Legal Policy Reconstruction for Sustainable Development: Towards an Interdisciplinary Regulatory Model

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ABSTRACT

This study aims to analyze the urgency of reconstructing legal policy to achieve sustainable development through an interdisciplinary approach integrating law, science, and public policy. The research employs a normative-juridical approach, utilizing primary legal materials such as national legislation and international instruments related to the SDGs, as well as secondary legal materials including interdisciplinary academic literature. The findings reveal that the fragmentation of sectoral legal policies in Indonesia has led to inconsistency among regulations and ineffective implementation of sustainability principles. Therefore, a paradigm shift toward knowledge-based regulation and evidence-based policy is essential to enable law to function as an integrative instrument across disciplines. The proposed interdisciplinary regulatory model encompasses an integrative design linking law–science–policy, a robust mechanism for institutional coordination and accountability, and the application of adaptive and collaborative principles within the national legal framework. Through this model, law is expected not only to uphold legal certainty and justice but also to act as an enabler of sustainable social and economic transformation in Indonesia.

Keywords: Interdisciplinary Regulation, Legal Policy, Sustainable Development.

INTRODUCTION

Sustainable development is a concept that places the balance among economic, social, and environmental dimensions as the foundation of public policy and legal direction. The concept gained global legitimacy since the World Commission on Environment and Development released its report Our Common Future (1987), which introduced sustainable development as a process of meeting the needs of the present generation without compromising the ability of future generations to meet their own needs (Borowy, 2023). In the legal context, this principle has transcended its moral-normative nature and become an integral part of both international and national legal instruments governing development and natural resource management.

Indonesia, as a state based on the rule of law (Article 1 paragraph (3) of the 1945 Constitution of the Republic of Indonesia), affirms that all development activities must be grounded in law. Law serves as a steering instrument that guides development not only toward economic growth but also toward social justice and environmental sustainability. Indonesia's commitment to sustainable development is reflected in various legislative instruments, such as Law Number 32 of 2009 concerning Environmental Protection and Management (UUPPLH), which integrates ecological dimensions into development decision-making processes.

However, in practice, the national legal system continues to exhibit a sectoral and fragmented character. Each development sector, such as mining, forestry, energy, and housing is governed by its own statutory regime, often with conflicting policy orientations (Nugroho & Surono, 2018). For instance, Law Number 3 of 2020 concerning Mineral and Coal Mining emphasizes the economic exploitation of natural resources, while the UUPPLH stresses the precautionary principle. Such inconsistencies cause development policies to operate without an integrated and sustainable legal framework.

This legal fragmentation is further exacerbated by the command and control paradigm that still dominates Indonesia's legal policy. This approach positions the state as the principal actor in a top-down regulatory model, leaving limited room for public participation and cross-disciplinary interaction (Wijaya, 2021). Consequently, law often functions repressively rather than adaptively—regulating

behavior without providing space for innovation or for knowledge- and technology-based solutions. In an era of global disruption marked by rapid social and ecological change, this legal policy model has become increasingly inadequate.

Another prominent weakness lies in the absence of inter-sectoral coordination in policy implementation (Wati, 2018). Each ministry or agency performs its mandate under sectoral regulations without cross-sectoral integration. For example, spatial planning policy (Law No. 26 of 2007 on Spatial Planning) is often inconsistent with forestry or energy policies. This lack of harmony leads to overlapping authorities, licensing conflicts, and reduced effectiveness in environmental protection and community welfare.

These challenges signify the urgent need for a reconstruction of legal policy capable of addressing normative and institutional fragmentation. Reconstruction in this sense does not merely mean formal legal reform, but rather a paradigm shift in understanding the function of law as an enabler of sustainable development. Law should no longer serve solely as a tool of control but as an instrument for integrating diverse interests, disciplines, and sustainability values into a coherent and adaptive regulatory system (Mensah, 2019).

The reconstruction of legal policy toward sustainable development must be grounded in an interdisciplinary approach, one that combines legal perspectives with environmental science, economics, social studies, and technology to produce policies that are more contextual and responsive to multidimensional challenges. Within this framework, law must be viewed not as a closed system, but as an open system interacting with other subsystems, as articulated by Niklas Luhmann in his Systems Theory of Law (Nielsen, 2024).

In the context of national policy, the urgency of reconstructing legal policy aligns with Indonesia's long-term development agenda as stated in the National Long-Term Development Plan (RPJPN) 2025–2045. This document emphasizes the importance of legal transformation in supporting a sustainable, inclusive, and globally competitive Golden Indonesia 2045. Consequently, legal policy can no longer stand apart from social and economic dynamics; it must become the foundation of an integrated, knowledge-based development system (Rafiqi, 2021).

