

Challenges of collaborative governance peatlands in Central Kalimantan, Indonesia

Hafiz Awlia Ramadhan,¹ Sandy Nofyanza,¹ Nining Liswanti,¹ Bimo Dwi Satrio,¹ Laura Graham,² Deti,² Hendrik Segah³ and Dhanu Pitoyo⁴

Key messages

- Bureaucratic inefficiency continues to obstruct collaborative peatland governance, preventing effective stakeholder engagement.
- Limited data on peatlands are shared due to information silos, hindering informed decision making.
- It is crucial to strengthen local government autonomy for sustainable peatland management, reducing dependence on external facilitators and fostering long-term capacity.

Introduction

Indonesia has 13.43 million hectares of peatlands, distributed across four main islands, with Kalimantan possessing 4.54 million hectares, accounting for 33.8% of the country's total peatlands (Anda et al. 2021). These vast ecosystems store 13.6–40.5 gigatons of carbon — around 30% more than mineral forests (Murdiyarso et al. 2010; Warren et al. 2017). In addition, peatland ecosystems play other crucial roles, such as acting as a water reservoir that can prevent flooding and provide water during the dry season. This function also creates favourable conditions for preserving biodiversity in the area (Harendra et al. 2018). However, peatlands have endured significant degradation due to deforestation, land conversion, fires, and resource exploitation, such as illegal logging or mining. The 2015 fire season underscored the severe consequences of peatland degradation, intensified by El Niño-driven droughts and rising temperatures (Harrison et al. 2016; IPB 2023). Without collaborative and unified conservation efforts from all stakeholders, the harmful effects of peatland degradation will continue to increase over time.

Over the past decade, Indonesia has prioritized peatland management, emphasizing protection and restoration policies. The earlier policy of a moratorium on new business licences to operate in primary forests and peatlands was enacted in 2011 and became permanent in 2019. Nevertheless, this policy has posed challenges for co-governance in conservation efforts. Moreover, the establishment of the Peatland Restoration Agency (BRG) in 2016, which later expanded into the Peatland and Mangrove Restoration Agency (BRGM), underscored the nation's commitment to rehabilitating 1.2 million hectares of peatlands by 2024. However, peatland fires — including those in 2019 — have hampered the achievement of restoration targets. Despite the challenges and a lack of coordination, initiatives for collaborative governance involving all stakeholders are needed to improve peatland conservation and restoration. For example, in our study site, the Mawas peat dome in Central Kalimantan, more than 30 entities share management roles, but misalignment between national policies and practices in the field often hinder progress (Hutagaol-Martowidjojo 2019; Uda et al. 2020).

Conservation and restoration initiatives require effective coordination and collaboration among stakeholders, as these efforts span multiple dimensions. However, challenges persist, including conflicting interests, insufficient cross-sectoral incentives for collaboration, and limited community engagement. To examine these issues, we combined a political economy analysis (Brockhaus and Angelsen 2012; Hall 1997) with social network analysis to identify barriers to more effective, efficient, and equitable governance of peatland conservation and restoration.

1 CIFOR-ICRAF
 2 The Borneo Orangutan Survival Foundation (BOSF)
 3 Center for Development of Science, Technology and Peatland Innovation (PPIIG), University of Palangka Raya
 4 Sociology Department, University of Palangka Raya



Peatland in Mawas Conservation Area. Photo by BOSF Mawas documentation Team

In this brief, we aim to highlight the aspirations from various stakeholders at multiple levels regarding the existing governance structures surrounding conservation and restoration in peatland areas, particularly in Central Kalimantan. We began by collecting various government laws, articles, and academic papers related to peatland regulation and the local contexts. We conducted interviews with 51 key stakeholders at national, provincial, regency, and village levels. Additionally, our social network survey garnered 127 responses from stakeholders in the period from early 2024 to mid-2024. Our study used a political economy framework focusing on institutions, interests, ideas, and information (Brockhaus and Angelsen 2012; Hall 1997) to develop questionnaires and interview guidelines. Key stakeholders in Central Kalimantan's peatland policy domain were interviewed.

