



Who Pays for Economic Growth? Unequal Ecological Risks in Indonesia's Eight-Percent Growth Model

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Abstract

Indonesia's ambition to achieve rapid economic growth, including an eight-percent growth target, raises an important question about how the environmental and social costs of development are distributed. Economic growth indicators generally capture production, investment, and income while providing limited insight into pollution, ecosystem degradation, displacement, public health impacts, and the loss of community livelihoods. This article examines Indonesia's growth-oriented development model through the concept of environmental externalities and distributive environmental justice. It asks whether the benefits generated by infrastructure, extractive industries, industrialization, and resource-based development are distributed proportionately with the risks they create. The analysis focuses on the structural separation between economic beneficiaries and communities exposed to ecological damage. Such disparities may occur across regions, social classes, generations, and urban-rural spaces. The article argues that environmental costs are frequently treated as external to economic calculations even when they generate substantial long-term burdens for communities and public institutions. Consequently, headline economic growth may coexist with declining environmental quality and increasing social vulnerability. A more comprehensive assessment of development should therefore incorporate ecological costs, social reproduction, public health, and intergenerational justice into economic decision-making. The article concludes that sustainable growth requires moving from a narrow growth-centered paradigm toward a model in which environmental integrity and social well-being constitute fundamental measures of economic success.

[Ambisi Indonesia untuk mencapai pertumbuhan ekonomi yang pesat, termasuk target pertumbuhan delapan persen, memunculkan pertanyaan penting tentang bagaimana biaya lingkungan dan sosial dari pembangunan didistribusikan. Indikator pertumbuhan ekonomi umumnya mencakup produksi, investasi, dan pendapatan, sementara memberikan wawasan terbatas tentang polusi, degradasi ekosistem, penggusuran, dampak kesehatan masyarakat, dan hilangnya mata pencaharian masyarakat. Artikel ini



mengkaji model pembangunan berorientasi pertumbuhan Indonesia melalui konsep eksternalitas lingkungan dan keadilan lingkungan distributif. Artikel ini mempertanyakan apakah manfaat yang dihasilkan oleh infrastruktur, industri ekstraktif, industrialisasi, dan pembangunan berbasis sumber daya didistribusikan secara proporsional dengan risiko yang ditimbulkannya. Analisis ini berfokus pada pemisahan struktural antara penerima manfaat ekonomi dan masyarakat yang terpapar kerusakan ekologis. Disparitas tersebut dapat terjadi di berbagai wilayah, kelas sosial, generasi, dan ruang perkotaan-pedesaan. Artikel ini berpendapat bahwa biaya lingkungan sering diperlakukan sebagai hal yang eksternal terhadap perhitungan ekonomi, bahkan ketika biaya tersebut menimbulkan beban jangka panjang yang substansial bagi masyarakat dan lembaga publik. Akibatnya, pertumbuhan ekonomi yang tampak jelas dapat terjadi bersamaan dengan penurunan kualitas lingkungan dan peningkatan kerentanan sosial. Oleh karena itu, penilaian pembangunan yang lebih komprehensif harus memasukkan biaya ekologis, reproduksi sosial, kesehatan masyarakat, dan keadilan antar generasi ke dalam pengambilan keputusan ekonomi. Artikel ini menyimpulkan bahwa pertumbuhan berkelanjutan membutuhkan pergeseran dari paradigma yang sempit dan berpusat pada pertumbuhan menuju model di mana integritas lingkungan dan kesejahteraan sosial menjadi ukuran mendasar keberhasilan ekonomi.]

Keywords: economic growth, environmental externalities, ecological inequality, distributive justice, sustainable development

Introduction

Economic growth remains one of the central measures through which governments evaluate national development. Higher growth is commonly associated with increased production, investment, employment, household income, and fiscal capacity. In developing economies, growth is also frequently presented as a necessary condition for reducing poverty and accelerating structural transformation. Indonesia is no exception. The government has articulated an ambitious objective of achieving economic growth of up to 8 percent by 2029 as part of the 2025–2029 National Medium-Term Development Plan (RPJMN). The strategy places particular emphasis on manufacturing, construction, tourism, investment, and other sectors expected to accelerate structural transformation and raise national productivity (Ministry of National Development Planning/Bappenas 2025). The government has framed this ambition within a broader development agenda that combines high economic growth with poverty reduction and human-capital development.

The pursuit of rapid growth, however, raises a fundamental question that cannot be answered by aggregate economic indicators alone: who benefits from economic growth, and who bears the environmental and social costs required to

produce it? Gross domestic product (GDP) measures the monetary value of goods and services produced within an economy, but it does not by itself distinguish between activities that improve long-term social welfare and activities that generate economic value while imposing environmental or social costs elsewhere. Pollution generated by industrial production may contribute to GDP through manufacturing output, while the resulting health costs may be borne by households or public institutions. Natural-resource extraction may increase investment and export earnings while simultaneously reducing ecological functions, degrading landscapes, or undermining livelihoods that depend upon forests, rivers, agricultural land, and coastal ecosystems. The resulting discrepancy between measured economic gains and unmeasured social and ecological losses represents a central problem of growth-centered development.

This problem is closely connected to the economic concept of externalities. In the classical formulation developed by Pigou (1920), an externality arises when the actions of one economic actor impose costs or benefits on others that are not fully reflected in market transactions. Environmental pollution represents a particularly important negative externality because producers and consumers may not bear the full social costs generated by their activities. When these costs are transferred to communities, ecosystems, or future generations, the apparent efficiency of economic production can depend upon the exclusion of environmental damages from economic calculation. Coase (1960) subsequently demonstrated that the allocation of property rights and transaction costs influences the possibility of addressing externalities through bargaining, but his analysis also highlights an important institutional problem: environmental conflicts cannot be resolved efficiently when affected parties possess unequal bargaining power or when transaction costs are substantial.

In practice, environmental externalities are rarely distributed randomly. Industrial facilities, mines, plantations, infrastructure projects, ports, power plants, and other forms of economic activity are geographically concentrated, meaning that their environmental consequences are also spatially concentrated. The communities living closest to productive activities may experience air pollution, water contamination, land degradation, noise, traffic, health risks, and livelihood disruption, while the economic benefits generated by those activities may circulate across distant cities, corporations, financial institutions, consumers, and national governments. Environmental burdens can therefore remain local even when the economic benefits become national or global. This spatial separation between the location of production and the distribution of benefits provides an important basis for understanding ecological inequality.

The concept of environmental justice expands the analysis beyond the question of aggregate environmental damage by asking how environmental benefits and burdens are distributed and whose interests are represented in environmental decision-making. Schlosberg (2007) argues that environmental justice involves multiple dimensions, including distribution, recognition, participation, and

capabilities. From this perspective, an environmentally unjust development model is not simply one that produces pollution. It is one in which particular groups systematically receive fewer benefits while carrying disproportionate environmental risks, lack recognition of their interests and identities, possess limited influence over decisions, or experience reduced capabilities to maintain a healthy and secure life. Walker (2012) similarly emphasizes that environmental justice is fundamentally concerned with the social distribution of environmental risks and benefits.

This perspective is particularly relevant to Indonesia because economic development is strongly connected to the exploitation and transformation of natural resources. Mining, energy production, plantation agriculture, industrial processing, infrastructure development, and urban expansion have contributed to national economic activity while also generating significant environmental pressures. The relationship between economic growth and environmental degradation is therefore not necessarily linear or uniform. Research on Indonesia has examined the environmental implications of economic growth, foreign direct investment, and the pollution-haven and Environmental Kuznets Curve hypotheses, demonstrating that the relationship between growth and environmental quality depends on the structure of production, investment, technology, and environmental regulation (Parahyangan, Maulana, and Hartanto 2023). Such findings challenge the assumption that economic growth will automatically generate environmental improvement as income increases.

The issue becomes particularly important when growth strategies depend on sectors with substantial ecological footprints. Manufacturing and industrial processing, for example, can generate employment and increase value added while requiring large quantities of energy, water, land, and raw materials. Extractive industries can generate export revenues and fiscal contributions while transforming landscapes and producing waste. Infrastructure can improve connectivity and stimulate investment while fragmenting ecosystems and altering land-use patterns. These effects should not be interpreted as evidence that development is inherently harmful. Rather, they demonstrate that economic production involves material and ecological relationships that conventional growth indicators only partially capture.

The Indonesian government's 8 percent growth ambition makes this question particularly significant because the scale and speed of development required to achieve such a target may increase pressure on natural resources and infrastructure systems. Bappenas has identified manufacturing, construction, and tourism among the sectors expected to serve as major engines of growth toward the 8 percent target (Ministry of National Development Planning/Bappenas 2025). These sectors have the potential to generate substantial economic and employment benefits, but they also involve land conversion, energy consumption, resource extraction, transportation, and environmental pressures. The analytical challenge is therefore not to reject economic growth as such, but to examine whether the environmental

costs associated with accelerated growth are adequately anticipated, regulated, and distributed.

This article approaches that question through the concept of ecological inequality. Ecological inequality refers to situations in which environmental resources, risks, and costs are distributed unequally across social groups, territories, or generations. The concept is closely related to environmental justice but places particular emphasis on the structural relationship between economic production and unequal exposure to environmental harm. Martinez-Alier (2002) demonstrates that environmental conflicts frequently emerge because economically powerful actors and less powerful communities assign different values to ecological resources and bear different consequences from their transformation. Environmental conflict is therefore not simply a disagreement about nature; it is also a conflict over the distribution of material benefits, environmental risks, and political authority.

