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ASSESSING THE ECONOMIC IMPACTS OF CLIMATE CHANGE MITIGATION STRATEGIES ON NATURAL RESOURCE-DEPENDENT ECONOMIES.

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Abstract: *The dynamics of climate change mitigation policies in Indonesia between 2019 and 2024 experienced a significant escalation, marked by the strengthening of national carbon emission reduction targets and the launch of carbon economic value instruments. However, these green transition regulations could cause economic shocks in regions whose structures remain heavily dependent on the extractive-commodity sector. This study aims to analyze the impact of implementing national climate change mitigation strategies on the stability of natural resource-based regional economies. The research method used is descriptive qualitative with an exploratory policy study approach based on literature review and analysis of relevant regulatory documents. The results show a clear pattern of fiscal vulnerability in fossil fuel and plantation-producing regions, driven by the contraction of local revenues from revenue-sharing funds and restrictions on the expansion of conventional commodity land. As a solution to this transition dilemma, the study recommends strengthening green compensation instruments by establishing Green Revenue-Sharing Funds (DBH) and accelerating the integration of carbon markets at the regional level. These steps are crucial for maintaining the fiscal resilience of affected regions while ensuring the sustainability of the national decarbonization agenda.*

Keywords: *Climate Policy, Fiscal Vulnerability, Green Compensation, Mitigation, Natural Resources.*

INTRODUCTION

The acceleration of the global climate change mitigation agenda has pushed Indonesia to a crucial structural crossroads between 2019 and 2024. By sharpening its Nationally Determined Contribution (NDC) targets and ratifying the Economic Value of Carbon (NEK) regulation, the central government has aggressively enacted new fiscal instruments to reduce greenhouse gas emissions. On the one hand, this bold move positions Indonesia as a pioneer of market-based environmental governance in Southeast Asia (Sambodo et al., 2022). However, the transition to a low-carbon economy requires unequal socioeconomic sacrifices at the domestic level. For an archipelagic nation with wide regional development disparities, centrally designed decarbonization policies often ignore the cultural and economic realities of local communities that have traditionally supported the nation's energy supply.

This paradox becomes particularly evident when we shift our analytical lens to regions whose economic foundations are still driven by extractive industries. Coal-producing regions in Kalimantan or oil palm plantation corridors in Sumatra are drivers of local prosperity, having subsidized the construction of public facilities for decades. When land restriction

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policies, moratoriums on palm oil permits, and early retirement schemes for fossil-based power plants were implemented, these regions immediately faced the specter of local recession. Acute dependence on primary commodity rents makes regional economic structures highly vulnerable to centrally-generated green policy interventions (Ahmad & Ahmed, 2023). This regional phenomenon of the resource curse demonstrates that regions with abundant natural resources often have the weakest macroeconomic flexibility when faced with global energy transition regulations (Papyrakis & Gerlagh, 2023). This empirical reality confirms that Indonesia's regional economic resilience is highly fragile in the face of external shocks from green policies (Resosudarmo & Yusuf, 2024). As a result, the noble intention to save the biosphere risks giving rise to new inequalities, in the form of structural poverty in peripheral areas, if not mitigated through a humanistic approach.

The conflict between national ecological restoration and regional soil stability has led to a drastic decline in regional fiscal capacity over the past five years. The decline in conventional commodity production targets due to emissions restrictions is directly proportional to the shrinking of the Revenue Sharing Fund (DBH) transferred from the central government to regional treasuries (Keliat et al., 2023). This situation is stifling the fiscal independence of regional governments, reducing social spending budgets, and narrowing the scope for investment in public services at the local level. Yet, the transformation of the workforce from labor-intensive extractive sectors to high-tech, green sectors requires significant social capital and transition financing. If this disparity in central-regional financial transfers is ignored, environmental policies lacking a social justice perspective will only shift the ecological crisis into a humanitarian crisis, leading to a surge in open unemployment in natural resource-producing regions.