Our roster included institutions at national, provincial, regency, and village levels, initially based on Atmadja et al. (2014), and updated through stakeholder mapping from the Australian Centre for International Agricultural Research (ACIAR) project FST/2021/145, led by the Borneo Orangutan Survival Foundation (BOSF). The lists of stakeholders were verified by expert collaborators in Central Kalimantan who had extensive peatland governance experience.

The need for collaborative governance

The complexity of peatland governance demands collaboration among diverse stakeholders and overlapping interests to drive transformational

change (Januar et al. 2021). Collaborative governance involves public agencies working directly with non-state actors through a formal, consensus-driven, and deliberative decision-making process to develop or implement policies and manage public resources (Ansell and Gash 2007). This approach emerged as an alternative to address the shortcomings of top-down governance – such as inefficiency, high costs, and political entanglements (Ansell and Gash 2007) – and the limited community engagement in peatland governance despite the importance of local knowledge and participation (Januar et al. 2021). Central to this model is inclusivity and active participation (Emerson et al. 2012), fostering partnerships between state and non-state entities to ensure that climate-related strategies are both viable and broadly supported, contributing to sustainable governance and societal transformation (Fritz et al. 2024). In theory, collaborative governance enhances coordination, resource sharing, and knowledge integration (Emerson and Nabatchi 2015). In practice, scholars have found that collaborative governance can strengthen village governance planning in peatland management (Januar et al. 2021). While challenging and time-consuming, a collaborative approach ensures the sustainability of restoration programmes through power sharing, transparency, holistic understanding, deeper insights, and wider-reaching outcomes (Toumbourou et al. 2024). However, such collaboration is often hindered by political and economic factors, including power imbalances that favour a few dominant actors and profit-driven innovations that neglect equity and sustainability (Hudson and Leftwich 2014). A political economy perspective provides valuable insights by identifying who wins and loses in governance processes, and by examining how resources are

distributed over time, offering pathways for more inclusive and equitable change. Atkinson and Alibašić (2023) argue that challenges in collaborative governance can also arise from disagreements in interpreting the restoration agenda itself. The issues surrounding peatlands cannot be viewed in isolation – as Puspitaloka et al. (2021) mentioned, a narrowly focused solution would risk the overall success of the restoration efforts.

Case study: Mawas Conservation Area

Located in the Mantangai Subdistrict, Kapuas Regency, Central Kalimantan, the Mawas Conservation Area is one of the BOSF's primary sites to enhance local livelihoods by providing alternative sources of income while addressing environmental degradation caused by illegal activity (Goldstein et al. 2020). The surrounding communities are predominantly Indigenous Dayak Ngaju people, along with a smaller population of settlers⁵ from Java and other areas. These communities heavily depend on their environment for fishing and agriculture; while most of them have abandoned the use of fire, its practical and cost-effective application remains (Atkinson and Alibašić 2023). The assertion that local communities lack sustainable knowledge in natural resource utilization is inaccurate. As Yunus et al. (2025) noted, a "value-action gap" exists between sustainable practices and community understanding of sustainability, particularly among those prioritizing economic gains. This highlights the urgent need for sustainable governance that balances ecological preservation with local needs.

The Mawas Conservation Area was subject to various external interventions, from extractive activities to market-based conservation approaches – due to its degraded peatlands, deforestation, and potential for carbon sequestration – with international cooperation and funding supporting local community development and environmental conservation efforts. The landscape was the site of the Mega Rice Project (MRP), which aimed to convert 1 million hectares of peatland into rice paddies. However, the project's industrial-scale peat draining and deforestation – occurring alongside traditional swidden agricultural practices and exacerbated by an exceptionally severe El Niño event in 1997–1998 – led to massive forest fires in 1997. These fires released an estimated 0.81–2.67 gigatons of carbon into the atmosphere (Miles 2021).

