

The role of regional mechanisms in global environmental governance

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Abstract

The research examines how regional mechanisms contribute to worldwide environmental governance by studying their joint work with international agreements and frameworks. The Paris Agreement establishes broad environmental objectives although regional governance bodies create specific adaptable solutions for local environmental problems. Through examination of the European Union's governance system researchers demonstrate how the European Green Deal and EU Emissions Trading System establish sustainable standards and innovative practices in environmental management. This study evaluates the ASEAN Agreement on Transboundary Haze Pollution to demonstrate the challenges faced by regions that combine institutional weakness and economic variety. Focusing on regional political entities enables extensive global agreements to meet local needs by creating policy novelties yet their complete success is constrained by conflicting regulations and inconsistent regional membership levels. The research supports guidelines that integrate regional achievements toward worldwide goals by establishing institutional framework collaboration while implementing validated structures and supporting infrastructure deficient areas until governments establish unified sustainable governance systems

Keywords: Regional Governance; Global Treaties; European Green Deal; Climate Policy; Regulatory Fragmentation; ASEAN Challenges

1 Introduction

1.1 Background and Context

The growing importance of regional mechanisms in addressing global environmental challenges has been widely acknowledged in recent decades. With issues such as climate change, biodiversity loss, and pollution intensifying at an alarming rate, it has become evident that global treaties alone are insufficient in managing these complex and multifaceted problems. Regional governance frameworks have emerged as essential instruments in implementing targeted solutions that bridge the gap between global commitments and national policies (Biermann & Pattberg, 2012). These mechanisms enable localized responses that take into account specific environmental, social, and economic contexts, ensuring that governance structures are both effective and adaptable.

Among regional actors, the European Union (EU) stands out as a model for effective environmental governance. The EU has established an extensive legal and policy framework aimed at promoting environmental sustainability, reducing carbon emissions, and protecting biodiversity (Jordan & Adelle, 2012). Its policies often extend beyond its borders, influencing international environmental negotiations and inspiring other regional initiatives. The EU's commitment to environmental governance, as reflected in ambitious regulatory frameworks such as the European Green Deal and the Emissions Trading System, underscores its leadership role in tackling global environmental challenges (Dupont & Oberthür, 2020).

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However, while regional governance structures offer many advantages, their interaction with global environmental treaties is complex and sometimes contentious. The interplay between regional and global mechanisms presents both opportunities and challenges for effective environmental governance. For instance, regional agreements can serve as laboratories for policy experimentation, leading to innovative solutions that can later be adopted at the global level. Conversely, the proliferation of regional agreements can contribute to regulatory fragmentation, creating conflicts between regional autonomy and the need for cohesive global coordination (Kuyper et al., 2018). This chapter introduces the increasing importance of regional governance systems, emphasizing their role in complementing, and at times challenging, global environmental agreements.

1.2 Research Problem and Rationale

Despite significant advancements in international environmental governance, the issue of fragmentation remains a major challenge. While regional agreements often enhance the effectiveness of environmental policies, they can also create regulatory overlaps, conflicting obligations, and governance gaps. The proliferation of regional mechanisms raises questions about the compatibility between regional and global governance structures, particularly concerning the enforcement and coherence of international treaties (Oberthür & Stokke, 2011). For example, while the Paris Agreement provides a global framework for climate action, its implementation relies heavily on regional and national commitments. The EU has positioned itself as a global leader in climate governance, setting ambitious emission reduction targets and implementing policies that extend beyond the requirements of international treaties (Gupta & Grubb, 2000). However, other regions have not demonstrated the same level of commitment, raising concerns about the effectiveness of fragmented governance approaches in achieving global sustainability goals.

Moreover, while the EU's environmental governance successes are well-documented, their applicability to other regions remains an area of limited research. Factors such as economic disparities, political will, and institutional capacity influence the effectiveness of environmental policies across different regions. This research seeks to address these gaps by examining how regional achievements, particularly those of the EU, can inform and enhance global environmental governance structures. Understanding the role of regional governance in shaping international environmental policies is essential for fostering a more integrated approach to global sustainability challenges.

1.3 Research Questions

To explore the relationship between regional and global environmental governance, this study aims to answer the following key research questions:

- How do regional mechanisms complement or conflict with international environmental treaties?
- What role does the European Union play as a leader in global environmental governance?
- How can regional successes in environmental governance be effectively scaled to the global level?

