Forest Conservation in Flores Island: A Public Administration Review

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ABSTRACT

Forest conservation in Indonesia faces significant challenges, specifically on Flores Island, where complex interactions between governance frameworks, traditional practices, and modern conservation approaches influence management outcomes. While existing literature extensively documents conservation initiatives, limited research addresses integrating traditional ecological knowledge with contemporary administrative frameworks. This study examines Flores Island's institutional and policy mechanisms governing forest management, focusing on identifying structural gaps and proposing integrated solutions. We analyzed policy documents using a qualitative case study approach and employed thematic analysis to evaluate current governance frameworks. Our findings reveal critical deficiencies in cross-sectoral coordination, emergency response protocols, and technological integration mechanisms. The study identified significant policy formulation and implementation gaps, especially in incorporating traditional ecological knowledge and climate change adaptation strategies. The research contributes to public administration literature by proposing an innovative governance framework that balances conservation objectives with socio-economic development. We recommend strengthening institutional frameworks through enhanced stakeholder coordination, sustainable financing mechanisms, and improved emergency response protocols. These findings have broader implications for similar regions facing forest conservation challenges, suggesting that effective conservation requires a comprehensive approach integrating traditional wisdom, modern practices, and robust administrative structures.

INTRODUCTION

Flores Island, located in the eastern part of the Indonesian archipelago in the Nusa Tenggara region, is a paramount ecological hotspot that embodies extraordinary biodiversity and complex socio-environmental challenges. With an estimated land area of around 14,300 square kilometres, the island has a unique geological landscape; including volcanoes; tropical forests; and distinctive endemic ecosystems (Wikipedia, 2024). Based on this, we explore the problematic environmental assessment that reveals that Flores Island has undergone significant ecological transformation, with forest cover decreasing from around 70% in the 1990s to around 45% in 2020 (Rosary, 2023). Here are the data:

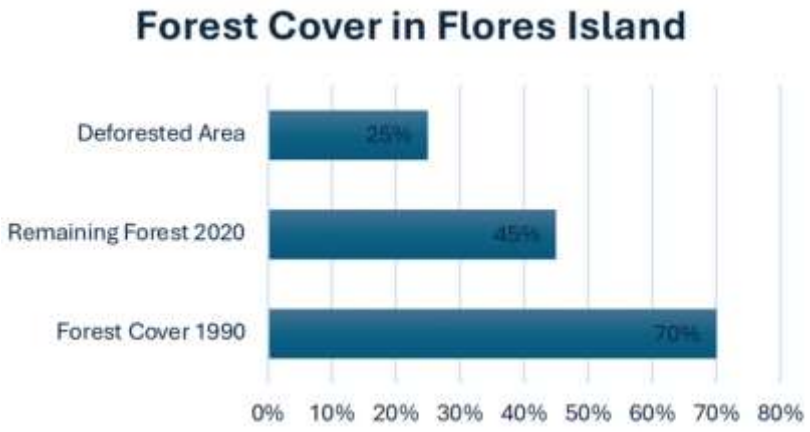

Fig. 1. Summary of Forest Cover in Flores Island

Source: Compiled from Agrarian Reform Consortium (KPA), Author's Analyzed, 2025

Moreover, socio-economically, Flores Island presents a complex landscape in which traditional communities are generally considered to be in conflict with modern conservation imperatives (Shamier et al., 2021). The island's population, estimated at around 5,6 million in 2024, comprises indigenous peoples with deep-rooted cultural ties to their natural environment (Central Bureau of Statistics NTT Province, 2024). Meanwhile, traditional land management practices, such as shifting cultivation and community-based forest use, have historically been essential in maintaining ecological balance. Regardless, rapid demographic changes; economic modernisation; and external market pressures have increasingly challenged these traditional sustainable practices, leading to accelerated forest degradation and biodiversity loss (Maring, 2022).

On this basis, we argue that the problems on Flores Island need to be reviewed from the conceptual perspective of public administration, which is considered to have an essential role in policy interventions and governance mechanisms related to addressing existing environmental challenges. Interestingly, previous research also supports this, highlighting the need for an integrated approach that simultaneously addresses ecological conservation; community development; and sustainable resource management (Ostrom, 2009).

