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An introduction from the Lex:lead President

Since presenting our first award in 2010, Lex:lead has reached 180 winners as we recognise more and more students from across our eligible countries, with 14 more students awarded this year. Lex:lead's annual essay competition on topics of law and development that is open to the world's least developed countries has been generously supported throughout by leading law firms and foundations including the International Bar Association (IBA) Foundation, which was the source of our first and some of our most generous grants over the years.

Lex:lead's panel of judges recognised the top essays this year on the question: 'How can legal frameworks be strengthened to promote sustainable infrastructure while balancing economic growth, environmental protection and social equity?' Each year our essay questions juxtapose an area of law with the effect it can have on economic development and the reduction of poverty, challenging our writers to think beyond the texts they learn in their academic environments and apply it to their lived experiences. The results are often thought-provoking insights into the nature of law and how law affects all of our lives, particularly those in developing countries.

I personally found this year's question particularly challenging but was pleased to see the students rise to the occasion. Equally challenging for me this year was making my annual 'President's Pick'. This year instead of nominating one or even several of the essays for this recognition, I will just note that a number of the essays made some very good points, highlighting the essays of Ann Aseya Ama Donya (Ghana) and Pearl Akosua Pokuaa Pipim (Ghana) among those worth a read.

Lex:lead has recognised contributions made to it many times with honorary awards and this year again recognised the highest-ranked female winner (this year Ms Winfrida Gavana (Tanzania)) with an award made in honour of our patron the Honourable Dame Linda Dobbs DBE.

Happy reading.

Anne Bodley
President/Founder, Lex:lead

Legal frameworks for sustainable infrastructure: balancing economic growth, environmental protection and social equity

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Introduction

Sustainable infrastructure is of paramount importance as societies grapple with the interconnected challenges of climate change, resource depletion and social inequality.[1] Extending beyond a focus on physical systems, the understanding set by the UN Sustainable Development Goals (SDGs) defines sustainable infrastructure holistically, speaking to systems that are planned, designed, constructed, operated and ultimately decommissioned to ensure economic, social, environmental and institutional sustainability over their lifecycle. The model is integrative, serving as a critical cross-cutting catalyst for the SDG's 2030 Agenda. While explicitly anchored in SDG9 (industry, innovation and infrastructure), which calls for 'quality, reliable, sustainable, and resilient infrastructure', the model is also linked to goals for clean water and sanitation (SDG6), affordable energy (SDG7), sustainable cities (SDG11), responsible consumption (SDG12) and climate action (SDG13).

To achieve this balance—simultaneously advancing economic development, environmental protection and social equity—is a profound legal and governance challenge.[2] This essay argues that effective legal frameworks, informed by international norms like the SDGs and fortified by judicial precedent, are indispensable to meeting such competing demands and translating the holistic vision of sustainability into binding practice. It explores how the law establishes standards, mandates integrated assessments, deploys economic instruments, balances property rights with societal interests and enforces accountability to ensure that infrastructure development is truly sustainable.

The foundational dimensions and the necessity of law

Sustainable infrastructure rests on three interdependent pillars: (1) environmental sustainability, to minimise ecological impact and build its resilience; (2) social equity, to ensure fair access, participation in and benefits for all; and (3) economic viability, to ensure financial soundness and support growth. According to Ayarkwa et al., these dimensions are frequently in tension:[3] a dam may promise economic benefits and clean energy (advancing SDG7 and SDG9) for example, but displace communities and harm ecosystems (undermining SDG11 and SDG13, and social equity). Developing legal frameworks are the primary mechanism for reconciling these conflicts. They provide the rules, procedures and institutions that guide planning, allocate costs and benefits, and hold stakeholders accountable, shifting sustainability from an ideal to a binding obligation. Acknowledging law's critical role in reconciling tension, the next step is to examine how such frameworks set enforceable standards at both domestic and international levels.

Establishing standards: domestic law and international obligations

The effective governance of sustainable infrastructure depends on the law's ability to establish clear, actionable and binding standards. Lon Fuller's jurisprudence emphasises that for law to function as a purposive enterprise and to command fidelity, it must embody an 'inner morality' characterised by clarity, consistency and practicability.[4] The transition from fragmented domestic environmental regulations to a coherent global governance model reflects these principles.[5] While domestic statutes provide a foundational framework, their scope is shaped by international treaty obligations which supply the clarity and direction that Fuller considers essential for long-term planning and investment.