These questions will guide the analysis and discussion throughout the dissertation, offering insights into the opportunities and challenges presented by regional environmental governance frameworks. By addressing these questions, the research aims to contribute to the broader discourse on how regional governance structures can be leveraged to enhance the effectiveness of international environmental policies.

1.4 Research Objectives

The primary objectives of this research are threefold. First, it seeks to analyze the relationship between regional mechanisms and international environmental governance frameworks, identifying areas of synergy and tension. This includes examining the extent to which regional policies reinforce or undermine global treaties and how regional governance can serve as a testing ground for broader environmental strategies (Biermann et al., 2020). Second, the study aims to evaluate the EU's role as a model for regional environmental leadership, assessing the factors that have contributed to its successes and the challenges it faces in maintaining its leadership position. This involves analyzing the effectiveness of EU policies, their impact on international negotiations, and their ability to inspire similar initiatives in other regions. Finally, the research explores potential pathways for scaling regional successes to the global level, offering policy recommendations for fostering a more cohesive and effective environmental governance system. These objectives aim to provide practical insights into how regional initiatives can be integrated into the global environmental governance architecture, ultimately contributing to the development of more sustainable and coordinated international policies.

This dissertation examines the role of regional governance mechanisms in shaping global environmental governance, focusing on their interplay with international treaties and frameworks. While global agreements set overarching

objectives, regional mechanisms provide tailored, flexible approaches to address localized environmental challenges. The study emphasizes the European Union (EU) as a leading example of effective regional governance, highlighting initiatives such as the European Green Deal and the EU Emissions Trading System, which demonstrate how robust policies can influence global environmental norms. In contrast, the analysis also examines the Association of Southeast Asian Nations (ASEAN), illustrating the difficulties faced by regions with weaker institutional capacities and greater diversity in economic and political contexts.

Findings indicate that regional mechanisms can complement global treaties by fostering innovation, strengthening enforcement, and addressing region-specific issues. However, challenges such as regulatory fragmentation and misalignment with international frameworks remain significant. The EU's success provides valuable lessons for other regions, emphasizing the importance of strong institutional frameworks, market-based mechanisms, and inclusive governance structures.

The dissertation contributes to the academic discourse by bridging the gap between regional and global environmental governance, offering practical recommendations to enhance their alignment. These include fostering collaboration between regional and global platforms, adopting successful institutional models, and developing funding mechanisms for less-developed regions. Additionally, the study identifies future research directions, such as exploring the role of technology in governance and assessing the long-term impacts of regional mechanisms on global treaty compliance.

Ultimately, the research underscores the critical role of regional governance in advancing global environmental objectives. A balanced approach that integrates regional innovation with global coordination is essential to addressing the pressing environmental challenges of our time, ensuring sustainability and equity in environmental governance.

1.5 Structure of the Dissertation

This dissertation is structured into five chapters, each of which builds upon the preceding sections to provide a comprehensive analysis of regional environmental governance and its implications for global sustainability. Chapter 1 introduces the background, research problem, objectives, and structure of the study. It lays the foundation for understanding the relevance of regional mechanisms in shaping international environmental policies. Chapter 2 provides a theoretical framework and literature review, examining key concepts related to regional and global environmental governance. It explores existing research on environmental governance structures, theories of international cooperation, and case studies that highlight the successes and limitations of regional initiatives (Najam et al., 2006).

Chapter 3 outlines the research methodology, detailing the qualitative approaches employed to analyze regional and international governance mechanisms. This includes a discussion of case study selection, data collection methods, and analytical frameworks used to evaluate the effectiveness of regional governance structures. Chapter 4 presents an in-depth analysis of regional mechanisms, with a particular focus on the EU's role in shaping global environmental policies. It examines key case studies, such as the EU's emission reduction strategies, biodiversity conservation efforts, and regulatory frameworks for environmental protection.

Finally, Chapter 5 concludes the study by summarizing key findings, offering recommendations, and suggesting future research directions. This chapter synthesizes the insights gained throughout the dissertation, emphasizing the need for greater coherence between regional and global governance mechanisms. It also proposes strategies for enhancing international cooperation, addressing regulatory fragmentation, and ensuring that regional successes are effectively translated into global policy frameworks. Together, these chapters aim to provide a comprehensive understanding of the role of regional mechanisms in global environmental governance and their potential to drive sustainable solutions on a global scale.

