

Forest Cosmology : A Study of the Talang Mamak Tribe in the Rantau Langsat Tourism Village, Bukit Tiga Puluh National Park

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Abstract

Talang Mamak is one of the indigenous tribes living in Riau that has been practicing sustainable subsistences and conservation for hundreds of years, which is a clear evidence of their worldview that considers ecology and cultures as two inseparable entities. This research explores the cosmological constructs of the Talang Mamak tribe and their manifestation in forest management practices in Bukit Tiga Puluh National Park (TNBT). This research employs a descriptive qualitative approach. We conducted in-depth interview with individuals deemed to meet our established criteria. Furthermore, we obtained data through participant observation. Then, a documentary studies were also conducted to obtain secondary data to complement the primary data. The results show that for the Talang Mamak tribe, the forest is not only a resource but also a living entity that functions as a spiritual center, a source of food and medicine, and an archive of collective knowledge. This cosmology is manifested in a traditional zoning system, sustainable farming practices, and spiritual norms that prevent excessive exploitation. This study concludes that the local wisdom of the Talang Mamak tribe offers a practical and adaptive conservation model, which is relevant to be developed within the framework of co-management of conservation areas. These findings enrich the discourse of political ecology and environmental anthropology by emphasizing the integration between local knowledge systems and state conservation policies.

Keywords : Talang Mamak Tribe; Cosmology; Forest; Conservation

Introduction

The natural resources spread from Sabang to Merauke are not the only assets that Indonesia has. Based on a cultural perspective, there are thousands, of tribes inhabiting the 38 provinces of Indonesia. They are spread across different types of communities, some of which still have close ties to the forest with a subsistence lifestyle. Some are slowly emerging from the shackles of backwardness (Dako et al., 2024). In Riau Province, several indigenous tribes are scattered across various regions, including the Akit, Sakai, Duanu, Talang Mamak, Petalangan, and others. Throughout their history, almost all of them have been dependent on the forest (Sidiq et al., 2021). However, over the past two decades, land conversion, population factors, and plantation development have eroded the forests that have long been the heart of their lives (Haqi et al., 2025).

This study focuses on the Talang Mamak tribe who live in Suit Sadan Hamlet, RT 006 and RT 007, located within the village of Rantau Langsat, Batang Gansal Subdistrict, Indragiri Hulu Regency,

Riau Province. Rantau Langsat Village is one of the Old Malay communities whose lives are strongly connected to nature and is included in the Bukit Tigapuluh National Park (TNBT) area. The life of this community remains relatively isolated geographically, with accessibility to the location highly dependent on traveling down the river, which takes 4 to 5 hours. TNBT was established in 2002 through Ministerial Decree No. 6407/Kpts-II/2002, to protect ecological processes, preserve biodiversity, and support science, education, and sustainable tourism. Based on Regulation of the Minister of Environment and Forestry No. P.76/Menlhk-Setjen/2015, the TNBT area is divided into several management zones (Jogasara, 2021). The latest data from 2021 shows changes in the area of several zones compared to the 2016 data, as shown in Table 1 below:

Table 1. TNBT Zone Classification

Number	Management Zone	Management Zone		Area Change
		2016	2021	
1	Core	55.589,34	55.589,34	0,00
2	Forest	75.924,37	74.730,94	(-) 1.193,43
3	Utilization Other Zones	1.701,88	2.149,23	(+) 447,35
4	Traditional	4.870,49	4.870,49	0,00
5	Rehabilitation	3.254,13	4.000,21	(+) 746,08
6	Special	2.882,79	2.882,79	0,00

The Talang Mamak tribe resides in a Traditional Zone covering 4,870.49 hectares, an area that has remained unchanged. It is in this living space that the forest functions integrally as a food "supermarket," a living pharmacy, a spiritual center, and an archive of collective knowledge that has been passed down from one generation to the next. The subsistence and sustainable conservation practices that this tribe has maintained for hundreds of years are a living testament to their worldview, which views ecology and culture as two inseparable entities. Therefore, this study aims to reveal and analyze the cosmological constructs of the Talang Mamak tribe and how these cosmologies manifest themselves in the actual practices of forest management and protection. This analysis is conducted in the context of the challenges of modernity and the state conservation regime that surrounds their lives.

