

PROTECTION OF ECOLOGICAL KNOWLEDGE ON THE INDIGENOUS FORESTS OF THE YEI TRIBE FROM EXPLOITATION

PROTEÇÃO DO CONHECIMENTO ECOLÓGICO SOBRE AS FLORESTAS INDÍGENAS DA TRIBO YEI CONTRA A EXPLORAÇÃO

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Abstract

Papua has the largest forest cover in Indonesia, home to a wide variety of plants and animals as well as a source of livelihood for indigenous peoples. These forests are threatened with exploitation or even destruction due to the ecological impact of degradation and deforestation under the pretext of food estates. However, the Yei tribe in South Papua, as the indigenous community directly affected, firmly rejects this agenda on their customary forests. The focus of this research is to explore the ecological knowledge of the Yei indigenous community in protecting their customary forests. This research is socio-legal research using an ethnographic study approach. The results show that the Yei indigenous community is highly dependent on their forest. Apart from being a symbol of identity and animistic/spiritual connection between humans, nature, and ancestors, the customary forest is also a source of livelihood, which they represent as mama. This ecological knowledge is also considered to contain a cosmological cycle and sustainable management of customary forests from generation to generation. Today, the Yei community has begun to stage traditional demonstrations to reject the government's food

Resumo

Papua possui a maior cobertura florestal da Indonésia, abrigando uma grande variedade de plantas e animais, além de ser fonte de subsistência para os povos indígenas. Essas florestas estão ameaçadas pela exploração ou mesmo pela destruição devido ao impacto ecológico da degradação e do desmatamento sob o pretexto de propriedades agrícolas. No entanto, a tribo Yei, no sul de Papua, como comunidade indígena diretamente afetada, rejeita veementemente essa agenda em suas florestas tradicionais. O foco desta pesquisa é explorar o conhecimento ecológico da comunidade indígena Yei na proteção de suas florestas tradicionais. Esta pesquisa é uma pesquisa sociojurídica que utiliza uma abordagem de estudo etnográfico. Os resultados mostram que a comunidade indígena Yei é altamente dependente de sua floresta. Além de ser um símbolo de identidade e conexão animista/espiritual entre os seres humanos, a natureza e os ancestrais, a floresta tradicional também é uma fonte de subsistência, que eles representam como mama. Considera-se também que este conhecimento ecológico contém um ciclo cosmológico e uma gestão sustentável das florestas tradicionais de geração em geração.



estate programme, which threatens the ecology of their customary forests, because if the forests disappear, their identity will also disappear. Moreover, state policy should be directed towards protecting their customary forests in accordance with the mandate of the constitution, the special autonomy system of government, the promotion of culture, the regulation of communal intellectual property and customary law, and not the other way around.

Keywords: Indigenous. Ecological. Knowledge. Forests. Food Estate. Yei Tribe.

Atualmente, a comunidade Yei começou a organizar manifestações tradicionais para rejeitar o programa de exploração agrícola do governo, que ameaça a ecologia das suas florestas tradicionais, porque se as florestas desaparecerem, a sua identidade também desaparecerá. Além disso, a política estatal deve ser orientada para a proteção das suas florestas tradicionais, em conformidade com o mandato da Constituição, o sistema especial de autonomia do governo, a promoção da cultura, a regulamentação da propriedade intelectual comunitária e o direito consuetudinário, e não o contrário.

Palavras-chave: *Indígenas. Ecológico. Conhecimento. Florestas. Propriedade Agrícola. Tribo Yei.*

1 INTRODUCTION

Indonesia is not only blessed with abundant mineral resources, but also cultural diversity and biological diversity (Iskandar, 2017). One source of these resources and diversity is forests. Forests can be defined as natural ecosystems dominated by trees and plants. Indigenous communities (indigenous peoples) are highly dependent on forests. Therefore, forests are a manifestation of life that must be protected and preserved.

