JEK
Journal of Earth Kingdom
JEK 4(1): 57–74
ISSN 3024-9821

Institute for Advanced Science, Social and Sustainable Future
MORALITY BEFORE KNOWLEDGE

Environmental policy in climate change law with smart regulation

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Received Date: May 27, 2026 Revised Date: July 7, 2026 Accepted Date: July 22, 2026

ABSTRACT
Background: In Indonesia, environmental law plays an important role in addressing climate change. This study aims to explore the direction of environmental legal politics on climate change in Indonesia by considering the principles of sustainable development and applying the theoretical approach of smart regulation. **Methods:** This study employs normative legal research using statutory, historical, and conceptual approaches to examine the coherence of existing legal norms, complemented by a socio-legal method to assess how these norms are enforced and complied with in practice, particularly in relation to smart regulation as an emerging approach in Indonesian environmental law. **Findings:** Climate change policy consists of a range of targeted strategies and measures implemented by governments or the international community aimed at reducing global warming and addressing its effects. The results show that Indonesia's climate change policies are developing toward recognizing the role of indigenous peoples and local communities as environmental protectors, in line with the commitment to reducing emissions. The implementation of economic instruments such as carbon trading and sustainability reporting is an important step forward in creating a more responsive and flexible policy mix in accordance with the principles of Smart Regulation. **Conclusion:** The main scientific contributions include the development of the theory of hybridization and localization of international law, the conceptualization of integrated policies based on carbon economic value (CEV), the reformulation of legal instruments through smart regulation theory, and the identification of legal gaps for cross-sectoral harmonization. Integrated legal hybridization and economic instruments are essential to transform fragmented environmental policies into a responsive, cross-sectoral framework. **Novelty/Originality of this article:** This study pioneers the application of Smart Regulation theory to Indonesian climate law by conceptualizing carbon economic value within localized indigenous governance.

KEYWORDS: climate change; environmental law; policy; mitigation.

1. Introduction

In order to utilize natural resources to promote public welfare as stated in the 1945 Constitution and to achieve happiness in life based on Pancasila, it is necessary to strive for harmonious and balanced environmental preservation to support sustainable development, implemented through integrated and comprehensive policies while taking into account the needs of present and future generations. To ensure legal certainty so that the public has awareness to participate in preserving their environment, the government has prepared legal instruments, particularly environmental laws, to take legal action against polluters and destroyers of the environment (Sutrisno, 2011). Environmental policy is a series of actions, decisions, or programs made by the government or institutions to manage the environment, prevent damage, and regulate the use of natural resources. Environmental law in the field

Cite This Article:
Bainto, M. A. (2026). Environmental policy in climate change law with smart regulation. *Journal of Earth Kingdom*, *4*(1), 57-74. https://doi.org/10.61511/jek.v4i1.2026.3858

of legal science is one of the most strategic fields of law because it has many aspects, namely administrative law, criminal law, and civil law. In simple terms, environmental law is defined as the law that regulates the environmental system (environment), where the environment includes all objects and conditions, including humans and their behavior, that exist within the space where humans live and that affect the survival and well-being of humans and other living organisms (Luisana Tijow, 2025).

Climate change is currently a global challenge because climate variability has a significant impact on communities throughout the world. If the climate change-related natural disaster crisis is not controlled, then by 2030 climate variability will threaten food security and water needs. The climate is beginning to become unstable due to global warming. In addition, global warming also causes sea level rise due to the melting of polar ice caps. Sea levels have risen by 1–2 meters over the last 100 years. The 1972 Stockholm Conference, which was the first environmental conference, produced the Declaration on the Human Environment, often referred to as the Stockholm Declaration, which became one of the triggers for the development of environmental law in Indonesia. In Indonesia, environmental regulations have been included in the 1945 Constitution of the Republic of Indonesia/*Undang-Undang Dasar Negara Republik Indonesia Tahun 1945*, Article 28H paragraph (1). This article mandates that every person has the right to obtain a good and healthy environment, which constitutes a human right and a constitutional right for every Indonesian citizen. Furthermore, Article 33 paragraph (3) mandates that the earth, water, and natural resources contained therein are controlled by the state and utilized to the greatest extent possible for the prosperity of the people. Environmental legal politics refers to the strategies, principles, or fundamental policies adopted by the government to formulate, revise, and execute environmental legal rules. This approach to law-making prioritizes the creation of legal tools (like statutes) that guarantee development proceeds sustainably and in an environmentally responsible way. Environmental legal politics serves as the basis for formulating regulations that can address the climate crisis through mitigation (emission reduction) and adaptation approaches (Ulum, 2023; Setiawan et al., 2025).

Of the various policy products issued by the government, many remain merely policy formulations that have not been properly implemented. Therefore, the implementation of development in practice still cannot be directly felt by the community (Irwan Parlaungan Panjaitan, 2024). Legal regulations regarding the environment are not only contained in the provisions of articles in the 1945 Constitution of the Republic of Indonesia/*Undang-Undang Dasar Negara Republik Indonesia Tahun 1945*, but are also regulated in Law Number 32 of 2009 concerning Environmental Protection and Management/*Undang-Undang Perlindungan dan Pengelolaan Lingkungan Hidup* (UUPPLH). In addition, the environmental legal regulations contained in Law Number 11 of 2020 concerning Job Creation/*Undang-Undang Cipta Kerja* (UU Cipta Kerja), particularly those contained in the Environmental Approval provisions, have attracted considerable public attention. However, in its development, Law Number 11 of 2020 concerning Job Creation was revoked and declared no longer valid by Government Regulation in Lieu of Law Number 2 of 2022 concerning Job Creation/*Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 Tentang Cipta Kerja*. The government subsequently enacted Government Regulation in Lieu of Law Number 2 of 2022 concerning Job Creation as law through Law Number 6 of 2023 concerning the Stipulation of Government Regulation in Lieu of Law Number 2 of 2022 concerning Job Creation into Law/*Undang-Undang Nomor 6 Tahun 2023 Tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 Tentang Cipta Kerja Menjadi Undang-Undang* (Sihotang et al., 2024)

