

ADAPTING ENVIRONMENTAL GOVERNANCE TO SOCIAL AND ECOLOGICAL CHALLENGES IN BIODIVERSITY CONSERVATION

Menyesuaikan Tata Kelola Lingkungan Dengan Tantangan Sosial dan Ekologis Dalam Konservasi Keanekaragaman Hayati

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Abstrak

Dinamika kebijakan publik di Indonesia seringkali tidak efektif dalam mengeksplorasi permasalahan yang ada terkait konservasi keanekaragaman hayati. Penelitian ini bertujuan untuk mengidentifikasi dan menganalisis kebijakan publik yang mengatasi tantangan konservasi keanekaragaman hayati melalui pendekatan studi literatur. Konservasi keanekaragaman hayati sangat penting untuk menjaga keseimbangan ekologis, melindungi spesies yang terancam punah, dan melestarikan sumber daya alam yang vital bagi masyarakat lokal. Penelitian ini mengungkapkan kesenjangan antara perumusan dan implementasi kebijakan serta menawarkan perspektif baru tentang bagaimana mengoptimalkan dan mengimplementasikan kebijakan pembangunan untuk hasil konservasi yang lebih baik. Dengan menganalisis berbagai sumber akademis, penelitian ini menunjukkan bahwa kurangnya koordinasi antar instansi pemerintah dan kurangnya partisipasi masyarakat merupakan hambatan utama dalam mencapai tujuan konservasi keanekaragaman hayati. Penelitian ini menggunakan metode tinjauan literatur sistematis yang berfokus pada tiga aspek utama: efektivitas, implementasi kebijakan, partisipasi masyarakat dalam proses kebijakan, dan dampak kebijakan terhadap masyarakat. Selain itu, penelitian ini mengungkapkan bahwa kebijakan yang dirancang dengan mempertimbangkan konteks lokal dan secara aktif melibatkan pemangku kepentingan cenderung lebih berhasil dalam mencapai tujuan konservasi keanekaragaman hayati yang diinginkan.

Kata Kunci: Kebijakan, Pembangunan, Keanekaragaman Hayati, Konservasi, Masyarakat Lokal

Abstract

The dynamics of public policy in Indonesia are often ineffective in exploring existing problems related to biodiversity conservation. This research aims to identify and analyze public policies addressing the challenges of conserving biodiversity through a literature study approach. Biodiversity conservation is critical for maintaining ecological balance, protecting endangered species, and sustaining natural resources vital to local communities. This research reveals the gap between policy formulation and implementation and offers a new perspective on how to optimize and implement development policies for better conservation outcomes. By analyzing various academic sources, this research shows that the lack of coordination between government agencies and the lack of public participation are the main obstacles to achieving biodiversity conservation objectives. This research uses a systematic literature review method that focuses on three main aspects: effectiveness, policy implementation, public participation in the policy process, and the impact of policies on society. In addition, this research reveals that policies designed by considering the local context and actively involving stakeholders tend to be more successful in achieving the desired goals of biodiversity conservation.

Keywords: Policy, Development, Biodiversity, Conservation, Local Community

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Introduction

Structuration theory is an important framework in environmental governance policy, especially in conservation areas in maintaining the balance between protecting natural habitats and meeting the needs of the community. It offers a revolutionary approach by recognizing that social structures and human agency are mutually constitutive, meaning social structures influence human behavior, and human actions simultaneously shape and reproduce these structures (Karpatne et al., 2016). This helps in developing more effective policies and strategies for conservation and sustainability (Zarte et al., 2022). Thus, structuration theory provides a powerful framework for addressing challenges in environmental governance and sustainability.

Structuration theory, developed by Anthony Giddens, provides a framework for understanding the interaction between social structures and individual practices. It not only maps complex relationships but also reveals transformative potential in a variety of contexts, including environmental governance. By emphasizing that social practices are recursive in that they shape and form social structures. This reciprocal relationship allows for stability and change in social systems. (Gynnild, 2021) Which emphasizes how structures from larger systems are separated, transformed, and recreated in local contexts. This process is critical in understanding how organizations and social systems evolve and adapt (Wong et al., 2019).

