

Eco-Social Welfare and Energy Citizenship: Integrating Environmental Governance and Social Policy to Tackle the Socio-Ecological Crisis

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Manuscript received May 9, 2026; accepted May 13, 2025; publish May 19, 2026.

Abstract—This paper explores the integration of environmental governance and social policy through the emerging paradigm of eco-social welfare. As global societies confront escalating socio-ecological crises driven by climate change, resource inequality, and environmental degradation, welfare systems that depend on economic growth are increasingly unsustainable. This study synthesizes the concepts of eco-welfare, sustainable welfare, and energy citizenship to construct a conceptual framework for adaptive policy transformation. Employing a qualitative synthesis and comparative policy analysis, it highlights the interdependence between environmental sustainability and social justice, arguing that effective welfare reform must integrate decarbonization, pre-distribution, and participatory governance. Using Indonesia's energy transition as a contextual case, particularly the persistence of energy poverty in eastern provinces such as Nusa Tenggara Timur, the research situates eco-social welfare as both a theoretical advancement and a practical policy direction. The resulting Eco-Social Governance Framework connects welfare systems, citizen participation, and ecological limits within a unified adaptive policy model. The study concludes that eco-social governance offers a strategic pathway for sustainable welfare transformation in the Anthropocene, enabling developing economies to pursue inclusive growth, climate resilience, and social equity within planetary boundaries.

Keywords—eco-welfare, energy citizenship, environmental governance, socio-ecological crisis, sustainable welfare, public policy

I. INTRODUCTION

The accelerating climate crisis underscores a profound tension between environmental limits and social welfare. Traditional welfare systems in both developed and developing nations were designed within the paradigm of continuous economic growth. However, this paradigm is now in conflict with the ecological boundaries of the planet [1]. As environmental degradation, resource depletion, and carbon dependency intensify, welfare states face fiscal and ethical challenges: how to maintain social protection and equality while pursuing decarbonization and sustainability.

In response, the concept of *eco-social welfare* [2] proposes a transformative synthesis that merges environmental and social policy objectives. This paradigm redefines the welfare state as a mechanism for ecological justice and sustainable well-being, emphasizing that social protection can no longer be detached from ecological sustainability. Meanwhile, *energy democracy* and *energy*

citizenship [3] introduce participatory approaches to renewable energy transitions, highlighting citizens as active co-creators rather than passive beneficiaries.

Despite the global relevance of these frameworks, their practical application remains limited in developing economies, particularly in Southeast Asia. In Indonesia, the interdependence between welfare and environmental policy has yet to be systematically integrated. The nation's energy poverty rate remains among the highest in the region, especially in eastern provinces such as Nusa Tenggara Timur (NTT), where electrification rates stand at only 92.5% [4]. At the same time, Indonesia's pledge to achieve net-zero emissions by 2060 [5] demands a just transition that ensures social inclusion and participatory governance.

This paper seeks to bridge global theoretical discourse on *eco-social welfare* with the contextual realities of Indonesia's socio-environmental challenges. It asks three central questions: (1) How can eco-social welfare reconcile environmental limits with welfare sustainability? (2) What role does energy citizenship play in participatory environmental governance? (3) How can these frameworks inform adaptive policy design for Indonesia's energy transition toward sustainable welfare?

II. LITERATURE REVIEW

A. Eco-Social Welfare: Theoretical Foundations

The *eco-social welfare* paradigm arises from the recognition that social and environmental systems are mutually interdependent and cannot be sustained in isolation. Carrosio and Vidovich [2] conceptualize the *socio-ecological crisis* as the dual tension between environmental degradation and the fiscal exhaustion of welfare states. Traditional welfare systems rely on economic growth as their redistributive engine; yet, this same dependence perpetuates unsustainable consumption and carbon-intensive production. Thus, welfare models designed for post-war industrial economies now face ecological obsolescence.

