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# Legal Policy of Carbon Trading and Threats to Indigenous Peoples' Sovereignty in Papua: A Critical Review

Trisoko Sugeng Sulistyo[1], Yos Johan Utama[2], Aju Putrijanti[3]

***Abstract***

*This study examines the implementation of carbon trading policies in Indonesia, focusing on its impact on the sovereignty and rights of indigenous peoples in Papua. Through policy analysis, legislative reviews, and case studies, this study identifies gaps between the national legal framework and the realities on the ground. The results show that the implementation of carbon trading schemes, while potentially positive for the global environment, often ignores the rights of indigenous peoples to the land, forests, and natural resources that are an integral part of their cultural identity. This study recommends policy reforms that prioritize the protection of indigenous peoples' rights, an agreement mechanism based on prior and non-coercive information (FPIC), and the development of a fair benefit-sharing model as a prerequisite for the sustainability of carbon trading programs in Papuan customary territories*.

***Keywords:*** *Carbon Trading, Indigenous Peoples, Papua, Territorial Sovereignty, Customary Rights, Environmental Justice*.

## Introduction

Global climate change has prompted birth of various mitigation policy instruments, one of which is carbon trading mechanism. In Indonesia, carbon trading is an important strategy in fulfilling the commitment to reduce greenhouse gas emissions as stated in the *Nationally Determined Contribution* (NDC) (Kementerian Lingkungan Hidup dan Kehutanan RI, 2021). However, implementation of this policy creates complex problems, especially when it comes to the rights of indigenous peoples who inhabit forest areas with high carbon stocks, such as in Papua.

Papua, with the largest tropical forest in Indonesia, is home to indigenous peoples whose sovereignty is closely linked to the management rights of their customary territories (Kayoi et al., 2020). The implementation of carbon trading policies in indigenous territories without understanding socio-cultural dynamics can trigger conflicts that threaten the sovereignty of indigenous peoples (Wollenberg & Springate-Baginski, 2022).

Carbon trading regulations in Indonesia have evolved from the Regulation of the Minister of Environment and Forestry No. P.70/MENLHK/SETJEN/KUM.1/12/2017 concerning Procedures for the Implementation *of Reducing Emissions from Deforestation and Forest Degradation* to the stipulation of Presidential Regulation No. 98 of 2021 concerning the Implementation of Carbon Economic Value (Peraturan Presiden Republik Indonesia Nomor 98 Tahun 2021) . Although the latest regulations try to integrate the protection of indigenous

[1] Doctoral Program in Law, Faculty of Law, Diponegoro University, Semarang, Indonesia, Email: trisokosugengsulistyo@gmail.com, (Corresponding Author)
[2] Doctoral Program in Law, Faculty of Law, Diponegoro University, Semarang, Indonesia, Email: yosjohanutama@yahoo.com
[3] Doctoral Program In Law, Faculty of Law, Diponegoro University, Semarang, Indonesia, Email: ajuputrijanti@lecturer.undip.ac.id

peoples' rights, their implementation on the ground still shows significant gaps. Neglect of the Free, *Prior, and Informed Consent* (FPIC) consent mechanism and limited recognition of customary rights are often at the root of conflicts in carbon trading projects in Papua (Larson, Sarmiento Barletti, & Ravikumar, 2023).

This study seeks to critically examine how carbon trading policies have the potential to threaten the sovereignty of indigenous peoples in Papua. By analyzing the applicable legal framework, implementation practices on the ground, and specific case studies, this study aims to identify gaps and contradictions in policy and formulate recommendations for more effective protection of indigenous peoples' rights in the context of carbon trading. This study is important not only to ensure justice for indigenous Papuans but also to ensure the effectiveness and sustainability of climate change mitigation programs in Indonesia as a whole (Fay & Denduangrudee, 2021).

## Methodology

This study uses a qualitative approach with *socio-legal methods* that integrates juridical-normative and empirical analysis to understand the complexity of the intersection between carbon trading policies and the sovereignty reality of indigenous peoples in Papua (Banakar & Travers, 2022). The research was carried out during the period from January to December 2024 by involving three stages of data collection and analysis that complemented each other.