The concept of ecological inequality also requires attention to social reproduction. Environmental degradation does not necessarily appear immediately as a decline in formal income. It can instead increase the time and resources required to maintain everyday life. When water becomes polluted, households may have to purchase water or travel farther to obtain it. When agricultural land becomes degraded, food production may decline and dependence on markets may increase. When fisheries decline, households dependent on aquatic resources may need to seek alternative livelihoods. Such costs may not be recorded as losses in national accounts, yet they represent real transfers of economic and social burdens from producers and beneficiaries of development toward households and communities.

These transfers become especially important when environmental costs are absorbed by public institutions. Pollution-related illness, environmental remediation, disaster recovery, infrastructure adaptation, and ecosystem restoration may require government expenditure. In such cases, the private economic benefits of production can coexist with the socialization of environmental costs. The distinction between private and social costs is therefore central to evaluating the sustainability of growth. If a project generates high private returns but imposes substantial long-term costs on communities and public institutions, its contribution to national welfare cannot be adequately evaluated through investment or output figures alone.

The same problem exists across generations. Natural resources and ecological systems constitute forms of intergenerational wealth. Forests store carbon and support biodiversity; wetlands regulate water; coastal ecosystems protect settlements and support fisheries; agricultural soils sustain future production. When economic activities degrade these systems, part of the cost may be transferred to people who did not participate in the original economic transaction. Intergenerational justice consequently requires that present development decisions consider not only current income but also the ecological assets and risks inherited by future generations (Rawls 1971; Weiss 1989).

Climate change further intensifies this challenge. Economic activities that depend heavily on fossil fuels or involve extensive land-use change can generate greenhouse-gas emissions while creating benefits for particular sectors and regions. The resulting climate risks, however, are distributed across society and can be especially severe for populations with fewer resources to adapt. Climate-related damages therefore add another layer to the question of who pays for growth. The economic benefits of carbon-intensive production can be geographically and temporally concentrated, while climate impacts can extend across national borders and generations.

This article does not assume that economic growth and environmental protection are necessarily incompatible. Rather, it questions a particular growth-centered paradigm in which the quantity of economic output becomes the dominant measure of development success while ecological degradation is treated as an external or secondary concern. The central problem is not growth itself but the institutional arrangements through which growth is produced and evaluated. A growth strategy can potentially improve social welfare if environmental costs are internalized, affected communities possess meaningful political power, ecological limits are respected, and economic benefits are distributed equitably. Conversely, high growth can coexist with declining welfare when environmental costs are systematically shifted onto less powerful groups.

The article therefore asks three interconnected questions. First, how does a growth-oriented development model produce and distribute environmental externalities? Second, which communities, regions, and social groups are most likely to bear the ecological costs associated with accelerated economic activity? Third, how should Indonesia evaluate economic success if conventional growth indicators fail to capture environmental degradation, public-health costs, social reproduction, and intergenerational losses? By addressing these questions, the article moves beyond the conventional debate over whether Indonesia should pursue high growth and instead examines the institutional and distributive conditions under which growth can legitimately be considered sustainable.

Methodologically, the article employs a qualitative political-economy and environmental-justice approach based on secondary analysis of academic literature, Indonesian development policy documents, environmental regulations, and documented evidence concerning resource-based and infrastructure-led development. Rather than attempting to calculate a single aggregate monetary value for all environmental externalities, the analysis traces how economic benefits and ecological burdens are produced, spatially separated, and distributed among different social groups. This approach allows the article to connect macroeconomic objectives with the everyday consequences of development at the community level. It also makes it possible to examine the institutional mechanisms through which environmental costs may become externalized and subsequently absorbed by households, communities, and the state.

The article makes two principal arguments. First, the pursuit of rapid economic growth can generate a structural separation between the beneficiaries of economic activity and those exposed to its ecological risks. This separation is particularly visible where investment, extraction, industrialization, and infrastructure development generate nationally or globally distributed economic benefits while environmental burdens remain concentrated in particular territories. Second, environmental costs that are excluded from conventional economic indicators do not disappear; they are transferred across space, social groups, institutions, and generations. A development model that records the benefits of production while obscuring these transfers risks overstating the actual contribution of growth to social welfare. Accordingly, the question posed by this article—who pays for economic growth?—is not merely rhetorical. It is an analytical question concerning the distribution of environmental risks, economic benefits, political power, and long-term social costs. Answering it requires moving beyond GDP growth toward a broader conception of economic success in which ecological integrity, public health, livelihood security, social reproduction, and intergenerational justice are treated as substantive dimensions of development rather than residual concerns.

Economic Growth and the Production of Environmental Externalities

The relationship between economic growth and environmental degradation cannot be reduced to a simple opposition between development and environmental protection. Economic activity necessarily involves the transformation of materials, energy, land, and ecological systems into goods and services. The central analytical problem therefore concerns how these transformations are organized and how their consequences are valued. When environmental damages are excluded from the economic calculations of production, growth can appear more beneficial than it actually is from the perspective of social welfare. The concept of environmental externalities provides a starting point for understanding this discrepancy because it directs attention to costs generated by economic activities but transferred to actors who are not fully involved in the original transaction (Pigou 1920; Coase 1960).

In conventional economic analysis, a firm may compare the private costs of production with the expected revenues generated by its output. Pollution, ecosystem degradation, or health impacts may not enter this calculation unless they are incorporated through regulation, taxation, liability, or other institutional mechanisms. From a social perspective, however, the relevant calculation is broader. The social cost of production includes both the private costs borne by producers and the external costs imposed upon other members of society. Pigou's (1920) analysis of social costs established the theoretical basis for correcting such divergences through interventions that align private incentives with broader social costs. The importance of this principle extends well beyond classical environmental economics because it establishes a fundamental question for development policy: whether the economic value reported by an activity reflects its actual contribution to collective welfare.

Coase (1960) subsequently challenged the assumption that externalities necessarily require direct state intervention by emphasizing the role of property rights, bargaining, and transaction costs. His contribution is important because environmental conflicts involve questions of institutional authority as much as questions of economic efficiency. In situations where affected parties can negotiate at low cost and possess clearly defined rights, bargaining may theoretically produce efficient outcomes. Yet many environmental conflicts do not satisfy these conditions. Communities may lack formal property rights, information, political influence, or financial resources, while the number of affected individuals may be too large to make private bargaining feasible. The distribution of bargaining power therefore becomes central to understanding why environmental costs persist.

This limitation is especially significant in resource-dependent economies. Natural resources frequently possess multiple forms of value that cannot be reduced to market prices. A forest may simultaneously function as a source of timber, a carbon sink, a biodiversity reservoir, a water-regulation system, a cultural landscape, and a livelihood base. A river may serve as an input into industrial production while also supporting fisheries, agriculture, household consumption, and cultural practices. When one use is prioritized through market transactions or state planning, other forms of value may be marginalized. Martinez-Alier (2002) describes such conflicts as forms of ecological distribution conflict, in which different social groups have unequal access to environmental resources and unequal exposure to ecological costs.

The problem is therefore not simply that environmental resources are “underpriced.” It is also that different forms of ecological value are often evaluated through unequal institutional systems. Market prices tend to privilege values that can be commodified and exchanged, whereas subsistence, cultural, ecological, and intergenerational values may remain poorly represented. This creates what can be understood as a valuation asymmetry: the economic benefits of resource extraction or land conversion become visible in investment, exports, employment, and GDP statistics, while the losses associated with ecological degradation remain dispersed across households, ecosystems, and future generations.

The Environmental Kuznets Curve (EKC) hypothesis offers another influential way of conceptualizing the relationship between economic growth and environmental quality. The basic proposition suggests that some forms of environmental degradation initially increase as income rises but may decline after societies reach higher income levels, producing an inverted-U relationship between income and particular pollutants (Grossman and Krueger 1995). The hypothesis has generated extensive empirical debate because environmental pressures vary according to the pollutant, technology, regulatory system, consumption structure, and production model being examined. Consequently, the existence of an EKC cannot be treated as evidence that economic growth automatically produces environmental improvement.

The Indonesian experience reinforces this caution. Parahyangan, Maulana, and Hartanto (2023), examining Indonesia over the 1980–2021 period, find that the relationship among economic growth, foreign direct investment, and environmental degradation cannot simply be interpreted through an unconditional assumption that investment produces either environmental harm or environmental improvement. Their analysis considers both the Environmental Kuznets Curve and pollution-related hypotheses, illustrating the importance of production structure and investment characteristics in determining environmental outcomes. More recent research focusing on mineral-rich provinces similarly finds a significant relationship between economic activity, mining output, energy consumption, and environmental quality (Ramadanti, Azwardi, and Subardin 2025). These findings are particularly relevant to a growth strategy that relies on manufacturing, resource processing, mining, and infrastructure.

The distinction between scale, composition, and technique effects is useful in interpreting these relationships. Economic growth can increase environmental pressure through the scale effect because greater production requires greater quantities of energy and materials. The composition effect refers to changes in the structure of production: an economy shifting toward heavy industry or resource extraction may generate different environmental consequences from an economy increasingly oriented toward low-material services. The technique effect describes the possibility that technological improvements, cleaner energy, and stricter environmental regulation can reduce environmental damage per unit of output. Economic growth can therefore have contradictory environmental effects depending on which of these processes dominates.

For Indonesia, the scale effect deserves particular attention because the government's growth strategy explicitly identifies manufacturing, construction, and tourism as major drivers toward the 8 percent target (Ministry of National Development Planning/Bappenas 2025). These sectors differ considerably in their environmental profiles, but all require material and spatial inputs. Manufacturing requires energy, water, raw materials, and industrial land. Construction requires minerals, cement, steel, and extensive infrastructure. Tourism can create pressure on coastal, forest, and urban ecosystems through transportation, accommodation, and land conversion. The pursuit of rapid expansion therefore creates a policy challenge: the environmental intensity of growth must be reduced faster than the scale of production increases if economic expansion is to remain within ecological limits.

