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POLICY DESIGN FOR PEATLAND MANAGEMENT BASED ON PUBLIC-PRIVATE PARTNERSHIP

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ABSTRACT. This research aims to develop a peatland management plan for Riau province that is based on the ideas of public-private collaboration. Data from this qualitative descriptive research were collected through a multimodal manner: interviews, in-depth literature reviews, and secondary data sources. The data analysis approach employed an interactive model that was inspired by Emerson and Nabatchi's work on the dynamics of collaborative governance. Interviews were conducted with members of the public and commercial sectors, as well as local communities and experts. This study found that there are recurring barriers in peatland management in Riau, such as the need for more active and robust collaboration between the government and private sectors. Although the government functions within defined boundaries, the private sector often designs programs aligned with the interests of specific stakeholder groups. This situation frequently leads to incomplete projects, overlapping programs, and inadvertent strategies. The findings show there are concerns about the future adoption of sustainable methods in peatland management due to the divide between the public and private sectors. For this reason, resolving these issues is essential to protecting Riau's peatlands and their ecological and economic significance for future generations.

Keywords: land degradation; peatland; policy design; public private partnership.

DESAIN KEBIJAKAN PENGELOLAAN LAHAN GAMBUT BERBASIS KEMITRAAN PUBLIK-SWASTA

ABSTRAK. Penelitian ini berupaya untuk menciptakan desain pengelolaan lahan gambut yang berakar pada prinsip kemitraan publik-swasta di Provinsi Riau. Dengan menggunakan metode penelitian deskriptif kualitatif, kami melakukan pengumpulan data melalui pendekatan multifaset, meliputi wawancara, analisis literatur komprehensif, dan sumber data sekunder. Metodologi analisis data menggunakan model interaktif yang terinspirasi oleh dinamika tata kelola kolaboratif, seperti yang diusulkan oleh Emerson dan Nabatchi. Teknik pengumpulan data dilakukan melalui wawancara dengan pejabat pemerintah, perwakilan sektor swasta, masyarakat lokal, dan pakar, serta tinjauan literatur yang komprehensif dan pemanfaatan sumber data sekunder. Hasil penelitian ini menggarisbawahi adanya hambatan yang berulang dalam pengelolaan lahan gambut di Riau: kurangnya kolaborasi yang aktif dan kuat antara pemerintah dan sektor swasta. Meskipun pemerintah berfungsi dalam batas-batas yang ditentukan, sektor swasta sering kali merancang program yang sejalan dengan kepentingan kelompok kepentingan tertentu. Hal ini sering mengakibatkan tumpang tindihnya program, inisiatif yang parsial, dan strategi yang tidak disengaja. Temuan penelitian menunjukkan bahwa kesenjangan yang ada antara pemerintah dan sektor swasta menimbulkan kekhawatiran mengenai penerapan praktik berkelanjutan dalam pengelolaan lahan gambut di masa depan. Karena itu, mengatasi tantangan-tantangan ini merupakan kunci untuk melestarikan lahan gambut di Riau dan menjaga kepentingan ekologis dan ekonominya bagi generasi mendatang.

Kata kunci: degradasi lahan; desain kebijakan; kemitraan publik-swasta; lahan gambut.

INTRODUCTION

Peatlands are being converted in large quantities in numerous regions across Riau province (Zulkarnaini, et al. 2022). As a result, deterioration is currently occurring in over 60% of the peatlands. The industries that undergo the greatest changeover are those related to plantations and agriculture. In fact, peatland conversion is widespread in an area that is rapidly developing. According to Hafidah et al. (2017), the issue with this behavior is that short-term financial interests mostly drive it. Long-term environmental factors are frequently disregarded. Local communities have indeed been generating more revenue and volume of production, but this has not kept up with the extent of the damage that has been done.

Subsequently, the community and the surrounding ecosystem encounter several setbacks and losses, particularly detrimental effects in ecology and health (Brotosusilo, et al. 2021). Mismanagement of poorly planned and managed peatland conversion will inevitably result in haze, which is often visible during the dry season. The effects of forest and land fires on human survival include contamination of the air and water and disturbances to the health of

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both adults and children. For instance, there were 2,193 acute respiratory infections (ARI) cases in 2021–2022.