The first stage includes the analysis of policy and regulatory documents related to carbon trading in Indonesia, both at the national and regional levels. The documents examined include Law No. 16 of 2016 concerning the Ratification of the *Paris Agreement*, Presidential Regulation No. 98 of 2021 concerning the Implementation of Carbon Economic Value, related Regulation of the Minister of Environment and Forestry, as well as various regional regulations on the recognition and protection of indigenous peoples in Papua (Bedner & Arizona, 2019). This normative analysis aims to identify regulatory gaps and potential conflict of norms between carbon trading policies and indigenous rights protection instruments.

The second phase is in the form of field research carried out in three districts in Papua and West Papua Provinces that have activated carbon trading projects, namely Jayapura Regency, Sorong Regency, and Tambrauw Regency. Data was collected through in-depth interviews with indigenous leaders, local governments, project implementers, academics, and NGOs, focusing on the perception and impact of carbon projects on indigenous peoples' sovereignty (Creswell & Poth, 2023). In addition to interviews, participatory observations were also conducted at community meetings and decision-making processes related to carbon projects to understand the dynamics of power relations and indigenous peoples' participation.

The third phase involves analysis of case studies of three carbon trading projects that have been running for at least three years in the Papua region. The three projects were selected based on variations in implementation mechanisms, scale, and level of indigenous involvement (Yin, 2018). The analysis of the case studies allows for an in-depth understanding of how carbon trading policies are operationalized on the ground and their implications for the sovereignty of indigenous peoples.

The collected data was analyzed using a thematic approach with the help of NVivo software for coding and categorization (Braun & Clarke, 2021). The validity of the data is ensured through triangulation of sources and methods, as well as member checking by involving key informants in verifying research findings. To ensure the ethics of the research, entire data collection process is preceded by an informed *consent process* and is carried out with respect for local customary

norms and protocols (Chilisa, 2020).

## Literature Review

Carbon trading as a climate change mitigation mechanism has been the focus of interdisciplinary research in the past two decades. Wong and Sanders (2021) identified that carbon trading policies tend to be designed with a neoliberal approach that prioritizes economic efficiency over social justice, thus potentially ignoring the dimensions of human rights and environmental justice (Wong & Sanders, 2021). In the Indonesian context, Astuti and McGregor (2017) show that the implementation of REDD+ has created new forms of territorialization and commodification of forests that threaten local communities' access to natural resources (Astuti & McGregor, 2017).

The study of indigenous peoples' sovereignty in context of global environmental policy shows that there is an inherent tension between global conservation interests and the rights of indigenous peoples. Studies such as Long and Dhir (2022) and Suiseeya (2020) show that carbon market mechanisms, such as REDD+, often lead to 'green grabbing' and turning forests from living spaces into carbon commodities, threatening the sovereignty of indigenous peoples (Long & Dhir, 2022) (Suiseeya, 2020).

In the context of Papua, several studies have examined the relationship between indigenous peoples and conservation policies. Fatem et al. (2018) illustrate that complexity of customary tenure systems in Papua is often simplified in the implementation of conservation policies, resulting in the marginalization of indigenous peoples' traditional knowledge and practices in forest management (Fatem, Awang, Pudyatmoko, & Sahide, 2018). The study of Ungirwalu and Awang (2020) identified a contradiction between the recognition of the customary rights of indigenous Papuans in regional legal instruments and forestry and investment policies that are still centralistic (Ungirwalu & Awang, 2020).

Regarding the legal aspect, Safitri's (2019) research shows a significant gap between the normative recognition of indigenous peoples' rights in the constitution and laws and their implementation in the field, including in the context of carbon trading (Safitri, 2019). This implementation gap is further exacerbated by the weakness of *Free, Prior, and Informed Consent* (FPIC) instruments which are often reduced to administrative formalities, as stated by Anderson (2021) in his study on the consultation process in REDD+ projects in Indonesia (Anderson, 2021).

The debate on *benefit sharing* in carbon trading projects has also been the focus of a number of studies. Lee and Gardner (2023) identified that the unclear definition of "indigenous peoples" in carbon trading policies in Indonesia has the potential to exclude groups that do not have formal recognition, despite having a de facto historical attachment to forest areas (Lee & Gardner, 2023). Meanwhile, Wibowo and Giessen's (2018) research shows that the distribution of benefits in carbon trading schemes tends to benefit local elites and actors with access to information and political networks, thereby exacerbating existing inequalities in indigenous communities (Wibowo & Giessen, 2018).

