

Drawing on Multi-stakeholder's Insights to Develop Vital Peatland Social Policy Model In Riau Province, Indonesia

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Abstract. The continued existence of the peatlands in Riau is of vital importance to the region's ecological and economic well-being. However, the underlying cause of these issues is the inadequate management of the peatlands. The objective of this project is to develop a social policy model that can address issues related to peatlands. The multi-stakeholder study, which formed the basis for this approach, engaged a diverse range of stakeholders, including representatives from government, business, indigenous communities, and non-governmental organizations. This study employed a descriptive qualitative methodology. The data employed in this study were derived from earlier studies and a range of research findings. The study's findings indicate that the implementation of an effective social policy for peatland management in Riau can contribute to the protection of peatlands. The creation of this model should ensure social fairness and provide all stakeholders with a fair voice in the decision-making process regarding the management of peatlands. This will help to prevent and sustain environmental harm for future generations. It is recommended that the government, businesses, and indigenous groups in Riau work together to address issues linked to peatlands that arise from the application of the policy model using an appropriate social policy approach.

1 Introduction

Peatlands are complex ecosystems that play a vital role in maintaining biodiversity, regulating water flow, and sequestering carbon. Nevertheless, the threat posed to these important habitats by deforestation, drainage, and fire has serious consequences for the environment and society. These challenges are particularly acute in Indonesia's Riau province, which is home to some of the largest peatlands in Southeast Asia. The necessity for a comprehensive social policy model that can successfully address the intricate

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interplay of ecological, economic, and social aspects in peatland management is becoming increasingly apparent in response to these problems. The objective of this research is to develop a peatland social policy model that is specifically tailored to the Riau context, taking into account the region's distinctive socioeconomic dynamics and environmental challenges. It is the intention of this model to provide a framework for the sustainable management of peatlands, one that is able to reconcile the competing demands of local residents with the imperative of conservation and restoration.

The extensive peatlands of Indonesia's Riau Province represent a significant ecological system, exhibiting unique characteristics that encompass both terrestrial and wetland zones. The coastal communities that inhabit the region are primarily reliant on agricultural commodities, including coconut, rubber, oil palm, and sago. However, the region's unsustainable development practices have resulted in a number of environmental and social issues, including biodiversity loss, forest fires, droughts, flooding, and climate change. A reassessment of policies and tactics for sustainable peatland management is required due to the transgressive repercussions of capital-driven processes on human-water interactions. This is exemplified by the concept of hydrosocial rupture, as explored in [1, 2] underscores the necessity of integrating community welfare and local knowledge into the utilization of peatlands for the preservation of biodiversity, the sequestration of carbon, and the management of water, ultimately contributing to the sustainable development of the Riau peat ecosystem.

It is imperative that sustainable peat management practices and the integration of peatland restoration measures with climate policy be taken into account when establishing a peatland social policy model in Riau. As observed in [3], an investigation of pioneering European cases sheds light on the processes of innovation associated with local voluntary carbon markets for peatlands. The design of effective social policies can benefit from an understanding of the ways in which governance modalities and actor constellations generate innovation. Moreover, the study conducted in Pulang Pisau District, as documented in [4], underscores the importance of aligning recently introduced techniques with the social and cultural characteristics of communities and addressing challenges such as the absence of support and group decision-making. These findings emphasize the necessity of considering regional circumstances, community engagement, and policy strategies to effectively develop a comprehensive peatland social policy model in Riau.

1.1 The environmental consequences of peatland degradation

The considerable environmental consequences of peatland degradation have been brought to light due to the alarming rates of deforestation and oil palm expansion in Central Kalimantan, Indonesia, as documented in [5]. As indicated in [6], the deterioration of peatlands, exemplified by those in the Central Congo peatlands complex, entails a multitude of risks, including alterations to the water balance, a decline in biodiversity, and substantial carbon emissions. These consequences have global implications for climate change mitigation and adaptation, in addition to disrupting local ecosystems. A comprehensive framework for evaluating and addressing these environmental impacts is provided by integrating ecosystem accounting and spatial modeling, as proposed in [7]. Policymakers in regions like Riau can prevent peatland degradation and promote sustainable land management practices that balance economic development and environmental preservation by valuing ecosystem services and employing a multifaceted approach to analyze land-use changes.