This point is important because technological efficiency does not automatically guarantee lower total environmental pressure. If the cost of producing one unit of output falls while total production increases substantially, aggregate resource consumption may continue to rise. This phenomenon, often discussed through the concept of rebound effects, demonstrates why improvements in efficiency must be evaluated alongside changes in overall production and consumption. A growth strategy that relies primarily on increasing efficiency without controlling aggregate

ecological pressure may reduce environmental intensity while still increasing absolute environmental damage.

The problem is particularly acute in extractive industries. Mining generates economic value by transforming geological resources into commodities, but the process can involve land clearing, waste generation, water consumption, energy use, and landscape transformation. The economic benefits may include exports, government revenue, employment, and downstream industrial investment. Yet the ecological consequences can remain concentrated around mining areas. The resulting geography creates a structural asymmetry: the commodity circulates through national and global markets, while pollution, land degradation, and livelihood disruption are often experienced locally.

Evidence from Indonesia's mineral-producing regions illustrates this tension. Research on mineral-economy provinces in Eastern Indonesia finds that environmental quality and human development are interconnected and that changes in environmental quality are associated with economic performance (Ramadanti, Azwardi, and Subardin 2025). Rather than supporting the assumption that mining-led economic expansion should be evaluated independently from environmental conditions, this evidence suggests that environmental quality is itself part of the conditions that shape long-term welfare. Environmental degradation can therefore undermine the very development objectives that economic growth is expected to achieve.

This is where the distinction between economic activity and economic welfare becomes essential. GDP records market production, not the distribution of its benefits or the costs that production imposes outside markets. Suppose an industrial project increases regional output while simultaneously contaminating a river. The increased industrial production contributes positively to GDP, while households may subsequently spend additional money purchasing clean water or treating pollution-related illnesses. The expenditure on medical treatment may also contribute to GDP. Yet the increase in measured economic activity does not mean that society has become better off. A portion of the additional economic activity represents expenditure required to compensate for a deterioration in environmental conditions.

This problem has been recognized in critiques of national accounting. Nordhaus and Tobin (1972) demonstrated that conventional economic measures can provide an incomplete representation of welfare because defensive expenditures and environmental disamenities are not adequately distinguished from productive economic activity. More broadly, Daly and Cobb (1989) argued that economic indicators should distinguish between activities that contribute to human welfare and those that merely increase market transactions. Their critique remains relevant to contemporary development strategies because environmental remediation and health expenditures can increase measured economic activity even when they are responses to ecological damage.

The inadequacy of GDP becomes more evident when environmental services are lost without direct market transactions. If a forest is cleared for industrial development, the value of timber and construction activity may be recorded in economic statistics, while the loss of carbon storage, water regulation, biodiversity, and subsistence resources is not necessarily recorded as a corresponding negative entry. The national economy may therefore register a gain even when the underlying stock of ecological wealth declines. This is a form of asset depletion that conventional growth accounting can obscure.

The distinction between income and wealth is particularly important in resource-dependent economies. Extracting a finite resource can increase current income while reducing the stock of natural capital available to future generations. Hartwick's (1977) rule concerning investment of resource rents and the broader literature on sustainability emphasize the importance of converting resource wealth into forms of capital that can sustain future consumption. If extraction revenues are not accompanied by adequate investment in human, physical, and ecological capital, current growth may effectively be achieved by consuming the asset base upon which future welfare depends.

This concern is closely related to the resource curse literature. Sachs and Warner (2001) identify a recurring association between natural-resource dependence and weaker long-term economic performance in a range of countries, although subsequent research has emphasized the importance of institutions and political conditions in explaining these outcomes. The resource curse is not inevitable, but it demonstrates that resource abundance does not automatically translate into broad-based development. Resource extraction can create concentrated economic interests, political dependency, regional inequality, and environmental conflicts. Consequently, the question of who benefits from resource-based growth must be considered alongside the question of who bears its costs.

The institutional dimension is particularly important because externalities are not simply technical failures. They are often produced through decisions about property rights, regulatory standards, taxation, licensing, spatial planning, and enforcement. Sikor and Lund (2009) emphasize that access to resources depends not only on formal property rights but also on power and authority. An individual or community may possess practical access to a forest, river, or agricultural area without holding formal legal ownership. Conversely, actors with formal permits may acquire legal authority to use resources even when local communities previously depended on them. Environmental externalization can therefore emerge from institutional restructuring as much as from market failure.

This perspective challenges the assumption that regulation automatically internalizes environmental costs. Environmental rules can be effective only when standards are sufficiently strong, monitoring is credible, enforcement is consistent, and affected communities have avenues to challenge violations. Weak enforcement can allow firms to continue generating pollution when the expected cost of non-compliance is lower than the cost of prevention. Regulatory fragmentation can

produce similar outcomes when responsibilities are distributed across agencies without effective coordination. In such circumstances, environmental costs remain externalized despite the existence of formal regulations.

The issue of enforcement also raises the question of political power. Large infrastructure and industrial projects can generate significant investment and employment, creating political incentives to facilitate their implementation. Local communities, by contrast, may possess fewer resources to contest decisions or demand compensation. This asymmetry means that the determination of what constitutes an acceptable environmental cost is itself a political process. What is described as a “development benefit” from a national perspective may be experienced as an uncompensated environmental burden at the local level.

Environmental justice scholarship helps make this distributional dimension explicit. Schlosberg (2007) argues that justice cannot be reduced to equal distribution because different groups may possess different needs, identities, capabilities, and relationships to the environment. An apparently equal distribution of environmental risks may still be unjust if some communities lack the capacity to avoid or respond to those risks. Similarly, Walker (2012) emphasizes that environmental inequality should be understood through the social processes that determine who is exposed, who is protected, and whose interests receive political recognition.

This framework is particularly relevant to rural communities and populations whose livelihoods depend directly on natural resources. The economic value of a forest, river, coastal zone, or agricultural landscape cannot be understood solely through its contribution to formal markets. These environments can provide food, water, shelter, cultural identity, and social security. Environmental degradation can therefore produce a livelihood externality: the loss of ecological resources transfers economic costs to households whose survival depends upon them. Such costs may not appear as lost wages because the underlying activities may involve subsistence production, informal work, or unpaid household labor.

The concept of social reproduction further expands this analysis. Feminist political ecology demonstrates that environmental change often redistributes labor within households and communities. When ecological resources become less accessible, households must compensate through additional work, purchases, or changes in consumption. Rocheleau, Thomas-Slayter, and Wangari (1996) emphasize that gender shapes environmental knowledge and access to resources, while Elmhirst (2011) highlights the importance of examining environmental change across household, community, and political-economic scales. Environmental externalities therefore have a temporal dimension as well: a polluted river today may generate additional care, health, and livelihood burdens for years.

This suggests that the true social cost of economic growth can be substantially larger than the immediate environmental damage recorded by regulators. Consider an industrial area in which air pollution contributes to respiratory illness. The immediate externality is increased pollution exposure. The secondary costs include

medical expenditure, lost working days, reduced household income, school absenteeism, and increased caregiving responsibilities. The tertiary consequences may include declining educational opportunities, reduced productivity, and long-term health effects. A narrow environmental assessment may identify the first layer while failing to capture the broader chain of social consequences.

The same logic applies to ecosystem degradation. Deforestation may initially appear as a land-use change, but its consequences can include soil erosion, altered water flows, biodiversity loss, increased flood risk, and reduced agricultural productivity. These effects can generate additional public expenditure and household losses. The environmental externality is therefore not a single cost but a chain of interconnected costs distributed across different actors and time periods.

This analytical approach is particularly useful for evaluating the eight-percent growth model. A target expressed as a percentage of GDP establishes a quantitative ambition but does not specify the acceptable ecological cost of achieving it. Two growth trajectories can produce identical GDP outcomes while generating radically different environmental consequences. One may rely on cleaner technologies, efficient resource use, strong environmental enforcement, and equitable benefit-sharing. Another may depend on rapid extraction, intensive energy consumption, weak enforcement, and the displacement of environmental costs onto communities. From the perspective of GDP, both trajectories can appear successful. From the perspective of social welfare and ecological sustainability, they are fundamentally different.

The policy significance is that environmental constraints should not be introduced after growth has been achieved. They need to be incorporated into the design of the growth strategy itself. This means considering ecological carrying capacity, resource intensity, cumulative environmental impacts, public-health consequences, and distributional effects before investment decisions are finalized. Environmental regulation should consequently be understood not as an obstacle external to economic planning but as part of the institutional infrastructure required to make growth socially sustainable.

A broader conception of externalities also changes the meaning of “internalization.” Internalizing an environmental cost does not simply mean imposing a monetary charge on pollution. Taxes, permits, compensation, liability rules, restoration obligations, and environmental standards can all contribute to internalization. Yet monetary instruments are insufficient when ecological losses are irreversible or when affected resources possess cultural or subsistence values that cannot be adequately represented through prices. Some environmental limits therefore need to be established through non-market regulatory mechanisms.

The principle of precaution becomes relevant in these circumstances. Where environmental consequences are potentially severe or irreversible, the absence of complete scientific certainty should not automatically justify continued development. Precautionary approaches are particularly important for biodiversity, water systems, toxic pollution, and ecosystem functions that may be difficult or

impossible to restore after degradation. A growth strategy that treats uncertainty as permission to proceed may effectively transfer the risk of irreversible harm to communities and future generations.

The analytical framework developed here therefore treats economic growth as a material and distributive process, rather than simply an increase in aggregate output. Growth requires inputs from ecosystems and generates outputs that may include pollution, waste, emissions, and altered landscapes. The benefits and costs of these transformations are then distributed through markets, institutions, property regimes, public policy, and social structures. Environmental inequality emerges when the distribution of benefits and burdens systematically favors some groups while exposing others to disproportionate risks. This perspective provides the foundation for the next stage of the analysis. If economic growth generates environmental externalities, the critical question becomes how those externalities are distributed geographically and socially. The fact that a national economy benefits from industrialization or infrastructure investment does not establish that the communities located near production sites receive a proportional share of the benefits.

