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Ecosystem-based governance: Efforts for legal harmonization in environmental permitting regulation in Indonesia

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Abstract
Ecosystem-Based Governance (EBG) presents a vital strategy for achieving the Sustainable Development Goals (SD) in Indonesia, given the nation's diverse natural resources and pressing environmental issues. This evaluates the EBG model's effectiveness in promoting the SDGs through a normative research approach, analyzing legal documents and policies on natural resource management across various regions. Findings demonstrate that EBG enhances ecological justice involving vulnerable communities in-making, thus safeguarding rights. The study that environmental impact assessments the EBG framework more comprehensive, facilitating risk identification and managing long-term effects. Furthermore, ecosystem-based management aligns resource exploitation practices with ecological recovery capacities, supporting sustainability. This research accentuates the EBG model's role in fostering collaborative efforts for sustainable resource management in Indonesia and advocates for necessary policy reforms that align with EBG principles to effectively achieve the SDGs.

Keywords: Ecosystem-based governance, sustainable development goals, ecological justice, environmental risk mitigation, resource sustainability

Introduction

Indonesia, as an archipelagic nation abundant in biodiversity and natural resources, faces complex challenges in pursuing sustainable development [1]. With over 17,000 islands, Indonesia harbors more than 70% of the world's biodiversity, making it one of the most biologically diverse countries on the planet [2]. However, the rapid growth of the population, coupled with escalating economic demands, has led to unsustainable exploitation of natural resources, posing a significant risk of long-term ecological damage [3]. This phenomenon is evidenced by alarming patterns such as widespread deforestation, which not only reduces forest cover but also disrupts essential ecological functions. The degradation of water and soil quality further exacerbates these challenges, as it diminishes the productivity of agricultural lands and affects freshwater availability for both human consumption and aquatic ecosystems [4]. Additionally, the loss of natural habitats critically endangers countless species, leading to potential extinctions and a decrease in biodiversity, which is fundamentally linked to ecosystem resilience and health [5].

The impacts of economic activities that exceed sustainable limits have direct implications for community welfare. Data from the Ministry of Environment and Forestry (MoEF) indicates that Indonesia experiences forest loss of approximately 1.07 million hectares annually, which contributes to increased greenhouse gas emissions and threatens ecosystem sustainability [6]. Research conducted by Datta *et, all*., [7] hows that deforestation in Indonesia significantly contributes to carbon emissions, exacerbating the climate change crisis that has already become a global issue. This problem is further compounded by regulatory overlaps, weak enforcement mechanisms, and a lack of community participation in decision-making processes related to natural resource management [8]. Consequently, the existing legal framework often fails to facilitate a balance between resource use and environmental protection. Ideally, environmental permits should ensure that every development project takes into account its impact on the environment [9]. However, these permits are often granted without comprehensive evaluations, and the oversight of compliance with environmental regulations tends to be weak. This has led to criticism of the legal policies surrounding environmental permits in Indonesia, with many arguing that this system does not effectively function to protect ecosystems [10]. The permitting process is frequently influenced by short-term economic interests, which overlook broader ecological considerations [11].

Efforts to regulate environmental permits in Indonesia have been undertaken through various regulations at both national and local levels. However, many of these regulations are sectoral and lack integration, leading to a narrow perspective in environmental management [12]. There are over 60 (sixty) laws and regional regulations related to conservation, natural resource management, and permitting that often conflict with one another, creating legal uncertainty for businesses and communities [13]. Additionally, challenges in harmonizing environmental permits are exacerbated by discrepancies between central and regional policies, regulatory complexities, and the dominance of economic interests in political decision-making [14]. The existing legal approaches frequently fail to address the diversity of values and interests within society, leading to injustices, particularly for local communities that rely on natural resources for their livelihoods. There is an urgent demand for the adoption of a more holistic and ecosystem-based approach that can support the harmonization of environmental permit regulations in Indonesia [15].

The Ecosystem-Based Governance (EBG) model has emerged as a potential solution to the challenges of

environmental management faced. This approach emphasizes the importance of integration in natural resource management by considering the complex interactions within ecosystems. EBG does not solely focus on legal aspects but also involves various stakeholders in the decision-making process, thereby producing policies that are more responsive, transparent, and inclusive. In this context, the implementation of the Ecosystem-Based Governance (EBG) model becomes highly relevant, as this approach not only considers economic aspects but also integrates environmental and social values in every decision-making related to permitting. EBG can help promote regulatory harmonization, enhance community participation, and provide support for the sustainable management of resources [16].