Studies related to indigenous peoples' responses and adaptations to carbon trading policies show a spectrum from rejection to strategic accommodation. Dewi and Putri (2022) argue that indigenous communities in Papua are developing various strategies for negotiation and resistance to carbon projects, including through the mobilization of indigenous identities and alliances with national and international civil society movements (Dewi & Putri, 2022). This is

reinforced by research by Tambunan et al. (2021) which shows that indigenous groups that have strong organizing and advocacy network support tend to be better able to defend their sovereignty in negotiations with carbon trading projects (Tambunan, Kinasih, & Napitupulu, 2021).

## Results and Discussion

### Legal and Policy Framework for Carbon Trading in Indonesia.

Carbon trading regulations in Indonesia have undergone significant evolution in the past decade, starting with the response to the global initiative *Reducing Emissions from Deforestation and Forest Degradation* (REDD+). The initial regulatory framework related to REDD+ was marked by the Regulation of the Minister of Forestry No. P.30/Menhut-II/2009 concerning Procedures for Reducing Emissions from Deforestation and Forest Degradation, which was later updated through P.20/Menhut-II/2012 (Indrarto et al., 2012). The momentum to strengthen carbon trading policy occurred after the ratification of *the Paris Agreement* through Law No. 16 of 2016, which affirmed Indonesia's commitment to reduce greenhouse gas emissions by 29-41% by 2030 (Kementerian Lingkungan Hidup dan Kehutanan, 2016). Further developments were marked by the issuance of the Regulation of the Minister of Environment and Forestry No. P.70/MENLHK/SETJEN/KUM.1/12/2017 concerning REDD+ Implementation Procedures which regulate the technical aspects of implementation, including benefit-sharing mechanisms and *safeguards* (Sari et al., 2018). The carbon trading policy in Indonesia reached a culmination point through the enactment of Presidential Regulation No. 98 of 2021 concerning the Implementation of Carbon Economic Value, which provides a comprehensive foundation for operationalization of various carbon economy instruments, including domestic and international carbon trading (Peraturan Presiden Republik Indonesia Nomor 98 Tahun 2021). This Presidential Regulation also regulates the establishment of the National Registry System for Climate Change Control (SRN PPI) as an integrated database for recording climate change mitigation and adaptation actions, as well as the issuance and transfer of carbon units.

Although Indonesia's carbon trading regulatory framework has gradually recognized the importance of protecting indigenous peoples, these provisions still show fundamental weaknesses. In Presidential Regulation 98/2021, the protection of indigenous peoples is only mentioned implicitly in the context of "paying attention to social aspects" in the implementation of the carbon economy, without elaborating specific mechanisms (Pasal 47 Peraturan Presiden Republik Indonesia Nomor 98 Tahun 2021). Similarly, the Regulation of the Minister of Environment and Forestry No. 70/2017 mentions *safeguards* as a principle for the implementation of REDD+, but its operationalization lacks adequate procedural details to protect substantive rights of indigenous peoples. Analysis of regulations shows that the protection of indigenous peoples tends to be positioned as a procedural aspect rather than a substantive right that must be respected (Gunawan & Thamrin, 2022). For example, the provision on consent on the basis of prior and non-coercive information (FPIC) is only generally regulated without adequate verification and validation mechanisms. This shortcoming reflects an instrumentalist approach to the protection of indigenous peoples, where the recognition of rights is aimed more at meeting formal requirements than transforming power relations (Urano, 2023). Furthermore, existing protection provisions have not accommodated the diversity of contextually specific customary land ownership and management systems in various regions of Indonesia, including Papua which has high complexity in its customary tenure system.