Through the integration of structuration theory, we can create more responsive, inclusive, and sustainable governance in conservation areas by following a framework that bridges the gap between individual agency and societal structures that influence each other. It emphasizes the role of agency in shaping and being shaped by social structures. (Andriana et al., 2020) .

In structuration theory, Anthony Giddens (1984) challenges the traditional dichotomy between agency and structure by putting forward the interdependence between the two. According to this theory, agency refers to the capacity of individuals to act independently and make free choices that interact with structure in defined rules and restrictive resources. Structure is not only the context in which actions occur but also the outcome of those actions. Interdependence is fundamental, emphasizing that agency and structure are mutually constitutive and cannot be understood independently of each other. (Crossley, 2022; Jackson, 1999; Kukaj & Nimani, 2022).

Structuration theory explains the dynamics of social systems through the concept of "duality". It states that structure and agency are interrelated and inseparable. Structures not only influence human behavior but are also recreated

through human action. This reciprocal relationship is the core of structuration theory. Social structures composed of rules and resources organize human action, enable interaction across distance and time, and create continuity and stability to help understand how human actions and decisions are influenced and affect social structures in environmental conservation efforts (Akalili & Sari, 2021).

Structuration theory can provide a perspective on the interaction between societal structures and environmental dynamics. Structuration theory states that social structures and human agency are mutually constitutive in that social structures shape human behavior, while human actions also shape and reproduce these structures. In the context of environmental governance, this means that societal structures, such as economic systems, political institutions, and cultural norms, influence the way individuals and groups interact with the environment. For example, the structure of resource-based urban industries significantly impacts ecological resilience and environmental stress, demonstrating how societal structures can influence environmental outcomes (Chen & Wang, 2022).

Structuration theory offers a framework for understanding the interdependent and mutually constructive structures of society and environmental dynamics. The theory emphasizes the interactions that shape environmental governance by focusing on the reciprocal relationship between social structures and human agency. It highlights how social structures, such as norms, resources, and interpretation schemes, influence human behavior and agency, which in turn shape and reproduce those structures.

In the context of environmental governance, structuration theory can be applied to analyze the complex interactions between government policies, environmental non-governmental organizations (NGOs), and community responses. For example, structuration theory is used to examine how the securitization of the environmental sector by the central government interacts with NGO activism and advocacy, resulting in diverse outcomes across different regions and periods. (Chen & Wang, 2022).

Structuration theory in environmental governance emphasizes the reciprocal relationship between social structures and human institutions. It highlights how social structures, such as norms, resources, and interpretation schemes, influence human behavior and agency, which in turn shape and reproduce those structures. The theory argues that social structures are not fixed entities but are continuously recreated through human actions and interactions. The theory recognizes that while social

structures influence human behavior, individuals also have agency and can influence the structures of which they are a part. This agency can lead to changes in the social structure over time. (Schiellerup, 2008; Simpson et al., 2022)..

In structuration theory, significance in an environmental context relates to how meaning is given to nature and conservation efforts. This involves understanding how societal values and ethics are reflected in the normative rules that govern environmental practices, thereby managing environmental conflict and encouraging sustainable practices. This approach ensures that environmental actions are not only effective but also socially and culturally acceptable, thereby promoting long-term sustainability (Chawla et al., 2024) .

In structuration theory, the concept of legitimacy in the context of nature conservation and community welfare improvement refers to the normative rules that govern environmental practices by reflecting community values and ethics. The concept emphasizes that for the implementation of nature conservation practices to be successful, the practices need to gain legitimacy by being incorporated into the interpretive schemes of organizational actors, resources need to be distributed, and the practices need to gain acceptance and support from the community (van Mierlo et al., 2018).