Who Bears the Costs? Unequal Ecological Risks across Communities and Regions

If environmental externalities are produced through the organization of economic activity, the next question concerns their distribution. Economic growth does not expose all members of society to environmental risks in the same way. The location of mines, industrial estates, ports, power plants, plantations, roads, and urban infrastructure creates a geography of exposure in which particular territories become sites of concentrated ecological burdens. At the same time, the economic benefits generated by these activities may circulate through national markets and global supply chains, reaching investors, corporations, consumers, financial institutions, skilled workers, and government institutions far beyond the communities located at the point of production. This spatial separation between production and consumption is central to understanding ecological inequality in Indonesia.

The distributional problem can first be observed through the distinction between benefit concentration and risk concentration. Economic benefits associated with major projects may include investment, tax revenues, export earnings, employment, infrastructure, and increased regional output. These benefits can be distributed across different scales. A mining project, for example, may contribute to national export revenues, regional government income, corporate profits, and local employment simultaneously. Environmental risks, by contrast, are often concentrated geographically around the extraction or processing site. Communities living near these facilities may experience changes in air quality, water quality, soil conditions, noise, traffic, landscape, and access to natural resources regardless of whether they participate significantly in the economic benefits generated by the project.

This asymmetry complicates the conventional argument that resource-based development benefits local communities through a “trickle-down” process. Employment and local procurement can certainly create economic opportunities, and infrastructure investment can improve access to services. Yet the existence of local economic benefits does not establish that those benefits are proportional to local environmental burdens. A community can simultaneously experience increased employment and deteriorating environmental conditions. The relevant question is therefore not whether any benefits exist, but whether the overall distribution of gains, losses, opportunities, and risks is equitable.

Empirical research from Indonesia's mineral-producing provinces provides an important illustration. Ramadanti, Azwardi, and Subardin (2025) examine the relationships among economic growth, environmental quality, and social welfare in mineral economy provinces in Eastern Indonesia. Their findings indicate a bidirectional relationship between environmental quality and human development, while improvements in environmental quality are associated with economic growth. They also identify relationships between environmental quality and economic variables including GDP, mining output, energy consumption, and forest resources. These findings challenge a development model in which environmental quality is treated merely as a cost that can be sacrificed for economic expansion. Instead, environmental quality can itself constitute an economic and social asset.

This relationship is important because it reverses the conventional policy hierarchy. If environmental quality contributes to human development and economic performance, environmental protection should not be regarded as a constraint imposed upon growth from outside the economy. It becomes part of the productive foundations of long-term welfare. Forests, clean water, healthy soils, coastal ecosystems, and stable climatic conditions perform economic functions even when those functions are not directly priced. Their degradation can therefore reduce welfare and productive capacity over time.

The Indonesian experience also indicates that the relationship between economic growth and environmental degradation depends on the structure of production and investment. Parahyangan, Maulana, and Hartanto (2023), using Indonesian time-series data from 1980 to 2021, examine both the Environmental Kuznets Curve and pollution-related hypotheses concerning economic growth and foreign direct investment. Their analysis demonstrates the importance of examining the characteristics of investment and production rather than assuming that foreign investment or economic growth has a uniform environmental effect. Prasetyanto and Sari (2021) similarly find evidence of a relationship between economic growth, energy consumption, and environmental degradation in Indonesia, reinforcing the importance of the energy and production structure underlying economic expansion.

These findings are particularly relevant to the government's high-growth strategy because the environmental consequences of an additional percentage point of GDP depend on what generates that percentage point. Growth derived

from labor-intensive services with relatively low material intensity presents a different ecological profile from growth derived from mining, mineral processing, heavy manufacturing, coal-based electricity, large-scale construction, or land-intensive commodity production. Consequently, the headline growth rate provides little information about the environmental quality of the underlying growth process.

The distribution of risks becomes particularly visible in extractive regions. Mining requires the physical removal and transformation of geological materials and therefore inevitably changes landscapes. Depending on the type and scale of extraction, consequences can include deforestation, soil erosion, water pollution, waste accumulation, habitat fragmentation, and changes in hydrological systems. These impacts are not necessarily distributed equally within producing regions. Communities closest to mining operations are generally more exposed to direct environmental changes, while the economic value of the extracted resource is distributed through supply chains that extend beyond the locality.

This is the fundamental contradiction of an extractive growth geography: the site that produces the commodity is not necessarily the site that captures the greatest share of its economic value. Minerals extracted from rural or peripheral territories can be transported to industrial centers, processed into intermediate products, incorporated into global manufacturing chains, and ultimately consumed in distant markets. The local community may therefore experience the environmental consequences of extraction while receiving only a fraction of the final economic value generated by the commodity.

The same logic applies to industrial downstreaming. The establishment of industrial parks can increase regional investment and employment while generating demands for land, water, electricity, transport, and waste-management infrastructure. The spatial concentration of multiple industrial activities can also create cumulative environmental pressures. A single facility may comply with its individual environmental obligations while the combined effects of many facilities exceed the ecological capacity of the surrounding area. This is why evaluating projects separately can underestimate the distributive consequences of industrialization.

The issue of cumulative impacts is particularly important for coastal industrial regions. Industrial estates located near coastlines may depend upon ports and maritime transport while simultaneously placing pressure on coastal water quality, fisheries, mangroves, and marine ecosystems. Communities whose livelihoods depend upon fishing or coastal resources may therefore experience indirect economic losses even when they are not formally categorized as project-affected landholders. The absence of formal land ownership over marine resources does not mean that the resources lack economic or social value.

This illustrates a wider limitation of compensation-based approaches. Compensation systems generally work most effectively when losses can be identified through formal property rights. Yet many environmental resources are shared, mobile, or collectively used. Fish stocks move through waters; rivers cross

administrative boundaries; forests provide ecological services beyond individual parcels; air pollution travels across jurisdictions. Environmental externalities therefore frequently affect people who do not possess a straightforward legal claim to the resource being degraded.

The resulting problem can be described as rights–exposure asymmetry. Those who possess formal rights over land may have clearer opportunities to claim compensation, while individuals who depend upon environmental resources without formal ownership may face significant losses without equivalent legal recognition. Fishers affected by declining coastal productivity, for example, may not possess property rights over the sea. Informal farmers may not hold formal titles to all land they cultivate. Communities using common forests may have collective relationships to resources that do not correspond to individualized ownership. The people most exposed to ecological change are therefore not always those most visible within compensation frameworks.

Environmental health provides another dimension of unequal ecological risk. Pollution is not distributed solely according to income, but social and economic vulnerability can shape the capacity of households to avoid or respond to environmental hazards. Communities with fewer financial resources may have less ability to relocate, purchase clean water, obtain private healthcare, install pollution-control technologies, or absorb temporary income losses. Consequently, the same level of environmental exposure can generate different consequences for different households.

Recent Indonesian scholarship on environmental health justice emphasizes this relationship between pollution and vulnerability. Wahyono, Akbar, and Dewantara (2024) examine environmental pollution in Indonesia through a health-justice perspective and identify vulnerable communities, including low-income populations and communities located near industrial areas, as particularly exposed to environmental health risks. This supports the broader argument that environmental inequality should not be measured solely through exposure. Justice requires considering the unequal capacity of different groups to prevent, withstand, and recover from environmental harm.

The health dimension also demonstrates how environmental costs can become socially invisible. Pollution may initially be experienced as discomfort, reduced water quality, respiratory symptoms, or declining food resources. Over time, however, these effects can produce medical expenditure, lost productivity, school absence, reduced household income, and increased care responsibilities. The costs are consequently distributed across households, employers, healthcare systems, and public budgets. When these secondary and tertiary costs are not attributed to the economic activities responsible for the pollution, the apparent profitability of production is partly dependent on the transfer of costs to other institutions.

This process can be understood as the socialization of environmental costs. Firms and investors may capture the direct economic returns of production, while households and the state absorb part of the costs associated with pollution, health,

infrastructure damage, ecosystem restoration, or livelihood disruption. This does not mean that corporations never bear environmental costs; environmental regulations, remediation requirements, taxes, and compliance expenditures can impose significant obligations. The distributive question concerns whether those obligations are sufficient to cover the full social and ecological costs generated by production.

The issue becomes more complicated when environmental damage affects livelihood systems that operate outside formal markets. Small-scale farming, fishing, forest gathering, and household production can contribute significantly to well-being without appearing proportionately in regional GDP. When ecological degradation reduces these activities, the resulting loss may be interpreted statistically as a shift from subsistence toward market dependence rather than as an economic loss. A household that previously obtained food directly from a river may now purchase food from a market. The purchase increases market activity, but the household has simultaneously lost an ecological resource that previously provided economic security.

This illustrates why marketization can conceal environmental impoverishment. A decline in access to common resources can generate additional monetary transactions, making the economy appear more commercialized while households become more dependent on cash income. The transition may be interpreted as modernization, but its welfare consequences depend on whether new income opportunities are sufficiently stable and accessible to compensate for the loss of ecological resources. Without this distinction, economic statistics may misinterpret the monetization of environmental loss as development.

The burden can be particularly severe for communities whose livelihoods combine multiple ecological resources. Rural households often diversify across agriculture, fishing, wage labor, forest resources, informal trade, and household production. Such diversification functions as a form of risk management. If one source of income declines, another can provide support. Environmental degradation can weaken several components of this livelihood portfolio simultaneously. A polluted river may affect fishing and household water use; land conversion may affect agriculture; increased traffic may affect local commerce; and restricted access to forests may eliminate supplementary resources.

