



Settlement Problem Encroachment in Area Conservation Reserve Natural Mountains Cyclops Through Track Non-litigation

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Abstract

Encroachment of conservation areas is a serious threat to the sustainability of the ecosystem, including in the Cyclops Mountains Nature Reserve, Jayapura, Papua Law enforcement through litigation is often ineffective and does not provide optimal results. This study aims to examine the resolution of encroachment conflicts in the Cycloop Mountains Nature Reserve through non-litigation channels. This study is a qualitative study, with normative legal methods and a descriptive analytical approach. The results of the analysis indicate that non-litigation resolution through mediation, negotiation, and empowerment of communities around the Cycloop Mountains Nature Reserve can be a more effective alternative in resolving encroachment problems. This approach is in line with the spirit of inclusive conservation area protection and recognition of the rights of indigenous peoples.

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Introduction

The Cycloop Mountains Nature Reserve, which stretches across the administrative areas of Jayapura City and Jayapura Regency in Papua Province, represents one of the most ecologically significant conservation landscapes in eastern Indonesia. This reserve functions as a critical habitat for endemic flora and fauna, a watershed regulator, and a natural buffer

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against environmental hazards. Its ecological importance is underscored by its biodiversity richness and its role in sustaining ecosystem services essential for surrounding communities (Margono et al., 2014). However, in recent decades, the reserve has been increasingly threatened by anthropogenic pressures, particularly encroachment by individuals and organized community groups who claim customary ownership over the land.

Encroachment within conservation areas is a complex socio-legal phenomenon that often stems from overlapping claims between state law and customary (adat) law. In the context of Papua, customary law plays a dominant role in regulating land tenure systems, where land is often perceived as ancestral heritage passed down through generations (Butt, 2014). Communities around the Cycloop Mountains assert that the reserve area falls under their ulayat (customary) rights, thereby legitimizing their use of the land for settlement, agriculture, and resource extraction. This situation creates tension between conservation policies enforced by the state and the socio-cultural realities of indigenous populations.

Forms of encroachment in the Cycloop Mountains Nature Reserve vary in scale and intensity. These include illegal logging, shifting cultivation, establishment of informal settlements, and small-scale mining activities. Such activities have led to significant environmental degradation, including deforestation, soil erosion, and disruption of hydrological cycles. Studies have shown that forest loss in Indonesia contributes substantially to biodiversity decline and increases vulnerability to natural disasters (Austin et al., 2019). In the Cycloop area, deforestation reduces the land's capacity to absorb rainfall, thereby heightening the risk of landslides and flooding.

A tragic manifestation of this environmental degradation was the 2019 flash flood in Sentani, Jayapura Regency, which resulted in hundreds of fatalities and extensive material damage. Scientific analyses link such disasters to land-use changes in upstream areas, particularly deforestation and encroachment in protected zones (Suwarno et al., 2020). The loss of vegetation cover diminishes slope stability and accelerates surface runoff, creating conditions conducive to flash floods. This event highlights the urgent need for effective conservation strategies that address both environmental and socio-cultural dimensions.

Law enforcement through litigation, such as prosecuting encroachers under environmental laws, has proven insufficient in addressing the problem. One major limitation is the scarcity of resources among law enforcement agencies, including personnel, funding, and technical capacity (Gunningham, 2017). Additionally, the legal process is often perceived as adversarial and may exacerbate tensions between authorities and local communities. In many cases, enforcement efforts fail because they do not consider the legitimacy of customary claims or the socio-economic needs of local populations.

Another significant barrier is the limited public awareness and understanding of conservation laws. Many community members are not fully informed about the legal status of the Cycloop Mountains as a protected area or the long-term consequences of environmental degradation. This knowledge gap undermines compliance and contributes to continued encroachment (Sodhi et al., 2010). Furthermore, the coexistence of state law and customary law creates legal pluralism, which can lead to conflicts and ambiguity in land governance (Meinzen-Dick & Pradhan, 2002).

Given these challenges, there is a growing recognition of the need for alternative, non-litigation approaches to resolving encroachment issues. Non-litigation mechanisms

emphasize dialogue, mediation, and participatory governance, aiming to achieve sustainable solutions that are socially acceptable and environmentally sound. One such approach is collaborative forest management, which involves local communities in conservation efforts while recognizing their customary rights (Dressler et al., 2010). By integrating traditional knowledge with scientific management practices, this approach can enhance both ecological outcomes and community livelihoods.

