

# Integrating Indigenous Wisdom and Village Authority in Environmental Protection: A Case Study of Indonesia

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## Abstract

*Environmental management in Indonesia faces significant challenges, including land conversion, pollution, and ecosystem degradation. These issues are primarily driven by human activities and a lack of integration between state policies and local wisdom. Indigenous peoples, who possess traditional knowledge and wisdom-based management systems, play a crucial role in environmental conservation. However, there are still gaps in the recognition of their rights regarding natural resource management. This research aims to analyze the role of local wisdom in environmental management within the framework of village authority and state responsibility. The methodology employed is descriptive analytical, utilizing a normative juridical approach that combines literature review and interviews with indigenous communities in Bali, Jambi, West Sumatra, and Papua. The findings indicate that while local wisdom values, such as Tri Hita Karana in Bali and arat sabulungan in Mentawai, significantly contribute to ecosystem maintenance, the integration between government policies and village authority remains limited. This research proposes strengthening the synergy between local wisdom and state policy to develop an inclusive and sustainable environmental management model. The novelty of this study lies in mapping the contributions of local wisdom within the context of village authority and highlighting the urgency for policy revisions to enhance the active role of indigenous peoples in environmental conservation.*

## 1. Introduction

Global environmental crises, including deforestation, land degradation, and climate change, pose significant challenges to the sustainability of ecosystems and human life.<sup>1</sup> Traditional top-down approaches to environmental management often encounter limitations, particularly in developing countries facing diverse social, cultural, and geographical issues. In this context, community-based approaches that incorporate indigenous knowledge have gained recognition as viable solutions.<sup>2</sup> Indigenous wisdom embodies sustainability values and offers effective natural resource management strategies that have been refined over generations. However, this potential is frequently underutilized within formal environmental policy frameworks, especially in culturally diverse and indigenous-rich countries like Indonesia.<sup>3</sup>

Indonesia benefits from local management through decentralization, which grants considerable authority to village governments under Law No. 6/2014, as amended by Law No. 3/2024 on Villages. This authority positions villages strategically to integrate local wisdom into environmental policies, particularly in managing natural resources and addressing environmental impacts at the community level.<sup>4</sup> Nevertheless, the

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<sup>1</sup> P. R. Oraon, Vidya Sagar, and Kumari Beauty, "Ecological Restoration of Degraded Land through Afforestation Activities," in *Land and Environmental Management through Forestry*, ed. Abhishek Raj et al., 1st ed. (Wiley, 2023), 201–16, <https://doi.org/10.1002/9781119910527.ch8>; Paul Atagamen Aidonojie et al., "Constitutional and Legislative Frameworks for Green and Sustainable Environmental Governance in Uganda," *International Journal of Constitutional and Administrative Law* 1, no. 1 (2025): 1–20.

<sup>2</sup> Centre for Science in Society, Te Herenga Waka/Victoria University of Wellington et al., "Connecting Science to Indigenous Knowledge: Kaitiakitanga, Conservation, and Resource Management," *New Zealand Journal of Ecology*, March 31, 2023, <https://doi.org/10.20417/nzj ecol.47.3521>; Sri Hariati, Moh. Jamin, and Adi Sulistiyono, "The Legal Status of Marriage (Merariq) Implementation Within The Indigenous People of Sasak Lombok," *Jurnal IUS Kajian Hukum Dan Keadilan* 12, no. 2 (August 30, 2024): 406–22, <https://doi.org/10.29303/ius.v12i2.1475>.

<sup>3</sup> D. F. Wardhani et al., "Environmental Education Model Based on Local Wisdom of the Dayak Paramasan Tribe Indonesia," *Nature Environment and Pollution Technology* 23, no. 4 (December 1, 2024): 2259–72, <https://doi.org/10.46488/NEPT.2024.v23i04.030>; Maria, "Local Wisdom of Indigenous Society in Managing Their Customary Land: A Comparative Study on Tribes in Indonesia," ed. D. Chalil et al., *E3S Web of Conferences* 52 (2018): 00023, <https://doi.org/10.1051/e3sconf/20185200023>.

<sup>4</sup> Mella Ismelina Farma Rahayu, Anthon F. Susanto, and Amad Sudiro, "The Meaning of the Principle of Local Wisdom in Management and Protection Law Environment Indonesia," *Journal of Lifestyle and SDGs Review* 5, no. 2 (November 12, 2024): e02958, <https://doi.org/10.47172/2965-730X.SDGsReview.v5.n02.pe02958>; Didik Sukriono et al., "Local Wisdom as Legal Dispute Settlement: How Indonesia's Communities Acknowledge Alternative Dispute Resolution?," *Legality: Jurnal Ilmiah Hukum* 33, no. 1 (April 15, 2025): 261–85, <https://doi.org/10.22219/ljih.v33i1.39958>.

implementation of village authority in environmental protection often faces challenges, such as a lack of synergy between national policies and local initiatives, along with the disregard for customary wisdom in formal regulations. Villages have the potential to play a pivotal role in realizing the state's responsibility for effective, community-based environmental protection.<sup>5</sup> This presents an opportunity to explore how village authority can be enhanced through the integration of local wisdom to support the state's environmental responsibilities.<sup>6</sup>

This research aims to address the urgent need to bridge the gap between national policy, village authority, and the indigenous peoples' local wisdom in environmental protection. By examining the synergy among these three elements, the study seeks to develop a conceptual framework for incorporating local wisdom into village-based environmental management within the context of state responsibility. The findings of this research will contribute practically to environmental governance in Indonesia and offer theoretical insights relevant to other countries with similar cultural and decentralization characteristics. Ultimately, it aims to strengthen the role of villages as key actors in sustainable environmental management and provide new perspectives in the literature on community-based environmental governance.

Although Indonesia possesses a rich cultural heritage and local wisdom that could enhance environmental protection, the incorporation of these customary values into national environmental policies remains suboptimal.<sup>7</sup> Many current policies adopt a centralized approach, overlooking the significant contributions that indigenous peoples can make to the sustainable management of natural resources.<sup>8</sup> Conversely,

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<sup>5</sup> Yan Guo et al., "Environmental Justice and the Politics of Scale under Ecological and Environmental Protection: A Case Study of a Village in the Ecological Protection Zone," *Tropical Geography* 44, no. 8 (2024): 1376–86, <https://doi.org/10.13284/j.cnki.rddl.20230868>; Fatrisia Bukulu, "Perlindungan Dan Pengelolaan Lingkungan Dalam Amdal: Telaah Kritis Penegakan Hukum Nasional," *Philosophia Law Review* 3, no. 1 (2023): 61–78, <https://doi.org/10.56591/pilar.v3i1.18816>.

<sup>6</sup> Eko Nuriyatman et al., "Strategi Implementasi Tanggung Jawab Sosial Lingkungan Dalam Perusahaan: Dampak Dan Tantangan," *LITIGASI* 25, no. 2 (October 31, 2024): 269–89, <https://doi.org/10.23969/litigasi.v25i2.18877>.