The loss of livelihood diversification increases vulnerability because households become more dependent on a smaller number of income sources. This is an important dimension of ecological inequality that may not be visible through regional employment statistics. A region can experience rising employment while individual households simultaneously lose the diversified resource base that previously protected them against economic shocks. Development can therefore increase aggregate economic activity while reducing the resilience of particular communities.

Regional inequality further complicates this distribution. Indonesia's economic geography is highly differentiated, with major metropolitan and industrial centers

benefiting from concentration of infrastructure, investment, skilled labor, and financial institutions. Resource-rich peripheral regions may contribute substantially to national production without receiving equivalent levels of human development or environmental security. The mineral economy provinces of Eastern Indonesia provide an important context for this issue because the relationship between resource extraction, environmental quality, and social welfare is particularly visible there (Ramadanti, Azwardi, and Subardin 2025).

This does not imply that resource-producing regions uniformly lose while urban centers uniformly gain. Local governments, workers, businesses, and households in producing regions can benefit substantially from investment and economic activity. Some communities may actively support development because employment and infrastructure provide tangible improvements. A distributive analysis must therefore avoid portraying affected communities as uniformly opposed to economic growth. The more important question is how different groups within the same region experience the transformation differently.

This internal differentiation is essential to understanding distributive justice. Workers employed by industrial projects may benefit from wages while neighboring farmers experience land-use pressures. Business owners may gain from increased demand while households dependent on subsistence resources face ecological losses. Local governments may receive additional fiscal revenues while public institutions must address pollution or infrastructure demands. The same development project can therefore generate both beneficiaries and burdened groups within a single community.

The distinction between absolute benefit and relative burden is useful here. A household can receive some economic benefit from development and still bear an unfair environmental burden if its exposure is disproportionate relative to the benefits received. Environmental justice does not require that everyone receive exactly the same economic benefit. Rather, it asks whether differences in benefits and burdens are justified, whether affected groups are recognized, and whether they possess meaningful power to influence the distribution.

Political voice therefore becomes a central component of distributive analysis. Communities with limited political influence may have fewer opportunities to shape environmental standards, negotiate compensation, demand monitoring, or challenge development decisions. This creates a feedback loop in which economic and political inequality reinforce environmental inequality. Groups with greater political and economic resources can influence where projects are located, how risks are regulated, and what forms of compensation are offered, while less powerful communities are more likely to absorb residual risks.

The concept of environmental sacrifice zones captures an extreme version of this process. A territory becomes treated as suitable for intensive economic use because its environmental and social costs are considered politically or economically acceptable. The designation may never appear formally in law, yet it can emerge through repeated decisions that prioritize extraction or industrial

development over ecological integrity and community well-being. Such processes raise a fundamental distributive question: why should particular territories repeatedly bear environmental burdens for benefits consumed elsewhere?

In Indonesia, this question is increasingly relevant as industrial and resource-development strategies expand into regions previously characterized by relatively low levels of industrialization. The transition from peripheral resource territory to industrial production zone can rapidly alter local environmental conditions. The challenge is not to prevent all development in such regions but to ensure that their transformation does not reproduce a hierarchy in which peripheral communities provide land and ecological resources while metropolitan and corporate centers capture disproportionate value.

The geography of infrastructure reinforces this relationship. Roads, ports, electricity systems, industrial estates, and urban developments can generate substantial public value, but their construction requires land and ecological transformation. Infrastructure can therefore function simultaneously as a development multiplier and a mechanism of environmental redistribution. Communities may lose access to agricultural land or forests while gaining improved transportation and services. The distributive outcome depends on whether the new benefits are accessible to affected households and whether the ecological losses are adequately addressed.

This is why the term public interest requires careful examination. Projects justified as serving national development may generate benefits that are broadly distributed, but the burdens may remain concentrated. A national benefit does not automatically eliminate the rights of communities exposed to localized harm. The principle of public interest should therefore be accompanied by proportionality: the greater the environmental and social burden imposed on a particular group, the stronger the justification, safeguards, compensation, participation, and benefit-sharing mechanisms should be.

Environmental law provides an important institutional framework for addressing these inequalities. Indonesia's Law No. 32 of 2009 on Environmental Protection and Management establishes principles concerning environmental protection, pollution control, public participation, and environmental rights (Republic of Indonesia 2009). The regulatory framework developed through Government Regulation No. 22 of 2021 further establishes requirements concerning environmental approvals and environmental management (Republic of Indonesia 2021). These instruments indicate that environmental quality is legally connected to public welfare rather than being treated merely as a private concern of project developers.

The legal existence of environmental safeguards, however, does not guarantee distributive justice. The effectiveness of environmental governance depends upon monitoring, enforcement, transparency, institutional capacity, and access to remedy. Where environmental monitoring is weak, communities may be required to demonstrate harm without having access to the technical information necessary

to establish it. Where enforcement is inconsistent, the legal cost of environmental compliance can become unevenly distributed. And where affected communities lack meaningful participation, environmental decisions may reflect the priorities of economically and politically powerful actors.

The principle of environmental justice therefore requires a shift from impact minimization to burden accountability. It is insufficient to ask whether a project produces environmental impacts; virtually all major projects do. The more important questions are: who experiences the impacts, how severe are they, who benefits from the project, who has decision-making power, and who is responsible for remediation when harm occurs? These questions transform environmental assessment from a technical exercise into a distributive governance process.

Public health should be integrated into this assessment. If environmental degradation increases disease or health risks, the economic costs should not be treated as separate from development. Health is a component of human capital and social welfare. A growth strategy that increases output while generating preventable health burdens may therefore undermine productivity and increase public expenditure. Research on environmental health justice in Indonesia emphasizes that vulnerable communities near pollution sources can experience disproportionate health consequences (Wahyono, Akbar, and Dewantara 2024). The economic value of preventing such harm should consequently be considered alongside the economic value of industrial production.

The same principle applies to Indigenous communities. Extractive development can affect customary territories in ways that involve not only environmental exposure but also the disruption of cultural relationships and collective livelihoods. Research on mining and Indigenous rights in Indonesia identifies tensions between extractive development, land dispossession, environmental degradation, and the protection of Indigenous communities (O’Faircheallaigh 2013). Nevertheless, the broader issue is well established in environmental-justice and Indigenous-rights scholarship. The relevant point is that environmental costs can include losses that cannot easily be converted into monetary compensation.

This raises the problem of non-compensable ecological losses. Some environmental assets can be restored or replaced, but others cannot. The disappearance of a species, destruction of a culturally significant landscape, irreversible contamination of groundwater, or permanent alteration of an ecosystem may exceed the capacity of monetary compensation to restore the original condition. In such circumstances, distributive justice requires prevention and precaution rather than reliance on compensation after damage occurs.

Intergenerational inequality adds another layer. Current generations may receive employment, investment, and fiscal revenues from resource extraction while future generations inherit degraded ecosystems and depleted natural resources. The temporal separation between benefits and costs can make environmental externalities politically easier to ignore. Present decision-makers can claim economic success within the current budget cycle while future communities

absorb the consequences. This is why intergenerational justice must be incorporated into assessments of growth-oriented development (Weiss 1989).

The problem is particularly significant when ecological degradation reduces the resilience of communities to future climate change. Forest loss, wetland degradation, coastal ecosystem destruction, and water-system disruption can reduce natural protection against floods, droughts, heat, and other climate-related hazards. Environmental degradation therefore does not simply create a static cost; it can increase future vulnerability. The communities that contribute least to the economic benefits of high-growth development may subsequently face greater adaptation costs.

These dynamics demonstrate that the question “Who pays for economic growth?” has no single answer. Costs can be borne by rural households through declining agricultural productivity; fishers through reduced marine resources; urban residents through air pollution; workers through occupational hazards; women through increased unpaid care work; local governments through environmental management costs; public health systems through pollution-related illness; and future generations through ecological depletion. The diversity of these burdens is precisely why aggregate economic indicators are inadequate for evaluating distributive outcomes.

At the same time, beneficiaries are similarly distributed across multiple scales. Corporate shareholders, investors, consumers, skilled workers, local businesses, government agencies, and national institutions may all benefit from economic expansion. Some benefits are immediate and monetized, while others are indirect. The central distributive problem arises when the mechanisms that allocate benefits are more effective than those that allocate responsibility for environmental costs. Markets can transmit profits rapidly across borders, while environmental accountability may remain geographically and institutionally fragmented.

The resulting asymmetry can be described as value mobility and burden immobility. Economic value is highly mobile: commodities can be exported, capital can move, profits can be distributed, and products can be consumed elsewhere. Environmental burdens are often less mobile: contaminated soil remains where pollution occurred, degraded forests cannot easily be relocated, and affected communities may not be able to move without substantial social and economic costs. This difference gives rise to a structural imbalance between those who can benefit from economic activity and those who remain exposed to its consequences.

The implications for the eight-percent growth model are therefore significant. A high growth target should not be evaluated solely according to whether the target is reached. It should also be evaluated according to the ecological intensity of growth and the distribution of its consequences. If achieving a higher growth rate requires substantially greater environmental degradation, then the apparent increase in national income may partly represent the conversion of ecological wealth into current economic output. Conversely, growth accompanied by

improved environmental quality and reduced inequality would represent a qualitatively different form of development.

The empirical literature already provides grounds for rejecting a simplistic trade-off between economic growth and environmental quality. In mineral-rich provinces of Eastern Indonesia, evidence of a relationship between environmental quality, human development, and economic growth suggests that environmental improvement can support rather than undermine economic welfare (Ramadanti, Azwardi, and Subardin 2025). Similarly, Indonesian studies of economic growth and environmental degradation demonstrate that the relationship depends on energy consumption, investment, production structure, and institutional conditions rather than following a universal trajectory (Parahyangan, Maulana, and Hartanto 2023; Prasetyanto and Sari 2021).