Although historical records show a strong harmonious relationship between humans and forests, ironically, forests are increasingly threatened by various forms of human exploitation. The impact of forest exploitation is evident in a report by the Geospatial Information Agency, which states that Indonesia's forest area in 2023 will only reach 102.53 million hectares (FWI, 2024). This forest cover has decreased by approximately 1.33 million hectares, or 0.7% compared to 2018 (Naurah, 2024). This reduction in forest area has occurred across all of Indonesia's major islands. Indonesia's forests, considered the "lungs of the world", have been classified as having the highest rate of deforestation in the world (GFW, 2024).

Papua Island is known to have the largest forest area nationally, with a total of 33.12 million hectares, equivalent to 32.2% of Indonesia's total forest cover (Nahriyah, 2024), (Sudiro & Suhartono, 2024). Papua's forests are predicted to experience a decline

due to the massive degradation and deforestation that are the main problems facing Papua's forests.

Greenpeace Indonesia noted that between 2001 and 2023, Papua's forests experienced deforestation covering an area of 722,256.2 hectares, leaving 84,594,197.1 hectares of forest remaining. The province with the most affected forests is South Papua Province. This province experienced the greatest loss of forest, covering an area of 196,650 hectares, and now only has 6,937,148.4 million hectares remaining. This figure has decreased by 3% and is predicted to continue to decline to 12% in the following year (Asra, 2024).

What is the cause of the decline in forest area in South Papua? This can be linked to the "National Strategic Project (PSN)" agenda, such as the *food estate* programme currently underway there. This does not include plans for plantations, the construction of sugar and bioethanol factories, biomass power plants, and road infrastructure (Solapari *et al.*, 2024). This is the latest programme, but this situation is not the first time it has been experienced by South Papua. The indigenous peoples of South Papua have had other painful experiences regarding their customary forests. In 2010, through the launch of the "*Merauke Integrated Food and Energy Estate (MIFEE)*" programme, the condition of the customary forests of Southern Papua was damaged by rice farming and oil palm plantation activities (Ramadayanti, 2020).

The state policy on the 2 million hectare *food estate* programme in Merauke, South Papua, currently aims to address the food crisis. However, the Indonesian government's efforts to utilise the forest have violated the traditional rights of local indigenous peoples, which have been recognised by the Indonesian Constitutional Court (MKRI) in its ruling No. 35/PUU-X/2012, which states that customary forests are forests located in customary areas and are no longer state forests, thus automatically granting management rights to indigenous peoples regarding the management of these forests (Farina *et al.*, 2024).

The court's recognition of customary forests and their management, taking into account the threat of exploitation of customary forests, means that it is only fitting that their existence should be protected and preserved. One way to do this is by protecting the ecological knowledge of local indigenous communities. Law No. 5 of 2017 on the Promotion of Culture stipulates that traditional knowledge is part of the objects of cultural promotion. Thus, traditional knowledge here includes knowledge and behavioural

customs related to nature and the universe (ecological knowledge). The loss of forests means the extinction of the ecological knowledge of communities.

Traditional knowledge (in this case, ecological knowledge) refers to knowledge or practices passed down from one generation to the next. There are various types of ecological knowledge, including knowledge about seasonal calendars, taboo zones, sago harvesting techniques, land clearing rules, and species protection rituals, which are practices that have been passed down from generation to generation in order to preserve biodiversity, local food security, culture, and social cohesion.

This kind of knowledge must be preserved, because once customary forests are transferred, all ecological knowledge and the identity of local indigenous communities will be lost. One of the indigenous communities in Merauke, South Papua, that has been affected by the *food estate* programme is the Yei tribe. The Yei indigenous community's protection, management and use of their customary forests has been guided by traditional customs and practices that have been in place for centuries and passed down from generation to generation in accordance with the rules established by the indigenous community itself (Devrayno, 2019).

We still find in the field how the Yei tribe in Merauke, South Papua, continues to reject the deforestation agenda over their customary rights or customary forests (Purwanda *et al.*, n.d.). The vast and flat Yei forest is not empty land for them, because within the forest there is a wealth of traditional knowledge about land use, conservation, and sustainable resource utilisation. This article aims to observe the ecological practices that still exist in the Yei indigenous community, as part of efforts to obtain legal protection and state recognition through the inventory of Communal Intellectual Property in the form of traditional ecological knowledge.

