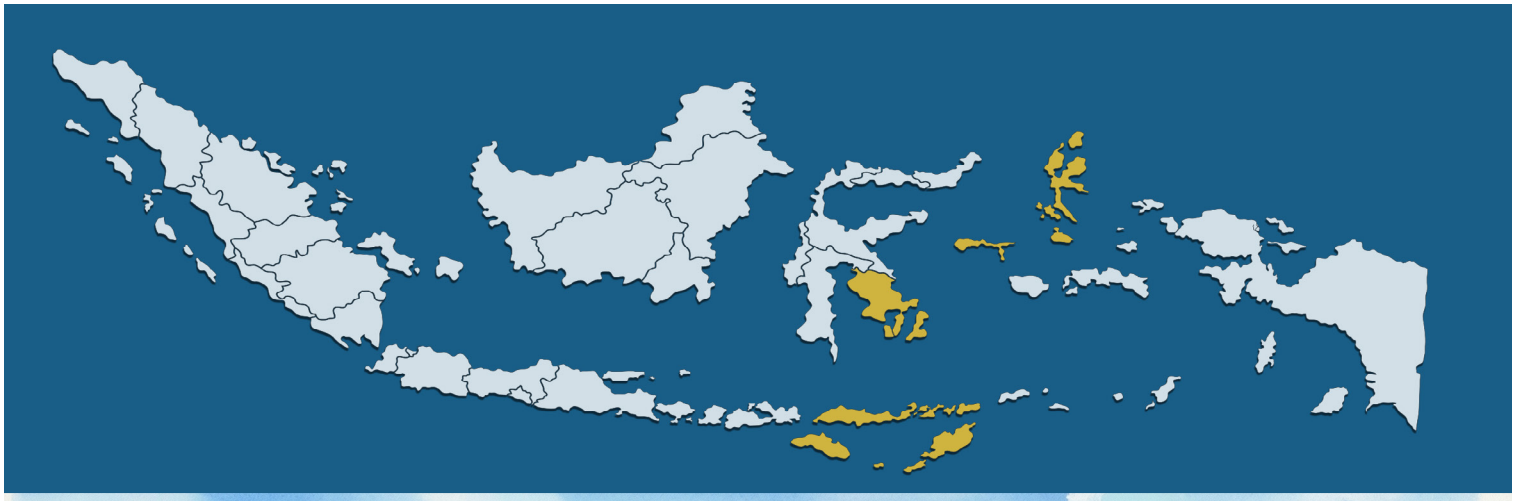
HEINRICH BÖLL STIFTUNG
SOUTHEAST ASIA

Safeguarding the Springs:

Assessing the Impact of Critical Mineral Extraction on Spring Waters in North Maluku, Southeast Sulawesi, and East Nusa Tenggara

Bernadinus Steni



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Assessing the Impact of Critical Mineral Extraction on Spring Waters in North Maluku, Southeast Sulawesi, and East Nusa Tenggara

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Content

Introduction

Around the world, communities have long engaged in water management, a practice known in "commons" literature as community-based natural resource management (CBNRM) [1, 2]. This involves the protection of water sources, their utilization in accordance with established rules and traditions, and the enforcement of these norms through supervision and appropriate sanctions.

Since the 1980s, Community-Based Natural Resource Management (CBNRM) has emerged as a compelling alternative to traditional state and private control of natural resources. This conventional approach has often been criticized for failing to strike a fair balance between conservation goals and the needs of local communities [3]. In contrast, CBNRM is widely recognized as a highly effective strategy for achieving a global equilibrium between conservation and resource use, delivering substantial advantages for both the environment and the people who depend on it [1, 3]. This view is strongly supported by Dawson et al. (2021), whose analysis of 169 case studies worldwide revealed a robust correlation between local institutional involvement in conservation governance and positive social and ecological outcomes [4]. Specifically, 55.9% of locally controlled initiatives reported success, a considerable improvement over externally controlled interventions, which achieved positive results in only 15.7% of cases (16 out of 102) [4]. It further emphasizes the critical role of local stewardship, according to Fa et al. (2024), who found that Intact Forest Landscapes (IFLs) on Indigenous Peoples' lands across 50 forested countries encompass at least 4.2 million km2, accounting for 36.2% of the world's total IFL area (11.6 million km2) [5]. Notably, the proportion of Indigenous Peoples' lands identified as IFLs was significantly higher (10.9%) compared to other lands (6.8%) [5].

Despite this strength, Indigenous territories and their associated Indigenous and Local Knowledge (ILK) are increasingly threatened by competing land uses. These pressures are further exacerbated by the surging global demand for critical minerals, driven by the need to address energy scarcity and achieve climate goals [6]. While ostensibly a shared objective, this pursuit often has a devastating consequences for Indigenous common-pool resources, leading to severe water, air, and land pollution, and subsequently, conflict [7, 8]. These socio-cultural impacts ripple across all levels of biological structures, from genetic diversity to entire ecosystems and landscapes [7].