The Paris Agreement transforms political goals into binding law. Article 2 establishes

clear benchmarks, limiting warming increases to 'well below 2°C' and mandating the alignment of finance with climate-resilient development. This establishes a redline legal duty for states to direct capital towards sustainable infrastructure. Article 4 reinforces this by requiring successive nationally determined contributions (NDCs), translating global standards into national action plans. Critically, the framework is built upon the principle of common but differentiated responsibilities and respective capabilities (CBDR-RC), anchored in the Agreement's preamble. This principle ensures equity by differentiating obligations based on national circumstances, historical responsibility and capacity, realised through flexible NDCs and developed countries' enhanced support duties. Together, these provisions create the stable, predictable and equitably differentiated platform necessary for effective global coordination, fulfilling Fuller's demand for a practicable and legitimate legal order.

Standards, however, gain meaning only through enforcement to fulfil Fuller's principle of congruence between rules and official conduct. Domestic courts provide this final link by operationalising abstract norms through adjudication. In *MC Mehta v Union of India*,[6] for instance, the Indian Supreme Court derived a right to a healthy environment from the constitutional right to life and ordered the closure of polluting industries near the Taj Mahal. This ruling gave force to sustainable development, prioritising ecological integrity over short-term industrial interests. This judicial role in enforcing global standards against state actors is also illustrated in *Urgenda Foundation v State of the Netherlands*[7] where the Dutch Supreme Court held that the state had a legal duty of care, derived from Articles 2 and 8 of the European Convention on Human Rights, to take more ambitious climate mitigation action. Crucially, it ordered the government to achieve a minimum 25 per cent reduction in greenhouse gas emissions by 2020, transforming the Agreement's temperature goals into a specific, enforceable national target. A Fullerian analysis thus reveals a functional hierarchy, with international law setting clear standards, domestic processes rendering them actionable and judiciaries enforcing them, ensuring that the legal framework for sustainable infrastructure advances from aspiration to action.[8]

Mandating comprehensive impact assessments and public participation

A cornerstone legal mechanism for reconciling development with sustainability is the environmental impact assessment (EIA) mandated by the Espoo Convention.[9] At its most effective, a robust EIA process transcends the technical audit it serves as a democratic forum for identifying ecological and social risks, evaluating project alternatives and prescribing substantive mitigation measures.[10] Its transformative potential is realised only when it integrates rigorous social dimensions and guarantees genuine public participation thereby ensuring that infrastructure projects are not only environmentally sound but also socially legitimate and equitable.[11]

This integration of procedure and rights is crystallised in international law. The Aarhus Convention (1998)[12] establishes a foundational triad of procedural environmental rights: access to information, public participation in decision-making and access to justice. These principles are complemented by the Agreement's substantive commitments. The Agreement's preamble explicitly obliges parties to respect human rights, including those of indigenous peoples and local communities, in taking climate action. More concretely, Article 7(5) of the Agreement mandates that adaptation action, as a core aspect of resilient infrastructure, follow a 'country-driven, gender-responsive, participatory and fully transparent approach, taking into consideration vulnerable groups, communities and ecosystems'. Together, these instruments create a legal imperative for inclusive and transparent infrastructure planning.

National jurisprudence has consistently reinforced this imperative. In the landmark case of *Vellore Citizens Welfare Forum v Union of India*,[13] the Indian Supreme Court elevated the precautionary principle and the 'polluter pays' principle to the status of enforceable environmental law, decreeing that developmental decisions must proactively account for community health and ecological integrity. This aligns with the higher standard of free, prior and informed consent (FPIC) for indigenous peoples, codified in International Labour Organization (ILO) Convention No 169 (1989). The standard has been applied in regional human rights systems. In the *Endorois* case,[14] the African Commission on Human and Peoples' Rights

ruled that the displacement of an indigenous community for development purposes violated its rights to property, religion and culture, mandating restitution and equitable benefit-sharing. The application of this standard is demonstrated in cases like *Carmen v State of Queensland*[15] in Australia where courts have upheld the necessity of meaningful consultation, asserting legal frameworks as critical bulwarks protecting social equity against the impetus of large-scale development.

Thus, while participatory and precautionary processes are essential for safeguarding communities and ecosystems, they must be part of a broader legal architecture. The legitimacy and equity secured through these mechanisms then create the foundation upon which economic instruments can effectively align financial incentives with long-term sustainability goals.