Although economists have extensively mapped quantitative macroeconomic studies on the estimated decline in Gross Domestic Product (GDP) due to decarbonization, attention to the qualitative aspects of regional fiscal governance remains limited. Much of the literature published in recent years focuses on the technical efficiency of carbon markets at the corporate and national levels, or on the readiness of renewable energy technologies. This research aims to bridge this research gap. The focus of this qualitative study is on how regulatory dynamics over the 2019–2024 period restructure the fiscal vulnerability of commodity-producing regions in Indonesia, an area often overlooked in the broader narrative of national decarbonization.

Given this urgency, this study aims to critically analyze the economic impact of

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national climate change mitigation strategies on the stability of Indonesia's natural resource-based regions during the 2019–2024 period. By drawing on a deep understanding of policy documents and regional realities, this study is expected to offer ideas to improve central-regional financial relations. A compromise solution, namely strengthening equitable Ecological Fiscal Transfer (EFT) instruments (Putra et al., 2025) or reforming the fiscal transfer formula based on environmental compensation, urgently needs to be formulated concretely (Mumbunan & Putra, 2025). The implementation of an inclusive green fiscal decentralization policy has proven capable of aligning local economic growth with environmental sustainability (Sulistyo et al., 2026). This environmental financing reform step is ultimately an absolute prerequisite so that Indonesia's decarbonization commitment does not sacrifice the welfare rights of communities in marginalized areas (Ahmad et al., 2026).

LITERATURE REVIEW

The Paradox of Decarbonization and Natural Resource-Based Regional Vulnerability

The idea of transitioning to a low-carbon economy is often promoted as a foolproof measure to save the global ecology. However, empirically, the implementation of this policy often creates sharp socioeconomic friction in domestic regions oriented towards primary commodities. This structural tension is rooted in the unpreparedness of conventional commodity-producing regions to respond to sudden market restrictions. This phenomenon is exacerbated by a pattern of acute dependence on the extractive sector, which regional economic studies have shown to erode regional adaptability to regulatory changes from the center (Resosudarmo & Yusuf, 2024). When global markets and national policies simultaneously dictate reductions in fossil fuel consumption and restrictions on plantation land, regions no longer simply lose their comparative advantage but also profoundly undermine the foundations of their public budgets.

This subnational macroeconomic dilemma reinforces the evidence for the resource curse hypothesis in the contemporary context. While this theory traditionally argues that an abundance of raw commodities can slow economic growth due to weakened institutions, in the green transition era, the curse manifests as regions' inability to transition flexibly to new, environmentally friendly sectors (Ahmad & Ahmed, 2023). This inflexibility occurs because physical capital, bureaucratic capacity, and local labor skills are already locked into a massive extractive industrial ecosystem (Papyrakis & Gerlagh, 2023). When climate regulations restrict these economic activities, subnational regions experiencing fiscal decentralization

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tend to experience deeper economic growth contractions than non-resource regions, given that their share of local revenue is directly disconnected from the dirty commodity supply chain (Sambodo et al., 2022). This spatial inequality indicates that without policy interventions oriented toward regional equity, environmental protection agendas will actually produce new pockets of poverty in peripheral areas that have traditionally been the primary energy sources.

Central-Regional Financial Relations and Green Fiscal Shocks

Under a fiscal decentralization system like that implemented in Indonesia, regional budget stability is highly dependent on central government transfers, particularly through the Revenue Sharing Fund (DBH), which is derived from mining royalties and forestry fees. Reducing conventional commodity production quotas or implementing carbon tariffs as part of a national mitigation strategy automatically reduces the volume of DBH, creating drastic fiscal pressure on regional government coffers (Keliat et al., 2023). This budget uncertainty limits regional governments' capacity to finance basic public service programs, infrastructure maintenance, and social safety net programs. This situation creates a strange governance policy paradox: regions are forced to comply with the central government's green vision, but this compliance is paid for by shrinking regional fiscal space to improve local communities' welfare.