2 RESEARCH METHODS

In conducting this research, *socio-legal* research was used with an ethnographic approach and various techniques such as observation, interviews with various key informants, and secondary data searches through literature studies and documents related to the local indigenous community. Observations were made on various occasions, especially during the performance of various rituals. The five senses were used to observe

the various activities carried out as carefully as possible. In conducting interviews, the researchers used semi-formal interviews (*semistandardised interviews*), in which various questions were asked to informants in no particular order but still directed towards the intended topic (Komariah & Satori, 2013). Both methods were supplemented with secondary literature that was useful for confirming the primary data found, such as comparative material, both with earlier traditions and various other traditions that are still within the scope of Melanesian culture.

3 RESULTS AND DISCUSSION

3.1 The Yei tribe's ecological knowledge practices in protecting customary forests

Discussing ecological knowledge of forests cannot be separated from the situation of the community and their complete understanding as part of their traditional knowledge. For centuries, the people of South Papua have depended on their natural environment, especially their customary forests. The forest is a cultural concept for the people of South Papua that describes a deep connection. They believe and trust that the plants and animals in the forest are their “family” or “ancestors” who refer to *their clan* identity (Raho, 2019). Each clan of the indigenous people of South Papua has a special relationship with certain species, which are considered “grandparents” (*amai*) or “siblings” (*namek*) or other terms referred to as *totem* (Gamu & Pranyoto, 2023). Destroying the forest is like killing one's own “family”. The clan symbol worn by a person is not just a label, but something essential in nature. The forest is not just a physical landscape; more than that, the forest is everything that has provided for their needs. In addition, the forest is not only a source of livelihood, but also a cultural identity and a cosmological space between humans, nature, and ancestral spirits (*dema*).

Perhaps, not many people are familiar with the Yei tribe compared to the Marind (Marind-Anim) tribe in Merauke, South Papua. In fact, literature based on the experiences of the Yei tribe is still very limited. The available literature that is often used to describe this tribe is based on the pre-independence period, the Dutch colonial era (Duff-Cooper, 1983). Meanwhile, post-colonial literature is still very rare. It is speculated that the

availability of pre-independence literature is due to the archiving efforts of missionaries (Muntaza, 2016).

Nevertheless, the growth of Yei literature during the Dutch colonial period cannot be overlooked, as it was part of an ongoing effort to investigate ethnic characteristics and traditional knowledge that continues to this day. So far, post-colonial literature related to the practices of the Yei indigenous community has come from the indigenous community itself, supported by environmental activists, against the backdrop of the Yei indigenous community's rejection of the recent news regarding the *food estate* agenda that will take over their customary forests (Simanjuntak *et al.*, 2025).

The indigenous Yei tribe (*Yei Nan* or Orang Yei), often referred to as *Yei l'Man'*, meaning Mother to the Orang Yei (BRWA, 2025), is a community that currently inhabits the border region of Merauke, South Papua with Papua New Guinea (PNG). It consists of six villages, namely Poo Village, Erambu Village, Toray Village, Kweel Village, Bupul Village, and Tanas Village. Previous studies have identified the Yei tribe as a sub-tribe of the Marind tribe (Muntaza, 2016). However, culturally they are very different from the Marind tribe (Duff-Cooper, 1983), (Pegan, 2017), especially in terms of language. This is because the Yei language is very close to the Yam or Marehead-Maros languages spoken in Papua New Guinea, compared to Marind (Palmer, 2017), which is so dominant in Merauke.