The Riau peatlands' surrounding communities rely heavily on the surrounding ecosystem for their livelihoods in addition to living there (Osaki et al. 2020). For this reason, they may serve as both environment protectors and destructors (Zulkarnaini, et al. 2020). Incompetent management of peatlands depletes the ecosystem's resources and harms the ecology itself. Naturally, the wider effects will negatively influence the wellbeing of those who depend on the ecosystem (Fatkhullah et al., 2021).

Peatland management in Riau has seemed to frequently fail on the part of both the public and private sectors. One of the reasons for this is that community empowerment is neglected in favor of solely repairing the ecological functions of peatlands in government and commercial sector programs (Zulkarnaini, et al. 2023). While the private sector develops programs based on the interests of its groups, the government carries out its own tasks. It is not unusual for programs to partially or even overlap. Data indicates that about 60% of the peatlands in this region are degraded. A peatland management strategy that can guarantee the ecosystem's sustainability is required in the future (Zulkarnaini, et al. 2024).

Various stakeholders should give the amount of the degraded peatlands and other issues resulting from the ongoing fires considerable consideration (Zulkarnaini, et al. 2021). It is necessary to consider a thorough strategy for sustainable and participatory peatland management as well as the continuation of the coordination process amongst relevant institutions. Because of this, the research focuses on public-private partnerships as a basis for sustainable peatland management policy.

Research on peatland degradation has become more popular in the last few decades. Conflicts over the management of natural resources are intimately related to degradation and are becoming more intense and wide-ranging, making it difficult to resolve them (Page et al., 2022). Based on concerns for social justice in their utilization, these conflicts can explain the disparate interests, strengths, and vulnerabilities of various social groups (Brotosusilo, et al. 2021). Furthermore, neither the government nor the business sector have been able to come up with a workable solution or a suitable venue for participation.

Partnerships between the public and private sectors are essential to the management of peatlands. This partnership would later affect the sustainability of peatlands as important ecosystems with several advantages for the environment, society, and economy. These collaborations are crucial because they take advantage of each sector's assets and capabilities to tackle the intricate problems of peatland restoration and protection. Partnerships between the public and commercial sectors are essential for managing peatlands effectively. A sustainable economic development can coexist with preserving these important ecosystems if resources, knowledge, creativity, and regulatory supervision are combined. The partnership can result in more sensible and practical solutions that are good for the economy, society, and environment.

This study highlights a persistent and essential barrier to Riau's peatland management: the absence of robust and proactive cooperation between the public and private sectors. This is demonstrated by the poor application of laws and rules pertaining to the management of peatlands, which raises legal ambiguity and deters investment in the field (Miettinen, et al. 2016). While the government works within set parameters, the private sector frequently modifies its initiatives to accommodate the objectives of particular interest groups or specific parties involved. Due to this divergence, there are concerns over the future adoption of sustainable methods in peatland management, which frequently leads to overlapping programs, incomplete initiatives, and inadvertent strategies. In order to protect Riau's peatlands and guarantee their ecological and economic value for the welfare of present and future generations, it is imperative that these difficulties be addressed.

This study focuses on the methodology employed to create a public-private partnership-based policy framework for managing peatlands. A multidisciplinary approach and a more comprehensive examination of peatland management are necessary to formulate this plan. This method will make it feasible to define the roles that policy players should play in resolving issues related to peatland management from various contextual scientific angles, such as ecological, social, economic, institutional, and technological ones.

The project's main goals are to determine the obstacles to Riau's peatland management, investigate stakeholders' viewpoints, evaluate the potential for cooperation, and develop a peatland management model based on public-

private partnerships. This project aims to produce a guide for managing peatlands sustainably while adhering to the principles of future development.

METHOD

In addition to a thorough literature review and the use of secondary data sources, the research methodology used in this study combines a descriptive qualitative approach with a number of data collection techniques, such as interviews with representatives of the public and private sectors, local communities, and experts. Emerson and Nabatchi's collaborative governance concepts serve as the foundation for an interactive architecture that facilitates data analysis. These guiding concepts make collaborative activities more successful, efficient, and beneficial to all stakeholders. Each party must be prepared to grow from their collaborative experiences and keep raising the bar on their performance. Informed consent and data privacy are two essential ethical factors in the study process. With the help of effective stakeholder engagement, this methodology seeks to provide a thorough understanding of the problems associated with peatland management in Riau and to establish sustainable solutions. In this study, the informants included pineapple farmers and representatives from Dinas Lingkungan Hidup dan Kehutanan Provinsi Riau, Bappeda Bengkalis Regency, Corporate Social Responsibility (CSR) of PT. Pertamina RU II Sungai Pakning, and the heads of the villages in Sungai Pakning.