This Fig. 1 [2] illustrates the reciprocal relationship between environmental degradation and the fiscal crisis of welfare states, as conceptualized by Gough [1]. The model shows how biocapacity depletion and economic acceleration intensify the environmental crisis, while legitimization and accumulation pressures reinforce the fiscal crisis, together creating a self-reinforcing socio-ecological loop.

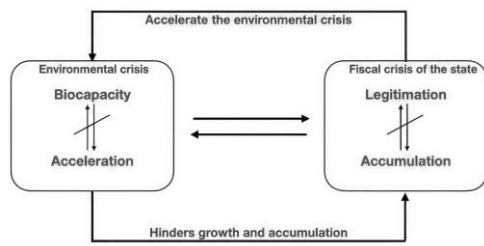


Fig. 1. The interdependencies of the socio-ecological crisis.

Gough [1] extends this critique by exposing the anthropocentric bias in conventional welfare economics. He proposes a needs-based theory of well-being that places ecological limits at the core of social justice. Human needs such as health, autonomy, and security are universal, non-substitutable, and ecologically constrained. This framework establishes an ethical foundation for what he later terms sustainable welfare [6], emphasizing well-being within planetary boundaries.

Integrating these perspectives, the eco-social welfare paradigm represents a normative and institutional transformation. It challenges the traditional dualism between economy and environment, proposing instead that well-being should derive from social and ecological resilience rather than material throughput. Policies must therefore shift from reactive redistribution, which compensates for market failure, to proactive pre-distribution and prevention, which address social and environmental risks before they materialize. Carrosio and Vidovich [2] highlight that such integration requires rethinking policy architectures so that welfare and environmental strategies operate as interdependent, co-evolving domains rather than parallel policy silos.

As illustrated in Fig. 1, the socio-ecological crisis arises from the reciprocal interaction between environmental degradation and the fiscal exhaustion of welfare states. The logic of continuous economic expansion undermines ecological biocapacity, while the ensuing environmental crisis constrains state revenues and redistributive capacity. This self-reinforcing cycle exposes the unsustainability of welfare systems that depend on fossil-fueled growth and highlights the need for a paradigm capable of integrating social and ecological objectives.

Eco-welfare emerges as a normative response to this dual crisis. Rather than viewing welfare and environmental policy as separate or even competing domains, eco-welfare conceptualizes them as interdependent and co-constitutive. It calls for pre-distributive strategies that integrate ecological limits into the design of welfare institutions and address environmental risks before they translate into social inequities. This paradigm shift redefines welfare not merely as compensation for market failures, but as a proactive instrument for ecological justice and sustainable well-being.

The eco-welfare paradigm can therefore be understood as a conceptual bridge between welfare and environmental policy domains. As shown in Fig. 2 [2], eco-welfare integrates the redistributive mechanisms of welfare systems with the preventive and resilience-oriented objectives of environmental governance, forming a unified policy space for sustainability.

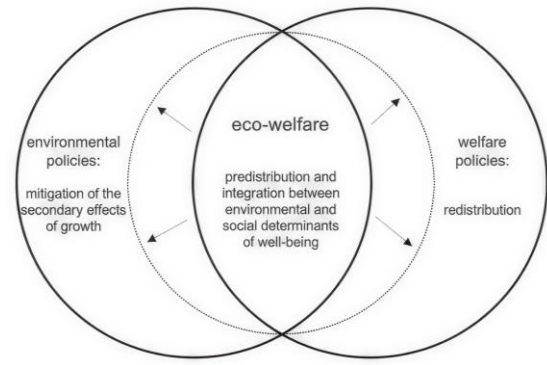


Fig. 2. The Configuration of eco-welfare between environmental and social policies.

B. Energy Democracy and Energy Citizenship

The literature on energy transition underscores the centrality of citizen participation in democratizing the governance of energy systems. Wahlund and Palm [3] define energy citizenship as a participatory model in which individuals and communities co-produce energy, engage in decision-making, and co-shape sustainable energy transitions. Their comprehensive review distinguishes energy democracy as a broader institutional reform agenda focused on collective ownership, policy transparency, and equitable access while energy citizenship centers on agency at the individual and community levels.