Furthermore, the interdisciplinary approach to law has direct relevance to the Sustainable Development Goals (SDGs), which Indonesia has adopted through Presidential Regulation Number 59 of 2017 on the Implementation of the Achievement of the SDGs. The SDGs promote synergy between legal, economic, and environmental policies to achieve a balance between progress and sustainability. Thus, an interdisciplinary legal policy framework will reinforce the driving force of SDG implementation at the national level.

The application of an interdisciplinary approach is also vital to address the epistemic deficit in the lawmaking process. Legislative processes in Indonesia have often focused excessively on legal drafting without adequate engagement with social or scientific research (Rahman et al., 2025). As a result, many regulations are not adaptive to shifts in social and technological contexts. For example, the policy on new and renewable energy management still faces obstacles due to regulations that inadequately accommodate green innovation and investment.

A similar weakness can be seen in environmental legal policy, which tends to be reactive rather than preventive. Government action is often limited to imposing administrative or criminal sanctions after environmental damage occurs, rather than constructing preventive legal mechanisms. Yet, the principle of prevention is better than cure has become a universal norm of sustainable development. Therefore, reconstructing legal policy that integrates the principles of prevention, precaution, and public participation has become an urgent necessity (Sembiring, 2023).

From an institutional perspective, legal policy reconstruction must also incorporate the principles of good governance. Transparency, accountability, participation, and the rule of law principles embedded in national regulations, must be internalized at every stage of policy formation and implementation (Putra et al., 2025). In this way, law functions not only as a normative product but also as an instrument for strengthening legitimacy and public trust in state policy.

The urgency of legal policy reconstruction is further reinforced by the challenges of global climate change and the escalating ecological crisis. Indonesia, as a megabiodiverse country, faces significant risks from uncontrolled natural resource exploitation. A legal policy that fails to respond to sustainability concerns will result in environmental degradation, threatening economic and social resilience. Therefore, the law must be designed to ensure intergenerational justice and ecological balance.

On the other hand, the proposed interdisciplinary regulatory model does not obscure the function of law; rather, it reinforces its role as an orchestrator among disciplines and interests. This model positions law as a framework for integration—where norms, policies, and knowledge work synergistically. Approaches such as adaptive governance and policy coherence should be adopted to ensure that law remains adaptive to social and ecological dynamics without sacrificing legal certainty.

In conclusion, the reconstruction of legal policy for sustainable development constitutes a fundamental necessity for Indonesia's modern legal system. Law must be transformed into an inclusive, integrative, and interdisciplinary instrument capable of addressing contemporary challenges and guiding development toward genuine sustainability. This effort holds not only theoretical significance for legal reform but also practical value in enhancing national competitiveness and resilience amidst the complexities of globalization and environmental change.

THEORETICAL FRAMEWORK

Legal policy, in essence, serves as a vehicle for transforming public objectives into a framework of norms and instruments capable of guiding collective behavior (Muhammad et al., 2023). In the context of development, the function of legal policy extends beyond merely setting prohibitions and obligations; it constitutes a mechanism for establishing a roadmap for resource allocation, rights protection, and the distribution of risks between public and private actors (Ghodoosi, 2015). The constitutional foundation for this function is embodied in the concept of the rule of law (Article 1 paragraph (3) of the 1945 Constitution), which affirms the role of law as the regulator of the national and state order, making legal policy a medium to realize national development goals in an orderly and just manner.

In the practice of public policy formation, law functions as an instrument of social engineering, capable of creating incentives, constraining negative externalities, and structuring decision-making processes. The tradition of law as social engineering requires policymakers to use legal norms consciously (Hidayat & Hainadri, 2021), integrating scientific evidence, economic analysis, and social assessment to ensure that regulation produces the intended outcomes. In Indonesia, legal instruments such as the Environmental Impact Assessment (AMDAL) regulated under Law Number 32 of 2009 concerning Environmental Protection and Management illustrate how normative mechanisms are designed to evaluate and control development impacts prior to final decision-making, positioning law as a tool for prevention and policy design, not merely for enforcement.

The theory of sustainable development situates the integration of economic, social, and environmental aspects as the primary criterion in formulating public policy. This framework requires legal norms that balance resource exploitation with the conservation of natural capital and the fulfillment of fundamental human rights, including those of future generations (Gupta & Vegelin, 2016). At the national policy level, Indonesia's commitment to the Sustainable Development Goals (SDGs), adopted through Presidential Regulation Number 59 of 2017, along with its long-term development vision, promotes the harmonization of sectoral norms so that economic, spatial, and environmental policies operate coherently rather than in isolated silos. This underscores the need for cross-sectoral and purpose-oriented legal policy.