In structuration theory, the concept of domination refers to the control and distribution of natural resources, which is crucial in managing environmental conflicts and promoting sustainable development practices. The concept highlights how power relations and access to resources can significantly impact the well-being of local communities and the environment. For example, a study on non-extractive natural resource governance in coastal Nemberala found that material power can change the composition of power and values in an area, leading to domination as an exercise of power. This domination can occur through unconstitutional practices in land acquisition processes, which negatively impact local communities and the environment. (Tiran et al., 2024),

Individuals and organizations are not only passive recipients of structural constraints but also active participants who can influence and reshape those structures through their actions. Such as the United States and the European Union, to facilitate public participation in environmental governance. The active involvement of communities in decision-making processes is essential to ensure that environmental policies are responsive to community needs and ecological challenges. (Akerboom & Craig, 2022)..

The important role of agencies in environmental decision-making in structuration theory emphasizes that individuals and organizations are not only passive recipients of structural constraints but also active in influencing and shaping those structures through their actions. The agency is important for the adaptation and resilience of environmental governance systems, which are required to respond to ecological changes and societal needs. The model helps in making sensible decisions by considering not only market changes but also the roles of various stakeholders (Zhai, 2020). By highlighting the roles of actors and stakeholders towards resource extraction, energy production, and consumption, the model helps in making sensible decisions considering not only market changes but also the roles of various stakeholders (Zhai, 2020). (Marshall, 2021).

Environmental governance involves the coordination of policies, institutions, procedures, tools, and information to enable various stakeholders, including the public, private sector, and local communities, to resolve conflicts, find solutions, and make critical decisions in effectively managing environmental resources. This approach aims to ensure that environmental issues are addressed comprehensively and sustainably.

Environmental governance involves engaging a wide range of stakeholders, including communities, the private sector, and local people. This engagement is critical to resolving conflicts and finding solutions that are acceptable to all parties. A case study of campus sustainability governance in Canada highlights the importance of stakeholder engagement in sustainability policy. (Vaughter et al., 2016). Scientific and Technical Support Epistemic institutions, which provide policy-relevant scientific advice, play an important role in environmental governance. These institutions help reduce scientific uncertainty and ensure the credibility of scientific information, which is essential for effective decision-making. (Feng, 2025)

Institutional Ownership and Firm Performance: Institutional investors can influence a company's environmental, social, and governance (ESG) policies, which in turn impact company performance. Local institutional ownership, for example, has been shown to reduce toxic chemical releases and improve firm performance by aligning the interests of shareholders and other stakeholders. (Kim et al., 2019). Conservation governance involves establishing clear policies and regulations to ensure the sustainable use and protection of protected animals and natural resources. Basic principles of environmental governance include participation, compliance with

the rule of law, transparency, inclusiveness, effectiveness, efficiency, and accountability. These principles are critical to effective conservation governance, as they help address the complex challenges of balancing environmental protection with socio-economic needs and ensuring that conservation efforts are sustainable and equitable (Gonçalves, 2023)

Methods

This research uses a systematic literature review method on public policy in environmental governance. The main objective was to identify, analyze, and synthesize relevant research to provide an in-depth understanding of this topic. To ensure only relevant and quality studies are included, we set strict inclusion and exclusion criteria. Accepted studies must be published in English or Indonesian, directly related to public policy in environmental governance, and published within the last 10 years. Studies without empirical data or those that are not relevant will be excluded.

Relevant literature will be searched through several leading Scopus databases. We will apply a comprehensive search strategy using keywords such as “governance” “environment” “conservation” “biodiversity” and found a total of 870 papers examining the topic. Initial screening will be conducted based on titles and abstracts to identify the most relevant studies. The study selection process will be documented transparently using the PRISMA diagram, which includes four stages: identification, screening, eligibility, and inclusion. At the identification stage, all studies found from the database search will be recorded. Then, screening is performed to remove studies that do not meet the inclusion criteria. The remaining studies will be further evaluated to determine their eligibility, and finally, studies that meet all criteria will be included in the final review (Page et al., 2021).