Global warming and climate change are not only experienced by a single country, but occur globally, including in Indonesia. Indonesia is a large country with many islands and oceans. The vast oceans within the territory of Indonesia can have an effect on global warming and climate change. Indonesia has also experienced relatively rapid changes. These changes occur due to human lifestyles and needs that are instant in nature, as well as the massive use of technology. Human lifestyles and activities that damage the environment can lead to an increase in temperature. The Intergovernmental Panel on Climate Change (IPCC) stated that within a period of 15 years, namely from 1990 to 2005, there was an increase in global temperatures on Earth of approximately between 0.15°C and 0.3°C (Ainurrohmah & Sudarti, 2022).

In previous research, Athya analyzed how international environmental law regulations related to climate change are ratified into legislation. These environmental law regulations, namely the climate change convention, the Kyoto Protocol, and the Paris Agreement, use the principle of Common but Differentiated Responsibilities (CBDR) as a reference or guiding principle in protecting the global climate system. However, the United Nations Framework Convention on Climate Crisis (UNFCCC), better known as the UN Framework Convention on climate change, adopts more than one principle in efforts to address climate change. The UNFCCC adheres to four principles, namely the principle of Common but Differentiated Responsibilities (CBDR), the principle of prioritizing and giving greater attention to developing countries with higher levels of vulnerability compared to developed countries, the precautionary principle, and the principle of sustainable development. Therefore, this study will discuss the direction of environmental legal politics in climate change by paying attention to the principle of sustainable development and using the "Smart Regulation" theoretical approach.

National climate policy remains scattered across various sectoral regulations, often resulting in inconsistencies between one regulation and another, thereby creating regulatory fragmentation. Studies linking environmental legal politics with human rights-based instruments to enhance state accountability regarding climate justice and human rights remain limited. Furthermore, weak law enforcement, such as gaps in agrarian governance and bureaucratic corruption that trigger land conflicts, often remains unintegrated within a comprehensive climate change legal framework (Naibaho, 2024; Setiawan et al., 2025).

Despite the existence of comprehensive legal instruments, enforcement and compliance with environmental law in Indonesia remain persistent challenges. Weak institutional capacity, overlapping regulations, inadequate monitoring mechanisms, and widespread corruption undermine effective law enforcement. Indonesia's commitment to international climate agreements, such as the Paris Agreement, underscores the urgency of aligning national legal frameworks with global climate goals. Indonesia has pledged to reduce greenhouse gas emissions by 29% unconditionally and up to 41% with international support by 2030 (Kesek, 2025).

Climate change policy is consists of a range of targeted strategies and measures implemented by governments or the international community aimed at reducing global warming and addressing its effects. This research outlines and describes the direction of climate change policy in Indonesia and analyzes the roles and mitigation measures undertaken in addressing climate change in Indonesia. In this context, the study describes the roadmap and direction of environmental legal politics in Indonesia in responding to the global climate crisis. It also analyzes the roles of mitigation and adaptation and evaluates the government's strategic measures in strengthening adaptive capacity toward climate-related disasters (Idrus & Usi, 2024).

2. Methods

The Smart Regulation refers to regulatory pluralism as a flexible, imaginative, and innovative form of social control. Pluralism in this context refers to the involvement of government, business actors, and the public (third parties) in the formulation and implementation of norms. In this context, unlike regulation that only emphasizes the relationship between two parties, namely the government as the regulator and business actors as the regulated communities, Smart Regulation is based on the idea that various parties can influence the behavior of regulated communities, both formally and informally. Smart Regulation not only examines the interrelationship and combination between one compliance instrument and another, but also explains the involvement of government, business actors, and the public (both commercial and non-commercial) in the implementation of these instruments (Zaman, 2024).