Good governance complements sustainable development as a theoretical component, emphasizing that sound governance—encompassing transparency, participation, accountability, and the rule of law, determines the effectiveness of norm implementation. These principles are not merely normative but also practical within public administration processes. For example, transparent and participatory licensing processes reduce the risk of corruption and social conflict, while institutional accountability strengthens the enforcement of environmental regulations and the protection of vulnerable communities. The coherence between governance principles and legal instruments enables regulation to fulfill SDG objectives without compromising legitimacy and social sustainability (Butt, 2021).

An interdisciplinary approach to regulation has emerged in response to the limitations of traditional, sectoral, and fragmented legal frameworks (Disantara, 2024). The interaction of law with economics, ecology, engineering, and policy sciences enriches the design of legal norms with scientific data, impact modeling, and realistic cost–benefit analyses. Interdisciplinarity is not merely the addition of perspectives but a transformation of the entire policy input process, from problem identification and regulatory design to impact evaluation, to making law an evidence-based and adaptive medium responsive to advances in knowledge and technology.

An effective conceptual model of interdisciplinary regulation contains several key features: policy

coherence across sectors, regulatory adaptability mechanisms, and multi-stakeholder forums for policy deliberation. Coherence entails aligning spatial planning law (Law No. 26 of 2007), environmental management law (Law No. 32 of 2009), and other sectoral regulations such as those governing energy and mining, to prevent normative contradictions. Adaptability mechanisms enable legal norms to be revised or supplemented by flexible implementing rules in response to new evidence, while multi-stakeholder forums provide space for the participation of communities, scientists, and businesses, thereby enhancing the legitimacy and effectiveness of policy.

Theoretically, integrating the precautionary principle, prevention, and intergenerational justice into the legal framework signifies a shift from reactive to proactive law. These principles, which have become foundational to Indonesia's environmental law, must also be internalized in economic policy and resource governance. This requires regulations that adopt preventive legal instruments, such as minimum environmental standards, ecosystem restoration obligations, and incentives for green investment, so that development does not compromise the natural capacities underpinning long-term welfare.

The interaction between law and economics is equally essential in designing efficient policy instruments, such as green fiscal tools, payment for environmental services mechanisms, and incentive schemes for clean technologies. The economic approach provides a foundation for developing policies that minimize social costs and maximize shared benefits; however, its effectiveness depends on a legal framework that ensures certainty and enforcement. Therefore, interdisciplinary regulation must combine economic analysis with clear legal provisions on responsibility, compensation mechanisms, and dispute resolution procedures.

METHOD

This research employs a normative juridical approach to capture both the normative and contextual dimensions of legal policy reconstruction for sustainable development. The normative juridical approach is selected because the research focuses on the study of norms, institutional structures, and regulatory coherence ((Rizkia & Fardiansyah, 2023), namely how statutory regulations construct a framework for the implementation of the principles of sustainable development. The normative analysis examines the hierarchy of norms, legal constructions, and regulatory intents embodied in primary national legal sources (e.g., the 1945 Constitution of the Republic of Indonesia, Law No. 32 of 2009 concerning Environmental Protection and Management, Law No. 26 of 2007 concerning Spatial Planning, and other sectoral regulations) as well as international and national instruments that adopt the SDGs agenda (e.g., Presidential Regulation No. 59 of 2017 on the Implementation of the SDGs).

The sources of legal materials are divided into primary and secondary legal materials, analyzed using qualitative and interpretative techniques. Primary materials include statutory texts, implementing regulations, national policies, international treaties, and relevant government policy documents; secondary materials consist of interdisciplinary academic literature, policy reports, empirical studies, and research findings in the fields of environment, economy, and public governance. The analytical technique follows a qualitative-interpretative method, employing doctrinal exposition of legal norms, content analysis of policy documents, and hermeneutic interpretation to discern the objectives and implications of norms within the evolving socio-economic-ecological context. To ensure the validity of findings, the results of interpretation are triangulated through cross-source comparison (legal, academic, and policy-based).

FINDINGS AND DISCUSSION

Critique of Legal Policy Fragmentation and Sectoral Regulation

The fragmentation of legal policy has emerged as a significant structural issue in achieving sustainable development in Indonesia. On one hand, there exists a strong normative framework, such as spatial planning regulations (Law No. 26 of 2007), environmental protection and management (Law No. 32 of 2009), and sector-specific provisions in energy and mining laws—but on the other hand, the existence of these norms does not automatically ensure policy harmonization. This fragmentation is not merely a technical problem; it reflects an inconsistency of regulatory objectives between short-term economic growth and long-term ecosystem preservation. Consequently, policies that should ideally complement each other often compete or even negate one another in practical implementation.

In the environmental domain, fragmentation is evident when licensing procedures for large-scale

projects are conducted separately from holistic spatial planning and strategic assessments (Susanto et al., 2024). The Environmental Impact Assessment (EIA/AMDAL) functions to evaluate project-specific impacts; however, when licensing decisions stem from divergent sectoral mandates—such as those driven by energy or mining investment priorities—the EIA risks becoming a mere administrative formality rather than a tool aligning broader policy objectives (Sukananda & Nugraha, 2020). This condition results in poorly implemented mitigation measures and, ultimately, recurrent environmental degradation.