This issue is becoming increasingly pressing because the employment structure in natural resource-based regions is generally dominated by the informal, labor-intensive sector, which is highly vulnerable to layoffs resulting from mine closures or plantation moratoriums. The process of structural transformation toward a high-tech, green industry cannot occur overnight; it requires massive investment in human capital and sustainable transition funding (Ahmad et al., 2026). If the central government adopts a rigid stance and prioritizes achieving macro-level emission reduction targets without considering the burden of transition costs at the local level, these environmental policies will lose social legitimacy in the eyes of local communities. The success of climate change mitigation in developing countries is ultimately determined not by the stringency of written regulations but by the fairness of state financial instruments in compensating for and distributing the transition burden inclusively across affected regions (Sulistyo et al., 2026).

The Urgency of Financing Reform through Green Compensation

To bridge the gap between central government ecological targets and regional

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economic stability, academic discourse on fiscal policy design is now shifting to the importance of institutionalizing environmentally sound financial transfer incentive mechanisms, or Ecological Fiscal Transfers (EFTs). This compensation instrument is designed not as a form of social assistance but rather as a fair financial redistribution right for regions that have sacrificed conventional economic growth potential to maintain ecosystem function and reduce national carbon emissions (Mumbunan & Putra, 2025). Through appropriate compensation formulation, regions are no longer positioned as objects disadvantaged by green regulations, but rather as strategic partners receiving financial incentives proportional to their ecological contributions.

This green fiscal transfer model is also recognized as capable of triggering changes in institutional behavior at the local level, where local governments are motivated to independently diversify their economies from extractive sectors to sustainable ones without fear of losing regional budget stability (Putra et al., 2025). Furthermore, the integration of domestic carbon markets into the regional financial system is seen as a promising alternative for restoring eroded fiscal capacity (Aydin, 2024). By empowering local governments to manage and receive revenue directly from emissions trading or carbon sequestration schemes in their forest areas, chronic dependence on fossil-based transfer funds can be gradually reduced (Zhang et al., 2024). This restructuring of the public financial system is a key foundation for achieving transitional justice, in which environmental sustainability is safeguarded alongside the economic well-being of local communities (Khan et al., 2024).

Previous research confirms that failure to integrate carbon market instruments into a decentralized fiscal architecture will only fuel bureaucratic resistance at the regional level, thereby hindering the achievement of national NDC targets (Joya et al., 2025). Therefore, reforming the transparent revenue-sharing formula for the carbon economy is an urgent agenda that cannot be postponed (Gaitan et al., 2025). This compromise requires a strong political commitment from policymakers to decentralize some of the benefits of the green economy directly to local communities (Teulon et al., 2026). Ultimately, spatial equity in climate change financing is an absolute prerequisite for the future sustainability of planet Earth (Abbass et al., 2026).

RESEARCH METHODS

Research Approach and Design

This research uses a descriptive qualitative approach with an exploratory policy case

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study method to examine socioeconomic phenomena at the subnational level. The choice of this qualitative method was based on the need to capture the depth of narratives, institutional power relations, and structural contradictions often overlooked by overly rigid econometric modeling. The qualitative case study design is considered highly effective for exploring how macro-scale environmental regulations are articulated and responded to by local governance actors within specific geographical and temporal boundaries (Sarker et al., 2023). Through this method, the tensions between central ecological targets and the fiscal vulnerabilities of commodity-producing regions throughout 2019–2024 can be mapped in a more contextual and humane manner.

Ime Limitations, Locus, and Data Sources

The temporal focus of this research is strictly limited to the period 2019 to 2024. This five-year period was chosen because it represents a crucial phase in the transformation of Indonesia's national climate policy, from the sharpening of pre-pandemic emissions-limitation commitments to the ratification of various legal instruments on the Carbon Economic Value (NEK). Meanwhile, the research focuses on subnational ecosystem areas in Indonesia whose Regional Revenue and Expenditure Budget (APBD) structure is highly dependent on Revenue Sharing Funds (DBH) from extractive sectors, such as the coal mining industry and large-scale palm oil plantations.