Significant gaps were identified between national-level carbon trading regulations and regional

regulations in Papua that govern the recognition and protection of indigenous peoples. Papua and West Papua Provinces already have specific legal instruments in the form of Papua Special Region Regulation (Perdasus) No. 23 of 2008 concerning Customary Rights of Customary Law Communities and West Papua Regulation No. 8 of 2012 concerning the Protection of Customary Law Communities (Dewi, 2017). Both regulations provide comprehensive recognition of indigenous peoples' sovereignty over their customary territories, including the right to refuse potentially harmful economic activities. However, national-level carbon trading regulations have not explicitly integrated or referred to those regional regulations, creating legal ambiguity in the implementation of carbon projects in Papuan customary territories (Fatem et al., 2020). As a result, developers of carbon projects often refer only to national regulations that have more minimal protection provisions, ignoring the higher standards set out in local regulations. This gap is exacerbated by the absence of a clear harmonization mechanism between national carbon trading policies and Papua's special autonomy, particularly in context of customary territory recognition and decision-making processes (Hidayat et al., 2021).

The implementation of carbon trading policies in Papua is marked by a complex conflict of norms between national law, local regulations, and customary law. Presidential Decree 98/2021 dominates regional regulations, although Law No. 21/2001 grants Papuan special autonomy to protect the rights of indigenous peoples, creating legal ambiguity (Undang-Undang Republik Indonesia Nomor 21 Tahun 2001). This situation creates ambiguity about which regulations should take precedence when there is a conflict of norms. In practice, the implementation of carbon projects in Papua often reflects the dominance of a centralistic approach that prioritizes national regulations, ignoring the specific nuances of local regulations on the rights of indigenous peoples (Royo & Wells, 2022). A conflict of norms also arises between the formal recognition of the role of indigenous peoples in national policies and the construction of "national interests" in the context of climate change mitigation that is often used to legitimize the abandonment of indigenous peoples' sovereignty. Furthermore, customary law, which is the main foundation for natural resource management for Papuan indigenous communities, is often positioned at the lowest hierarchy in implementation practices, even though it is constitutionally recognized through Article 18B paragraph (2) of the 1945 Constitution (Cahyadi & Danardono, 2019). This condition reflects structural problems in the architecture of carbon trading policies that have not fully integrated legal pluralism as Indonesia's socio-legal reality.

**The Reality of the Implementation of Carbon Trading Projects in Papuan Customary Territories.**

This study examines three carbon trading projects in Papuan customary territories with different but representative characteristics of carbon project typologies in Indonesia. The first project, the "Mamberamo Carbon Initiative" (MCI) in Jayapura Regency, is a large-scale REDD+ project covering 150,000 hectares of forest involving multinational companies and supported by international donors with an emission reduction target of 500,000 tons of $CO_2$ per year (Wandesforde-Smith & Moser, 2022). The second project, the "Tambrauw Forest Partnership" (TFP) in Tambrauw Regency, is a community-based carbon scheme with an area of 50,000 hectares initiated by a national NGO in collaboration with the federation of local indigenous peoples Tambunan, Kinasih, & Napitupulu, 2021). The third project, the "Sorong Mangrove Carbon Project" (SMCP) in Sorong Regency, focuses on the conservation and restoration of 25,000 hectares of mangroves with *a public-private partnership* approach involving local governments, national companies, and coastal community groups (Murdiyarso et al., 2022). These three projects show variations in implementation approaches, the volume of carbon credits

generated, as well as benefit distribution mechanisms that reflect the spectrum of carbon trading practices in Indonesia.

An analysis of the consultation process and implementation of FPIC in all three projects shows a significant gap between principles and implementation. In the MCI project, consultations are carried out through a series of formal meetings with village heads and specific indigenous leaders without involving the entire spectrum of community representatives, especially women's groups and the younger generation (Anderson & Kusters, 2023). Approval documentation focuses more on the administrative aspect of signing documents that are often not fully understood by the public due to the technical complexity and language used. In the TFP project, although the consultation process is more inclusive using local language and visual media, limitations are still found in the provision of information on potential risks and the duration of restrictions on access to forests (Garnett et al., 2021). The SMCP project demonstrates best practices through a six-month phased consultation approach by involving independent facilitators and providing space for internal community decision-making according to customary mechanisms (Nugraha & Ridwan, 2022). These findings indicate that the implementation of FPIC tends to be treated as an administrative procedure for project legitimacy, rather than as a dialogical process to ensure comprehensive understanding-based approval.

