

Role of customary forest recognition and social trust in community-based biodiversity conservation in Bungo, Jambi, Indonesia

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Abstract. Ridwan, Maryam S, Epriadi D, Rizki, Alam MDM, Sari SP, Kirin A. 2025. Role of customary forest recognition and social trust in community-based biodiversity conservation in Bungo, Jambi, Indonesia. *Biodiversitas* 26: 4511-4521. Forests, including those governed by customary practices, are critical ecosystems that help maintain global climate balance. This study explores how customary forest recognition and social beliefs shape community behavior in protecting biodiversity in the Datuk Sinaro Putih customary forest in Jambi, Indonesia. Data were collected using a descriptive qualitative design through 17 semi-structured interviews with customary leaders, village officials, members of the Customary Forest Management Institution (LPHA), youth, community leaders, and non-governmental organizations from February to October 2024. Data were refined through participant observation and document analysis. The findings indicate that customary forest recognition and social beliefs are positively correlated with conservation behavior. *Seloko Adat*, the indigenous oral tradition of Datuk Sinaro Putih local community, serves as a symbolic and behavioral system, preserving traditional ecological knowledge, upholding customary law, and fostering intergenerational responsibility. This study highlights how the recognition of customary forests and social trust not only discourages extractive behavior through customary sanctions but also embeds conservation values into people's daily lives. These findings suggest that forestry policies should recognize and strengthen the functions of customary institutions through legal support, institutional strength, and sustainable financing schemes. Policies that incorporate customary principles, such as ecological prohibitions and collective farming practices, can enhance the legitimacy and success of conservation while safeguarding ecosystems. Future research should include a more comprehensive multi-level governance model that integrates local wisdom with national policies and the global biodiversity agenda, and analysis of economic, spiritual, and cosmological dimensions, as well as the relationships between customary institutions and external actors.

Keywords: Biodiversity, community-based conservation, customary forest, indigenous forest tenure, qualitative analysis

INTRODUCTION

Forests are central to maintaining global climate stability through carbon sequestration and the provision of critical ecosystem services (Harris et al. 2021). They serve as habitats for diverse species (Marín et al. 2021) and support human well-being by regulating air quality, hydrology, and climate (Zhu et al. 2021). Thus, forest conservation is vital not only for mitigating climate change but also for preserving biodiversity and sustaining livelihoods (Fernández-Llamazares et al. 2021). Within this context, community-based forest management, particularly by indigenous peoples, has emerged as an effective approach for maintaining ecological integrity.

Customary forests, governed by traditional rules and indigenous institutions, often exhibit lower deforestation rates and higher ecological resilience than state or commercially managed forests (Santika et al. 2017; Sze et al. 2022). Their strength lies in collective norms and long-standing ecological knowledge, which integrate

conservation into cultural identity. Empirical evidence demonstrates that biodiversity levels in customary forests frequently surpass those in other forest tenures (Armstrong et al. 2021). Despite these advantages, external pressures—such as tourism (Dawson et al. 2023), mining (Alemzero et al. 2021), and plantation expansion (Diepart et al. 2023)—continue to threaten customary forest governance. These pressures result in degraded water systems (Albert et al. 2021), land-use disruption (Winkler et al. 2021), and broader socio-economic vulnerabilities (Tyukavina et al. 2022; Krsnik et al. 2023).

The resilience of indigenous forest governance aligns with Ostrom's theory of common-pool resources, which emphasizes the role of local institutions, norms, and social trust in sustaining shared ecosystems (Ostrom 2009, 2015). An illustrative case is the Datuk Sinaro Putih community in Jambi, Indonesia, where forests are safeguarded through the oral tradition of *Seloko Adat*. Despite recurrent external encroachment, this community has maintained its ecological ethos, earning national recognition through the

Kalpataru Award (Ridwan et al. 2022b). Such examples parallel traditions like *Sasi* in Maluku (Saptenno and Timisela 2024), the *Cerekang* practices in South Sulawesi (Akhmar et al. 2022), and the *Tembawang* system in Kalimantan (Roslinda et al. 2017). Similar indigenous frameworks worldwide—from sacred groves in West Africa (Kühnert et al. 2019) to community forests in Brazil, South Africa, and New Zealand—affirm the importance of traditional ecological knowledge (Schmidt et al. 2021; Powers et al. 2020; Hosen et al. 2020).

This growing body of literature underscores the value of biocultural diversity (BCD), which conceptualizes the interplay of biodiversity, culture, and language (Buizer et al. 2016; Franco 2022). Policies incorporating BCD and adaptive governance tend to be more inclusive, equitable, and ecologically effective (Karpouzoglou et al. 2016; Li et al. 2020). For example, Colombia's recognition of biocultural rights has enhanced indigenous resource management (Nemogá et al. 2022), while experiences in Mongolia show how mobility and traditional knowledge foster ecological resilience (Seele et al. 2019). In Indonesia, Ministerial Regulations No. 9/2021 and No. 4/2023 highlight government commitments to community forestry, though successful implementation requires deeper insights into local governance systems.