Having a direct interaction with informants, researchers can obtain a comprehensive grasp of perspectives, experiences, and views pertaining to the research issue using data collection methodologies. Drawing primarily from journal articles, books, and other scholarly resources, including research-related papers and literature reviews, this study also incorporates secondary data sources. This research employed the interactive model for data analysis and utilized techniques outlined by Miles and Huberman (2002), encompassing data gathering, reduction, presentation, and conclusion drawing. the interactive model for data analysis.

RESULTS AND DISCUSSION

Peatland management is still commonly done partially and by accident in Riau Province (Zulkarnaini et al., 2022). The primary factor is that peatlands' unique qualities, which set them apart from other mineral soils, tend to be ignored by central and regional policymakers (Susanto, 2020). An effective management of peatlands should consider the unique features of the land. In a cross-sectorial institution, management is not coordinated in either the vertical or horizontal dimensions. Furthermore, there are no comprehensive and stringent laws or policies in support of this problem. It is also important to note that the term "management" does not yet include "local wisdom" or the application of certain technologies that can be used in accordance with peatlands' carrying capacities. Furthermore, the selection of adaptable and conservation-related goods is not given enough consideration.

Numerous peatlands in the Riau Province are currently undergoing degradation due to this inadequate management. It is projected that 2.31 million hectares, or 59.54%, of the 3.89 million hectares of total peatland distribution in Riau are degraded. This deterioration in twelve districts and cities affects all areas with peatlands (Zulkarnaini, et al., 2019). Even worse, protected places like wildlife reserves, protected forests, and biosphere reserves are affected by this degradation. In fact, the exploitation of peatland resources in these regions is highly problematic since it frequently involves damaging and exploitative practices. There are currently burned peatlands in many of these regions.

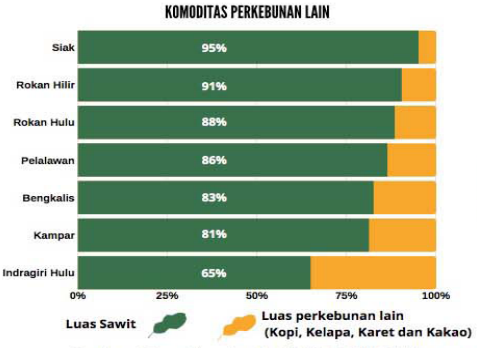

Figure 1. Comparison of the area of oil palm plantations with the area of other plantation commodities in Riau

Sources: Riau in Angka, 2021

Converting land for forestry, agriculture, plantations, and settlements is one of the various activities that communities and businesses engage. Land conversion mainly occurs in oil palm plantations, which in one area reaches 95% compared to other plantations. Figure 1 shows the high ratio of oil palm plantations in several districts in Riau from the lowest 65% to the highest 95%. This phenomena of land conversion persists unabated, purportedly emerging as the

principal cause behind the annual, severe forest and land fires (Pardiansyah, 2019).

According to data from the Riau Regional Disaster Management Agency (BPPD), peatland fires in the Riau province typically happen in the same location or close by the site of the preceding incident. In 2020, for instance, the area of flames in Rokan Hilir Regency nearly surpassed 2,000 hectares, or around 35 percent of the entire area of fires in Riau. These fires happen on communal plantations and property controlled by the enterprise. Nevertheless, the magnitude of deteriorated peatlands and the issues brought on by the ongoing fires have not gotten enough attention from different parties (Zulkarnaini, et al., 2020). Regarding conservation, rehabilitation, and restoration activities, participative and sustainable peatland management has not been prioritized by decision-makers.

In Riau Province, the idea of sustainable development is inextricably linked to the peatland management strategy (Sanudin, 2021). Harmony between the ecological (environmental), economic, and social dimensions is necessary for sustainable development. As for the development and use of peatlands, there is a significant disparity between these three factors. Sustainable (ecological) land management needs to catch up with the financial gains. Low land productivity is the outcome of the ecological degradation of the peatlands brought on by this (Terzano et al., 2022). Peatland management has not taken an integrative approach to ecological, social, economic, institutional, and technological factors.