Extensive conservation work in Mawas was initiated by BOSF, which started conserving intact peatland spared

from the fires to protect the orangutans' habitat. Another intervention, the Central Kalimantan Peatland Project (CKPP), active from 2006 to 2008, was one of the major efforts aimed at rehabilitating peatlands and reducing poverty in communities located in the former MRP area. This initiative involved collaboration among various stakeholders, including state and non-state actors, such as CARE Indonesia, Wetlands International, the World Wide Fund for Nature (WWF), BOSF, the University of Palangka Raya, as well as the governments of both Central Kalimantan Province and Indonesia (Miles 2020). Following the conclusion of CKPP, the Kalimantan Forests and Climate Partnership (KFCP) – Indonesia's first pilot project for REDD+ – was launched in 2010 and ran until 2014 (Atmadja et al. 2014). Collaboration continued during this period, involving CARE Indonesia, BOSF, the Indonesia-Australia Forest Carbon Partnership (IAFCP), the World Bank, and multiple levels of Indonesian government (KFCP 2009). These sustained collaborative initiatives in the Mawas area demonstrate stakeholders' interests in protecting the peatlands from further deforestation and degradation.

Despite the controversy surrounding the MRP, the narrative of achieving food sovereignty and security remains a common justification for converting peatlands into agricultural lands. In 2020, Indonesian President Joko Widodo responded to the Food and Agriculture Organization of the United Nations (FAO) warning of a food security crisis in the aftermath of the COVID-19 pandemic by supporting the launch of a new Food Estate Programme in Central Kalimantan (ANTARA 2020). More recently, President Prabowo Subianto has expanded Jokowi's Food Estate legacy by establishing a new target area for agriculture as well as establishing the new Coordinating Ministry for Food Affairs (Hakim 2024).

Another issue in the landscape is the ecosystem services from the conservation activity. Over the past decade, market-oriented conservation policies have continued to be promoted. This included REDD+ (although not as successful in Central Kalimantan as in other regions); the new type of forestry licenses known as the Ecosystem Restoration Concessions (ERCs); and social forestry.⁶ Although there are no for-profit ERCs located in the Mawas Conservation Area, restoration was still being undertaken by BOSF. Some interviewed stakeholders were also keen on the ERCs since they were the main vehicle for attracting private-sector participation in voluntary – and potentially mandatory – carbon trading, which would be a lucrative business in a peatland landscape.

5 The arrival of settlers through the transmigration programme: <https://www.transmigrasi.go.id/profil/sejarah-kementrans/#:~:text=Antara%20tahun%201950%2D1959%20pemerintah,biaya%20sendiri%20tanpa%20bantuan%20pemerintah.> Accessed on 18 March 2025)

6 Ecosystem Restoration Concessions were established under the Minister of Forestry Decree No. 159/Menhut-IL/2004 on Ecosystem Restoration in Production Forest Areas. These concessions were officially referred to as *Izin Usaha Pengelolaan Hasil Hutan Kayu Restorasi Ekosistem dalam Hutan Alam* (IUPHHK-RE) or recently as *Perizinan Berusaha Pemanfaatan Hutan Restorasi Ekosistem* (PBPH-RE) following the enactment of Law No. 11/2020 on Job Creation.

Notes from the field

Recentralized authority and disengagement in peatland

Peatlands are a highly strategic landscape, leading to intense competition among stakeholders for control, and leaving limited room for collaboration or negotiation (Purwanto 2018; Brockhaus and Angelsen 2012). Unlike the clearly defined responsibilities seen in road infrastructure – where national authorities oversee major roads, while provincial governments manage intercity roads, and local governments handle intracity roads – peatland policies lack clear jurisdictional clarity. National government representatives assert primary authority over peatland programmes (Sanders et al. 2017), while provincial governments push for greater autonomy to manage their jurisdictions without excessive national interference. This ambiguity frequently sidelines local government offices, leading to their growing disengagement from what is meant to be a collaborative governance approach, according to a local government official we interviewed. A local stakeholder voiced concern regarding their limited influence, characterizing their role as primarily symbolic and hampered by bureaucratic inefficiencies. Furthermore, the recent trend of recentralizing governance has resulted in locally developed strategies being superseded by nationally mandated programmes due to bureaucratic prioritization. While these concerns are widely expressed, it is essential to consider that the ongoing trend of forest recentralization in Indonesia was partly a response to the extensive deforestation that occurred during the post-Soeharto decentralization era (Muhyidin 2019).