By systematically exploring the interactions between regional and global environmental governance, this research contributes to a deeper understanding of how decentralized governance structures can complement international legal frameworks. As the world faces unprecedented environmental challenges, strengthening cooperation between regional and global governance mechanisms will be crucial for achieving long-term sustainability and environmental resilience.

2 Literature Review

2.1 Global Environmental Governance: Key Concepts and Challenges

Global environmental governance represents a complex interplay of actors, institutions, and agreements aimed at addressing transboundary and global environmental issues. At its core, it seeks to harmonize diverse interests to mitigate environmental degradation and promote sustainability. The foundation of this governance structure is a network of international treaties, conventions, and institutions, including seminal agreements such as the Paris Agreement and the Kyoto Protocol. These frameworks have provided a roadmap for collaborative climate action, with commitments to reduce greenhouse gas emissions, enhance resilience to climate impacts, and mobilize financial resources for sustainable development (Skeete et al., 2020).

However, despite these achievements, global environmental governance faces significant challenges. Foremost among these is the issue of fragmentation. Multiple institutions often operate independently, leading to overlapping mandates, duplicative efforts, and sometimes contradictory priorities. For instance, while the United Nations Framework Convention on Climate Change (UNFCCC) focuses on climate change mitigation, organizations like the World Bank prioritize development goals, which may occasionally conflict with strict environmental measures (Gupta et al., 2020). This fragmentation not only hampers effective coordination but also exacerbates jurisdictional ambiguities, making it difficult to hold parties accountable.

Another persistent challenge is the tension between universal goals and regional or national interests. For example, while global agreements set overarching targets, their implementation often requires adaptation to the unique environmental, economic, and political conditions of individual regions. Achieving coherence between global and regional mechanisms thus demands a delicate balance. The need to respect state sovereignty, coupled with the diversity of stakeholders involved, complicates efforts to create a unified approach to global environmental governance (Broadbent et al., 2018).

Harmonization of efforts also depends heavily on the availability of financial and technological resources. Developing nations, which are disproportionately affected by climate change, often lack the resources to implement ambitious environmental policies. Mechanisms such as the Green Climate Fund (GCF) aim to address this gap, yet disbursement of funds remains uneven, with bureaucratic hurdles impeding timely access (Forsythe et al., 2023). These systemic challenges highlight the need for innovative governance models that integrate global objectives with localized priorities while addressing disparities in capacity and resources.

2.2 Regional Mechanisms in Environmental Governance

Regional environmental governance has emerged as an effective complement to global efforts, addressing localized environmental challenges while reflecting regional contexts. Regional mechanisms are implemented through legally binding agreements, policy frameworks, and collaborative strategies led by organizations such as the European Union (EU), the African Union (AU), and the Association of Southeast Asian Nations (ASEAN). These mechanisms allow member states to tailor solutions to specific challenges, such as deforestation, transboundary water management, and regional pollution.

The flexibility inherent in regional mechanisms provides a key advantage. For instance, ASEAN has established the Agreement on Transboundary Haze Pollution, which aims to tackle the issue of forest fires and air pollution in Southeast Asia. Unlike global treaties, which often require consensus among diverse parties, regional agreements can focus on shared priorities among geographically and culturally aligned nations (Buzzavo, 2014).

Enforcement capabilities also tend to be stronger at the regional level. Proximity and shared interests often lead to more robust monitoring and compliance mechanisms. For example, the EU has successfully implemented stringent environmental standards across its member states, supported by its ability to impose penalties for non-compliance. However, these advantages are not without challenges. Conflicts between regional and global governance frameworks can create legal and procedural ambiguities. For example, regional carbon trading mechanisms may conflict with broader global commitments, leading to discrepancies in reporting and verification (Das, 2019).

Disparities in governance approaches across regions can also undermine collective environmental outcomes. For instance, while the EU has adopted an ambitious climate agenda, other regions, such as parts of South Asia and Africa, struggle to implement even basic environmental safeguards due to economic and institutional constraints (Janssen,

2015). Bridging these disparities is critical for ensuring that regional mechanisms contribute effectively to global environmental goals.