<sup>7</sup> Yenny Eta Widyanti, "Human Rights and Indonesian Legal Protection of Traditional Cultural Expressions: A Comparative Study in Kenya and South Africa," *Jurisdictie: Jurnal Hukum Dan Syariah* 14, no. 2 (January 10, 2024): 315–34, <https://doi.org/10.18860/j.v14i2.24318>; Nuraisah Masita Utiahman, "Corporate Legal Liability for Environmental Damage," *Estudiante Law Journal* 7, no. 1 (February 20, 2025): 236–51, <https://doi.org/10.33756/eslaj.v7i1.30768>.

<sup>8</sup> Maria, "Local Wisdom of Indigenous Society in Managing Their Customary Land."

the decentralization of village authority has created opportunities for local governments to emerge as key players in community-based environmental management. Nonetheless, the effective use of this authority is often hindered by a lack of understanding regarding how local wisdom can be systematically integrated into the framework of state responsibilities. As a result, local environmental sustainability frequently relies on isolated initiatives that lack consistent policy support.<sup>9</sup>

This challenge is further complicated by the disconnect between community-based environmental policy approaches and the broader responsibilities of the state.<sup>10</sup> Practically, there is no comprehensive strategy to connect village authority with indigenous wisdom-based management to bolster state environmental responsibilities. This results in a dilemma: while villages are empowered to manage environmental resources, they lack a clear framework for systematically leveraging customary values.<sup>11</sup> Moreover, the academic literature addressing the role of villages in local wisdom-based environmental management is limited and has not provided practical conceptual models. Therefore, this research intends to address this gap by investigating the strategic role of villages in incorporating local wisdom into environmental policies while reinforcing state responsibilities to ensure sustainable environmental protection.

The goal of this research is to explore and analyze how indigenous wisdom can be integrated into environmental protection policies through village authority within the context of state responsibility. As a nation rich in biodiversity and cultural diversity, Indonesia has a unique opportunity to develop environmental protection strategies rooted in local traditions. This research emphasizes strengthening the role of villages as pivotal actors in environmental management, positioning local wisdom as a central

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<sup>9</sup> Sumarmi et al., "Local Wisdom for Global Challenges: Memayu Hayuning Bawono as a Model for Sustainable Environmental Practices," *International Journal of Sustainable Development and Planning* 19, no. 2 (February 28, 2024): 527–38, <https://doi.org/10.18280/ijstdp.190210>.

<sup>10</sup> Triono Eddy, Agustina, and Sagita Purnomo, "Ecological Crisis and Human Security: A Legal Analysis of the Exploitation of the Sei Ular River," *Khazanah Hukum* 7, no. 2 (2025): 140–55.

<sup>11</sup> Sulaiman Sulaiman, "Good and Sustainable Village Governance: Unpacking the Responsibilities of the Village Head," *Pakistan Journal of Life and Social Sciences (PJLSS)* 22, no. 2 (2024), <https://doi.org/10.57239/PJLSS-2024-22.2.00674>; Eduardo S. Brondizio et al., "Locally Based, Regionally Manifested, and Globally Relevant: Indigenous and Local Knowledge, Values, and Practices for Nature," *Annual Review of Environment and Resources* 46, no. 1 (October 18, 2021): 481–509, <https://doi.org/10.1146/annurev-enviro-012220-012127>.

component of these efforts. This integration aims not only to enhance the effectiveness of environmental policies but also to ensure the sustainability of natural resources through an inclusive, adaptive, and community-based approach. Consequently, this research can provide a conceptual foundation for understanding how villages, in synergy with customary values, can act as instruments of the state in fulfilling environmental responsibilities.

Additionally, this research seeks to offer a systematic framework that links indigenous wisdom, village authority, and state responsibility in environmental governance. This framework is anticipated to address existing theoretical gaps in the literature while contributing practically to policy development that reflects local conditions and community needs. By examining the role of villages in environmental management, this research sheds light on how decentralization can effectively bridge national policies with local initiatives. Ultimately, this research aims to enhance the status of villages not only as administrative entities but also as frontline defenders of environmental sustainability rooted in local traditions and values.

Academic studies on environmental protection often emphasize a top-down approach, positioning the state as the primary actor in policy-making, while overlooking the potential contributions of indigenous peoples' local wisdom. Although some research discusses the role of local wisdom in environmental management, few explicitly connect it to village authority as a formal instrument for implementing environmental policies. In Indonesia, where village autonomy plays a strategic role in natural resource governance, the interplay between village authority, local wisdom, and state responsibility remains largely unexplored. Addressing this gap is crucial, as villages possess significant potential to enhance environmental sustainability by integrating local values into formal policies.<sup>12</sup>

This research addresses a critical gap in the literature by proposing a conceptual framework that integrates indigenous wisdom, village authority, and state

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<sup>12</sup> Rahayu, Susanto, and Sudiro, "The Meaning of the Principle of Local Wisdom in Management and Protection Law Environment Indonesia"; Maria, "Local Wisdom of Indigenous Society in Managing Their Customary Land"; Sumarmi et al., "Local Wisdom for Global Challenges"; Wardhani et al., "Environmental Education Model Based on Local Wisdom of the Dayak Paramasan Tribe Indonesia," December 1, 2024.

responsibility in environmental protection. While existing studies predominantly examine environmental governance through either national policies or community-based initiatives, they often overlook the intersection of formal village authority and traditional ecological knowledge. This research clarifies the role of villages as key actors in community-based environmental management and advances a synergistic approach that aligns national policies with localized practices. By emphasizing the optimization of village authority through the incorporation of indigenous wisdom, this study contributes both theoretically and practically to the discourse on sustainable environmental governance in Indonesia. Furthermore, its relevance extends beyond Indonesia, offering insights applicable to other countries with comparable socio-political structures.

This study introduces a novel framework that integrates indigenous wisdom with village authority to enhance the implementation of state responsibilities in environmental protection. It highlights the dynamic interplay between customary traditions and formal legal frameworks established through village autonomy. Unlike previous research, which tends to treat national policy-driven and community-based environmental protection as separate domains, this study bridges the two, creating a more holistic and sustainable governance model. Its originality lies in positioning villages as pivotal actors in environmental management, leveraging their formal authority to institutionalize traditional ecological practices that have long contributed to ecosystem sustainability.<sup>13</sup>

The justification for this research stems from the urgent need to address increasingly complex global and local environmental challenges, alongside Indonesia's remarkable potential as a nation with unique cultural diversity. This research is vital not only for strengthening locally-based environmental policies in Indonesia but also for contributing to the broader international discourse on community-based environmental governance. By providing a model that can be replicated in other

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<sup>13</sup> Lorenza Arango Vásquez, "Indigenous Peoples, Commons and the Challenge of Sustaining Life Amid Capitalist Land Grabs," *The Journal of Peasant Studies*, December 9, 2024, 1–28, <https://doi.org/10.1080/03066150.2024.2431517>; Nadia S. Santini and Yosune Miquelajauregui, "The Restoration of Degraded Lands by Local Communities and Indigenous Peoples," *Frontiers in Conservation Science* 3 (April 25, 2022): 873659, <https://doi.org/10.3389/fcsc.2022.873659>.

countries with similar social and cultural contexts, this research holds the potential to expand its impact on a global scale. Furthermore, by bridging the gap between formal policies and traditional practices, this research offers strategic guidance for policymakers in designing environmental policies that are inclusive, effective, and responsive to the needs of local communities.