Both frameworks share a normative commitment to justice, equity, and sustainability. They reject the neoliberal framing of citizens as passive “energy consumers,” emphasizing their role as co-creators of low-carbon futures. Energy democracy thus advocates for redistribution of power and ownership within the energy sector, while energy citizenship highlights the behavioral, ethical, and participatory dimensions of that transformation. Together, they represent complementary scales of democratic energy governance: institutional and societal.

Wahlund and Palm [3] also note that energy citizenship operates through multiple modes of engagement ranging from everyday sustainable practices (e.g., energy saving, prosumer behavior) to collective activism and local policy participation. These forms of engagement contribute to social learning and cultural change, both essential for long-term energy transition.

This conceptual framework aligns closely with the eco-social welfare paradigm, which situates citizen agency and collective responsibility within ecological limits. While energy democracy provides the structural foundation for equitable energy systems, energy citizenship embodies the social capabilities and ethical commitment necessary to sustain them. When embedded within welfare systems, these participatory practices can transform energy governance into a vehicle for social inclusion, solidarity, and environmental resilience core elements of eco-social welfare.

In developing contexts such as Indonesia, these concepts hold transformative potential. Decentralized energy systems and community-based renewables could empower local citizens, aligning energy access policies with broader goals of welfare equity and sustainable development. Thus, energy democracy and energy citizenship together offer a pathway to

reimagining not only energy systems but also welfare institutions under the constraints of climate change.

C. Integrating Theories: Toward an Eco-Social Governance Framework

Integrating eco-social welfare and energy citizenship theories gives rise to the concept of Eco-Social Governance, a comprehensive model that unites welfare reform, environmental resilience, and participatory democracy. This integration transcends the conventional separation between social and environmental policy domains, proposing a unified approach that situates welfare systems within the limits of ecological sustainability while empowering citizens as active co-governors of energy transitions.

Conceptually, eco-social welfare provides the normative foundation by redefining welfare not as post-distributive compensation, but as proactive investment in human and ecological well-being. Energy citizenship, on the other hand, operationalizes this foundation through participatory practices co-production, collective ownership, and community-level governance that make sustainability socially embedded. When integrated, these two frameworks produce a governance logic in which environmental goals and welfare objectives reinforce one another through participatory and preventive policy mechanisms.

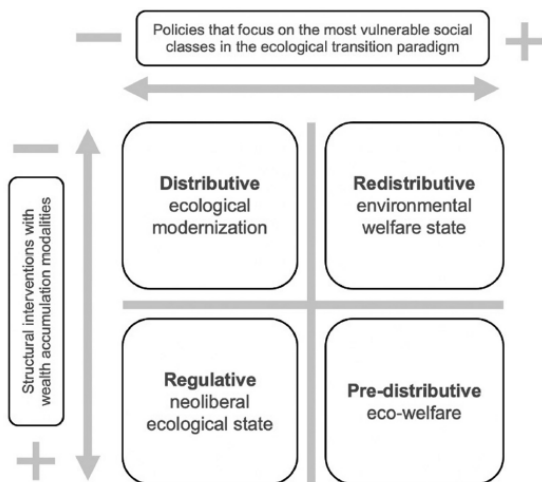


Fig. 3. Fourfold classification of policy models within the ecological transition and the wealth accumulation cycle.

This Fig. 3 [2] illustrates four types of state interventions: regulative, distributive, redistributive, and pre-distributive, adapted from [7] policy typology and applied to the ecological transition paradigm [2]. The pre-distributive eco-welfare model represents the most transformative approach, integrating preventive and participatory principles within welfare and environmental governance.