Adopting the EBG model offers significant potential to create a more holistic and responsive permitting system that meets the needs of local communities and ecosystem conditions. By encouraging collaboration among various stakeholders, including government, civil society, and the private sector, EBG can help address issues of regulatory overlap and improve ecological justice that is often neglected in natural resource management [17]. This process involves more comprehensive environmental impact assessments, where the interactions among ecosystem elements are taken into account in the decision-making process. Additionally, this approach underscores the importance of transparency and accountability through improved public engagement mechanisms, ensuring that the voices of communities, especially the most vulnerable, are heard in the permitting process [18]. Thus, this study aims to further explore the potential of EBG in creating a balance between resource utilization and environmental protection, as well as how this model can be effectively implemented in Indonesia to achieve sustainable development goals.

Research Method

This study employs a normative approach [19] with a focus on comparative legal analysis to explore the regulation of environmental permitting in Indonesia and other countries that have implemented the principles of Ecosystem-Based Governance (EBG). The first step in this research is to examine the regulations governing environmental permitting in Indonesia, including Law No. 32 of 2009 on the Protection and Management of the Environment and other related regulations. Additionally, an analysis is conducted on relevant legal documentation to identify weaknesses and potential harmonization in the application of EBG [20]. The research also compares the practices of environmental permitting regulation in several countries that have successfully implemented EBG, such as the Netherlands, the European Union, Belgium, New Zealand, Canada, and the United States [21]. Through literature review and document analysis, the researcher evaluates key elements of policies and regulations in these countries to identify factors that support the successful implementation of EBG, including the involvement of local communities, the protection of community rights, and effective monitoring mechanisms [22]. The results of this analysis are expected to provide specific recommendations for enhancing the legal framework in Indonesia and creating a more sustainable natural resource management system by effectively integrating EBG principles into environmental permitting regulations [23].

Results and discussion

Implementation of EBG instruments in several countries

Environmental permitting is a crucial aspect of balancing economic growth and environmental preservation, with each country adopting different approaches. In Indonesia this system is governed by Law No. 32 of 2009, places the Environmental Impact Assessment (EIA) as the primary focus. However, challenges in its implementation include limited public participation and inconsistencies in law enforcement. In the European Union, the legal framework is more comprehensive through Directive 2011/92/EU, which mandates environmental impact assessments for significant projects and features a robust public consultation mechanism. The Netherlands and Belgium exemplify integrated systems that include active community participation, aiding in the creation of more efficient and representative permitting processes. The United States and New Zealand also emphasize the importance of public involvement in permitting, supported by legal frameworks that promote sustainability and environmental impact assessments. In this context, the permitting models from the Netherlands, Canada, and the European Union may serve as references for enhancing the permitting system in Indonesia. Focusing on community participation and the application of technology for impact monitoring must be strengthened to foster transparency. Reinforcing sanctions against violations, as well as educating officials and the public about environmental issues, is essential for building an effective and sustainable permitting system that aligns with local conditions and international standards.

The potential of EBG in creating a balance between resource utilization and environmental protection in Indonesia

The legal policy applied in environmental permitting is predominantly based on an ecological paradigm, thereby compelling individuals, businesses, and communities to adhere to established standards for obtaining environmental permits. Consequently, as a chained permit (ketting vergunnning), business actors are more concerned with environmental permits, considering that the revocation of an environmental permit may lead to the cancellation of their business permits. However, through the Job Creation Law (UU Cipta Kerja), changes in the construction of such articles have led business actors to tend to base their business permits more on technical requirements rather than environmental approvals, reflecting an economic paradigm.

Ecosystem-Based Governance (EBG) is an innovative approach that integrates resource utilization with environmental protection in the face of challenges such as climate change and biodiversity loss. This model considers the dynamic interactions between humans and nature while focusing on the sustainable management of resources and the protection of ecosystems. By involving stakeholders such as local communities, government, and the private sector, EBG creates essential space for dialogue in addressing conflicts of interest related to resource exploitation (Berkes *et al*., 2016). As a country with high biodiversity, Indonesia faces challenges in regulating environmental permits. EBG offers an effective legal harmonization model while emphasizing ecological justice. This approach makes resource management an integral component of all permitting decisions, aiming to create a balance between utilization and environmental protection.

The principle of participation in EBG allows for the involvement of local communities in decision-making, which is particularly vital for communities dependent on natural resources. Integrating local knowledge with modern science in resource management can enhance policy effectiveness and provide adaptive solutions to local conditions.