## **2. Problem Statement**

This research aims to identify and analyze the gap between nationally regulated environmental protection policies and the potential of indigenous peoples' local wisdom in natural resource management at the village level. While Indonesia has granted significant authority to villages through the Village Law, the application of this authority in the context of local wisdom-based environmental protection remains limited and often overlooked in formal policies. Additionally, the mismatch between local practices and national policies highlights the need for a deeper understanding of how villages can integrate indigenous wisdom to fulfill state responsibilities for environmental sustainability. Consequently, this research focuses on exploring the effectiveness of village authority in enhancing environmental protection through local wisdom-based approaches, as well as examining how synergies between the two can be realized to create sustainable and inclusive environmental management.

## **3. Methods**

This research employs a descriptive analytical approach combined with a normative juridical framework,<sup>14</sup> aimed at analyzing and describing the application of village authority in environmental protection rooted in local wisdom. The primary focus of the study is on both primary and secondary legal materials, including laws and regulations concerning village autonomy, environmental protection, and scientific literature that explores theories of decentralization and local wisdom. Data collection involved a comprehensive literature review of various legal documents, such as relevant laws, regional regulations, and decrees.<sup>15</sup>

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<sup>14</sup> Suratman and H. Philips Dillah, *Metode Penelitian Hukum* (Bandung: Alfabeta, 2013).

<sup>15</sup> Irwansyah Irwansyah, *Penelitian Hukum: Pilihan Metode & Praktik Penulisan Artikel* (Yogyakarta: Mirra Buana Media, 2020).

Data analysis was conducted qualitatively,<sup>16</sup> emphasizing a thorough interpretation of relevant legal aspects and local wisdom within the context of decentralization and environmental protection. This approach aims to provide a holistic understanding of how village authority can be optimized to promote environmental sustainability through enduring local values. The ultimate purpose is to assess the effectiveness of village authority in fulfilling state responsibilities in environmental management and to offer recommendations for strengthening policies based on local wisdom within the framework of decentralization.

#### **4. Indigenous Environmental Ethos: Interpreting Local Wisdom as a Normative Source of Ecological Justice**

##### **4.1. Conceptual Framework for Local Wisdom-Based Environmental Protection**

Environmental protection grounded in local wisdom is an increasingly relevant strategy in addressing global challenges to the sustainability of natural resources. Local wisdom, which encompasses the traditional values and practices of indigenous peoples in maintaining ecosystem balance, has shown to make significant contributions to environmental conservation.<sup>17</sup> This concept is based on the longstanding harmonious relationship between humans and nature found in various cultures worldwide, including Indonesia. In this context, local wisdom is regarded not just as cultural heritage, but as a crucial element in sustainable environmental management that should be integrated into formal policies.<sup>18</sup>

The significance of local wisdom in environmental protection is evident when indigenous peoples and villages are positioned as primary actors in natural resource management. Indigenous communities possess deep knowledge of local ecosystems and sustainable methods for utilizing natural resources.<sup>19</sup> These values of local wisdom

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<sup>16</sup> Irwansyah.

<sup>17</sup> Jundiani, "Local Wisdom in the Environmental Protection and Management," *IOP Conference Series: Earth and Environmental Science* 175 (July 24, 2018): 012130, <https://doi.org/10.1088/1755-1315/175/1/012130>.

<sup>18</sup> Annisa Weningtyas and Endang Widuri, "Pengelolaan Sumber Daya Air Berbasis Kearifan Lokal Sebagai Modal Untuk Pembangunan Berkelanjutan," *Volksgeist: Jurnal Ilmu Hukum Dan Konstitusi*, June 30, 2022, 129–44, <https://doi.org/10.24090/volksgeist.v5i1.6074>.

<sup>19</sup> Azlan Abas, Azmi Aziz, and Azahan Awang, "A Systematic Review on the Local Wisdom of Indigenous People in Nature Conservation," *Sustainability* 14, no. 6 (March 15, 2022): 3415, <https://doi.org/10.3390/su14063415>.



are often holistic, intertwining spiritual, social, and ecological aspects. Consequently, environmental management based on local wisdom involves not only the conservation of natural resources but also respect for the culture and rights of indigenous peoples<sup>20</sup>.

Conversely, the national legal system in Indonesia, like that of many other countries, frequently prioritizes formal law as the foundation for environmental management. This approach often overlooks the complex local dynamics and cultural values present within indigenous communities.<sup>21</sup> Therefore, it is crucial to re-examine how national laws and government policies can be aligned with local wisdom to foster more effective and sustainable environmental protection solutions. This integration requires a deeper understanding of how local wisdom can coexist with the formal legal framework without undermining the cultural values it embodies.<sup>22</sup>

A decentralized approach to environmental management is essential for integrating local wisdom. Under Indonesia's village autonomy system, villages have the authority to regulate and manage natural resources in a localized manner. This autonomy presents an opportunity to tailor environmental policies to the unique conditions and prevailing customary values of each community. As a result, villages can play a significant role in local wisdom-based environmental management, enabling a contextualized approach that meets the needs of local populations. In this framework, local wisdom can guide decisions that affect ecosystem sustainability.<sup>23</sup>

However, a major challenge in merging local wisdom with village authority is the insufficient understanding of how these two elements can support one another. Local wisdom is often overlooked in government policies, which tend to favor formal, law-based, and technocratic approaches. Conversely, village authority has limited influence on national policies, which frequently fail to adapt to specific local needs. To address

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<sup>20</sup> Rahayu, Susanto, and Sudiro, "The Meaning of the Principle of Local Wisdom in Management and Protection Law Environment Indonesia."

<sup>21</sup> Weningtyas and Widuri, "Pengelolaan Sumber Daya Air Berbasis Kearifan Lokal Sebagai Modal Untuk Pembangunan Berkelanjutan."

<sup>22</sup> Rahayu, Susanto, and Sudiro, "The Meaning of the Principle of Local Wisdom in Management and Protection Law Environment Indonesia."

<sup>23</sup> F Azzahra and R L Kaswanto, "Correlation Analysis of Biodiversity with Local Wisdom in Indigenous Villages and Non-Indigenous Villages in Bogor Regency," *IOP Conference Series: Earth and Environmental Science* 501, no. 1 (May 1, 2020): 012036, <https://doi.org/10.1088/1755-1315/501/1/012036>.

this gap, it is crucial to enhance the capacity of villages to implement policies that incorporate local wisdom in natural resource management.<sup>24</sup>

Understanding the relationship between local wisdom and government policies is vital for reinforcing the existing legal framework. It is important for the government to create avenues for indigenous peoples and villages to participate in decision-making related to environmental management.<sup>25</sup> In this context, village institutions play a strategic role as intermediaries between indigenous communities and the government. A key element in this integration is the acknowledgment of indigenous peoples' rights in environmental management.<sup>26</sup> Recognizing customary rights—whether through customary forest management, community-based conservation areas, or other natural resource arrangements—is crucial for balancing national law with local wisdom.<sup>27</sup> This recognition also creates opportunities for greater involvement of villages in supporting environmental policies that respect indigenous peoples' rights.

