

The Challenges of Preserving the Kasepuhan Karang Indigenous Forest and Its Strategic Role in Addressing Climate Change

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Abstract

Kasepuhan Karang is one of the Sundanese indigenous communities located in the Lebak Regency, Banten Province, Indonesia. This community is part of a network of kasepuhan around the Gunung Halimun Salak National Park (TNGHS). Their lives are closely related to environmental sustainability, especially in the management of customary forests. The social and cultural systems of the Kasepuhan Karang community reflect harmony between humans and nature. These values are reflected in customary traditions such as ngaseuk (planting), customary spatial planning that divides the area into restricted forests, production forests, and agricultural land, as well as tatali paranti (customary rules) that serve as guidelines for maintaining ecosystem sustainability. This study focuses on the importance of the Kasepuhan Karang Customary Forest in the context of environmental conservation and climate change mitigation. In addition, this study will identify the main challenges faced in preserving customary forests, including policy aspects, cross-sectoral understanding, and external pressures that threaten their sustainability. By prioritizing the perspective of indigenous peoples as the primary managers of the forest, this study aims to provide an overview of how synergy between local traditions and modern policies can be realized to support sustainable development.

Keywords: Customary Forest; Climate Change; Kasepuhan Karang; Challenge; Strategic Role.

A. Introduction

Climate change has become one of the greatest challenges facing humanity in the 21st century.¹ Increased concentrations of greenhouse gases in the atmosphere, largely caused by human activities such as deforestation, burning fossil fuels, and land use change,² have resulted in global warming that threatens the balance of ecosystems and human life. The impacts of climate change are extensive and cover various aspects, ranging from extreme weather to threats to biodiversity. According to reports from various international

¹ Nida Humaida and others, *Dasar-Dasar Pengetahuan Lingkungan Berbasis Perubahan Iklim Global* (UrbanGreen Central Media, 2024).

² Sukarno Aburaera, Muhadar, and Maskun, *Filsafat Hukum: Teori Dan Praktik, Sustainability* (Switzerland), vol. 11 (Jakarta: Kencana, 2019).

institutions, including the World Meteorological Organization (WMO) and the Intergovernmental Panel on Climate Change (IPCC), 2023 was recorded as the hottest year on record.

Indonesia has demonstrated a strong commitment to addressing the challenges of climate change through various initiatives and policies.³ As a country with rich biodiversity and vast tropical forests, Indonesia's contribution to improving the climate is very important, both nationally and globally. Indigenous peoples in Indonesia are part of the solution to climate change adaptation and mitigation because they view humans as part of nature that must be cared for and preserved. Indigenous peoples have knowledge of how to preserve and utilize the natural resources in their habitats.⁴ They also have customary laws related to this and customary institutions.

Indigenous forests, as an integral part of the natural ecosystem, play a strategic role in climate change mitigation.⁵ Indigenous forests are forests managed by indigenous peoples based on local wisdom and cultural values that have been passed down from generation to generation.⁶ In addition to serving as habitats for biodiversity, indigenous forests also act as highly effective natural carbon sinks. Trees in forests absorb carbon dioxide from the atmosphere through photosynthesis and store it in the form of biomass, soil, and other vegetation.⁷ Customary forests contribute significantly to reducing greenhouse gas concentrations in the atmosphere. As stated in Article 18B paragraph (2), the state recognizes and respects customary law communities and their traditional rights as long as they are still alive and in accordance with the development of society. One of the recognized customary forests is the Kasepuhan Karang Customary Forest.

The Kasepuhan Karang Customary Forest is one of Indonesia's unique cultural and environmental heritages. Managed by the Kasepuhan Karang indigenous community in West Java, this forest reflects the harmony between humans and nature that has existed for centuries.⁸ The local wisdom-based management system implemented by the indigenous community not only serves to preserve biodiversity but also maintains the overall balance of the ecosystem. The Kasepuhan Karang Customary Forest is a concrete example of how tradition and culture can go hand in hand with environmental conservation efforts.⁹ The Kasepuhan Karang Customary Forest has been recognized through the Decree of the Minister of Environment and Forestry No. SK.6748/2016. This decree stipulates that the Kasepuhan Karang Customary Forest covers an area of \pm 462 hectares in Jagaraksa Village, Muncang District, Lebak Regency, Banten Province. This decree removes the forest area from its status as a conservation area within the Gunung Halimun Salak National Park

³ Tyas Mutiara Basuki et al., "Improvement of Integrated Watershed Management in Indonesia for Mitigation and Adaptation to Climate Change: A Review," *Sustainability* 14, no. 16 (2022): 9997.

