

POWER ASYMMETRIES IN PEATLAND RESTORATION: A POLITICAL ECOLOGY PERSPECTIVE ON MULTI-STAKEHOLDER PARTICIPATION IN THE MENDAHARA–BATANGHARI PEAT HYDROLOGICAL UNIT

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ABSTRACT

Peatland ecosystems play a strategic role in global climate change mitigation through their capacity for carbon sequestration and hydrological regulation. However, peatland degradation in Indonesia demonstrates that environmental degradation is not merely an ecological issue but is also closely associated with power dynamics, public policies, and political-economic interests. This study aims to examine the dynamics of multi-stakeholder participation in peatland restoration and to analyze how power relations influence the effectiveness of restoration policy implementation within the framework of the peat hydrological unit. A qualitative research approach employing a participatory action research (PAR) design was adopted. Data were collected through participant observation, in-depth interviews, focus group discussions (FGDs), and document analysis in the Mendahara–Batanghari peat hydrological unit, Jambi Province, Indonesia. The data were analyzed using thematic analysis integrated with a political ecology perspective to examine power relations and conflicts of interest among stakeholders. The findings reveal that multi-stakeholder participation in peatland restoration remains largely procedural rather than substantive, as decision-making processes continue to be dominated by government institutions and corporate actors. Although local communities possess high legitimacy and valuable ecological knowledge, they remain marginalized due to limited access to resources and decision-making power. Furthermore, conflicts between economic development objectives, particularly the expansion of oil palm plantations and the ecological goals of peatland restoration constitute a major obstacle to the effectiveness of restoration programs. Peatland degradation is rooted in unequal power structures and broader political-economic processes that facilitate resource exploitation. Co-management based multi-stakeholder participation that emphasizes power redistribution, the strengthening of local institutions, and the integration of ecosystem-based policies through the peat hydrological unit framework is expected to enhance the long-term effectiveness of peatland restoration while promoting more equitable, inclusive, and sustainable natural resource governance.

Keywords: Political ecology, Peatland restoration, Multi-stakeholder participation, Co-management.

ABSTRAK

Ekosistem gambut memiliki peran strategis dalam mitigasi perubahan iklim global melalui fungsi penyimpanan karbon dan pengaturan hidrologi. Namun, degradasi gambut di Indonesia menunjukkan bahwa kerusakan lingkungan tidak hanya merupakan persoalan ekologis, tetapi juga berkaitan erat dengan dinamika kekuasaan, kebijakan, dan kepentingan ekonomi. Penelitian ini bertujuan untuk menganalisis dinamika partisipasi multipihak dalam restorasi gambut serta mengkaji bagaimana relasi kekuasaan

mempengaruhi efektivitas implementasi kebijakan restorasi dalam kerangka Kesatuan Hidrologis Gambut (KHG). Penelitian ini menggunakan pendekatan kualitatif dengan desain *Participatory Action Research* (PAR), melalui observasi partisipatif, wawancara mendalam, *Focus Group Discussion* (FGD), dan studi dokumentasi di wilayah kesatuan hidrologis gambut Mendahara–Batanghari, Provinsi Jambi. Analisis data dilakukan secara tematik dengan integrasi perspektif ekologi politik untuk mengungkap relasi kuasa dan konflik kepentingan antaraktor. Hasil penelitian menunjukkan bahwa partisipasi multipihak dalam restorasi gambut masih bersifat *551elola551ral* dan belum substantif dengan dominasi *551elol* negara maupun korporasi dalam proses pengambilan keputusan. Masyarakat lokal, meskipun memiliki legitimasi tinggi dan pengetahuan ekologis yang relevan, berada pada posisi marginal akibat keterbatasan akses terhadap sumber daya dan kekuasaan. Konflik kepentingan antara orientasi ekonomi, khususnya ekspansi perkebunan, dan tujuan ekologis restorasi menjadi *551elola* utama yang menghambat efektivitas program. Dalam perspektif ekologi politik, temuan ini menegaskan bahwa degradasi gambut merupakan hasil dari ketimpangan struktur kekuasaan dan proses ekonomi-politik yang mendorong eksploitasi sumber daya. Partisipasi multipihak berbasis co-management yang menekankan redistribusi kekuasaan, penguatan kelembagaan lokal, serta integrasi kebijakan berbasis kesatuan hidrologis gambut diharapkan dapat meningkatkan efektivitas restorasi gambut secara berkelanjutan, sekaligus mendorong terciptanya tata *551elola* sumber daya alam yang lebih adil dan inklusif.