The distributive implication is straightforward but significant: environmental quality should be treated as part of the distribution of development benefits, not simply as a constraint on production. A clean river, healthy population, functioning forest, stable climate, and productive agricultural landscape are themselves forms of social wealth. If growth improves monetary income while degrading these assets, then part of the apparent economic gain may be illusory from a broader welfare perspective.

The challenge for policy is consequently to redesign the mechanisms through which environmental costs are allocated. Polluters should bear appropriate costs of prevention and remediation; environmental standards should reflect ecological and health risks; affected communities should receive meaningful participation and access to information; compensation should recognize livelihood and collective losses where appropriate; and public investment should protect ecological assets that generate broad social benefits. These mechanisms should operate before, during, and after development projects rather than being activated only once environmental damage becomes politically visible.

The central conclusion from this distributive analysis is that economic growth is not a neutral aggregate process. It reorganizes access to land, resources, infrastructure, employment, environmental quality, and political power. The distribution of these changes determines whether growth improves collective welfare or merely increases the volume of economic activity. Indonesia's eight-percent growth ambition should therefore be understood not simply as a macroeconomic target but as a distributive project whose consequences must be assessed across territories, social groups, institutions, and generations.

Beyond Eight Percent: Reconstructing the Meaning of Sustainable Growth

The preceding analysis demonstrates that the central problem with a growth-centered development model is not necessarily the pursuit of economic expansion itself, but the institutional manner in which the benefits and costs of expansion are calculated and distributed. If environmental degradation, public-health impacts, livelihood losses, and ecological depletion remain outside the principal accounting

framework of economic performance, a higher growth rate may conceal a deterioration in forms of wealth that are essential to long-term welfare. The challenge is therefore to move from a model in which environmental protection is treated primarily as a constraint on economic activity toward one in which ecological integrity constitutes an integral component of economic development.

This requires reconsidering what should count as a successful growth strategy. The eight-percent target established within Indonesia's current development framework represents a quantitative ambition concerning the expansion of economic activity. The National Medium-Term Development Plan for 2025–2029 is formally established through Presidential Regulation No. 12 of 2025 and operates within the longer-term framework of Law No. 59 of 2024 concerning the National Long-Term Development Plan for 2025–2045 (Republic of Indonesia 2024; Republic of Indonesia 2025). The existence of such a target is not inherently inconsistent with sustainability. The problem arises when the rate of economic expansion becomes the dominant indicator of development success while the ecological conditions required to sustain that expansion are treated as secondary.

A more comprehensive approach would distinguish between growth in output and growth in social wealth. Output can increase through the extraction of natural resources, construction, manufacturing, and other market activities. Social wealth, however, depends upon a broader set of assets, including healthy ecosystems, human health, social cohesion, secure livelihoods, productive infrastructure, and institutional capacity. Daly and Cobb (1989) argue that conventional economic indicators can obscure the distinction between activities that genuinely improve welfare and those that merely increase market transactions. This distinction is particularly important for resource-dependent development because the extraction of natural capital can generate current income while reducing the ecological asset base available to future generations.

The first requirement of a more sustainable growth model is therefore the internalization of environmental costs. Pigou's (1920) basic insight remains relevant: when producers do not bear the full social cost of environmental damage, market prices provide an incomplete signal of the true cost of production. Internalization seeks to correct this discrepancy through taxation, environmental charges, liability, standards, compensation, restoration obligations, or other instruments. Yet internalization should not be understood narrowly as the imposition of a pollution tax. The objective is to ensure that economic decisions reflect the real ecological and social consequences of production.

Indonesia already possesses an important legal basis for this principle. Law No. 32 of 2009 on Environmental Protection and Management establishes the legal architecture for environmental protection and management and remains a central statute in Indonesia's environmental governance framework (Republic of Indonesia 2009). The law was subsequently amended through the regulatory changes associated with the Job Creation framework, while Government Regulation No. 22 of 2021 provides detailed rules concerning environmental approvals,

environmental impact assessment, pollution control, waste management, environmental information, restoration guarantees, supervision, and administrative sanctions (Republic of Indonesia 2021).

The significance of this framework is that Indonesian environmental law does not conceptually treat the environment as an issue separate from development. Environmental protection is integrated into planning, licensing, pollution control, monitoring, and enforcement. Government Regulation No. 22 of 2021, for example, regulates environmental approval, environmental impact assessment, water and air quality management, waste management, environmental restoration guarantees, monitoring, supervision, and administrative sanctions. The regulation also provides mechanisms concerning the internalization of environmental protection costs in water-quality management.

From the perspective of the eight-percent growth model, this legal architecture has an important implication: economic expansion cannot legitimately be evaluated independently from environmental compliance. If a project contributes to regional or national output but violates environmental quality standards or creates uncompensated ecological damage, its economic contribution should not be treated as a complete measure of social benefit. Environmental law functions, in this sense, as a mechanism for correcting the informational and distributive limitations of market-based economic measurement.

However, the existence of environmental regulation is not sufficient. The effectiveness of internalization depends upon implementation. A pollution standard has limited value if monitoring is irregular, data are inaccessible, sanctions are weak, or restoration obligations are not enforced. Ningsih, Frinaldi, and Rembrandt (2024) note that the post-Cipta Kerja framework transformed the previous environmental permit system into an environmental approval mechanism integrated with business licensing. This institutional transformation makes the quality of environmental assessment and oversight particularly important because environmental considerations become closely connected to the broader licensing process.

The challenge is therefore not merely whether environmental approval exists but whether the approval process adequately captures cumulative and distributive impacts. Conventional environmental assessment can focus on the impacts of an individual project, while communities may experience the combined consequences of multiple projects operating within the same ecological system. A river basin, coastal zone, forest landscape, or industrial region does not experience each project independently. Pollution, land conversion, water extraction, and infrastructure development can interact. Environmental governance must therefore move beyond project-by-project compliance toward landscape- and ecosystem-level assessment.

This is also where economic planning and environmental planning need to become more closely integrated. If the government identifies manufacturing, construction, infrastructure, and investment as engines of economic expansion, the

ecological requirements of these sectors should be incorporated at the beginning of planning rather than after projects have been approved. The question should not simply be whether a particular project satisfies a minimum environmental requirement. It should also be whether the cumulative expansion of a sector is compatible with the ecological capacity of the territory in which that expansion occurs.

A second requirement is the adoption of environmental accounting. National economic accounts should distinguish between income generated by production and the depletion or degradation of natural assets associated with that production. This principle is consistent with broader developments in environmental-economic accounting, which seek to integrate information on ecosystems, natural resources, and economic activity. The significance of such accounting is conceptual as much as statistical: it prevents environmental degradation from disappearing simply because it does not have a market price.

For Indonesia, this means that economic planning should increasingly consider whether growth is accompanied by increases or decreases in natural capital. A province may record rapid growth in mining output while simultaneously losing forest cover, water quality, agricultural productivity, or fisheries. If only the first set of indicators is incorporated into development evaluation, the apparent success of the province may conceal the depletion of assets that support future welfare. Environmental indicators should therefore not function merely as supplementary statistics but as part of the core evaluation of development performance.

Such an approach would also improve the interpretation of regional economic disparities. A resource-producing region with high GDP growth should not automatically be considered more developed than a region with slower growth but stronger environmental quality, better public health, and more resilient livelihoods. Development rankings based exclusively on monetary output can inadvertently reward the rapid conversion of ecological assets into market income. A broader assessment would instead distinguish between income generated through sustainable production and income generated through the depletion of natural capital.

The third requirement is the strengthening of the polluter-pays principle through credible liability and restoration mechanisms. The polluter-pays principle does not imply that every environmental harm can be resolved through monetary compensation. Rather, it establishes a responsibility relationship: actors whose activities generate environmental risks should bear appropriate costs for prevention, control, remediation, and restoration. Without such responsibility, the incentive structure of production remains asymmetric because environmental damage can be cheaper than environmental protection.

Government Regulation No. 22 of 2021 is relevant in this regard because it establishes provisions concerning environmental restoration guarantees, environmental monitoring, supervision, administrative sanctions, and waste management (Republic of Indonesia 2021). These mechanisms can help prevent

the state and local communities from becoming the default bearers of remediation costs. Yet their effectiveness depends on whether restoration obligations are proportionate to actual ecological damage and whether financial guarantees are sufficient to cover long-term restoration.

This point is especially important for projects with potentially irreversible impacts. Where ecological damage cannot realistically be restored to its original condition, monetary compensation after the fact is inadequate. In such circumstances, environmental governance must prioritize prevention, precaution, and avoidance. The economic logic should therefore change from “damage first, compensate later” to “demonstrate ecological acceptability before irreversible transformation occurs.”

A fourth requirement concerns public participation and procedural justice. Distributive environmental justice cannot be achieved merely by calculating the monetary value of environmental damage. Affected communities must have meaningful opportunities to participate in decisions concerning activities that transform their territories. Participation is particularly important where local communities possess ecological knowledge or livelihood relationships that may not be visible within formal technical assessments. Schlosberg (2007) emphasizes that recognition and participation are integral components of environmental justice because distributional outcomes are shaped by whose interests are recognized in decision-making.

The Indonesian environmental governance framework provides a legal basis for public involvement, but the practical meaning of participation depends on the quality of information, timing, accessibility, and responsiveness of decision-making. Participation that occurs after major decisions have already been made is unlikely to constitute meaningful procedural justice. Similarly, consultation conducted through highly technical documents can exclude communities that lack the resources or expertise to evaluate them. Procedural justice therefore requires not merely the existence of consultation but the creation of conditions under which affected communities can genuinely influence outcomes.

