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Restoration of Watersheds Under Forest Area Use Permits: Insights from PT. Dempo Sumber Energi Reforestation Program

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ABSTRACT

This research aims to assess efforts in restoring watersheds through the implementation of forest area use permits, with a specific focus on PT. Dempo Sumber Energi reforestation program in Nagari Palangai Kaciak, Pesisir Selatan Regency. A normative legal methodology combined with conceptual analysis was employed, using primary legal references such as Government Regulation No. 26/2020 on Reforestation and Restoration and Minister of Environment and Forestry Regulation No. P.59/MENLHK/SETJEN/KUM.1/10/2019. The study revealed that PT. Dempo Sumber Energi rehabilitated 67 hectares of the watershed through intensive reforestation efforts, planting 625 seedlings each hectare. The land preparation involved clearing and planting activities using strip and contour techniques, adapted to the terrain's topography. Two reforestation strategies were applied: intercropping and buffer zone planting, which were selected to enhance compatibility with local conditions. The findings underline the significance of regulated and systematic planting practices in restoring watershed functionality, reducing environmental risks, and promoting sustainable land management. The initiative not only supports environmental conservation but also complies with legal mandates requiring collaboration between government agencies and private sectors. In conclusion, well-structured reforestation strategies, backed by clear legal frameworks, are crucial for achieving watershed restoration goals and fostering ecological resilience.

KeyWords: *Watershed Rehabilitation, Forest Area Use Permits, Reforestation, Buffer Zone Planting, Environmental Sustainability.*

INTRODUCTION

Indonesia, renowned for hosting the world's third-largest rainforest, is home to a critical natural resource that holds immense ecological, economic, and social significance (FAO, 2020). These rainforests play a crucial role in mitigating climate change by acting as carbon sinks and preserving global biodiversity (Baccini et al., 2012). However, the sustainability and functionality of these rainforests are under threat due to deforestation and forest degradation. Key drivers of this issue include natural disasters and unsustainable practices such as illegal logging, mining, and plantation activities (Margono et al., 2014). This degradation severely impacts nearby river basins, which are vital natural systems responsible for collecting, storing, and channeling rainwater into lakes and seas. River basins, defined by their topographical boundaries, are profoundly influenced by land-based activities (Ministry of Forestry, 2009).

The degradation of river basins, particularly in upstream areas, has become an urgent

problem requiring joint efforts from governments, communities, and businesses (Wohl, 2021). Watershed rehabilitation emerges as a critical solution to address this issue, focusing on restoring the ecological functions of degraded river basins. Regulatory frameworks, such as the Ministry of Environment and Forestry's Government Regulation No. 59/2019, highlight the importance of reforestation and vegetation planting activities in watershed restoration. These measures aim to regenerate vegetation both within and beyond forested areas, thereby restoring hydrological functions and reducing the risks of floods, landslides, and droughts (Gholami et al., 2021).

Human activities, including seasonal agriculture and illegal logging, further exacerbate watershed degradation by reducing land cover and compromising the soil's ability to absorb and retain water (van Noordwijk et al., 2015). Watershed restoration efforts seek to counter these impacts through strategic tree and vegetation planting, improving the soil's capacity for water retention. Under Government Regulation No. 59/2019, companies holding forestry permits are required to conduct such rehabilitation activities under the Ministry of Environment and Forestry's supervision.

A notable example of these efforts is the initiative by PT. Dempo Sumber Energi, a mining and energy company operating in Pesisir Selatan Regency, West Sumatra Province. To fulfill its environmental obligations under forest area use permits, the company launched a watershed rehabilitation program in 2021. The initiative involved planting vegetation across 67 hectares in Nagari Pelangai Kaciak. This project aims to restore, maintain, and enhance watershed functionality, aligning with the company's regulatory commitments. Beyond environmental benefits, the project provides tangible improvements to local communities, such as better ecosystem services and enhanced resilience against natural disasters (Sayer et al., 2013). This study evaluates the effectiveness of watershed restoration initiatives conducted under forest area use permits, with a particular focus on the case of PT. Dempo Sumber Energi in Pesisir Selatan Regency.