The issue is that it does not seem like the public and private sectors are working together equally. The lengthy history of forest clearing for economic growth is the root cause of the unequal power relations between the public and private sectors in managing peatlands (Muharram, et al., 2022). The growth of land-based and forest industries—such as the growth of oil palm plantations since the 1990s and the lumber business since the 1970s—is directly linked to the rising frequency of fires in peatlands. The political economy aspect of peatlands, where the growing demand for palm oil products from the worldwide market, influences the need for more acreage for oil palm farms.

Peatlands burn because of the large-scale forest-clearing process, which is fueled by development policies that exploit natural resources and the financial incentives of firms to remove land through burning (Darnall and Potoski, 2014). In a political environment where the government and the private sector both possess the means to influence the direction and pattern of natural resource use, peatland fires carry political ramifications. Community members, on the other hand, are the most vulnerable group and suffer from the effects. In the end, peatland fires turn into a stage where political interests are contested based on the players' roles, clout, and motivations (Page & Baird, 2016).

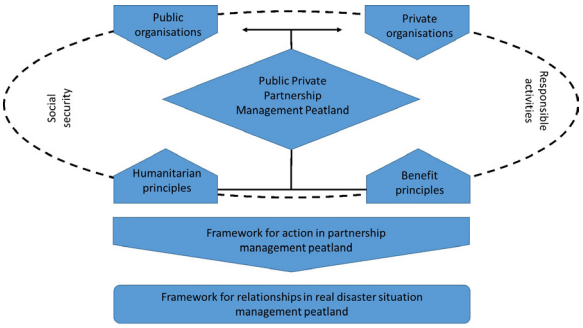

Figure 2. Public-private partnership in peatland management framework

Sources: Processed by researchers, 2023

Figure 2 illustrates the need for a comprehensive and sustained strategy for effective and sustainable peatland management. Effective and sustainable management of peatlands necessitates collaboration between several stakeholders and the integration of social, economic, and ecological elements. Here, it is advised that policies supporting sustainable peatland management be formed, primarily through suitable incentives and regulations. For this, government and private sector cooperation should be encouraged.

It appears that policymakers are unaware that peat soils differ greatly from other types of soils, making it impossible to manage them similarly. Options for effective and sustainable peatland management by all stakeholders involved are shown in Figure 2. The most crucial point is that a coordinated cross-sectoral institution should consider the unique features of peatlands in vertical and horizontal dimensions (Muharram, et al., 2022). Supporting stringent, comprehensive laws and regulations that pay attention to adaptive conservation measures and commodity selection is also crucial. Another is the application of particular technologies that can be used while considering the peatlands' carrying capacity and local knowledge (Sayer et al., 2021; Sanudin, 2021).

Public-private partnerships (PPPs) are essential to managing peatlands sustainably. The government can collaborate with private businesses to set up training programs for

farmers and breeders who operate near peatlands. Sustainable livestock management methods and ecologically friendly farming strategies may be included in this course. A peatland restoration initiative can be started by the government and backed by private businesses with resources and labor (Fatkhullah et al., 2021). Replanting lost peat vegetation is part of this restoration process.

Public-private partnerships in the management of peatlands are very positive and show the potential advantages of working together to preserve and manage these crucial ecosystems sustainably. This discovery holds particular significance and urgency given that peatlands, characterized by their high carbon content and unique biodiversity, face severe threats from deforestation and the subsequent release of carbon dioxide. Public-private cooperation in managing peatlands offers numerous benefits. The conservation and responsible use of peatlands become more possible when the public and commercial sectors work together. More sustainable peatland management results from the cooperation between public and private organizations. This is important because peatlands contribute significantly to climate change mitigation by acting as enormous carbon sinks. In the end, sustainable management techniques support international efforts to prevent climate change by assisting in reducing carbon emissions and deforestation.

A significant obstacle is presented by the lack of collaboration between the public and commercial sectors (Surahman, et al 2018). It jeopardizes these landscapes' ecological integrity and long-term economic viability by casting doubt on the possibility of integrating sustainable techniques in peatland management. The stakes are high since, in light of climate change and biodiversity loss, the preservation and restoration of Riau's peatlands are not just local but also urgent worldwide issues.