The Eco-Social Governance Framework thus envisions welfare sustainability as contingent upon three interrelated pillars: environmental resilience, social equity, and civic participation. Environmental resilience ensures that welfare systems operate within ecological boundaries; social equity guarantees fair distribution of resources and opportunities; and civic participation embeds democratic legitimacy and adaptive capacity in policy processes. Together, these elements construct a multidimensional policy lens capable of addressing the intertwined challenges of energy poverty,

climate adaptation, and welfare sustainability simultaneously.

Beyond theoretical synthesis, the framework also provides a heuristic tool for policymakers. It guides governments in designing adaptive, cross-sectoral policies that integrate welfare, energy, and environmental goals. By institutionalizing participatory governance and embedding ecological principles into social policy, the Eco-Social Governance Framework represents both a conceptual innovation and a strategic pathway for achieving sustainable welfare in the Anthropocene era.

III. MATERIALS AND METHODS

This study employs a qualitative and conceptual synthesis approach designed to integrate theoretical insights from the fields of welfare economics, environmental governance, and participatory energy policy. Such an approach is appropriate for addressing the study's objective to develop an integrative conceptual framework (Eco-Social Governance) since it prioritizes analytical reasoning and theory-building over empirical measurement.

The research combines Systematic Literature Review (SLR) and comparative policy analysis. The SLR component ensures comprehensive coverage of peer-reviewed journal articles, policy reports, and sustainability assessments published between 2015 and 2023. These sources were selected from databases such as ScienceDirect, Taylor & Francis Online, and SpringerLink, using key terms including "eco-social welfare", "sustainable welfare", "energy citizenship", and "environmental governance". Policy documents and statistical reports ([4, 5, 8–10]) provide contextual grounding for the Indonesian case.

The analytical process followed four structured stages:

- 1) Thematic Extraction: Identification of core theoretical constructs (eco-welfare, sustainable welfare, energy democracy, and energy citizenship) and their interrelations.
- 2) Comparative Analysis: Mapping conceptual overlaps and divergences between welfare state theory and environmental governance literature.
- 3) Conceptual Integration: Synthesizing the extracted themes into the *Eco-Social Governance Framework*, illustrating the linkages among welfare mechanisms, civic participation, and ecological boundaries.
- 4) Contextual Application: Applying the framework to Indonesia's socio-environmental policy landscape, particularly energy poverty and transition strategies, drawing on BPS data, SDG targets, and the Net Zero Emission Roadmap 2060 [5].

This mixed qualitative–conceptual design enables both theoretical generalization and contextual specificity. The integration of literature synthesis and policy comparison enhances conceptual validity ensuring that theoretical propositions are systematically grounded in existing evidence and strengthening the transferability of findings to similar socio-ecological contexts. Overall, the methodology provides a rigorous and transparent basis for linking normative theories with applied policy challenges in Indonesia's energy transition.

IV. RESULT AND DISCUSSION

A. Dimensions of Eco-Social Welfare

The eco-social welfare paradigm can be understood through three interrelated dimensions: (1) Decarbonization of welfare systems, (2) Pre-distribution and prevention, and (3) Participatory and deliberative governance. Together, these dimensions define how welfare systems can evolve from reactive compensation mechanisms into proactive, sustainable, and inclusive governance frameworks.

1) Decarbonization of welfare systems

The first dimension involves aligning welfare institutions with the goals of carbon neutrality and environmental sustainability. Gough [6] argues that welfare states have historically been tied to carbon-intensive models of production and consumption. Decarbonizing welfare thus requires reorienting public expenditure, subsidies, and infrastructure toward low-emission sectors. Examples include transitioning from fossil fuel subsidies to renewable energy investments, promoting public transport and energy-efficient housing, and embedding environmental criteria in social spending. This transformation not only reduces ecological footprints but also enhances fiscal sustainability by minimizing the long-term social costs of climate change.

Conceptually, this dimension addresses the paradox of growth-dependent welfare. Traditional welfare states rely on economic expansion for redistribution, yet such growth undermines ecological stability. Decarbonized welfare redefines prosperity beyond GDP growth, aligning with the notion of “sustainable well-being” that prioritizes quality of life within planetary boundaries.