This study critically examines the challenges confronting community-based water management on Indonesia's small and medium-sized islands, particularly in the context of the nation's policy emphasis on critical mineral extraction. Indonesia has 47 critical mineral commodities, including globally significant nickel deposits, and currently accounts for 51% of the world's nickel supply [9].

The scale of nickel extraction is genuinely alarming. A report from the mining advocacy network, Jaringan Advokasi Tambang (JATAM) reveals that 218 nickel concessions have been granted across 34 small islands, covering a staggering 274,000 hectares [10]. Official data sources further underscore this, indicating a total of 339 active nickel permits spanning 839,000 hectares across eight provinces [11, 12].

On the other hand, statistics show that springs are among the main sources of drinking water on these provinces. Its consistent supply has contributed to an increase in the villages' access to drinking water from 82.74% in 2020, to 84.93% in 2022, and 87.6% in 2024 [13]. However, under the combined pressures of climate change and aggressive land-use change, the stability of springs across several islands has been seriously compromised in recent years, posing a growing threat to local water security.

In several small and medium-sized islands in eastern Indonesia, including West and East Nusa Tenggara, Southeast Sulawesi, and Maluku, the role of the springs is even more crucial, as they serve as the primary source of freshwater. Rivers in these areas are often contaminated by zinc [14]. Indigenous Peoples and local communities obtain drinking water not from the rivers but from springs. Moreover, the vital function of springs is also deeply reflected in the cultural and spiritual lives of these communities. Many Indigenous cultures regard springs as integral to the cosmology of life, defining the very existence and identity of their peoples. The loss of springs would therefore mean the loss of communal identity itself.

This study argues the importance of defining the concept of boundaries for springs protection in the context of critical mineral mapping resources in Indonesia. Over the past 30 years, springs have remained the only common resource that communities can directly manage, after other shared resources, including communal lands, forest, and marine areas have been taken over by the state or private entities. The geographical vulnerability of small and medium-sized islands, compounded by the impacts of climate change as modeled by the government, further undermines community resilience. The mining operations exacerbate the fragility, and threatening the survival of these islands. Therefore, this study suggests for the integration of the cultural significance of springs and mapping of springs into protected area planning, specifically in small and medium-sized islands where these water sources sustain critical life systems.

Method

Research location

We identified three locations that have been affected by critical mineral operations, as shown in Figure 1. These include Obi Island in the South Halmahera District, North Maluku Province, and Wawonii Island in the Konawe Islands District, Southeast Sulawesi Province, both of which have been granted nickel mining permits. Manggarai District in East Nusa Tenggara Province has also been granted mining permits for manganese, another key mineral used in the production of battery. According to Bappenas, [15] these regions face significant environmental challenges by 2045, specifically due to their susceptibility to water scarcity. They are also vulnerable to marine and coastal inundation (notably Wawonii Island, Figure 1a), drought, and natural disasters in Manggarai (Figure 1b), and impacts on rice production, particularly Obi Island (Figure 1c). Given these vulnerabilities, each location is slated for strategic intervention. The Manggarai District is a top priority for the water sector, Wawonii Island for the agriculture sector, and Obi Island for the coastal and marine sector.