Another promising strategy is the use of restorative justice principles in environmental governance. Restorative justice focuses on repairing harm through inclusive processes that engage all stakeholders, including affected communities, government agencies, and civil society organizations (Braithwaite, 2002). In the context of Cycloop, this could involve negotiated agreements that allow limited, regulated use of resources while ensuring the protection of critical ecological zones.

Education and capacity-building initiatives are also crucial components of non-litigation approaches. Raising awareness about the importance of conservation and the risks associated with environmental degradation can foster behavioral change and encourage community participation in sustainable practices. Environmental education programs tailored to local cultural contexts have been shown to be effective in promoting conservation ethics (Ardoin et al., 2020).

Furthermore, strengthening institutional coordination between government agencies, customary leaders, and non-governmental organizations is essential for effective governance. Multi-stakeholder platforms can facilitate communication, build trust, and support the co-creation of policies that reflect diverse interests. Such collaborative frameworks have been successfully implemented in various conservation contexts worldwide (Reed, 2008).

In conclusion, the encroachment of the Cycloop Mountains Nature Reserve is a multifaceted issue that requires a holistic and integrative approach. While litigation remains an important tool for enforcing environmental laws, it is not sufficient on its own. Non-litigation strategies that prioritize dialogue, participation, and respect for customary rights offer a more sustainable pathway for resolving conflicts and ensuring the long-term conservation of this vital ecosystem. By addressing both the ecological and socio-cultural dimensions of encroachment, policymakers and stakeholders can work towards a balanced solution that protects biodiversity while supporting the well-being of local communities.

Methods

This study employs a qualitative design based on a normative legal research method combined with a descriptive-analytical approach. Normative legal research focuses on examining law as a system of norms derived from statutory regulations, legal principles, and doctrines (Benuf & Azhar, 2020). In this study, the approach is used to analyze the legal framework governing conservation areas in Indonesia, particularly in relation to environmental protection and biodiversity conservation within the Cycloop Mountains Nature Reserve. It also explores the interaction between state law and customary (adat) law, which reflects legal pluralism and often influences land-use conflicts in Papua (Meinzen-Dick & Pradhan, 2002).

The descriptive-analytical approach is applied to systematically identify and examine the forms of encroachment occurring in the conservation area, such as illegal logging, land conversion, and informal settlements. Furthermore, it is used to analyze non-litigation dispute resolution mechanisms, including mediation, negotiation, and community-based natural resource management, which emphasize participatory and restorative approaches (Braithwaite, 2002; Dressler et al., 2010). This approach enables a comprehensive understanding of both the legal and socio-environmental dimensions of encroachment issues.

Data collection is conducted through library research by reviewing relevant legal documents, scholarly articles (including Scopus-indexed journals), and supporting references from both printed and digital sources. The data are analyzed using qualitative content analysis, involving data reduction, classification, and interpretation to address the research questions (Reed, 2008). To ensure validity and reliability, this study applies source triangulation by comparing multiple legal and academic perspectives, thereby providing a robust and comprehensive analysis of encroachment and its non-litigation resolution strategies.

Results and Discussions

1. Identification of Encroachment in the Cycloop Mountains Nature Reserve

a. Causal Factors

The findings of this study indicate that encroachment within the Cycloop Mountains Nature Reserve is driven by a complex interplay of socio-economic, legal, and institutional factors. One of the primary drivers is the economic vulnerability of local communities living around the conservation area. The rapid development of Jayapura City as an administrative and economic center has intensified competition for land, employment, and resources. However, many indigenous and local residents lack adequate access to formal economic opportunities, which pushes them toward informal and often illegal land use practices within protected areas. As expressed by local customary leaders, encroachment is frequently motivated by basic survival needs, reflecting a subsistence-driven rationale rather than purely exploitative intent (Karababa & Dhikr, 2018). This aligns with broader findings in environmental governance literature that poverty and limited livelihood options are significant predictors of illegal resource use in conservation areas (Sodhi et al., 2010).

In addition to economic pressures, structural and governance-related factors significantly contribute to encroachment. Empirical findings from Yumai and Jikwa (2018) highlight several key issues, including unclear boundary demarcation of the conservation area, limited availability of land for settlement and agriculture, and increasing population growth. The absence of clearly defined and socially recognized boundaries creates ambiguity, enabling communities to justify land use based on customary perceptions. Furthermore, weak institutional capacity—manifested in limited supervision, inadequate security measures, and inconsistent law enforcement—exacerbates the situation. Regulatory gaps and the lack of strict enforcement mechanisms reduce the deterrent effect of conservation laws, allowing encroachment activities such as illegal logging, land clearing, and settlement expansion to persist. Similar patterns have been observed in other tropical forest regions,

where ineffective governance structures correlate strongly with environmental degradation (Margono et al., 2014).