Despite increasing recognition of customary institutions, research gaps remain. Studies of *Seloko Adat* have largely focused on conflict resolution (Pahrudin and Halim 2019; Halim and Pahrudin 2020), religious integration (Noor 2019), or forest protection in specific contexts (Alfathin and Makarim 2020). Yet, little is known about how *Seloko Adat* functions as a mechanism of social trust in forest conservation. Likewise, while studies in Lampung highlight strong interpersonal trust among farmers, institutional limitations hinder agroforestry expansion (Qurniati et al. 2017). Broader research often

emphasizes economic or policy outcomes of community forestry (Santika et al. 2017; Rakatama and Pandit 2020; Rochmah et al. 2021), with less attention to the cultural and social capital dimensions underpinning conservation behavior. Thus, empirical evidence linking social trust, customary governance, and biodiversity conservation remains underexplored in Indonesia.

To address this gap, this study examines the role of *Seloko Adat* as a cultural mechanism of social trust in guiding indigenous conservation practices within the Datuk Sinaro Putih customary forest in Jambi, Indonesia. Specifically, it investigates how local norms and trust-based institutions influence community compliance, strengthen ecological stewardship, and provide lessons for integrating customary governance into national conservation frameworks. By focusing on the intersection of social trust, traditional ecological knowledge, and biodiversity governance, this research contributes both conceptually and practically to the discourse on community-based conservation.

MATERIALS AND METHODS

Study area

The Datuk Sinaro Putih customary forest is located at 1°48'06.9"S and 101°52'00.8"E (Figure 1). This forest was designated as a customary forest in 2002 (Ridwan et al. 2022a, b, c). Administratively, it is located in Batu Kerbau and Dusun Baru Villages, Pelepat Sub-district, Bungo District, Jambi Province, Indonesia. The community traces its origin to the Pagaruyung Kingdom in West Sumatra Province and has lived in the region for centuries and preserved ecological balance through inherited indigenous values.

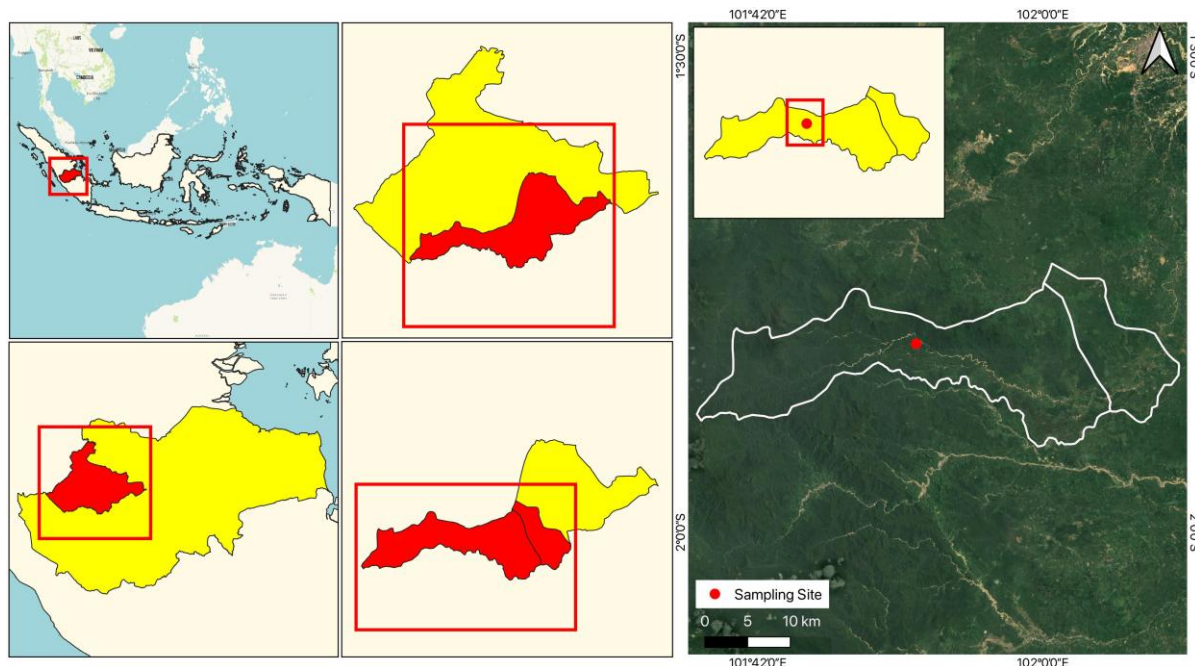


Figure 1. Map of study area of Datuk Sinaro Putih customary forest in Pelepat Sub-district, Bungo District, Jambi Province, Indonesia

The forest spans approximately 1,998 hectares, distributed across several hamlets: Lubuk Tebat (360 ha), Batu Kerbau (386 ha), Belukar Panjang (472 ha), and Dusun Baru (780 ha). It functions as a socio-ecological reservoir containing over 500 plant species, of which 300 are utilized for food, medicine, and construction. The forest contains high-value timber species, such as *Shorea parvifolia* (red meranti), *Endospermum didenum* (medang senduk), and *Anisoptera marginata* (mersawa), as well as non-timber forest products like rattan, bamboo, durian, honey, *Parkia speciosa* (stinkbean), and *Archidendron pauciflorum* (dogfruit), which contribute to the local livelihoods (Adnan et al. 2008).