2.3 The EU as a Leader in Regional Environmental Governance

The European Union (EU) is widely recognized as a pioneer in regional environmental governance, demonstrating how regional frameworks can lead to impactful climate action. The European Green Deal, introduced in 2019, exemplifies the EU's commitment to achieving climate neutrality by 2050. This comprehensive strategy includes measures to decarbonize the economy, promote renewable energy, and transition to a circular economy. Through initiatives such as the EU Emissions Trading System (EU ETS), the EU has established itself as a global leader in carbon pricing, providing a model for other regions to emulate (Harrison & Thiel, 2017).

The EU's governance framework extends beyond its borders, influencing international negotiations and fostering partnerships with developing nations. For instance, the EU has played a pivotal role in shaping global environmental norms through its active participation in the UNFCCC and other international platforms. It has also invested in capacity-building initiatives, such as funding renewable energy projects in Africa and Asia, to support sustainable development in regions with limited resources (Conzade et al., 2022).

Despite these achievements, the EU faces challenges in maintaining its leadership role. Internally, member states occasionally clash over the pace and scope of environmental policies, as seen in debates over renewable energy targets and agricultural emissions. Externally, the EU's influence is sometimes met with resistance from other global actors, particularly when its stringent standards are perceived as imposing unfair economic burdens on trading partners (Chen & Perez, 2018). Addressing these challenges will require continued innovation in governance and diplomacy to sustain the EU's position as a leader in environmental governance.

2.4 Literature Gaps

While existing literature provides valuable insights into the successes of global and regional environmental governance, significant gaps remain in understanding how these two levels can be harmonized. Studies often focus on the achievements of regional mechanisms, such as the EU ETS or ASEAN's haze agreement, but rarely explore how these successes can be scaled to the global level (Buzzavo, 2014).

Moreover, the relationship between regional and global governance frameworks remains underexplored. Questions about how regional mechanisms can complement, rather than conflict with, international treaties are particularly pertinent. For example, can regional carbon trading systems be integrated into a global framework without creating inconsistencies in measurement and verification standards? Scholars have yet to reach a consensus on best practices for achieving such integration (Fang et al., 2018).

Another area that warrants further research is the role of emerging economies in regional governance. Much of the existing literature focuses on established regional bodies like the EU, with limited attention to how regions in Africa, Asia, and Latin America are developing their own governance mechanisms. Understanding the unique challenges and opportunities in these regions is crucial for advancing global environmental goals (Kim et al., 2022).

Finally, the literature lacks a comprehensive analysis of how digital technologies are reshaping environmental governance. Emerging tools, such as blockchain for carbon trading and artificial intelligence for environmental monitoring, have the potential to address some of the challenges identified in this chapter. However, their integration into existing governance frameworks remains an area ripe for exploration (Forsythe et al., 2023).

Addressing these gaps is essential not only for advancing theoretical insights but also for informing the design of more effective and equitable governance frameworks. By bridging the divide between regional and global efforts, future research can contribute to a more coherent and impactful approach to environmental governance.

3 Methodology

3.1 Research Design

This study employs a qualitative research design, combining legal analysis, policy evaluation, and case studies to investigate the role of regional mechanisms in advancing global environmental governance. A qualitative approach is particularly well-suited to this inquiry as it allows for an in-depth exploration of governance structures, policy intricacies, and the interaction between regional and global frameworks. Unlike quantitative methodologies that focus

on numerical data, this approach emphasizes contextual understanding, making it ideal for analyzing complex, multi-layered governance mechanisms.

Legal analysis serves as a cornerstone of the research design, focusing on the alignment and consistency of regional regulations with international environmental treaties. This aspect of the methodology evaluates the extent to which regional policies harmonize with global agreements such as the Paris Agreement and the Kyoto Protocol. Additionally, legal analysis sheds light on potential conflicts, ambiguities, or gaps within the governance landscape, providing a foundation for identifying areas where regional mechanisms can enhance global coherence.

Policy evaluation complements the legal analysis by examining the practical implementation of regional frameworks. This includes assessing how regional bodies enforce agreements, address compliance issues, and manage transboundary challenges. Policy evaluation is critical for understanding the effectiveness of regional governance structures in achieving environmental objectives, as well as for identifying best practices that could inform global governance models.