Another crucial dimension is the role of legal pluralism, particularly the coexistence of state law and customary (adat) law. Indigenous communities around the Cycloop Mountains strongly believe that they possess ulayat (customary land) rights over the conservation area, as it is considered an ancestral heritage passed down through generations. From their perspective, utilizing land and natural resources within the reserve does not constitute a violation but rather an exercise of legitimate traditional rights. This perception is reinforced by their socio-cultural identity and a livelihood system that is highly dependent on natural resources. However, this customary claim often conflicts with the formal legal status of the area as a protected conservation zone under state law. Such conflicts illustrate the challenges of legal pluralism in environmental governance, where overlapping legal frameworks create ambiguity and contestation over land ownership and resource use (Meinzen-Dick & Pradhan, 2002).

Moreover, limited public awareness and understanding of conservation regulations further aggravate the problem. Many community members are not fully informed about the ecological significance of the Cycloop Mountains or the long-term consequences of environmental degradation, including increased risks of landslides and flooding. This lack of awareness reduces community compliance and participation in conservation efforts. At the same time, insufficient engagement between government authorities and local communities has led to a lack of trust and cooperation, weakening the effectiveness of top-down conservation policies. Studies emphasize that conservation initiatives that fail to incorporate local knowledge and participation are less likely to succeed in the long term (Reed, 2008).

Overall, the results demonstrate that encroachment in the Cycloop Mountains Nature Reserve cannot be attributed to a single factor but rather emerges from the interaction of economic necessity, governance weaknesses, and socio-cultural dynamics. Addressing these issues requires a holistic approach that integrates legal enforcement with community-based strategies, recognizes customary rights, and enhances institutional capacity. Without such an integrated framework, efforts to mitigate encroachment are likely to remain ineffective and unsustainable.

2. Forms of Encroachment

Empirical findings indicate that encroachment within the Cycloop Mountains Nature Reserve particularly in the Sentani region of Jayapura Regency manifests in several recurring patterns of unauthorized land use and resource extraction. Field observations and patrol reports reveal that the dominant forms of encroachment are closely linked to subsistence needs and income-generating activities. These include forest clearing for agriculture, illegal logging, and the harvesting of wild flora and fauna. During routine monitoring, enforcement teams often prioritize persuasive and educative approaches, such as direct counseling to community members encountered in the field, reflecting a recognition that enforcement alone is insufficient without awareness-building and community engagement (Kahar & Dzikry, 2018). This finding is consistent with broader conservation studies showing that encroachment in protected areas is frequently driven by livelihood pressures rather than purely commercial motives (Sodhi et al., 2010).

More specifically, this study identifies three dominant forms of encroachment in the Cycloop Mountains Nature Reserve. First, forest burning is commonly practiced to convert land into agricultural plots. This slash-and-burn method is considered efficient and low-cost by local communities but has severe ecological consequences, including deforestation, soil degradation, and increased vulnerability to landslides and flooding. Second, illegal logging remains prevalent, with timber extracted both for local use and for sale in informal markets. This activity contributes significantly to forest cover loss and biodiversity decline, undermining the ecological integrity of the conservation area (Margono et al., 2014). Third, the hunting and collection of wild plants and animals are carried out for subsistence consumption and supplementary income. While traditionally embedded within local livelihoods, increased commercialization has intensified exploitation, threatening endemic species and disrupting ecosystem balance. These patterns reflect a shift from subsistence-based use to more market-oriented exploitation, a trend widely documented in tropical forest regions (Austin et al., 2019).

From a legal perspective, these activities clearly fall within the category of prohibited actions under Indonesian conservation law. Law Number 32 of 2024, which amends Law Number 5 of 1990 on the Conservation of Biological Natural Resources and Their Ecosystems, explicitly prohibits any activity that may alter the integrity of a nature reserve. Article 19 stipulates that actions such as reducing the area of a reserve, degrading its ecological function, conducting burning activities, extracting biological or non-biological resources, and introducing non-native species are strictly forbidden. The forms of encroachment identified in this study—forest burning, illegal logging, and wildlife exploitation—are therefore in direct violation of these provisions. However, the persistence of such practices highlights a significant gap between legal norms and their implementation in practice, particularly in regions characterized by strong customary land claims and limited enforcement capacity (Gunningham, 2017).