Environmental management grounded in local wisdom and village authority offers a more inclusive and sustainable approach. This strategy not only protects ecosystems and natural resources but also fosters cultural diversity and upholds the rights of indigenous peoples, who have demonstrated a long-term commitment to environmental stewardship. Integrating village authority with local wisdom can serve as a foundation for developing more effective and locally relevant environmental management solutions, thereby positively impacting environmental sustainability in Indonesia.

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<sup>24</sup> Rohmini Indah Lestari et al., "The Village Fund Program and Indonesia's 18th Sustainable Development Goal: A Bibliometric and Content Study," *International Journal of Sustainable Development and Planning* 18, no. 11 (November 30, 2023): 3505–18, <https://doi.org/10.18280/ijstdp.181115>; Utiahman, "Corporate Legal Liability for Environmental Damage"; Apriyansa Pranata Ayuba, "The Effectiveness of Restorative Justice in Resolving Cases of Mistreatment in the Police Environment," *Estudiante Law Journal* 6, no. 2 (2024): 419–30.

<sup>25</sup> Weningtyas and Widuri, "Pengelolaan Sumber Daya Air Berbasis Kearifan Lokal Sebagai Modal Untuk Pembangunan Berkelanjutan."

<sup>26</sup> Dian Ekawaty Ismail et al., "Collocation of Restorative Justice with Human Rights in Indonesia," *Legality: Jurnal Ilmiah Hukum* 32, no. 2 (September 20, 2024): 394–417, <https://doi.org/10.22219/ljih.v32i2.35374>.

<sup>27</sup> Zulkifli Aspan et al., "Local Wisdom-Based Water Resources Conservation: Enhancing Local Wisdom in Society 5.0," *Hasanuddin Law Review* 9, no. 2 (November 24, 2023): 233, <https://doi.org/10.20956/halrev.v9i2.4298>.

## 4.2. Village Authority in Environmental Management

The implementation of village authority in environmental management is a crucial component of decentralisation initiated by the enactment of Law No. 6/2014, as amended by Law No. 3/2024 on Villages. This law empowers villages to manage and utilise local natural resources, aiming to enhance community welfare and maintain ecosystem sustainability. However, despite the recognition of village authority, its effective implementation is often hindered by limited human resources, budget constraints, and inadequate technical capacity at the village level. As a result, many villages struggle to fully utilise their authority for environmental management rooted in local wisdom.<sup>28</sup>

At the policy level, villages have significant potential to engage communities in environmental management through village regulations that govern various aspects of ecological life, such as forest management, fisheries, and sustainable agriculture.<sup>29</sup> This authority enables villages to create local policies that are more responsive to their specific ecological conditions. Consequently, villages can adopt an integrated approach that aligns central government policies with the local potential of indigenous communities. This highlights the importance of the village's role as a governmental unit capable of harmonising local values with formal legal norms in environmental management.<sup>30</sup>

Nevertheless, strengthening village authority in environmental management faces several structural and legal challenges.<sup>31</sup> One major issue is the ambiguous boundaries of village authority in managing natural resources, which often conflict with

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<sup>28</sup> Sulaiman, "Good and Sustainable Village Governance."

<sup>29</sup> Maxensius Tri Sambodo et al., "Towards a New Approach to Community-Based Rural Development: Lesson Learned from Indonesia," *Cogent Social Sciences* 9, no. 2 (December 15, 2023): 2267741, <https://doi.org/10.1080/23311886.2023.2267741>.

<sup>30</sup> Agus Surono, "Legal Harmonization of Village Authority on Forestry Management," *Journal of Legal, Ethical and Regulatory Issues* 24, no. 4 (2018): 1–9; Moh Fadli et al., "Inquiring into the Sustainable Tourism Village Development Through the Social Complexity of Adat Peoples in Digital Era," *Legality: Jurnal Ilmiah Hukum* 31, no. 2 (August 18, 2023): 181–201, <https://doi.org/10.22219/ljih.v31i2.26438>; Mahrus Ali, "Overcoming the Dilemma between the Clarity and Flexible Norms in Environmental Offenses," *De Jure: Jurnal Hukum Dan Syar'iah* 14, no. 2 (2022): 276–87, <https://doi.org/10.18860/j-fsh.v14i2.18279>.

<sup>31</sup> Mohammad Ridwan Rangkuti and Zoraya Alfathin Rangkuti, "The Policy of Village Infrastructure Service in Deli Serdang Regency, Indonesia," *Multidisciplinary Reviews* 6, no. 3 (August 17, 2023): 2023021, <https://doi.org/10.31893/multirev.2023021>.

district/provincial or national regulations, particularly regarding forest and conservation area management. Although the Village Law grants broad authority, its implementation is frequently obstructed by overlapping regulations and a lack of coordination among village governments, district governments, and other relevant institutions. This results in legal uncertainty for villages as they carry out their responsibilities in natural resource management, including environmental protection.<sup>32</sup>

Additionally, village-based environmental management must consider the rights of indigenous peoples who have traditionally managed their customary territories and natural resources for generations. As the entity closest to the community, the village is pivotal in involving these groups in policy formulation and environmental management based on local wisdom.<sup>33</sup> In regions such as Bali and Papua, indigenous communities have long engaged in sustainable environmental practices that should be recognised within the formal legal system. Therefore, village authority should be optimised to uphold customary rights and create space for nature management practices grounded in established local traditions.<sup>34</sup>

Limited capacity at the village level poses a significant challenge to effective environmental management. Many villages struggle to develop environmental management policies grounded in scientific evidence and best practices. Therefore, enhancing the capacity of village institutions—particularly in legal understanding, technical skills, and budget management—is crucial for enabling village authorities to exercise their roles effectively. Support from both central and local governments is essential, including training, resources, and effective coordination, to empower villages

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<sup>32</sup> Surono, "Legal Harmonization of Village Authority on Forestry Management."

<sup>33</sup> Farida Patittingi, "New Paradigm in Natural Resources Management: Securing Indigenous Peoples Rights," *Hasanuddin Law Review* 6, no. 1 (April 12, 2020): 56, <https://doi.org/10.20956/halrev.v6i1.2267>; I Gusti Agung Mas Rwa Jayantiari et al., "The Rights of Customary Law Communities to Resources: The Relationship of Coexistence of State Law and Customary Law," *Jurnal IUS Kajian Hukum Dan Keadilan* 13, no. 1 (April 28, 2025): 187–98, <https://doi.org/10.29303/ius.v13i1.1329>.

<sup>34</sup> I N U Mahardika et al., "Local Traditions and Environmental Preservation - Genius Loci in Penglipuran Village in Protecting Public Spaces," *IOP Conference Series: Earth and Environmental Science* 903, no. 1 (November 1, 2021): 012010, <https://doi.org/10.1088/1755-1315/903/1/012010>; Antoni Ungirwalu et al., "Customary Forests in West Papua: Contestation of Desires or Needs?," *Forest and Society*, July 18, 2021, 365–75, <https://doi.org/10.24259/fs.v5i2.13350>.

in their efforts to protect and preserve the environment.