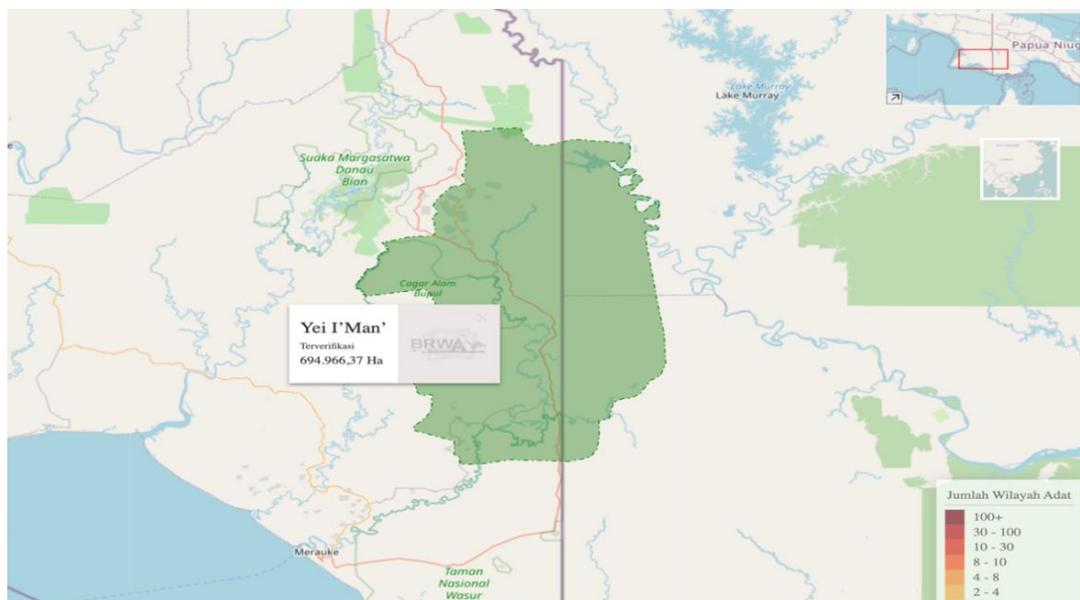
The early history of the Yei tribe's ancestors is believed to have originated in the east, specifically in Papua New Guinea around the Fly River, which gradually moved westward to what is now Indonesia and formed new settlements along the Maro River in Merauke. As the Yei tribe migrated, the Yei customary forest area expanded. According to the Customary Territory Registration Agency (BRWA), the total verified area of the Yei customary forest is 694,966.37 hectares (BRWA, 2025). Interestingly, this area extends beyond the territory of Indonesia into the territory of PNG, meaning that most of the Yei forest is located within Indonesia, covering an area of 445,255.55 hectares, equivalent to 64%, while the rest is located in PNG, covering an area of 249,710.82 hectares, equivalent to 36%. The eastern part of the Yei region borders the customary territory of the Boazi tribe (PNG) and natural swamps, the western part borders the customary territory of the Marind Kumb tribe and natural forests, the southern part borders the customary territory of the Marind tribe and the customary territory of the

Kanum tribe, and the northern part borders the customary territory of the Marind Mbiyan Anim tribe until it meets the Fly River in PNG.

Geographically, the Yei region is low-lying land covered with forests, savannahs and swamps. The Yei forest area is divided among each *clan*, which means that ownership of the Yei forest is still based on inclusive communal rights. Communal rights are determined based on clan ownership. The Yei people do not recognise individual ownership, which tends to be exclusive and absolute.

Figure 1

Map of the Yei Tribe's Customary Territory



Communal ownership rights over clan land are referred to in their language as *Ywallel Kar*, whereby each clan has a *totem*. In general, a *totem* is a figure that refers to an element of nature in the form of plants or animals (Baal, 1987) that is considered to have a spiritual connection, ancestor, protector, or symbol of kinship for the *clan* group so that each clan that has a *totem* in the form of plants or animals must be preserved/protected in the *Ywallel Kar* area.

According to Benediktus, forests are a reflection of themselves (Benediktus, 2025). If forests are destroyed, it is the same as destroying themselves. This view is in line with Ter Haar's description that the deep connection between humans and forests in the minds of indigenous peoples is considered a legal relationship (*rechtbetrekking*),

which defines the relationship between humans and forests in a holistic and integral manner (Lilik Mulyadi, 2022). The same thing was also mentioned in a conversation with Yosep Kalujai, a Yei leader, who said that almost all aspects of Yei life, from birth to marriage to death, are closely related to cultural and ecological values as a reciprocal relationship (Yosep, 2025).