Kata kunci: Ekologi politik, Restorasi gambut, Partisipasi multipihak, Co-management.

INTRODUCTION

Peatland ecosystems constitute one of the most important ecological systems for maintaining environmental sustainability due to their capacity to store carbon and regulate hydrological processes. However, from the perspective of critical theory, peatland degradation should not merely be understood as an ecological or technical issue. Rather, it is the outcome of power relations, public policies, and politico-economic practices that shape how humans interact with the environment. This critical perspective, as developed within political ecology, emphasizes that environmental degradation is a consequence of unequal power relations, the distribution of resources, and competing interests among social actors (Astuti, 2020; Bryant & Mitchell, 2021; Robbins, 2020).

From a critical perspective, the environment is understood not as a neutral entity but as a contested arena where multiple actors compete to advance their respective interests. This perspective is particularly evident in the governance of Indonesia's peatlands, where the state, corporations, and local communities exercise unequal power in determining access to and control over natural resources (Atkinson, 2023; Meilinda et al., 2025; Monteverde et al., 2022). Accordingly, peatland degradation cannot be attributed solely to unsustainable land-use practices (Yuwati et al., 2021), rather, it is embedded in structural power relations that systematically enable resource exploitation (Rossita et al., 2023). This situation reflects not only deficiencies in environmental governance but also the broader politico-economic structures that sustain the intensive exploitation of peatlands, especially through the expansion of large-scale plantation enterprises (Rotinsulu et al, 2022).

The expansion of oil palm plantations is frequently justified as a strategy for fostering national economic development (Astuti, 2021). From the perspective of political ecology, however, this expansion represents a process of *accumulation by dispossession* (Harvey, 2003), through which local communities are progressively excluded from access to and control over natural resources. Consequently, communities lose access to their customary lands, whereas the economic gains are disproportionately appropriated by politically and economically powerful actors. These conditions reflect a process of ecological marginalization, in which vulnerable groups become increasingly exposed to the consequences of environmental degradation due to their subordinate position within prevailing power structures. Local

communities are frequently the most adversely affected by peatland fires, flooding, and declining environmental quality, despite not being the principal agents responsible for such degradation.

Moreover, peatland restoration policies implemented through a top-down governance approach can be critically examined from the perspective of political ecology. Restoration initiatives designed within a predominantly technocratic framework often neglect local knowledge systems and the socio-cultural dynamics of affected communities. Consequently, community participation is frequently reduced to a symbolic rather than substantive role. This condition reinforces the argument that environmental policies do not invariably represent the interests of society at large; instead, they may primarily reflect the interests and power of dominant actors (Bryant, 2021; Fleming et al., 2021; Purnomo et al., 2024; Sanudin et al., 2023).

Within this context, multi-stakeholder participation is regarded as a fundamental principle of environmental governance. Nevertheless, participation should not be reduced to the mere involvement of diverse actors in formal deliberative processes; it must also encompass the extent to which power is equitably distributed throughout decision-making. In practice, participatory mechanisms that appear inclusive often reproduce existing power asymmetries, thereby limiting their capacity to bring about substantive institutional and environmental change (Purnomo et al., 2024; Yuwati et al., 2021; Wiharja et al., 2024). Likewise, the peat hydrological unit framework provides a more integrated approach to peatland ecosystem management.

However, from a political ecology perspective, its implementation is inherently shaped by competing interests and unequal power relations. Institutional fragmentation, inter-actor conflicts, and divergent stakeholder interests frequently undermine the effectiveness of Peat hydrological unit implementation in practice (Ward et al., 2021). Consequently, political ecology highlights that peatland restoration should be understood not merely as a technical or ecological intervention but also as an issue of social justice and power redistribution. In this sense, peatland restoration extends beyond ecological recovery to encompass the establishment of a more equitable, participatory, and inclusive system of environmental governance. Accordingly, a more critical and integrative approach to peatland governance is needed that extends beyond technical considerations to incorporate the social and political dimensions of environmental management. Within this context, the development of a multi-stakeholder participation model grounded in the peat hydrological unit framework and a co-management approach represents a strategic alternative capable of enhancing both ecological effectiveness and social inclusiveness.