⁴ John Fredette et al., "The Promise and Peril of Hyperconnectivity for Organizations and Societies," 2012, 113–19.

⁵ Rina Suryani Oktari et al., "Indonesia's Climate-Related Disasters and Health Adaptation Policy in the Build-up to COP26 and Beyond," *Sustainability* 14, no. 2 (2022): 1006.

⁶ Azlan Abas, Azmi Aziz, and Azahan Awang, "A Systematic Review on the Local Wisdom of Indigenous People in Nature Conservation," *Sustainability* 14, no. 6 (2022): 3415.

⁷ Wahyu Nugroho and others, "Relationship between Environmental Management Policy and the Local Wisdom of Indigenous Peoples in the Handling of COVID-19 in Indonesia," *Onati Socio-Legal Series* 11, no. 3 (2021): 860–82.

⁸ Hendra Sukarman et al., "The Position of the National Forestry Board in Determination of Forest Area," in *International Seminar on Border Region (INTSOB 2023)*, 2024, 110–20.

⁹ J K Gasaneat and M Borobia, "ITTO Projects in Columbia, Panama, Thailand, India, and Japan: The Course of Mangrove Conservation and Sustainable Management," *Tropical Forest Update* 14, no. 4 (2004): 14.

(TNGHS) and designates it as a customary forest managed by the Kasepuhan Karang community.¹⁰ The boundaries of the Kasepuhan Karang Customary Forest are also recorded in the Kasepuhan Karang Land Minutes document.

The uniqueness of the Kasepuhan Karang Customary Forest lies in the way the community manages natural resources in a sustainable manner. Traditions such as “ngaseuk” (planting) and “tatali paranti” (customary rules) ensure that forest products are harvested without damaging the environment, and divide the area into restricted forest, production forest, and agricultural land, with tatali paranti (customary rules) serving as guidelines for maintaining ecosystem sustainability.¹¹ The Kasepuhan Karang Customary Forest not only functions as a natural resource, but also as a center of social and cultural life for the indigenous community. The Kasepuhan Karang community relies on traditional knowledge that has been passed down from generation to generation in the management of this forest. The Kasepuhan Karang Indigenous Community divides the forest into several categories based on function, such as cultivated forests for agriculture and protected forests to preserve the ecosystem.¹² These practices reflect deep local wisdom and a commitment to environmental sustainability.

In addition, the spiritual values inherent in the lives of indigenous peoples make the forest a sacred part that must be preserved.¹³ Despite its high ecological and cultural value, the preservation of the Kasepuhan Karang Customary Forest faces various complex challenges, both socially, economically, and in terms of policy. One of the main challenges is the lack of socialization regarding the designation of customary forest areas, which has not reached the lowest levels of government.¹⁴ For example, officials at the Gunung Halimun Salak National Park (TNGHS) often lack adequate understanding of the status and management of customary forest areas. This has the potential to cause discord between indigenous peoples and national park managers. In addition, there are differences in understanding about conservation between indigenous peoples and outsiders. For indigenous peoples, conservation is not only about preserving ecosystems, but also includes the spiritual and cultural dimensions inherent in forests.¹⁵ Conversely, the conservation approach by outsiders is often more technical and does not take local values into account, which can lead to conflicts in the implementation of forest management.

Reflecting on Lebak Regency Regulation Number 8 of 2015 concerning the Recognition, Protection, and Empowerment of the Kasepuhan Indigenous People, it explains that there is recognition of the rights of indigenous peoples to manage and utilize natural resources in customary forests. Articles 2, 3, and 4 of the Regional Regulation,

¹⁰ Abas, Aziz, and Awang, “A Systematic Review on the Local Wisdom of Indigenous People in Nature Conservation.”

¹¹ Dewi Sad Tanti, Irmulansati Tomohardjo, and Siti Syafinah, “THE CHALLENGE OF ENVIRONMENTAL SUSTAINABILITY: COMMUNICATION ACTION OF CITOREK’S YOUNG GENERATION,” *Asian People Journal (APJ)* 8, no. SI1 (2025): 152–71.

