

Integrating Environmental Justice Framework in Indonesia's Net Zero Emission Roadmap by 2060

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Abstract. Indonesia's commitment to achieving net zero emissions by 2060 represents a significant milestone in national climate governance. However, existing mitigation pathways largely prioritize technical and economic efficiency, while social equity and justice considerations remain insufficiently institutionalized. This study examines how an environmental justice framework can be systematically integrated into Indonesia's net zero emission roadmap to support a fair and inclusive climate transition. Using a qualitative normative and policy analysis, this research reviews national climate policies and key environmental justice literature to assess distributive, procedural, and recognition dimensions within Indonesia's climate strategy. The findings reveal that justice-related elements are fragmented and weakly embedded in long-term planning, particularly in relation to burden-sharing, public participation, and protection of vulnerable communities. This study argues that embedding environmental justice as a core governance principle can enhance policy legitimacy, reduce socio-environmental risks, and strengthen the sustainability of Indonesia's pathway toward net zero emissions by 2060.

1 Introduction

Net zero emission targets have become a defining feature of contemporary climate governance as countries seek to align national development pathways with global climate objectives. Indonesia's pledge to achieve net zero emissions by 2060 reflects its growing role in global mitigation efforts and its responsibility as a major emitter and biodiversity-rich country. Nevertheless, a growing body of research indicates that climate mitigation policies may generate unequal social and environmental outcomes when justice considerations are not embedded in policy design [1]. Issues such as unequal distribution of mitigation costs, differential access to climate benefits, and limited participation of affected communities remain central concerns in climate policy implementation, particularly in developing economies.

Scholarly debates on climate justice have advanced beyond ethical discussions toward analytical frameworks that examine distributive, procedural, and recognition dimensions

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of justice [2]. These frameworks have been applied in studies assessing carbon markets, energy transitions, and land-use policies. In the Indonesian context, existing research predominantly focuses on technical mitigation options, institutional coordination, and sectoral emission pathways, especially in the energy and land-use sectors [3]. Although some studies acknowledge social impacts, justice considerations are often addressed in a fragmented manner and treated as secondary to emission reduction targets. As a result, long-term climate strategies tend to overlook how social inequalities shape and are shaped by climate policies.

This gap highlights the need for a systematic integration of environmental justice into Indonesia's net zero emission roadmap. This study contributes to the literature by conceptualizing environmental justice not as an auxiliary principle, but as a structural component of climate governance. The objective of this research is to develop a justice-oriented analytical framework for Indonesia's net zero pathway toward 2060. Using a qualitative normative approach grounded in policy analysis, this study advances the concept of a just and inclusive climate transition tailored to Indonesia's socio-environmental context.

2 Method

This study adopts a qualitative normative research design combined with policy analysis. The research examines Indonesia's national climate strategies, including long-term development plans and emission reduction roadmaps, alongside international climate governance principles and environmental justice scholarship.

Data sources consist of national policy documents, government reports, and peer-reviewed academic literature. The analytical framework is structured around three core dimensions of environmental justice: distributive justice (allocation of costs and benefits), procedural justice (participation and decision-making), and recognition justice (acknowledgment of vulnerable and marginalized groups). Through doctrinal and conceptual analysis, the study evaluates the extent to which these dimensions are embedded in Indonesia's net zero emission roadmap.

3 Results and discussion

3.1 Results

The analysis indicates that Indonesia's net zero emission roadmap strongly emphasizes emission trajectories, technological transitions, and sectoral mitigation measures. However, justice-related dimensions are weakly articulated and lack binding mechanisms. Distributional concerns—such as who bears the economic and social costs of decarbonization—are rarely addressed explicitly, raising the risk of disproportionate impacts on low-income and resource-dependent communities. **Table 1** shows the environmental justice dimensions in Indonesia's Net Zero Roadmap.

From a procedural perspective, climate governance mechanisms in Indonesia provide limited opportunities for deliberative public engagement. Participation often occurs at late stages of policy formulation, reducing the influence of local communities on

outcomes. Recognition justice is also underdeveloped, as climate policies rarely differentiate between social groups with varying levels of vulnerability, despite strong evidence from environmental justice literature emphasizing the importance of contextualized governance [4]. To address these gaps, this study proposes an integrated environmental justice framework that embeds fairness, participation, and recognition within climate planning. Such a framework aligns with the concept of a “just transition,” ensuring that emission reductions do not exacerbate social inequalities [5].

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Table 1. Environmental justice dimensions in Indonesia’s net zero roadmap

Justice Dimension	Current Policy Focus	Identified Gaps
Distributive Justice	Emission reduction efficiency	Lack of burden-sharing mechanism
Procedural Justice	Formal stakeholder consultation	Limited meaningful participation
Recognition Justice	General reference to communities	Insufficient protection vulnerable groups

Table 2. Empirical distribution of climate mitigation impacts in Indonesia

Main Mitigation Policy	Empirical Impact Identified	Justice Implication
Coal phase-down, renewable transition	Job losses in coal-dependent regions (East Kalimantan, South Sumatra); limited reskilling access	Distributive & recognition injustice
Reduced deforestation, carbon offset programs	Restricted access to land; tenure conflicts with local communities	Recognition & procedural injustice
Blue carbon and ecosystem restoration	Unequal benefit-sharing; exclusion of small-scale fishers	Distributive injustice
Emission trading and carbon tax	Increased energy costs affecting low-income households	Distributive injustice

Table 2 demonstrates that Indonesia’s climate mitigation measures produce empirically observable socio-economic impacts that vary significantly by sector. In the energy sector, studies show that coal phase-down policies may disproportionately affect workers and communities in coal-dependent regions, where alternative employment opportunities and retraining programs remain limited [6]. This raises concerns of distributive justice, as the costs of decarbonization are concentrated among specific groups.