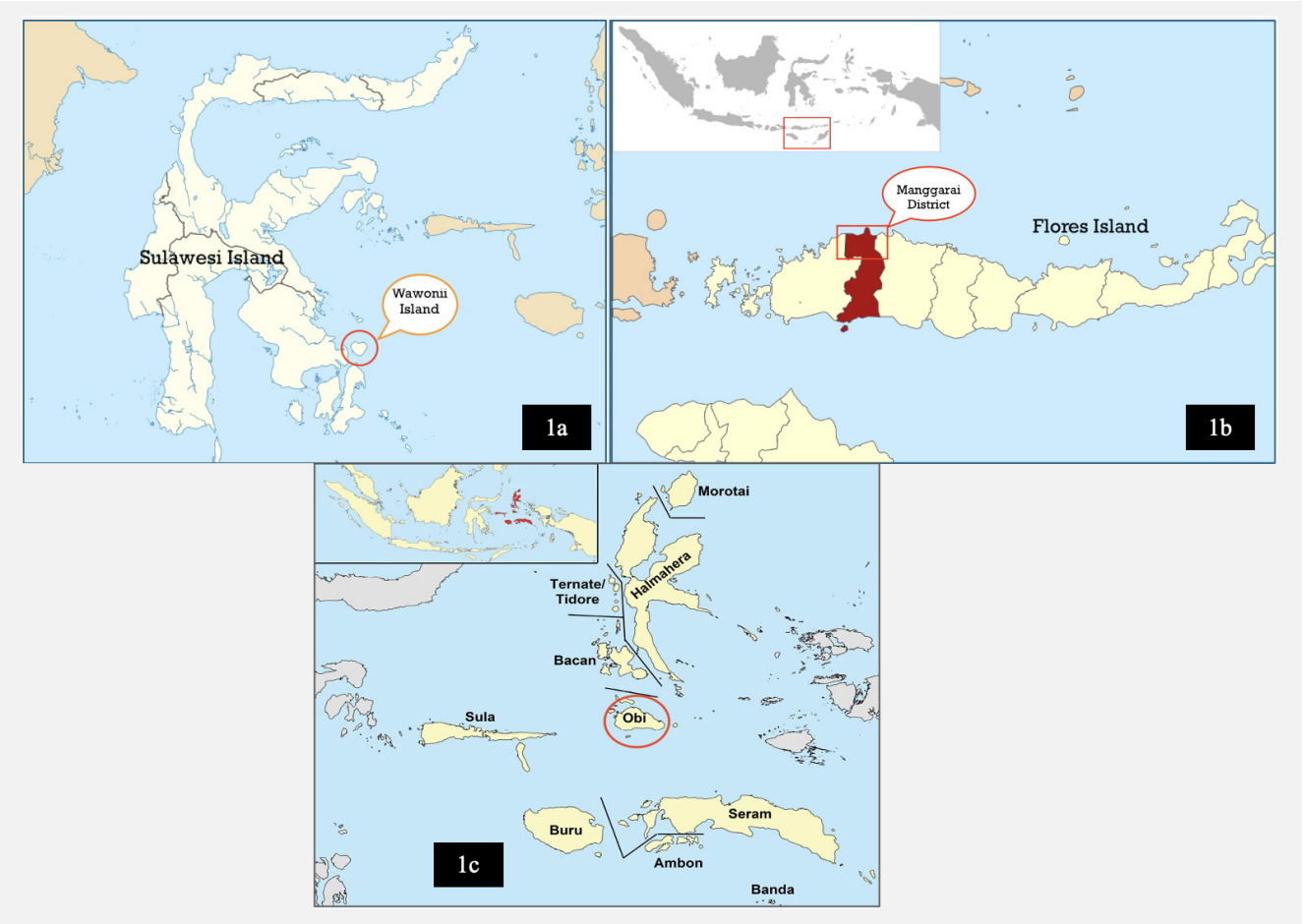

Figure 1. Research location [1a. Wawonii Island, 1b Manggarai District, 1c Obi Island]. Source: Wikipedia, supplemented by individual analysis

Conceptual framework

To understand the concept of boundaries, we employ two main concepts: (1) common-pool resources in the form of community-based management (CBM), and (2) the concept of boundaries.

Common-pool resources management in community-based management

The common-pool resources (CPR) include forests, fisheries, water, minerals, coastal and marine areas, rivers, lakes, genetic resources, etc. They are globally recognized as among the most contested areas of resource management. The main issue in this contestation lies in determining how best to manage these resource through appropriate institutions, values, norms, and practices, and in designing policies to sustain them.

Research led by Nobel laureate Elinor Ostrom on the management of Common-Pool Resources (CPR) demonstrates that Indigenous Peoples and local communities are often the most effective guardians of these shared resources. This framework is widely known as Community-Based Natural Resource Management (CBNRM). In a CBNRM system, communities established mechanisms to sustain and protect their natural resources. Researchers highlight several key characteristics of this management model, including defined boundaries, exclusive access protocols, efforts to deter unauthorized use, and internally developed community arrangements [2, 3]. Furthermore, customary land tenure system is foundational to CBNRM, as they define how rights and responsibilities are distributed and specify the permissible and impermissible actions that ultimately govern resource management [2, 3].

Advocated by civil society, these principles have increasingly shaped Indonesian policies over the last two decades. The most significant shift occurred in 2012 when the rights of Indigenous Peoples to their customary forests were formally recognized, giving them authority over the management of those lands. Similar policies are now gradually expanding into other sectors, including coastal and conservation areas, acknowledging the rights and proven management capabilities of local and Indigenous communities.

Cultural concept of Boundaries

Spring area boundaries are critical markers of legitimate authority and resource control, not just lines on a map. Drawing on the foundational work of anthropologist Fredrik Barth (1969), a boundary is defined as far more than a physical demarcation. It serves as an active social mechanism that codifies the concept of collective life, thereby demanding and signaling specific behaviors that demonstrate a member's commitment to the agreed-upon social order [16]. They define the very governance norms expected of a community and external actors. When these markers are contested or absent, they become direct sources of protracted social conflict. More profoundly, these boundaries carry deep cultural meaning, intrinsically reflecting a community's identity, history, and sacred traditions.

For indigenous communities, the delineation of spring boundaries reflects a distinct ontological worldview that fundamentally differs from modern, resource-centric views. These boundaries are not merely cartographic zones or disposable objects; they define a territorial concept deeply rooted in what scholars term "more-than-human relations" [17, 18].