Based on this premise, it is essential to examine the living conditions and circumstances of the Talang Mamak tribe. This study aims to uncover and analyze the tribe's cosmological framework and investigate how this worldview is actualized in their forest management and protection practices amidst the challenges posed by modernity and state-imposed conservation regimes. The contribution of this research lies in its role as an integrative nexus connecting three often separate academic discourses: political ecology, environmental anthropology, and conservation studies. Focusing specifically on the Talang Mamak community within Bukit Tiga Puluh National Park (TNBT)—a site

where national park designation frequently generates tensions with indigenous peoples—this study serves as a case study to explore how local cosmology can function as an effective model for co-management. In contrast to prior studies that predominantly document local wisdom, this research endeavors to conceptualize cosmology as a systematic and actionable knowledge system.

This study is theoretically grounded in the framework of Traditional Ecological Knowledge as articulated by Fikret Berkes. This theoretical approach offers a lens through which to examine the institutionalization of cosmologically derived knowledge into adaptive resource management strategies, including regulatory norms, customary forest zoning, and spiritual restrictions. By integrating these theoretical perspectives, the analysis extends beyond mere description of beliefs to uncover the social and symbolic processes that underpin the role of such beliefs in ecosystem preservation. The ecological significance of this research is underscored by the status of Bukit Tigapuluh National Park (TNBT) as the primary refuge for biodiversity conservation in Sumatra's lowland areas, where community-driven conservation efforts by the Talang Mamak tribe represent an effective and economically viable approach to sustainability. However, the socio-cultural continuity of this tribe's traditional knowledge faces threats from the pervasive forces of globalization and plantation development, which heighten the imperative for its systematic documentation.

The political dimension of this study corresponds with endeavors to reinforce the recognition and legitimacy of indigenous peoples within the framework of national forestry regulations, as mandated by Constitutional Court Decision No. 35/PUU-X/2012. From a comparative academic perspective, the research by Purba and Mardawani on the Dayak Seberuang community in West Kalimantan highlights a sophisticated arrangement of territorial zoning alongside customary regulations known as "*Adat Tubuh*" and "*Adat Basa*". Concurrently, the investigation conducted by Tresno and colleagues in Minangkabau illustrates that state policies, exemplified by the Hutan Nagari program, may inadvertently undermine customary structures and marginalize indigenous populations if such policies are not properly aligned with established local tenure systems.

Methods

This study employs a descriptive qualitative approach to achieve a thorough and contextually nuanced understanding of the phenomenon under investigation. Key informants were purposefully selected based on specific criteria: 1) affiliation with the Talang Mamak tribe; 2) possession of extensive knowledge regarding Talang Mamak customs; and 3) active involvement in the tribe's daily life practices. Accordingly, traditional elders, community leaders, and conservation practitioners from the Talang Mamak tribe were chosen for interviews. Furthermore, these initial informants recommended additional participants considered relevant, facilitating an organic expansion of the informant network and enabling the exploration of more complex social dynamics.

The data collection process was carried out by combining three primary methods, namely in-depth interviews to capture narratives, perceptions, and local knowledge; participatory observation at the research site to witness firsthand the practices in the field and their social dynamics; and a documentary study of traditional archives and regulations to reinforce historical and factual data. Next, all collected data was analyzed using Miles and Huberman's interactive model, which is dynamic and iterative. The analysis process began with data reduction, which involved simplifying, focusing, and organizing raw data into a more structured form. The next stage is data presentation, where the reduced information is arranged in matrices, charts, or descriptive narratives to facilitate the identification of patterns and relationships. The final stage is drawing conclusions and verification, where initial findings are interpreted in depth and continuously tested for validity through discussions with peers or by returning to the field until solid and accountable conclusions are obtained.