Economic instruments, financing and the polluter pays principle

Legal frameworks are instrumental in aligning financial incentives with long-term sustainability by internalising environmental costs and directing capital flows. The foundational economic principle is that of the 'polluter pays', first formalised by the Organisation for Economic Co-operation and Development (OECD)[16] and later entrenched in Principle 16 of the Rio Declaration. This norm mandates that actors responsible for environmental harm bear the costs of mitigation and remediation. Domestic and regional law operationalises this principle through liability regimes. For instance, in *Cambridge Water Co Ltd v Eastern Counties Leather plc*,[17] the UK House of Lords established strict liability for pollution, affirming that a commercial enterprise must bear the cost of unintended environmental damage from its operations. This common law approach is reinforced by harder statutory frameworks like the European Union Environmental Liability Directive (2004/35/EC), which creates a comprehensive administrative system for preventing and remedying environmental damage at the operator's expense. Such legal structures transform an ethical principle into a binding financial deterrent, ensuring environmental externalities are accounted for in project economics.

Beyond assigning costs under the polluter pays principle, the law proactively structures sustainable finance mechanisms. The rapid growth of the green bond market is underpinned by voluntary standards like the International Capital Market Association's green bond principles which provide the legal and reputational framework for defining 'green' projects and ensuring that proceeds are allocated accordingly. Similarly, legal contracts for public-private partnerships (PPPs), often modelled on frameworks from institutions like the World Bank, can embed sustainability covenants, such as energy efficiency targets or ecological compensation, into long-term concession agreements. At the international level, the Green Climate Fund, established under Article 11 of the UN Framework Convention on Climate Change (UNFCCC), exemplifies a treaty-based financial mechanism. Its governing instrument creates a legal entity to channel concessional finance specifically towards low-emission and climate-resilient infrastructure in developing countries, thereby implementing the equity principle of common but differentiated responsibilities.

The development of sustainable infrastructure inherently requires land resources, however, creating a fundamental tension between progress and the protection of human rights. Legal frameworks must therefore mediate between the state's power of compulsory acquisition and the protection of both property rights and social equity, guided by international safeguards like the UN's principles on evictions, which mandate meaningful consultation, fair compensation and adequate resettlement. This balance is critically defined by national jurisprudence: while the United States Supreme Court in *Kelo v City of New London*[18] broadly expanded 'public use' to include economic development, the South African Constitutional Court in *Government of the Republic of South Africa v Grootboom*[19] prioritised socio-economic rights, obliging the state to address the needs of the dispossessed. These contrasting approaches demonstrate how constitutional law can actively safeguard social justice, ensuring that the pursuit of sustainability does not itself perpetuate inequality.

Balancing land acquisition, property rights and social justice

India's Land Acquisition Act of 2013, with its requirements for social impact assessments and consent, represents a significant domestic legislative effort to operationalise international human rights norms. These

include the UN's Basic Principles on Development-based Evictions, which mandate protection for displaced persons, and the standard of FPIC for indigenous communities, as articulated by the Inter-American Court in *Saramaka People v Suriname*.[20] Furthermore, the World Bank's Environmental and Social Standard (ESS) 5 on involuntary resettlement provides a parallel operational framework for ensuring that project finance does not undermine social equity. Thus, the Act embodies a national response to an imperative defined by international soft law, human rights jurisprudence and global best practice. Protecting rights on paper is not enough; enforcement and adaptive governance are essential to ensure these protections translate into practice.

Enforcement, accountability and adaptive governance

Effective legal frameworks require both enforcement and adaptability. The 1984 Bhopal gas tragedy[21] demonstrates the catastrophic costs of regulatory failure, underscoring the need for stringent compliance mechanisms.[22] Conversely, law must also integrate new scientific knowledge. The US National Environmental Policy Act (NEPA) exemplifies adaptive governance, mandating environmental impact statements, a duty reinforced in *Calvert Cliffs' Coordinating Committee, Inc v AEC*[23] to ensure ongoing project accountability. Scholars advocate enhancing this model with enforceable post-approval monitoring. Thus, combining strict enforcement with structured adaptation allows law to balance development, environmental protection and equity.[24] By enforcing compliance while remaining adaptive, legal frameworks sustain the delicate balance between growth, protection and equity.

Conclusion

Ultimately, sustainable infrastructure is a legal construct. As demonstrated, effective legal frameworks are indispensable for reconciling economic, environmental and social imperatives. They convert global aspirations, like those behind the Paris Agreement, into binding duties; mandate participatory and precautionary planning through EIAs and FPICs; and align finance with sustainability via instruments like the 'polluter pays' principle. Crucially, independent courts from *Urgenda* to *MC Mehta* and *Grootboom* enforce these standards, ensuring accountability and justice. Thus, building a sustainable future depends on continuously strengthening this legal architecture, ensuring development is not only resilient but also equitable.