Pioneers in common-pool resource management, such as Ostrom, have long emphasized that analysing boundaries is a cornerstone for effective management. However, the boundaries are not merely a physical line, but a multi-dimensional concept, significantly encompassing cultural aspects. Border/boundary is not merely a physical line, but as a multi-dimensional concept, significantly encompassing cultural aspects. They are potent markers imbued with meaning that transcends their physical presence. As Kondrad and Szary [19] argue, boundaries are not limited by political barriers; they extend beyond territorial constructs. Even legal boundaries conceal layers of representation and imagination that evolve beyond simple legal concepts. The boundaries define a space where collective life extends beyond the human social sphere to include spiritual, ecological, and ancestral entities. Consequently, the boundaries serve as cultural and political markers that govern an entire, interconnected ecology. They signal a profound relationship of reciprocity - the human community protects the spring's sacred integrity, and in return, the spring provides the vital water resource ensuring the continuity of both the human and ecological system within that defined territory.

Therefore, the significance of a physical boundary lies not just in its demarcation, but profoundly in the meaning attributed to it. This meaning shapes existence itself, forming a historical continuum whose loss could fundamentally erode a community's identity and heritage [17, 18].

Legal concept of the boundaries

The traditional concept of legal certainty is profoundly challenged by ecological necessity. Legal boundaries have been typically defined as precise, unyielding lines that delineate subjects and objects, where even the slightest encroachment may result in severe political and legal repercussions. Yet, driven by the complex, dynamic realities of natural resource governance, this rigid paradigm is beginning to give way. Legal boundaries are now being reframed as negotiated boundaries [20]. This critical shift is evident in the growing number of legal frameworks that recognize the limitations of static, text-based laws in responding to fluid social circumstances. Most notably, recent regulations have begun to formally recognize the rights of Indigenous Peoples. Crucially, the practical challenge of resource management now lies at the forefront of policy debates, focusing on how to translate these communal rights into genuine, adaptive, and effective governance practices on the ground.

Method and analysis

This study employed a three-stage analysis of water spring locations and manganese and nickel mining permits:

1. Identify the concept of boundaries surrounding springs as defined within existing laws and regulations, as well as within the cultural frameworks of two communities: Manggarai and Obi peoples.

2. Overlap Identification: Mining permit maps were overlaid with the spatial locations of springs to identify potential areas of intersection.

3. Implication Analysis: For each identified overlap, the study analyzed the associated legal, social and environmental implications.

Findings of the Study

Boundaries in Regulations

Since the early 1990s, Indonesia's spatial planning laws and regulations have incorporated provisions for demarcating the boundaries of natural resources, including areas surrounding springs. One of the key provisions established a 200-meter protection radius. The 2007 Spatial Planning Law (Law No. 26/2007) and its implementing regulation (GR No. 15/2010) significantly enhanced resource protection (see Table 1). A central feature of this legal framework is the decentralization of planning and management authority to sub-national governments - provinces and districts through detailed spatial plans and management guidelines. Within the law, springs are classified as protected areas and public property, subject to strict management rules that limit activities and access. Extractive or potentially polluting activities are explicitly prohibited within spring zones. In cases where private land ownership or permits exists within these areas, the exercise of such rights must not obstruct public access to the springs. Any violation of this provision my result in administrative sanctions, including the revocation and cancellation of licenses and the imposition of fines.

Table 1. Regulation of springs protection

Regulation	Description
Presidential Decree (Keppres) 32 of 1990 (Article 20)	The spring protection zone (spz) requires a minimum 200-meter radius from the spring's center.
Government regulation (PP) 43 of 2008 (article 40)	To preserve groundwater recharge capacity and maintain water quality integrity. Drilling, excavation, and other disruptive or extractive activities are strictly prohibited within a 200-meter radius of any spring.
Regulation of Public Works and Housing Ministry (Permen) No 28/PRT/M/2015	The spring protection boundary is established at a minimum 200-meter radius from the spring's center.
Regulation of Energy and Mineral Resources Ministry (Permen) 31 of 2018	To protect springs, a 200-meter radius must be delineated around their source. Within this zone, drilling and excavation activities are strictly prohibited.

In 2019, Indonesia enacted Water Management Law (Law No. 17 of 2019), which significantly clarifies the objectives and scope of water conservation. The law mandates the government to adopt a holistic and integrated approach to water management, including the recognition of the role of indigenous water tenure systems. Although further provision is required through implementing regulations, this legislation marks a significant legal milestone by establishing a framework for formally supporting indigenous water governance. Under this law, both the central and sub-national governments are tasked with developing comprehensive plan, including the identification and recognition of indigenous water systems. Moreover, the outcomes of these conservation initiatives are intended to serve as key references in spatial planning.