Indigenous peoples' involvement in the carbon project cycle shows a varied pattern but generally tends to decline as the project progresses. In the planning stage, MCI projects only involve communities as a source of information about forest conditions without substantive participation in the determination of project area boundaries, *safeguards mechanisms*, or benefit-sharing structures (Lee & Ingalls, 2023). At the implementation stage, the community is positioned as project workers with technical roles such as forest supervisors and patrol personnel, with no involvement in strategic decision-making. TFP projects show higher participation rates with community involvement in the management of conservation and restoration activities, although decisions on the sale of carbon credits remain dominated by the project management NGOs (Dhiaulhaq, McCarthy, & Yasmi, 2022). Only the SMCP project shows a *co-management* model with the formation of a management board representing indigenous peoples, governments, and companies with a clear division of authority. The monitoring and evaluation of all three projects is dominated by international indicators, less involving local perspectives (Eriksen, Nightingale, & Eakin, 2023).

A comparison of the governance models of the three projects reveals different implications for the sovereignty of indigenous peoples. The company-dominated governance model of MCI results in a hierarchical structure with limited community involvement in consultation, reflecting a significant transfer of power from indigenous peoples to external actors (Myers, Intarini, Sirait, & Maryudi, 2020). In this context, indigenous peoples' sovereignty over their traditional territories is reduced to consultative rights without veto power. The TFP model with a community-based approach results in a more collaborative governance structure, but control over technical and financial aspects remains with the managing NGOs, creating dependency and limiting community autonomy (Mbatu, 2021). The SMCP model with *a co-management* approach is relatively better able to defend the sovereignty of indigenous peoples through clear division of authority and allows for the integration of indigenous decision-making mechanisms in the formal structure of the project (Sapulette & Tokede, 2022). These findings suggest that the implementation of carbon projects in Papua tends to create new forms of territorialization that transform the status of indigenous peoples from land owners to managers or even stakeholders within their own territories, although the degree of such transformation varies

depending on the governance model applied.

**The Impact of Carbon Trading Projects on Indigenous Sovereignty.**

Carbon trading projects in Papua's customary territories have led to significant changes in tenure systems and access to natural resources. Research at three project sites revealed the formalization of previously flexible territorial boundaries, which were managed through agreements among indigenous groups (Van Dam & Humphreys, 2021). The mapping and delineation of carbon project areas often result in rigid territorial definitions that overlook the kinship-based land ownership central to Papuan customary tenure. For instance, the Mamberamo Carbon Initiative (MCI) in Jayapura Regency reclassified parts of customary territory into "carbon conservation zones," restricting access to subsistence activities like seasonal hunting and agriculture that have been practiced for generations (Astuti & McGregor, 2017). Similarly, in Tambrauw Regency, while the TFP project acknowledges traditional rights, its zoning creates fragmentation that disrupts traditional mobility related to livelihoods. This reflects Corbera's (2021) concept of "carbon territorialization," which transforms forests from communal spaces into regulated carbon reservoirs for global markets.

The commodification of traditional ecological knowledge and customary forest management practices poses long-term risks to cultural identity of indigenous peoples. During the drafting of carbon project documents, indigenous knowledge about biodiversity and conservation practices is often extracted and converted into technical data for carbon calculations, without recognizing the underlying value systems (Howell, 2019). In Jayapura, traditional sasi practices are reduced to mere "local conservation mechanisms" in project documentation (Ungirwalu et al., 2019). Local wisdom in forest management is frequently subordinated to a "scientific forestry" approach that prioritizes quantitative measurement, reflecting "extractive conservation" where traditional knowledge is accommodated only insofar as it aligns with global climate goals (Büscher & Fletcher, 2020). Ironically, while some projects market carbon credits using the narrative of "local wisdom," their implementation often undermines these knowledge systems.