2) Pre-distribution and preventive policies

The second dimension emphasizes prevention overcompensation. Instead of merely redistributing resources after social or environmental damage occurs, eco-welfare promotes pre-distributive policies that prevent inequality and degradation at their source [6]. This includes structural reforms such as inclusive access to clean energy, green housing, and early investment in education and health that reduce vulnerability to environmental shocks.

Pre-distribution is both ethical and efficient: it anticipates risks and redistributes opportunities before crises arise. Policies that integrate environmental and social objectives such as subsidies for renewable energy in low-income communities or incentives for sustainable consumption illustrate how preventive strategies can generate co-benefits for welfare and the environment. This approach shifts welfare from a reactive safety net into an enabling framework for resilient and low-carbon societies.

3) Participatory and deliberative governance

The third dimension concerns the governance process itself. Eco-welfare cannot succeed without democratic legitimacy and social engagement. Participation transforms welfare from a top-down redistributive mechanism into a co-governed model of shared responsibility. Wahlund and Palm [3] conceptualize energy citizenship as a form of participatory governance where citizens contribute to

decision-making, co-produce energy, and hold institutional actors accountable.

Participatory governance strengthens policy outcomes in three ways. First, it ensures policy responsiveness through citizen feedback and localized knowledge. Second, it enhances equity by giving marginalized groups a voice in sustainability transitions. Third, it builds social trust and collective ownership critical for long-term commitment to decarbonization policies. Mechanisms such as community energy cooperatives, participatory budgeting for green projects, and local consultation platforms exemplify this dimension in practice.

4) Integration of the three dimensions

These dimensions are not discrete but mutually reinforcing. Decarbonization provides the structural direction, pre-distribution delivers the preventive logic, and participation ensures legitimacy and adaptability. When embedded together, they constitute a self-reinforcing eco-social governance cycle: sustainable welfare enables environmental stability, which in turn strengthens the social foundations of collective well-being. This integrative logic anchors the Eco-Social Governance Framework developed in this study, serving as both a conceptual model and a policy tool for sustainable transformation.

B. The Eco-Social Governance Framework

The Eco-Social Governance Framework integrates the core principles of eco-social welfare and energy citizenship into a unified model for sustainable policy design. As illustrated in Fig. 1, the framework posits that the long-term sustainability of welfare systems depends on the dynamic interplay among three foundational pillars: (1) Environmental Limits, (2) Social Justice, and (3) Participatory Governance. These pillars collectively define the conditions under which welfare, environmental, and democratic systems can co-evolve toward sustainability.

Environmental Limits serve as the ecological boundaries within which welfare policies must operate. Drawing from studies [1, 6], this pillar recognizes that social well-being cannot be achieved at the expense of planetary stability. Welfare systems must therefore internalize ecological constraints through decarbonization, sustainable resource management, and green public investment to ensure intergenerational equity.

Social Justice represents the ethical and distributive dimension of the framework. Carrosio and Vidovich [2] argue that eco-social policy must address not only the fiscal and environmental crises but also the growing inequalities they produce. This pillar emphasizes the equitable distribution of energy access, environmental benefits, and welfare opportunities, ensuring that climate mitigation and adaptation efforts do not exacerbate social disparities.

Participatory Governance provides the procedural and institutional foundation of the framework. Wahlund and Palm [3] conceptualize energy citizenship as a mechanism through which individuals and communities actively co-govern energy systems and sustainability transitions. Embedding participation into welfare and environmental policymaking enhances democratic legitimacy, accountability, and adaptive capacity.

The intersection of these three pillars forms the space of adaptive eco-social policy, where welfare objectives align with ecological boundaries and citizen agency. This model emphasizes co-evolution rather than trade-offs: environmental goals reinforce welfare sustainability, while participatory governance strengthens both legitimacy and long-term resilience. In this sense, eco-social governance moves beyond the traditional dichotomy between welfare expansion and environmental protection it conceptualizes them as mutually reinforcing processes that together define the foundations of sustainable development.