Regarding environmental stewardship and sustainable resource management, there is an urgent issue that has to be addressed: the significant and enduring gulf in cooperation between public and private sector entities. Some studies have highlighted this difficult issue and demonstrated how it creates a huge cloud of doubt regarding the viability of integrating sustainable techniques into peatland management. This is by no means a limited concern; instead, it has broad implications that extend well beyond local boundaries. It poses a severe danger to these distinctive landscapes' economic viability and ecological integrity, with grave ramifications for future generations. The stakes are extremely high in light of the current climate catastrophe and the catastrophic loss of biodiversity, highlighting the necessity of protecting and restoring Riau's peatlands on a global scale rather than just as a regional issue.

This is a crucial matter because both organizations are essential to managing and preserving peatlands. Government agencies frequently oversee environmental laws and land use, while the private sector also engages in infrastructure development, forestry, and other industries like agriculture. These groups' lack of cooperation may hamper the sustainable management of peatlands. Peatlands are special ecosystems that support abundant biodiversity and store enormous amounts of carbon. Unsustainable practices that degrade peatlands have the potential to unleash stored carbon and exacerbate climate change. This interdependence emphasizes how problems in one area, like Riau, can have far-reaching effects, which is why protecting peatlands is so essential on a worldwide scale. As they store carbon and are vital homes for a variety of species, peatlands are crucial for reducing the effects of climate change. They are involved in the control of water systems as well. Additionally, they may provide a means of subsistence for nearby communities. The degradation of peatlands brought on by a lack of cooperation puts these landscapes' ecological integrity and economic viability in jeopardy (Indrajaya et al., 2022).

Practical cooperation between public authorities, the commercial sector, local communities, and environmental organizations is required to address this problem. Creating and applying sustainable land use and conservation strategies should be the goal of this partnership. It is necessary to implement laws and incentives that support preserving and repairing peatlands. Fostering a sense of responsibility and engagement in peatland protection also requires public knowledge and education. This problem has wide-ranging and intricate ramifications that impact not only the ecosystem but also how we respond to climate change and biodiversity loss on a global scale. Global and regional cooperation is required to close this collaboration gap and advance sustainable practices in order to protect peatlands for future generations.

It has been confirmed that the peatlands of Riau are degrading at an alarming rate, with these ecosystems already at risk. The main causes of this deterioration include drainage for different uses, agricultural land conversion,

and unsustainable exploitation. There is a lack of strong and ongoing cooperation between the public and private sectors in the management of peatlands. Although the government has put in place programs and regulations to conserve peatlands, the private sector frequently acts with interests in mind other than those of broader conservation (Smith, 2020). The fragmentation and inefficiencies in the management of peatlands result from this divergence. The ineffective cooperation has led to the growth of incomplete projects and overlapping programs. Numerous government and commercial sector players are working separately, frequently without cooperation, to conserve peatlands. There is a lack of a cogent strategy, and there is resource waste as a result of this redundancy. Concerns regarding the long-term viability of peatland management are raised by the current gulf between public and private sector organizations (Pacheco, 2020). The lack of a cohesive strategy may make adopting sustainable practices and meeting conservation objectives more difficult.

In locations where peatlands are common, disaster management is essential to maintaining the security and resilience of ecosystems, economies, and communities (Flood et al., 2022). Given their heightened vulnerability to various disasters, peatlands require efficient management techniques to lessen the effects of these events (Rozaki, 2022). Peatland regions have a multifaceted disaster management approach, including risk assessment, preparedness, mitigation, and response activitiesAs peatlands store carbon and provide vital ecological services, managing peatlands effectively is essential for preventing climate change and protecting communities and habitats. The long-term survival of these ecosystems and their places depends on ongoing work to enhance disaster management in peatland areas (Wiesner, & Dargusch, 2022).

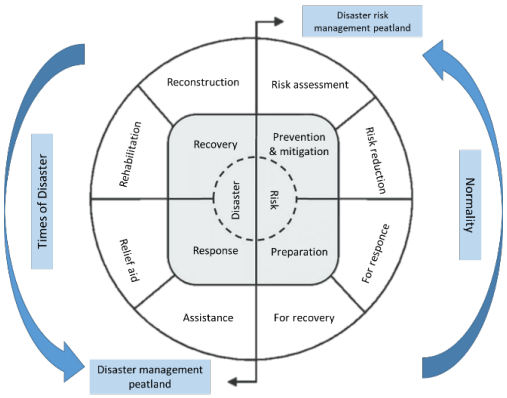

Figure 3. Important aspects of peatlands management based on PPPs

Sources: Processed by researchers, 2023

Figure 3 illustrates how a management model that considers every element—including the local resources present in peatland ecosystems—is designed. To delineate the processes leading to improper peatland management, which had a detrimental effect on the surrounding environment, the design incorporates key stakeholders. This design allows for formulating an integrated peatland management policy that incorporates all pertinent factors. However, it is important to keep in mind that the two main actors are the public and private sectors.