Boundaries in reality of the springs

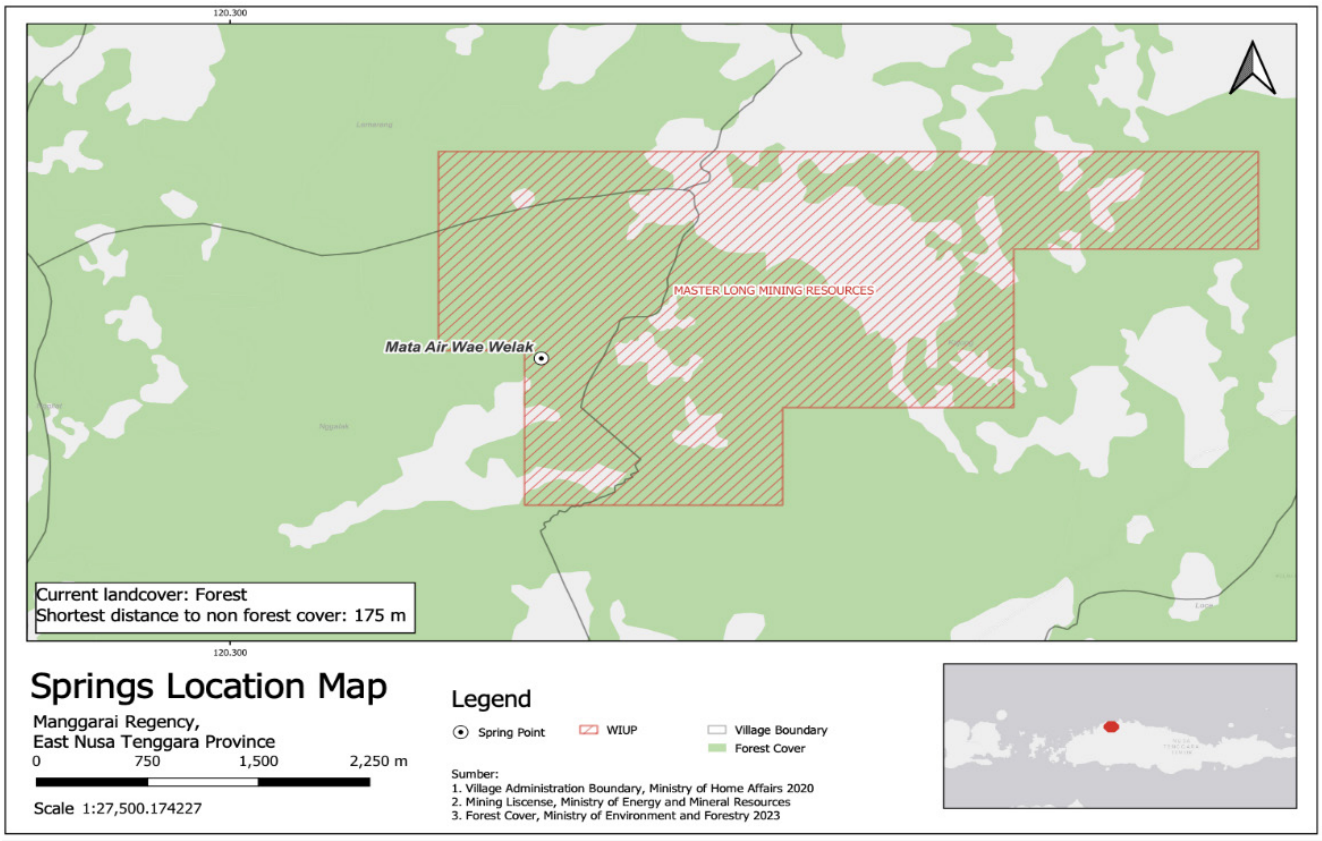

Figure 2. Manganese mines vs Wae Welak Spring in Manggarai
Source: One map platform 2022, supplemented by individual analysis

Despite the existing regulatory provisions, the permitting of critical minerals operates outside the regulatory framework. In practice, the fundamental requirement to enforced boundary protections is routinely violated.

This regulatory failure is evident in the conflict between spring protection and mining activities in Manggarai District. As illustrated in Figure 2, the Wae Welak spring, a vital source of communal water for Nggalak Village, lies directly within the operational area of a manganese mine operated by PT. Master Long Mining Resources, reportedly, is a China-based for the major industry in Guangzhou, China.

PT. Master Long Mining Resources holds an operational permit issued under Governor of East Nusa Tenggara Decision No. 540.10/21/DPMPTSP/2017 [21] authorizing operations until 2032. While public information about the company is limited, the permit covers 982.4 hectares [22], which intersects with three villages and encompasses the Wae Welak spring.

Similarly, springs have been found to overlap with nickel mining operations (see Figure 3). On Obi Island in the South Halmahera District, North Maluku Province, a spring is located within the operational area of Trimegah Bangun Persada (TBP), a national company under the Harita Group. TBP has been granted concessions to extract nickel until 2030, operating under several affiliated mining permits, including those held by Gane Permai Sentosa, Gane Tambang Sentosa, Jikodolong Megah Pertiwi, and Obi Anugerah Mineral [23].