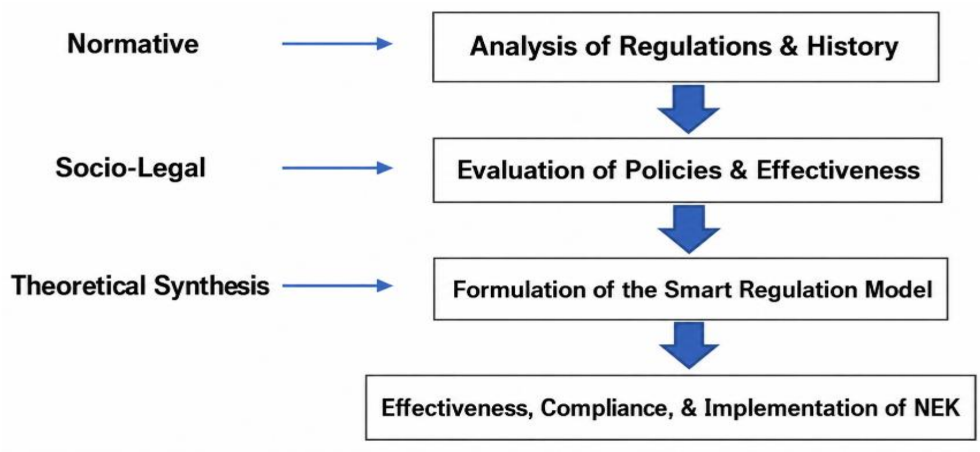

Fig. 1. Design of the flow of legal text review

To implement Smart Regulation, it is important to note that traditionally, regulation has been viewed as a two-party process involving only the government as the regulator and businesses as the regulated entities. However, many empirical studies have revealed that regulatory diversity involving multiple actors also influences the behavior of regulated groups under more complex conditions. Based on the perspective of the Smart Regulation concept, greater attention should be given to understanding the influence of regulation and its broader interactions, including international standards organizations; trading partners and supply chains; commercial institutions and financial markets; peer pressure and self-regulation through industry associations, internal environmental management systems, and organizational culture; as well as civil society in its various forms (Gunningham & Sinclair, 2022).

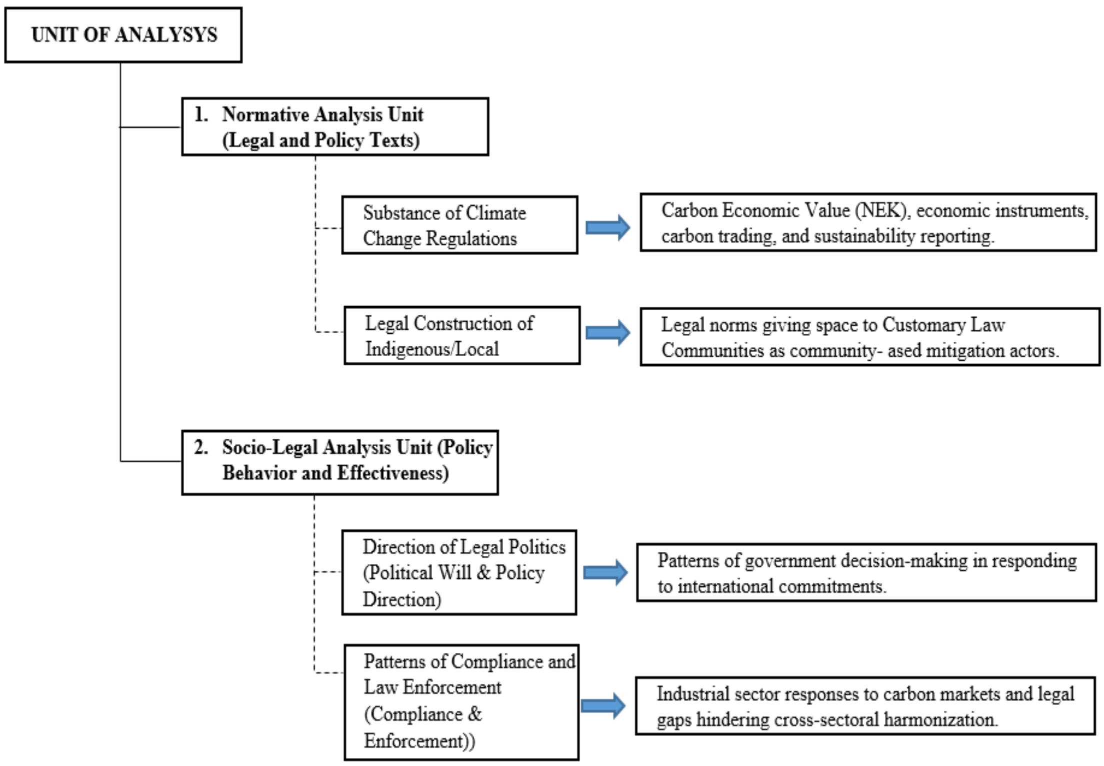

Fig. 2. Main categories units of analysis

The first main issue in this research is the direction of climate change policy in Indonesia. The first indicator discussed under this issue is the analysis of the philosophical foundations of climate change policy in Indonesia using the theory of "The Law of Non-Transferability of Law" and a historical approach by reexamining the historical background and development of climate change. The second indicator analyzes the urgency of climate change policy in Indonesia using development law theory and a statutory approach (Ulum, 2023). The second main issue in this research is the roles and policy measures of environmental law in climate change mitigation in Indonesia. The first indicator analyzes and inventories climate change mitigation policies in Indonesia using a statutory approach. The second indicator analyzes strategies for implementing climate change mitigation policies in Indonesia by examining Smart Regulation theory through a conceptual approach. The expected outcome of this research is the strengthening of environmental legal politics in addressing climate change in Indonesia. Due to its exploratory nature, this research design is structured as a flow from the study of legal texts toward the analysis of policy implementation in practice on Figure 1. The units of analysis are divided into two main categories in accordance with the combined approach used on Figure 2.

Table 1. Five main stages

Main stages	Description
Secondary Data Collection	Involving the collection of various documents and publications related to environmental and air quality policies, including government regulations, Ministry of the Environment/*Kementerian Lingkungan Hidup* reports, and studies conducted by international institutions
Data Reduction	Involving the filtering and selection of important information relevant to the research focus;
Thematic Categorization	Involving the grouping of data based on major themes such as policy effectiveness, implementation barriers, and public demands
Narrative Interpretation	Involving in-depth analysis to understand socio-political contexts and policy dynamics
Conclusions and Recommendations	Conclusions and Recommendations, involving the formulation of research conclusions and policy recommendations based on the results of the analysis (Mansa et al., 2025)

This research employs normative and socio-legal approaches. The rationale for selecting documents is that documents are not merely positioned as static legal materials, but also as reflections of ongoing products of environmental legal politics (Bella, 2025). This research aims to examine governance theory in analyzing climate change policy in Indonesia.