Village authority in environmental management presents a valuable opportunity to enhance environmental sustainability through the adoption of localized policies that draw on local wisdom. However, to fully realize this potential, structural and coordination challenges between various levels of government must be addressed. This research aims to identify ways to maximize village authority in strengthening local wisdom-based environmental protection and to provide recommendations for optimizing the implementation of village authority in the context of ecosystem sustainability and equitable natural resource management.

#### **4.3. Local Wisdom of Indigenous Peoples in Environmental Protection**

Local wisdom is a vital aspect of the lives of indigenous peoples, playing a crucial role in maintaining ecological balance and the sustainability of natural resources. In this context, local wisdom transcends tradition; it constitutes a system of knowledge grounded in ethical and normative principles related to living harmoniously with nature.<sup>35</sup> These practices stem from the community's profound understanding of their surrounding ecosystem and the necessity of preserving it for their survival. For instance, many indigenous tribes in Indonesia, such as the Bali Aga tribe in Bali,<sup>36</sup> the Dayak people in Kalimantan,<sup>37</sup> and various tribes in Papua, adhere to strict customary rules regarding forest utilization, farmland management, and natural resource conservation, all aimed at ensuring ecological sustainability.

The principles of local wisdom are often intertwined with deep-seated concepts of spirituality and culture. In Bali, for example, the indigenous community follows the Tri Hita Karana philosophy, which emphasizes the importance of maintaining a harmonious relationship between God, humans, and nature. This philosophy is practically reflected in natural resource management practices that are based on social

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<sup>35</sup> Henri et al., "Community's Local Wisdom and Its Relationship with Environmental Conservation Efforts in Bangka Belitung, Indonesia," *IOP Conference Series: Earth and Environmental Science* 1115, no. 1 (December 1, 2022): 012036, <https://doi.org/10.1088/1755-1315/1115/1/012036>.

<sup>36</sup> Tuti Mutia et al., "Local Wisdom in Indonesia's Customary Forest Management: Case Studies in Sasak, Bali Aga and Minangkabau," *Ecology, Environment and Conservation* 25, no. 3 (2019): 1077–83.

<sup>37</sup> D. F. Wardhani et al., "Environmental Education Model Based on Local Wisdom of the Dayak Paramasan Tribe Indonesia," *Nature Environment and Pollution Technology* 23, no. 4 (December 1, 2024): 2259–72, <https://doi.org/10.46488/NEPT.2024.v23i04.030>.

agreements and customary rules designed to protect forests, rivers, and agricultural land from over-exploitation. Although these practices are rooted in local beliefs, they hold significant ecological value, especially in the face of modern environmental challenges such as deforestation and land degradation.<sup>38</sup>

Furthermore, local wisdom underscores the role of indigenous peoples as custodians and sustainable managers of the environment. In many instances, management systems based on local wisdom are more adaptive to environmental changes, having proven their resilience over time. For example, the use of agricultural rotations and agroforestry systems in numerous Indonesian indigenous communities not only preserves soil fertility but also fosters biodiversity. Consequently, local wisdom offers a sustainable alternative solution to the environmental crisis, drawing on time-tested traditional knowledge and local experiences.<sup>39</sup>

Local wisdom holds significant potential for environmental protection; however, challenges emerge when it intersects with the dynamics of modernization and state policies that often favor technocratic and formal approaches.<sup>40</sup> In some instances, development policies that disregard the rights of indigenous peoples and local wisdom-based management can actually worsen environmental degradation. Therefore, it is crucial to create more opportunities for local wisdom in the formulation of environmental policies to enhance ecosystem sustainability.

The vital role of local wisdom in environmental management underscores the necessity of including indigenous peoples in any natural resource management policy. The government should recognize customary management systems that have effectively maintained ecological balance. This recognition not only strengthens the rights of indigenous peoples but also fosters a more comprehensive understanding of the interactions among humans, nature, and culture. Acknowledging local wisdom within environmental policy is an essential step toward bridging the gap between formal

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<sup>38</sup> Catrini Pratihari Kubontubuh, "Tri Hita Karana, a Spiritual Connection to Nature in Harmony," *Journal of the Siam Society* 111, no. 2 (2023): 247–52.

<sup>39</sup> Jessica Chavez et al., "Impact of Farm Management on Soil Fertility in Agroforestry Systems in Bali, Indonesia," *Sustainability* 16, no. 18 (September 10, 2024): 7874, <https://doi.org/10.3390/su16187874>.

<sup>40</sup> Aspan et al., "Local Wisdom-Based Water Resources Conservation."

policies and management practices rooted in local and social knowledge. In this way, indigenous peoples can become strategic partners in fostering more inclusive and sustainable environmental protection initiatives.

#### **4.4. Case Studies on Local Wisdom-Based Environmental Management in Bali, Jambi, West Sumatra, and Papua**

Environmental management in Bali Province highlights the need to integrate traditional practices with modern challenges to preserve nature. Known for its thriving tourism sector, Bali faces numerous environmental issues, including land conversion, soil degradation, and inadequate waste management.<sup>41</sup> According to the Indonesia Environmental Status Report 2022, although the Environmental Quality Index (EQI) in the Bali-Nusa Ecoregion showed improvements, Bali Province saw a decline in 2021, particularly in waste management and land conversion. A significant factor contributing to this decline is the pressure from the tourism sector, which increases waste generation and transforms agricultural land into commercial areas.<sup>42</sup>

Despite these challenges, Bali possesses the potential to leverage local wisdom, such as the Tri Hita Karana philosophy, which emphasizes harmonious relationships among humans, nature, and God. This philosophy is reflected in traditional practices like the subak irrigation system, which supports agricultural sustainability and ecosystem preservation. Indigenous communities in villages such as Tenganan Pagringsingan and Trunyan have successfully maintained their forests and rice fields by adhering to these traditional principles, even as modernization poses threats to their sustainability.<sup>43</sup>

Bali's most significant challenge lies in preserving local wisdom amid rapid modernization. Social, economic, and ecological changes driven by industrialization and urbanization threaten the relevance of traditional practices. The rapid growth of

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<sup>41</sup> I Gusti Ngurah Made Wiratama and I Made Wahyu Wijaya, "Study on Temple Waste Management and Its Potential for Reducing Carbon Emission," *Revista de Gestão Social e Ambiental* 18, no. 4 (May 22, 2024): e06684, <https://doi.org/10.24857/rgsa.v18n4-103>; Prisca Listiningrum et al., "Waste Management Without Direction in Indonesia: A Proposed Legal Reform Towards Smart Cities," *Legality: Jurnal Ilmiah Hukum* 31, no. 2 (August 26, 2023): 224–44, <https://doi.org/10.22219/ljih.v31i2.27375>.

<sup>42</sup> Imamulhadi Imamulhadi, *Hukum Lingkungan Alternatif (Hukum Lingkungan Adat, Hukum Lingkungan Islam)* (Bandung: Unpad Press, 2011); Dimas Akmarul Putera et al., "Enhancing Waste Management and Marine Ecosystem Protection for Tourism Sustainability on Buluh Island," ed. G. Jameson et al., *BIO Web of Conferences* 134 (2024): 06010, <https://doi.org/10.1051/bioconf/202413406010>.