In the energy and mining sectors, sectoral regulatory models often promote resource exploitation without sufficient policy integration mechanisms. Sectoral regulations emphasizing production targets, investment incentives, or energy sovereignty may overlap with environmental protection norms and spatial planning requirements (Permana, 2020), allowing companies to obtain permits that operationally damage ecosystems or interfere with local community rights. The resulting impacts include social conflict, the loss of community livelihoods, and the degradation of ecosystem services that are not reflected in the economic valuation of projects.

Empirical cases—such as mining conflicts in production forest areas or plantation expansion encroaching upon protected zones—illustrate how regulatory fragmentation facilitates harmful trade-offs between short-term economic gains and long-term environmental loss (Rahim, 2017). Differences in the interpretation of authority between central and regional governments, combined with weak inter-ministerial coordination mechanisms, have caused slow and often biased problem resolution favoring actors with political access or strong capital. This phenomenon underscores the urgent need for legal policy reconstruction that places sustainability considerations at the core of governance.

Reforms in licensing administration intended to simplify investment procedures through integrated licensing mechanisms and also raise concerns if not accompanied by substantive policy harmonization. Centralization or procedural simplification without integrating environmental and spatial standards may weaken oversight and open the door to “permit shopping”, detrimental to the public and the environment (Bhamatika et al., 2025). Therefore, administrative reform must be designed to strengthen, not undermine, cross-sectoral policy integration.

Policy fragmentation also reveals gaps in distributive justice and public participation. Sectoral regulations that marginalize or exclude community participation in decision-making, such as through formal yet non-substantive public consultations, undermine the rights of indigenous peoples and local communities to engage meaningfully and to obtain fair compensation for development impacts (Mubarok et al., 2024). As a result, policy legitimacy declines and the potential for social disputes increases, ultimately disrupting project continuity and eroding the goals of sustainable development.

From an institutional perspective, fragmentation indicates the need for stronger coordination mechanisms, both horizontally among ministries and vertically between central and regional governments. Weak formal coordination leads to overlapping authorities and inconsistent implementation. Strengthening inter-agency coordination forums, mandating Strategic Environmental Assessments (KLHS) at the planning stage, and integrating planning outcomes into technical licensing processes are crucial instruments to reduce fragmentation and enhance policy coherence (Ulum & Ngindana, 2017).

Moreover, addressing fragmentation requires improving the analytical capacity of legislative and policy-making processes. Regulators must be equipped with interdisciplinary assessments that integrate scientific evidence, economic analysis, and social studies before adopting new legal norms. In this way, regulations are not merely derived from narrow sectoral perspectives but grounded in a comprehensive understanding of the interactions between natural systems and socio-economic systems affected by regulation.

Solutions to fragmentation are not only technical but also normative. It is essential to reaffirm the fundamental policy principles underlying all sectoral regulations—such as the principles of precaution, prevention, intergenerational equity, and transparency as hierarchical guidelines binding in the formulation of sectoral rules. Strengthening these principles at both the statutory and implementing regulation levels can help ensure that sustainability objectives are not subordinated to fiscal or investment priorities.

The critique of legal policy fragmentation in Indonesia thus highlights that without systematic reconstruction encompassing normative harmonization, strengthened coordination mechanisms, integration of interdisciplinary analysis in law-making, and the fulfillment of participatory rights—the

goals of sustainable development will remain difficult to achieve. The isolated sectoral approach must shift toward a coherent, adaptive, and just regulatory model, allowing law to truly function as a transformative instrument for managing interrelated environmental, social, and economic challenges.

The Urgency of Legal Policy Reconstruction in Sustainable Development

The reconstruction of the legal policy paradigm constitutes a strategic necessity if law is to play a role beyond that of a merely normative instrument reactive to conflict or market failure. Law must be positioned as an integrative instrument that unites various disciplines such as economics, ecology, sociology, and policy studies, so that the formulation of regulations no longer emerges from a purely sectoral logic (Rafalyuk, 2019)). In the Indonesian context, affirming the role of law as a regulator of sustainable development aligns with the Constitution (Article 1 paragraph (3) of the 1945 Constitution of the Republic of Indonesia) and various sectoral laws such as Law No. 32 of 2009 on Environmental Protection and Management and Law No. 26 of 2007 on Spatial Planning, which demand the harmonization of economic and environmental objectives in policy practice.