In addition, empirical research focusing on forest conservation on Flores Island through the lens of public administration is still limited, creating a significant knowledge gap in comprehending the complex relationships between administrative structures; community dynamics; and environmental conservation. Against this backdrop, the main research question guiding this study emerges: How do public administration perspectives, particularly policy interventions and governance mechanisms, attempt to address forest conservation issues?. Ultimately, this study aims to contribute to a better understanding of how a public administration perspective can drive policy and governance interventions to produce more resilient and adaptive strategies for forest conservation in an era of increasing environmental and development pressures.

LITERATURE REVIEW

1. Public Administration Perspectives

First, we must acknowledge that public administration serves as a foundational framework for governance, offering mechanisms for implementing policies and managing public resources. Operating at the nexus of theory and practice, it draws upon diverse political; economic; and social perspectives to address multifaceted societal challenges (Gerton & Mitchell, 2019). Central to the discipline is pursuing efficiency; equity; and accountability; aiming to deliver outcomes that serve the public good while navigating constraints such as limited resources and competing priorities (Wojciechowski et al., 2023). This theoretical underpinning assumes particular significance when applied to pressing real-world issues, such as forest conservation on Flores Island.

In addition, we believe that the forest conservation case in Flores Island illustrates the critical intersection of public administration and environmental governance. The island faces pressing ecological challenges, including deforestation; biodiversity loss; and the adverse effects of climate change; which profoundly impact local communities reliant on forest ecosystems for their livelihoods. The next move to address these issues requires an integrated approach within the framework of public administration, combining environmental stewardship with socio-economic development. In this context, the policymakers must navigate a delicate balance between conservation imperatives and economic growth and cultural preservation realities, leveraging participatory and collaborative governance models that engage local stakeholders; non-governmental organizations; and international agencies (Bjärstig et al., 2024).

2. Policy Intervention

Policy interventions play a pivotal role in addressing complex societal challenges by offering a structured approach to problem-solving through the design and implementation of targeted measures. In theory, effective policy interventions are informed by evidence-based research; stakeholder engagement; and a clear understanding of underlying issues (Bakkeli, 2023). In practice, nonetheless, their success often hinges on the capacity of governing institutions to execute policies efficiently and adapt to evolving circumstances. This dynamic is notably evident in forest conservation on Flores Island, where policy interventions are critical for mitigating deforestation; preserving biodiversity; and addressing the socioeconomic needs of local communities.

Based on this, policy interventions for forest conservation on Flores Island must strike a balance between environmental protection and community development. These interventions may include regulatory measures, such as establishing protected areas and enforcing stricter logging bans; alongside incentive-based approaches; such as payments for ecosystem services (PES) and subsidies for sustainable agricultural practices (Kangas & Ollikainen, 2022). While these measures are grounded in environmental governance principles; their practical outcomes are shaped by the institutional framework; stakeholder participation levels; and resource availability. Such as, poorly designed or inadequately enforced policies may fail to curb illegal logging, leading to further environmental degradation.

3. Governance

At its core, governance forms the bedrock of public administration. It encompasses three vital elements: organizational structures (the framework through which authority flows); systematic processes (step-by-step methods for achieving goals); and operational mechanisms (specific tools and procedures for implementation). Through these components, organizations can effectively make informed decisions, put policies into practice, and work toward broader societal objectives. For governance to function effectively, it must demonstrate four essential qualities: transparency (open and transparent operations); accountability (taking responsibility for actions); inclusivity (involving all relevant parties); and responsiveness (adapting to changing needs) (Olowu, 2002).

The characteristics ensure that institutions not only operate efficiently but also serve the diverse needs of all stakeholders. While governance reaches beyond traditional government bodies to include community groups; businesses; and international organizations; it often encounters significant challenges (Frederickson, 2009). In addition, the obstacles include weak institutional structures (inadequate organizational frameworks); corruption (misuse of power or resources); and conflicting interests (competing priorities among different groups) (Jin, 2024). These challenges are evident in forest conservation efforts on Flores Island, where governance must carefully balance environmental protection with community development needs.

METHOD

To begin the process of this research, we employ a qualitative approach anchored in interpretive analysis to examine the complex interplay between public administration mechanisms and forest conservation efforts in Flores Island. This methodological choice allows for a nuanced comprehending of policy interventions; governance structures; and their practical implementation in addressing forest

degradation challenges. The study primarily utilises a desk research strategy (Creswell & Poth, 2016), systematically reviewing and analysing various secondary data sources; including government policy documents; conservation reports; academic publications; local government archives; or institutional frameworks related to forest management in Flores Island.