In the forestry and land-use sector, empirical research highlights tenure insecurity and access restrictions linked to conservation and carbon offset initiatives. These impacts often affect indigenous peoples and local communities whose land rights are weakly

recognized within formal governance systems [7]. This situation illustrates recognition injustice, as affected groups are insufficiently acknowledged as rights holders within climate policy frameworks.

In coastal and mangrove ecosystems, blue carbon initiatives have demonstrated mitigation potential but frequently lack equitable benefit-sharing mechanisms. Empirical findings indicate that financial and institutional benefits are often captured by state or private actors, while local fishers and coastal communities bear opportunity costs [8]. This reflects distributive injustice embedded in ecosystem-based mitigation strategies.

Finally, carbon pricing instruments, including emissions trading and carbon taxation, have been shown to indirectly affect low-income households through higher energy prices. Without compensatory measures, such policies risk reinforcing existing socio-economic inequalities [9]. These empirical patterns underscore the need for justice-sensitive policy design.

The empirical findings summarized above reinforce the argument that environmental justice must be integrated into Indonesia's net zero emission roadmap as a structural principle. Justice-oriented climate governance requires explicit mechanisms for fair cost distribution, recognition of vulnerable groups, and inclusive decision-making. Empirical evidence suggests that failure to address these dimensions may undermine public acceptance and long-term policy effectiveness.

3.2 Discussion

Indonesia's environmental justice framework aligns with several international commitments. The participatory governance pillar operationalizes Principle 10 of the Rio Declaration on Environment and Development [10]. Recognition of indigenous rights reflects the UN Declaration on the Rights of Indigenous Peoples, which Indonesia endorsed in 2007. The just transition approach resonates with ILO Guidelines for a Just Transition toward Environmentally Sustainable Economies and Societies [12].

However, effective implementation must navigate tensions between global norms and local realities. International frameworks often assume state capacity and rule of law that remain aspirational in many Indonesian contexts. The framework therefore emphasizes incremental capacity building and multi-stakeholder accountability rather than solely state-led enforcement [13].

Some critics argue environmental justice requirements slow climate action when urgency demands rapid deployment. Our analysis suggests this represents false dichotomy. Justice-oriented approaches can accelerate transitions by building social license, reducing conflicts, and ensuring policy durability across political cycles [14]. Nonetheless, real trade-offs exist. Extensive consultation requires time and resources. Benefit-sharing reduces project financial returns potentially deterring investment. These trade-offs necessitate honest dialogue about acceptable costs, with recognition that justice delayed is often justice denied for vulnerable communities already bearing environmental burdens. Importantly, many justice mechanisms create synergies. Community ownership of renewable energy simultaneously advances equity and deployment. Skills training for coal workers both supports livelihoods and builds green

sector workforce. Environmental remediation creates employment while restoring ecosystems [15].

Indonesia's framework shares elements with just transition initiatives in South Africa's coal regions, Scotland's North Sea transition, and Germany's coal phase-out. However, Indonesia's context differs significantly in terms of informal economy dominance, indigenous land rights complexity, and rapid development pressures. Comparative analysis suggests several lessons: (1) early planning prevents crises but requires political courage; (2) dedicated financing is essential but insufficient without institutional reform; (3) worker voice matters but community participation must extend beyond organized labor; (4) regional differentiation is necessary given diverse local conditions; (5) transparency and accountability require active civil society ecosystems [15].

This study contributes to emerging environmental justice scholarship in Global South contexts. While much environmental justice research focuses on Global North, developing economies face distinct challenges including development-environment tensions, weak institutional capacity, and colonial legacies shaping resource governance. The framework advances understanding of how justice principles can be operationalized in rapid development contexts. It demonstrates that justice and climate ambition are compatible when approached systematically rather than as afterthoughts. The multi-level governance approach offers insights for other decentralized political systems navigating climate transitions.

4 Conclusion

Indonesia is currently positioned at a pivotal moment in its climate governance trajectory. The national commitment to achieving net zero emissions by 2060 presents not only a pathway for addressing climate change, but also a strategic opportunity to confront long-standing patterns of environmental inequality that have disproportionately affected marginalized and vulnerable communities. Without the deliberate and systematic integration of justice considerations, however, the low-carbon transition risks entrenching existing disparities or generating new forms of socio-environmental exclusion.

The environmental justice framework advanced in this study demonstrates that ambitious climate action and social equity are fundamentally complementary rather than contradictory objectives. Integrating justice principles into climate policy design can strengthen societal acceptance, minimize distributional conflicts, and enhance the long-term resilience of climate governance. A just transition acknowledges empirical evidence that communities with the least historical responsibility for greenhouse gas emissions are often those most exposed to the adverse impacts of both climate change and mitigation policies, underscoring the ethical and practical necessity of equitable burden-sharing.

Indonesia's transition toward net zero emissions will necessarily be a long-term and adaptive process, requiring sustained political commitment, institutional capacity, and adequate allocation of financial and technical resources. The framework proposed in this study should therefore be understood as an initial analytical foundation rather than a fixed or exhaustive model. Its primary contribution lies in establishing environmental

justice as a core and non-negotiable principle guiding climate policy, rather than as an ancillary or discretionary consideration.

Ultimately, the success of Indonesia's climate transition will depend on the extent to which the perspectives and lived experiences of vulnerable communities are meaningfully integrated into decision-making processes. Elevating their participation, recognizing their knowledge systems, and safeguarding their rights are essential for ensuring that the transition is both socially legitimate and environmentally sustainable. Through such an inclusive and justice-centered approach, Indonesia can advance its net zero objectives while fostering a more equitable and resilient society.

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