1.2 The impact of socio-economic factors on the viability of peatland communities

Socio-economic issues are inextricably linked to the livelihoods of those residing in peatlands in Riau Province, exerting a profound impact on their decision-making processes and resource management strategies. As evidenced by studies on the restoration of peatlands and sustainable livelihood transitions, interventions aimed at reviving and changing livelihoods must consider the economic interests of the community while adhering to restoration goals [8]. Moreover, the integration of tourism information systems can provide valuable insights into the impact of socioeconomic issues on travel decisions and their potential to support local economies [9], further underscoring the significance of understanding these dynamics for sustainable development in peatland areas. The creation of a comprehensive peatland social policy model that addresses the needs of Riau's communities and ecosystems can be achieved by recognizing the interrelationship between socio-economic considerations, community livelihoods, and environmental conservation initiatives.

The construction of an overarching social policy model incorporating all requisite elements is of paramount importance in addressing the intricate issues associated with peatland management in Riau. It is of the utmost importance to prioritize community participation by incorporating local communities into the decision-making process in order to guarantee that their needs and perspectives are taken into account. Secondly, in order to regulate peatland utilization and conservation efforts, it is necessary to implement a robust regulatory framework with appropriate standards for sustainable land management [10]. Furthermore, capacity-building programs must be implemented to enhance the knowledge and capabilities of stakeholders, enabling their active involvement in peatland restoration initiatives. Additionally, collaborative partnerships between public and private sector organizations, NGOs, and government agencies can facilitate the sharing of tasks and resources, ensuring the efficient governance of peatlands. By integrating these elements into a unified social policy paradigm, Riau can pursue sustainable peatland management that balances community welfare, economic growth, and environmental conservation.

2 Methods

This research employs a descriptive qualitative approach, which is deemed the most suitable for investigating pertinent data concerning the phenomenon under examination. The qualitative approach enables the researcher to provide a comprehensive description of the characteristics of the research data [11] and previous studies that support the role of peatlands in social policies. Once the research data has been gathered from a variety of sources, including scientific journals, reference books, and other materials, the subsequent step is to process the data in order to draw conclusions. This data processing will entail a comprehensive examination of the information obtained, with the aim of investigating the relevance of social policies in addressing the ecological, economic, and social dimensions of peatland management. Consequently, the findings of this research are anticipated to make a notable contribution towards the development of more effective and sustainable social policies.

3 Results and discussion

3.1 A strategy for developing an effective peatland social policy model

The largest tropical peatland in the world is located in Indonesia [12–13]. Indonesia has 13.4 million hectares of peatlands, the majority of which are situated on the island of Sumatra, particularly in the province of Riau, which has the largest peatland, Kalimantan, and Papua, according to data from the Ministry of Agriculture (2019). Since 2016, Peat Hydrological Units (KHGs), a landscape strategy based on the functions of the peat ecosystems within them, have been employed for the planning and implementation of peat ecosystem management. The government has designated 865 national KHGs with peat ecosystem functions through SK No. 129/MENLHK/SETJEN/PKL.0/2/2017 on Determination of National Peat Hydrological Units and SK No. 130/MENLHK/SETJEN/PKL.0/2/2017 on Determination of National Peat Ecosystem Functions. The 24.7 million hectares of area in question comprises 12.4 million hectares of peat ecosystem cultivation functions and 12.3 million hectares of peat ecosystem protection functions (see Figure 1 and Table 1). The maps of the KHG and peat ecosystem functions were prepared based on information obtained from the Ministry of Agriculture in 2011 on the distribution of Indonesia's peatlands.



Fig. 1. Depicts the distribution of national peat hydrological units (KHG) as defined by the Ministry of Environment and Forestry (MoEF) in 2019.

A review of Government Regulation No. 71 of 2014 and Government Regulation No. 57 of 2016 on Peat Ecosystem Protection and Management is included in the Peatland Protection and Management policy plan. Additionally, Law No. 32 of 2009 on Environmental Protection and Management is incorporated. The 2014 and 2016 regulations, respectively, focus on the identification of the nature, standards, and criteria for peat damage, as well as the requirements and guidelines for its protection and management. This can be observed in Figure 2 below. Additionally, the regulations grant the government greater authority in the protection and management of peat ecosystems.