¹² Paul Michael Gilmour, “Lifting the Veil on Beneficial Ownership: Challenges of Implementing The UK’S Registers of Beneficial Owners,” *Journal of Money Laundering Control* 23, no. 4 (January 2020): 717–34, <https://doi.org/10.1108/JMLC-02-2020-0014>.

¹³ Scholastica Akalibey et al., “Integrating Indigenous Knowledge and Culture in Sustainable Forest Management via Global Environmental Policies,” *Journal of Forest Science* 70, no. 6 (2024): 265.

¹⁴ Fahrul Rozi Sembiring, Leti Sundawati, and Bramasto Nugroho, “The Failure Factors of Collective Action in Promoting the Recognition of Customary Forest: Case of Kenegerian Rumbio Customary Forest in Riau Province,” *Jurnal Manajemen Hutan Tropika* 27, no. 2 (2021): 110.

¹⁵ Mastewal Yami and Wolde Mekuria, “Challenges in the Governance of Community-Managed Forests in Ethiopia,” *Sustainability* 14, no. 3 (2022): 1478.

which contain the objectives and scope of this Regional Regulation, aim to provide a strong foundation for the recognition and protection of the rights of the Kasepuhan customary law community and to ensure that they can actively participate in the development and management of natural resources in their area as stipulated in the regulation.

The sustainability of customary forests depends heavily on how indigenous peoples wisely conserve and utilize these resources.¹⁶ Traditions and cultural values passed down from generation to generation enable indigenous peoples to utilize forest products without damaging the ecosystem, ensuring that future generations can also benefit from these resources. Furthermore, customary forests play an important role in preserving biodiversity, reducing the risk of natural disasters, and even contributing to climate change mitigation through natural carbon storage. Based on the above background, the novelty of this customary research is to provide socialization regarding the establishment of customary forest areas that have not been reached by the government at the lowest level so that harmony between indigenous peoples and national park managers can be created so that the Kasepuhan Karang Customary Forest will no longer be recognized by any party.¹⁷ Based on this, the author will discuss two main issues, namely how legal issues in the preservation of the Kasepuhan Karang Customary Forest can be overcome and what is the strategic role of the Kasepuhan Karang Customary Forest in climate change mitigation in Indonesia.

Based on the background described above, the research questions raised in this study are: 1) How can legal issues in the preservation of the Kasepuhan Karang Customary Forest be overcome? and 2) What is the strategic role of the Kasepuhan Karang Customary Forest in climate change mitigation in Indonesia?

B. Research Method

This study uses ethnographic methods to explore a deep understanding of the challenges of preserving the Kasepuhan Karang Customary Forest and its strategic role in addressing climate change.¹⁸ An empirical approach is the main foundation of this study, which includes the collection and analysis of data based on direct experience through participatory observation, in-depth interviews, and document analysis.¹⁹ Participatory observation allows researchers to be directly involved in the activities of the Kasepuhan Karang community related to the preservation of customary forests. A legislative approach is an important element in this study. Analysis of regulations governing customary forests and the recognition of indigenous peoples' rights was conducted to identify the relationship between national policies and local practices. The overall methods applied in this study complement each other. Participatory observation provides concrete empirical data, in-depth interviews enrich the community's perspective, and document analysis strengthens the historical and normative context. The legislative approach provides a relevant legal framework, while the conceptual approach provides an analytical basis for interpreting the

¹⁶ Asep Mulyadi, Moh Dede, and Millary Agung Widiawaty, "The Role of Tradisional Belief and Local Wisdom in Forest Conservation," *Jurnal Geografi Gea* 22, no. 1 (2022): 55–66.

¹⁷ Nelson Chanza and Walter Musakwa, "Indigenous Practices of Ecosystem Management in a Changing Climate: Prospects for Ecosystem-Based Adaptation," *Environmental Science & Policy* 126 (2021): 142–51.

¹⁸ Arivan Mahendra et al., "Metode Etnografi Dalam Penelitian Kualitatif," *Jurnal Ilmiah Wahana Pendidikan* 10, no. 17 (2024): 159–70.

¹⁹ Meisy Permata Sari et al., "Penggunaan Metode Etnografi Dalam Penelitian Sosial," *Jurnal Pendidikan Sains Dan Komputer* 3, no. 01 (2023): 84–90.

research findings. By combining these various methods, the study is expected to produce a holistic and in-depth understanding of the challenges of preserving the Kasepuhan Karang Customary Forest and its role in addressing climate change.