Stakeholders widely recognized the importance of collaborative governance in achieving effective peatland management (Ansell and Gash 2007). However, interpretations of this concept differ significantly between national and subnational stakeholders. National stakeholders, primarily government representatives, have stated that collaborative governance is most effective when rooted in regulatory activities to ensure programme alignment across levels of government. By contrast, subnational stakeholders have expressed the view that collaboration should focus on incorporating the needs and aspirations of local communities, who are often seen as possessing deeper knowledge of – and connection to – their environment.

Efforts to improve peatland governance are showing varied results, as stakeholders have different priorities. Interestingly, the existence of more than 30 laws and regulations on peatland management has presented opportunities and challenges. While these regulations aim to accommodate diverse stakeholder interests, they have also led to complexity in implementation.



PPIIG Peatland Landscape. Photo by Hafiz Awlia Ramadhan/CIFOR-ICRAF

To foster effective collaboration between national and subnational stakeholders, it would be beneficial to review and refine the regulatory framework. One potential solution to address this issue is the establishment of a dedicated agency to oversee all peatland governance activities, providing a centralized framework for coordination and decision making. To be effective, this agency would need strong regulatory backing and diverse representation from various sectors, including local communities, who are often marginalized in governance processes. This inclusive approach would help ensure that responsibilities are



KELOLA Kick Off meeting-Palangka Raya 7 December 2023. Photo by Nining Liswanti/CIFOR-ICRAF

allocated transparently, and that local communities' voices are heard, rather than being overshadowed by national priorities. Without such an institution, there is a risk that local communities' perspectives will continue to be neglected, undermining efforts to achieve inclusive and effective governance. Another suggestion for improving stakeholder engagement in peatland governance is to redesign the existing collaborative model, with a focus on strengthening the role and commitment of existing institutions. Our analysis reveals that while multiple stakeholders are involved, many lack meaningful decision-making power due to bureaucratic constraints within this framework. To address this shortcoming, the redesigned model should prioritize the empowerment of stakeholders, particularly those at local level, to take an active role in decision-making processes.

Data and information are hoarded like gold

Data and information on peatland governance – such as regulations, peat characteristics, and water levels – are often fragmented due to inadequate coordination between national and subnational stakeholders, as well as among subnational actors. This lack of coordination can lead to challenges during policy formulation and programme planning, resulting in overlapping initiatives at the subnational level. To improve collaboration, stakeholders could

benefit from sharing knowledge, tools, and information more openly. However, some institutions may be hesitant to do so due to a natural tendency to focus on their own priorities and areas of expertise (Nofyanza et al. 2020).

A notable challenge is that sectoral interests often guide the work of key stakeholders, with each government institution operating within its own jurisdiction and distinct responsibilities, as noted by a representative from the local government. While this may not be an issue for stakeholders with significant power and information, the siloed nature of governance can make it difficult for less-informed stakeholders to feel included. This sense of exclusion can lead to frustration and hinders efforts to establish effective collaborative governance (Diamond and Allcorn 2009). Additionally, some organizations may be hesitant to share information due to concerns about partnerships or project status – as noted by a representative from a local NGO – such as the perceived status of the Mawas Conservation Area. Others have suggested that change in partnerships, such as the one between KLHK (Kementrian Lingkungan Hidup dan Kehutanan, The Ministry of Environment and Forestry)⁷ and WWF,⁸ may contribute to this reluctance (Arumingtyas and Saturi 2020).