Since many people's livelihoods currently depend on the presence of peatlands, public-private partnerships are extremely possible. The primary goal of these collaborations is to pool resources, knowledge, and interests from the two industries to produce projects and services that are more inventive, efficient, and long-lasting (Darnall and Potoski, 2014). Both parties share the duties, liabilities, and benefits of a specific peatland management project or service in this partnership (Sayer et al., 2021). In addition to providing the necessary legislative framework and regulation, the private sector also provides capital, technology, management, and operational skills.

Peatlands in the Riau Province are an essential ecosystem component because of their exceptional natural resources. Nonetheless, managing peatlands is a difficult undertaking. Land clearance procedures for plantations, agriculture, and other human activities frequently cause degradation of peatlands. This leads to the emission of greenhouse gases that are harmful to the environment (Adesiji, et al, 2015). For this reason, careful management of peatlands requires significant effort. They present a challenge that calls for cooperation between the public and private sectors because of their sensitivity to environmental change and their part in reducing the effects of climate change (Thomas et al., 2019).

There are many advantages to public-private cooperation in the management of peatlands. Collaboration can make peatland management more sustainable by lowering carbon emissions and deforestation (Surahman et al. 2018). The private sector has the potential to foster economic development in a region through investment and job creation. By enforcing stringent environmental standards, the government can mitigate the adverse effects that private firms have on peatlands. Preservation of this vital environment for future generations requires collaboration in peatland management between

the public and private sectors. By working together, we can save the environment and meet sustainability targets.

Private sector participation in peatland management can promote local economic growth (Atkinson & Alibašić, 2023). Local communities can gain from private company investments in technology, infrastructure, and job growth. This is a win-win situation that protects peatlands while simultaneously fostering livelihoods and regional development. In these collaborations, the government is critical in ensuring that private enterprises follow stringent environmental standards. This oversight reduces detrimental effects on peatlands, like pollution and unchecked exploitation. These laws are crucial for peatlands to be sustainable over the long term and retain their ecological integrity.

The public and private sectors must work together. It promotes a shared commitment to sustainable management and peatland protection (Trefon, 2017). This alliance guarantees the achievement of ecological and economic objectives while improving peatland protection's efficacy. The significance of protecting peatlands for upcoming generations can not be overstated. These ecosystems have numerous advantages, from biodiversity preservation to carbon sequestration. The study indicates that the long-term sustainability objectives for peatlands can be met with a dedication to collaboration and sustainable methods (Norris, 2021).

Public-private partnerships in peatland management highlight the importance of teamwork in preserving these priceless ecosystems. It shows how various objectives can be addressed concurrently, ranging from fostering local economic growth to lowering carbon emissions and deforestation. Such collaborations are indispensable to ensure that peatlands continue to play a crucial role in preserving ecological balance and tackling the difficulties posed by climate change. Achieving sustainability objectives and safeguarding the environment for future generations necessitates collective effort from all parties involved.

CONCLUSION

The findings of this study underscore the critical importance of fostering government and private sector cooperation in peatland management, which has frequently faced challenges, by anchoring it upon the principles of an effective partnership. These challenges frequently lead to dispersed efforts and obstruct the development of all-encompassing and long-term strategies for managing peatlands. These issues must be resolved to preserve Riau's peatlands and its ecological and economic significance. A more unified and well-coordinated strategy involving the public and private sectors must be created. The development of cooperative efforts and the application of sustainable management practices are essential to the sustainability of Riau's peatlands and its significance for future generations.

The government's and the private sector's lack of collaboration presents significant problems for peatland management in Riau. Nonetheless, the study emphasizes how things could be done better with a well-designed public-private partnership model that promotes cooperation, transparent government, community involvement, and education. By implementing and practicing them, Riau's peatlands can have a more sustainable future that will maintain their ecological value and economic viability for future generations. The study's conclusions are applicable to Riau and other areas facing comparable management challenges with peatlands, supporting the worldwide endeavor to safeguard these priceless ecosystems.

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