Ecosystem-Based Governance (EBG) adopts a holistic approach that accounts for interactions among ecosystem components. In Indonesia, where resource management is often sectoral, EBG promotes cross-sector collaboration to enhance forest protection, fishery management, and biodiversity conservation while promoting sustainable economic growth (Perdana *et al*., 2020). For instance, ecosystem-based coastal management focuses on the protection of marine habitats while optimizing fishery resources for the welfare of coastal communities. EBG can also enhance community adaptation to climate change by considering its impacts in resource management. The restoration of peatlands and the protection of mangroves play a crucial role in climate change mitigation and the reduction of natural disaster risks in Indonesia (Widiati *et al*., 2020). To realize the potential of EBG, commitment and cooperation from all stakeholders, as well as supportive pro-environment government policies, are essential. Establishing a legal framework that supports EBG and providing resources for its implementation are crucial for balancing resource utilization and protection. By adopting EBG principles, Indonesia has the opportunity to safeguard biodiversity and the environment while ensuring the sustainable use of natural resources for future generations.

Effective implementation of the EBG model in Indonesia to achieve sustainable development goals

The implementation of the Ecosystem-Based Governance (EBG) model in Indonesia offers an innovative framework for achieving the Sustainable Development Goals (SDGs). Given the abundant natural resource wealth and the environmental challenges faced, including deforestation, biodiversity loss, and the impacts of climate change, the application of EBG provides comprehensive solutions. Considering the complexity of the environmental challenges faced by this archipelagic nation, such as deforestation, loss of biodiversity, and climate change impacts, the adoption of the EBG model can serve as an effective solution. EBG focuses on the sustainable protection and utilization of natural resources while considering the interactions between ecosystems and communities.

Ecosystem-Based Governance (EBG) in Indonesia, within the context of environmental permitting, represents an innovative approach aimed at integrating sustainable natural resource management while taking into account ecological, social, and economic dimensions. The implementation of EBG begins with a more comprehensive Environmental Impact Assessment (EIA) process, wherein each project is required to thoroughly evaluate potential impacts on ecosystems. The involvement of local communities is a crucial aspect of this process; public consultation forums are held to ensure that the voices and concerns of citizens are heard and addressed in EIA reports. Furthermore, collaboration with various stakeholders, including non-governmental organizations and academic institutions, is strengthened to enrich perspectives in decision-making. EBG also encourages policy integration across different sectors, ensuring that environmental permits align with sustainability-oriented spatial planning. The importance of an ecosystem-based approach is underscored by the necessity to consider ecological capacity in land use, as well as the management of water and forest resources. Continuous monitoring and evaluation after permit issuance are critical steps to ensure that project impacts remain managed and in accordance with established environmental management plans.

The Ecosystem-Based Governance (EBG) model emphasizes the sustainable utilization and protection of natural resources, prioritizing interactions between ecosystems and communities. One of the key benefits of EBG is the enhancement of ecological justice, achieved through community involvement in decision-making, thereby safeguarding the rights of vulnerable groups and accommodating local aspirations. This approach strengthens policy legitimacy and increases public trust in resource managers. EBG also plays a vital role in mitigating environmental risks. Through a holistic impact evaluation, potential risks and long-term effects can be identified, allowing decision-makers to design appropriate preventive measures. With a better understanding of environmental conditions, EBG not only protects nature but also safeguards communities dependent on the sustainability of ecosystems for their livelihoods.

Sustainability of natural resources is at the core of the Ecosystem-Based Governance (EBG) model. This approach emphasizes management that considers the regenerative capacity of ecosystems and regenerative processes, thus not solely focusing on exploitation. Therefore, EBG policies are directed towards supporting environmental sustainability and community resilience, allowing future generations to benefit from existing resources. In Indonesia, the implementation of EBG is conducted holistically and integratively. This involves strengthening the legal framework, fostering community participation, encouraging cross-sector collaboration, utilizing technology, and restoring ecosystems. With this approach, EBG not only protects vital ecosystems but also ensures that communities actively participate and benefit from sustainable resource management.

Conclusion

The Ecosystem-Based Governance (EBG) model plays a pivotal role in reforming environmental permitting regulations in Indonesia, highlighting the need for policy integration, community involvement, and adaptive management. Grounded in ecological justice, the EBG model enhances the efficiency of permitting processes while promoting sustainability for both communities and ecosystems. Incorporating diverse stakeholder perspectives is crucial for formulating policies that effectively address environmental challenges and socio-economic contexts. The participatory nature of EBG empowers local communities, ensuring their rights and voices are integral to decision-making, which can improve compliance with environmental regulations and lead to better outcomes. Adaptive management facilitates continuous policy adjustments based on evolving environmental conditions and community needs. Successful EBG implementation requires robust support from all stakeholders—including government, civil society, and the private sector—ensuring collaborative efforts realize lasting positive impacts. Ultimately, adopting

the EBG model in Indonesia offers a transformative opportunity to align social equity with ecological sustainability, fostering resilience for future generations.

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