This is particularly important in cases involving land acquisition, infrastructure development, mining, and industrial estates. Communities may possess different understandings of the value of land from those reflected in compensation calculations. Land can function simultaneously as property, livelihood, cultural space, social security, and intergenerational inheritance. A compensation formula based exclusively on market price may therefore compensate for the loss of a physical asset without compensating for the social and ecological functions attached to it.

A fifth requirement is to incorporate public health into economic evaluation. Environmental degradation should be treated as an economic issue because its health consequences generate real costs for households, workers, employers, and public institutions. Wahyono, Akbar, and Dewantara (2024) demonstrate the importance of environmental health justice in understanding how pollution affects

vulnerable communities in Indonesia. Environmental risks should consequently be incorporated into project evaluation through health-impact assessment, exposure monitoring, disease surveillance, and transparent disclosure of environmental-health data.

The economic rationale is straightforward. Preventing pollution can be less costly than treating its consequences. Yet the distributional rationale is equally important. Low-income households often possess fewer resources to adapt to environmental hazards. If pollution is allowed to continue because affected communities can be expected to absorb its consequences, environmental governance effectively converts economic inequality into health inequality. A just growth strategy must prevent this conversion.

Public health also illustrates why environmental costs should not be treated as isolated sectoral issues. The ministry responsible for health, environmental agencies, local governments, labor institutions, and economic planners may each hold different pieces of information concerning a pollution problem. Effective governance requires coordination among these institutions. Otherwise, environmental damage may be identified as a regulatory issue, health consequences as a medical issue, and economic losses as a household issue, even though all three are manifestations of the same underlying externality.

A sixth requirement is recognition of social reproduction as an economic dimension of environmental sustainability. Economic indicators tend to emphasize paid employment and market production, while unpaid care, household labor, subsistence production, and community-based resource management remain less visible. Feminist political ecology demonstrates that environmental degradation can increase the amount of unpaid labor required to maintain households and communities (Rocheleau, Thomas-Slayter, and Wangari 1996; Elmhirst 2011). A river that becomes polluted may increase the time required to obtain usable water. Declining agricultural productivity may increase household labor. Environmental health problems may increase caregiving responsibilities. These are genuine economic consequences even when they do not appear in formal employment statistics.

Consequently, a sustainable growth model should evaluate not only how many jobs are created but also whether development reduces or increases the unpaid burdens associated with maintaining everyday life. This perspective broadens the concept of productivity. A project that generates formal employment while simultaneously increasing unpaid household labor should not automatically be regarded as producing an unambiguous welfare gain. Social reproduction must be considered as part of the infrastructure of economic activity.

A seventh requirement concerns intergenerational justice. Current growth strategies should not be permitted to convert irreplaceable ecological assets into short-term income without considering future consequences. Weiss (1989) conceptualizes intergenerational equity as a relationship in which each generation should inherit the Earth in a condition that allows future generations to meet their

needs. Hartwick's (1977) work similarly raises the question of how income derived from non-renewable resource extraction can be transformed into other forms of capital capable of supporting future welfare.

Applied to Indonesia, this means that revenues generated from extractive development should contribute to long-term human, physical, technological, and ecological capital. The objective should not simply be to maximize current extraction but to ensure that resource wealth creates durable improvements in welfare after the resource itself has been depleted. If natural capital is reduced while financial income rises temporarily, the resulting growth may represent intertemporal redistribution rather than sustainable development.

This argument also has implications for climate policy. Natural ecosystems provide carbon storage and adaptation functions that have economic value even when they are not directly monetized. Forest degradation, peatland destruction, mangrove loss, and other forms of ecosystem transformation can increase emissions and reduce resilience to climate impacts. Consequently, climate policy should not be separated from the distributional analysis of economic growth. A development project that increases current GDP while reducing carbon storage may create a climate cost that is experienced by populations and generations far removed from the project itself.

The long-term development framework adopted by Indonesia provides a basis for integrating these concerns. Law No. 59 of 2024 establishes the National Long-Term Development Plan for 2025–2045, while Presidential Regulation No. 12 of 2025 establishes the 2025–2029 medium-term development framework (Republic of Indonesia 2024; Republic of Indonesia 2025). The significance of these instruments lies in the possibility of connecting short-term economic targets with longer-term sustainability objectives. A high-growth period should not be evaluated independently from the ecological and social conditions required to sustain development over several decades.

The challenge is to ensure that long-term planning is not reduced to the coexistence of economic and environmental indicators without institutional integration. It is possible for a government to simultaneously report strong GDP growth and environmental degradation. Such parallel reporting does not resolve the underlying tension. Sustainable planning requires mechanisms through which environmental performance can influence investment priorities, budget allocation, licensing decisions, and evaluations of development programs.

This points toward the importance of green budgeting and ecological fiscal policy. Public budgets can influence the environmental direction of growth through infrastructure investment, energy subsidies, tax incentives, procurement, and regional transfers. If fiscal policy rewards activities that generate environmental damage while environmental protection receives comparatively weak financial support, the state may unintentionally subsidize ecological externalization. Conversely, fiscal instruments can support cleaner technologies, ecosystem

restoration, public transportation, renewable energy, resource efficiency, and environmental monitoring.

Such policies should nevertheless be designed carefully because environmental taxation can itself produce regressive effects. If environmental costs are passed through entirely to consumers, low-income households may bear a disproportionate share of the adjustment. Environmental fiscal reform must therefore combine environmental pricing with social protection and targeted redistribution. The objective is not merely to increase the price of environmentally harmful activities but to ensure that the transition toward cleaner production does not reproduce socioeconomic inequality.

This is why just transition should be incorporated into Indonesia's growth strategy. Workers and communities dependent on environmentally intensive sectors cannot simply be instructed to move toward cleaner activities without access to training, alternative employment, social protection, and regional investment. A transition that protects ecosystems while abandoning workers would create a new distributive problem. Sustainability requires simultaneous attention to ecological transformation and economic security.

The same principle applies to regions dependent on extractive industries. Local governments may rely on resource-based economic activity for employment and fiscal revenues. Rapid restrictions without alternative economic strategies could generate unemployment and fiscal stress. A just growth model therefore needs mechanisms for economic diversification before ecological limits are reached. Resource-dependent regions should be supported in developing alternative productive sectors so that environmental protection does not become synonymous with economic decline.

The principle of benefit-sharing provides another mechanism for addressing unequal development. Where communities provide land, ecological resources, or environmental services that enable economic activity, they should receive a meaningful share of the resulting benefits. Benefit-sharing can take the form of local employment, revenue-sharing, infrastructure, public services, community development funds, or direct participation in economic projects. However, such mechanisms should supplement rather than replace environmental safeguards. A community should not be required to accept irreversible ecological damage simply because compensation or local investment is offered.

This distinction is crucial because distributive justice cannot be reduced to compensation. Compensation assumes that an environmental loss can be exchanged for an equivalent economic benefit. Yet some ecological and cultural values are not substitutable. A destroyed ecosystem, lost cultural landscape, or permanently contaminated water source may not be adequately replaced by monetary payment. Prevention and recognition are therefore as important as compensation.

A further institutional requirement is transparency. Environmental information should be accessible to communities, researchers, journalists, civil society

organizations, investors, and government institutions. Transparent information reduces information asymmetry between corporations, government agencies, and affected populations. It also improves accountability because environmental performance becomes subject to public scrutiny. Government Regulation No. 22 of 2021 explicitly incorporates environmental information systems alongside monitoring and supervision within the environmental governance framework (Republic of Indonesia 2021). The challenge is to ensure that such information is not merely formally available but usable, timely, geographically specific, and understandable.

Transparency is particularly important for cumulative environmental risks. Communities need information not only about one company's emissions but also about total pollution loads, water extraction, land conversion, waste generation, and ecological thresholds across an entire industrial area. Without cumulative information, it is difficult for communities or regulators to determine whether the ecological burden of development remains within acceptable limits.

Environmental monitoring should consequently be treated as a continuous governance process rather than a one-time licensing requirement. Development projects evolve after approval: production capacity may expand, technologies may change, waste streams may increase, and surrounding land use may transform. Monitoring must therefore remain adaptive. Regulatory authorities should be able to revise requirements when environmental conditions deteriorate or when new scientific evidence indicates previously underestimated risks.

This leads to a broader conception of accountability across the life cycle of development. Economic projects should be evaluated before construction, monitored during operation, and assessed after closure. Liability should extend to restoration and post-closure impacts where necessary. This is particularly important for extractive activities because environmental consequences can persist after production ends. A growth model that counts employment and investment during the operational phase but ignores post-closure environmental liabilities effectively transfers part of the project's cost into the future.

The same life-cycle principle should be applied to infrastructure. Roads, industrial estates, ports, dams, and urban developments can generate benefits for decades, but their ecological consequences may also persist. Project appraisal should therefore incorporate construction impacts, operational emissions, maintenance requirements, land-use changes, and long-term ecological effects. This would allow policymakers to compare projects not only according to their immediate economic returns but also according to their full social and environmental life cycle.

At this point, the concept of sustainable growth requires a conceptual reformulation. Sustainable growth should not simply mean maintaining a high rate of GDP growth while adding environmental safeguards around the margins. It should mean increasing social welfare without systematically reducing the ecological and social assets required for future welfare. This distinction changes the

policy question from “How can Indonesia achieve 8 percent growth?” to “What form of growth can improve welfare at the required scale without transferring unacceptable costs across communities, ecosystems, and generations?”

The second question is more demanding because it requires evaluating the quality of growth rather than its quantity alone. It requires identifying sectors that generate high social value with comparatively low ecological intensity, directing investment toward resource-efficient technologies, protecting ecosystems that provide essential public goods, and ensuring that communities exposed to development risks possess meaningful decision-making power. It also requires acknowledging that some forms of economic activity may generate GDP but reduce overall welfare when their environmental costs exceed their social benefits.