In the second part, we mainly examined the past decade's administrative records; including forest management plans; conservation project evaluations; and inter-agency coordination documents. The analysis involves careful documentation review; thematic coding; and pattern identification to uncover key governance approaches; policy evolution; and implementation challenges (Adeoye-Olatunde & Olenik, 2021). Based on this, the desk-based investigation is complemented by the systematic analysis of regulatory frameworks, focusing mainly on how various administrative levels-from national to local government-interpret and implement forest conservation policies.

The research also examines public-private partnership documents; community engagement reports; and environmental impact assessments to understand the administrative ecosystem surrounding forest conservation efforts comprehensively. In conclusion, to ensure analytical rigour, the study employs triangulation by cross-referencing multiple data sources, including official statistics; policy briefs; and academic literature. This approach helps validate findings and provides a more robust understanding of how public administration mechanisms influence forest conservation outcomes. The interpretative analysis focuses on identifying patterns in policy formulation; implementation gaps; and governance innovations that have emerged in response to forest conservation challenges in Flores Island. To facilitate comprehension, we describe the analytical framework in this research as follows:

Fig. 2. Research Design

Source: Conceptual by Author's, 2025

Stage 1 Problem Definition: This stage focuses on identifying and clearly articulating the forest conservation issues in Flores Island. The researchers would need to outline specific challenges such as deforestation rates; threats to biodiversity; local community impacts; and current conservation policy gaps. It establishes the fundamental research questions and scope of the investigation.

Stage 2 Data Collection: This phase involves gathering information from three key sources: policy documents (likely including local and national forest management policies); conservation reports (from NGOs, environmental agencies; and research institutions), and government archives. This multi-source approach ensures a comprehensive understanding of Flores Island's historical and current forest management practices.

Stage 3 Document Review: Researchers conduct a detailed analysis of the collected data during this stage. This would involve examining policy implementation effectiveness; identifying patterns in conservation efforts; understanding regulatory frameworks; and evaluating the roles of various stakeholders in forest management on Flores Island. The review will likely include both qualitative and quantitative analysis of documentation.

Stage 4 Interpretation: This crucial phase involves synthesising the analysed data to draw meaningful insights. Researchers would identify key trends; policy impacts; implementation

challenges; and successes in forest conservation efforts. This stage would also involve understanding the relationships between stakeholders and their influence on conservation outcomes.

Stage 5 Recommendations: The final stage produces evidence-based recommendations for improving forest conservation practices on Flores Island. These recommendations would likely address policy reforms; implementation strategies; stakeholder engagement; and specific conservation measures. The suggestions would be grounded in the context of public administration and focus on governmental and institutional improvements.

RESULTS AND DISCUSSION

Based on the analysis's results, we try to systematically describe the existing findings, where each indicator adopted can discuss and explore improvements to the problems faced in improving sustainable forest management on Flores Island.

1. Public Administration Perspectives

Referring to the documents, we found that genuine efforts were applied. This is contained in the Klorane Botanical Foundation document, which includes several efforts: Reforestation and Agroforestry; Sustainable Livelihoods and economic development; community Engagement; and Environmental Education (Klorane Botanical Foundation, 2025). From a public administration perspective, this initiative highlights the role of governance; policy interventions; and stakeholder collaboration in achieving sustainable development goals. We argue that effective environmental governance requires a structured approach in which local governments, NGOs, and international partners work together to design and implement conservation strategies. Likewise, in the case of Flores Island, a decentralized governance model that empowers local communities to take ownership of conservation efforts can increase policy effectiveness, which connotations seek to incorporate traditional ecological knowledge and promote agroecological techniques and interventions are in line with the principles of participatory governance, which encourage environmental sustainability and socio-economic resilience.

Meanwhile, policy interventions play a paramount role in ensuring the long-term success of forest conservation initiatives. A regulatory framework that enforces land-use planning incentivizes sustainable agricultural practices and establishes protected areas essential to prevent further deforestation should be included. In addition, economic incentives, such as payments for ecosystem services (PES) or support for sustainable value chains such as medicinal plant cultivation, can provide alternative sources of income that reduce reliance on forest clearing. Thus, integrating agroforestry, which combines tree planting with agricultural production, represents a policy approach that balances conservation with economic viability.