METHODS

The research employs a normative legal methodology integrated with conceptual analysis, focusing on established legal frameworks and conceptual underpinnings rather than purely jurisprudential theories. This approach involves analyzing a legislative framework that includes primary legal references such as the 1945 Constitution of the Republic of Indonesia, Law No. 41/1999 on Forestry, Law No. 16/1999, and Law No. 19/2004. Additionally, the study examines Government Regulation No. 26/2020 on Reforestation and Restoration, as published in the State Gazette of the Republic of Indonesia (2020) and its supplementary materials. The analysis also incorporates the Regulation of the Minister of Environment and Forestry No. 59/MENLHK/SETJEN/KUM.1/10/2019, which governs river basin rehabilitation and reforestation efforts.

This methodological framework ensures a thorough examination of legal texts and their

practical application to reforestation and watershed restoration initiatives, aligning with existing regulatory policies (Efendi, 2018). By dissecting these statutes and regulatory provisions, the study establishes a solid legal foundation for addressing challenges related to environmental sustainability and ensuring compliance in the management of forestry and river basins (Santoso & Purba, 2021).

RESULTS

Watershed Rehabilitation

Watersheds are essential ecosystems that encompass critical natural resources, including plants, soil, and water. These ecosystems serve as habitats for diverse species and are fundamental to human survival, providing essential resources for daily life (Law No. 7/2004). Functioning as integral components of the water cycle, watersheds collect, store, and channel water through rivers, groundwater systems, and springs into lakes and seas. The boundaries of these systems are defined by topographical features and are significantly affected by land-based activities, which can impact their long-term sustainability (Ministry of Forestry, 2009). As unified natural regions, watersheds deliver a wide range of benefits, including water production and supply for humans, plants, and animals. Realizing these benefits requires a sustainable and adaptive water resource management system that considers the dynamic processes influencing watersheds, including natural, political, socio-economic, institutional, and technological factors (Wohl, 2021).

Watershed rehabilitation focuses on reforestation efforts across both forested and non-forested areas, a responsibility explicitly mandated for forest permit holders under government regulations. The goal is to restore degraded areas to their optimal ecological functionality by addressing issues such as land cover loss and soil degradation caused by unsustainable forestry practices or natural disasters. Forest reclamation efforts aim to repair these damaged landscapes and reinstate their vital ecological roles based on Government Regulation No. 26/2020. To ensure effectiveness, specific soil protection techniques, and standardized criteria are implemented during rehabilitation and reclamation activities. These measures align with the principles outlined in Article 3 of applicable forestry laws, enhancing soil stability and strengthening the ecosystem's resilience against further degradation (van Noordwijk et al., 2015).

Forest Utilization and Permit System

Forests are invaluable resources that not only serve as the "lungs of the world" but also support a wide range of commercial activities essential for human livelihoods. However, unsustainable exploitation of forest resources often results in environmental degradation. The effective management of natural resources within watersheds requires the integration of water, soil, and forest resources while addressing the impact of human activities in these areas. To promote sustainable utilization, regulatory frameworks mandate companies holding forest utilization permits to actively participate in watershed rehabilitation

programs (Santoso & Purba, 2021).

Permit holders are obligated to allocate areas specifically for planting activities as part of their responsibilities in restoring degraded watershed ecosystems. These allocations must adhere to predetermined ratios, such as a 1:1 proportion between the area utilized and the area rehabilitated. Additional obligations apply to disturbed zones classified as L3. For non-commercial land use permits, the same 1:1 ratio is enforced. Permit holders are also tasked with rehabilitating watershed areas identified by the Director General, ensuring compliance with established benchmarks and guidelines (Ministry of Environment and Forestry, 2019). Rehabilitation activities emphasize the planting of endemic and multipurpose tree species across various landscapes, including protected forests, urban green areas, and coastal zones. Restoration of mangroves and coastal forests, particularly in downstream river regions, plays a crucial role in enhancing watershed stability and preserving ecosystems. These initiatives encompass diverse planting activities, namely 1) Reforestation or enrichment planting in protected forests using endemic tree species; 2) Planting multipurpose tree species in protected zones, where harvesting for production is restricted; and 3) Planting in non-forest areas such as urban green spaces and public facilities provides direct benefits to local communities.

Furthermore, non-forest area utilization permits are issued without altering the land's designation or status, ensuring that these areas maintain their ecological roles while supporting sustainable environmental management practices (Gholami et al., 2021).