The topography is hilly, with elevations between 125 and 170 m asl and average annual rainfall of 225 mm. The area is isolated and largely undeveloped, accessible only via 80 km unpaved road from the district capital, Muara Bungo. According to the Central Statistics Agency (Badan Pusat Statistik Kabupaten Bungo 2024), the community spans 42,000 hectares and had a population of 4,163 in 2023. Livelihoods are primarily based on rubber and oil palm cultivation, wet rice farming, livestock rearing, and inland aquaculture.

There are limited communication services since no tower or cellular telephone operator, and mobile phone signals are unavailable in Batu Kerbau and Dusun Baru areas (Badan Pusat Statistik 2024). The Datuk Sinaro Putih customary forest is considered as a remnant forest after the issuance of logging concessions (*Hak Pengusahaan Hutan/HPH*) for plantation companies. Currently, three companies operate in the region: Prima Mas Lestari (PML), Citra Sawit Harum (CSH), and Inhutani V (Ridwan et al. 2022a, b, c).

Research design and data collection.

This research applied a descriptive qualitative approach to answer the "how" and "why" questions in research about a phenomenon of interest, where the researcher has little control over the events being studied (Yin 2018). This approach was used to explore the embedded ecological wisdom of *Seloko Adat* in the governance of the customary forest. Using qualitative data, one can maintain a chronological flow, identify which events contribute to the flow, and derive helpful explanations (Miles et al. 2018). Data collection took place from February to October 2024 and employed multiple techniques: semi-structured interviews, participant observation, and document analysis. Informants granted informed consent, and ethical research protocols were followed throughout.

Batu Kerbau and Dusun Baru villages were chosen because they are the territories of the Datuk Sinaro Putih indigenous community. These two villages were deliberately selected because they are the centers of the Datuk Sinaro Putih indigenous community, which has legal recognition and historical authority over 1,998 hectares of customary forest. These two villages are also relevant and representative because of their strong adherence to *Seloko Adat*, which will be discussed in this study. A purposive sampling strategy was used to select participants based on their functional roles, expertise, and long-term involvement

in customary forest governance. A total of 17 participants were interviewed. They consisted of four customary leaders, three village officials, three members of the Customary Forest Management Institution/LPHA, two representatives of environmental NGOs, three community and cultural figures, and two young members who patrolled the customary forest.

There were 19 questions asked to informants, including what *Seloko Adat* is, examples of its application in daily life, when *Seloko Adat* began to be known, how it is inherited, the role of *Seloko Adat* in protecting the forest, community meetings in the context of *Seloko Adat*, why they obey it, customary sanctions for others, how Customary Forest Management Institution (LPHA), how LPHA synergizes with villages, traditional leaders and the community, conflicts with outsiders, how to establish relationships, young people's involvement in LPHA, the level of trust between community members in protecting the forest, what flora and fauna are protected, forest utilization rules based on *Seloko Adat*, customary prohibitions related to forest ecosystems, and their opinions on forest sustainability. Researchers ensure that research ethics are implemented by implementing informed consent, where informants consciously agree to be interviewed after understanding the research. Each participant was informed of the study's purpose and their right to confidentiality. They were also given the freedom to stop their studies at any time without any consequences.

Each category of informants contributed unique insights. Traditional leaders explained the origins and spiritual significance of *Seloko Adat*; village officials elaborated the regulatory support and budgeting for forest management; LPHA members described on-the-ground patrols and conservation challenges; and NGO actors contextualized institutional support for indigenous conservation. Observational data complemented these narratives through on-site assessments of land-use practices and biodiversity indicators. Interviews typically lasted 60 to 120 minutes, with an average of 90 minutes per session. The distribution of informants, their roles, and the primary topics discussed are summarized in Table 1.

Data analysis

The qualitative data collected in this study—comprising transcribed interviews, observational notes, documents, and visual records—were analyzed using the interactive model developed by Miles et al. (2018). This model facilitated a structured and iterative approach to interpreting field data within the complex socio-cultural and ecological context of the Datuk Sinaro Putih customary forest.

The analysis began with a process of data reduction, in which raw data were systematically organized and coded according to emerging thematic categories. This involved identifying key patterns related to social trust, traditional ecological knowledge, community engagement, and the normative function of *Seloko Adat*. Redundant information was removed, and essential details were condensed to highlight the most relevant elements for addressing the study's objectives. Theme development was also part of the coding.

Following this, the reduced data were displayed in a coherent manner through thematic matrices, analytical summaries, and narrative constructs. This stage aimed to clarify the interconnections between indigenous values, community practices, and biodiversity conservation outcomes. In particular, it enabled the identification of how *Seloko Adat* articulates behavioral norms and shapes collective responses to environmental pressures.

The final stage involved drawing conclusions and verifying findings. Interpretations were continuously refined through triangulation, which involves cross-checking data from multiple sources and informant categories to enhance the credibility and depth of the analysis. Attention was given to contextual robustness, ensuring that interpretations accurately reflected both the cultural integrity and ecological realities of the study setting.

Through this methodological framework, the study was able to generate a nuanced and contextually grounded understanding of how *Seloko Adat* functions as a socially embedded mechanism of environmental governance, effectively guiding conservation behavior and sustaining biodiversity in the Datuk Sinaro Putih customary forest.