Such an approach is expected to reconcile the diverse interests of multiple stakeholders while addressing power asymmetries that characterize peatland governance. From this perspective, peatland restoration should be conceived not merely as an effort to rehabilitate degraded ecosystems but as a broader process of institutional and social transformation toward more sustainable, equitable, and inclusive natural resource governance. Therefore, this study seeks to make a theoretical contribution by integrating political ecology with peatland governance through the application of the co-management approach. By employing a political ecology perspective, the study provides a critical understanding of the power relations that shape peatland governance, while the proposed co-management model offers a practical framework for strengthening the long-term sustainability and effectiveness of peatland restoration initiatives.

METHOD

This study adopted a qualitative research approach employing a participatory action research (PAR) design. PAR was chosen because it enables researchers not only to investigate social phenomena but also to actively participate in processes of social transformation in collaboration with local communities. Within the PAR framework, community members are regarded as co-researchers who possess the knowledge, lived experiences, and critical capacities necessary to reflect upon and address their own social realities (Kendon et al., 2007). In the context of peatland restoration, PAR provides an appropriate methodological framework for examining multi-stakeholder participation while facilitating dialogue,

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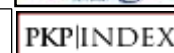
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collective learning, and consensus-building among diverse actors. This approach is particularly suitable for addressing complex governance issues characterized by multiple stakeholders, unequal power relations, and competing interests.

The research was Implemented through an Iterative PAR cycle comprising four interconnected stages: (1) planning, involving problem identification and stakeholder mapping; (2) action, involving the implementation of participatory interventions; (3) observation, involving systematic field data collection; and (4) reflection, involving collaborative evaluation and critical reflection with research participants. These stages were repeated iteratively to develop a deeper, more comprehensive, and contextually grounded understanding of the phenomena under investigation.

This study was conducted in the Mendahara–Batanghari Peat hydrological unit in Jambi Province, Indonesia, one of the country’s peatland landscapes facing substantial ecological degradation and socio-environmental challenges. The research was undertaken in Sinar Wajo Village, which was purposively selected based on several considerations: (1) the presence of ecologically important peatland ecosystems; (2) significant land-use changes affecting the landscape; (3) the involvement of multiple stakeholders, including local communities, government institutions, and private-sector actors; and (4) its role as an active site for peatland restoration initiatives. Field observations revealed that the study area has experienced profound land-use transformation driven primarily by the expansion of oil palm plantations and other economic activities. These changes have produced far-reaching ecological consequences while simultaneously reshaping the social conditions and livelihoods of local communities.

The study involved a diverse range of stakeholders engaged in peatland governance, including local communities (farmers, customary leaders, and farmer associations), government representatives at the village, sub-district, and relevant agency levels, plantation companies and concession holders, non-governmental organizations (NGOs), and academics. Informants were purposively selected based on their knowledge, experience, and direct involvement in peatland management and restoration. To broaden the range of perspectives and identify additional key participants, a snowball sampling strategy was subsequently employed, whereby initial informants recommended other individuals with relevant expertise or experience. Rather than establishing a predetermined sample size, the study followed the principle of data saturation, with data collection continuing until no new themes, perspectives, or substantive findings emerged from subsequent interviews.

Data were collected through participant observation, semi-structured interviews, focus group discussions (FGDs), and document analysis. Participant observation enabled the researchers to directly engage with local communities and examine social practices, interaction patterns, and peatland management processes within their natural settings. Semi-structured interviews were conducted to capture stakeholders’ perspectives, experiences, and interests while allowing flexibility to explore issues that emerged during the research process. FGDs facilitated dialogue among stakeholders to identify shared understandings, divergent perspectives, and potential conflicts of interest, while also serving as a collaborative reflection process within the participatory action research (PAR) framework. Documentary analysis of government policies, peatland restoration reports, spatial planning documents, and previous studies was undertaken to triangulate and validate the empirical findings.

The data were analyzed using thematic analysis through an iterative process involving data reduction, coding, categorization, and interpretation. Stakeholder analysis was further employed to map actors according to their relative levels of power, legitimacy, and urgency, thereby providing insights into the distribution of influence and competing interests in peatland governance. Finally, a political ecology perspective served as the overarching analytical framework for interpreting the dynamics of power relations, institutional arrangements, and stakeholder conflicts that shape peatland restoration and governance.