Table 2. Classification of groups of legal materials

Data sources	Data displayed
Primary legal materials	Consisting of climate change regulations and policies in Indonesia
Secondary legal materials	Consisting of documents that provide explanations and analyses of primary legal materials, including legal textbooks, reputable scientific journal articles, research reports from environmental institutions, and academic literature concerning Smart Regulation theory.
Tertiary legal materials	In the form of policy mapping indexes and reference materials used to define operational technical terms

The research data are presented descriptively. The data used in this study are secondary data, which serve as substitutes for primary data. Data were collected from journals, news articles, and internet sources relevant to the research topic (Syahputra, 2025). This research does not directly measure quantitative variables, but instead explores meanings, contexts, and evolving dynamics through the interpretation of available data. Meanwhile, library research was conducted to collect and examine various relevant and credible secondary data sources, including academic books, national and international scientific journals, government policy reports, and publications issued by international institutions discussing air pollution, environmental policy, and environmental governance (Setiawan et al., 2025). This research consists of five main stages on Table 2.

Table 3. The main objective of selecting qualitative methods

Main reasons	Policy	Purpose of qualitative methods
Exploration of the policy process	Climate change policy in Indonesia involves dynamic interactions among actors, including the government, non-governmental organizations (NGOs), and the private sector	Researchers to understand how and why political decisions are made, rather than merely examining statistical outcomes
Socio-political context	Namely capturing the meanings behind political narratives and strategic interests underlying environmental regulations	Examining the actual political commitments behind the rhetoric of "climate mitigation"
Data flexibility	Considering that climate change issues often intersect with sensitive or restricted data, the presentation of data through flexible and in-depth narrative descriptions enables	Assess whether the formulated policies are aligned with the principles of good environmental governance (Hayatulah et al., 2023).

The data sources collected in this research are classified into three main categories of legal materials on Table 2. Data collection was conducted through several authoritative databases, including national regulatory databases, international and national journal databases, and global policy databases. The search for literature and legal documents was carried out using combinations of keywords to broaden the scope of the search, namely (environmental legal politics and climate change), (Smart Regulation and environmental policy), (Carbon Economic Value/carbon trading), (indigenous communities and emission mitigation), and (law enforcement and environmental compliance) to maintain the relevance of the data to the research focus concerning the direction of environmental legal politics and the effectiveness of Smart Regulation, document selection was based on inclusion and exclusion criteria.

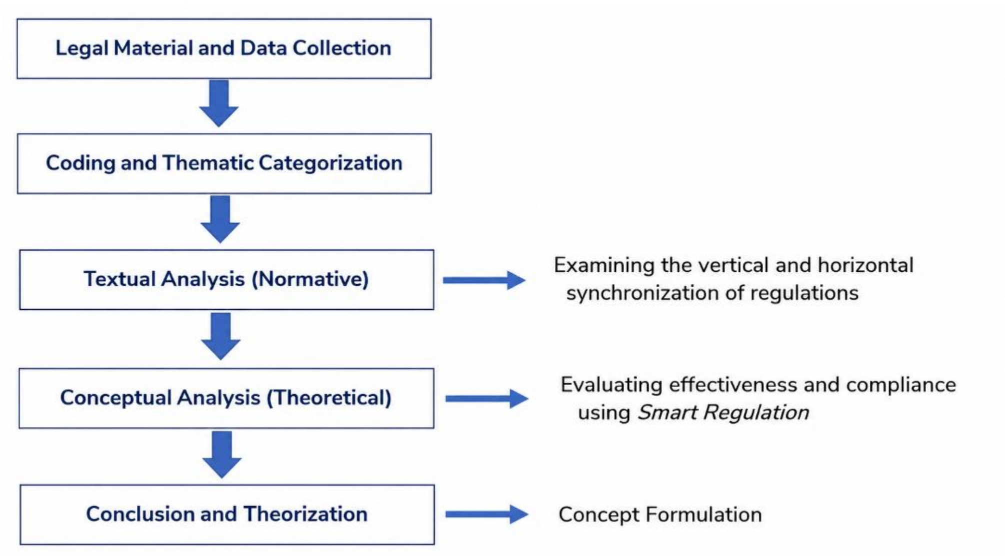

Fig. 3. Design socio-legal methods

Data analysis in this research was conducted qualitatively using the interactive model, which involves three concurrent processes: data reduction, data display, and conclusion drawing or verification (Hidayat & Saleh, 2023; Bangsawan et al., 2025). Following the data reduction process, the data were classified into thematic categories, namely policy actors, the roles of the central government, regional governments, non-governmental organizations (NGOs), and the private sector. Policy content, mitigation and adaptation strategies, such as energy transition and forest protection. Political factors, economic interests, political contestation, and international pressure (Mahardhika et al., 2024). The qualitative approach in this research is based on the consideration that the phenomenon of environmental political policy is complex and involves power dynamics that cannot be measured numerically. There are three main reasons for selecting this method, this research also adopts the Integrative Literature Review (ILR) procedure as the primary strategy for examining, evaluating, and synthesizing representative literature concerning the legal politics of climate change. The process operates cyclically using socio-legal methods.