Case studies represent another pivotal component of the research design, offering a focused examination of specific regional governance frameworks. This method allows for a detailed analysis of successes, limitations, and lessons learned from real-world applications of regional mechanisms. By investigating two distinct case studies—the European Green Deal and the ASEAN Agreement on Transboundary Haze Pollution—this study provides comparative insights into diverse governance models and their contributions to global environmental goals. The integration of these methodological elements ensures a holistic analysis that bridges theoretical understanding with practical implications.

3.2 Data Sources

The research relies on a comprehensive array of primary and secondary data sources to ensure a robust and multi-faceted analysis. Primary sources form the foundation of the study, encompassing official policy documents, international treaties, and legal frameworks. These include cornerstone agreements such as the Paris Agreement, the Kyoto Protocol, and the ASEAN Agreement on Transboundary Haze Pollution, as well as regional regulations like the EU Emissions Trading System (EU ETS) and the European Green Deal. These documents provide essential insights into the legal and institutional underpinnings of regional governance mechanisms and their alignment with global objectives.

In addition to primary sources, secondary data sources play a crucial role in contextualizing and enriching the analysis. Academic literature, including peer-reviewed journal articles, provides theoretical frameworks and critical perspectives on regional and global environmental governance. For example, works by Broadbent et al. (2018) and Skeete et al. (2020) offer insights into best practices and pitfalls in environmental policy implementation, while studies by Chicksand and Rehme (2018) and Ferrigno et al. (2024) explore the interplay of value creation and governance in collaborative efforts. Reports from NGOs, think tanks, and international organizations further contribute to the research by offering practical evaluations and case-specific data. These diverse sources ensure a balanced and comprehensive examination of the subject matter.

The integration of primary and secondary sources also enables triangulation, a methodological strategy that enhances the validity and reliability of the findings. By cross-referencing legal texts, policy documents, and scholarly analyses, the research ensures that conclusions are grounded in a robust evidence base. This multi-dimensional approach not only strengthens the credibility of the study but also facilitates a nuanced understanding of the complexities inherent in regional and global environmental governance.

3.3 Case Study Approach

The case study approach is central to this research, providing a detailed examination of specific regional governance mechanisms and their contributions to global environmental objectives. Two case studies have been selected to represent diverse governance models and address varying environmental challenges: the European Green Deal and the ASEAN Agreement on Transboundary Haze Pollution. These case studies were chosen for their relevance, diversity, and potential to offer transferable lessons for other regions and global governance frameworks.

The first case study focuses on the European Green Deal, the European Union's ambitious strategy to achieve climate neutrality by 2050. This initiative encompasses a wide range of policies, including decarbonization, renewable energy adoption, circular economy practices, and biodiversity preservation. The EU Emissions Trading System (EU ETS), a cornerstone of the Green Deal, serves as a model for carbon pricing and emission reduction efforts worldwide. By analyzing the Green Deal, this study evaluates the EU's leadership in environmental governance, its ability to influence global policy discussions, and the challenges it faces in balancing regional priorities with international obligations. For

instance, Chen and Perez (2018) highlight the EU's success in fostering innovation through its stringent regulatory frameworks, while Brown et al. (2019) discuss the challenges of integrating diverse national interests within a unified regional strategy.

The second case study examines the ASEAN Agreement on Transboundary Haze Pollution, which addresses recurring air pollution problems in Southeast Asia caused by slash-and-burn agricultural practices. This agreement represents a regional effort to tackle a transboundary issue that has significant environmental, economic, and public health implications. The analysis explores ASEAN's coordination mechanisms, enforcement challenges, and the role of member states in implementing the agreement. Studies by Broadbent et al. (2018) and Das (2019) provide valuable insights into the socio-economic and political complexities of addressing transboundary haze, while Anaya (2021) discusses the role of local markets and governance in mitigating pollution.

By comparing these two case studies, the research identifies commonalities and differences in regional governance approaches, offering insights into their effectiveness and scalability. This comparative analysis also sheds light on the interplay between regional and global mechanisms, highlighting areas where regional initiatives can complement and enhance international efforts.

3.4 Ethical Considerations

Ethical considerations are integral to the research process, ensuring that the study maintains objectivity, transparency, and integrity. One of the primary ethical principles guiding this research is the commitment to presenting a balanced evaluation of regional mechanisms without bias towards specific regions, policies, or governance models. This involves critically analyzing both the successes and limitations of the case studies, as well as acknowledging the diversity of perspectives and approaches within regional and global governance frameworks.