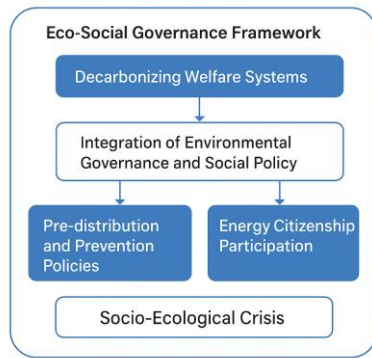


Fig. 4. The eco-social governance framework.

Practically, the framework serves as a heuristic tool for policymakers seeking to operationalize sustainability across sectors. It guides decision-makers in designing cross-ministerial policies that align welfare, environmental, and energy objectives bridging institutional silos that have historically fragmented social and environmental governance. For developing contexts such as Indonesia, this model provides a conceptual foundation for integrating energy justice, social inclusion, and decarbonization strategies into a coherent national policy framework.

C. Empirical Relevance: Indonesia's Energy Poverty and Policy Transition

Indonesia provides a fertile context for operationalizing eco-social welfare. Despite progress, 6.6% of households remain below adequate energy access [4]. The transition toward renewable energy has been dominated by centralized planning with limited local participation. Adopting energy citizenship principles could democratize this process.

Eco-social policy in Indonesia should therefore integrate welfare and environmental priorities to address the interlinked challenges of inequality and sustainability. Specifically, this integration should focus on three main policy alignments: (1) improving access to clean and affordable energy; (2) embedding environmental considerations within social protection programs; and (3) strengthening local governance capacity for participatory decision-making.

First, equitable energy access must become a fundamental component of welfare policy. Programs such as the Listrik Desa (Village Electrification Program) and the National Energy Policy (KEN) should incorporate community-based renewable energy systems to reduce dependence on fossil fuels while promoting social inclusion. Public-private-community partnerships can mobilize local knowledge and resources to accelerate electrification in

remote areas, ensuring that the benefits of clean energy are shared equitably.

Second, environmental sustainability should be mainstreamed into social protection schemes. Climate change increases vulnerability to disasters and income shocks, disproportionately affecting low-income groups. Integrating green adaptation measures such as energy-efficient housing, sustainable agriculture support, and green public works into welfare programs can prevent climate-induced poverty. This approach aligns with Gough's [6] argument for pre-distribution policies that address structural inequalities before crises emerge.

Third, participatory governance must become central to Indonesia's energy transition. Energy citizenship emphasizes the active involvement of citizens in co-producing sustainable energy systems. By institutionalizing community consultations, cooperative ownership models, and transparent energy budgeting, the state can build trust and legitimacy in the energy transition process. Local energy cooperatives and community renewable projects, already emerging in parts of Central Java and Bali, demonstrate the potential of decentralized governance in enhancing both welfare and environmental outcomes.

The integration of these three policy alignments would establish a new form of eco-social governance in Indonesia one that simultaneously tackles poverty, inequality, and carbon dependency. By embedding social justice into environmental policy, Indonesia can move from a compensatory welfare model toward a preventive, participatory, and sustainable welfare state. This transformation is consistent with the 2030 Sustainable Development Goals (SDGs), particularly Goal 7 (Affordable and Clean Energy), Goal 10 (Reduced Inequalities), and Goal 13 (Climate Action).

Furthermore, the government's Net Zero Emission Roadmap 2060 [5] can serve as the backbone for eco-social integration if complemented by strong social policies. Fiscal reform redirecting fossil fuel subsidies to renewable energy investments can strengthen welfare sustainability while reducing emissions. This would create a virtuous cycle: decarbonization supports fiscal stability, which in turn finances inclusive welfare programs.