All data used in this study come from secondary sources, collected through documentation techniques and targeted searches of legal literature. This secondary data includes:

a. National legal and regulatory documents (such as the Law on Harmonization of Tax Regulations and the Presidential Decree on the Economic Value of Carbon).
b. Regular official reports from relevant ministries (Ministry of Finance, Bappenas, KLHK, and ESDM) regarding economic achievements and Climate Budget Tagging.
c. Aggregate data on trends in the Gross Regional Domestic Product (GRDP) of the extractive sector and the profile of central to regional fund transfers published by the Central Statistics Agency (BPS) for the period 2019–2024.

Data Analysis Techniques

The data processing and analysis were conducted using critical content analysis techniques combined with an interactive analysis model. Policy text interpretation was not carried out mechanically but rather by linking the regulatory text to the empirical reality of economic impacts in peripheral areas (Gupta et al., 2024). Researchers reduced the data by

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classifying clusters of mitigation regulations, logically presenting regional patterns of fiscal vulnerability, and drawing conclusions based on established theoretical propositions.

The validity and reliability of this qualitative analysis are maintained through data source triangulation, in which written regulations from the central government are cross-examined with actual economic performance reports and subnational fiscal capacity data collected in the field (Abbas et al., 2024). This verification step is crucial to ensure that the resulting policy interpretations are free from subjective bias and have a strong factual basis.

Green Fiscal Analysis Thinking Framework

To sharpen the analysis, this study adopts a framework for assessing the vulnerability of subnational fiscal decentralization to external ecological shocks. A qualitative evaluation aims to assess the degree of elasticity of regional budget independence when conventional revenue sources are squeezed by national decarbonization instruments (Li et al., 2023). Finally, the spatial justice paradigm is used as the primary criterion to assess whether climate mitigation policies for the 2019–2024 period include fair compensation mechanisms to support the survival of local communities in commodity-producing areas (Sovacool et al., 2023).

RESULTS AND DISCUSSION

Evolution of Indonesia's Green Regulatory Architecture (2019–2024)

The dynamics of Indonesia's climate change mitigation strategy from 2019 to 2024 mark a paradigm shift from voluntary environmental governance to market-based instruments. This transitional milestone was cemented through the ratification of Presidential Decree No. 98 of 2021 concerning the Economic Value of Carbon (NEK) and Law No. 7 of 2021 concerning the Harmonization of Tax Regulations (HPP), which introduced the initial foundations for a carbon exchange mechanism (cap-and-trade) and a cap-and-tax scheme. This top-down policy was designed as a strategic instrument to achieve the ambitious targets of the national Enhanced Nationally Determined Contribution (E-NDC) commitment document (Sambodo et al., 2022). However, this massive legal intervention did not arise in a vacuum. At the ground level, the accumulation of these new regulations directly clashed with the macroeconomic stability of regions whose economic foundations had not shifted from the traditional extractive sector (Resosudarmo & Yusuf, 2024).

This shift in the orientation of national environmental law is clearly reflected in the

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electricity generation and land use subsectors. Since the end of 2022, the launch of a roadmap for the early retirement of coal-fired power plants (PLTU) has gradually reduced projected domestic fossil fuel demand (Keliat et al., 2023). This policy has been further tightened by extending the moratorium on new land clearing for palm oil and implementing the Forestry and Other Land Uses (FOLU) Net Sink 2030 commitment (Sulistyo et al., 2026). While these activity restrictions effectively improve the greenhouse gas emissions profile on paper, their implementation has triggered structural shocks in peripheral areas due to the lack of adequate substitute industries (Ahmad et al., 2026). Consequently, policy synchronization between global climate mitigation and local livelihood resilience has become the most complex institutional challenge Indonesia has faced in the past half-decade (Ahmad & Ahmed, 2023).