Transparency in data interpretation is another key ethical consideration. The research explicitly outlines the sources of data, the methods of analysis, and the limitations of the study, ensuring that the findings are presented in a clear and accountable manner. For instance, the study acknowledges potential gaps in data availability, such as the lack of comprehensive enforcement data for the ASEAN Agreement, and discusses how these limitations may influence the conclusions.

Respecting the unique political, cultural, and economic contexts of the regions under study is also paramount. Environmental governance is inherently shaped by local conditions, and this research strives to recognize and respect these differences while exploring their implications for global governance. For example, the study considers the socio-economic challenges faced by ASEAN member states in implementing the haze agreement, as well as the EU's varying capacities to enforce environmental regulations across its member states. By adopting a culturally sensitive approach, the research ensures that its analysis is both accurate and respectful of regional contexts.

Finally, the research adheres to ethical standards in academic writing, including proper citation of sources and acknowledgment of intellectual contributions. This not only upholds the integrity of the research but also ensures that it contributes meaningfully to the broader academic discourse on environmental governance. Through these ethical principles, the study aims to provide credible, impartial, and actionable insights into the role of regional mechanisms in advancing global environmental governance.

By integrating legal analysis, policy evaluation, and case studies within a robust ethical framework, this methodology provides a comprehensive foundation for exploring the complexities of regional and global environmental governance. It enables a nuanced understanding of how regional mechanisms operate within the broader context of international efforts, offering valuable insights for policymakers, scholars, and stakeholders seeking to enhance environmental governance structures worldwide.

4 Data Analysis, Presentation and Interpretation

4.1 Complementarity and Conflict Between Regional Mechanisms and International Treaties

Regional mechanisms play a crucial role in advancing international environmental goals, yet their relationship with global treaties often presents both synergy and tension. Frameworks such as EU regulations frequently align with international agreements like the Paris Agreement, contributing to enhanced enforcement and localized adaptation of global goals. For instance, the EU's binding emission reduction targets complement the broader, non-binding objectives set by international treaties, allowing for more concrete implementation. Regional frameworks offer flexibility, enabling

regions to tailor strategies to address unique environmental challenges. However, these regional mechanisms can also create regulatory fragmentation, leading to inconsistencies across jurisdictions. Overlapping regulations may result in duplication of efforts, while disparities in enforcement standards could generate trade barriers that undermine global uniformity. Such conflicts highlight the need for stronger alignment between regional and global approaches to environmental governance.

4.2 The Role of the EU as a Leader in Global Environmental Governance

The European Union has established itself as a global leader in environmental governance through ambitious policies and diplomatic influence. The EU Green Deal exemplifies its commitment to achieving climate neutrality by 2050, setting an example for other nations and regions. This framework not only addresses internal sustainability goals but also integrates environmental requirements into external trade agreements, effectively exporting green standards. Similarly, the EU Emissions Trading System (EU ETS) has become a model for carbon pricing, inspiring initiatives like China's emissions trading system. Furthermore, the EU has played a pivotal role in international climate diplomacy, notably during the Paris Agreement negotiations and successive COP summits. However, the EU's leadership is not without challenges. Accusations of environmental protectionism have emerged, with critics arguing that stringent green requirements sometimes serve as disguised trade barriers. Additionally, domestic compliance remains a persistent issue, as resistance from member states occasionally undermines collective progress.

4.3 Scaling Regional Successes to the Global Level

The successes of regional environmental governance, particularly within the EU, offer valuable lessons for global frameworks. Institutional robustness, effective enforcement mechanisms, and financial incentives have been key pillars of the EU's success. Mechanisms such as penalties for non-compliance and structured funding for green transitions ensure accountability and progress toward climate targets. Moreover, the EU's emphasis on regional cooperation, facilitated through technology transfer and capacity-building initiatives, highlights a scalable model for other regions. However, replicating such successes globally is fraught with challenges. Political will, institutional capacity, and resource availability vary significantly across regions, often hindering effective implementation. Developing countries face additional hurdles, including economic dependencies on carbon-intensive industries and limited technological infrastructure. Bridging these gaps requires a nuanced approach that balances global ambitions with local realities.