This is one of many ecological beliefs still held by the indigenous people of Yei. At the very least, this relationship can be illustrated by the concept of *totems*, which not only serve as symbols of the animistic/spiritual relationship between the Yei people and nature and their ancestors, but also contain moral and ecological boundaries, especially in the use of natural resources, which is oriented towards a balance between livelihood needs and sustainable nature conservation. In addition to *totems*, there is other Yei ecological knowledge regarding the importance of forests to them. The following are other forms that we were able to find.

3.1.1 Rituals and life cycles

The Yei tribe views human life as part of a cosmological cycle, beginning with birth, life, death, and return to the ancestors. This cycle never stands alone, but is always connected to the forest and ancestral spirituality. The rituals that accompany each stage of life serve as a social mechanism for maintaining the balance between humans and nature and the spiritual world (Aptasari *et al.*, 2024). To this day, the processes of birth, life (marriage) and death among the Yei people cannot be separated from the forest as the centre of their lives. This is illustrated more clearly in Table 1 below.

Table 1

Rituals and Life Cycle of the Yei Indigenous People

Rituals and Life Cycle	Description
Birth	The forest is a birthing ground. Pregnant women are taken to the forest with a village midwife for 3-4 days, from pre-delivery to postpartum. The postpartum recovery process uses traditional (natural) medicines taken directly from the forest. Even on the day of birth, the baby's father is prohibited from engaging in any outdoor activities, especially hunting or gathering in the forest

Marriage	Every man who wishes to marry must first clear forest land for cultivation as a source of livelihood after marriage. Meanwhile, women are granted rights to manage the forest.
Death	Hunting or gathering in the forest is not permitted for a certain period of time, as it is believed to bring misfortune or disaster. This is because it is believed that the spirits of the deceased still reside in the forest.
<i>Yamudap</i>	The leaves of the plant are pounded and then applied to the wound

Sources: Authors, 2025 (edited).

The rituals and life cycles of the Yei people are mechanisms for maintaining cosmological balance. There is a view that does not see themselves as rulers of the forest but rather as part of the forest, even in a more extreme sense: dominated by the forest (Melliana & Wauran, 2023). For this reason, the survival of the Yei people is highly dependent on their knowledge of reading the signs of nature and following existing cosmological rules. According to Yosep Kalujai, when entering the forest to hunt/gather or for other activities, it must be preceded by certain traditional rituals such as offering cigarettes, betel nuts, and/or siri and using the Yei language (local language) to pray for safety and success during hunting or gathering (Yosep, 2025).

3.1.2 Forest management

The preservation of customary forests is the aspiration of indigenous peoples, because customary forests are forests managed according to customary laws and traditional knowledge passed down from generation to generation, in order to protect the forests from damage to their functions (Ritonga *et al.*, 2014). This also applies to the Yei tribe, whose activities utilising the forest have been going on for a long time and have been passed down from generation to generation. Forests have a special meaning for those who are highly dependent on them. This dependence has given rise to various forms of forest management. In general, three forms of forest management practised by the Yei community can be identified. For details, see Table 2.

Table 2*Yei Indigenous Forest Management Area*

Rituals and Life Cycle	Description
<i>Yeremsow Kar/Yeremcow Kar,</i>	A livelihood area located around the Maro River from the west to several kilometers to the east. This area is used as a source of food, timber, clothing, including traditional medicines, and a source of economic income for the Yei people.
<i>Kabekar/Hargekar,</i>	Protected forest, reserve, and limited use areas located east (far) of the Maro River to the Flay River in PNG. This area is only occasionally or periodically utilized because it has several natural landscapes, namely jungle/primary/natural forests, swamps (permanent and seasonal), valleys, and ecosystems inhabited by birds of paradise, cassowaries, kangaroos and the like. Management of these forests generally only involves protection activities without direct utilization.
<i>Wonkorar,</i>	The settlement area of the Yei tribe is spread across six villages located along the banks of the Maro River.