The economic impacts and benefit distribution of carbon trading projects reveal patterns that generally erode indigenous economic sovereignty. Analysis of benefit-sharing schemes across the three projects indicated inequalities in the distribution of economic benefits (Luttrell et al., 2018). In the MCI, only 20% of carbon credit sales revenue is allocated to indigenous peoples, with the remainder going to project developers, governments, and operational costs. Moreover, benefits are often collective, tied to infrastructure projects or welfare programs dictated by project managers, limiting community autonomy in fund usage (Duchelle et al., 2018). Although TFP and SMCP offer higher benefit-sharing percentages (30-40%), their fund management structures remain dominated by formal mechanisms that do not integrate with traditional economic systems. These findings support West's (2016) assertion that carbon projects can create new economic dependencies, undermining the subsistence systems that previously provided greater autonomy for indigenous peoples. While some families report increased income from project involvement, the shift from subsistence producers to beneficiaries or workers raises concerns about food sovereignty and long-term economic independence (West, 2016).

**Indigenous Peoples' Response and Adaptation Strategy.**

This study explores the diverse responses of indigenous peoples in Papua to carbon trading projects, ranging from outright rejection to strategic accommodation. In Ingkondi Village, Jayapura Regency, indigenous communities actively resisted the Mamberamo Carbon Initiative

(MCI) by refusing to participate and conducting customary rituals to prohibit access to forest areas claimed by the project, rooted in historical land-grabbing experiences (Dewi & Putri, 2022). Conversely, in Wensi Village, Tambrauw Regency, the community engaged in TFP projects while reinforcing traditional management systems in areas outside project (Cromberg, Duchelle, & Rocha, 2018). Malaseme Village showcased a "mimicry and modification" model, where community adapted the SMCP project structure to fit their customary management logic (Bong et al., 2019). These varied responses highlight evolving agency of indigenous peoples shaped by historical contexts and internal dynamics.

Mobilizing indigenous identities and forming alliances with civil society are crucial strategies for addressing power imbalances in carbon trading projects. In all three research sites, there was a notable strengthening of indigenous identity, which underpinned territorial claims and sovereignty through the revitalization of customary practices (Cámara-Leret, Fortuna, & Bascompte, 2019). In Jayapura, indigenous groups allied with the Alliance of Indigenous Peoples of the Archipelago (AMAN) for national advocacy and access to international networks (Royo & Wittman, 2022). In Sorong, the Moi community partnered with environmental NGOs to gain technical knowledge and funding, enhancing their capacity to engage critically in SMCP projects (Moeliono et al., 2020). This identity mobilization not only serves as a political tool but also strengthens internal cohesion and revitalizes traditional ecological knowledge.

Indigenous communities are increasingly using formal legal instruments to bolster customary sovereignty in carbon trading contexts. In Tambrauw, they leveraged Constitutional Court Decision No. 35/PUU-X/2012 and Ministerial Regulation No. 32/2015 to seek recognition of customary forests, enhancing their legal standing in negotiations (Arizona & Cahyadi, 2019). In Jayapura, efforts are underway to develop a Regional Regulation recognizing customary rights, explicitly addressing carbon trading (Kawai & Scheeles, 2022). This legal strategy is supported by participatory mapping and documentation of traditional knowledge, reflecting what Larson et al. (2023) describe as "legal bricolage," creatively utilizing various legal instruments to assert indigenous sovereignty in climate change policies.

Indigenous initiatives in renegotiating carbon projects illustrate constructive dynamics in power relations. In Sorong, the Moi community successfully renegotiated the SMCP benefit-sharing scheme, increasing their share from 30% to 45% (Thuy et al., 2021). In Tambrauw, indigenous women's groups established Sasi Perempuan, integrating traditional economic activities with conservation goals, which became an official component of the TFP project (Liswanti, Tamara, & Djoudi, 2022). A significant transformation occurred in Jayapura, where a coalition of indigenous peoples developed a "Customary Carbon" model that merges carbon trading with customary governance, serving as a basis for negotiations with project developers (Safitri & Bosko, 2021). These initiatives demonstrate that indigenous peoples are not passive subjects of carbon trading policies but active agents capable of reformulating projects to respect their sovereignty.

**Reformulation of Approach: Towards a Carbon Trading Model that Protects Indigenous Peoples' Sovereignty.**

The current carbon trading policy development paradigm often overlooks sovereignty of indigenous peoples, functioning as an extension of an extractive economy that prioritizes financial gain over socio-ecological sustainability (Lohmann, 2021). This approach reflects structural inequalities in global environmental governance, marginalizing local perspectives and knowledge in decision-making (Schroeder, 2020). Numerous cases demonstrate that

implementing carbon projects without meaningful indigenous involvement can lead to conflict, displacement, and loss of access to traditional resources (Cavanagh & Benjaminsen, 2022).