Data will be extracted using a template specifically designed to collect key information from each study, such as author name, year of publication, research objectives, methodology used, key findings, and conclusions. A double-checking process will be conducted to ensure the accuracy of the extracted data. Data analysis will be conducted using thematic and narrative analysis methods to identify key patterns and themes in the data. The quality of the included studies will also be evaluated using recognized quality assessment tools to ensure the validity and reliability of the findings.

This study employed a systematic literature review (SLR) approach, adhering to the PRISMA 2020 guidelines to ensure transparency, reproducibility, and rigor in the study selection process. The literature search was conducted systematically through the Scopus database using a combination of keywords organized with Boolean operators, such as: “environmental governance” OR “tata kelola lingkungan” AND “biodiversity conservation” OR “konservasi keanekaragaman hayati.” This search yielded 870 articles in the initial identification phase.

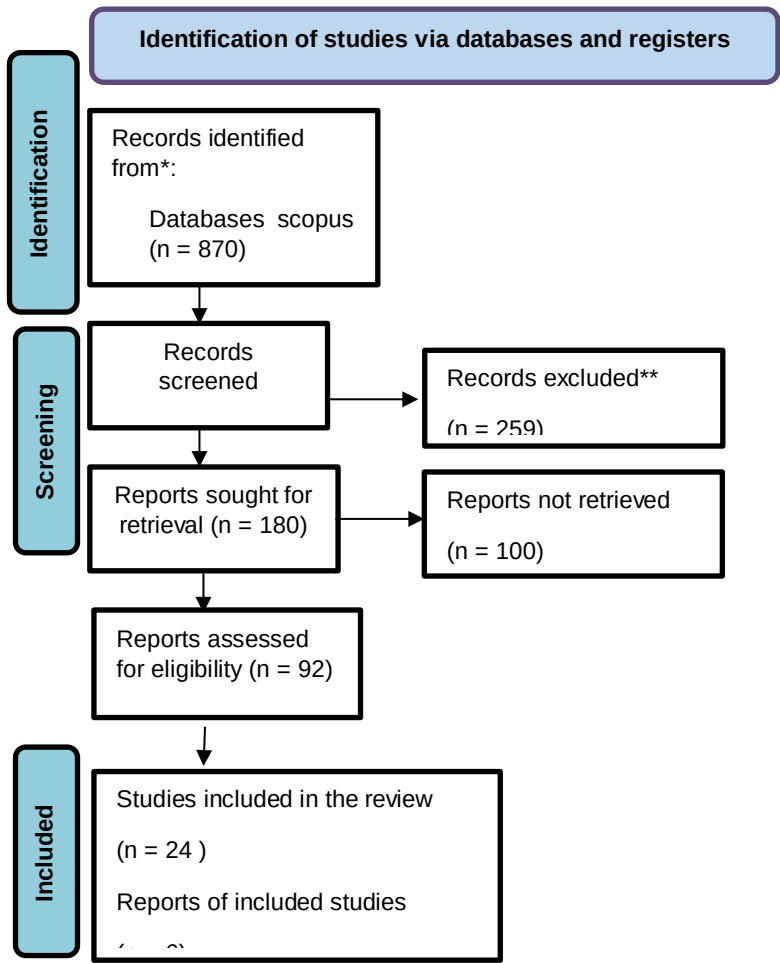


Figure 2. Diagram of the study flow

The identified articles were screened through several stages. A screening stage was conducted to filter articles based on titles and abstracts to eliminate those irrelevant to the research focus, leaving 579 articles that met the initial criteria. Of these, 259 articles were excluded due to irrelevance to the topic, duplication, or failure to meet inclusion criteria. Next, a review of the full-text articles was conducted, during

which 180 articles were successfully accessed, while 100 articles could not be obtained in full. The available articles then entered the eligibility phase for evaluation based on the established inclusion criteria, such as substantive relevance, methodological clarity, and contribution to environmental governance studies. At this stage, 92 articles were deemed eligible for further analysis.