In conclusion, Indonesia's experience underscores the practical significance of the eco-social welfare paradigm. By adopting participatory governance, ensuring equitable energy access, and linking welfare systems to environmental resilience, Indonesia can emerge as a model for eco-social transformation in the Global South.

D. Discussion: From Theoretical Integration to Policy Practice

The integration of eco-social welfare and energy citizenship theories presents a transformative opportunity for reimagining policy innovation in the Anthropocene era. At the theoretical level, this synthesis transcends the traditional compartmentalization of welfare and environmental policy, establishing a unified paradigm of governance grounded in social justice, ecological resilience, and citizen participation. At the policy level, it provides a practical roadmap for governments to design cross-sectoral mechanisms that ensure

coherence between social protection, sustainability, and energy transition objectives.

Within the Eco-Social Governance Framework (ESGF) developed in this study, theory and policy intersect through three operational logics: integration, redistribution, and participation. Integration ensures that welfare, energy, and environmental policies function as interdependent domains. Redistribution shifts from compensating post-crisis damage to pre-distributing sustainable opportunities. Participation embeds democratic legitimacy and local agency into policy design and implementation.

The implications of this integration extend beyond administrative reform they redefine the normative role of the state. Rather than functioning solely as a redistributor of economic resources, the eco-social state becomes a facilitator of sustainable well-being, enabling citizens and communities to co-create adaptive solutions. This transformation aligns with the principles of Dynamic Governance [11], emphasizing anticipatory, reflective, and collaborative policymaking. It also resonates with Indonesia's long-term development vision, which aspires to achieve inclusive growth, climate resilience, and social justice under the Sustainable Development Goals (SDGs) framework.

For developing economies such as Indonesia, adopting the Eco-Social Governance Framework offers a strategic pathway toward policy coherence and institutional adaptability. It provides not only a model for integrating welfare and environmental objectives but also a paradigm for rethinking state–citizen relations in the era of climate change anchoring national development in sustainability, participation, and equity.

V. CONCLUSION

This paper contributes to the expanding discourse on eco-social welfare by integrating theoretical and practical perspectives from environmental governance, welfare economics, and participatory energy policy. Through the synthesis of eco-social welfare and energy citizenship theories, the study developed the Eco-Social Governance Framework (ESGF) a conceptual model that redefines welfare sustainability as a product of environmental resilience, social equity, and participatory governance.

Theoretically, this framework bridges the long-standing divide between welfare and environmental policy, offering a unified paradigm for understanding social well-being within planetary boundaries. Practically, it provides policymakers with a roadmap for designing adaptive, cross-sectoral strategies that simultaneously advance decarbonization, social inclusion, and democratic participation.

For Indonesia, the findings highlight that sustainable welfare in the 21st century demands more than technological innovation it requires institutional transformation. Governments must embed decarbonization principles within welfare systems, empower citizens as co-producers of sustainable energy, and institutionalize eco-social coordination mechanisms that integrate social, environmental, and economic objectives. These reforms would not only strengthen Indonesia's capacity to achieve the Sustainable

Development Goals (SDGs) but also position it as a model for eco-social policy innovation in the Global South.

Ultimately, as Gough [1] reminds us, human needs are universal yet ecologically bounded. Meeting them equitably and sustainably defines the moral and political essence of welfare in the Anthropocene era. The Eco-Social Governance Framework thus provides both a conceptual compass and a practical instrument for navigating this global transformation where social justice and ecological integrity must evolve together.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

F.K.M. developed research ideas and concept, and wrote a preliminary script; M.J. developed methodology and provided research documentation; F.K. and I.C.W. conducted field research, and managed and organized data; all authors discussed research results and findings, and had approved the final version

ACKNOWLEDGMENT

The author wishes to express sincere gratitude to Lembaga Pengelola Dana Pendidikan (LPDP), Ministry of Finance of the Republic of Indonesia, for providing the scholarship that made this research possible. The author also wishes to thank academic supervisors, colleagues, and research peers for their valuable insights and discussions that contributed to the refinement of this work.

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