

# Sustainable Water Resource Governance and the Integration of Local Wisdom in Bali

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## ABSTRACT

This study examines several regulations related to water resources, emphasizing the necessity for existing legislation to be environmentally oriented. The utilization of water resources in Bali to date has not sufficiently adhered to the principles of environmental management, such as the precautionary principle, equity, and community-oriented approaches. This research addresses governance issues in the utilization of water resources, underscoring the imperative of aligning such practices with environmental considerations. Accordingly, it proposes the formulation of water resource policies that are oriented towards sustainability, inclusivity, and environmental stewardship, in accordance with the objectives of sustainable development.

The research employs a normative legal method, analyzing existing laws and regulations related to water resources, both for daily community needs and for industrial purposes. The findings indicate that sustainable water resource management must be based on strategies that aim to balance and harmonize economic, ecological, and socio-cultural dimensions. Such strategies enhance water utility, minimize losses, and support environmental restoration and conservation. In the Province of Bali, the adoption of Danu Kerthi as a policy foundation represents a progressive and exemplary approach for other regions.

Danu Kerthi as a policy basis demonstrates that the Balinese government integrates not only technocratic and legalistic approaches, but also cultural values as guiding principles for environmental conservation. This reflects a form of cultural ecological awareness, where water preservation is regarded not solely as a governmental responsibility, but also as a spiritual and communal practice. Similarly, within the framework of Sad Kerthi, Danu Kerthi teaches that water is not merely a commodity but a sacred, living entity whose purity must be protected, as it is intrinsically linked to ecological balance and human existence. This philosophy aligns with contemporary conservation principles and offers a powerful model for local ecological ethics—reminding us that natural resources also encompass moral and spiritual dimensions.

**Keywords:** Water resources, Utilization, Fulfillment of the right to water.

## INTRODUCTION

Water is a divine gift from God Almighty to all living beings, enabling them to grow and carry out their life activities. Since the dawn of life, living organisms—particularly humans—have relied on water as an essential element for survival; for humans, it is an absolute necessity (1). Given the fundamental importance of water as the source of life for all living beings, its regulation has been embedded in the constitutional framework of the Republic of Indonesia since the nation's founding. This is affirmed in Article 33, paragraph (3) of the 1945 Constitution of the Republic of Indonesia (UUD NRI 1945), which states: "The land, the waters, and the natural resources therein shall be controlled by the state and utilized for the greatest benefit of the people.

A good and healthy environment is a constitutional right of every Indonesian citizen, as stipulated in Article 28H paragraph (1) of the 1945 Constitution of the Republic of Indonesia. This right also entails a corresponding obligation on the part of the state to protect, manage, and preserve the environment so that it may serve as a sustainable source of life .(2)

Environmental law in Indonesia is primarily aimed at protecting, managing, and conserving the environment and natural resources in a sustainable manner. It is designed to maintain a balance between economic growth and environmental preservation efforts. However, the enforcement of environmental law continues to face significant challenges. One of the key legal foundations in this context is Law No. 32 of 2009 concerning Environmental Protection and Management (3).

From the perspective of sustainable development, it is essential to conduct research, studies, and development of local wisdom that has been proven effective in preventing the degradation of environmental functions.(4) Local wisdom—often conceptualized as local knowledge, local genius, and local policy—is defined under Law No. 32 of 2009 on Environmental Protection and Management as noble values embedded within community life, which are utilized, among other things, to manage and protect the environment sustainably (4)

One of the most pressing concerns facing society today is the water crisis. This crisis is not solely driven by climate change, but also by the degradation of watershed ecosystems, inefficient land use, increasing demand for water, and economic interests. These challenges require an integrated approach to protection and management in order to prevent more severe water scarcity (3)

Bali, as a globally renowned tourist destination, also faces serious water-related challenges. These include meeting the water demands of both the local population for daily needs and the tourism industry. Behind Bali's image as a tropical paradise lies a critical struggle involving environmental degradation and water resource management. Rapid tourism growth, increased urbanization, and the escalating impacts of the climate crisis are placing immense pressure on the island's already limited water resources (Dewi, 2024). Based on the aforementioned background, the following research questions can be formulated: What is the current policy orientation regarding water resource management in the Province of Bali?