DISCUSSION

The findings of this study underscore that peatland restoration should not be conceived merely as a technical intervention but rather as a complex socio-ecological process embedded within broader power relations. Evidence of structural inequalities among stakeholders, limited substantive participation, and persistent conflicts of interest indicates that the effectiveness of peatland restoration is fundamentally shaped by how interactions among actors are governed within an inclusive institutional framework. From the perspective of political ecology, peatland degradation in the Mendahara–Batanghari Peat hydrological unit is best understood as the product of intertwined economic interests, public policies, and political practices that frequently operate in conflicting ways. The expansion of oil palm plantations, for instance, not only reflects a national development agenda but also constitutes a form of political-economic investment that facilitates the large-scale exploitation of natural resources. Within this context, the state and corporate actors exercise disproportionate influence over land-use decisions, whereas local communities occupy comparatively marginalized positions within prevailing governance structures.

Taken together, these findings suggest that effective peatland restoration requires the capacity to address the intertwined social, political, and ecological dimensions of environmental governance. Technically oriented interventions alone are insufficient to overcome the structural drivers of degradation. Instead, peatland restoration should be grounded in an integrated, participatory, and socially just governance framework that accommodates the diverse interests of stakeholders while addressing power asymmetries and promoting more equitable natural resource management.

Peatland Restoration from Ecological and Social Perspective

Peatland restoration is a systematic effort to restore the ecological functions of degraded peatland ecosystems, primarily through the rehabilitation of hydrological conditions and vegetation. From an ecological perspective, the success of peatland restoration largely depends on the ability to maintain peat moisture by implementing interventions such as canal blocking (*rewetting*) and the rehabilitation of native vegetation (*revegetation*) (Abdurrahim et al., 2025). However, a purely technical approach is insufficient because peatland ecosystems are living systems characterized by complex social dimensions.

The failure of peatland restoration is often attributed to the lack of integration between ecological and social dimensions (Lestari et al., 2025). In many cases, technical interventions fail to consider local knowledge and community economic needs, thereby generating resistance and even conflict. Consequently, peatland restoration should be understood as a socio-ecological process that involves dynamic interactions among humans, ecosystems, and institutions. Furthermore, restoration approaches that focus solely on physical targets such as the total area restored tend to overlook the quality of implementation processes and long-term sustainability. Dohong et al. (2021) demonstrated that the success of peatland restoration depends substantially on the sustainability of post-intervention management, which can only be achieved through the active involvement of local communities. Accordingly, peatland restoration should be regarded as an adaptive process that requires continuous learning and institutional flexibility.

Peatland degradation and the challenges of restoration are not merely technical issues but also the result of complex interactions among power, economic interests, and public policy. Within this context, the expansion of plantation development can be understood as part of a broader political-economic process in which natural resources are increasingly utilized for capital accumulation. This process frequently neglects ecological and social consequences while reinforcing inequalities between actors who possess access to power and those who do not.

These findings are consistent with Harvey's (2003) concept of accumulation by dispossession, which argues that development processes often marginalize local communities' access to natural resources. In the context of this study, local communities have experienced reduced access to peatlands that previously served as the basis of their livelihoods, forcing them to adopt economic strategies that are not always

environmentally sustainable. Moreover, top-down restoration policies often reflect the dominance of technocratic perspectives in environmental governance. Such approaches frequently overlook local knowledge and the socio-cultural context of affected communities, thereby reducing the effectiveness of implementation. From a political ecology perspective, the shortcomings of peatland restoration are therefore not solely attributable to technological limitations or resource constraints but also to unequal distributions of power and access to natural resources.

From a political ecology perspective, these conditions also indicate inequalities in the distribution of adaptive capacity among stakeholders. Local communities possess extensive knowledge and experience in peatland management; however, their limited access to information, technology, and decision-making authority constrains their ability to adapt to ongoing environmental changes. In contrast, actors such as private companies generally have greater institutional and financial capacity to exploit natural resources, despite frequently contributing to significant ecological degradation.