To make law an integrative instrument means transforming its traditional function from merely prescribing orders and sanctions into a vehicle for orchestrating cross-sectoral policy. In practice, this requires legal mechanisms that facilitate horizontal coordination among ministries and agencies, as well as vertical coordination between central and regional governments. Legal instruments such as the Strategic Environmental Assessment (KLHS) and Environmental Impact Assessment (AMDAL) demonstrate normative potential to synergize planning with impact assessment; however, their effectiveness depends on consistent integration between the outcomes of these assessments and technical licensing as well as other sectoral policies.

The knowledge-based regulation approach reinforces this integrative concept by positioning scientific evidence as the basis of normative legitimacy. Knowledge-based regulation requires a systematic process: data-driven problem identification, evidence-supported policy option selection, and rule evaluation and revision based on monitoring outcomes (Van Kerkhoff & Pilbeam, 2017)). In the context of environmental and green economy issues, scientific evidence concerning ecosystem capacity, environmental service valuation, and socio-economic impact projections must constitute essential inputs in norm formulation to prevent policies that generate substantial future externalities.

The concept of evidence-based policy complements knowledge-based regulation by emphasizing empirical methods and causal analysis in evaluating the effectiveness of policy choices (Andersen & Rocca, 2020). Legislation and regulations supported by empirical impact evaluation and cost-benefit analysis tend to be more efficient and equitable, as they reveal trade-offs, beneficiaries, and those adversely affected by policy interventions. For Indonesia's legal system, adopting such practices requires enhanced analytical capacity within policymaking bureaucracy and the availability of reliable data from environmental, social, and economic as operational prerequisites.

For law to effectively function as a disciplinary integrator, formal institutional mechanisms must be established to bind the rulemaking process. These mechanisms include the obligation to conduct regulatory impact analyses, involve cross-disciplinary experts at the drafting stage, and establish multi-stakeholder deliberative forums providing space for civil society, academia, and the private sector. Such legal instruments not only improve the substantive quality of norms but also strengthen social legitimacy and reduce implementation resistance.

Paradigm reconstruction must also address the methodological dimension of legislation. This involves a shift from mere text-based drafting toward a legislative process that incorporates documented scientific studies, the formulation of performance indicators, and periodic evaluation mechanisms. Law drafters and regulators must therefore design norms that not only satisfy formal legality but can also be measured in effectiveness through quantitative and qualitative indicators aligned with sustainability objectives. Consequently, regulation becomes more goal-oriented and can be systematically corrected when evidence shows that outcomes remain suboptimal.

A recurring pragmatic challenge is the capacity gap, as policymakers and supervisory institutions often lack the technical resources to conduct in-depth interdisciplinary analysis. Hence, paradigm reconstruction must be accompanied by investment in institutional capacity, such as strengthening policy analysis units within ministries, forming cross-disciplinary expert teams to support legislation, and establishing partnerships with universities and research institutions. This capacity is fundamental to ensuring that knowledge-based regulation evolves from mere rhetoric into a sustainable practice.

From the standpoint of democratic legitimacy, integrating scientific knowledge into legal processes must be combined with substantive public participation mechanisms. Evidence-based policy built without the involvement of affected communities risks neglecting local knowledge and social values crucial to implementation sustainability. Therefore, integrating scientific evidence with local wisdom through deliberative processes enriches the normative foundation and enhances compliance and public support for the resulting policies.

The proposed normative reform must also emphasize regulatory flexibility. Law should facilitate controlled policy experimentation (regulatory sandboxes), pilot projects, and adaptive management mechanisms that allow iterative policy learning (Baskoro, 2024). This adaptive framework enables legal norms to evolve in response to new knowledge without undermining the legal certainty required by economic actors. In the context of sustainable development, such an approach is vital for addressing scientific uncertainty and the dynamics of green technology.

In conclusion, the reconstruction of the legal policy paradigm entails both functional and institutional transformation: repositioning law as an integrative cross-disciplinary instrument, institutionalizing knowledge-based regulation and evidence-based policy, and building the capacity and mechanisms that allow legal norms to be adaptive and deliberative. This effort is not merely a technical clause within regulatory governance but a prerequisite for achieving equitable, effective, and sustainable development governance—a paradigm shift that must be reflected in legislative processes, public administrative practices, and policymaking culture in Indonesia.

Interdisciplinary Regulatory Model for Achieving Sustainable Development

The proposed interdisciplinary regulatory model positions the design of legal norms as a synthesis between law, science, and public policy, ensuring that every provision not only complies with formal legal standards but is also supported by scientific evidence and adequate policy analysis. In this model, statutes and implementing regulations serve as boundary-setting frameworks, while technical instruments and dynamic operational standards (Zhong & Shang, 2025) occupy the adaptive space of implementation. Scientific studies and policy evaluations subsequently inform and populate this operational domain. Such an approach prevents rigid sectoral regulation by promoting principle-based norms at the legislative level and rule-based mechanisms that are periodically updated at the implementation level.