⁷ Since President Prabowo Presidency, this ministry had been separated into The Ministry of Environment and The Ministry of Forestry by Presidential Decree No. 140 (2024)

⁸ SK.32/Menlhk/Setjen/KUM.1/1/2020

Dependency on NGOs for resources; lack of institutional capability

Since most resources – such as funding, expertise, and information – are concentrated in the central government's network, subnational governments face significant challenges in implementing policies and programmes mandated by laws and regulations. For instance, the creation of the subnational Peat Ecosystem Protection and Management Plan (*Rencana Perlindungan dan Pengelolaan Ekosistem Gambut*, or RPPEG) – assigned to provincial environmental offices by the Ministry of Environment and Forestry (MoEF) – required facilitation and resources obtained through collaboration with non-governmental organizations (NGOs), academic institutions, and various experts, not through the state budget. While NGOs helped subnational governments overcome bureaucratic constraints (Gemmill and Bamidele-Izu 2002), this collaboration unfortunately did not enhance subnational office staff's skills and abilities to develop and implement their own initiative in policymaking or programme management.

Conclusion

As our analysis has shown, peatland governance in Central Kalimantan is characterized by complex interactions among diverse stakeholders who often have conflicting interests. This research highlighted several critical issues, including the focus on information exchange over collaborative action; fragmented networks hindering effective governance; legal constraints limiting stakeholder participation; and the lack of local community involvement in restoration programmes. These findings underscore the need for a more inclusive and collaborative approach to peatland management. To achieve sustainable peatland governance, it is essential to emphasize restoration, enhance collaboration among stakeholders, and integrate technology into management practices.

Acknowledgements

The research was funded by the Australian Centre for International Agricultural Research (ACIAR) through grant No. CLIM/2022/138. The authors wish to thank the Central Kalimantan Provincial Government and the Kapuas Regency Government for providing their support to the CIFOR-ICRAF team during the study. We are also grateful to the academic staff from the University of Palangka Raya and the Environmental Monitoring Team of the Borneo Orangutan Survival Foundation, which supported us during the study. The authors would also like to thank Bondan Winarno

(National Research and Innovation Agency, BRIN) and Sofyan Ansori, a Ph.D. candidate in the Department of Anthropology at Northwestern University, for their valuable comments and feedback for this brief.

Sandy Nofyanza receives a UK Research and Innovation (UKRI) Frontier Research Grant (EP/X023222/1).

References

- Anda M, Ritung S, Suryani E, Sukarman, Hikmat M, Yatno E, Mulyani A, Subandiono RE, Suratman, Husnain. 2021. Revisiting tropical peatlands in Indonesia: Semi-detailed mapping, extent and depth distribution assessment. *Geoderma* 402:115235. <https://doi.org/10.1016/j.geoderma.2021.115235>
- Ansell C and Gash A. 2008. Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory* 18(4):543–571. <https://doi.org/10.1093/jopart/mum032>
- ANTARA Indonesian News Agency. 23 September 2020. Implementation of food estate program is in progress: Jokowi. Implementation of food estate program is in progress: Jokowi - ANTARA News
- Arumingtyas L and Saturi S. 31 January 2020. Kala Kementerian Lingkungan Putus Kerja Sama dengan WWF Indonesia. *Mongabay*. <https://www.mongabay.co.id/2020/01/31/kala-kementerian-lingkungan-putus-kerja-sama-dengan-wwf-indonesia/>. Accessed 25 March 2025.
- Atmadja SS, Indriatmoko Y, Utomo NA, Komalasari M, Ekaputri AD. Kalimantan Forests and Climate Partnership, Central Kalimantan, Indonesia. 2014. *In* Sills EO, Atmadja S, De Sassi C, Duchelle AE, Kweka D, Resosudarmo IAP, Sunderlin WD. eds. REDD+ on the ground: A case book of subnational initiatives across the globe. Bogor, Indonesia: Center for International Forestry Research (CIFOR). <https://doi.org/10.17528/cifor/005202>
- Atkinson CL and Alibašić H. 2023. Prospects for governance and climate change resilience in peatland management in Indonesia. *Sustainability* 15(3):1839. <https://doi.org/10.3390/su15031839>
- Brockhaus M and Angelsen A. 2012. Seeing REDD+ through 4Is: A political economy framework. *In* Angelsen A, Brockhaus M, Sunderlin WD, Verchot L. eds. *Analysing REDD+: Challenges and choices*: 15–30. Bogor, Indonesia: Center for International Forestry Research (CIFOR)
- Brockhaus M, Di Gregorio M, Djoudi H, Moeliono M, Pham TT, Wong GY. 2021. The forest frontier in the Global South: Climate change policies and the promise of development and equity. *Ambio* 50:2238–2255. <https://doi.org/10.1007/s13280-021-01602-1>
- Diamond MA and Allcorn S. 2009. Silo mentality. *In* *Private selves in public organizations*. New York: Palgrave Macmillan. 49–72. https://doi.org/10.1057/9780230620094_4