Results and Discussion

The Meaning of Forests for the Talang Mamak Tribe

For the Talang Mamak tribe, the forest is a living narrative that tells of their origins, journey, and identity. The concept of the forest as the Mother of Civilization is a truth that needs no declaration, because it is embodied not in words, but in the rhythm of daily life. Every step taken among the dense trees is like turning the pages of a sacred book written by their ancestors, in which every plant species, river flow, and animal track contains lessons, stories, and laws that govern life. It is within this vast natural classroom that a variety of traditional practices have evolved and been refined over centuries. Shifting cultivation techniques, carried out in strict cycles and long fallow periods, ensure soil regeneration without overexploitation.

Knowledge of the forest pharmacopoeia, encompassing herbs from roots, leaves, and bark, is a science learned not from textbooks, but through experience and observation passed down by word of mouth. A strict set of taboos and spiritual etiquette surrounds every hunting and gathering activity. This sophisticated cultural mechanism prevents over-exploitation and ensures that nature is always allowed to recover. These practices are not merely survival strategies; they are manifestations of a cosmology that sees humans not as rulers of nature, but as one strand in a complex and interconnected web of life. In this cosmology, cutting down unnecessary trees or killing animals indiscriminately is not only unwise, but a sin against the cosmic balance, a denial of the sacred covenant with ancestors and the creator.

Therefore, when the outside world approached their living space with concepts such as conservation areas and Bukit Tiga Puluh National Park (BTP), a fundamental clash of paradigms ensued. For the state and conservation agencies, TNBT was a legally and formally established boundary, an area that required management and protection from threats, which sometimes included

indigenous peoples. However, for the Talang Mamak tribe, the boundary line on the map is a foreign artifact superimposed on a sacred map that has existed in their minds and rituals long before Indonesia's independence. They do not need a status designation to understand the value and urgency of forest protection. The claim that they need to be guided or mentored in conservation is ironic and arrogant, because they are the first teachers of the forest itself. Modern conservation programs often come with manuals and projects, while Talang Mamak-style conservation is embedded in prayers, rituals, myths, and customary laws that govern every interaction with nature. For them, the forest is a mother who has nursed, educated, and protected their souls. A mother does not need to be given status by her children to be recognized; motherhood is an inherent and indisputable truth.

For the Talang Mamak tribe, protecting the forest is equivalent to defending their existential sovereignty. It is a holy war to protect their mother from exploitation and destruction. Any attempt to separate them from the forest or to regulate their interactions with it based on external logic is not only a threat to their livelihoods but also an attack on the core of their civilization. This awareness is the primary driving force behind every decision, from traditional leaders to children learning to recognize animal tracks. They are guardians born from the womb they protect. The legacy they pass on to future generations is not land certificates or material wealth, but a living forest, complete with all the knowledge, spirituality, and wisdom it contains. In every old tree left standing, in every plot of land cleared wisely, and in every prayer offered before taking anything from the forest, there is a deep and enduring philosophy of conservation—a harmony that has been tested by time, which may in fact be the most outstanding teacher for the modern world, which often fails in its conservation efforts.

Utilization and Forest Management Practices by the Talang Mamak Tribe

The Talang Mamak tribe utilizes the forest as a source of food, such as gathering vegetables, hunting wild fowl, fishing in rivers, and collecting pandan leaves for weaving. Their household economy is fundamentally built on the principle of mutualistic symbiosis with nature, where the harvesting of forest resources, both timber and non-timber forest products (NTFPs), is carried out with full awareness and restraint. Daily activities, such as collecting honey, rattan, and game animals for consumption, including wild chickens, are carried out in a highly controlled manner and almost entirely to meet their own needs, rather than for large-scale commercial interests.



(a)



(b)

Figure 1. Utilization of Non-Timber Forest Products (a) Jernang sap for limited sale (b) Rattan for house building materials

In fact, logging is carried out for two primary purposes: as fuel for cooking and as a building material for the houses they will live in. This sustainable pattern of utilization stems from a deep-rooted philosophy of life, namely the generational responsibility to protect the forest. This commitment is further strengthened by guidance from the forest police (Polhut) of Bukit Tiga Puluh National Park. Outside the forest, farming is another pillar of the economy. They grow rice, bananas, durians, and various other short-term crops, with the primary focus being on household consumption. This farming system, both settled and limited shifting, reflects their food self-sufficiency. Any surplus from the fields, if there is any, is sold, and the profits are allocated to supplement needs that cannot be produced independently, such as side dishes or additional rice.