Conceptually, the integrative design promotes a clear hierarchy of norms, in which principles such as sustainability, precaution, and intergenerational equity are positioned as foundational values guiding sectoral regulation (Mitrofanenko, 2016). These principles are then operationalized into performance indicators and technical standards jointly developed by policymakers, the scientific community, and relevant stakeholders. In Indonesia, mechanisms such as the Strategic Environmental Assessment (Kajian Lingkungan Hidup Strategis – KLHS) and the Environmental Impact Assessment (AMDAL) can be reconceptualized as integral components of this process to serving not merely as administrative requirements but as binding normative-scientific inputs in decision-making.

This model further requires the establishment of a coordinating institution vested with legal authority to harmonize cross-sectoral policies and to oversee the incorporation of scientific knowledge into regulatory processes (Saputra & Rahman, 2024). Such a coordinating body should be empowered to issue technical guidelines, mandate evidence-based reviews prior to licensing, and enforce inter-policy integration standards. The legal framework underpinning this coordination mechanism is essential to ensure that scientific and policy recommendations are not merely advisory in nature but carry binding administrative force that secures national policy coherence.

Coordination mechanisms should also include vertical coordination between central and regional governments. Ideally, the interdisciplinary model provides a national interoperable data platform that integrates environmental, social, and economic information, thereby enabling regional planning to align with national policies (Widijawan et al., 2023). Reliable data availability is a prerequisite for evidence-based regulation; likewise, data transparency strengthens accountability and enables public monitoring of policy implementation.

Institutional accountability within this model is operationalized through several instruments, such as mandatory periodic public reporting, independent audits of policy implementation, and administrative sanctions for agencies that disregard integrative guidelines. Public information disclosure, as guaranteed under Law No. 14 of 2008 on Public Information Disclosure, must be utilized to ensure that decision-

making processes combining scientific evidence and public consultation remain auditable by civil society and legislative bodies.

The adaptive principle constitutes the core of the proposed regulatory model, emphasizing that legal norms must be designed to evolve in response to advances in science and shifts in socio-economic dynamics (Yamani, 2024). Technically, this may be realized through provisions mandating periodic reviews, mechanisms for updating technical standards based on monitoring and evaluation, and controlled policy experimentation (regulatory sandboxes) allowing innovation to be tested prior to full-scale implementation. The legal framework for such adaptive mechanisms merges legal certainty with governance flexibility.

The collaborative principle necessitates procedures for multi-stakeholder engagement at every stage of the policy process—from formulation to implementation and evaluation. This participation includes dialogue with academics, the private sector, local communities, and civil society organizations, ensuring that resulting norms incorporate diverse forms of knowledge, including local and indigenous wisdom (Nonet et al., 2022). Properly designed participatory procedures enhance the legitimacy of decisions and mitigate implementation resistance, as stakeholders are engaged from the outset.

To ensure the practical integration of law, science, and policy, the model recommends institutional capacity-building measures. These include establishing research and policy analysis units within ministries, developing networks of research institutions capable of producing independent studies, and securing funding mechanisms for policy research (Ostrom, 2019). Investment in bureaucratic technical capacity is crucial to ensure that knowledge-based regulation becomes a genuine practice that yields measurable, high-quality, and evaluable regulations rather than a rhetorical aspiration.

Implementation of the interdisciplinary model also necessitates harmonization of legal instruments governing licensing, spatial planning, and environmental protection, ensuring that the licensing and impact assessment processes follow a single logical framework and avoid contradictory outcomes. This can be achieved through synchronization of implementing regulations, strengthening of joint technical guidelines, and legal requirements mandating the integration of KLHS/AMDAL results into licensing decisions—thereby making scientific and policy considerations a substantive prerequisite for the legitimacy of permits.

Ultimately, the proposed interdisciplinary regulatory model emphasizes not only structural reform in legal and institutional design but also a cultural transformation in policymaking—from a sectoral orientation toward a policy culture grounded in evidence integration, cross-disciplinary collaboration, and public accountability. If consistently implemented, this model can reinforce the role of law as an enabler of sustainable development—harmonizing legal certainty, adaptive flexibility, and social legitimacy so that national policies align with long-term socio-economic objectives and environmental sustainability.

CONCLUSION

The reconstruction of legal policy for sustainable development is an imperative necessity in addressing the complexity of intertwined social, economic, and environmental challenges in the modern era. Indonesia's legal system, which remains largely sectoral and grounded in a command-and-control paradigm, has not yet fully adapted to the dynamics of sustainable development that demand cross-disciplinary integration and the incorporation of scientific evidence into decision-making processes. Through an interdisciplinary approach, law is no longer perceived merely as a controlling mechanism but rather as an integrative instrument that unites scientific perspectives, public policy considerations, and social values. This transformation requires a paradigm shift in legal policy formulation from a reactive orientation toward knowledge-based regulation and evidence-based policy, where empirical and scientific knowledge constitutes the foundation of regulatory legitimacy.