This can be done by ensuring and strengthening transparency; accountability; and adaptive management strategies within public administration frameworks to make them more flexible and coordinated. Thus, in an attempt to connect this to the broader public administration discourse, the case of forest conservation in Flores Island underscores the priority of an integrated policy approach that combines environmental management with socio-economic development. This framework should encourage inclusive governance; utilize policy tools; and involve local communities.

2. Policy Intervention

Forest conservation on Flores Island is a complex but essential effort to protect the region's unique biodiversity. Over the years, conservation strategies have been improved through better planning; local community engagement; and scientific research. Here, the primary approach adopted is Resort-Based Management (RBM), which allows conservation teams to work more effectively locally (Wiratno, 2017). Nevertheless, in practice, challenges remain as illegal logging; deforestation; and habitat destruction continue to threaten the forest.

To address these issues, the government must be consistent with conservation programs that focus on strengthening local institutions, encouraging community participation, and using scientific knowledge to support sustainable management. Not to mention, we found that Flores Island is home

to rare species, including the tree fern "*Dicksonia Timorense*" and the Komodo dragon, which live in several areas outside Komodo National Park. It is revealed through marine research in the region, which has also resulted in the discovery of a compound derived from sponges, "*Candidaspongiolide*", with potential anticancer properties.

These findings highlight the paramount of preserving Flores' natural habitats, not only for biodiversity but also for medical and scientific advancements. Nonetheless, long-term monitoring still has gaps, and conservation efforts need stronger links between research institutions and government policies to ensure continued progress. As we advance, several steps can improve forest conservation in Flores. First, local communities should play a more significant role in conservation through training and incentives that make forest protection worthwhile.

Second, more scientific research is needed to understand how climate change affects the island's ecosystems. Third, the government should strengthen policies to stop illegal logging and land encroachment. Another critical step is to promote sustainable ecotourism, which can generate income while protecting the environment. Finally, restoring degraded forests through tree-planting projects will help maintain healthy ecosystems for future generations.

For conservation to be successful, policy interventions must focus on protecting the environment and supporting local communities. The government should formulate land use and conservation enforcement laws while providing financial incentives for communities and businesses that follow sustainable practices. However, this has been stated in the NTT Governor's Decree Number 173/KEP/HK/2023 dated April 26, 2023, concerning the NTT Provincial Level Forest and Land Fire Control Task Force (*Satgas Dalkarhutla*). Notwithstanding, existing regulations and training programs are not necessarily enough, but this can help conservation officers and local groups better manage forest areas. Withal, the government must re-increase or revive collaboration between government agencies; environmental organizations; scientists; and communities, which is also key to creating long-term solutions. Thus, conservation policies must consider climate change and adapt to ensure that forests remain protected in the long term. By implementing this strategy, the forests of Flores Island can be preserved for future generations. A balanced approach that protects nature while benefiting local communities will ensure the survival of unique species; contribute to scientific discovery; and support sustainable development.

Capacity Building: There needs to be workshops to train local conservation officers and community groups in ecological monitoring and conservation techniques that have outcomes that support government programs in protecting forests or land use. Cross-Sector Collaboration: Fostering partnerships between government agencies; NGOs, academics; and local stakeholders to improve conservation efforts. Climate Adaptation Strategy: The government must develop policies integrating climate resilience into forest conservation planning, ensuring long-term sustainability.

3. Governance

In conducting this analysis, we have identified several critical gaps that require careful consideration. First, the organizational structure does not appear to have an explicit mechanism for integrating local knowledge that is already a visibly supportive element of local community oversight. To this end, we argue that the context for social forestry components is present. Still, we also observe that traditional ecological knowledge systems; vibrant on Flores Island; are not positioned within the governance framework (Governor Regulation No. 12 Concerning the Position, Organizational Structure, Duties and Functions, and Work Procedures of the Environmental and Forestry Service of the Province of East Nusa Tenggara, 2022). As a result, this oversight can potentially limit the effectiveness of conservation efforts, specifically in areas where traditional practices have historically maintained forest health.