- Emerson K and Nabatchi T. 2015. Collaborative governance regimes. Public management and change series. Washington, DC: Georgetown University Press. <https://www.jstor.org/stable/j.ctt19dzcvf>
- Emerson K, Nabatchi T, Balogh S. 2012. An integrative framework for collaborative governance. *Journal of Public Administration Research and Theory* 22(1):1–29. <https://doi.org/10.1093/jopart/mur011>
- Fritz L, Baum CM, Brutschin E, Low S, Sovacool BK. 2024. Climate beliefs, climate technologies and transformation pathways: Contextualizing public perceptions in 22 countries. *Global Environmental Change* 87, 102880. <https://doi.org/10.1016/j.gloenvcha.2024.102880>
- Gemmill B and Bamidele-Izu A. 2002. The role of NGOs and civil society in global environmental governance. In Esty DC and Ivanova MH. *Global environmental governance: Options & opportunities*. New Haven, Connecticut: Yale School of Forestry & Environmental Studies. 77–100.
- Goldstein JE, Graham L, Ansori S, Vetruta Y, Thomas A, Applegate G, Vayda AP, Saharjo BH, Cochrane MA. 2020. Beyond slash-and-burn: The roles of human activities, altered hydrology and fuels in peat fires in Central Kalimantan, Indonesia. *Singapore Journal of Tropical Geography* 41(2):190–208. <https://doi.org/10.1111/sjtg.12319>
- Hakim IA. 2024. Ditugasi Prabowo Wujudkan Swasembada Pangan, Menko Zulhas Andalkan Food Estate Papua. <https://www.kompas.tv/nasional/547599/ditugasi-prabowo-wujudkan-swasembada-pangan-menko-zulhas-andalkan-food-estate-papua>. Accessed 16 January 2025.
- Hall PA. 1997. The role of interests, institutions, and ideas in the comparative political economy of the industrialized nations. In Lichbach MI, Zuckerman AS. eds. *Comparative politics: Rationality, culture, and structure*. New York: Cambridge University Press. 174–207.
- Harenda KM, Lamentowicz M, Samson M, Chojnicki BH. 2018. The role of peatlands and their carbon storage function in the context of climate change. In Zielinski T, Sagan I, Surosz W. eds. *Interdisciplinary approaches for sustainable development goals*. GeoPlanet: Earth and Planetary Sciences. Springer International Publishing, Cham. 169–187. https://doi.org/10.1007/978-3-319-71788-3_12
- Harrison ME, Capilla BR, Thornton SA, Cattau ME, Page SE. 2016. Impacts of the 2015 fire season on peat-swamp forest biodiversity in Indonesian Borneo. In *International Peat Society*. eds. *Peatlands in harmony: Agriculture, industry & nature*. Proceedings of the 15th International Peat Congress: Oral presentations. International Peat Society. 713–717.
- Hudson D and Leftwich A. 2014. From political economy to political analysis. Research paper 25. Birmingham, UK: Developmental Leadership Program
- Hutagaol-Martowidjojo YRI. 2019. Borneo Orangutan Survival Foundation (BOSF): Building trust in diverse stakeholders. *Asian Case Research Journal* 23:539–560. <https://doi.org/10.1142/S0218927519500226>
- IPB University. 2023. IPB University presents experts, reviews the chance of El Nino occurrence, anticipatory steps and technological innovations to reduce its impacts. Bogor, Indonesia: IPB University. <https://www.ipb.ac.id/news/index/2023/05/ipb-university-presents-experts-reviews-the-chance-of-el-nino-occurrence-anticipatory-steps-and-technological-innovations-to-reduce-its-impacts/4-fb1e79cf0099732e2056522902c2bc0>. Accessed 11 February 2025.