This approach does not require abandoning industrialization or resource development. Indonesia's economic transformation can continue, but its success should be judged through a wider set of indicators. Economic output, employment, productivity, poverty reduction, environmental quality, public health, carbon intensity, ecosystem condition, inequality, and livelihood security should be assessed together. The purpose is not to create an impossibly broad measure of success but to prevent one indicator—GDP—from becoming a proxy for all dimensions of welfare.

The legal framework already provides important foundations for such an approach. Law No. 32 of 2009 establishes environmental protection as an integral element of development, while Government Regulation No. 22 of 2021 operationalizes environmental approval, impact assessment, pollution control, waste governance, restoration, information, monitoring, and sanctions. The national development framework established through Law No. 59 of 2024 and Presidential Regulation No. 12 of 2025 creates an additional opportunity to align economic planning with long-term sustainability. The challenge is therefore less about the complete absence of legal instruments than about ensuring that economic policy, environmental regulation, and distributive justice operate coherently.

From this perspective, the central policy principle should be no economic benefit without ecological accountability. Economic activity should be permitted and encouraged where it generates genuine social value, but the ecological costs it creates must be identified, minimized, internalized, monitored, and, where possible, restored. Communities should not be treated as passive recipients of development but as rights-bearing participants in decisions affecting their territories. Future generations should not be treated as residual claimants whose interests become relevant only after current economic objectives have been achieved.

The eight-percent target can therefore be interpreted in two fundamentally different ways. Under a narrow growth paradigm, it is an end in itself: the success of policy is demonstrated when GDP reaches the targeted rate. Under a sustainable and distributively just paradigm, it is a means toward broader social objectives. Growth becomes valuable insofar as it improves livelihoods, expands capabilities,

reduces poverty, strengthens public services, and builds productive assets without systematically degrading ecological systems. The latter interpretation does not make economic growth less ambitious; it makes the definition of economic success more demanding.

Ultimately, the question of who pays for economic growth is inseparable from the question of what society considers valuable. If forests, rivers, clean air, healthy bodies, community livelihoods, unpaid care work, and ecological resilience are treated as peripheral to economic calculation, their degradation can be interpreted as an acceptable side effect of growth. If they are recognized as components of social wealth, however, their destruction becomes a reduction in development performance rather than an external inconvenience.

A genuinely sustainable growth model must therefore reverse the conventional hierarchy between economy and environment. The economy is embedded within society, and society is embedded within ecological systems. Production depends upon natural resources, functioning ecosystems, healthy workers, stable communities, and public institutions. Economic growth that undermines these foundations may increase current output while weakening the capacity to generate welfare in the future. The objective of development should consequently be not simply to expand the economy, but to maintain and improve the ecological and social foundations upon which economic life depends.

The central proposition emerging from this analysis is that Indonesia should not abandon the ambition of rapid growth, but should redefine the conditions under which rapid growth qualifies as development success. Such a redefinition requires environmental costs to be internalized, ecological assets to be incorporated into economic accounting, polluters to bear appropriate restoration responsibilities, communities to possess meaningful participation and access to remedy, public-health consequences to be incorporated into project evaluation, social reproduction to be recognized as part of economic welfare, and future generations to be treated as legitimate stakeholders in present development decisions. Only under these conditions can economic expansion move from being merely quantitatively impressive to being substantively sustainable and socially just.

Conclusion

This article has argued that Indonesia's ambition to accelerate economic growth cannot be evaluated adequately through aggregate indicators such as GDP, investment, and employment alone. The central problem is not economic growth itself, but the unequal distribution of the ecological and social costs associated with producing that growth. Mining, industrialization, infrastructure development, energy consumption, and resource-based production can generate substantial economic value while simultaneously transferring environmental burdens to communities, local governments, public-health systems, ecosystems, and future generations. Such a pattern creates a structural asymmetry between the mobility of economic value and the geographical persistence of environmental damage.

Consequently, a high rate of economic growth may coexist with declining environmental quality, weakened livelihood resilience, and increasing social vulnerability. The analysis therefore challenges the assumption that environmental degradation can simply be treated as an external cost of development. Environmental quality, public health, ecological resources, and community livelihoods are themselves components of social and economic wealth.

The article further demonstrates that Indonesia already possesses important legal and institutional foundations for addressing these challenges. Law No. 32 of 2009 on Environmental Protection and Management, Government Regulation No. 22 of 2021, Law No. 59 of 2024 on the National Long-Term Development Plan for 2025–2045, and Presidential Regulation No. 12 of 2025 on the National Medium-Term Development Plan for 2025–2029 provide a framework within which economic development can be connected to environmental protection and long-term planning (Republic of Indonesia 2009, 2021, 2024, 2025). The issue, therefore, is not simply the absence of environmental rules but the extent to which environmental accountability is integrated into economic decision-making and effectively enforced. A more just growth model requires the internalization of environmental externalities, credible implementation of the polluter-pays principle, cumulative-impact assessment, transparent environmental information, meaningful community participation, public-health safeguards, recognition of unpaid and reproductive labor, and mechanisms for intergenerational protection. The eight-percent growth ambition should consequently be assessed not only by whether additional economic output is generated, but also by whether that output is produced without systematically degrading the ecological and social foundations of future welfare.

Ultimately, the question “Who pays for economic growth?” should lead to a broader redefinition of what constitutes development success in Indonesia. Growth should not be considered sustainable when its apparent economic gains depend upon the depletion of natural capital, the deterioration of public health, the displacement of livelihood systems, or the transfer of environmental risks to communities with limited political and economic power. Sustainable development requires a shift from growth as an end in itself toward growth as a means of improving collective well-being. This entails integrating ecological integrity, distributive justice, health, livelihood security, and intergenerational equity into the assessment of economic performance. Indonesia does not need to choose between economic development and environmental protection as mutually exclusive objectives; rather, it must determine the institutional conditions under which economic expansion strengthens rather than undermines the ecological and social foundations of prosperity. Under such a framework, the success of the eight-percent growth model would ultimately be measured not by how much the economy expands, but by whether the benefits of that expansion are broadly shared and whether the environmental costs are prevented, fairly allocated, and never simply passed on to those with the least capacity to bear them.

References

- Daly, Herman E., and John B. Cobb Jr. 1989. *For the Common Good: Redirecting the Economy toward Community, the Environment, and a Sustainable Future*. Boston: Beacon Press.
- Elmhirst, Rebecca. 2011. "Introducing New Feminist Political Ecologies." *Geoforum* 42, no. 2: 129–132.
- Hartwick, John M. 1977. "Intergenerational Equity and the Investing of Rents from Exhaustible Resources." *American Economic Review* 67, no. 5: 972–74.
- O'Faircheallaigh, Ciaran. 2013. "Extractive industries and Indigenous peoples: A changing dynamic?." *Journal of Rural Studies* 30: 20-30. <https://doi.org/10.1016/j.jrurstud.2012.11.003>
- Parahyangan, Dominikus Leonardo, Muhammad Maulana, and Justin Hartanto. 2023. "Impact of Economic Growth and FDI on Indonesia Environmental Degradation: EKC and Pollution Hypothesis Testing." *Jurnal Ekonomi Pembangunan* 21, no. 1. <https://doi.org/10.22219/jep.v21i01.24294>.
- Pigou, Arthur Cecil. 1920. *The Economics of Welfare*. London: Macmillan and Co.
- Prasetyanto, Panji Kusuma, and Farmila Sari. 2021. "Environmental Kuznets Curve: Economic Growth with Environmental Degradation in Indonesia." *International Journal of Energy Economics and Policy* 11, no. 5: 622–628. <https://doi.org/10.32479/ijeep.11609>.
- Ramadanti, Sarindang Suci, Azwardi, and Muhammad Subardin. 2025. "Economic, Environment, and Social Welfare in the Mineral Economy Provinces of Eastern Indonesia." *Jurnal Ekonomi Pembangunan* 22, no. 2. <https://doi.org/10.22219/jep.v22i02.34599>.
- Republic of Indonesia. 2009. *Law of the Republic of Indonesia Number 32 of 2009 concerning Environmental Protection and Management*. Jakarta: Government of the Republic of Indonesia.
- Republic of Indonesia. 2021. *Government Regulation of the Republic of Indonesia Number 22 of 2021 concerning the Implementation of Environmental Protection and Management*. Jakarta: Government of the Republic of Indonesia.
- Republic of Indonesia. 2024. *Law of the Republic of Indonesia Number 59 of 2024 concerning the National Long-Term Development Plan for 2025–2045*. Jakarta: Government of the Republic of Indonesia.
- Republic of Indonesia. 2025. *Presidential Regulation of the Republic of Indonesia Number 12 of 2025 concerning the National Medium-Term Development Plan for 2025–2029*. Jakarta: Government of the Republic of Indonesia.
- Rocheleau, Dianne E., Barbara P. Thomas-Slayter, and Esther Wangari, eds. 1996. *Feminist Political Ecology: Global Issues and Local Experiences*. London: Routledge.

- Schlosberg, David. 2007. *Defining Environmental Justice: Theories, Movements, and Nature*. Oxford: Oxford University Press.
<https://doi.org/10.1093/acprof:oso/9780199286294.001.0001>.
- Wahyono, Agus, Sulaiman Akbar, and Aldo Dewantara. 2024. "Environmental Health Justice: The Impact of Pollution on Vulnerable Communities in Indonesia." *Indonesian Health Justice Review* 1, no. 2.
<https://doi.org/10.65815/365re090>.
- Weiss, Edith Brown. 1989. *In Fairness to Future Generations: International Law, Common Patrimony, and Intergenerational Equity*. Tokyo: United Nations University; Dobbs Ferry, NY: Transnational Publishers.

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