3. Results and Discussion

A core element of Smart Regulation theory emphasizes the efficient use of a combination of policy instruments rather than relying on a single approach. Through literature analysis, it was found that third-party involvement and the use of a "regulatory pyramid" are key factors in creating flexible compliance while still maintaining firm enforcement mechanisms if persuasive measures fail. An evaluation of national regulations found that Presidential Regulation No. 98 of 2021 represents a concrete manifestation of environmental economic instruments in Indonesia through carbon trading mechanisms. However, significant challenges remain in aligning national economic ambitions, as reflected in the Job Creation Law, with environmental protection standards that potentially weaken oversight mechanisms and public participation. The researchers synthesized that the implementation of Presidential Regulation No. 98 of 2021 represents Indonesia's effort to shift from a traditional command-and-control approach toward a smarter combination of regulatory instruments. By integrating carbon trading mechanisms, carbon taxes, and performance-based payment systems, this regulation reflects the principle of instrument pluralism aimed at reducing decarbonization costs by up to 23% through market participation. Further examination revealed tensions between the climate ambitions contained in the Enhanced Nationally Determined Contribution (Enhanced NDC) and the regulatory simplification introduced through the Job Creation Law (Arifin & Siagian, 2024). Serious concerns have emerged that the weakening of Environmental Impact Assessment (EIA/Amdal) standards in order to attract investment may create legal uncertainty that hinders sustainable business practices. Within the perspective of Smart Regulation theory, this condition may be regarded as a failure to maintain a balance between flexibility and environmental protection. Based on this theory, effective regulation does not solely depend on government intervention, but rather on a combination of economic instruments, self-regulation, and third-party involvement in achieving climate goals.

Table 4. Field data implementation of presidential regulation No. 98 of 2021

Data	Policy Implementation	Description
The growth of carbon trading	The Economic Value of Carbon (Nilai Ekonomi Karbon/NEK) regulation has stimulated emissions trading and carbon offset initiatives	The Indonesian Carbon Exchange (IDXCarbon) has recorded active transaction activities involving various companies in the energy sector.
Support for low-carbon investment	Regulation has encouraged the private sector	Integrate carbon costs into their production cost structures in order to improve competitiveness.
The success of the forestry sector	The reduction of emissions within the Forestry and Other Land Use (FoLU) sector	Deforestation reduction programs and Result-Based Payment (RBP) mechanisms
Challenges in verification and coordination	Field evaluations still identify obstacles	The complexity of project registration procedures and suboptimal coordination between central and regional governments regarding reporting mechanisms

Field data indicate that the implementation of Presidential Regulation No. 98 of 2021 has encouraged the development of carbon market infrastructure, including the launch of the Indonesian Carbon Exchange, the registration of thousands of mitigation actions within the National Registry System for climate change control (SRN PPI), and pilot emissions trading schemes in the power generation sector. However, several technical challenges remain. The findings indicate as follows. The researchers examined how the principle of regulatory pluralism can strengthen environmental legal politics related to climate change in Indonesia. Through data synthesis, it was found that regulatory effectiveness depends not only on state authority, but also on the ability to utilize market incentives and involve non-state actors. The findings revealed that the implementation of economic instruments such as carbon exchanges and sustainability reporting represents a progressive step toward creating a more responsive and flexible policy mix in accordance with the principles of Smart Regulation. The study also evaluated the fundamental challenges of adopting regulatory models derived from global perspectives into the domestic context. The findings indicate a risk of law enforcement failure due to limited technical resources and uneven supervisory capacity. A contradiction was identified between sophisticated policy designs and realities in the field, where the influence of extractive industry sectors remains highly dominant, often weakening the principle of parsimony, namely the use of minimal yet effective regulatory instruments. Further analysis in this study focuses on formulating a framework to overcome institutional and technical barriers in carbon governance.

Smart Regulation has five basic principles or characteristics that distinguish it from conventional legal approaches, namely instrument flexibility, complementarity, multi-actor involvement, enforcement pyramid, and resource efficiency through maximizing oversight capacity. Although Indonesia already has Presidential Regulation No. 98 of 2021 concerning the Implementation of Carbon Economic Value/*Nilai Ekonomi Karbon* (NEK) and the Law on Harmonization of Tax Regulations regarding Carbon Tax, the "smart" implementation of these regulations still faces several structural obstacles. These obstacles include the dominance of ineffective command-and-control approaches, inconsistencies in market-based and carbon economic instruments, such as delayed carbon taxation and uncompetitive carbon prices, sectoral ego and overlapping regulations that tend to be counterproductive, as well as the suboptimal involvement of third parties, including civil society and the private sector.

This study explores meanings, contexts, and evolving dynamics through the interpretation of existing data. The approach is developed by focusing on the configuration of power relations and the political economy of climate change, the effectiveness of climate change law implementation, Smart Regulation instruments, and the state's law enforcement capacity. These aspects are employed to rationally describe the causal relationships (empirical causality) underlying climate governance phenomena in Indonesia.