To reformulate carbon trading policies, a fundamental transformation based on three key principles is necessary. First, there must be full recognition of indigenous peoples' sovereignty as rightful owners of their traditional territories and carbon resources (Winer, Murphy, & Ludwick, 2022). Second, distributive justice should ensure equitable economic benefits, acknowledging the historical contributions of indigenous peoples in forest protection (Martin et al., 2021). Third, a dialogical approach is essential, prioritizing two-way communication, respecting local knowledge systems, and recognizing communities' rights to approve or reject projects based on FPIC (Free, Prior, and Informed Consent) principles (Dehm, 2022).

An alternative model based on indigenous sovereignty would empower local communities to control carbon initiatives within their territories, positioning them as primary designers, implementers, and beneficiaries of these projects (Duchelle et al., 2023). This model includes community capacity building, the use of context-appropriate technology, and decision-making mechanisms that strengthen indigenous institutions (McElwee et al., 2020). Evidence from Amazon shows that indigenous-led approaches effectively protect forests and enhance socio-economic well-being (Vasco et al., 2021).

For the indigenous peoples of Papua, reformulating carbon trading policies could significantly strengthen their sovereignty. This approach may enhance their bargaining power in negotiations with government and business actors (Fatem et al., 2022). Recognizing indigenous rights to carbon can serve as a tool to defend their territories against deforestation and degradation caused by extractive industries (Phelps, Webb, & Agrawal, 2020). Additionally, revenue from carbon projects can support cultural revitalization and social infrastructure responsive to local needs (Garnett et al., 2021). This reformulation also creates space for articulating indigenous political identities and aspirations within global environmental governance (Sikor et al., 2021).

Implementing indigenous sovereignty-based carbon trading models requires strong political will and paradigm shifts at both global and national levels. Updating legal frameworks to explicitly recognize indigenous carbon rights, establishing accessible funding mechanisms, and providing technical support that respects local knowledge are essential steps toward a more equitable and sustainable carbon trading system (Sunderlin et al., 2022). Ultimately, this reformulation not only aids in climate change mitigation but also bolsters the global movement for environmental justice and the recognition of indigenous rights (Temper et al., 2021).

**Challenges and Opportunities for the Integration of Indigenous Peoples' Sovereignty in Carbon Trading Policies.**

Transforming carbon trading policies to incorporate indigenous peoples' sovereignty encounters several structural and bureaucratic challenges. Institutional fragmentation at the national level complicates authority over forests, land, and climate change, as various ministries often have conflicting interests (Corbera & Schroeder, 2021). Bureaucratic complexities hinder the recognition of indigenous rights and their participation in decision-making (Larson et al., 2023). Additionally, there is a disconnect between international commitments and local implementation, with many national regulations failing to fully integrate UNDRIP and FPIC principles in carbon projects (Bayrak & Marafa, 2022). Limited financial and technical resources further restrict governments' ability to create comprehensive regulatory frameworks, while many indigenous communities struggle to access necessary information and technology (Duchelle et

al., 2021).

Reconciling the global carbon market's interests with indigenous sovereignty presents its own set of challenges. Market-driven approaches focused on efficiency often conflict with indigenous perspectives that view forests as integral to their spiritual and cultural identity (Sullivan, 2022). Current international carbon verification standards do not adequately reflect local knowledge systems (Lyster, 2021). Furthermore, differences in language and understanding between market participants and indigenous peoples hinder effective collaboration (Howson & Kindon, 2023). The push for standardized carbon projects can threaten the diversity of traditional forest management practices (Astuti & McGregor, 2022).