### **Purpose and Objectives of the Research**

To analyze laws and regulations concerning water resources in Bali, particularly in relation to environmental management principles such as the precautionary principle, equity, and community-based approaches, and then to examine the application of Danu Kerthi as a policy foundation in Bali, which integrates technocratic, legal, and cultural approaches to environmental conservation.

## **LITERATURE REVIEW**

Water is not only a fundamental necessity for meeting daily human needs but also plays a vital role in religious ceremonies in Bali. Without proper protection, water resources are at risk of degradation, including the drying up of springs and the decline in water quality. One of the main contributing factors to the degradation of water resources in Bali is the rapid development of various industries. The dominant presence of tourism and agriculture industries has resulted in erosion and contamination from industrial waste ((5)

The growing population, expansion of industrial sectors, and the booming tourism industry have significantly increased the demand for water. Rural residents who once had easy access to clean water are now required to pay to meet their basic water needs. During the dry season, communities living downstream must compete with livestock for access to bathing water. According to the Ministry of Environment, Bali has experienced a water deficit since 1995 of approximately 1.5 billion m<sup>3</sup> per year. This deficit increased to 7.5 billion m<sup>3</sup> in 2000, and by 2015, it was projected that Bali would face a shortage of 27.6 billion m<sup>3</sup> annually .(6)

Article 18B paragraph (2) of the 1945 Constitution of the Republic of Indonesia recognizes and respects the existence of customary law communities along with their traditional rights, as long as they are still alive and in accordance with societal developments and the principles of the unitary state, as regulated by law (7) Article 28I paragraph (3) of the same Constitution further affirms that “the cultural identities and rights of traditional communities shall be respected in accordance with the evolution of times and civilization.” Based on these constitutional recognitions, indigenous communities hold legitimate rights to manage their local environment and natural resources. These rights are not merely cultural but are fundamentally linked to human rights.

In this context, Article 28H paragraph (1) of the 1945 Constitution establishes a clear relationship between environmental management and the fulfillment of every citizen's right to a good and healthy environment (8). Furthermore, Law No. 32 of 2009 on Environmental Protection and Management, particularly Article 88, stipulates that any party involved in activities using, producing, or managing hazardous and toxic waste (B3 waste) that potentially threatens the environment, holds strict liability for any resulting damages.

The right to water implies non-discriminatory access for all individuals. It entails that everyone is entitled to obtain water fairly and equitably. As affirmed in Article 28H of the 1945 Constitution: "Every person shall have the right to live in physical and spiritual prosperity, to reside, and to enjoy a good and healthy living environment, and shall have the right to obtain health services." The right to safe and clean water is considered a basic human right, encompassing the broader right to health—a positive right that imposes a corresponding duty on the state to ensure its fulfillment.(9)

Research conducted by Ardhiwinda Kusumaputra emphasizes that Article 33 paragraph (3) of the 1945 Constitution forms the constitutional basis for the central government to strengthen its authority over water resources. Regional governments are thereby positioned as implementers of central government policy. Furthermore, Law No. 11 of 2020 was enacted to accelerate investment growth led by the central government. In this context, there is a need to deconstruct sustainable development principles by emphasizing local prosperity through optimal supervision and utilization of water resources at the regional level .(10)

In contrast, I Gusti Ayu Ketut Rahmi Handayani argues that the decisions of the Constitutional Court lack enforceability when they do not specify a timeline for implementation, thereby undermining the purpose of Article 24C paragraph (1) of the 1945 Constitution, which states that the Constitutional Court's decisions are final and binding in reviewing legislation against the Constitution. However, some legislative bodies have responded to Constitutional Court rulings by including deadlines for execution in their subsequent regulations .(11)