C. Results and Discussion

a. Legal Issues in the Preservation of the Kasepuhan Karang Customary Forest Can Be Overcome

The preservation of the Kasepuhan Karang Customary Forest faces a number of legal problems stemming from limited recognition of customary institutions and weak protection of indigenous peoples' rights. Jaro Wahid, Head of Kasepuhan Karang Village, explained during a discussion session that although this customary forest has been officially recognized through Minister of Environment and Forestry Decree No. 6748/2016, Jagaraksa Village, where the forest is located, still has the status of a general village, not a customary village. This raises a fundamental problem because recognition of customary villages through local regulations is an important requirement for communities to obtain full legal legitimacy. Without this status, the protection of customary rights, access to indigenous-based development programs, and stronger legal protection mechanisms cannot be fully realized.

Another serious obstacle is the lack of optimal coordination and understanding across sectors regarding the status of indigenous forests.²⁰ This situation is evident in the paradigm shift between the concept of conservation according to positive law and the views of indigenous peoples. Positive law tends to be technical and administrative in nature, for example through the obligation to form formal groups or institutional structures regulated by agencies or non-governmental organizations. In contrast, indigenous peoples emphasize management based on a balance between humans and nature, with priority given to cooperation among citizens and sufficient water to support agriculture, which is their source of livelihood. This difference in perspective often hinders policy implementation because programs that come from outside are not always in line with local needs. This shows that building a bridge of understanding between positive law and customary law is an urgent need to ensure harmony in the management of customary forests.

Despite these problems, a solution is still possible through strategic steps. First, the local government needs to immediately strengthen the recognition of Jagaraksa Village as a customary village through local regulations so that the rights of indigenous peoples obtain stronger formal legitimacy. Second, it is necessary to harmonize regulations and increase cross-sectoral socialization so that there are no more differences in understanding regarding the management of customary forests. With this harmony, indigenous peoples can carry out their traditions without conflict with state policies, while also obtaining solid legal protection.

In addition to regulatory support, strengthening customary law as living law is also important as a basis for environmental protection.²¹ Simple but effective customary

²⁰ Bhubaneswor Dhakal et al., "How Policy and Development Agencies Led to the Degradation of Indigenous Resources, Institutions, and Social-Ecological Systems in Nepal: Some Insights and Opinions," *Conservation* 2, no. 1 (2022): 134–73.

²¹ Achmad Faishal and others, "Laws and Regulations Regarding Food Waste Management as a Function of Environmental Protection in a Developing Nation," *International Journal of Criminal Justice Sciences* 17, no. 2 (2022): 223–37.

rules, such as prohibiting tree felling around springs, are strictly enforced to preserve the ecosystem, and violations are punished by the obligation to replant three trees. Rules such as these demonstrate the effectiveness of customary law as part of a sustainable environmental protection system. Integrating these values into formal policy will reinforce the position of customary law not only as a cultural tradition, but also as a legitimate instrument in environmental governance. Thus, customary law plays a real role as a partner to state law in maintaining the sustainability of customary forests.

Furthermore, the Kasepuhan Karang community has also begun to combine local wisdom with technological innovation. For example, digital systems are used for recording crops, land coordinates, and even careful irrigation management. This adaptation demonstrates the ability of indigenous peoples to protect forests while innovating in line with the times. If this step receives clear regulatory support, it will result in modern, measurable customary forest governance that remains rooted in cultural values. Thus, the combination of formal recognition, customary law, and modern technology will be able to overcome legal issues in the preservation of the Kasepuhan Karang Customary Forest while making it a model for sustainable customary forest management in Indonesia. Therefore, legal issues in the preservation of the Kasepuhan Karang Customary Forest can be overcome through the synergy of positive law, customary law, and technological innovation. This is important because customary forests not only concern the protection of indigenous peoples' rights but also make a real contribution to global environmental sustainability.

b. The Strategic Role of the Kasepuhan Karang Customary Forest in Climate Change Mitigation in Indonesia

Indigenous forests in Indonesia serve as carbon sinks that help absorb carbon emissions and reduce the risk of deforestation and land degradation, which are sources of greenhouse gas emissions.²² One such forest is the Kasepuhan Karang indigenous forest, which contributes significantly to carbon storage as a key to mitigating global climate change.²³ The Kasepuhan Karang customary forest is part of the cultural heritage of indigenous peoples, managed based on traditional knowledge passed down from generation to generation and focused on ecological balance and sustainability in the use of natural resources. This customary forest is divided into three categories, namely covered areas, cultivated areas, and entrusted areas.²⁴ The covered area is a conservation area dominated by tree vegetation, and the indigenous community has the right to manage it based on their local wisdom,²⁵ while the cultivated area is a conservation area used by the indigenous community as a source of livelihood and economy. Meanwhile, the entrusted area is an indigenous forest area believed to be a legacy from the ancestors and a historical site that must be preserved in its entirety.