Table 1. Distribution of National Peat Hydrological Units (KHG) (MoEF, 2019)

Province	Number of KHGs	Administrative boundaries of the region			Total Area (ha)
		District/ City	Across all District/ City	Across the Province	
Aceh	37	18,274	136,050	12,840	338,164
Bangka Belitung	17	72,381	25,531	0	97,913
Jambi	14	175,859	526,127	202,127	904,423
Kepulauan Riau	5	16,284	0	0	16,284
Lampung	7	44,479	53,118	0	97,597
Riau	59	1,503,404	3,664,911	187,058	5,355,374
Sumatera Barat	14	129,974	16,256	7,629	153,859
Sumatera Selatan	36	1,400,010	583,177	118,574	2,101,761
Sumatera Utara	27	121,544	286,787	116,555	524,885
Total Sumatera	207	3,662,152	5,291,957	650,420	9,604,529
Kalimantan Barat	124	2,028,147	760,339	12,961	2,801,447
Kalimantan Selatan	4	0	191,021	47,444	238,465
Kalimantan Tengah	35	769,751	3,829,367	75,988	4,675,105
Kalimantan Timur	16	147,162	195,188	0	342,350
Kalimantan Utara	13	189,597	157,854	0	347,451
Total Kalimantan	190	3,134,656	5,133,770	136,392	8,404,818
Sulawesi Barat	2	0	0	42,476	42,476
Sulawesi Tengah	3	12,345	0	8,469	20,814
Total Sulawesi	5	12,345	0	50,945	62,290
Papua	250	3,200,949	1,896,328	0	5,097,276
Papua Barat	216	1,289,714	208,176	0	1,497,891
Total Papua	465	4,490,663	2,104,504	0	6,595,167
Indonesia	865	11,299,816	12,530,231	837,757	24,667,804

In order to develop an effective social policy model for peatlands in Riau, it is essential to consider a range of potential approaches. It is of the utmost importance to conduct comprehensive research in order to gain a nuanced understanding of the distinctive social dynamics and needs of local communities residing in or in close proximity to peatlands. This may be accomplished by engaging in discourse with interested parties through the utilization of focus groups, surveys, and interviews, thereby acquiring opinions and insights that can inform the formulation of policy. Forming strategic partnerships with regional businesses, government organizations, and foreign specialists can also facilitate the optimization of assets and knowledge, thereby enhancing the development of comprehensive and sustainable social policies. Furthermore, it is essential to facilitate community ownership and involvement in the policy-making process to ensure its relevance and success. By engaging local communities in policy formulation and implementation, there is a greater probability of policies being approved and implemented effectively. Ultimately, the creation of a robust peatland social policy model in Riau necessitates a multifaceted strategy that integrates collaboration, research, and community engagement [14].

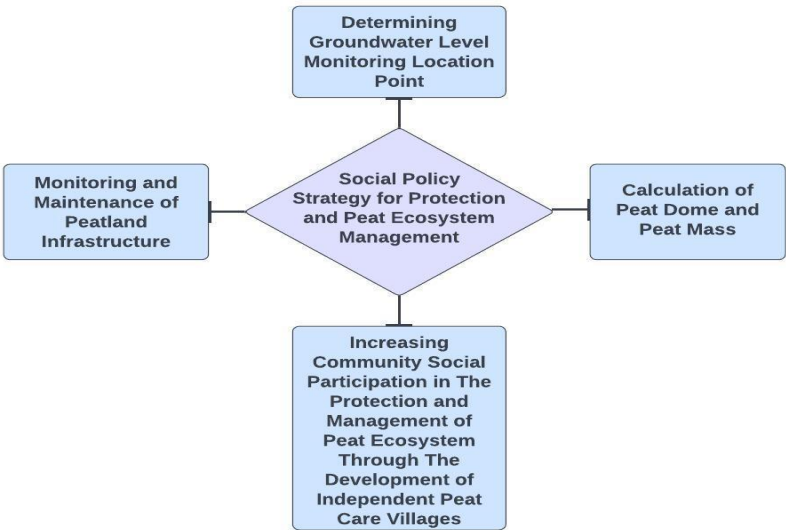


Fig. 2. Depicts a peat ecosystem, with the identification of peat properties, standards, and criteria.

3.2 Component of an effective peatland social policy model

The formulation of an overarching social policy model incorporating all requisite elements is of paramount importance in addressing the intricate issues associated with peatland management in Riau. It is of the utmost importance to prioritize community participation by incorporating local communities into the decision-making process in order to guarantee that their needs and perspectives are taken into account. Secondly, in order to regulate peatland utilization and conservation efforts, it is necessary to implement a robust regulatory framework that establishes appropriate standards for sustainable land management [14]. Furthermore, capacity-building programs must be implemented to enhance the knowledge and capabilities of stakeholders, enabling their active involvement in peatland restoration initiatives. Furthermore, collaborative partnerships between public and private sector organizations, NGOs, and government agencies can facilitate the sharing of tasks and resources, which is essential for efficient peatland governance. The integration of these elements into a coherent social policy framework would enable Riau to pursue sustainable peatland management that balances environmental conservation, community welfare, and economic growth.