Only studies that fully met all the criteria were included in the final analysis. Based on this selection process, a total of 24 articles were incorporated into the main synthesis. The entire selection process was systematically documented using the PRISMA flowchart to ensure transparency and accountability in the research process. Data from the selected studies were extracted using a structured format that included the authors, year of publication, research objectives, methods, key findings, and policy implications. To ensure accuracy, the extraction process was systematically double-checked.

The data were then analyzed using thematic and narrative approaches to identify patterns, relationships between concepts, and research gaps in environmental governance and biodiversity conservation. This approach enables a synthesis that is not only descriptive but also analytical and integrative. The quality of the studies was evaluated based on recognized academic criteria to ensure the validity and reliability of the findings, taking into account methodological aspects, consistency of results, and research relevance. As part of the synthesis, a summary table was compiled that outlines the key researchers and methodological approaches used, to provide a comparative overview and identify opportunities for further research.

Table 1. Research Summary

Researcher(s)	Year	Topic/Focus	Research Methodology/Approach
Karpatne et al.	2016	Social structures and environmental governance	Review of computational intelligence, theory
Zarte et al.	2022	Sustainability-based production planning	Theoretical and empirical study
Gynnild	n.d.	Agency and structure in education	Theoretical analysis
Wong et al.	2019	Provider communication and recovery outcomes	Empirical study (associations analysis)
Andriana et al.	2020	University governance using structuration perspective	Policy analysis
Crossley	2022	Structure and agency in sociology	Theoretical framework review

Chen & Wang	2022	Industrial structure and ecological resilience	Panel data analysis of 24 cities
Akalili & Sari	2021	Social systems and stereotyping	Qualitative content/study analysis
Chawla et al.	2024	Waste management behavior	Empirical behavioral study
van Mierlo et al.	2018	HRM implementation from structuration perspective	Qualitative research
Tiran et al.	2024	Coastal natural resource governance	Empirical case study
Akerboom & Craig	2022	Public participation and environmental decision making	Comparative legal analysis
Kim et al.	2019	Institutional investors' influence on ESG policies	Quantitative corporate data analysis
Vaughter et al.	2016	Campus sustainability governance	Content analysis of policy documents
Feng	2025	Role of scientific advice in environmental governance	Conceptual / theoretical study
Gonçalves	2023	Responsive governance for biodiversity	Policy analysis / theoretical study
Marshall	2021	Sociotechnical decision-making in energy	Course-based study, qualitative
Simpson et al.	2022	ESG disclosures in developing countries	Qualitative analysis with regulators' perspectives
Zhai	2020	Agency role model in decision-making	Model development and case studies

Discussion

In some conservation programs, success metrics have been explicitly set, focusing on biodiversity gains and ensuring that compensatory conservation activities are not only implemented but also produce tangible benefits. For example, projects such as Basslink (early 2000s, particularly 2000–2006) and Kennecott (1990s–early 2000s) have adopted explicit objectives such as 'net gain to native vegetation' and 'no net loss'. These projects have used systematic and quantitative approaches to measure biodiversity losses at impacted sites compared to gains at compensation sites. The intrinsic values of biodiversity are at the core of these evaluations, highlighting the importance of clear outcomes for conservation efforts to be considered successful.

A comprehensive study across different regions in China from 2001 to 2017 has shed light on eco-economic efficiency in conservation practices. This cross-regional

comparative study categorizes provinces based on their eco-economic performance, identifying comparator regions that demonstrate high efficiency and others that require significant improvement. For example, some provinces were noted to have high economic production efficiency but low pollution treatment efficiency. This insight suggests that while some regions excel in certain aspects of environmental management, there is a need for a balanced strategy that equally emphasizes economic development and environmental conservation. This type of analysis not only helps in understanding regional disparities but also in formulating targeted policies to improve overall environmental governance.