- Januar R, Sari EN, Putra S. 2021. Dynamics of local governance: The case of peatland restoration in Central Kalimantan, Indonesia. *Land Use Policy* 102:105270. <https://doi.org/10.1016/j.landusepol.2020.105270>
- KFCP (Kalimantan Forests and Climate Partnership). 2009. Design document. Australia-Indonesia Partnership. iafc-p-kalimantan-design-doc-pd.pdf
- Miles WB. 2021. The invisible commodity: Local experiences with forest carbon offsetting in Indonesia. *Environment and Planning E: Nature and Space* 4(2):499–524. <https://doi.org/10.1177/2514848620905235>
- Miles WB. 2020. Forest fires – Indonesian experience highlights prevention challenges. *East-West Wire*. Honolulu, Hawaii: East-West Center. <https://www.jstor.org/stable/resrep26407>
- Muhyidin A. 2019. Guarding central government control over forest: Forest governance in the post decentralization Indonesia. *Jurnal Politik* 4(1):5. <https://doi.org/10.7454/jp.v4i1.186>
- Murdiyarso D, Hergoualc'h K, Verchot LV. 2010. Opportunities for reducing greenhouse gas emissions in tropical peatlands. *Proc. Natl. Acad. Sci.* 107, 19655–19660. <https://doi.org/10.1073/pnas.0911966107>
- Nofyanza S, Moeliono M, Selviana V, Dwisatrio B, Liswanti N, Tamara A, Komalasari M. 2020. Revisiting the REDD+ experience in Indonesia: Lessons from national, subnational and local implementation. Bogor, Indonesia: Center for International Forestry Research (CIFOR). <https://doi.org/10.17528/cifor/007880>
- Purwanto EA. 2018. Coping with policy paradoxes and actor interests in peatland and oil palm management in Indonesia. *Bisnis & Birokrasi: Jurnal Ilmu Administrasi dan Organisasi* 25(3). <https://doi.org/10.20476/jbb.v25i3.9966>
- Puspitaloka D, Kim Y-S, Purnomo H, Fulé PZ. 2021. Analysis of challenges, costs, and governance alternative for peatland restoration in Central Kalimantan, Indonesia. *Trees Forests and People* 6:100131. <https://doi.org/10.1016/j.tfp.2021.100131>
- Sanders AJP, Hyldmo HDS, Prasti H RD, Ford RM, Larson AM, Keenan RJ. 2017. Guinea pig or pioneer:

Translating global environmental objectives through to local actions in Central Kalimantan, Indonesia's REDD+ pilot province. *Global Environmental Change* 42:68–81. <https://doi.org/10.1016/j.gloenvcha.2016.12.003>

Uda SK, Schouten G, Hein L. 2020. The institutional fit of peatland governance in Indonesia. *Land Use Policy* 99:103300. <https://doi.org/10.1016/j.landusepol.2018.03.031>

Warren M, Hergoualc'h K, Kauffman JB, Murdiyarso D, Kolka R. 2017. An appraisal of Indonesia's immense peat carbon stock using national peatland maps: Uncertainties and potential losses from conversion. *Carbon Balance and Management* 12, 12. <https://doi.org/10.1186/s13021-017-0080-2>

Yunus M, Pagdee A, Baral H. 2025. Local livelihoods and determinants of peatland protection in Indonesia. *Trees Forests and People* 19:100800. <https://doi.org/10.1016/j.tfp.2025.100800>

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