The interdisciplinary regulatory model proposed in this study is built upon three main pillars: the integration of law, science, and public policy; the establishment of strong institutional coordination and accountability mechanisms; and the application of adaptive and collaborative principles within the national legal framework. Through these mechanisms, the law is expected to serve as an enabler of sustainable socio-economic transformation rather than a mere tool of administrative control. Implementation of this model necessitates the harmonization of legislation, the enhancement of institutional capacity, and the cultivation of an evidence-based and participatory legislative culture. Accordingly, the law can function as a dynamic foundation for governance that is just, inclusive, and

sustainable—consistent with the constitutional mandate and Indonesia's commitment to the Sustainable Development Goals (SDGs).

REFERENCES

Andersen, F., & Rocca, E. (2020). Underdetermination and evidence-based policy. *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences*, *84*, 101335.

Baskoro, A. (2024). TRANSFORMASI KUALITAS LEGISLASI: REGULATORY SANDBOX SEBAGAI SARANA PARTISIPASI PUBLIK DAN EVALUASI DALAM PEMBENTUKAN PERATURAN PERUNDANG-UNDANGAN. *Jurnal Rechts Vinding: Media Pembinaan Hukum Nasional*, *13*(3).

Bhamatika, N. W., Nabilah Hidayat, N., Yulia Putri, S., Kusuma Dewi, A., Kamal, U., & Adymas Hikal Fikri, M. (2025). Dari Regulasi ke Implementasi: Problematika Pengawasan dalam Menghadapi Ancaman Lingkungan Hidup di Indonesia. *PESHUM: Jurnal Pendidikan, Sosial Dan Humaniora*, *4*(4), 5248–5259.

Borowy, I. (2023). The World Commission on Environment and Development. In *Elgar Encyclopedia of Development* (pp. 615–619). Edward Elgar Publishing.

Butt, M. J. (2021). The role of the international law in shaping the governance for sustainable development goals. *Journal of Law and Political Sciences*, *28*.

Disantara, F. P. (2024). Innovative Legal Approaches for Contemporary Challenges in Indonesia: Pendekatan Hukum Inovatif untuk Tantangan Kontemporer di Indonesia. *Indonesian Journal of Innovation Studies*, *25*(4), 10–21070.

Ghodoosi, F. (2015). The concept of public policy in law: Revisiting the role of the public policy doctrine in the enforcement of private legal arrangements. *Neb. L. Rev.*, *94*, 685.

Gupta, J., & Vegelin, C. (2016). Sustainable development goals and inclusive development. *International Environmental Agreements: Politics, Law and Economics*, *16*(3), 433–448.

Hidayat, D., & Hainadri, H. (2021). Hukum Sebagai Sarana Pembaharuan Dalam Masyarakat (law as a tool of social engineering). *Datin Law Jurnal*, *2*(1), 66–75.

Mensah, J. (2019). Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review. *Cogent Social Sciences*, *5*(1), 1653531. https://doi.org/https://doi.org/10.1080/23311886.2019.1653531

Mitrofanenko, T. (2016). Intergenerational Practice: An Approach to Implementing Sustainable Development and Environmental Justice. In *Women and Children as Victims and Offenders: Background, Prevention, Reintegration: Suggestions for Succeeding Generations (Volume 2)* (pp. 721–743). Springer.

Mubarok, A., Alviana, A., Marselina, F. P., Febriansyah, M. A. B., Shabrina, S., & Gayatri, T. I. (2024). Perlindungan hak atas tanah masyarakat adat di era otonomi daerah: Tantangan dan peluang. *Almufi Jurnal Sosial Dan Humaniora*, *1*(2), 69–77.

Muhammad, K., Firdaus, S. U., & La Aci, M. H. (2023). Kebijakan publik dan politik hukum: Membangun demokrasi berkelanjutan untuk masyarakat. *Sovereignty*, *2*(4), 354–368.

Nielsen, S. P. P. (2024). Introduction: A Special Issue on Niklas Luhmann's systems theory and law. *Oñati Socio-Legal Series*, *14*(5), 1206–1226.

Nonet, G. A.-H., Gössling, T., Van Tulder, R., & Bryson, J. M. (2022). Multi-stakeholder engagement for the sustainable development goals: introduction to the special issue. *Journal of Business Ethics*, *180*(4), 945.

Nugroho, W., & Surono, A. (2018). Rekonstruksi Hukum Pembangunan dalam Kebijakan Pengaturan Lingkungan Hidup dan Sumber Daya Alam. *Jurnal Hukum Lingkungan Indonesia*, *4*(2), 77–110.

Ostrom, E. (2019). Institutional rational choice: An assessment of the institutional analysis and development framework. In *Theories of the Policy Process, Second Edition* (pp. 21–64). Routledge.