The configuration of power relations and the political economy of climate change constitute key factors that trigger, constrain, or shape the direction of environmental regulation (Batiran, 2024). Since climate policy represents a contestation of interests, the independent variables emphasize the asymmetric influence of political and economic actors (Isnaini, 2021). Corporate lobbying and pressure from the fossil fuel sector are used to measure the extent of influence exerted by capital-intensive dirty energy industry associations, including coal mining companies and fossil-fuel power plant operators, in intervening in the legislative process and obstructing the implementation of carbon tax penalties (Setyawan & Rakhmindyarto, 2020). The fragmentation of state bureaucratic institutions reflects the level of cohesion or dualism of authority within governmental administration. This condition is indicated by clashes in policy paradigms between environmentally oriented conservation institutions, such as the Ministry of Environment and Forestry, which administers the carbon registry, and macroeconomic and extractive investment-oriented institutions, such as the Coordinating Ministry for Maritime Affairs and Investment, which oversees carbon governance policy. In addition, concerns regarding social fiscal risk mitigation by the Ministry of Finance further complicate policy coordination. Meanwhile, the dynamics of intervention and pressure from the international regime are examined through institutional capacity, foreign climate investment sentiment (e.g., green sovereign bonds), and global agreement reporting mechanisms under the Paris Agreement, all of which place pressure on the Indonesian government to remain aligned with its long-term NDC commitments and CM2 funding commitments (Yovana & Andatara, 2023).

The effectiveness of climate change law implementation represents the outputs and actual outcomes of climate law enforcement at both national and subnational levels, aimed at safeguarding citizens from the risks of global ecosystem degradation (Presidential Regulation, 2021). Compliance with baseline determination and industrial carbon accounting is assessed through the ratio of corporate compliance in submitting verified annual carbon footprint inventories to the National Registry System database, as mandated by Presidential Regulation No. 98/2021, in a transparent and orderly manner. Regarding the integrity and liquidity of the Carbon Economic Value (Nilai Ekonomi Karbon/NEK) instrument, performance is reflected in the trading volume of carbon credits on the Indonesian Carbon Exchange (IDX Carbon), fluctuations in domestic carbon commodity prices, and the level of international buyer confidence in Indonesian decarbonization products that are free from information asymmetry, greenwashing, or other forms of manipulative marketing practices (Ulum, 2023).

The Smart Regulation theory proposes a shift from centralized command-and-control regulation toward a more diverse combination of instruments, including legal, economic, and participatory approaches. In Indonesia, regulatory pluralism is evident in climate mitigation practices through collaboration among the state (government), the private sector (market/business), and civil society, in order to achieve the Net-Zero Emissions target (Zaman, 2024). The following are concrete applications of the Smart Regulation concept and regulatory pluralism in Indonesia: the role of government (state regulation & legal instruments), the government functions as the primary framework for ensuring that national and international climate standards are met. This is operationalized through legal instruments such as Presidential Regulation No. 98 of 2021, which provides the legal basis for Carbon Economic Value governance. In addition, the government implements cross-sectoral policy programs such as Indonesia's FOLU Net Sink 2030, which aims to reduce emissions from the forestry and land-use sector (Syahputra, 2025).

The role of the private sector (economic instruments & self-regulation), within the framework of regulatory pluralism, the private sector is no longer merely a regulated object but is also positioned as an active regulatory actor. This is reflected in the adoption of market-based mechanisms and self-regulatory standards. These include carbon pricing instruments such as carbon taxes and emissions trading through the Indonesian carbon exchange, as well as the implementation of Environmental, Social, and Governance (ESG) standards and voluntary sustainability certification schemes, such as RSPO certification for palm oil and renewable energy certification systems.

The role of civil society (participatory instruments & customary law), civil society, including local communities, academics, and indigenous peoples, plays a complementary role in addressing governance gaps not fully covered by state or market mechanisms. These actors are actively involved in community-based environmental initiatives, including peatland and mangrove restoration efforts recognized as Nature-Based Solutions (Seddon et al., 2026). Furthermore, the recognition of customary rights and indigenous legal systems (customary law) contributes to climate change mitigation, particularly through the protection of customary forests in various regions, demonstrating the integration of non-state normative systems into Indonesia's national environmental governance framework (Tarigan & Hafandi, 2024).

Previous academic and policy studies demonstrate a clear evolution in the understanding of environmental legal governance in Indonesia. Early studies generally focused on a normative legal framework, assessing the processes and success of transposing international agreements into domestic positive law. However, over time, more recent literature has shifted toward empirical evaluations of policy implementation, political economy analysis, and the exposure of structural limitations within the state apparatus.

Through the theoretical and methodological contrasts discussed above, this study clearly distinguishes itself from conventional literature. It does not merely describe the systemic failures of environmental law in Indonesia but instead formulates a new regulatory model that is flexible, multi-stakeholder, and adaptive to contemporary political-economic realities.

The overall implication of the findings from this analysis concerns how environmental political policy operates under the grip of an extractive industry–based political economy, evaluates the extent to which international normative frameworks are implemented at the domestic level, uncovers structural pathologies within state apparatuses, and assesses the prospects and paradoxes of Smart Regulation implementation amid the complexity of governance in the Republic of Indonesia. This comprehensive synthesis of paradigmatic academic transition, structural political-economic deconstruction, and operational mapping of Smart Regulation concepts yields several critical implications that must be incorporated into the architecture of climate change policy design in Indonesia.

First, it is widely recognized that the climate mitigation crisis (a super wicked problem) cannot be addressed solely by strengthening normative planning documents, revising Nationally Determined Contributions (NDCs), national climate action plans developed by countries that are parties to the Paris Agreement to reduce greenhouse gas emissions and adapt to climate change impacts in a purely quantitative manner, or merely advancing investment instruments such as Green Bonds (Rachmawati & Mahardhika, 2020). Empirical reports indicate that the central obstacle lies clearly in the hierarchical architecture of oligarchic political-economic power. To realize the concept of Climate Compatible Development (CCD) and achieve “triple wins”—ensuring synergy between emissions mitigation, community-based adaptation strategies, and socio-economic redistributive justice—comprehensive governance prerequisites are required (Wibisana, 2019). The government must break the vicious cycle of rent-seeking behavior, eliminate the influence of illicit political financing from mining entities, and ensure legal certainty over customary land rights as a foundational element of climate infrastructure (Andrini, 2016).