<sup>43</sup> Kubontubuh, "Tri Hita Karana, a Spiritual Connection to Nature in Harmony."

the tourism sector has particularly impacted waste management and sustainable land use.<sup>44</sup> However, in rural Bali, residents continue to incorporate Tri Hita Karana values into their daily lives, demonstrating that this local wisdom can remain relevant when appropriately adapted. To ensure the sustainability of these principles, more intensive documentation efforts and the use of modern media to educate younger generations are essential. Balinese people must maintain the relationship between tradition and modernity, allowing traditional principles to be applied in broader and more dynamic contexts.<sup>45</sup>

In Jambi Province, indigenous local wisdom also plays a crucial role in environmental management. Research in Sarolangun Regency reveals that the Anak Dalam community in Sei Pingai maintains a close relationship with nature through traditional settlements and agricultural practices based on local knowledge. Their settlements, constructed from natural materials and situated along riverbanks, exemplify how indigenous communities sustainably utilize natural resources. Their farming practices reflect local wisdom, where land selection is guided by natural signs and traditional tools are used for resource management. Additionally, the Malay community in Jambi demonstrates a strong connection with nature, as they observe natural phenomena to determine optimal farming times. Customary beliefs and certain prohibitions act as mechanisms to maintain ecosystem balance and prevent environmental damage from overexploitation.<sup>46</sup>

In West Sumatra Province, a study on local wisdom-based environmental management highlights how the Mentawai indigenous people preserve nature through the Arat Sabulungan customary system. This system governs the use of natural resources, such as wood, water, and fish, emphasizing the importance of maintaining ecological balance. The Mentawai integrate spiritual and customary values into their environmental practices, ensuring that every action considers its potential impact on

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<sup>44</sup> Yoko Mayuzumi, "Analysis of the Impact of Ethnic Tourism on the Transmission of Traditional Crafts: Case Study in Bali, Indonesia," *Studies in Regional Science* 51, no. 2 (2021): 303–21, <https://doi.org/10.2457/srs.51.303>.

<sup>45</sup> Kubontubuh, "Tri Hita Karana, a Spiritual Connection to Nature in Harmony."

<sup>46</sup> Refniza Yanti et al., "The Communication Model of Forest Management Based on Environmental Awareness," *Management of Environmental Quality: An International Journal* 29, no. 6 (September 4, 2018): 1093–1109, <https://doi.org/10.1108/MEQ-02-2018-0028>.



the ecosystem. In coastal villages like Sago Village, fishermen employ traditional fishing gear and conduct ceremonies, such as Mendarai Pasia, to support the marine ecosystem's balance and protect natural resources. The sustainability of marine ecosystems is a key concern for fishing communities in West Sumatra, who wisely apply local knowledge to prevent exploitative practices that could harm the environment.<sup>47</sup>

Another study conducted in Taluak Village, Padang Pariaman Regency, illustrates how fishing communities manage marine resources using sailboats and outboard engines while avoiding overfishing that could damage coral reefs. These communities possess extensive knowledge of marine ecosystems, passed down through generations, and prioritize sustainable management of coral reefs and fish populations.<sup>48</sup> The Maubek Lauik tradition, which aims to enhance the sea's fertility, further reflects the community's social and spiritual connection to nature. This demonstrates that despite facing significant environmental challenges, the local wisdom of the community remains an effective approach to maintaining environmental sustainability and community well-being.<sup>49</sup>

In Papua, environmental management encounters more complex challenges, particularly concerning water pollution, extreme climate change, and land conversion that threaten biodiversity and water quality. Indigenous communities in rural Papua often struggle to have their customary forest rights recognized. While regulations exist to acknowledge customary forests as part of social forestry, implementation is hindered by policies that classify these forests as state forests. Thus, recognizing customary forests in Papua necessitates concrete actions, such as establishing local regulations that involve indigenous communities in forest management. Empowering these communities through such processes is vital for sustaining natural resources in

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<sup>47</sup> . Elfiondri et al., "Family Story on Land-Related Tradition as Base for Land-Use Management and Sustainable Development: The Case of Indigenous Mentawai," *International Journal of Engineering & Technology* 7, no. 4.9 (October 2, 2018): 82–89, <https://doi.org/10.14419/ijet.v7i4.9.20621>.

<sup>48</sup> L Zamzami et al., "Marine Resource Conservation for Sustainable Food Security in Indonesia," *IOP Conference Series: Earth and Environmental Science* 583, no. 1 (October 1, 2020): 012039, <https://doi.org/10.1088/1755-1315/583/1/012039>.

<sup>49</sup> Binay Kumar Pattnaik, ed., *Environmental and Ecological Sustainability Through Indigenous Traditions: Perspectives from the Global South* (Singapore: Springer Nature Singapore, 2024), <https://doi.org/10.1007/978-981-19-7079-5>.

Papua, where customary forests are essential for maintaining water quality, wildlife habitats, and biodiversity.<sup>50</sup>

The Asmat people, renowned for their woodcarving, exemplify a profound connection between culture and nature. Their wood carvings reflect myths and social values, serving as a means for the Asmat to maintain harmony with the natural world. The myths surrounding creation and enrichment highlight the significance of this balance between humans and nature. This art form not only embodies cultural expression but also symbolizes local wisdom that aids the Asmat in navigating harsh environmental conditions. The Asmat people's ability to adapt and innovate while preserving their traditional knowledge is a testament to their resilience.<sup>51</sup>

Despite the differing environmental challenges faced by the provinces of Bali, Jambi, West Sumatra, and Papua, the local wisdom-based environmental management practiced by indigenous communities in each area reveals considerable potential for ecosystem sustainability. This wisdom, which emphasizes harmonious relationships between humans and nature and is passed down through generations, provides a strong foundation for preserving natural resources. Therefore, it is crucial to recognize and integrate this local wisdom into broader environmental policies to develop more effective solutions to future environmental challenges.

#### **4.5. Integrating Local Wisdom and Village Authority within the Framework of State Responsibility**

The integration of local wisdom and village authority in environmental governance represents a paradigm shift in sustainable development, reinforcing the role of decentralized governance in ecological conservation. As states bear the primary responsibility for natural resource management and environmental protection, the incorporation of community-based knowledge and local institutions into national

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<sup>50</sup> Yubelince Y. Runtuboi et al., "Oil Palm Plantations, Forest Conservation and Indigenous Peoples in West Papua Province: What Lies Ahead?," *Forest and Society*, December 25, 2020, 23–31, <https://doi.org/10.24259/fs.v5i1.11343>.