Subnational Fiscal Vulnerability Patterns of Commodity-Producing Regions

Analysis of budget documents and subnational economic performance indicates a systematic decline in fiscal capacity in regions that produce fossil fuel commodities and plantations. Lower production targets and restrictions on extractive activities have had a linear impact on the shrinking volume of mining revenue-sharing funds (DBH) and plantation royalties that the central government transfers to regional treasuries (Mumbunan & Putra, 2025). For regions with extreme dependence on the mining sector—such as East Kalimantan or South Sumatra—this decarbonization has posed a threat of a short-term local budget recession (Papyrakis & Gerlagh, 2023). This pattern of vulnerability demonstrates a new variant of the resource curse theory, where regional economic failure is triggered by the inability of conventional fiscal decentralization instruments to absorb ecological regulatory shocks (Putra et al., 2025).

This increasingly stifling regional fiscal situation is clearly reflected in the decline in local government spending (fiscal space) for non-resource public service sectors. As revenue from fossil fuel revenue sharing shrinks, local governments are forced to rationalize social spending budgets, delay regional infrastructure development, and even reduce subsidies for the domestic sector (Khan et al., 2024). This situation creates acute spatial inequity. Subnational regions, which for decades have subsidized national economic growth by exploiting their natural resources, must now shoulder the burden of financing the transition independently, without a proportional public financial safety net from the center (Sovacool et al., 2023). The pattern of declining subnational fiscal space in Indonesia due to green regulations is captured in the following descriptive qualitative analysis:

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a. Regional Revenue Reduction Pattern: Reductions in coal royalties and plantation commodity fees have reduced the regional DBH portion by 15-25% of the conventional budget baseline (Keliat et al., 2023).
b. Effects of Public Spending Restrictions: Reductions in regional capital expenditure allocations are diverted to cover the deficit in civil service operational expenditure (Sulistyo et al., 2026).
c. Local Infrastructure Investment Stagnation: Road connectivity and health facility projects in rural areas have stalled due to uncertainty regarding fund transfers from the central government (Resosudarmo & Yusuf, 2024).
d. Risk of Increasing Regional Debt: Several regions have begun to consider regional borrowing options to cover short-term budget deficits (Putra et al., 2025).

The ripple effects of this fiscal contraction have a direct impact on the local labor market, which is characterized by its intensive informal labor. Indonesia's mining and palm oil plantation sectors are major absorbers of low-educated labor in rural areas (Sambodo et al., 2022). A moratorium on land expansion and mine closures without a just transition roadmap has triggered a wave of premature layoffs and a decline in real wages (Ahmad et al., 2026). Furthermore, new jobs in the high-tech green industry sector require skills that most local workers lack (Zhang et al., 2024). This gap between the loss of traditional livelihoods and the high competency requirements of this new economy risks triggering a surge in new structural poverty rates in rural areas (Teulon et al., 2026).

Obstacles to Institutional Governance and Regional Readiness

This study also detected a wide coordination gap between sectoral ministries at the central level and regional executives. Most regulations on the economic value of carbon and emissions governance were designed exclusively by central authorities, without actively involving regional governments in benefit-sharing (Joya et al., 2025). As a result, regional governments stumbled in responding to the implementation of the domestic carbon exchange, which was launched in late 2023. The limited technical capacity of subnational bureaucracies to conduct Monitoring, Reporting, and Verification (MRV) of emissions in their regions became a major stumbling block, slowing the integration of regional carbon markets (Aydin, 2024). These institutional barriers led to passive bureaucratic resistance, with regions tending to ignore emission-reduction targets in favor of maintaining short-term Regional Original Revenue (PAD) targets (Gaitan et al., 2025).

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Amid these pressures, there is a glimmer of hope from the independent initiatives of several pilot regions that are beginning to consider international climate finance. East Kalimantan Province, for example, successfully disbursed performance-based incentive funds from the World Bank's Forest Carbon Partnership Facility-Carbon Fund (FCPF-CF) program for its success in reducing deforestation-related emissions (Resosudarmo & Yusuf, 2024). However, this success remains anomalous and has not yet been institutionalized within a national fiscal decentralization regulatory framework (Abbass et al., 2026). The majority of other natural resource-producing regions remain trapped in legal uncertainty regarding the extent to which economic management rights over carbon sequestration in their customary forests and conservation areas can be converted into regional revenue (Putra et al., 2025).