The findings further suggest that the legal classification of encroachment as a violation must be understood within the broader context of legal pluralism and socio-cultural dynamics. Indigenous communities surrounding the Cycloop Mountains often perceive their activities not as illegal acts but as legitimate exercises of customary (*ulayat*) rights inherited from their ancestors. This divergence in legal perception creates tension between state-based conservation frameworks and local customary systems. As argued by Ruth Meinzen-Dick and Rajendra Pradhan (2002), such conflicts are characteristic of plural legal systems, where multiple normative orders coexist and compete for legitimacy. Consequently, strict legal enforcement without consideration of local socio-cultural realities risks exacerbating conflict and undermining conservation objectives.

Therefore, addressing encroachment in the Cycloop Mountains Nature Reserve requires a balanced and integrative approach. While the enforcement of conservation laws remains essential to protect ecological integrity, it must be complemented by strategies that recognize and accommodate the rights and livelihoods of indigenous communities. This includes participatory land-use planning, community-based conservation programs, and non-litigation conflict resolution mechanisms that emphasize dialogue, negotiation, and mutual benefit. Such approaches have been shown to enhance compliance, reduce conflict, and improve conservation outcomes in similar contexts (Dressler et al., 2010; Reed, 2008).

Ultimately, a sustainable solution must ensure that conservation objectives are achieved without marginalizing local communities, thereby fostering a governance model that is both legally robust and socially inclusive.

b. Non-litigation Path in Settlement Problem

Non-litigation methods constitute an essential alternative for resolving environmental and tenure conflicts outside formal court processes. Commonly referred to as Alternative Dispute Resolution (ADR), these mechanisms emphasize deliberation (*musyawarah*), consensus, and peaceful settlement, aligning closely with Indonesian socio-cultural values. In contrast to litigation—which is often formalistic, time-consuming, and limited in addressing underlying socio-cultural dynamics—non-litigation approaches are considered more flexible, adaptive, and capable of producing sustainable outcomes. The legal basis for ADR in Indonesia is firmly established in Law No. 30 of 1999 concerning Arbitration and Alternative Dispute Resolution, as well as Law No. 32 of 2009 on Environmental Protection and Management, which explicitly provides avenues for resolving environmental disputes through non-judicial channels. In conservation contexts such as the Cycloop Mountains Nature Reserve, non-litigation mechanisms are particularly relevant due to the involvement of indigenous communities with strong historical and cultural ties to the land. Thus, instruments such as multi-stakeholder dialogue, participatory mapping, and recognition of customary land rights become critical in fostering equitable and lasting solutions.

From a sociological and empirical perspective, ADR reflects indigenous approaches to conflict resolution that prioritize harmony, social cohesion, and restorative outcomes (Triana, 2019). In the context of encroachment within the Cycloop Mountains Nature Reserve, ADR can be operationalized through several key mechanisms, including mediation, negotiation, and community empowerment. These approaches not only aim to resolve disputes but also to address the root causes of encroachment, such as economic dependency, limited access to land, and weak institutional engagement. Importantly, integrating local wisdom and customary institutions into these processes enhances legitimacy and community acceptance, thereby increasing the likelihood of long-term compliance and environmental sustainability (Reed, 2008).

1. Mediation

Mediation is a non-litigation dispute resolution mechanism involving a neutral third party who facilitates dialogue between disputing parties without imposing a binding decision. The term originates from the Latin *mediare*, meaning “to be in the middle,” reflecting the mediator’s role as an impartial intermediary. Mediation is voluntary, informal, and cooperative, allowing parties to reach mutually acceptable agreements based on consensus (Triana, 2019). In environmental conflicts, mediation has been widely recognized as an effective tool for balancing competing interests while preserving relationships among stakeholders (Braithwaite, 2002).

In the case of encroachment in the Cycloop Mountains Nature Reserve, mediators may include customary leaders, community elders, religious figures, or respected local actors who possess social legitimacy and cultural authority. In Papuan society, traditional leaders such as *ondoafi* play a central role in regulating customary land use and resolving disputes.

Their involvement in mediation processes is crucial, as they are trusted by local communities and capable of bridging the gap between state law and customary norms. By incorporating such local leadership, mediation processes become more culturally sensitive and effective in achieving sustainable conflict resolution.