Sources: Authors, 2025 (edited).

Forests as communal property of clans associated with totemism provide strong and valuable motivation to protect forests sustainably rather than exploiting them indiscriminately (Resubun, 2017). Each clan has the right to use the forest as a source of livelihood, whether it be fishing in the swamps, hunting animals, gardening and cultivating traditional local foods, or gathering traditional medicines. This includes the clothing of the Yei tribe, which is made entirely from materials sourced from the forest and can be used during traditional rituals. This also applies when the Yei tribe builds traditional houses. They will choose certain types of wood from the forest, rattan ropes for tying, sago leaves for roofing, sago *husks* for walls, and *nibung* tree bark for flooring. According to Egenius, in an interview, the Yei people can live without palm oil and sugar cane, but they cannot live without their land and forests (Egenius, 2025).

Figure 2*Traditional Demonstration*

The Yei people also pay close attention to the forest, which is an important place for them because it is associated with myths and the journeys of their ancestors (*folklore*). To this day, the Yei tribe believes that the customary forest contains many sacred places that must be preserved and protected, located throughout almost the entire Yei customary forest. These places are marked as sacred sites, natural water sources (natural wells), old villages, and places of ancestral mythology, especially those located in the *Yeremsow Kar* and *Kabekar* forests. That is why when the customary forests and territories of the Yei tribe are threatened by degradation and deforestation, customary rituals become a way of voicing their rejection, for example through dances or customary demonstrations.

According to Egenius, during the traditional demonstration, the Yei community gathered in the *Wonkorar* forest area where traditional houses are located, wearing traditional clothing from the forest and carrying medicines from the forest as a symbol of the Yei indigenous community's rejection and resistance. This action was taken to protect the sustainability of the Yei forest.

3.1.3 Customary law

Long before the Dutch colonial period, forest management was regulated by the customary laws of each indigenous community (Dahlan, 2018). Customary law was first introduced by Snouck Hurgronje and adopted by C. van Vallenhoven as a technical legal term (Nurtresna *et al.*, 2024). Furthermore, customary law, (Rado & Alputila, 2022), as referred to by Friedman constitutes the substance of law within indigenous communities (existing and being enforced to regulate the social order within these communities. In Yei society, customary law is still preserved and practised today, although the sanctions have been adjusted in line with the dynamics and developments of the times. Of the many customary laws that regulate the way of life of the Yei people, there are several customary laws in the form of prohibitions, especially in forest management, as described in the following table.

Table 3

Customary Law Prohibitions Related to the Customary Forests of the Yei Indigenous Community

No.	Customary Law Prohibitions related to Customary Forests
1	Prohibition on owning/selling clan forests/land to people outside the clan; use is only permitted with the permission/knowledge of the owner clan;
2	Prohibition on searching for or taking food/game in the territory (forest/river/swamp) of another clan without permission;
3	Prohibition on crossing another clan's forest/land without permission;
4	Prohibition on entering sacred forests/places of worship belonging to other clans;
5	Prohibition on taking/hunting aquatic or terrestrial animals, especially animals that are <i>totems</i> of clans in the forest;
6	Prohibition on cutting down trees, especially trees that are <i>totems</i> of clans in the forest;
7	Prohibition on the excessive sale of forest products.

Sources: Authors, 2025 (edited).

These prohibitions have existed since ancient times, so no one can abolish any of these customary laws. These prohibitions enable the community to preserve and protect the forest for future generations. Violations or disputes related to the forest are resolved through the Yei customary institution, either through customary deliberation or

consensus. For example, in the past, those who hunted without permission in other clans' forests could be sentenced to death. The current punishment for violators is the confiscation of some or all of their hunted game, while those who cut down sago trees are required to plant new ones. Similarly, those who cross another clan's forest without permission may be fined or required to provide "wati" plants, which are traditional (local) plants used as a traditional drink by the Yei people (Ibo & Arifa, 2021).