Despite these challenges, there are significant opportunities for synergy between climate change mitigation and recognition of indigenous sovereignty. Research indicates that forests managed by indigenous peoples can sequester more carbon and support biodiversity (Walker et al., 2023). Global focus on climate issues allows for the integration of indigenous perspectives into policy discussions, exemplified by initiatives like the Local Communities and Indigenous Peoples Platform under the UNFCCC (Tengö et al., 2021). The rise of socially responsible investment encourages businesses to uphold indigenous rights in carbon projects (Duchelle et al., 2022). Advances in technology enable better documentation of indigenous territories, reinforcing their sovereignty and access to carbon markets (DeVore, 2021). Additionally, a growing transnational network of indigenous peoples facilitates knowledge sharing and advocacy (Claeys & Delgado Pugley, 2023).

To address these challenges and leverage opportunities, several recommendations emerge for stakeholders. Governments should strengthen legal frameworks recognizing indigenous carbon rights, develop equitable benefit-sharing mechanisms, and harmonize policies related to forests and climate change (Larson et al., 2022). Companies are encouraged to adopt practices aligned with FPIC principles and invest in community capacity building (Wunder et al., 2021). Civil society organizations can facilitate dialogue and support indigenous negotiations with market participants (Sikor et al., 2022). Indigenous communities should focus on strengthening governance systems and documenting traditional ecological knowledge (Schroeder & McDermott, 2021). Collaboration among these stakeholders is essential to create a carbon trading ecosystem that effectively mitigates climate change while empowering indigenous sovereignty (Howell, 2022).

Ultimately, integrating indigenous peoples' sovereignty into carbon trading policies necessitates a fundamental paradigm shift, requiring patience and long-term commitment from all parties. The potential benefits extend beyond climate targets and biodiversity, promoting social justice for communities that have historically protected forests. By addressing structural barriers and capitalizing on emerging synergies, carbon trading can reinforce, rather than undermine, indigenous sovereignty in natural resource management (McAfee, 2023).

## Conclusion

The study concludes that carbon trading policies in Papua, while supporting climate change mitigation through Nationally Determined Contributions (NDC) commitments, often threaten the sovereignty of indigenous peoples. National regulations, such as Presidential Decree No. 98/2021, tend to overlook principles of Free, Prior, and Informed Consent (FPIC) and customary rights. This oversight leads to a lack of indigenous peoples' participation in decision-making processes, resulting in the rigid formalization of customary territories and an unfair distribution

of benefits that disproportionately favors companies or local elites. Legal ambiguities between national regulations and regional regulations, such as the Papuan Perdasus, further weaken the position of indigenous peoples, complicating their efforts to defend their rights to traditional land and natural resources that have been passed down through generations.

Despite these challenges, indigenous Papuans are demonstrating remarkable resilience through various strategies, including resistance, accommodation, and negotiation. Initiatives like the "Indigenous Carbon" project and alliances with organizations such as the Alliance of Indigenous Peoples of the Archipelago (AMAN) exemplify their proactive approach. There is a pressing need for policy reformulation that prioritizes recognition of customary sovereignty, distributive justice, and a dialogue process grounded in FPIC principles.

Indigenous people-based carbon models, as successfully demonstrated in the Amazon, can effectively support both environmental sustainability and socio-economic well-being. Global opportunities, such as the UNFCCC platform and advancements in geospatial technologies, serve to reinforce customary claims and provide indigenous communities with tools to assert their rights. However, challenges such as institutional fragmentation and pressures from global markets necessitate strong political will and cross-party collaboration to address these issues effectively.

With this reformulation, carbon trading can evolve into a powerful tool for promoting environmental justice and strengthening the sovereignty of indigenous Papuans. By ensuring that indigenous voices are heard and respected in the carbon trading framework, it is possible to create a more equitable system that not only mitigates climate change but also uplifts the rights and livelihoods of indigenous communities. This holistic approach can lead to sustainable development that honors the cultural heritage and ecological knowledge of indigenous peoples, ultimately fostering a more just and inclusive future for all stakeholders involved.

Furthermore, integrating traditional ecological practices into carbon trading initiatives can enhance biodiversity conservation and ecosystem resilience. By valuing indigenous knowledge systems, policymakers can develop strategies that are not only effective in reducing carbon emissions but also promote the well-being of local communities. This synergy between environmental goals and indigenous rights can pave the way for innovative solutions that address both climate change and social equity, ensuring that the benefits of carbon trading are shared fairly among all participants.

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