<sup>51</sup> Mehmet Ersal, "Materialization of Ritual: The Example of Alevi Belief System," *Milli Folklor* 18, no. 143 (September 15, 2024): 28–39, <https://doi.org/10.58242/millifolklor.1463390>; Dr. Ashwini Machey, Dr. Sashi Knata Saikia, and Dr. Jyoti Prasad Phukan, "Arts And Crafts Of The Singpho Tribe Of Assam: An Empirical Study," *IOSR Journal of Humanities and Social Science* 29, no. 10 (October 2024): 34–37, <https://doi.org/10.9790/0837-2910053437>.

frameworks has emerged as a critical factor in fostering resilience and sustainability.<sup>52</sup> Despite its potential, however, the integration of indigenous wisdom and village authority remains underexplored in mainstream environmental governance discourse, often overshadowed by centralized, top-down policies that fail to accommodate the nuances of local ecological practices. While many national and international frameworks acknowledge the value of participatory governance, they frequently relegate indigenous and customary institutions to a subsidiary role rather than positioning them as central actors in decision-making.<sup>53</sup>

Globally, numerous case studies demonstrate the success of integrating local wisdom into environmental governance. For instance, Japan's Satoyama landscape management concept illustrates a harmonious interaction between human communities and nature through traditional agricultural and forestry practices.<sup>54</sup> Recognized by the United Nations University as a model of socio-ecological production landscapes, Satoyama governance underscores the role of community-based land management in achieving biodiversity conservation and sustainable livelihoods.<sup>55</sup> Similarly, Ecuador's constitutional recognition of Pachamama (Mother Earth) grants legal rights to nature, ensuring that indigenous communities play an active role in ecological governance, thereby establishing a legal foundation for integrating local wisdom into national policies.<sup>56</sup> In contrast, Indonesia, despite possessing a rich

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<sup>52</sup> E Maryani and S Indrianty, "The Role of Government and Community in the Development of Local Wisdom-Based Sustainable Tourism Village," *IOP Conference Series: Earth and Environmental Science* 1366, no. 1 (July 1, 2024): 012009, <https://doi.org/10.1088/1755-1315/1366/1/012009>.

<sup>53</sup> Brondízio et al., "Locally Based, Regionally Manifested, and Globally Relevant."

<sup>54</sup> Ryo Kohsaka et al., "Local Assessment of Tokyo: Satoyama and Satoumi – Traditional Landscapes and Management Practices in a Contemporary Urban Environment," in *Urbanization, Biodiversity and Ecosystem Services: Challenges and Opportunities*, ed. Thomas Elmqvist et al. (Dordrecht: Springer Netherlands, 2013), 93–105, [https://doi.org/10.1007/978-94-007-7088-1\\_8](https://doi.org/10.1007/978-94-007-7088-1_8).

<sup>55</sup> Hayato Hasegawa et al., "Emergence Process of Governance for Restoring an Unmanaged Ecosystem: Comparison of Two Activities at the Satoyama Forest and Coastal Pine Forests in Fukutsu City, Japan," *Landscape and Ecological Engineering* 20, no. 3 (July 2024): 299–310, <https://doi.org/10.1007/s11355-023-00593-3>; Hayato Hasegawa et al., "Collaborative Management of Satoyama for Revitalizing and Adding Value as Green Infrastructure," in *Urban Biodiversity and Ecological Design for Sustainable Cities*, ed. Keitaro Ito (Tokyo: Springer Japan, 2021), 317–33, [https://doi.org/10.1007/978-4-431-56856-8\\_14](https://doi.org/10.1007/978-4-431-56856-8_14).

<sup>56</sup> Cristina Espinosa, "Interpretive Affinities: The Constitutionalization of Rights of Nature, <i>Pacha Mama</i>," in Ecuador," *Journal of Environmental Policy & Planning* 21, no. 5 (September 3, 2019): 608–22, <https://doi.org/10.1080/1523908X.2015.1116379>; Daniel P. Corrigan and Markku Oksanen, *Rights of Nature: A Re-Examination*, ed. Daniel P. Corrigan and Markku Oksanen, 1st ed. (Abingdon, Oxon ; New

repository of indigenous ecological knowledge, continues to struggle with effectively embedding local governance structures within its broader environmental policy framework. While the subak irrigation system in Bali stands as an exemplar of local wisdom sustaining agricultural and ecological balance, its institutionalization within national policy remains incomplete, highlighting the broader issue of limited legal recognition of customary environmental governance systems.<sup>57</sup>

A critical barrier to integrating local wisdom into state policies lies in the epistemological clash between centralized governance and indigenous knowledge systems. State environmental policies often rely on a modernist, technocratic approach that prioritizes quantitative assessments, regulatory enforcement, and economic growth, whereas local wisdom is deeply embedded in philosophical and spiritual conceptions of nature, emphasizing reciprocal relationships and ecological balance.<sup>58</sup> This tension manifests in the marginalization of customary governance structures, as state-driven conservation efforts frequently override indigenous management practices. For example, in the Amazon basin, indigenous communities have long practiced rotational agroforestry, which maintains biodiversity while supporting subsistence economies.<sup>59</sup> However, state-led conservation initiatives, often influenced by international funding bodies, have imposed rigid land-use restrictions that undermine indigenous autonomy and disrupt ecological equilibrium. A similar pattern is observed in Indonesia, where village authority in environmental management is frequently subordinated to national policies favoring extractive industries and large-scale infrastructure projects. The conflict between economic development and environmental sustainability is particularly pronounced, as short-term state-driven

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York, NY : Routledge, 2021. | Series: Routledge explorations in environmental studies: Routledge, 2021), <https://doi.org/10.4324/9780367479589>.

<sup>57</sup> Xuan Gao et al., "Traditional Subak Irrigation System and Its Eco-Hydrological Effects in Bali Rice Terraces, Indonesia," *Chinese Journal of Ecology* 38, no. 3 (2019): 873–81; Eulis Dewi yuliana et al., "Irrigation System Implementation Implications of Renewable Subak Land on Rice Field in Bali," *Opcion* 35, no. Special Issue 19 (2019): 1311–31.

<sup>58</sup> Melanie (Lain) Dare and Anna Lukasiewicz, "Are Environmental Water Advisory Groups an Effective Form of Localism?," *Journal of Environmental Planning and Management* 62, no. 2 (January 28, 2019): 205–28, <https://doi.org/10.1080/09640568.2017.1406343>.

<sup>59</sup> Deborah Delgado Pugley, "Planning for Autonomy and Conservation: 'Life Plans' and Communal Reserves in the Amazonian Borders of Peru," *Oxford Development Studies* 52, no. 4 (October 2024): 413–28, <https://doi.org/10.1080/13600818.2024.2418370>.

economic priorities often contradict the long-term ecological principles upheld by local communities.<sup>60</sup>

Legal pluralism presents another challenge in bridging local wisdom with national policies. Many indigenous communities operate under customary law, which governs resource use through unwritten norms, oral traditions, and communal decision-making processes. However, state legal frameworks, which tend to be codified and universalized, often fail to accommodate the fluid and context-specific nature of customary governance.<sup>61</sup> In Indonesia, while various policies nominally recognize indigenous land rights, implementation remains inconsistent, and local communities frequently encounter bureaucratic and corporate resistance. The struggle of the Aman (Indigenous Peoples Alliance of the Archipelago) to secure legal recognition of customary forests exemplifies this challenge, as many indigenous territories continue to be classified as state land, making them vulnerable to external appropriation.<sup>62</sup> To address this, environmental governance must adopt a more inclusive legal approach that harmonizes state law with customary governance structures, ensuring that village communities retain autonomy while contributing to broader environmental sustainability goals.<sup>63</sup>

Another critical consideration is the structural capacity of villages to manage environmental policies effectively. While many communities possess profound ecological knowledge, they often lack access to resources, technology, and institutional support necessary for large-scale environmental governance.<sup>64</sup> Comparative studies

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<sup>60</sup> Rangkuti and Rangkuti, "The Policy of Village Infrastructure Service in Deli Serdang Regency, Indonesia."