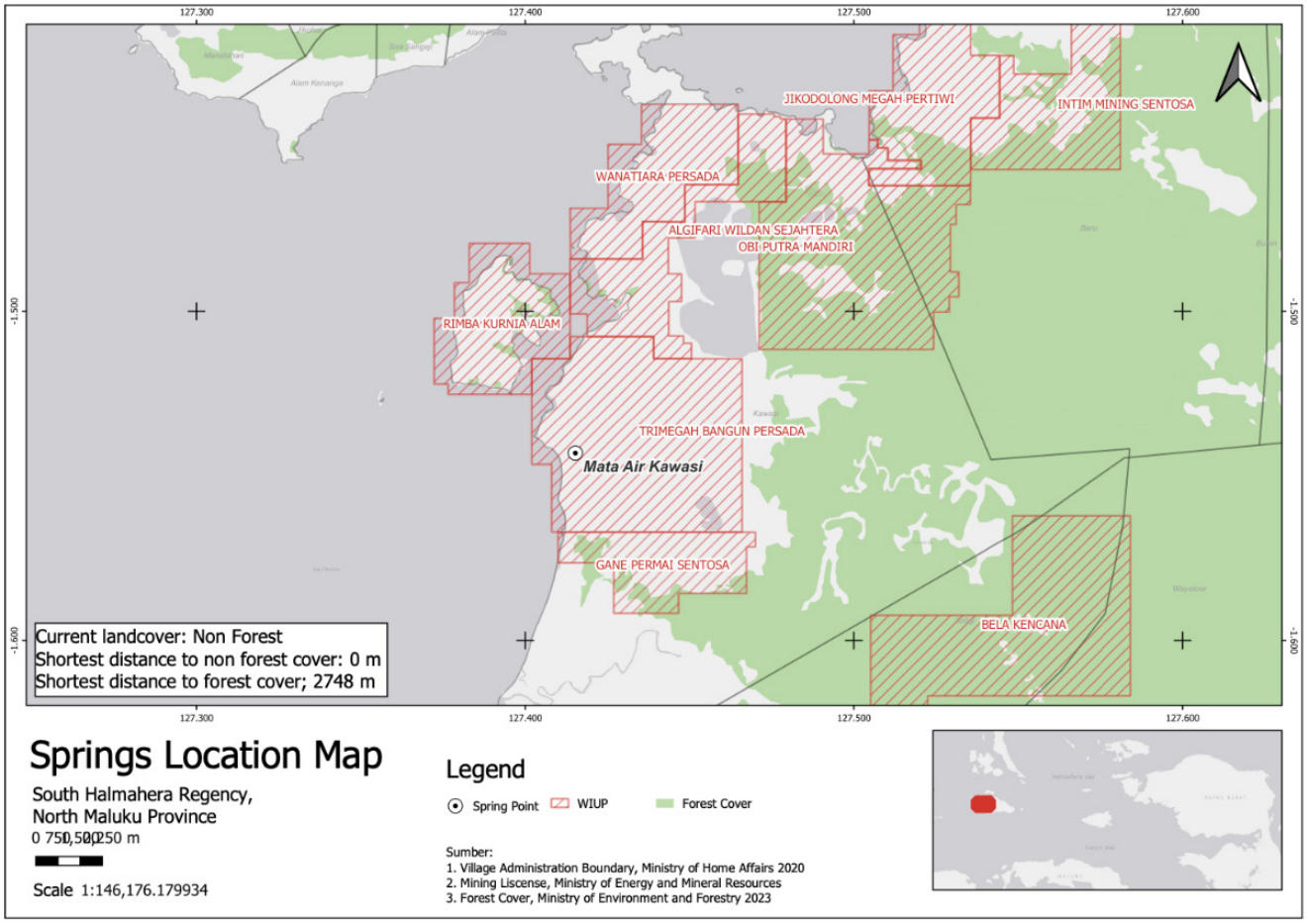

Figure 3 Nickel mine vs Kawasi Spring in Obi Island.
Source: One map platform 2023, supplemented by individual analysis

Trimegah Bangun Persada (TBP) has been fully operational since 2011, managing a 5.524-hectare nickel mining area in Kawasi Village, Obi District [24]. In its public sustainability report of 2023, the company acknowledges the presence of the Kawasi Spring near its operational site [25]. Although the report does not explicitly confirm that the spring lies within the IUP (Izin Usaha Pertambangan - Mining Business Permit) location, it states that the company's environmental

team has maintained the spring in good condition over the past decade (2013-2023) [26]. However, the Kawasi Spring serves as the main source of drinking water for the residents of Kawasi village, who have since been relocated due to the uninhabitable conditions caused by mining activities [27].

Media and independent reports revealed severe environmental degradation on Obi Island, including on springs, rivers and residential areas [24, 25, 26]. The study found that water sources were polluted, the air was thick with dust and other contaminants, seawater had turned murky and brownish, and even local fish were found to contain with heavy metals [26]. The company, however, has rejected these findings, denying any causal connection between the pollution and their operations [27].

Another challenging overlap between nickel mining operations and vital spring zones is found on Wawonii Island, Konawe Kepulauan District, Southeast Sulawesi Province. The company at the center of local protests is PT Gema Kreasi Perdana (PT GKP), a subsidiary of the Harita Group. PT GKP began its operations in 2018 in Southeast Wawonii District, particularly in Sukarela Jaya Village [28, 29]. The mining activities have been met with strong local resistance, escalating in violent conflict in March 2022, when the company forcibly evicted villagers from their land and gardens [30]. Beyond land disputes, the company's mining activities on the surrounding hills are suspected of contaminating both spring and river water, which serve as the primary sources of drinking water for the villagers [28, 29, 30] (see Figure 4).