Second, regulatory overlap and lack of synchronization demonstrate contradictions among policies (for instance, between the Job Creation Law, which promotes accelerated investment, and environmental protection frameworks). This creates legal uncertainty, weakens law enforcement, and undermines the effectiveness of mitigation actions (Maulidyna, 2022). Regulatory inconsistency generates chronic legal uncertainty. Climate policy governance at both central and regional levels remains suboptimal due to overlapping authorities. Conflicts between central and regional regulations, as well as across sectors (horizontal conflicts), create ambiguity for businesses and local communities. Long-term investors tend to avoid markets with unstable or conflicting regulations due to high legal risks, compounded by weak law enforcement in which authorities often face difficulties in implementing rules because of differing standards across laws governing the same subject matter (Widjaja, 2025). Governance and decentralization challenges in climate policy continue to be marked by weak coordination between central and regional governments, limited technical capacity at the local level, and funding constraints (Sibarani, 2017). The fiscal capacity gap between central and regional governments further limits local authorities’ ability to finance adaptation and mitigation programs. Local governments often face minimal budgets, complex administrative procedures, and dependence on central government funding (Ekaputra et al., 2025).

Third, successful implementation of participatory actor pluralism within the Smart Regulation framework requires a strong legal umbrella protecting rights. Centralized deregulatory policies, such as the removal of strict liability principles in the Job Creation Law, must be urgently corrected and reassessed in order to restore the deterrent effect of law enforcement against perpetrators of forest landscape burning (Khoirunnisa & Jubaidi, 2025). At the same time, the modernization of outdated legislation, such as Law No. 41 of 1999 on Forestry, is urgently needed to ensure full integration with emerging Carbon Economic Value initiatives and recognition of socio-ecological participatory rights sovereignty (Ardyanto & Wulandari, 2025).

Table 5. Summary of discussion

Aspects/Pillars	Focus Discussion	Challenges & Criticism
Paradigm Shift	The first pillar of successful Smart Regulation implementation is the abandonment of reliance on single policy instruments. Historically, environmental law in Indonesia has been shaped and dominated by Command and Control (CAC) instruments, explicitly manifested in Law No. 32 of 2009 on Environmental Protection and Management.	Although CAC instruments are crucial for establishing minimum compliance thresholds to prevent severe environmental degradation, they have been widely criticized. This approach is considered overly inflexible, involves high enforcement costs borne by the state, is vulnerable to bureaucratic corruption, and does not provide sufficient economic incentives for industries to achieve environmental performance beyond minimum compliance.
Political Dynamics	Indonesia's economy exhibits a structural dependence on natural resource extraction. In the energy sector, although the government targets a 23% renewable energy mix/*energi baru dan terbarukan* (EBT) by 2025, actual achievement in 2024 was reported at only 13.1%	Dependence on fossil fuels remains substantial, with more than 60% of national electricity supply generated by coal-fired power plants.
Sectoral Ego and Cross-Institutional Harmonization Challenges	Environmental governance in Indonesia is characterized by hyper-regulation that paradoxically leads to policy disharmony. A multidimensional approach to climate change requires absolute synchronization among stakeholders.	sectoral ego as a major implementation barrier. Horizontally at the central government level, climate governance authority is distributed across multiple ministries that often operate in bureaucratic silos without integrated coordination. This sectoral ego results in policy misalignment.
Enforcement Deficit in Environmental Governance	In the discourse of climate law in Indonesia, the most fundamental regulatory disruption in the past decade is marked by the enactment of Law No. 11 of 2020 on Job Creation (amended into Law No. 6 of 2023).	Legal and political analyses indicate that this regulation has in fact eroded the ecological protection backbone.
Multi-Actor Participation and Climate Litigation	The Smart Regulation framework emphasizes the importance of empowering third-party actors, particularly civil society and non-governmental organizations (NGOs), to complement the state's limited monitoring capacity	The success of mitigation and adaptation agendas is sociologically measured by the achievement of climate justice, namely ensuring that both the burdens of climate impacts and the benefits of green initiatives do not generate new forms of discrimination

In deeper discussion, first, Smart Regulation theory is not merely about creating new rules or replacing government regulations, but rather an innovative combination of multiple instruments (command-and-control, economic, and persuasive tools) to achieve effectiveness. Second, climate justice and human rights perspectives emphasize that environmental law must not only prevent temperature increases but also restore victims of climate impacts (indigenous peoples, farmers, and fishers). Carbon trading policies often risk marginalizing communities if they are not inclusively involved in emission reduction initiatives (Prihatiningtyas Wilda et al., 2023). The implementation of Presidential Regulation No. 98 of 2021 on Carbon Economic Value/*Nilai Ekonomi Karbon* (NEK) has driven the establishment of carbon market instruments in practice. Empirical evidence of its effectiveness is reflected in the launch of IDX Carbon and emission reductions in the energy and forestry (FoLU) sectors, although its macro-level effectiveness remains constrained by coordination and regulatory integration problems (Farhan et al., 2025).

Third, Indonesia's national commitment and legal politics, through the Enhanced NDC (2022) and the Net Zero Emission (NZE) 2050 target, require a strong and consistent legal framework. However, legal policy often still conflicts with short-term economic development agendas (Richwanudin & Zakiyah, 2023).

