa Kajang. *International Journal of Health, Economics, and Social Sciences (IJHESS), 6*(2), 514–520. https://doi.org/10.56338/ijhess.v6i2.5266

Satrianegara, M. F., Juhannis, H., Lagu, A. M. H. R., Habibi, H., Sukfitrianty, S., & Alam, S. (2021). Cultural traditions and special rituals related to health in Bugis ethnics Indonesia. *Gaceta Sanitaria, 35*, S56–S58. https://doi.org/10.1016/j.gaceta.2020.12.016

Sinka, V., Kerr, M., Dickson, M., Stephens, J. H., Craig, J. C., Vastani, R. T., Hewage, A. H., Dal Grande, E., & Jauré, A. (2025). The perspectives of young indigenous people on chronic disease prevention programs: A systematic review of qualitative studies. *Journal of*

Adolescent Health, *77*(2), 181–190. https://doi.org/10.1016/j.jadohealth.2025.04.005

Sinthumule, N. I. (2023). Traditional ecological knowledge and its role in biodiversity conservation: A systematic review. *Frontiers in Environmental Science*, 11. https://doi.org/10.3389/fenvs.2023.1164900

Sinthumule, N. I., & Mashau, M. L. (2020). Traditional ecological knowledge and practices for forest conservation in Thathe Vondo in Limpopo Province, South Africa. *Global Ecology and Conservation*, 22. https://doi.org/10.1016/j.gecco.2020.e00910

Sizo, A., Lino, A., Rocha, Á., & Reis, L. P. (2025). Defining quality in peer review reports: A scoping review. *Knowledge and Information Systems, 67*(8), 6413–6460. https://doi.org/10.1007/s10115-025-02435-0

Tahir, G., Ilham, M., Asrifan, A., & Barsihannor, B. (2025). Eco-sufism in Ammatoa community: Harmonizing Islamic values and local traditions for environmental conservation in Kajang Bulukumba. *Journal of Islamic Thought and Civilization, 15*(1), 124–145. https://doi.org/10.32350/jitc.151.08

Ungirwalu, A., Mansoben, J. R., Runtuboi, Y. Y., Fatem, S. M., Peday, M. H., Marwa, J., & Maryudi, A. (2025). The fall of the kings: Power relations and dynamics in Papua's indigenous community in forest resource management. *Forest Policy and Economics*, 172. https://doi.org/10.1016/j.forpol.2025.103424

United Nations Framework Convention on Climate Change. (2024). *Local Communities and Indigenous Peoples Platform (LCIPP)*. https://lcipp.unfccc.int

Biography of Author

Amalya Reza Oktaviani, Department of Environmental Science, Graduate School of Sustainable Development, Universitas Indonesia, Central Jakarta 10430, Indonesia.

- Email: amalya.reza@ui.ac.id
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A