In practice, direct community participation is employed in the restoration of peat ecosystems in public spaces. In order to enhance direct community involvement, the Ministry of Environment and Forestry (MoEF) established the "Desa Mandiri Peduli Gambut" initiative, which is a peat ecosystem management and conservation program. As previously stated, the fundamental concept of peatland restoration is the rewetting of the ecosystem, which involves restoring water levels. This is followed by the rehabilitation of the land, which encompasses the reintroduction of vegetation and the natural succession of ecosystems. Additionally, the restoration process aims to enhance community livelihoods by fostering greater community involvement and participation, which strengthens direct community interaction and engagement. Figure 3 provides a comprehensive illustration of this process.

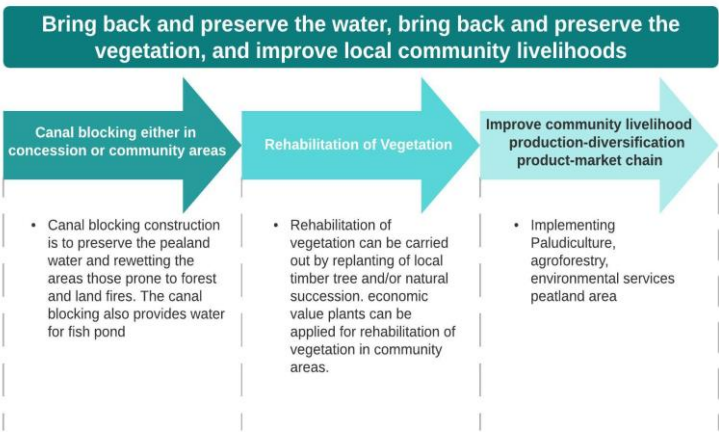


Fig. 3. Illustrates the concept of enhancing community partnership.

In developing a social policy model for peatlands in Riau, it is essential to prioritize community interaction and participation. Inclusion in decision-making processes at the local level can facilitate the development of policies that are both inclusive and sustainable, taking into account the needs and concerns of the community. By cultivating a sense of ownership over the policy-making process and fostering trust among stakeholders, this engagement can ultimately increase the likelihood of successful implementation. As evidenced by research, communities are more likely to assume an active role in peatland conservation and restoration if they perceive a sense of value and involvement. To ensure that social policy models are culturally sensitive and tailored to the distinctive needs of communities, policymakers must integrate local knowledge and perspectives [15]. Consequently, the development of a comprehensive and effective peatland social policy model in Riau must prioritize community involvement and engagement.

3.3 Integration of traditional knowledge and practices

The integration of traditional knowledge and practices proved to be a crucial element of the peatland social policy model in Riau, which will be the subject of further investigation. Local communities possess a wealth of knowledge that can inform the development of sustainable management plans, given their long-standing history of living and interacting with peatland ecosystems. By incorporating local wisdom into contemporary policy structures, policymakers can gain a comprehensive understanding of the environmental, social, and cultural dimensions of peatlands. Furthermore, this integration provides local stakeholders with a sense of empowerment and belonging, which in turn enhances the effectiveness of policy. It has been argued that the incorporation of traditional knowledge can facilitate the alignment of community opinion with scientific understanding, thereby enabling the implementation of more flexible and situationally appropriate activities. Furthermore, [16] underscored the significance of acknowledging and upholding customs when formulating regulations that promote peatland conservation and community well-being. Ultimately, the development of a comprehensive social policy model that successfully balances social equity and environmental conservation in Riau hinges on the integration of traditional knowledge and practices.

3.4 Engagement and participation of key stakeholders

The role of stakeholders in the success of the National Peat Management Strategy is of paramount importance. The efficacy of the planning, implementation, and monitoring processes is contingent upon the active involvement of all relevant stakeholders. The roles of stakeholders can be classified into three principal categories: planning and budgeting, implementation, and monitoring, evaluation, and reporting. The roles of stakeholders are illustrated in Figure 4.