2. Negotiation

Negotiation represents a direct form of dispute resolution in which the parties involved engage in dialogue to reach a mutually acceptable agreement. Unlike mediation, negotiation does not necessarily involve a third party, although facilitators may be present to guide discussions. The process is highly flexible and can be adapted to local customs and practices (Triana, 2019). In the context of the Cycloop Mountains Nature Reserve, negotiation typically involves community groups accused of encroachment and government authorities responsible for conservation management, particularly the Natural Resources Conservation Agency (BBKSDA Papua).

Negotiation processes in Papua often take place within traditional forums such as *para-para adat*, where deliberation is guided by customary norms and leadership structures. The role of *ondoafi* is particularly significant in these settings, as they hold authority over land use decisions and resource management within customary territories. Through negotiation, agreements can be reached regarding controlled land use, community access rights, and conservation responsibilities. Such arrangements not only reduce conflict but also foster shared ownership of conservation goals, thereby enhancing compliance and long-term sustainability (Dressler et al., 2010).

3. Community Empowerment

Community empowerment is a strategic approach aimed at enhancing the capacity, independence, and well-being of local communities, enabling them to manage resources sustainably while improving their socio-economic conditions. Empowerment encompasses economic, social, cultural, and institutional dimensions, allowing communities to reduce their dependence on conservation areas for survival. In the Cycloop Mountains Nature Reserve, empowerment initiatives are implemented through programs such as *Desa Binaan* (Desbin) and conservation partnerships (*Kemitraan Konservasi*).

These programs are designed to provide alternative livelihoods that are environmentally sustainable and culturally appropriate. For example, community members are supported in developing orchid cultivation, processing sago into value-added products, and producing handicrafts such as imitation bird-of-paradise ornaments. Such initiatives are tailored to local potential and indigenous knowledge systems, ensuring relevance and acceptance. Empirical observations indicate that these programs have contributed to increased household income, expanded market access, and reduced reliance on forest exploitation. Moreover, several Desbin initiatives have gained recognition at regional and national levels, further strengthening community motivation and participation.

From a governance perspective, community empowerment aligns with participatory conservation models that emphasize collaboration between government agencies and local communities. By integrating economic incentives with conservation objectives, empowerment programs create a mutually beneficial framework that addresses both environmental protection and community welfare (Reed, 2008). Consequently, these

initiatives play a critical role in mitigating encroachment while promoting sustainable development in and around the Cycloop Mountains Nature Reserve

Conclusion

The Cycloop Mountains Nature Reserve represents a conservation landscape of exceptionally high biodiversity value, functioning not only as a habitat for endemic species but also as a critical ecological buffer for surrounding communities. For generations, indigenous peoples living around the reserve have depended on natural resources as part of their customary livelihood systems, grounded in ancestral traditions and local wisdom. However, the formal designation of the Cycloop Mountains as a protected conservation area has created a fundamental tension between state-based environmental law and customary land-use practices. This contradiction is reflected in the persistence of encroachment activities, which commonly take the form of forest burning for agricultural expansion, illegal logging, and the harvesting of wild flora and fauna. From a legal standpoint, such practices constitute clear violations of conservation regulations; yet, from a socio-cultural perspective, they are often perceived by local communities as legitimate expressions of customary rights. This duality underscores the complexity of conservation governance in Papua, where legal pluralism and socio-economic pressures intersect, making purely coercive approaches to enforcement insufficient and, in some cases, counterproductive.

In response to these challenges, non-litigation approaches particularly those framed within Alternative Dispute Resolution (ADR) have emerged as more adaptive and sustainable pathways for addressing encroachment issues. Institutions such as the Papua Natural Resources Conservation Agency (BBKSDA Papua) have implemented various ADR-based strategies, including mediation, negotiation, and community empowerment programs. Among these, community empowerment initiatives such as Desa Binaan (Desbin) and conservation partnerships have demonstrated significant effectiveness in reducing community dependence on conservation areas by providing alternative, sustainable livelihoods aligned with local potential and cultural values. Nevertheless, empowerment alone is not sufficient; it must be complemented by continuous mediation and negotiation processes that involve customary leaders and local stakeholders to ensure legitimacy and long-term compliance. Ultimately, a balanced approach that integrates legal enforcement with participatory, culturally sensitive, and economically viable solutions is essential to safeguarding the ecological integrity of the Cycloop Mountains Nature Reserve while simultaneously upholding the rights and welfare of indigenous communities.

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