Figure 4. Polluted springs in Wawonii Island
Source: Yunus, Kompas, 2023

Although no map of the spring area was provided, the report explicitly links the pollution to the company's operations. It highlights villagers' testimonies stating that their water wells have become unusually murky, even during the rainy season [30]. Similarly, the Banda Spring, located in the Southeast Wawonii forest and serving as a vital source of clean water for Dompo-Dompo Jaya residents, has also become murky [28, 29, 30]. The spring originates from a karst cave and flows into several tributaries that irrigate local gardens and farms [28, 29].

Holistic Approach to Boundaries

As aforementioned, boundaries are not merely legal constructs but multifaceted concepts. Among the Manggarai, Wawonii and Obi communities, there are at least three dimensions of boundaries that uphold community-based water management.

Springs as a life support system

In 2021, the Government of Indonesia released a national document on climate change resilience, identifying small and medium-sized islands as being in critical conditions due to various environmental impacts, including water scarcity and agricultural decline [15]. However, the current regulatory framework remains detached from local realities, particularly concerning the vital life- support functions that these islands provide. Maintaining the integrity of these landscapes requires a delicate balance among land use, biodiversity, and the social-ecological relationship [31]. Given its geographic scale, Wawonii Island represents an interconnected landscape, where ecosystems are closely linked to one another. This interconnection provides essential ecological and cultural services, reinforcing the island's role as a life-supporting system.

Therefore, without sustaining these interlinkages, the island risks losing its ecological function and cultural vitality. On the other hand, the current regulations give limited attention to life-supporting systems. As analysed by Deden Rukmana [32] the mandated templates for sub-national spatial planning adopt a uniform standard based on identical assumptions, disregarding the unique conditions of small and medium-sized islands. This results in a dangerously flawed premise – the technical assumption that all ecologies share similar parameters, thereby allowing a one-size-fits-all approach. Consequently, arbitrary measures – such as the blanket application of a 200-meter protection radius – are imposed nationwide. These standardized technical frameworks are fundamentally inadequate because they fail to account for the complex socio-hydrological dynamics traditionally governed by indigenous systems. This crucial omission has prevented the integration of sustainable and effective water resource management practices developed by Indigenous communities, which have only recently gained formal recognition under the law.

Springs as a cultural landscape

In many cultures, springs are considered sacred sites. Among the Manggaraians, springs hold deep cultural significance, revered as manifestations of benevolent spirits that sustain human life. This reverence emphasizes why the presence of spring water was a primary criterion in the establishment of early settlements [33].

For the people of Manggarai, a spring's meaning transcends its physical presence. It is intimately connected to their ancestors, serving as a powerful reminder of the village history, and, most importantly, represents the spiritual bedrock of the community [33, 34, 35]. Without this profound meaning, a certain village, in their understanding, could never be truly founded. Thus, a spring's boundary is not merely a line defined by a specific radius. As Sivapalan describes it [36], it embodies a complex socio-hydrological meaning, signifying an intertwined and inseparable relationship between humans and nature.

The cultural significance of springs is also reflected in the Wawonii people's legend of La Samana – a fable about a deer that drank from a spring and miraculously gave birth to a son [37]. This illustrates the intrinsic bond between humans and nature, reinforcing the deep respect the Wawonii people hold for springs. As Sivapalan and others elaborate through the concept of socio-hydrology and resource arenas, such profound connections transcends physical boundaries [36].

Although the inhabitants of Obi Island are predominantly migrants from other islands, their connection to the forest, springs, lakes, and waterfalls has endured for generations. For instance, the Tobelo people migrated from Halmahera to Obi as early as the 19th century [38], establishing the Kawasi village, because of the spring found there, also called Kawasi Spring. As analyzed by some studies, the Tobelo people's culture is crucial for maintaining the landscape; their values, norms, and social interactions are deeply built upon this ecological relationship [39, 40]. For many, the tradition of honoring water as a "mother culture" remains a cherished legacy passed down through generations.

The cultural significance of these springs transcends their physical boundaries. Their true meanings are not defined by Western concepts of property and rigid legal demarcations but are inscribed within the community's spiritual and social fabric. A spring is not merely a resource to be owned; it is a living entity that sustains a reciprocal relationship with human society. Its presence is a testament to the symbiotic interaction between people and water. Its loss would not only threaten ecological balance but also erode social cohesions and cultural identity that depend on it.

Loopholes in current regulations

Legal frameworks are intended to protect spring areas, typically mandating a 200-meter radius as a safeguarded zone, with severe penalties for non-compliance. However, this requirement is not met in at least two mining concessions as shown in Figures 2 and 3, where the Mining Business Permits (IUPs) directly overlap with the spring sites. Although the company, TBP, claims in its sustainability reports to uphold environmental protection standards [23, 27], the profound cultural and ecological significance of these springs has already suffered considerable damages.