Notes

1 Srinivas Yanamandra, 'Sustainable Infrastructure: An Overview Placing Infrastructure in the Context of Sustainable Development' (University of Cambridge Institute for Sustainability Leadership, 2020).
2 Cynthia Amaka Obiorah, et al., 'Sustainable Development Planning and Social Justice: Examining the Relationship between Economic Growth and Social Equity' (2025) International Journal of Innovative Legal and Political Studies.
3 Joshua Ayarkwa, et al., 'Sustainable Building Processes' Challenges and Strategies: The Relative Important Index Approach' (2022) 7 Cleaner Engineering and Technology.
4 Lon L Fuller, *The Morality of Law* (Rev edn, Yale University Press 1969).
5 Louis J Kotzé, 'Articulating Global Environmental Governance: Lessons from the Anthropocene' in Louis J Kotzé (ed), *Environmental Law and Governance for the Anthropocene* (Hart Publishing 2017) which discusses the shift from fragmented to coherent governance models.
6 AIR 1997 SC 734.
7 ECLI:NL:HR:2019:2007.
8 *Ibid.*
9 UN Economic Commission for Europe (UNECE), Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) (New York and Geneva 2017).
10 EU EIA Directive: Directive 2011/92/EU of the European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment (2012) OJ L26/1 (as amended by Directive 2014/52/EU).
11 *Ibid*, 25.
12 UN Convention on Access to Information, Public Participation in Decision-making, and Access to Justice in Environmental Matters (Aarhus Convention), UNTS Vol. 2161 at 447.
13 AIR 1996 SC 2715.
14 Centre for Minority Rights Development (Kenya) and Minority Rights Group International on behalf of *Endorois Welfare Council v Kenya*, Communication 276/2003, African Commission on Human and Peoples' Rights (4 February 2010).
15 [2018] QLC 40.
16 Founded in 1961.
17 [1994] 2 AC 264.
18 545 US 469 (2005).
19 2001 (1) SA 46 (CC).
20 Judgment of 28 November 2007, Inter-American Court of Human Rights Series C No 172.
21 A catastrophic industrial disaster that occurred in the early hours of 3 December 1984 in Bhopal, Madhya Pradesh, India. It is considered among the world's worst industrial disasters in history.
22 Mohd Akhter Ali, et al., 'Economic Policies for Sustainable Development: Balancing Growth, Social Equity, and Environmental Protection' [2024] ASEAN Journal of Economic and Economic Education.
23 449 F 2d 1109 (DC Cir 1971).
24 Adishree Sakhare, Navigating Legal Challenges for Sustainable Infrastructure Development: A Comprehensive Analysis and Policy Recommendations, Ile Law Reporter (Ile Lre), 1 (1) Of 2023, pp 33–54, Apis – 3920 – 0043.

How can legal frameworks promote sustainable infrastructure while balancing economic growth, environmental protection and social equity?

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Introduction

The objective of every thriving economy is to achieve societal growth without compromising resources. From roads, power plants, water systems and factories, infrastructure is a foundation for economic and social progress. Today, the issue is establishing sustainable structures without harming the environment. Under the Paris Agreement,[1] signatory nations pursue climate-resilient pathways that conform with environmental sustainability. The 2014-2019 'Flint water crisis' in the United States, for example, shows some of the stakes: weak regulatory oversight and poor infrastructure governance exposed tens of thousands of marginalised residents to toxic drinking water.[2] The failure shows that essential infrastructure can affect both people and our environment when legal frameworks are ineffective. This paper argues that a balance between economic growth, environmental protection and social equity requires clear, enforceable legal standards. It also includes participatory governance schemes and incentive-driven structures that drive compliance. It examines key concepts, evaluates existing frameworks, explores how they can harmonise economic growth, environmental protection and social equity, and proposes reforms capable of enhancing the delivery of sustainable infrastructure.