Nita Triana's research reveals that environmental rights and water resource management are not yet integrated across regional boundaries. As a result, local government policies tend to focus on maximizing regional revenues, which leads to environmental degradation in both upstream and downstream areas and suboptimal water use. This condition underscores the need for a water resource legal system based on an ecoregion approach—where terrestrial and aquatic boundaries are defined not by political jurisdictions, but by the geographical features of ecosystems and human communities).(12)

Water resource management increasingly faces multifaceted challenges due to population growth and accelerating socio-economic development. Among the key issues are the deteriorating conditions of watershed areas and morphological degradation of river systems. A comprehensive water management framework should encompass conservation, utilization, and the control of water's destructive potential.

## RESEARCH METHODS

Based on the aforementioned background, this paper aims to explore the relationship between local wisdom and sustainable water resource management, as well as the challenges to the continued existence and relevance of local knowledge in managing water resources. To address these issues, this study employs a normative legal research method, utilizing a juridical-normative approach. This approach focuses on the study of legal norms, including principles, doctrines, and statutory regulations .(13)

Normative legal research is library-based research that primarily examines primary and secondary legal materials (14) The research findings are analyzed qualitatively in order to identify answers to the research problem have been previously formulated. The legal materials used in this study include Law No. 32 of 2009 on Environmental Protection and Management and Law No. 17 of 2019 on Water Resources.

## RESULTS AND DISCUSSION

One of the pressing issues currently facing society is the water crisis. This crisis is not solely attributed to climate change, but also to the degradation of watershed ecosystems, inefficient land use, increasing water

demand, and underlying economic interests. These complex and interrelated factors necessitate an integrated approach to the protection and management of water resources in order to prevent a more severe crisis (15).

As a major international tourist destination, Bali also faces significant water-related challenges. These include fulfilling water needs for both domestic consumption and industrial use—particularly in the tourism sector. Behind Bali's image as a tropical paradise lies serious environmental challenges, especially in terms of water resource management. Rapid tourism growth, increasing urbanization, and the impacts of climate change place a substantial burden on the island's already limited water availability (16)

In response to these challenges, the Provincial Government of Bali has adopted policies grounded in the island's cultural and ecological values. Guided by the Balinese vision of "Nangun Sat Kerthi Loka Bali" and the local value of Danu Kerthi—which embodies the sanctification and reverence of water—the government enacted Governor Regulation No. 24 of 2020, focusing on the protection of lakes, springs, rivers, and marine waters. In addition, Regional Regulation No. 8 of 2019 promotes organic agriculture to preserve water quality.

Moreover, Bali Provincial Regulation No. 2 of 2023 on the Regional Spatial Plan (RTRW 2023–2043) sets forth comprehensive regulatory frameworks for water conservation. Article 107 designates water catchment zones and prohibits activities that damage soil absorption capacity or water quality. Article 62 outlines protections for lakes (Batur, Beratan, Buyan, Tamblingan), bans harmful activities, and promotes organic farming and environmentally based ecotourism. These regulations also establish river border protection and irrigation network safeguards to support water conservation and sustainable organic water use.

A holistic management approach based on the Tri Hita Karana philosophy is applied in the governance of the Ayung River estuary. This traditional Balinese concept integrates three dimensions: Parahyangan (conservation), Pawongan (utilization), and Palemahan (impact control). As part of this approach, a proposed reservoir system is being developed to capture and store rainwater during the wet season for use during the dry season, ensuring sustainable and resilient water availability year-round.

Sustainable water resource governance involves an integrated approach that considers social, economic, and environmental dimensions. In the Province of Bali, water resource management policies focus on conservation, efficient utilization, and environmental protection, with active community involvement in decision-making processes.

Water management must be conducted comprehensively from upstream to downstream areas, treating the watershed as a unified planning unit that ensures sustainability, equity, and fairness, enabling water—as a vital source of life—to meet human needs adequately. Reform in water governance is one of the government's key strategies in addressing poverty alleviation, food and energy security, and the conservation of natural resources.(17)

This commitment reflects the government's effort to integrate the Millennium Development Goals (MDGs) into national development strategies, particularly in addressing fundamental human rights and freedoms for societal welfare and sustainable development. The MDGs aim to reduce hunger, guarantee universal access to basic education for children, eliminate gender disparities at all levels of education, reduce child mortality, and decrease the number of people lacking access to clean water.