Certain forest commodities, such as kelukup and damar resin, are indeed an additional source of cash, with a significant selling value, but their collection remains within reasonable limits. In carrying out all these economic activities, both in the forest and in the fields, the participation of all family members is commonplace. Husbands, wives, and children who are considered adults work together, dividing tasks to maximize results and efficiency. This flexibility is also evident in the diversification of their livelihoods, such as becoming river fishermen who catch various types of fish, such as catfish, gabus, and wader, as well as growing durian, the fruit of which is sold outside the village when the harvest season arrives, attracting buyers who come directly because of the cheaper prices. Despite being surrounded by abundant natural resources, the biggest challenge faced by the Talang Mamak tribe is limited accessibility, which is a significant obstacle in distributing their farm produce to broader markets. However, this does not dampen their enthusiasm. As a creative and adaptive community, they continue to develop other skills, such as weaving, to create added value and ensure the sustainability of their harmonious life within the forest they protect.

Customary Norms and Ethics of the Talang Mamak Tribe towards the Forest

The Talang Mamak indigenous community has developed a complex system of local wisdom that is in harmony with nature, enabling them to manage their forest, river, and agricultural resources effectively. One of the most prominent practices is the shifting cultivation system. In this system, the pattern of migration and land clearing was not arbitrary, but based on a belief in supernatural forces that also influenced the determination of the right day to start planting. This spiritual belief colored their entire agricultural cycle, making it more than just an economic activity, but also a sacred cultural practice. However, this practice of shifting cultivation is now almost non-existent. This significant change is mainly due to the designation of their residential area as part of a national park.

Forest police officers actively encourage the community to continue farming within the national park area, provided that they do not damage the environment and refrain from relocating their operations. This appeal aims to facilitate a transition to a settled farming system, thereby reducing pressure on the forest due to logging for new land clearance. Although their spatial farming patterns have changed, the community still holds fast to their deep belief in the supernatural forces that govern their farming life. In addition to farming, the Talang Mamak community also meets its protein needs through hunting, which is carried out with caution and sustainability in mind. Hunting, which typically targets animals such as deer or wild boar, is never commercial in nature (Ismarizal et al., 2023).

The hunted animals are only consumed by their own families or shared with relatives, strengthening the community's social bonds. It is worth noting that their hunting methods are very traditional and selective, using only spears. They consistently avoid the use of snares or firearms, a choice that reflects their respect for the balance of nature and prevents overhunting. These hunting activities are often combined with the search for jernang sap, demonstrating efficiency in the use of time and forest resources. The same principle is applied to fishing. They do this traditionally by fishing, using traps, or nets, methods that are non-destructive and allow the fish population in the river to be maintained (Mildawati et al., 2024).

The foundation of all these practices is a set of customary rules governing land and resource management. The Talang Mamak tribe clearly distinguishes between resource ownership: forests are considered common-pool resources, while residential areas and gardens are private property inherited within families. Rivers, on the other hand, are managed based on group ownership. This division ensures that no individual can exploit the forest arbitrarily. Their local wisdom strongly emphasizes sustainability, with a strict avoidance of excessive forest exploitation. This philosophy of living in harmony with nature is reflected in one of the most inspiring practices, which occurs when harvest time arrives (Titisari et al., 2019). The Talang Mamak community deliberately sets aside a portion of their rice harvest, leaving it for animals such as elephants and monkeys, which are often considered pests, to eat. This action is not wasteful, but rather a recognition that humans are part of a larger ecosystem. By sharing the fruits of the earth, they maintain the balance of life and nurture a peaceful

coexistence with all the forest's inhabitants, a rare and precious form of harmony (Agustian & Sutinah, 2019).