Key concepts: legal frameworks, sustainable infrastructure, economic growth, environmental protection and social equity

Legal frameworks comprise rules and mechanisms to ensure order and compliance. In environmental governance, frameworks operate as safeguards with a mandate of promoting environmental protection, translating globally-adopted schemes into enforceable standards. As emphasised by the United Nations Environment Programme (UNEP), environmental laws are essential to every nation.[3] International and regional instruments, including the draft Global Pact for the Environment,[4] the Aarhus Convention[5] and the longstanding Montevideo Programme,[6] embody principles such as the precautionary approach, the 'polluter pays' principle and public participation, collectively ensuring transparency and accountability.[7] Legal frameworks are not mere static rules: they catalyse development towards sustainable outcomes. Environmental protection agencies, for example, issue regulations that set pollution limits and enforce sector-specific guidelines. Environmental protection involves the responsible stewardship of our planet undertaken to preserve the integrity of the environment and prevent its degradation due to mass industrialisation.[8] Challenges persist despite progress made, including institutional capacity and resource scarcity. Consequently, the effectiveness of environmental protection hinges on comprehensive and participatory frameworks.

The World Bank Sustainable Infrastructure Action Plan 2009-2011[9] defines sustainable infrastructure as extending beyond core sectors (transport, energy and information and communications technology (ICT)) to require integrated, cross-sectoral approaches that balance social, environmental and financial objectives. Infrastructure projects may be sustainable if assessed at their design stage as contributing to the UN Sustainable Development Goals (SDGs). In ascertaining what would constitute sustainable infrastructure, tenets must be considered. First, there must be a demonstrable commitment at the design stage toward the achievement of one or more of the SDGs. Second, the project must be assessed and monitored against well-defined social, environmental and economic objectives, adopting a 'triple-bottom-line' approach. Third, due regard must be given to financial sustainability, ensuring the project remains viable without causing further harm.

Economic growth refers to an increase in the production of economic goods and services in one period compared to a previous period.[10] Infrastructure drives economic growth by reducing costs, increasing productivity, attracting investment and improving access to essential services. However, researcher Shukrat Shadmanov's analysis cautions that infrastructure does not automatically generate growth as its impact varies across nations depending on the quality of governance, finance and long-term maintenance.[11] Poorly designed or mismanaged projects can become inefficient, increase public debt or fail to benefit vulnerable groups.

Social equity entails the fair, just and equitable management of public institutions and the implementation of public policy, as well as the commitment to promote fairness, justice and equity in the formation of public policy.[12] The SDG framework reinforces that development must leave no one behind, with a focus on vulnerable or marginalised groups including women, children, persons with disabilities and economically disadvantaged communities. This study aligns with SDG10 on reducing inequality and SDG11 on making cities inclusive and sustainable, where infrastructure must serve all persons regardless of their background.[13]

Key legal frameworks for sustainable infrastructure

Environmental protection begins where legal frameworks draw the line between overexploitation and responsibility. The 2015 Paris Agreement, for example, is an international treaty adopted at the UN Climate Change Conference (COP 21) with a core mandate to limit global temperature rises well below 2°C, and ideally not greater than 1.5°C.[14] At its tenth anniversary in Bonn (June 2025), UN Framework Convention on Climate Change (UNFCCC) Executive Secretary Simon Stiell highlighted the treaty's progress and emphasised that actions must be real and implementation take precedence over gestures. He highlighted that the world is gravitating towards clean energy.[15] In one year alone, Stiell stated that almost US$2tn had been invested in solar power, wind power and modern infrastructure. Although the Paris Agreement offers good outcomes, economic disparities between developing and developed nations limit its efficiency. Developing nations such as Bangladesh, because of their low-lying geographies, are vulnerable to sea level rises and flooding. Developed nations under UNFCCC Article 9 are tasked with providing financial assistance to support mitigation and adaptation efforts in developing nations but funding has consistently fallen short, undermining the effectiveness of the framework.

Similarly, the UN 2030 Agenda for Sustainable Development, adopted by its members in 2015, aims for a world where all 17 SDGs are realised.[16] The SDGs give the nexus between the environment, social aspects and sustainable development. The initiative is universal and time-bound. It encompasses legally non-binding objectives adopted by governments, and its centre lies in the concept of sustainability. From eradicating poverty to strengthening global partnership, it serves as a good path to solving world problems. The UN Office for Project Services (UNOPS)/Economist Intelligence Unit Report identifies barriers to sustainable infrastructure development.[17] These include short-termism in policy development caused by election cycles, poor legislation, bureaucratic constraints, limited capacity and insufficient financing challenges that are particularly acute in developing states where competing priorities often elevate economic growth over long-term sustainability goals.[18]