Multi-Stakeholder Participation in Natural Resource Governance

Multi-stakeholder participation is a governance concept in which natural resource management involves various actors with diverse interests and backgrounds throughout the decision-making process. Participation is regarded as a mechanism for enhancing the legitimacy, transparency, and effectiveness of governance (Wicaksono & Zainal, 2022; Widayati et al., 2026). However, political ecology emphasizes that participation is not merely a technical mechanism for involving stakeholders but also reflects power relations that shape decision-making processes. Under ideal conditions, participation should create equal opportunities for all stakeholders to contribute, including local communities, government agencies, the private sector, and civil society organizations. In practice, however, participation often becomes a formality without substantive influence on public policy.

Within the context of peatland governance, participation is understood as an interaction among government institutions, local communities, private companies, and civil society organizations. Every stakeholder possesses different interests and capacities, resulting in governance dynamics that cannot be separated from power relations. According to Wicaksono & Zainal (2022) and Wiharja et al. (2024), the success of peatland management is strongly influenced by the extent to which stakeholders are actively involved throughout the governance process. In peatland governance, more substantive participation occurs at the partnership level, where decision-making authority is shared between government institutions and local communities. Conversely, at the citizen control level, communities possess full authority to determine policies affecting their own lives (Bixler et al., 2023).

The findings of this study indicate that stakeholder participation in peatland restoration remains largely concentrated at the consultation level, with communities being involved primarily in planning meetings and implementation activities but having limited influence over strategic decision-making. This pattern suggests that participatory governance in peatland restoration has yet to achieve a genuinely collaborative model based on equitable power-sharing among stakeholders. Consequently, strengthening participation requires institutional mechanisms that move beyond procedural consultation toward meaningful collaboration, shared decision-making, and community empowerment.

Social Capital as a Foundation for Collaborative Models

Social capital refers to the networks, norms, and trust that enable individuals or groups to work together effectively. In the context of natural resource management, social capital serves as a key factor in fostering collective collaboration (Wiharja et al., 2024). Within society, social capital encompasses shared values that encourage mutual trust, cooperation, and collective action to achieve common goals in natural resource governance. Consequently, social capital represents a significant resource for supporting peatland restoration programs through strengthening community participation, thereby enhancing the ecological and economic sustainability of restoration initiatives.

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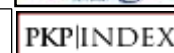
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Although social capital has long been recognized as a structural, social, and relational resource, indicate that it also faces substantial challenges within the context of environmental governance. The transformation of social structures, economic pressures, and shifts in public policies have significantly altered the patterns of social interaction within communities, thereby weakening the traditional solidarity that once served as the foundation for natural resource management. Wiharja et al. (2024) argues that social capital can deteriorate when communities experience increasing economic pressures. Under such conditions, individuals tend to prioritize personal interests over collective interests, leading to a decline in community capacity to negotiate through participatory mechanisms. Consequently, even communities with strong social capital may encounter serious obstacles in building effective collaboration due to economic pressures and external political interventions.

Furthermore, social capital demonstrates a dynamic relationship with the environmental governance. Strong social capital supports the continuity of participatory natural resource management through enhanced collective action. Conversely, weak social capital contributes to the fragmentation of social networks and the weakening of institutional capacity to address environmental challenges. These findings suggest that strengthening social capital should be complemented by more inclusive institutional arrangements and more equitable access to natural resources.

Stakeholder Analysis and Power Relations

Stakeholder analysis is an essential analytical tool for understanding the dynamics of actors involved in natural resource governance. The classical stakeholder framework developed by Mitchell et al. classifies stakeholders according to three principal attributes: power, legitimacy, and urgency. This framework continues to be widely applied in contemporary environmental governance studies to examine stakeholder dynamics and institutional interactions (Widayati et al., 2026).

In the context of peatland restoration, stakeholder analysis facilitates the identification of key actors and the power relations that shape interactions among them. This is particularly important because the success of restoration initiatives largely depends on the ability to manage conflicts and foster coordination among diverse stakeholders. Nevertheless, stakeholder analysis should not be applied in isolation from more critical perspectives, such as political ecology, which argues that relationships among actors are inherently shaped by unequal power structures rather than being politically neutral. Power determines not only who participates in decision-making processes but also how environmental problems are framed and how policy solutions are formulated. Consequently, stakeholder analysis should be complemented by an examination of power relations to provide a more comprehensive understanding of governance dynamics.