Transmission of Local Knowledge of the Talang Mamak Tribe about Forests

The process of passing down local wisdom, environmental ethics, and patterns of forest utilization in the Talang Mamak community is not a formal subject taught in the classroom, but rather a seed that is planted early on, even before a child is born. From pregnancy, a mother takes an active role in preparing her child's future tangibly and sustainably. She will plant annual trees, such as durian, petai, or jengkol, which will grow along with her child's growth and development. These plants are not just trees, but a life savings that can later be harvested to meet the family's needs or exchanged to fulfill other needs, so that children understand from the womb the importance of planning and the symbiotic relationship with nature.

After the children were born, this educational process continues through the oral transmission of values. Mothers, parents, and traditional community leaders recite the advice and wisdom of their ancestors in the form of poetry or moralistic sentences. These messages aim to instill a spirit that upholds the commands and wisdom of the ancestors, shaping the identity and responsibility of the Talang Mamak community. The internalization of these values does not stop at words, but is reinforced by direct experience. Children, especially boys, are often invited to enter the forest from an early age, either to accompany their parents on business in the forest or for specific activities such as gathering firewood. Through these experiences, they not only learn the paths and types of plants, but also feel firsthand the pulse of the forest that is their source of livelihood.

As they grow older and stronger, their role in utilizing the forest becomes more complex and responsible. A boy who is considered capable will begin to engage in tasks that require more expertise, such as climbing trees to pick petai and jengkol fruits, or even helping in the process of collecting forest honey. Each of these activities becomes a stepping stone in understanding the balance of the ecosystem. They learn when the right time to harvest is, which parts of the tree should not be damaged, and how to collect forest products without disturbing their sustainability. Likewise, the use of tools at work is taught to use tools that do not damage or threaten the forest (including trees and rivers). The entire cycle of life, from conception to birth, childhood, and adolescence, becomes a long and gradual learning space, where knowledge is transmitted not as instructions but as a way of life that is integrated into their identity.

Discussion: Traditional Ecological Knowledge in the Talang Mamak Living Space

Traditional Ecological Knowledge (TEK) in Fikret Berkes' thinking is understood as a dynamic framework of knowledge that is accumulated from generation to generation through a process of continuous adaptation (Debbarma, 2022; Haq et al., 2023; Tynsong et al., 2020). Berkes defines TEK as a cumulative body of knowledge, practices, and beliefs that evolve through adaptive processes and are passed down through cultural transmission, concerning the relationships between living beings

(including humans) and their environment (Cruz et al., 2025). This view is not merely a collection of facts or a list of species, but rather a complete knowledge system that encompasses spiritual, ethical, and social aspects of a deep relationship with nature (Singleton et al., 2023; Mohd Salim et al., 2023)

The core of Berkes' concept of TEK lies in its holistic, contextual, and experience-based nature. This knowledge arises from direct and long-term interaction between communities and the specific environments in which they live, making it highly sensitive to changes in the ecosystem (Mikkonen, 2025). Unlike Western scientific approaches, which are often reductionist and detached from social values, TEK integrates ecological understanding with cultural systems, beliefs, and practices of sustainable resource management (VijayKumar, 2019).

The concept of Traditional Ecological Knowledge (TEK) developed by Fikret Berkes finds its manifestation and operationalization in the lives of the Talang Mamak tribe in Bukit Tiga Puluh National Park (TNBT). For them, the forest is not merely a resource to be exploited, but a living entity that is the Mother of Civilization and the heart of their identity, spirituality, and survival. This cosmological belief serves as the ethical foundation for all their natural resource management practices, which operate as a sophisticated environmental management system. This knowledge system is institutionalized into a strict set of customary rules, such as a clear distinction between the forest as communal property, gardens as family property, and rivers as group property.

This division prevents excessive exploitation by individuals and ensures sustainability (Lizarazo-Rodriguez et al., 2025). Practices such as farming with long fallow periods, selective hunting using only spears, fishing with traditional methods, and voluntarily setting aside part of the harvest for animals like elephants and monkeys are all cultural mechanisms designed to maintain ecological balance. In addition, TEK is transmitted through a long and comprehensive learning process, starting in the womb with mothers planting trees as a life-saving measure for their children (Jakes, 2024), to the direct experience of children entering the forest to learn every trace, sound, and wisdom stored within it (Sinthumule, 2023).