We also further identify mechanisms for climate change adaptation. While comprehensive in its basic environmental management approach, the current structure does not explicitly address how climate change considerations are integrated into decision-making processes across divisions. It is precise concerning when considering Flores Island's vulnerability to climate impacts and the need for adaptive forest management strategies. Our analysis also notes the absence of precise inter-

agency coordination mechanisms, distinct in the tourism and agriculture sectors. Given that forest conservation efforts on Flores Island often intersect with these sectors, the lack of formal coordination channels can lead to policy conflicts and implementation challenges.

The structure's silence on cross-sectoral governance mechanisms is a significant omission in an era that calls for an integrated approach to environmental management. Moreover, we identified critical gaps in the monitoring and evaluation framework. While the structure provides an implementation unit, it does not clearly describe how conservation outcomes are measured; reported; and fed into the policy-making process. This gap can potentially hamper adaptive management efforts and make it difficult to assess the effectiveness of conservation initiatives.

We noted a notably glaring omission: the absence of a specific emergency response protocol within the organizational structure. Given the increasing frequency of forest fires and other environmental emergencies, the lack of a precise, rapid response mechanism within the governance framework could seriously affect the agency's ability to protect forest resources during crises. Our analysis also revealed limited attention to technology integration and digital transformation. In an era where remote sensing, GIS, and other digital tools are essential for effective forest monitoring and management, the structure does not adequately address how these technologies are incorporated into daily operations and decision-making processes. In addition, we observed that the current structure lacks precise mechanisms to resolve conflicts between conservation objectives and development pressures. This is specially problematic on Flores Island, where expansion of tourism infrastructure and agricultural activities often compete with forest conservation objectives. Another critical gap lies in the financial sustainability mechanism. While the structure provides for a range of conservation activities, it does not clearly outline how these initiatives will be funded sustainably over time, usually in the context of competing budget priorities and limited resources. This critical gap highlights the need for structural reform and policy innovation in forest conservation governance.

CONCLUSION

This research has provided significant insights into the complexities and challenges of sustainable forest management on Flores Island, precisely through the lens of public administration, policy intervention, and governance frameworks. Our analysis reveals that while genuine conservation efforts exist, as exemplified by initiatives like the Klorane Botanical Foundation's programs, substantial gaps in implementation and structural frameworks remain that require immediate attention.

In the next move, the key message emerging from this study is that effective forest conservation on Flores Island necessitates an integrated, multi-stakeholder approach that incorporates traditional ecological knowledge with modern conservation practices. Our findings demonstrate that the current governance structure, while foundational, lacks crucial mechanisms for incorporating local wisdom, climate change adaptation, and cross-sectoral coordination. Usually noteworthy is the absence of explicit protocols for emergency response and technological integration, which significantly impacts the region's ability to respond to environmental crises and implement effective monitoring systems.

Moreover, the broader implications of this research extend beyond Flores Island, offering valuable insights for similar regions grappling with forest conservation challenges. Our study contributes to the existing body of knowledge by identifying critical gaps in organizational structures and proposing innovative solutions that balance conservation objectives with socio-economic development. Specifically, we highlight the importance of developing integrated governance frameworks that effectively address competing land-use interests while maintaining environmental sustainability.

This research's main contribution lies in its comprehensive analysis of Flores Island's administrative and policy frameworks governing forest conservation. We provide a practical roadmap for policy reform and institutional strengthening by identifying specific structural deficiencies and proposing targeted solutions. The study's emphasis on the need for better integration of traditional ecological knowledge and modern conservation practices represents a significant advancement in our understanding of effective forest management strategies. Future research should focus on developing

quantifiable metrics for assessing conservation outcomes and investigating innovative financing mechanisms for sustainable forest management. Additionally, studies examining the impact of climate change on Flores Island's forest ecosystems and evaluating the effectiveness of various adaptation strategies would provide valuable insights for policy development.

This research concludes with a clear call to action for policymakers, conservation practitioners, and local stakeholders. Immediate steps must be taken to strengthen institutional frameworks, enhance cross-sectoral coordination, and develop sustainable financing mechanisms for forest conservation. Notwithstanding, there is an urgent need to integrate climate change considerations into forest management strategies and establish clear protocols for emergency response and technological adaptation. Only through such comprehensive reforms can we ensure the long-term preservation of Flores Island's unique forest ecosystems while supporting sustainable development for local communities.

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