RESULTS AND DISCUSSION

Result

Overview of Datuk Sinaro Putih community forest

The Datuk Sinaro Putih is a traditional community bound together in a community association. They have customary institutions, legal jurisdiction, and customary legal institutions and instruments that are still applied. The ancestor of the customary community of Baru Pelepat,

Batu Kerbau, and Lubuk Telau hamlets was Datuk Sinaro Putih. He came from the Minangkabau region, and his descendants continue to serve as customary leaders in the three hamlets. The Datuk Sinaro Putih community was given authority by the government to regulate its own government affairs through Regional Regulation Number 3 of 2006 concerning the Datuk Sinaro Putih community (Ridwan and Isman 2019). This community still protects its customary forest based on customary values. For hundreds of years, this customary forest has been a protected area to conserve various flora and fauna.

A series of legal protections and decrees have been enacted to preserve the Datuk Sinaro Putih customary forest. These include ministerial decrees and regional regulations (Table 2), reflecting the cumulative success of indigenous community advocacy efforts and NGO collaboration. The legal recognition afforded by these policies has strengthened community autonomy in forest management, reducing vulnerability to external pressures such as deforestation, illegal logging, and agribusiness encroachment.

This multi-tiered legal instrument underscores how the Datuk Sinaro Putih community has successfully engaged with state mechanisms to secure long-term forest rights and biodiversity conservation. As the global environmental crisis deepens, this case demonstrates the critical role of customary governance in preserving life-supporting ecosystems. Regional Regulation No. 3 of 2006 marked the first milestone in recognizing the Datuk Sinaro Putih customary forest. The indigenous community's struggle for legal recognition was a long journey, supported by the environmental NGO KKI Warsi (Ridwan et al. 2022a, b, c). A KKI Warsi staff member explained:

Table 1. Distribution of informants and their roles, methods and interview themes

Role	Data collection focus	Key themes
Customary authority; preservation of <i>Seloko Adat</i>	In-depth semi-structured interviews	Meaning and transmission of <i>Seloko Adat</i> ; ecological ethics and forest guardianship
Local governance; funding of LPHA operations	In-depth interviews	Institutional support, budgeting, policy alignment with forest protection
Patrol and management of forest lands	Semi-structured interviews	Forest condition, community mobilization, patrolling mechanisms
Advocacy and program support	In-depth interviews	NGO collaboration, training, and empowerment of indigenous groups
Influence cultural and social dynamics	Semi-structured interviews	Community engagement in <i>Seloko Adat</i> , generational knowledge
Archive traditional practices	Document and visual analysis	Symbolism, ritual practices, ecological storytelling
Monitor community behavior and ecological impact	Participant observation	Traditional land use, forest-society interactions, sustainability indicators

Table 2. Legal basis of Datuk Sinaro Putih customary forest, Jambi Province, Indonesia

Location	Legal basis	Area (ha)
Batu Kerbau	Bungo Regent's Decree No. 1249 of 2002 and Minister of Forestry and Environment Decree No. 5254/MENLHK.PSKI/PKTHA/PSL.11/2017	386
Dusun Baru	Bungo District Regulation No. 3 of 2006 and Minister of Forestry and Environment Decree No. 5531/MENLHK.PSKI/PKTHA/PSL.11/2017	780
Belukar Panjang Hamlet	Bungo Regent's Decree No. 1249 of 2002 and Bungo District Regulation No. 3 of 2006	472
Lubuk Tebat Hamlet	Bungo Regent's Decree No. 1249 of 2002 and Bungo District Regulation No. 3 of 2006	360

Source: Ridwan et al. (2022a, b, c)

"I helped the indigenous community to maintain their customary forest. At that time, there were 125 chainsaws operating in the customary forest. In 2005, there was a surge in Logging Business Permits (IPKK). Logging by loggers had expanded into the customary forest. We fought with the indigenous community to lobby the Regent and the Bungo Regional People's Representative Council (DPRD) to establish the customary forest's status."

Community perception

The customary values, ancestral history, and environmental practices passed down through generations through customary practices and local cultural expressions, particularly the *Seloko Adat*, shape the community's perceptions of the Datuk Sinaro Putih customary forest. The community views their forest ecosystem as a lifeline and a legacy passed down through generations, contributing to their cultural identity. Their *Seloko Adat* governs their relationship with the forest and the environment. It encompasses customary, ecological, and historical principles passed down orally from generation to generation.

Regarding the protection of customary forests, the traditional leader of the Datuk Sinaro Putih community stated: *"We manage this customary forest to pass it on to our children and grandchildren. Anyone who cuts down trees in the customary forest will be subject to customary sanctions."*

Another traditional leader spoke about respecting the forest in their culture:

"Every five years, we hold a traditional ritual involving a vow, which involves slaughtering two buffalo and praying for a good harvest for our agriculture."

Another village figure shared their commitment to protect their customary forests:

"We patrol the customary forests every two months, going around the entire customary forest area. The customary forest guard team includes young people who are still strong enough to walk."

A respected traditional leader said:

"The forest that we guard, thank God, no one dares to take forest products for their own economic gain. According to the old customary agreement, namely Seloko Adat, customary sanctions are given to those who violate it,

that's what we use until now. We also have a customary forest guard institution that always patrols once a month or once every two months to guard, and that's normal, we've been doing it for a long time. Our young children are involved because they are strong enough to walk around the customary forest, while we, the older ones, are no longer able to. They are involved as administrators of the customary forest guard institution. As for the gold mining carried out by the community, it only operates outside the customary forest and never disturbs the customary forest."