Customary sanctions or fines apply in accordance with the prohibitions imposed on offenders. As stated by Benediktus, it is not uncommon for those who, without the permission of the clan and through customary mechanisms, sell their forests or customary lands to parties outside the clan to suffer disaster or misfortune (death) as part of "customary law" that is difficult to comprehend with human reasoning (Benediktus, 2025). It can be said that every custom in society, in which every action is carried out in accordance with the customary institutions that exist in that society itself.

3.2 Protection of Yei tribe's indigenous forest ecological knowledge from exploitation

Customary forests are forests located within the territories of indigenous communities in Indonesia. Traditionally, forests play an important role in the lives of indigenous communities, including the Yei community. For them, the forest is their "mother" who gives them life and provides everything they need. Constitutionally, Article 18B paragraph (2) of the 1945 Constitution stipulates that the state has an obligation to recognise, respect and protect indigenous peoples and their rights. This is reinforced by Constitutional Court Decision No. 35/PUU-X/2012, which states that customary forests are the rights of (customary law communities) and no longer have the status of state forests (Rumbekwan *et al.*, 2020).

Long before the Constitutional Court ruling, Law No. 21 of 2001 on Special Autonomy (Papua Special Autonomy Law) had recognised the existence of indigenous Papuan communities. Article 1 letter r of the Papua Special Autonomy Law defines customary law communities as indigenous Papuan communities who, since birth, have lived in a certain area and are bound by and subject to certain customary laws with a high sense of solidarity among their members. Furthermore, Article 38 paragraph (2) of the

Papua Special Autonomy Law states that economic activities in Papua that utilise natural resources must be carried out with respect for the rights of indigenous peoples and the principles of environmental conservation and sustainable development.

In addition to matters relating to indigenous peoples, indigenous peoples have customary rights in the protection and management of their forests, as stated in Article 1(s) of the Papua Special Autonomy Law, which states that “Customary rights are communal rights held by certain indigenous peoples over a specific area that constitutes the living environment of their citizens, which includes the right to utilise the land, forests and water and their contents in accordance with the laws and regulations”. Regulations concerning the protection of forests and natural resources in indigenous communities in Papua are then regulated technically through various regional products within the framework of special autonomy, which essentially explicitly determines the rights of indigenous peoples to manage and utilise their customary forests based on the traditional knowledge of the local community. Referring to the above provisions, indigenous peoples are the sovereign holders of the management and utilisation of forests to meet their livelihood needs. The forests on Papuan land are the property of indigenous peoples. They are part of their basic and constitutional rights, which must be recognised and respected by all parties, including the state. The state is responsible for respecting, protecting and fulfilling the rights of the indigenous peoples of Papua, including the Yei tribe, without exception. These constitutional provisions include forests, food sovereignty rights, and traditional social and cultural rights.

In the context of cultural advancement, the state is also obliged to protect traditional knowledge regarding the ecological knowledge of the Yei indigenous community, as stipulated in Law Number 5 of 2017 concerning Cultural Advancement, the explanation of Article 5 letter e, which stipulates that traditional knowledge is all ideas and concepts within a community that contain local values as a result of real experiences in interacting with the environment, developed continuously and passed down to the next generation. Traditional knowledge includes, among other things, knowledge and behavioural habits regarding nature and the universe. Based on this provision, the government is obliged to protect traditional knowledge (Widyanti, 2020).