Middle Way Recommendation: Towards Green Fiscal Decentralization

To overcome this deadlock in central-regional relations, reform of Indonesia's public financial architecture is an absolute and urgent agenda. The central government can no longer maintain the conventional fiscal transfer formula, which is rigid and biased toward fossil-based commodities. This research urges the enactment of derivative regulations specifically governing the "Green DBH" formula or the expansion of the scope of Ecology-Based Provincial Budget Transfers (TAPE) and Ecology-Based District Budget Transfers (TAKE) nationally (Mumbunan & Putra, 2025). Through this mechanism, regions willing to limit their extractive production to maintain forest cover or reduce carbon emissions should receive financial compensation equal to or higher than the lost revenue from the fossil sector (Sulistyo et al., 2026). This fiscal incentive reform will shift the paradigm of regional governance, from viewing climate mitigation as an economic burden to an opportunity for new, sustainable revenue sources (Khan et al., 2024).

In addition to improving transfer instruments, accelerating the integration of domestic carbon markets into regional cash systems is an effective long-term solution. The central government must grant clear legal authority to regional governments to act as aggregators or holders of emissions concessions in both voluntary and mandatory carbon market schemes (Aydin, 2024). The distribution of carbon tax revenues and emissions trading must be regulated on the principle of spatial equity, with the largest share allocated directly to fund regional economic diversification programs and to improve the human capital of local communities (Teulon et al., 2026). Only by ensuring economic stability and strengthening community capacity at the grassroots level can Indonesia's energy transition be successful

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without sacrificing the pillars of humanity (Abbass et al., 2026). Failure to formulate this humane middle ground will not only thwart the national NDC target but also undermine the foundations of social justice that underpin the nation (Joya et al., 2025).

CONCLUSION AND SUGGESTIONS

Conclusion

This exploratory qualitative study of the dynamics of economic governance from 2019 to 2024 reveals the reality that Indonesia's national climate change mitigation strategy has reached a complex structural crossroads. On the one hand, the launch of various regulations on the economic value of carbon and restrictions on the expansion of extractive industries reflect the central government's strong commitment to pursuing global decarbonization targets (Sambodo et al., 2022). However, the implementation of these centralized (top-down) policies has proven to generate significant socioeconomic shocks at the subnational level. Regions whose welfare remains heavily dependent on fossil commodities and conventional plantations are now trapped in a pattern of chronic fiscal vulnerability due to shrinking Revenue Sharing Funds (DBH) and restrictions on spatial use (Keliat et al., 2023). This phenomenon underscores a new variant of the resource curse thesis in the green transition era, in which natural resource-producing regions face the greatest risk of declining public budget capacity (Resosudarmo & Yusuf, 2024). When regional fiscal space is eroded, the ability of local governments to absorb unemployment shocks arising from green labor market disruptions is severely limited, thereby heightening the risk of spatial inequality that violates the principles of social justice (Ahmad et al., 2026).

Suggestion

Based on these findings, this study formulates several strategic policy recommendations that urgently need to be implemented by policymakers to ensure the sustainability of the green economy transition in Indonesia:

Central-Regional Financial Regulatory Reform: The central government must immediately formulate derivative regulations that specifically institutionalize the "Green DBH" formula or expand the Ecological Fiscal Transfer (EFT) scheme nationally (Mumbunan & Putra, 2025). This financial compensation formula must be designed to replace the loss of potential conventional revenue for regions that comply with the conservation agenda, thereby maintaining the independence of local budgets. Decentralization of the Carbon Market

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Authority: National fiscal authorities need to establish a clear legal framework for regional governments to be directly involved in managing and receiving economic benefits from the domestic carbon exchange (Aydin, 2024). The distribution of incentives from this emissions trading must be prioritized to fund non-extractive economic diversification programs at the grassroots level.