Trust mechanism

Social trust within a community is the primary foundation for managing customary forests. Traditional rules, passed down from generation to generation, serve as unwritten rules that bind the entire community. In practice, these rules are reinforced by customary forest patrols, customary sanctions, and collective moral obligations that apply to all community members. The head of the customary forest management institution stated:

"We conduct regular patrols with youth members of the customary forest management institution. We enforce customary rules and ensure that customary forests and customary rules are not violated. Operational support is provided by village funds."

Another village leader stated:

"We work together to maintain these customary laws and forests. All elements of society are involved, including traditional leaders, community members, and village leaders. Everything is done through a mutual cooperation system."

Various sanctions have been imposed on violators of customary laws for the preservation and protection of customary forests by the indigenous community. The sanctions imposed for violations of customary laws can be seen in Table 3.

Conservation practices

The conservation practices practiced by the Datuk Sinaro Putih indigenous community regulate all activities related to forest protection. Hunting, fishing, farming, and gardening are regulated by customary rules to protect forest biodiversity. One customary leader stated.

Table 3. Various violations related to Datuk Sinaro Putih customary forests and their sanctions in Jambi, Indonesia

Type of violation	Year	Sanctions
Timber harvesting for buildings by people of Dusun Batu Kerbau	2004	The wood was confiscated, the legal sanctions were in the form of a fine of one goat, 20 gantang (50 kg) of rice, four pieces of cloth (4 times the price of the fabric)
Forest clearing in customary lands by the Suku Anak Dalam (SAD)	2022	The SAD were evicted from the forest by Bungo Resort Police
Oil palm planting by PT Citra Sawit Harum (CSH) in the customary forest	2002	PT CSH withdrew from the customary forest and ceased plantation activities
Timber harvesting by residents of Dusun Baru	2004	Customary sanctions
Cutting down trees for Eid celebration by residents of Dusun Baru	2004	Customary sanctions

Source: Ridwan et al. (2022a, b, c)

"Our customary forests are protected for future generations. Our customary forests have been established through a ministerial decree (Peraturan Menteri Kehutanan), but their function has been returned to customary law. If there are violations, we will impose fines or customary sanctions."

A team from the environmental NGO KKI Warsi said, *"We, the KKI Warsi team, are assisting the indigenous community there to save the forest. Together with the indigenous community, we are mapping the customary forest to ensure its integrity. We are also collaborating with the National Land Agency of Bungo District."*

Meanwhile, in *Seloko Adat*, several conservation practices are reflected as seen in Table 4.

The *Seloko Adat* "sompak, kompak, satumpak" promotes synchronized and collective farming in one designated area, a traditional technique that prevents forest fragmentation and minimizes habitat disturbance. This practice aligns with modern ecological principles aimed at reducing agricultural encroachment and deforestation.

Likewise, forest product extraction is regulated by wise-use principles embedded in several *Seloko Adat* expressions. The phrases "nan kuek ka tunggak tuo," "nan lantiak ka bubungan," and "nan bungkuak ka tangkai bajak" denote the efficient allocation of specific wood types to appropriate uses. By avoiding waste and limiting logging to absolute necessities, the community has developed a highly efficient and ecologically respectful timber management system that reduces pressure on forest resources.

In terms of fauna protection, the proverb "tanah tombang, umput layu" embodies a system of accountability whereby hunters must share their catch with traditional leaders. This custom ensures that wildlife populations are not excessively exploited and that their numbers are known and monitored. For aquatic biodiversity, "lubuk larangan pumpunan ikan" establishes conservation zones in river

systems where fishing is strictly forbidden. Permissible fishing practices in other parts of the river are also regulated under customary law. Only traditional tools such as nets, dip nets (tangguk), bamboo fish traps (lukah), and small trawls are allowed. The use of poisons, electric currents, or explosives is strictly prohibited, reflecting a conservation ethic rooted in ecological wisdom rather than external enforcement.

Taken together, these *Seloko Adat* principles act as a culturally embedded conservation framework. Their continued relevance and implementation have enabled the Datuk Sinaro Putih community to effectively conserve forest biodiversity amidst escalating socio-economic and environmental pressures. Meanwhile specific biodiversity elements protected by each *Seloko Adat* practice can be seen in Table 5.

Forest patrols are a conservation practice that plays a vital role in protecting customary forest areas. These routine patrols are supported by the village government, which provides operational funds. As stated by the Head of the Customary Forest Management Institution (LPHA).

"The village government also supports customary forest protection by providing funding. We also collaborate with companies operating near customary forests."

A village leader said:

"We work together to protect customary forests. Through the established institution (LPHA), we conduct patrols once or twice a month to check the condition of the customary forest."