Knowledge and behavioural practices regarding nature and the universe are forms of local knowledge or wisdom that encompass understanding, skills, and practices passed

down from generation to generation by a community regarding disaster mitigation, ecological conservation, and spiritual or philosophical relationships with nature or forests as traditional culture and must be protected, including in Government Regulation No. 56 of 2022 concerning Communal Intellectual Property, which explicitly states that ecological knowledge is a type of traditional knowledge that must be recognised and protected by the state. As previously identified and explored in relation to the traditional ecological knowledge of the indigenous Yei tribe. At least several types of ecological knowledge methods or practices are documented, particularly in the Communal Intellectual Property database (<https://kikomunal-indonesia.dgip.go.id/home/explore/traditional>) . Further details are provided in Table 4 below:

Table 4

Types of Ecological Knowledge about the Yei Customary Forest

Type of Ecological Knowledge or Customary Forest	Description
Boundaries of the Yei Customary Forest Area	There is protection for the verified area of the Yei customary forest, covering 694,966.37 hectares, with defined boundaries.
Customary rituals	The community always performs traditional rituals in the form of demonstrations wearing traditional clothing, including traditional rituals for birth, marriage and death.
Forest management and customary sanctions	The Yei community divides the forest into areas for livelihoods, protected forests, and settlement areas, including the application of customary sanctions in the event of violations, as an effort to protect and improve the sustainability of the Yei tribe's forests.

Sources: Authors, 2025 (edited).

This forest protection is a form of ecological knowledge that has been passed down from generation to generation by the Yei community. In fact, given the importance of the existence of Yei and all its traditional knowledge in 2024, the Regent of Merauke Regency issued Decree Number 100.3.3.2/1413/Year 2024 concerning the Recognition, Protection, Respect for the Rights of the Yei Indigenous People and their Customary Territory in Merauke Regency, which, among other things, legitimises the history of origin, *clans*, customary institutional structures and maps of the Yei customary territory (customary forest) as legal recognition and protection by the state of the existence of indigenous peoples and their traditional rights.

Unfortunately, in recent years, while the Yei indigenous community has been marginalised, their customary forests have been exploited under the guise of *food estates*. The forests have been taken away from the Yei people, who are the rightful owners of the land. The Yei tribe is one of the indigenous groups affected by the *food estate* policy covering more than 300,000 hectares of Yei forest (Hadad & Indrarto, 2025). Large-scale deforestation has resulted in water sources drying up or disappearing altogether and waste polluting their only source of water and food. Not only that, the environmental damage caused by the *food estate* project could also destroy their spiritual relationship with nature. They have lost the space to perform their traditional rituals and their identity. Australian anthropologist Chao (Chao, 2021) states that deforestation and the expansion of oil palm plantations under the *food estate* programme are the causes of future ecological disasters.

The Yei community's strong concern for protecting their forests is evident in their efforts to reject *the food estate*, which the government has justified on the grounds of food and energy security, while the local food sources of the Yei people are being lost. The Yei community rejects *the food estate*, believing that the forests will be eroded if this agenda goes ahead, with concerns that exploitation will spread to include oil palm plantations. The forests will be destroyed, and the distinctive characteristics of the Yei people as an indigenous community living in forests and swamps will fade. It is feared that *the food estate* will weaken the Yei community's relationship with their forests. They will lose their connection with their forests, their source of food, and their traditional ritual spaces.

4 CONCLUSION

The indigenous Yei community, as owners of their customary forests and all their ecological knowledge, cannot be separated from their way of life. In line with their development, the Yei community has protected and managed the forest for generations, in accordance with their beliefs. The importance of the forest lies not only in fulfilling the symbol of cultural identity and animistic/spiritual relationship between the Yei people and nature and their ancestors, but also in providing food, economic and other resources. If the customary forest is destroyed, the Yei people will lose all their sources of livelihood, as they perceive the forest as part of themselves.

The ecological knowledge of the Yei tribe's customary forests, as reflected in the forest area map, meets the qualifications for demonstrating historical ownership of traditional knowledge in line with regulations in the legal framework for the Promotion of Culture and Communal Intellectual Property, which explicitly stipulates the protection of knowledge and behavioural practices relating to nature and the universe (ecological knowledge). Furthermore, the importance of protecting and preserving customary forests as part of the ecological knowledge of the Yei indigenous community has long been constitutionally affirmed and through the special autonomy government system as the customary rights of the Indigenous Papuan People (OAP) and not state forests that can be exploited indiscriminately, which could result in ecological disasters for future generations.

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Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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