It is of critical importance to evaluate how various stakeholders can be effectively engaged in the development of a peatland social policy model in Riau, given the increasing recognition of the importance of stakeholder engagement and participation in the policy development process. A multifaceted strategy is necessary to facilitate this process, which entails identifying pivotal stakeholders, comprehending their objectives and concerns, and establishing avenues for their constructive involvement. A substantial body of research demonstrates that stakeholder engagement not only enhances the efficacy and quality of policy, but also fosters a sense of responsibility and ownership among stakeholders [17]. Consequently, a more inclusive, sustainable, and contextually appropriate policy framework can be established by actively involving a diverse range of stakeholders, including local communities, government agencies, NGOs, and corporate sector actors, in the development of social policy models on peatlands.

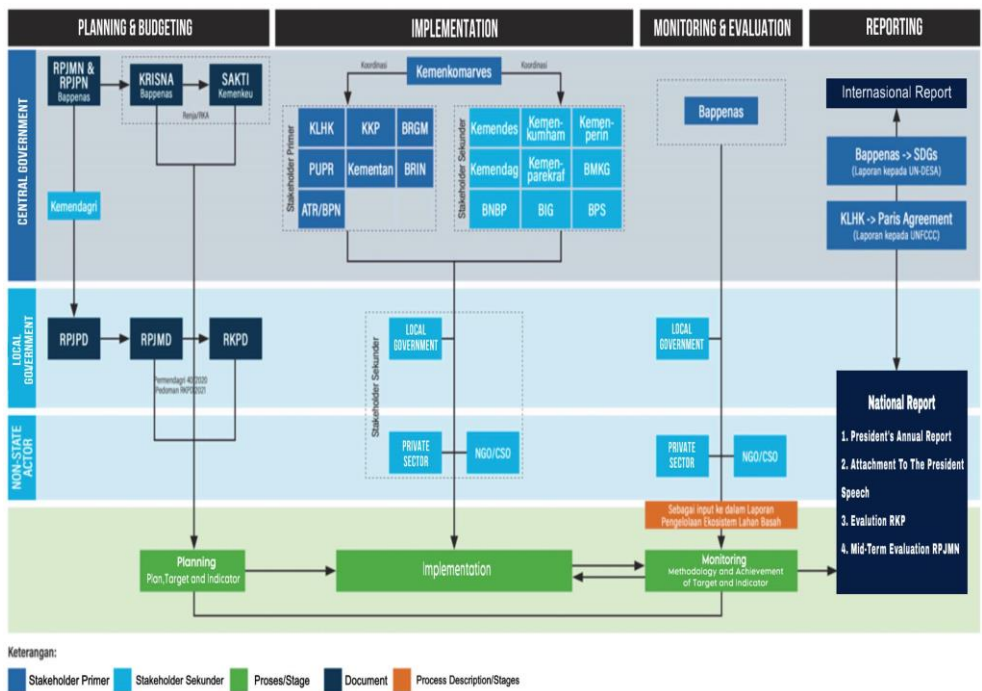


Fig. 4. Illustrates the roles and relationships between stakeholders in peat ecosystem management, as delineated in the planning, implementation, monitoring, assessment, and reporting mechanisms. It should be noted that BRGM is an ad hoc institution that will serve until 2024.

4 Conclusion

In conclusion, the establishment of a peatland social policy model in Riau represents a crucial step towards the region's community empowerment and sustainable peatland management. The integration of knowledge from scientific research, policy analysis, and community interaction provides a comprehensive methodology for addressing the multifaceted issues associated with peatland areas. Furthermore, the emphasis on multi-stakeholder collaboration, which encompasses local communities, governmental and non-governmental organizations, underscores the importance of comprehensive and inclusive decision-making processes in achieving long-term sustainability objectives. [14] In order to ensure the continued applicability and efficacy of this social policy model, it is essential to implement successful techniques, conduct ongoing monitoring, and implement assessment procedures. In general, the creation of a peatland social policy model in Riau may prove to be an invaluable model for the sustainable management of peatlands in other areas facing comparable environmental and social issues.

Our study on the creation of a peatland social policy model in Riau yielded several significant conclusions that shed light on the complex interconnections between diverse stakeholders, governmental initiatives, and environmental degradation. Firstly, it was found that the inefficient management of peatlands is a consequence of inadequate coordination and communication between regional communities, governmental organisations and businesses. As a consequence, there has been a considerable reduction in the area of peatlands, which has increased the risk of environmental disasters, including fires and the loss of biodiversity. In order to maintain sustainability and resilience, it is essential to encourage cooperation, knowledge exchange, and democratic decision-making based on these findings. This strategy can support Riau's sustainable development while also addressing the significance of integrating indigenous knowledge and practices into peatland management techniques. It is therefore recommended that a multi-stakeholder platform be created to address the underlying causes of the degradation of peatlands.

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