Another customary leader said:

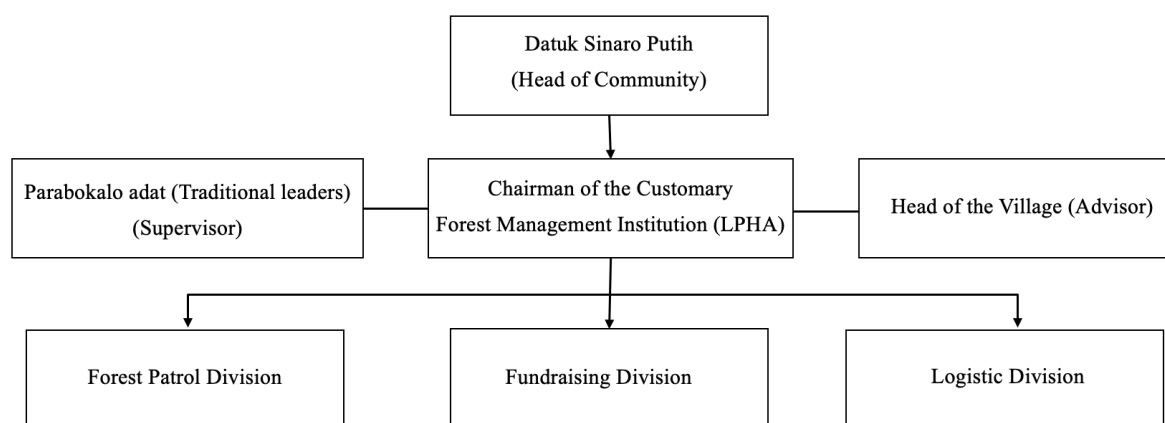
"In the past, the Anak Dalam tribe established an oil palm plantation in the customary forest area. We contacted the police to control them. Finally, police patrols from the Bungo Police Department arrived to prevent them from entering the customary forest area."

Table 4. Various kinds of *Seloko Adat* (customary proverbs), their meanings and their conservation and ecological functions

<i>Seloko Adat</i>	Translation	Meanings	Conservation and ecological functions
Sompak, kompak, satumpak	Simultaneous, compact and in one location	To avoid pests and indiscriminate killing of animals, farming should be coordinated in one area	Promote simultaneous farming to minimize pest spread and ecosystem disturbance, as well as to maintain agroecosystem health
Nan kuek ka tunggak tuo	Strong for the main pole	Strong wood is used for house pillars (wood efficiency)	Reducing deforestation through wood conservation and durable wood selection
Nan lantiak ka bubungan	Flexible one for the ridge	Flexible wood is used for roof structures (resource efficiency)	This leads to the use of flexible wood species, which increases material efficiency and reduces environmental waste
Nan bungkuak ka tangkai bajak	Bent one for a plough handle	Bent wood is used for plough shafts (wood efficiency)	Encourage the use of natural materials, reducing the need for processing and wood waste
Tanah tombang, umput layu	The land where animals die, grass withers	Animal hunting must be reported to leaders to ensure sustainable and reasonable extraction	Enforcing ethical limits on hunting, protecting areas vulnerable to extinction, and ensuring population regeneration
Lubuk larangan pumpunan ikan	Forbidden pool where fish gather	Prohibits fishing in designated conservation zones	Functioning as fish sanctuaries, maintaining biodiversity, and protecting against over-exploitation
Umpang boleh disisip, kerap boleh diganggu	The empty ones may be disturbed	Resources can only be taken when ecosystem conditions are favorable	Prioritize ecosystem health, enable regeneration, and prioritize natural ecosystem cycles
Ka darek babungo kayu, ka ayik babungo pasir	To the land the reward is wood, to the river the reward is sand	Resource extraction must benefit community development and follow ecological rationale	Promotes equitable and ecologically based use of ecosystem resources and links resource use to social and environmental responsibility

Table 5. Specific biodiversity elements protected by conservation practices through *Seloko Adat* in the Datuk Sinaro Putih indigenous community in Jambi Province, Indonesia

<i>Seloko Adat</i> practices	Biodiversity element protected (and/or local name)	Habitat types
Prohibition on taking plants	<i>Koompasia excelsa</i> (Sialang), <i>Shorea parvifolia</i> (meranti merah), <i>Endospermum didenum</i> (medang senduk), <i>Anisoptera marginata</i> (mersawa), <i>Shorea multiflora</i> (kawang kunyit)	Primary forest
Prohibition on hunting animals	<i>Cervus unicolor</i> (rusa), <i>Muntiacus muntjak</i> (kijang), <i>Tragulus javanicus</i> (kancil)	Primary forest
No-catch fishing zone	<i>Tor tambroides</i> (Semah), <i>Macrones mikrocanthus</i> (Singgiring), <i>Mystus nemurus</i> (Ikan baung), <i>Cryptopterus limpok</i> (Lais), <i>Osteochilus hasselti</i> (Palau), <i>Puntius schwanenfeldi</i> (Lampam), <i>Microphis brachyurus</i> (Tilan), <i>Pristolepis grootii</i> (Batung), <i>Oxyleotris marmorata</i> (Betutu), <i>Osphronemus gouramy</i> (Gurami), <i>Thynnichthys thynnoides</i> (Lambak)	Primary forest

**Figure 2.** The structure of Customary Forest Management Institution (LPHA) of Datuk Sinaro Putih, Jambi Province, Indonesia

To institutionalize forest protection, communities have formed Customary Forest Management Institution (LPHA) (Figure 2), which play a strategic role in forest governance. These institutions are designed to operationalize customary norms and enforce ecological obligations rooted in *Seloko Adat* (customary law). From imposing sanctions for violations to establishing protected areas, LPHAs are an operational part of customary forestry law. Informants 1, 2, and 3 emphasized the effectiveness of the community:

“Even though our customary forest is surrounded by palm oil companies, thank God it is still well-maintained. Our customary forest has been proposed for biocarbon funding by the government.”