The findings reveal that the stakeholder structure involved in peatland management and restoration within the Mendahara–Batanghari peat hydrological unit, particularly in Sinar Wajo Village, is both complex and multi-layered. Based on stakeholder analysis, the actors can be classified into three principal categories: definitive stakeholders, expectant stakeholders, and latent stakeholders. Definitive stakeholders consist primarily of government institutions and private companies, both of which possess substantial authority in determining policy directions and land-use decisions. These actors have privileged access to financial resources, regulatory instruments, and political networks that enable them to exert considerable influence over decision-making processes. In contrast, expectant stakeholders, including non-governmental organizations (NGOs) and academic institutions, primarily perform mediating and facilitating roles, although their capacity to influence policy remains comparatively limited.

Meanwhile, local communities generally fall within the category of latent stakeholders. Although they possess high legitimacy due to their close dependence on and long-standing relationship with peatland resources, they have relatively limited power to influence policy formulation and implementation. This imbalance reflects significant asymmetries in the distribution of power within peatland governance. These findings are consistent with the political ecology perspective, which argues that natural resource governance is never politically neutral but is continuously shaped by unequal power relations among

actors. Within this context, the dominance of particular stakeholders contributes to the marginalization of others, especially local communities, in decision-making processes.

One of the principal findings of this study is the existence of persistent conflicts of interest among stakeholders engaged in peatland governance. These conflicts primarily arise from the tension between economic interests represented by plantation companies and ecological objectives promoted through peatland restoration programs. The expansion of oil palm plantations has emerged as the principal driver of these conflicts. Private companies generally prioritize land productivity and economic profitability, whereas restoration initiatives emphasize the conservation of peatland ecological functions. These contrasting priorities generate considerable tensions during policy implementation. From a political ecology perspective, such conflicts can be understood as manifestations of contestation over access to and control of natural resources. Actors possessing greater political and economic power are better positioned to determine land-use patterns according to their interests, whereas less powerful actors are often compelled to adapt to decisions imposed by dominant stakeholders.

In addition to conflicts between local communities and private companies, the findings also reveal internal conflicts within local communities themselves. Divergent interests between community members engaged in the plantation sector and those who continue to depend on traditional natural resource-based livelihoods have contributed to increasing social fragmentation. This finding demonstrates that governance conflicts are not exclusively external but also emerge within local communities. Such internal divisions directly undermine the effectiveness of peatland restoration programs. Without effective conflict resolution mechanisms and inclusive institutional arrangements, restoration initiatives are likely to encounter persistent resistance, thereby limiting their overall effectiveness and long-term sustainability.

The Peat Hydrological Unit as a Framework for Peatland Governance

The peat hydrological unit represents a peatland management approach based on the integrity of natural hydrological systems. This approach emphasizes that peatland management should be implemented in an integrated manner across a single hydrological ecosystem rather than being fragmented by administrative boundaries (Atkinson & Alibašić, 2023). Conceptually, the peat hydrological unit framework provides a more holistic approach to peatland governance by integrating ecological, social, and economic dimensions into a unified management system. However, the implementation of the peat hydrological unit approach in Sinar Wajo Village continues to face several challenges, including institutional fragmentation, conflicting stakeholder interests, and limited intersectoral coordination. Within this context, integrating the peat hydrological unit framework with a multi-stakeholder participation approach is essential for achieving more inclusive, adaptive, and sustainable peatland governance. Such integration enables diverse stakeholders to collaborate within a common institutional framework while promoting shared responsibility for peatland restoration and management.

Based on the empirical findings, this study proposes a co-management-based multi-stakeholder participation model as an alternative governance framework for peatland restoration. The proposed model emphasizes a more equitable distribution of roles, responsibilities, and decision-making authority among stakeholders. It comprises four principal components:

1. Strengthening local institutions by enhancing community capacity to participate effectively in decision-making processes.^[1]_{SEP}
2. Establishing collaborative forums that provide inclusive platforms for dialogue, communication, and consensus-building among stakeholders.^[1]_{SEP}
3. Developing conflict resolution mechanisms to manage competing interests constructively and promote collaborative problem-solving.^[1]_{SEP}
4. Integrating cross-sectoral policies to reconcile ecological conservation objectives with socio-economic development priorities.^[1]_{SEP}

Within this model, local communities are no longer positioned merely as beneficiaries of restoration programs but as active partners who play a central role in peatland governance. From a theoretical perspective, the findings reinforce the argument that natural resource governance should be understood within a complex socio-ecological systems framework. Political ecology offers a valuable analytical perspective by revealing the power dynamics and institutional inequalities that are often overlooked in predominantly technical studies. Practically, the findings provide important policy recommendations for developing more inclusive, participatory, and collaborative approaches to peatland restoration.