Table 6. Research limitations

Domain of Limitations	Identified Gaps	Implications for Policy
Methodological Approach	Dominance of doctrinal/normative studies with minimal integration of socio-legal empirical methods.	Produces policy recommendations that are alienated from real-world compliance behavior of industries and bureaucratic actors (Nurliana et al., 2026)
Data Transparency	Access to the National Registry System for Climate Change Mitigation/*Sistem Registri Nasional Pengendalian Perubahan Iklim* (SRN-PPI) is closed; the absence of real-time corporate emissions data is publicly available.	Weakening independent civilian oversight and the validity of carbon market performance evaluations (Kesek, 2025)
Intersectional Justice	The absence of a feminist legal perspective and marginalization of customary tenure rights in the commodification of carbon trading systems.	Giving birth to executive (top-down) mitigation policies that have the potential to trigger new land grabbing and sideline local wisdom (Pratiwi et al., 2026).
Ecological Refugees	The lack of human rights instruments and rehabilitation regulations for victims of climate-induced displacement.	Placing millions of coastal residents outside positive legal protection (stateless in ecological context) (Hazyar, 2025).
Stability & Obsolescence	The phenomenon of hyper-regulation and the dynamic Omnibus Law limits research on long-term longitudinal impacts (Hindiawati, 2024).	Uncertainty regarding green investment recommendations and unclear legal enforcement capacity in courts (legal uncertainty).

Furthermore, the role of climate litigation in courts is increasingly contributing to climate law enforcement, for example by requiring climate impact assessments within Environmental Impact Assessments/*Analisis Mengenai Dampak Lingkungan (AMDAL)* (Ismaya & Wafi, 2023). In essence, the implementation of Smart Regulation in Indonesia's climate change law demands Regulatory Pluralism, meaning policy success is not measured by the number of laws enacted, but by the effectiveness of multiple instruments (legal, market-based, and social) operating in harmony. Summary in this section consists of several parts:Research limitations can be seen in the following table 6.

4. Conclusions

This study concludes that the direction of climate change policy in Indonesia is significantly shaped by the adoption of international agreements Climate change policy in Indonesia has transformed from merely following international norms into the adoption of localized values through national regulations. However, the approach remains predominantly top-down and is often characterized by inter-sectoral overlap. Climate change mitigation in Indonesia is the result of hybridization between international law and national law. Its effectiveness depends heavily on how these regulations are translated into technical implementation without neglecting socio-economic justice for local communities. Mitigation roles and measures in Indonesian environmental law represent a transformation of global values into local governance structures. This is reflected in regulatory instruments such as Presidential Regulation No. 61 of 2011 on the National Action Plan for Greenhouse Gas Emission Reduction (RAN-GRK) and various technical ministerial regulations that serve as the backbone of mitigation efforts.

The implementation of Smart Regulation in Indonesian climate change law is reflected in the combination of command-and-control instruments (statutory regulations) with market-based instruments (carbon economics, emissions trading). However, its effectiveness is still constrained by fragmentation in sectoral regulations and the need for improved inter-institutional coordination and harmonization. Climate change governance in Indonesia requires a combination of instruments, including government regulation, market mechanisms, and social sanctions. Indonesian climate law cannot yet be considered fully "smart" in an ideal sense because these instruments still operate in a partial manner. This study emphasizes that Indonesia's legal mitigation measures are not merely a formal ratification process, but are undergoing a transformation toward the recognition of indigenous peoples and local communities as environmental protection agents, in line with emission reduction commitments. The main scholarly contributions of this research to the development of environmental legal politics in Indonesia include: the development of hybridization and localization theory of international law; the conceptualization of integrated policy based on Carbon Economic Value; the renewal of legal instruments through Smart Regulation theory; and the identification of legal gaps for cross-sectoral harmonization.

As a recommendation, the government and the House of Representatives need to accelerate the establishment of a comprehensive climate change law. This law should be capable of addressing overlapping sectoral regulations (forestry, energy, spatial planning) to ensure legal certainty and the effectiveness of mitigation efforts. Strengthening enforcement through smarter regulatory approaches by combining administrative sanctions (command-and-control) with economic incentives for companies that implement environmentally friendly practices, in order to accelerate the achievement of the Net Zero Emission target. Enhancing stronger policy integration between central and local governments to ensure that Nationally Determined Contributions (NDCs) are effectively implemented at the local level, supported by transparent climate financing mechanisms (through the Environmental Fund Management Agency/*Badan Pengelola Dana Lingkungan Hidup* (BPDLH). Law enforcement agencies and the judiciary need to improve their capacity in handling climate change litigation by prioritizing the principles of climate justice and ensuring the protection of vulnerable groups affected by environmental degradation.

Acknowledgement

The author would like to express gratitude to the reviewers for their invaluable feedback and insightful recommendations, which significantly enhanced the quality and clarity of this manuscript.

Author Contribution

The author was solely responsible for the conceptualization, methodology, data collection, data analysis, interpretation of results, drafting of the manuscript, critical revision of the content, and approval of the final version of the manuscript.

Funding

This research received no external funding.

Ethical Review Board Statement

Not available.

Informed Consent Statement

Not available.

Data Availability Statement

Not available.

Conflicts of Interest

The author declares no conflict of interest.

Declaration of Generative AI Use

During the preparation of this work, the authors used Grammarly to assist in improving grammar, clarity, and academic tone of the manuscript. After using this tool, the authors reviewed and edited the content as needed and took full responsibility for the content of the publication.

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