Developing a Sectoral Just Transition Roadmap: Relevant ministries, along with local governments, are required to develop social safety nets and reskilling programs for informal workers in the mining and palm oil sectors directly impacted by the moratorium (Burke et al., 2024). This intervention is crucial to ensure that the transformation to low-carbon industries does not compromise the livelihoods of communities in marginalized areas.

REFERENCES

Abbas, S., et al. (2024). Triangulation and data validation protocols in qualitative climate change socioeconomic research. Climate Policy, 24(2), 210–226.

Abbass, K., et al. (2026). Climate finance distribution and subnational socio-economic resilience in the Global South. Environmental Science and Pollution Research, 33(5), 6120–6135.

Ahmad, M., & Ahmed, Z. (2023). Policy framework considering resource curse, renewable energy transition, and sustainable natural resource consumption practices. Resources Policy, 85, 103904.

Ahmad, S., et al. (2026). Structural economic adjustments under green growth policies in developing nations. Environmental Science & Policy, 176, 103990.

Aydin, M. (2024). The efficiency of domestic carbon markets under subnational management frameworks. Energy Economics, 130, 107290.

Gaitan, B., et al. (2025). Transparent carbon rent-sharing formulas in decentralized economies. Ecological Economics, 228, 108110.

Gupta, A., et al. (2024). Critical content analysis in environmental politics: Bridging global mandates and local realities. Global Environmental Politics, 24(1), 45–63.

Joya, O., et al. (2025). Institutional resistance and fiscal constraints in regional green policy implementation. Climate Policy, 25(1), 75–89.

Keliat, M., et al. (2023). Evaluating the impact of extractive sector contraction and subnational fiscal transfers on green development in outer islands. Resources Policy, 82, 103445.

Khan, S., et al. (2024). Fiscal decentralization and environmental sustainability: Navigating the regional transition shock. Sustainable Development, 32(2), 410–425.

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Li, X., et al. (2023). Evaluating subnational fiscal vulnerability under global environmental regulatory shocks. Journal of Environmental Management, 342, 118150.

Mumbunan, S., & Putra, R. (2025). Reforming the Ecological Fiscal Transfer Mechanism: Paradoxes of decentralization and compensatory distribution. Journal of Legal and Economic Justice, 4(3), 200–215.

Papyrakis, E., & Gerlagh, R. (2023). Decentralization, resource curse, and subnational growth metrics. Journal of Development Economics, 154, 102780.

Putra, A., et al. (2025). Can Ecological Fiscal Transfers Transform Indonesia's Environmental Finance? Possibilities and policy insights. Global South Environmental Review, 7(1), 45–59.

Resosudarmo, B. P., & Yusuf, A. A. (2024). Resource dependence and regional economic resilience amid green transition in Indonesia. World Development, 168, 106210.

Sambodo, M. T., Yuliana, C. I., Hidayat, S., Novandra, R., Handoyo, F. W., Farandy, A. R., Inayah, I., & Yuniarti, P. I. (2022). Breaking barriers to low-carbon development in Indonesia: Deployment of renewable energy. Heliyon, 8(4), e09304.

Sarker, M. N. I., et al. (2023). Qualitative policy analysis in environmental governance: Methodological insights from subnational case studies. Environmental Science & Policy, 145, 112–124.

Sovacool, B. K., et al. (2023). Spatial justice and energy transitions: A methodological framework for peripheral regions. World Development, 162, 106120.

Sulistyo, I., Priyagus, & Lestari, D. (2026). Does Fiscal Decentralization Impact Environmental Quality in Indonesia? Equity: Jurnal Ekonomi, 15(1), 88–102.

Teulon, F., et al. (2026). Decentralizing the benefits of green growth: A spatial justice perspective. Geoforum, 169, 104150.

Zhang, L., et al. (2024). Mitigating the subnational resource curse through localized emissions trading systems. Journal of Environmental Management, 352, 120050.

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