Permana, R. R. (2020). *Hukum Lingkungan dan Kebijakan Pembangunan Berkelanjutan dalam Pemanfaatan Energi Geothermal Untuk Kesejahteraan Masyarakat*. Penerbit Adab.

Putra, J. A. M., Permata, D., Djani, A. I. P., Sabetu, D. L., Finit, Y. N., & Mas'ud, F. (2025). Evaluasi Penerapan Prinsip Good Governance dalam Sistem Pemerintahan Indonesia: Tantangan dan Peluang dalam Mengatasi Kesewenang-wenangan. *JIMU: Jurnal Ilmiah Multidisipliner*, *3*(02), 1239–1251.

Rafalyuk, E. E. (2019). Integration as an object of research of legal sciences. *RUDN Journal of Law*, *23*(4), 490–509.

Rafiqi, I. D. (2021). Pembaruan Politik Hukum Pembentukan Perundang-Undangan Di Bidang Pengelolaan Sumber Daya Alam Perspektif Hukum Progresif. *Jurnal Bina Hukum Lingkungan*, *5*(2), 319–339. https://doi.org/http://dx.doi.org/10.24970/bhl.v5i2.163

Rahim, S. (2017). Konflik Pemanfaatan Ruang Akibat Penambangan Emas Tanpa Ijin (PETI) di Kawasan Hutan Produksi Terbatas. *GeoEco*, *3*(1).

Rahman, M. T., Mahfuzah, S., Al-Madani, M. R., Lahmudinnur, L., & Efendy, N. (2025). Menyempurnakan Proses Legal Drafting Di Indonesia: Tantangan, Strategi, Dan Rekomendasi Untuk Regulasi Berkualitas. *Indonesian Journal of Islamic Jurisprudence, Economic and Legal Theory*, *3*(2), 1160–1175.

Rizkia, N. D., & Fardiansyah, H. (2023). *Metode Penelitian Hukum (Normatif dan Empiris)*. Penerbit Widina.

Saputra, I. E., & Rahman, A. (2024). Reformasi Sistem Perundang-Undangan Indonesia: Strategi Pembentukan Lembaga Independen untuk Menangani Hiper-Regulasi: Reform of Indonesia's Legal System: Strategies for Establishing Independent Institutions to Address Hyper-Regulation. *JAPHTN-HAN*, *3*(1), 69–88.

Sembiring, S. N. (2023). *Rekonstruksi Regulasi Partisipasi Masyarakat Dalam Pembentukan Peraturan Perundang-undangan Berbasiskan Nilai-Nilai Keadilan*. Universitas Islam Sultan Agung (Indonesia).

Sukananda, S., & Nugraha, D. A. (2020). Urgensi penerapan analisis dampak lingkungan (AMDAL) sebagai kontrol dampak terhadap lingkungan di Indonesia. *Jurnal Penegakan Hukum Dan Keadilan*, *1*(2), 119–137.

Susanto, S. D. P., Marselina, S., Zahira, Z., & Dulkiah, M. (2024). Urban Spatial Planning: Strategies and Challenges in Managing Urbanization. *JCIC: Journal of Urban Sociology*, *1*(1), 75–96.

Ulum, M. C., & Ngindana, R. (2017). *Environmental Governance: Isu Kebijakan dan Tata Kelola Lingkungan Hidup*. Universitas Brawijaya Press.

Van Kerkhoff, L., & Pilbeam, V. (2017). Understanding socio-cultural dimensions of environmental decision-making: A knowledge governance approach. *Environmental Science & Policy*, *73*, 29–37.

Wati, E. P. (2018). Perlindungan dan Pengelolaan Lingkungan Hidup Dalam Pembangunan yang Berkelanjutan. *Bina Hukum Lingkungan*, *3*(1), 119–126.

Widijawan, D., Farida, I., & Mulyanti, D. (2023). Integrasi Kebijakan Smart Environment Sebagai Upaya Standarisasi Sistem Manajemen Lingkungan Nasional Dan Global. *LITRA: Jurnal Hukum Lingkungan, Tata Ruang, Dan Agraria*, *3*(1), 71–92.

Wijaya, V. (2021). Perubahan paradigma penataan regulasi di indonesia. *Jurnal Rechts Vinding: Media Pembinaan Hukum Nasional*, *10*(2), 167–186.

Yamani, A. Z. (2024). Legal drafting untuk perubahan hukum: Tantangan dan solusi dalam penyusunan regulasi dan undang-undang yang adaptif. *Journal of Law and Nation*, *3*(4), 1026–1036.

Zhong, Y., & Shang, D. (2025). Legislative Coordination in Regional Environmental Governance and Pathways to Implementation. *Journal of Humanities, Arts and Social Science*, *9*(5).