The governance foundation of LPHAs is strengthened by Village Regulation No. 2/2005, which legally recognizes the management and use of customary forests. Enacted on July 3, 2005, by the village head, the regulation mandates that a portion of the village budget be allocated annually for Customary Forest Protection Groups (KPHA) operations. This regulation symbolizes the synergy between traditional ecological knowledge and formal governance, demonstrating that customary systems can align with, and strengthen, national and global policy framework.

Field observations also indicate that the forest area is well-maintained, as evidenced by installing forest boundary markers at the borders. Customary forest management institutions, assisted by environmental NGOs, provide

markers and boundary markers between customary forests, community lands, and palm oil company lands.

Discussion

Trust-building institutions

The research results show that community-based conservation in the Datuk Sinaro Putih indigenous community is determined by formal rules and trust-building institutions embedded in the community's cultural traditions. Trust-building institutions in the Datuk Sinaro Putih indigenous community are deeply embedded in customary practices and have existed for many years to govern the community. Customary institutions such as the *ninik mamak* (customary leaders), *parabokalo adat* (customary leaders), and customary community deliberations play a crucial role in establishing context, maintaining the legitimacy of rules, and ensuring that every member of the community follows and adheres to conservation practices.

These findings align with several previous studies that emphasize the importance of formal recognition of customary forests and how indigenous communities' ecological knowledge plays a crucial role in the success of community-based conservation. Resosudarmo et al. (2019) emphasized that state recognition of customary forests strengthens local legitimacy and enables. Research on the Datuk Sinaro Putih indigenous community in Bungo shows

a similar trend: formal recognition through regional regulations, regent regulations, and forestry ministerial decrees increases the Datuk Sinaro Putih indigenous community's authority to protect their customary forest areas. However, as Resosudarmo et al. (2019) note, the success of legal recognition depends heavily on the ability of the community and its supporting networks, such as NGOs, to conduct sustained advocacy.

Furthermore, Berkes (2008) stated that social beliefs and traditional knowledge are highly accepted in successfully managing natural resources in indigenous communities (Hill et al. 2020). In the case of the Datuk Sinaro Putih indigenous community, traditional beliefs and knowledge are permitted in customary forest management through *Seloko Adat* practices and deliberation mechanisms. These findings align with Berkes' (2008) sacred ecology theory, which views traditional knowledge systems as part of the social and spiritual structures that govern the community's relationship with its ecosystem.

Research on the Datuk Sinaro Putih indigenous community in Bungo shows that trust-building institutions create social trust, encourage community compliance with customary rules, and maintain the transmission of customary ecological knowledge from generation to generation. This pattern is conceptually similar to research on the *Sasi* method conducted by Saptanno and Timisela (2024) in Maluku, where local communities impose temporary bans on the use of specific natural resources, both marine and terrestrial, thus creating institutional mechanisms based on social norms that enhance environmental conservation and support community economic empowerment.

Furthermore, this research aligns with that of Roslinda et al. (2017), who examined the *Tembawang* economic system in West Kalimantan, a traditional mixed garden managed by the Dayak community. Based on this research, *Tembawang* maintains biodiversity and functions as an ecological ecosystem that generates sustainable income for the community. Therefore, the Datuk Sinaro Putih and *Tembawang* customary forests in Kalimantan demonstrate that biodiversity can be created when the socio-economic interests of the community are combined with ecological interests.

There are variations in institutional models compared to the aforementioned studies. *Sasi* in Maluku focuses more on temporary prohibitions on natural resource utilization, managed collectively and based on normative awareness (Saptanno and Timisela 2024). Meanwhile, *Tembawang* in Kalimantan demonstrates an economically profitable agroforestry system (Roslinda et al. 2017). Similarly, Resosudarmo et al. (2019) did not sufficiently examine the daily practices that support the sustainability of customary forests at the community level, focusing instead on policy analysis and governance. This study of the Datuk Sinaro Putih customary forest in Bungo demonstrates a combination of formal legal recognition and the daily practice of implementing customary values passed down through generations.

Berkes (2008) also has limitations compared to this study. First, Berkes's (2008) work is more general and

theoretical, using case studies from various parts of the world (Canada, the Arctic, Africa). However, it does not delve into customary law and institutions in Indonesia. Second, Berkes (2008) emphasizes the relationship between humans and nature within a traditional cosmological framework, but does not discuss how it relates to formal legal systems and governance. In the context of the Datuk Sinaro Putih indigenous community in Bungo, the relationship between custom and state forestry policy plays a significant role in determining the success or failure of conservation.

Therefore, the research on the Datuk Sinaro Putih indigenous community in Bungo covers the context of post-decentralization Indonesia when custom becomes a socio-political instrument and ecological knowledge system that goes hand in hand with formal law and state conservation policies.

Rule compliance

Adherence to customary values and rules is crucial to the sustainability and governance of the Datuk Sinaro Putih customary forest. These rules include prohibitions on cutting certain trees in customary forest areas, prohibitions on fishing in prohibited areas, and social sanctions for violators. Adherence to these customary values and rules stems not from coercion, but from a collective awareness of the importance of preserving ancestral forests for future generations and a deep respect for existing customary values and rules.