<sup>61</sup> Natalya Novikova, "Customary Law Today," in *The Siberian World*, by Vladimir Davydov, Jenanne Ferguson, and John P. Ziker, 1st ed. (London: Routledge, 2023), 123–38, <https://doi.org/10.4324/9780429354663-10>.

<sup>62</sup> Laely Nurhidayah et al., "Resolving Land-Use Conflicts over Indonesia's Customary Forests: One Map, Power Contestations and Social Justice," *Contemporary Southeast Asia* 42, no. 3 (December 10, 2020): 372–97, <https://doi.org/10.1355/CS42-3c>.

<sup>63</sup> Julie Ynès Ada Tchoukou, "A Conceptual Framework for Regulating Customary Law within Pluralistic African States: Reassessing Justice Sector Reforms for Reconciling Legal Traditions," *Global Journal of Comparative Law* 9, no. 2 (June 19, 2020): 245–70, <https://doi.org/10.1163/2211906X-00902004>; Sulaiman, "Good and Sustainable Village Governance."

<sup>64</sup> Pingyang Liu and Aixi Han, "How Does Community Leadership Contribute to Rural Environmental Governance? Evidence from Shanghai Villages\*," *Rural Sociology* 88, no. 3 (September 2023): 856–94, <https://doi.org/10.1111/ruso.12504>.

indicate that successful models of local environmental management often involve a robust collaboration between state institutions and local communities. For example, in Sweden, the Sami Parliament operates as a semi-autonomous indigenous body that engages directly with national environmental policy, ensuring that reindeer herding and traditional land management practices are preserved within the framework of sustainable development.<sup>65</sup> Similarly, New Zealand's co-management approach in the governance of the Te Urewera protected area, where the Maori people hold legal personhood rights over the land, demonstrates how formal recognition of indigenous governance can lead to effective conservation outcomes.<sup>66</sup> In Indonesia, however, village governments frequently lack the institutional capacity and financial resources to implement similar models, necessitating increased state investment in community-based environmental management initiatives.<sup>67</sup>

Technological integration also presents an opportunity to strengthen village authority in environmental governance. By leveraging digital tools, remote sensing, and participatory mapping, local communities can enhance their ability to monitor environmental changes, enforce conservation laws, and document customary land tenure.<sup>68</sup> The emergence of community-based monitoring initiatives in the Amazon and the use of geospatial mapping by indigenous groups in Canada illustrate the transformative potential of technology in reinforcing local governance.<sup>69</sup> In Indonesia,

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<sup>65</sup> Annelie Sjölander-Lindqvist et al., "Knowledge Claims and Struggles in Decentralized Large Carnivore Governance: Insights from Norway and Sweden," *Frontiers in Ecology and Evolution* 8 (June 5, 2020): 120, <https://doi.org/10.3389/fevo.2020.00120>.

<sup>66</sup> C.Y. Bataille et al., "Stakeholder Values Inform Indigenous Peoples' Governance and Management of a Former National Park in New Zealand," *Human Ecology* 48, no. 4 (August 2020): 439–53, <https://doi.org/10.1007/s10745-020-00170-4>.

<sup>67</sup> E Rosalina and Sucipto, "Analysis of Environmental Resilience Index Due to Realization of Village Funds in the Bangka Belitung Islands Province," *IOP Conference Series: Earth and Environmental Science* 599, no. 1 (November 1, 2020): 012088, <https://doi.org/10.1088/1755-1315/599/1/012088>.

<sup>68</sup> A.R. Hernandez-Martinez, "Remote Sensing for Environmental Analysis: Basic Concepts and Setup," in *Green Sustainable Process for Chemical and Environmental Engineering and Science* (Elsevier, 2021), 209–24, <https://doi.org/10.1016/B978-0-12-821883-9.00012-6>.

<sup>69</sup> Thomas J. McGurk and Sébastien Caquard, "To What Extent Can Online Mapping Be Decolonial? A Journey Throughout Indigenous Cartography in Canada," *Canadian Geographies / Géographies Canadiennes* 64, no. 1 (March 2020): 49–64, <https://doi.org/10.1111/cag.12602>; Rachel Olson, Jeffrey Hackett, and Steven DeRoy, "Mapping the Digital Terrain: Towards Indigenous Geographic Information and Spatial Data Quality Indicators for Indigenous Knowledge and Traditional Land-Use Data Collection," *The Cartographic Journal* 53, no. 4 (October 2016): 348–55, <https://doi.org/10.1080/00087041.2016.1190146>.

the adoption of similar approaches could empower village communities to actively participate in conservation efforts, particularly in monitoring deforestation, illegal logging, and land conversion. However, the success of such initiatives hinges on equitable access to technology and the willingness of the state to recognize community-generated data as a legitimate source of environmental governance.

Furthermore, the integration of local wisdom into environmental management must be grounded in principles of social justice. Historically, indigenous and rural communities have been marginalized in environmental policymaking, often treated as passive stakeholders rather than active decision-makers.<sup>70</sup> To rectify this imbalance, participatory governance mechanisms must be institutionalized to ensure that village voices are not merely symbolic but carry substantive influence in policy formulation and implementation. This requires a fundamental rethinking of environmental governance, moving beyond a hierarchical state-centric model toward a more polycentric governance structure where villages hold meaningful authority in decision-making.

## 5. Conclusion

This research demonstrates that environmental management rooted in local wisdom and village authority is crucial for supporting ecosystem sustainability in Indonesia. Case studies from provinces like Bali, Jambi, West Sumatra, and Papua illustrate that indigenous communities possess profound knowledge and traditions that effectively maintain the balance of nature. However, significant challenges arise from the disconnect between state policies and the recognition of local communities' rights. Consequently, more concerted efforts are required to incorporate local wisdom into national policies, emphasizing effective decentralization and enhancing the capacity of village governments in managing natural resources.

The findings suggest that achieving sustainable development goals necessitates the formulation of more inclusive policies by the state—ones that not only recognize but

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<sup>70</sup> Israel Solorio, Raúl Romero, and Claudia Ros, "Indigenous and Local Knowledge in Environmental Decision Making," in *Routledge Handbook of Environmental Policy*, by Helge Jörgens, Christoph Knill, and Yves Steinebach, 1st ed. (London: Routledge, 2023), 194–206, <https://doi.org/10.4324/9781003043843-16>.

also empower indigenous peoples and villages in environmental management. To create a holistic and equitable environmental management model, closer collaboration among the central government, local governments, indigenous peoples, and the private sector is essential. Additionally, it is vital to implement mechanisms that adapt local wisdom to modern development needs, ensuring that traditional values remain relevant amid the dynamics of globalization. This research provides a solid foundation for policy development that synergizes local wisdom and village authority in environmental preservation.

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