Access to clean water, which is increasingly limited, has become a central issue in several regions. The causes include:

- a) the continuous degradation of forest ecosystems due to illegal logging, fires, and encroachment—despite forests being critical to maintaining environmental carrying capacity and water availability;
- b) global warming, which drives climate change, resulting in increased frequency and intensity of extreme weather events.(18)

In Gema Keadilan, examined the implementation of regional autonomy in water resource management. They emphasize that regional governments—including the Provincial Government of Bali—possess full authority to



determine water management patterns and plans within inter-district river basins, while the management of nationally strategic rivers remains under central government coordination. This integration supports the province's policy orientation in spatial planning, recharge area zoning, and inter-regional synchronization.(19)

Tarigan and Simatupang, analyzed the impact of Law No. 7/2004 on Water Resources on the subak irrigation institutions in Bali. Their findings suggest that the law promotes the privatization and commercialization of water, prioritizing economic tourism sectors and undermining the social and spiritual roles of subak as a traditional water governance system. (20)This has led to reduced water quotas for agriculture and the conversion of farmland into commercial areas, decreasing farmers' incomes and weakening the subak's role as a local water manager. Their findings highlight the need for policy harmony among agriculture, environmental protection, and community-based water services, grounded in the philosophy of Tri Hita Karana.(6)

Eviani Yuliantari and Ditayani Antari, in *Jurnal Advokasi*, investigated the legal aspects of integrated watershed (DAS) governance in Bali. They stress the importance of cross-district coordination by the provincial government at all stages—planning, implementation, monitoring, and evaluation—to ensure integrated and sustainable upstream-downstream water management. This approach supports the implementation of recharge zoning, spring conservation, and the Ayung I Regional Water Supply System (SPAM Ayung I), which serves multiple regencies. (21)

Antari Ratu and Subha Karma Resen, writing in *Kertha Desa*, highlight a deep ecology perspective in water governance. They conclude that water-related policies in Bali increasingly reflect ecological values that treat the environment as a living ecosystem, rather than focusing solely on social and economic aspects. Such regulatory frameworks represent both integral and supportive environmental policies aimed at achieving sustainability and societal well-being without sacrificing natural habitats. These efforts reinforce Bali's policy direction rooted in local wisdom, particularly the philosophical principles of Danu Kerthi and Tri Hita Karana.(2)

## CONCLUSION

The water crisis is a multidimensional issue influenced by climate change, ecosystem degradation, the growing imbalance between water demand and supply, as well as the increasing dominance of economic interests in the management of natural resources. The Province of Bali, as a globally renowned tourism destination, faces mounting pressure on the availability and quality of its water resources, exacerbated by accelerating urbanization and intensive tourism activities. In response to this crisis, the Provincial Government of Bali has introduced a range of policies emphasizing sustainable water protection and management, underpinned by local wisdom values such as Danu Kerthi and the Tri Hita Karana philosophy.

Through regional regulations and gubernatorial decrees—such as Regional Regulation No. 8 of 2019 and Governor Regulation No. 24 of 2020—Bali has formulated strategic approaches to water resource conservation, protection of recharge zones, environmental impact mitigation, and the promotion of organic agriculture and eco-tourism.

Effective water governance in Bali reflects an integrated model that bridges social, economic, and environmental dimensions. It also requires cross-sectoral and cross-regional collaboration, ensuring coordination from upstream to downstream areas. Nonetheless, national-level policies, such as Law No. 7 of 2004 on Water Resources, have at times negatively affected traditional water management institutions such as subak. The law's tendencies toward privatization and commercialization of water have undermined the role of farmers, reduced agricultural water quotas, and eroded the spiritual and social values embedded in these indigenous systems

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