The uniqueness of Talang Mamak's position becomes particularly striking when compared to findings from various journals. Research by Alves et al. (2022) in the Brazilian Amazon reveals that the traditional knowledge of forest specialists regarding ethnospecies plants remains resilient despite the threats posed by deforestation and mining. These findings align with the resilience of Talang Mamak's TEK, but the context is different. Talang Mamak not only survives but actively implements a proactive management system in a national conservation area, creating a unique dynamic. They are not just a community living near the forest, but a recognized (albeit tense) life within a National Park. This creates a real-life laboratory for how cosmological knowledge systems interact, and sometimes clash, with state knowledge systems represented by the TNBT conservation regime. While Alves' study emphasizes the knowledge component (plant species), the Talang Mamak TEK studied highlights the aspects of management practices and social institutions (customary rules, zoning) that

are at the core of the Berkes framework.

A comparison with other indigenous communities in Indonesia also reveals distinctive nuances. A study by Mahyuni & Topan (2023) on the Dayak Kotabaru in Kalimantan Click or tap here to enter text.reveals a highly structured model of forest protection based on customary law, including Palinuhan (protection of honey trees), Palailan (protection of rivers), and Bahuma (a shifting cultivation system). Although both have detailed rules, customary sanctions for violators in Dayak Kotabaru often take the form of material fines, such as Tahil (melawin plates). In contrast, for Talang Mamak, sanctions are more socio-spiritual in nature, involving shame and fear of disturbing the cosmic balance.

In addition, the Talang Mamak's strong cosmological roots in determining the pattern of shifting cultivation (before it was stopped) and determining planting days based on supernatural powers indicate a more prominent spiritual layer. Meanwhile, Witasari's research on communities in the former Mangkunegaran region of Java shows how local wisdom is preserved through rituals such as sedekah bumi (earth alms) and myths deliberately constructed to protect the forest (Witasari, 2022). The Talang Mamak shares the same spirit in terms of transmitting values through rituals and beliefs. However, the context in which they face these pressures is different, not from feudal rulers or Perhutani, but from their status as a national park that restricts their traditional movement. Like the Inner Baduy studied by Permana (2025), the Talang Mamak also have a high degree of determination in upholding the rules of their ancestors. However, while the Inner Baduy practice strict isolation from modernity, the Talang Mamak demonstrate a unique strategy of adaptation. They accepted the TNBT's request to cease moving from one field to another. However, at the same time, they persistently maintained the core of their cosmology and supernatural beliefs in their settled farming practices. This demonstrates the dynamic and adaptive nature of TEK as emphasized by Berkes. It is not something static, but capable of changing in its practice without losing its spirit and fundamental principles (Casi et al., 2021).

The study of the Talang Mamak not only confirms Berkes' theory but also enriches the discourse on TEK by presenting a complex and dynamic case. Their uniqueness lies in their ability to maintain a coherent and operational cosmological knowledge system within a landscape whose status as a national conservation area often marginalizes indigenous peoples. The tension between state authority and indigenous autonomy, as well as their adaptive strategies in responding to external pressures without abandoning their cultural identity, make Talang Mamak a concrete example of how TEK is not a relic of the past, but a relevant and resilient living system that offers a profound perspective on the harmonization of humans and nature amid waves of modernity and conservation policies that are often top-down in nature (Abdullah & Khan, 2023).

Conclusion

The findings indicate that the Talang Mamak tribe perceives the forest as a cosmological entity intrinsically linked to their identity and survival. This cosmology extends beyond a theoretical framework to manifest in tangible practices, including forest zoning, customary regulations, and sustainable resource utilization methods. Their ability to sustain forest ecosystems despite the challenges posed by modernization and state regulatory frameworks underscores the robustness of indigenous knowledge systems grounded in spiritual values and ecological insights. This study underscores the critical need to acknowledge and incorporate indigenous knowledge within national conservation policies, especially in the context of co-management arrangements in protected areas. Future research should focus on developing institutional mechanisms that mediate the interests of both the state and indigenous communities, as well as conducting comparative analyses with other indigenous groups to enhance forest management models rooted in local customary wisdom.

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