The Kasepuhan Karang indigenous community is aware of the importance of

²² Maria Theresia Sri Budiastuti, Djoko Purnomo, and Desy Setyaningrum, "Agroforestry System as the Best Vegetation Management to Face Forest Degradation in Indonesia," *Reviews in Agricultural Science* 10 (2021): 14–23.

²³ Farhan Fefionaldo, "The Impacts of Reducing Emissions from Deforestation And Forest Degradation (Redd+) to the Human Rights of Indigenous People in Indonesia" (Universitas Islam Indonesia, 2025).

²⁴ Obani Izuchukwu Precious et al., "Impact of Deforestation on Carbon Emissions: A Data-Driven Study of the Amazon and Southeast Asia," *European Journal of Life Safety and Stability* 50 (2025): 17–36.

²⁵ James S Sinclair et al., "Effects of Land Cover and Protected Areas on Flying Insect Diversity," *Conservation Biology* 39, no. 4 (2025): e14425.

managing the Kasepuhan Karang customary forest.²⁶ In general, the management of the Kasepuhan Karang customary forest is carried out by maintaining ecosystem balance, protecting biodiversity, and preserving water resources, which have a direct impact on the environmental sustainability and local communities. The collective and cooperative approach to forest management makes customary forests the “lungs” of the ecology and an ecological bulwark in the face of climate change. Although the term climate change is not explicitly used by the Kasepuhan Karang indigenous community, they have a traditional ecological understanding that is essentially in line with this concept. For the Kasepuhan Karang indigenous community, forests are not only viewed as natural resources, but also as a lifeline that maintains the balance of the earth. They believe that if forests are destroyed, the natural cycle will be disrupted, water will become difficult to obtain, the air will become polluted, and the soil will lose its fertility. This belief stems from long experience and generations of interaction with nature, so that even though it is not packaged in modern scientific terminology, its substance reflects a deep ecological understanding.

The view of the Kasepuhan Karang indigenous community shows that there is local wisdom that places the forest at the center of life sustainability, both for humans and other ecosystems.²⁷ The principle of “if the forest is damaged, the earth is damaged” represents an ecological paradigm that indirectly contributes to climate change mitigation. By preserving the forest, they not only maintain their cultural identity and spirituality, but also make a real contribution to global environmental sustainability. This is proof that local wisdom can go hand in hand with modern scientific knowledge in responding to the challenges of climate change.

Indigenous forest management is carried out collectively by all villagers, with forest functions divided into three main categories: strictly protected forest cover, cultivated areas as a source of community income, and entrusted areas that include cemeteries and other important sites, without any specific regulatory body.²⁸ This management system emphasizes how indigenous peoples can preserve the integrity of the forest, thereby maintaining the ecosystem and contributing to environmental stability. These conservation efforts strengthen the position of indigenous peoples as the spearhead of environmental management and climate change mitigation, while also serving as an example for other communities in Indonesia.²⁹ Formal support from the government through the recognition of customary forests and the legal empowerment of indigenous peoples is a key factor that can strengthen their strategic role in climate change mitigation.

²⁶ Sutiyo Sutiyo, “The Struggle for Land by Indigenous Groups: From Conflict to Cooperation in Kasepuhan Ciptagelar, Indonesia,” *Community Development Journal* 60, no. 2 (2025): 304–22.

²⁷ I Geria et al., “The Degradation of Local Wisdom’s Role in Managing the Wain River Protected Forest within the Buffer Zone of New Indonesia’s Capital City in Kalimantan,” *Gusti Komang Dana and Suparta, I. Wayan and Simantjuktak, Truman and Sofian, Harry Octavianus, The Degradation of Local Wisdom’s Role in Managing the Wain River Protected Forest within the Buffer Zone of New Indonesia’s Capital City in Kalimantan*, n.d.