Future research in environmental governance should focus on the integration of traditional knowledge and modern technology, as highlighted by initiatives such as Ecosystem Jaguar. Advantages of the Jaguar Ecosystem approach include:

1. Integration of Traditional and Modern Knowledge: Honors community traditions and leverages technological advances, promoting culturally sensitive and technologically informed conservation efforts.
2. Alignment with SDGs: Supports environmental governance that is socially and economically sustainable, targeting triple impacts (social, environmental, and economic).
3. Inclusive and Holistic Governance: Encourages stakeholder engagement and multidisciplinary approaches, potentially improving the efficacy of conservation initiatives.
4. Potential to Foster Community Well-Being: By involving local knowledge and priorities, it may enhance local support and long-term sustainability of conservation programs.
5. Disadvantages or challenges to consider:
6. Need for Clear Evaluation of Effectiveness: The article notes the necessity to analyze the Jaguar Ecosystem's advantages and disadvantages, implying that empirical evaluation of outcomes and scalability is still required.
7. Potential Complexity in Implementation: Balancing traditional practices with modern technologies might introduce challenges related to coordination, resource allocation, or conflicting values.
8. Risk of Incomplete Stakeholder Inclusion: Without adequately considering all local stakeholders or power dynamics, initiatives might fail to gain full legitimacy or lead to domination in resource governance.
9. Uncertainty about Long-Term Impact: Without systematic assessment, the

sustainability and actual benefit of such hybrid approaches remain to be fully understood.

This approach honors community traditions while leveraging technical advances to promote environmental, social, and economic well-being. The fusion of ancestral wisdom with contemporary practices offers a unique model for sustainable development, aligned with the global Sustainable Development Goals (SDGs). Organizations like Portafolio Verde illustrate the importance of structured work cells that serve diverse clients while adhering to the SDGs. This model promotes a holistic approach to addressing environmental challenges, ensuring that governance models are inclusive and aligned with international goals. The emphasis on triple impacts - social, environmental, and economic - underscores the need for governance models that evaluate performance across these dimensions, potentially changing the rules of engagement for public policy.

Organizational ethnography presents a valuable method for researching conservation organizations. By studying the diversity of practices within these organizations, researchers can identify areas for improvement and encourage better biodiversity and social outcomes. This qualitative approach helps in understanding how assumptions and worldviews held by organizations influence their projects and how these are perceived by staff and stakeholders.

Decision science also offers significant insights for future research. By structuring the thinking around decision-making, it ensures that decisions are informed, transparent, and defensible. Research could explore how decision science can be further integrated into conservation strategies to improve the effectiveness of protected areas and species conservation. This includes examining how cultural, social, and economic values are incorporated into decision-making processes, to ensure that conservation efforts are aligned with the values of all stakeholders involved. This future direction not only promises to refine governance models but also to increase the practical application of theories and methodologies that support sustainable environmental management.

Conclusion

By reflecting on the integration and practical application of structuration theory in environmental governance, it is clear that understanding the complex dance between agency and structure is critical to improving conservation efforts. This approach not

only highlights the dynamic and reciprocal relationship between human actions and societal norms but also emphasizes the transformative power of participatory and informed decision-making. Through the lens of structuration theory, multi-faceted environmental conflicts and conservation challenges can be addressed more effectively, thus ensuring a sustainable and resilient future for communities and natural habitats.

Moreover, the exploration of structuration theory in environmental contexts, supported by empirical evidence from conservation areas, offers promising avenues for future research and innovative governance models. Emphasizing the importance of balancing ecological, economic, and social values, these insights advocate for an integrated approach to conservation that is adaptable and inclusive. As we move forward, the continued application of structuration theory and its principles will undoubtedly play an important role in shaping robust environmental governance frameworks, promoting harmonious coexistence between human development and the preservation of our planet's precious natural resources.

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