Base Implementation Activities

Despite the presence of numerous regulations on river basin management, conflicting responsibilities, overlapping functions, and unclear authority often impede the effective and sustainable governance of these areas. Comprehensive guidelines for river basin management are outlined in Government Regulation of the Republic of Indonesia No. 37/2012, which specifies the management of river systems from downstream to upstream. This regulation introduces a structured framework that encompasses planning, implementation, monitoring, evaluation, training, and supervision. Responsibilities for managing these river basins are shared across central, regional, and local governments, along with community stakeholders, highlighting the importance of participatory and collaborative approaches (Government Regulation No. 37/2012, Article 57).

Community involvement plays a pivotal role in river basin management, as articulated in Article 57, which allows communities to participate in both individual and collective efforts through watershed coordination forums. These forums serve as platforms to promote integrated watershed management, encouraging public engagement and fostering a sense of shared accountability (Efendi, 2018). Furthermore, Article 58 specifies the responsibilities of the River Basin Management Coordination Forum. The forum provides guidance on community-driven water management initiatives, develops innovative watershed solutions, and supports public involvement in the monitoring and supervision of river basin activities (Santoso & Purba, 2021). The planning phase for river basin development is governed by Article 53 of Government Regulation No. 37/2012, which

mandates that urban and regional authorities align watershed management plans with local and provincial development objectives. These objectives include restoring and maintaining the carrying capacity of water catchment areas and ensuring that watershed plans are integrated into broader industrial and regional development frameworks. Oversight of these plans is conducted at national, provincial, and municipal levels to guarantee a comprehensive and coordinated approach (Ministry of Environment and Forestry, 2019).

The criteria for delineating watershed structures are detailed in Minister of Forestry Regulation No. S.60/Menhut-II/2014, which provides guidelines for assessing and monitoring watershed boundaries. These criteria help identify watersheds that require rehabilitation or preservation based on their ecological capacities. Additionally, reforestation and rehabilitation efforts are outlined in Minister of Environment and Forestry Regulation No. P.59/MENLHK/SETJEN/KUM.1/10/2019, which mandates forest area use permit holders to replant forested areas and adjacent zones to restore and enhance the ecological functionality of river basins (Gholami et al., 2021). Forest area use permits are issued for non-forestry activities without altering the legal designation or status of the forest. These permits ensure that converted production forest areas are replaced with regions capable of supporting long-term ecological productivity. Rehabilitation efforts focus on restoring, conserving, and enhancing watershed functionality by maintaining their carrying capacity, productivity, and ecological support systems (van Noordwijk et al., 2015). These regulatory frameworks underscore the critical role of stakeholder collaboration in balancing ecological preservation and sustainable resource utilization.

Planting in the Context of Rehabilitation

The watershed rehabilitation planting initiative undertaken by PT. Dempo Sumber Energi was carried out in Nagari Palangai Kaciak, Pesisir Selatan Regency, covering an area of 67 hectares. The land predominantly consisted of rubber bushes, plantations, and the Jengkol Botanical Gardens. This reclaimed area featured a combination of flat and hilly terrain, with elevations ranging between 160 and 220 meters above sea level. An intensive reforestation approach was adopted, involving the planting of 625 seedlings each hectare. Before planting, site preparation included clearing the surrounding area and digging planting holes, creating paths approximately one meter wide in flat and open areas. In sections where strip planting patterns were feasible, planting was conducted along these designated paths. Conversely, in terrains unsuitable for strip planting, contour planting patterns were applied to accommodate the topographical challenges.

To enhance planting efficiency, two alternative methods were employed: transplantation and buffer zone planting. These strategies ensured flexibility in adapting to site-specific conditions while achieving the dual objectives of restoring the watershed and maintaining its ecological functionality. This approach is consistent with reforestation best practices, which emphasize adaptability to local environmental contexts and the promotion of sustainable land use management (Gholami et al., 2021).

CONCLUSIONS

The findings of this study emphasize the critical role of planting initiatives in watershed restoration, as detailed in Minister of Environment and Forestry Regulation No. P.59/MENLHK/SETJEN/KUM.1/10/2019. The watershed rehabilitation project was carried out by PT. Dempo Sumber Energi focused on restoring the river basin in Nagari Palangai Kaciak, Ranah Pesisir District, Pesisir Selatan Regency, encompassing an area of 67 hectares. The planting efforts adhered to established guidelines, employing two alternative methods: interplanting and buffer zone planting patterns. These methods were specifically selected to suit the unique conditions of the land, ensuring greater success in the reforestation process. This initiative highlights the importance of strategic and regulated planting techniques in promoting the sustainability and functionality of river watersheds.

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