The study further demonstrates that top-down policy approaches constitute one of the major barriers to effective peatland restoration. Centrally designed policies frequently fail to accommodate local socio-economic contexts and overlook the diversity of community needs and priorities. Consequently, restoration initiatives often lack local relevance, resulting in community resistance or limited engagement. In this regard, the co-management approach proposed in this study offers a viable alternative by promoting the equitable sharing of authority, responsibilities, and benefits among government institutions, local communities, and other relevant stakeholders in natural resource governance. Such an approach facilitates a more balanced integration of ecological conservation and economic development objectives while creating meaningful opportunities for communities to participate actively in decision-making processes (Armitage et al., 2021).

Nevertheless, the implementation of co-management cannot be achieved instantaneously. It requires a gradual process of institutional transformation, involving changes in governance structures, power relations, coordination mechanisms, and stakeholder capacities. Within this process, government institutions play a pivotal role as facilitators responsible for creating inclusive spaces for dialogue, strengthening inter-organizational collaboration, and ensuring equitable benefit-sharing among stakeholders. Furthermore, integrating the peat hydrological unit framework into the co-management model is essential for maintaining long-term ecological sustainability. By managing peatlands according to natural hydrological boundaries, the peat hydrological unit framework reduces policy fragmentation and enhances the effectiveness of restoration interventions (Ward et al., 2021). However, as demonstrated by the findings of this study, the implementation of the peat hydrological unit approach continues to encounter significant challenges, particularly sectoral conflicts and limited coordination among government agencies and other institutions.

Accordingly, strengthening cross-sectoral policy integration and enhancing institutional capacity at the local level are critical prerequisites for improving peatland governance. These efforts should include empowering village governments, expanding community access to information, knowledge, and financial resources, and developing effective, transparent, and participatory conflict resolution mechanisms. Such institutional improvements are expected to enhance stakeholder collaboration, reduce governance fragmentation, and ultimately contribute to more resilient, equitable, and sustainable peatland restoration.

CONCLUSION

This study makes significant theoretical and practical contributions to the field of natural resource governance by integrating the perspectives of political ecology, multi-stakeholder participation, and the peat hydrological unit ecosystem-based approach. The findings demonstrate that peatland restoration in the Mendahara–Batanghari peat hydrological unit is a complex socio-ecological process shaped not only by technical and ecological considerations but also by social, economic, political, and institutional dynamics. The stakeholder structure is characterized by pronounced power asymmetries, with government institutions and private companies exercising dominant influence over policy and land-use decisions, while local communities remain marginalized despite their legitimacy and extensive ecological knowledge. Consequently, unequal power relations significantly affect decision-making processes, benefit distribution, and the overall effectiveness of peatland restoration.

The study further reveals that multi-stakeholder participation remains largely procedural rather than substantive, with community involvement concentrated primarily at the implementation stage and limited participation in planning and strategic decision-making. Conflicts of interest between economic objectives, particularly oil palm plantation expansion, and ecological restoration goals, together with institutional fragmentation and weak cross-sectoral coordination, continue to constrain restoration outcomes. Although local communities possess valuable social capital, indigenous knowledge, and collective capacity, these assets have not been fully utilized due to limited access to resources, information, and decision-making authority. These findings underscore the need to strengthen local institutions, promote inclusive participation, establish effective conflict resolution mechanisms, and improve policy integration within the peat hydrological unit framework.

From a political ecology perspective, peatland degradation and restoration challenges are deeply embedded in broader power relations and political-economic structures rather than being solely environmental or technical issues. Accordingly, this study proposes a co-management-based multi-stakeholder participation model that emphasizes equitable power-sharing, institutional strengthening, and inclusive collaborative governance as a more effective framework for peatland management. Further studies are encouraged to employ quantitative or mixed-methods approaches, conduct comparative analyses across different peat hydrological units, and develop integrated evaluation frameworks encompassing ecological, social, economic, and institutional dimensions. Overall, the study concludes that sustainable peatland restoration depends on the establishment of governance systems that are equitable, participatory, and inclusive, while effectively integrating ecological objectives with social justice and balanced stakeholder power relations.

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