Furthermore, Indonesian law explicitly prohibits mining activities on small islands such as Wawonii [41]. The island's residents invoked this legal provision to successfully challenge the company in court. Yet, despite this victory, mining operations persists. This situation highlights a deeper systemic problem – one that extends beyond national jurisdiction and legal compliance reflecting the global demand for critical minerals market. The case illustrates that legal instruments alone are insufficient to address the broader structural forces driving environmental degradation and cultural loss.

While Indonesia acknowledges the grave threats posed by climate change and dwindling resources to these small and medium-sized islands, it has not implemented specific policies to protect them. Instead, the government is applying a one-size-fits-all strategy, extending the same mineral-extraction models used for larger islands like Kalimantan, Java, and Sumatra. This strategy disregards local ecological variations, thus, fail to adequately address the specific needs of these diverse regions.

This policy is based on the false and disproven assumption that small islands, like their larger counterparts, can simply absorb vast development pressures. The ongoing, devastating destruction on Indonesia's largest islands serves as a powerful and tragic warning. It is self-evident that applying the same aggressive, unregulated extraction to smaller, more delicate islands will not just harm them–it will destroy them completely. This is a critical oversight that demands immediate, strict regulations before these irreplaceable habitats and the communities they support are lost forever.

Conclusion

Indonesia's regulatory framework, which prescribes a 200-meter protection radius for springs and assigns planning authority to the government, is failing critically in practice. This study reveals inconsistency between codified law and corporate operations. Companies routinely violate the legally mandated spring ecosystem zones, encroaching upon and exploiting the resources of the areas that are meant to be protected.

This pervasive violation is not a simple regulatory lapse; it stems from a lack of concern for the fragile ecological situations of small and medium-sized islands. The failure is systemic: resource management strategies continue to replicate models designed for larger islands – a model demonstrably incompatible approach for smaller, environmentally delicate systems that demand a higher degree of sustainability.

The uniform application of technical boundaries fundamentally misrepresents the true nature of the resource. Springs are not just physical sites; they form the essential core of the life-support systems sustaining these islands. It has been managed through Community-Based Natural Resource Management (CBNRM) for generations embodying both ecological and cultural stewardship. Therefore, their protection cannot be reduced to an an arbitrary, standardized radius.

Moreover, springs are cultural landscapes. They are living spaces that carry significant social and spiritual meaning to the communities. Their significance transcends physical boundaries, shaping the cultural identity and continuity of the communities they sustain. The recognition of the existence of these non-physical, socio-cultural boundaries is vital to ensure the long-term protection of small and medium-sized islands.

Based on this findings, a fundamental policy transformation is urgently needed. Future resource governance in archipelagic regions must move beyond narrow technical definitions to integrate the multi-layered significance of natural resources. Spatial planning must formally account for cultural and social dimensions while directly addressing the escalating ecological crisis. Only by integrating these considerations into policy can Indonesia ensure the sustainability and survival of its smaller islands.

This study suggests three key policy recommendations to address the challenges associated with critical mineral mining:

1. Establish permanent protection zones for all spring sites by integrating boundary rules that reflect the unique local socio-ecological situation of each island instead of applying uniform technical standards.

2. Review all ongoing mining operations to evaluate their compliance with spring protection regulations. Assess whether the company respect the community's traditional ways of managing common-pool resources (CPR).

3. The government must formulate a comprehensive macro-strategy dedicated for small island protection. This strategy must be specific to the island's unique conditions, moving away from the one-size-fits-all approach used for larger islands.

Moreover, the protection of Indonesia's medium-sized islands is not merely an aspirational goal – it is a legal obligation that the country is fundamentally failing to fulfill. The absence of a concrete protection plan, or even a preliminary steps toward one, exposes a profound neglect of the very laws intended to safeguard these vital ecosystems. This is not a simple policy gap; it represents a serious dereliction of duty, leaving these fragile islands and their communities vulnerable to irreversible harm. The socio-hydrology framework and our socio-legal analysis illuminated the situation within the "spring arena." However, to fully understand the depth of the problem, the analysis must be expanded to include the government policies and global market standards for critical minerals. Buyers and investors in critical minerals need to recognize the socio-hydrological relationship within these landscapes – relationships that define common-pool resources (CPR) boundaries not only in legal terms but also through their socio-cultural significance.

Therefore, this study highlights the need for further research on how global market forces influence community-based water management and reshape local resource governance in the vulnerable island systems.

About the author:

Bernadinus Steni is an environmental lawyer. As a co-founder of Kaleka, Steni worked for the rights of indigenous communities and smallholders. Originally from Manggarai, Flores, Steni's work is deeply informed by his firsthand witness to the critical struggles over spring-water land use in his homeland. He has been involved in promoting district-level regulations aimed at protecting common resources, including water, riparian zones, and local food systems. Steni is currently spearheading Lingko Hijau, an "Inherit the Future" initiative that seeks to instill a local wisdom for farming and ecological stewardship in children from an early age.

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