4.4 Case Studies

The case studies of the EU Green Deal and the ASEAN Haze Agreement provide contrasting examples of regional governance models. The EU Green Deal demonstrates how ambitious regional policies can influence global climate governance by inspiring similar commitments worldwide. Its integrated approach, combining legal enforcement, economic incentives, and technological innovation, sets a benchmark for other regions. However, challenges persist in scaling these models to less-developed regions, where financial and institutional constraints remain significant barriers.

In contrast, the ASEAN Haze Agreement highlights the importance of regional cooperation in addressing specific environmental issues, such as transboundary air pollution. ASEAN's collective effort to mitigate haze pollution showcases the potential for collaborative governance. Nevertheless, enforcement gaps and resource limitations continue to hinder its effectiveness. These case studies illustrate both the opportunities and limitations of regional governance in addressing global environmental challenges.

4.5 Emerging Trends and Strategic Challenges

The growing prominence of regional blocs in environmental governance signals a shift toward localized solutions for global problems. Regional mechanisms are increasingly filling the gaps left by slow-moving global treaties, offering innovative strategies tailored to regional contexts. However, the success of these efforts depends on fostering stronger collaboration between regional frameworks and global governance structures. Emerging trends also emphasize the importance of addressing inequalities in environmental governance, particularly the disparities between developed and developing regions. As regions like the EU continue to lead, there is an urgent need to ensure that their leadership does not perpetuate global inequalities but instead fosters inclusive, equitable solutions. Balancing innovation, equity, and sustainability remains one of the most pressing challenges in the evolving landscape of global environmental governance.

In summary, regional mechanisms, exemplified by the EU and ASEAN, demonstrate significant potential to drive environmental progress. However, alignment with international treaties, effective scaling strategies, and addressing structural inequalities are critical to achieving cohesive and impactful global environmental governance.

5 Conclusion

5.1 Summary of Key Findings

This dissertation has illuminated the intricate relationship between regional mechanisms and international environmental governance frameworks. Regional governance, as demonstrated, offers substantial potential to address environmental issues through flexible and region-specific strategies. However, it also poses challenges in terms of regulatory fragmentation and potential conflicts with global treaties. The European Union (EU) emerged as a frontrunner in regional environmental governance, with initiatives such as the European Green Deal and the EU Emissions Trading System (ETS) exemplifying its capacity for leadership in climate action. These frameworks showcase how robust regional mechanisms can complement global treaties, creating opportunities for innovation and enforcement while providing blueprints for other regions.

The study also analyzed the Association of Southeast Asian Nations (ASEAN) Agreement on Transboundary Haze Pollution. Unlike the EU, ASEAN faces greater challenges in enforcement, reflecting disparities in regional capacities, governance structures, and economic priorities. This comparative perspective underscores the dual nature of regional mechanisms: while they allow for tailored responses to localized environmental challenges, their efficacy is significantly influenced by institutional strength, economic resources, and political will.

Additionally, the findings highlighted the need for balance between regional flexibility and global coherence. The fragmentation of environmental governance systems can undermine the overarching goals of international treaties, as differing regional priorities and regulatory standards sometimes lead to inefficiencies or conflicts. Nevertheless, regional successes, particularly those seen in the EU, offer transferable lessons that could inform global strategies, from strengthening monitoring systems to improving compliance mechanisms.

5.2 Contribution to Knowledge

The study makes a meaningful contribution to the academic discourse on environmental governance by analyzing the interplay between regional mechanisms and global environmental objectives. Previous research often treated regional frameworks as supplementary to global treaties. This dissertation, however, positions regional governance as an essential component of a multilayered approach to environmental challenges. It emphasizes that regional mechanisms, rather than being mere appendages to global treaties, have the potential to lead, innovate, and shape international environmental norms.

One significant contribution of this study is its in-depth examination of the EU's environmental governance. The EU's approach, characterized by its legally binding policies, rigorous enforcement mechanisms, and ambitious targets, provides a model for other regions. For instance, the EU ETS is a prime example of how market-based mechanisms can drive reductions in greenhouse gas emissions while fostering economic innovation. Similarly, the European Green Deal demonstrates how an integrated policy framework can align economic, social, and environmental priorities.

Conversely, the ASEAN case study highlights the challenges of regional coordination in contexts with weaker institutional frameworks and varying levels of economic development. By juxtaposing these cases, this study reveals how regional disparities shape the effectiveness of environmental governance, offering nuanced insights into the scalability of regional mechanisms. This research thereby bridges the gap between theoretical discussions and practical applications of regional governance in the global environmental context.