²⁸ Yixiao Peng and Wenyi Huang, “Using Blockchain Technology and Sharing Culture to Promote Sustainable Forest Management in Tribal Communities,” *Journal of Environmental and Public Health* 2022, no. 1 (2022): 1529407.

²⁹ Mas Rahmah and Adi Sulistyono, “The Integration of Traditional Knowledge and Local Wisdom in Mitigating and Adapting Climate Change: Different Perspectives of Indigenous Peoples from Java and Bali Island,” in *Traditional Knowledge and Climate Change: An Environmental Impact on Landscape and Communities* (Springer, 2024), 61–80.

Furthermore, the preservation and management of customary forests is not only ecological but also social and cultural in nature.³⁰ Based on interviews with the head and members of the Kasepuhan Karang indigenous community, they agreed that the forest provides food, water, and non-timber forest products that support their daily lives. The philosophy of forest management based on sustainability values also strengthens the community's resilience in facing the challenges of climate change. With cultural and spiritual values integrated into forest management, the Kasepuhan Karang indigenous community has a strong moral incentive to maintain environmental sustainability.

Furthermore, the Kasepuhan Karang community also has a deep understanding of the relationship between forests and the local climate.³¹ They have a different seasonal pattern from the seasonal information usually announced by the government. This demonstrates local wisdom that is adaptive to the surrounding environment. The basic principle in facing climate change according to this indigenous community is to preserve the forest, as it is considered the main source of the local microclimate balance. In addition to its ecological aspects, the Kasepuhan Karang customary forest also plays an important role in preventing natural disasters such as floods and landslides through its well-preserved condition. The absence of a decline in the yield of the Kasepuhan Karang customary forest felt by the indigenous community in recent years reflects the success of sustainable and adaptive forest management to environmental changes. However, the indigenous community realizes the importance of support from the government and other institutions to maintain the sustainability of customary forests, including legal recognition of customary villages, which signifies stronger institutional protection.

Collaborative research conducted by lecturers and students of the Jakarta "Veteran" National Development University together with the head and indigenous people of Kasepuhan Karang as the main actors in environmental management shows the synergy between indigenous knowledge and modern science that strengthens climate change mitigation strategies. Thus, the strategic role of the Kasepuhan Karang customary forest in climate change mitigation includes maintaining the forest's carbon storage capacity, sustainable resource management based on local wisdom, integration of cultural values, and the role of indigenous peoples as guardians and protectors of the environment. This approach makes a real contribution to maintaining ecosystem balance while building the socio-economic resilience of indigenous communities amid the current challenges of climate change.

D. Conclusion and Recommendations

The conclusion of this study found that although it has been recognized by the Ministry of Environment and Forestry, the status of Jagaraksa Village, which has not been designated as a customary village through local regulations, is a major obstacle in obtaining full legal legitimacy and access to development programs. This problem is exacerbated by a lack of coordination and differences in paradigm between positive law, which is technical and administrative in nature, and the local wisdom of indigenous peoples, which emphasizes ecological balance. The articulated solutions include accelerating the recognition of customary

³⁰ Lalu Noval Banu Harly, "Sustainable Forest Management from the Perspective of Customary Law in Indonesia: A Case Study in the Bayan Community," *International Journal of Social Sciences and Humanities* 1, no. 1 (2023): 32-42.

³¹ Kevin Aditia et al., "Potential of Local Wisdom as an Effort to Prevent Damage to Forest Resources," *JPBI (Jurnal Pendidikan Biologi Indonesia)* 10, no. 3 (2024): 1171-79.

villages by local governments, harmonizing cross-sectoral regulations, and strengthening customary law as a living law through the integration of its values into formal policies.

The Kasepuhan Karang Customary Forest has also been identified as having a crucial strategic role in climate change mitigation, which is rooted in local wisdom in natural resource management. Indigenous peoples manage forests based on the principle of ecological balance by dividing them into three categories: conservation areas, cultivation areas (livelihood sources), and entrusted areas (ancestral sites), which effectively maintain the forest's function as a carbon sink and supporter of biodiversity. Although they do not use modern scientific terminology, their understanding that "if the forest is damaged, then the earth is damaged" reflects a deep understanding of ecological cycles and the local microclimate, as evidenced by the seasonal patterns they recognize that differ from government information. These conservation efforts not only preserve cultural and spiritual identity, but also make a real contribution to maintaining global environmental stability, strengthening the position of indigenous peoples as the front line in facing the challenges of climate change.

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