These findings support previous research. According to Berkes (2008), communities can adapt to environmental changes through adherence to customary rules (Hill et al. 2020). Resosudarmo et al. (2019) stated that formal legal recognition of customary rules has increased the legitimacy of local communities and encouraged them to maintain their traditional conservation practices. Furthermore, Roslinda et al. (2017) showed that adherence to customary rules among Dayak communities in managing *Tembawang* in Kalimantan has protected the ecosystem and generated financial benefits for the community. Meanwhile, Saptanno and Timisela (2024) stated that strengthening customary rules and values as social mechanisms can achieve community-based resource governance and increase collective community trust. Our study shows that compliance based on customary values and rules and recognition through formal law are two layers that strengthen continuity in the governance of the Datuk Sinaro Putih customary forest.

Although this study demonstrates that adherence to customary rules is crucial for conserving the Datuk Sinaro Putih customary forest in Bungo, it has several limitations. First, it does not comprehensively assess the economic impact of customary community adherence to customary values and *Seloko Adat*. This contrasts with Roslinda et al. (2017), who emphasized how customary rules contribute to the loss of ecosystem services and financial gains. Second, this study is limited to a systematic examination of the socio-collective dimensions of customary existence, unlike the study conducted by Saptanno and Timisela (2024) in Maluku, which emphasized the role of *Sasi* in building

social capital and community cohesion. Third, this study does not delve into the cosmological and spiritual aspects of communities' relationships with nature. Instead, it focuses more on normative and formal policy summaries, which differentiate it from Berkes (2008) conceptual framework.

Therefore, this research cannot yet explain the impact of rule compliance on the economy, society, cosmology, and politics. By combining economic-ecological analysis (as in the *Tembawang* study), social capital (such as the practice of *Sasi*), local cosmology (as proposed by Berkes (2008)), and multi-level governance (as proposed by Resosudarmo et al. (2019)), this opens up space for further, more comparative and integrative research.

Indigenous ecological knowledge

The success of the Datuk Sinaro Putih indigenous community's conservation practices in Bungo is heavily influenced by their traditional ecological knowledge. This traditional knowledge, embodied in *Seloko Adat*, guides them in protecting the forest and its ecosystem. Through rules, rituals, and daily practices, this knowledge is passed down from generation to generation.

In Sacred Ecology, Berkes (2008) states that traditional ecological knowledge is an adaptive form of knowledge, combining social customs and ritual practices (Hill et al. 2020). This finding aligns with this notion. Furthermore, Resosudarmo et al. (2019) argue that local knowledge can collaborate with official state policies to create a more inclusive and efficient forest governance model. Roslinda et al. (2017) provides a practical example of how Dayak communities manage *Tembawang* using local ecological knowledge, which maintains resource sustainability and generates financial benefits for the local community. Furthermore, in their study of *Sasi* in Maluku, Saptenno and Timisela (2024) emphasize that indigenous ecological knowledge is linked to social networks and collective trust, which makes community-based resource management more effective.

Study of the Datuk Sinaro Putih indigenous community in Bungo shows that traditional environmental knowledge (TEK) is embedded in *Seloko Adat*. This particularly applies to river protection regulations, logging prohibitions, and sanctions for violators. However, there are several limitations compared to other studies. Compared to Roslinda et al. (2017), this study does not examine the relationship between traditional knowledge, economic potential, and ecosystem services. Furthermore, compared to the study by Saptenno and Timisela (2024) in Maluku, which showed that *Sasi* is a TEK technique that increases social capital and community cohesion, the Bungo study is still limited to examining how *Seloko Adat* builds trust and social solidarity within the Datuk Sinaro Putih custom. This study is simpler than Berkes' (2008) framework because it does not comprehensively examine the cosmological and spiritual aspects of indigenous communities' relationships with their environment. This is a crucial issue in TEK literature worldwide. Finally, this study discusses how *Seloko Adat* negotiates with external parties such as local governments and private institutions.

This study also differs from the analysis by Resosudarmo et al. (2019), which emphasized TEK within the context of multi-level governance and forestry policy dynamics. Therefore, there are still limitations in positioning TEK as a whole—from economic-ecological, social, cosmological, and political-governance perspectives—in this study. This limitation opens up space for further research that can integrate these four dimensions to improve our understanding of the role of TEK in customary forest management in Indonesia.

In conclusion, this study demonstrates that customary forest recognition and social trust serve as ecological trust institutions that strengthen the legitimacy of customary rules, encourage community social compliance, and ensure the transmission of knowledge across generations. These findings suggest that community well-being is not the result of coercion, but stems from a collective awareness of the importance of sustainability. These findings suggest that forestry policies should recognize and strengthen the function of customary institutions through legal support, institutional strength, and sustainable financing schemes. Policies that incorporate customary principles, such as ecological prohibitions and collective farming practices, can enhance the legitimacy and success of conservation while safeguarding ecosystems. Future research could offer a more comprehensive multi-level governance model that integrates local wisdom with national policies and the global biodiversity agenda. Future research should include analysis of economic, spiritual, and cosmological dimensions, as well as the relationship between customary institutions and external actors.

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