5.3 Recommendations

To enhance the efficacy of regional mechanisms in global environmental governance, several actionable recommendations emerge from this study. These recommendations aim to address the observed gaps and challenges, fostering greater alignment between regional and global environmental objectives.

Firstly, collaboration between regional bodies and global environmental frameworks must be strengthened. Effective multilevel governance requires mechanisms for harmonizing regional policies with international treaties. This can be achieved through greater engagement between regional actors and global platforms such as the United Nations Framework Convention on Climate Change (UNFCCC). For instance, regular consultations between regional bodies and global environmental agencies could help align priorities, reduce conflicts, and ensure cohesive action.

Secondly, regions should draw on successful institutional models, particularly those implemented by the EU. The EU's comprehensive monitoring, enforcement, and compliance mechanisms are exemplary. For instance, the establishment

of independent regulatory bodies to oversee environmental compliance could benefit regions with weaker institutional capacities. Moreover, adopting market-based mechanisms, such as emissions trading systems, could provide both economic and environmental benefits.

Thirdly, financial and capacity-building support must be prioritized for less-developed regions. The success of regional mechanisms often hinges on the availability of resources to implement and enforce policies. International funding mechanisms, such as the Green Climate Fund, should be expanded to support regional environmental initiatives, particularly in the Global South. Additionally, capacity-building programs, including technical training and knowledge exchange, can empower regional bodies to design and implement effective governance frameworks.

Fourthly, regional agreements must be better integrated into global environmental governance structures. This involves ensuring that regional initiatives are recognized and leveraged in global negotiations, such as the Conference of the Parties (COP) to the UNFCCC. By providing a platform for regional actors to share experiences and best practices, these forums can enhance the visibility and impact of regional governance efforts.

Lastly, there is a need for greater inclusivity in regional governance frameworks. Regional mechanisms must account for the diverse perspectives of member states, particularly those with differing economic and social priorities. Inclusivity can foster greater buy-in, improving the effectiveness and sustainability of regional policies.

5.4 Future Research Directions

While this dissertation has provided valuable insights into the role of regional mechanisms in global environmental governance, several areas warrant further exploration. Future research should expand the scope to include other regional blocs, such as the African Union (AU) and the Southern Common Market (MERCOSUR). These regions face unique environmental challenges and governance dynamics, making them valuable case studies for understanding the scalability and adaptability of regional approaches.

Comparative studies across regions with varying economic, political, and environmental contexts could also yield important findings. For example, investigating how regions with limited resources can replicate elements of the EU's governance model could provide practical recommendations for policymakers. Additionally, research focusing on the long-term impacts of regional mechanisms on global treaty compliance would offer a clearer understanding of their sustainability and effectiveness.

Another promising avenue for research is the role of technology and innovation in enhancing regional governance. Digital tools, such as remote sensing and blockchain technology, hold significant potential for improving monitoring, reporting, and enforcement mechanisms. Exploring how these technologies can be integrated into regional frameworks could provide actionable insights for advancing environmental governance.

5.5 Final Reflections

In conclusion, regional mechanisms occupy a critical space in the architecture of global environmental governance. Their flexibility and region-specific focus enable them to address localized environmental challenges effectively. The EU's leadership, exemplified by initiatives such as the European Green Deal, demonstrates how regional frameworks can drive significant progress while influencing global standards. However, as the ASEAN case study illustrates, disparities in institutional capacity and political will can limit the effectiveness of regional governance in certain contexts.

Achieving cohesion between regional and global governance remains a significant challenge. The inherent tension between regional autonomy and the need for global coherence underscores the importance of multilevel governance structures. Moving forward, a balanced approach that integrates regional leadership with global coordination will be essential. This approach must prioritize inclusivity, resource-sharing, and capacity-building to ensure that all regions can contribute meaningfully to global environmental goals.

The environmental challenges of our time demand urgent and collective action. By leveraging the strengths of regional mechanisms while addressing their limitations, the global community can create a more cohesive and effective governance framework. In doing so, it will be better equipped to tackle pressing issues such as climate change, biodiversity loss, and resource depletion, ultimately advancing the shared goal of sustainable development.

Compliance with ethical standards

Statement of ethical approval

Ethical approval was obtained.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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