How legal frameworks promote sustainable infrastructure

Legal frameworks serve as compasses to sustainable systems. Failing to adhere to standards conforming to national and global sustainability norms should attract penalties. Rules for planning and implementing projects responsibly must include consultation with affected communities and environmental assessments. Principle 10 of the 1992 Rio Declaration on Environment and Development emphasises that environmental issues are best handled with the inclusion of concerned citizens. States should facilitate public awareness and access to information, ensuring transparency and accountability.[19] Critics argue that in developing countries, economic priorities often override sustainability concerns in infrastructure planning. The framework's compromise between industrialised and developing nations weakens enforceability and its anthropocentric focus, where human-centric goals are prioritised over ecological

preservation.[20] Despite its limitations, it remains a foundational framework that provides legal direction for sustainable infrastructure. The Kyoto Protocol's binding emission reduction targets have marked a significant breakthrough in frameworks that integrate climate considerations into infrastructure planning, serving as a template influencing reforms in national laws aimed at promoting low-carbon and resilient infrastructure in countries around the world.[21] A 2021 report by the Global Infrastructure Hub shows that 60 per cent of global private investment in infrastructure was green, demonstrating how international legal frameworks like the Paris Agreement and UNFCCC are translating into real capital flows for sustainable infrastructure.[22] In Ghana, the Environmental Protection Act (Act 1124) requires environmental impact assessments but enforcement is weak due to limited funding and other resources.[23] This underscores the need for predictable finance to translate policy into implementation. Stiell calls climate finance 'the great accelerator', arguing that scaling up funding is the turning point for strengthening legal frameworks to ensure real-world impact.

International treaties and agreements serve as templates that can influence municipal frameworks at national level. Local laws can align their mandates with global standards to ensure better compliance. This strategy ensures that nations develop better laws to tackle issues simultaneously, including standards for climate action, environmental protection and social equity. Aligning with treaties like the Paris Agreement can provide state access to transnational networks. Barcelona's Metropolitan Commitment 2030 stands as an example of how international frameworks, like the SDGs, can be used as blueprints to create better local laws.[24] Rather than abandoning the SDGs as abstract ideologies, the initiative turns them into local missions that address environmental, social and economic challenges. Through eight cross-cutting missions from innovative urban policies and sustainable mobility to green infrastructure, Barcelona 2030 channels effort towards SDGs.

Public-private partnership (PPP) laws also help governments and private companies work together to build necessary infrastructure. These laws can be strengthened when key considerations are incorporated. The UN Commission on International Trade Law (UNCITRAL) Model Legislative Provisions on Public-Private Partnerships (2019), along with its accompanying Legislative Guide, promote sustainability into PPP projects by setting procedures for comprehensive project procurement. PPP contracts factor in climate risk assessments so that both public and private partners share the cost of climate-related complexities.[25] According to the World Bank's 'Country Guidance', PPP programmes can be explicitly designed to prioritise SDGs. By embedding SDG goals into PPP contracting, institutions do not just build for building's sake but ensure that projects are developed with sustainability in mind.[26]

Planning and zoning laws, such as the UN's New Urban Agenda (2016), present a paradigm shift based on the science of cities, and lay out standards and principles for planning, construction and the improvement of urban areas.[27] By guiding infrastructure to the right zones, these laws reduce the risk of habitat destruction, flooding and water pollution. In Ghana, this is reflected in the 2016 Land Use and Spatial Planning Act which serves as a blueprint for promoting organised growth and environmental protection.[28] Such laws also prevent unplanned urban expansion, which can lead to overcrowding and the over-exploitation of limited resources.

Strong frameworks such as the US Inflation Reduction Act provide long-term tax credits for companies and individuals who invest in clean energy projects.[29] They provide incentives such as tax relief, subsidies or PPP arrangements to further encourage private sector investment. The law thus rewards compliance while also deterring non-compliance, supporting companies that establish projects that underscore public interest, but are also eco-friendly. Investor confidence is also increased due to the predictability of these regulations. When investors know what to expect in terms of the possible outcomes from adhering to the accepted practices and what incentives exist, they can make decisions with less risk, much like farmers rely on predictable seasons to plan their harvest.

Balancing economic growth with environmental protection and social equity

The quest for rapid economic growth has too often turned infrastructure development

into a race for numbers, sidelining the sustainability and wellbeing it was meant to serve. Economic growth is often measured by gross domestic product (GDP), which represents the total market value of goods and services produced by a country over a given period. However, while GDP provides a quantitative measure of economic activity, it does not necessarily capture the qualitative aspects of growth, such as environmental sustainability and equitable wealth distribution.

To reconcile economic growth with ecological and societal goals, environmental considerations must be fully incorporated into economic planning. Environmental impact assessments (EIAs) often focus on individual projects and overlook cumulative impacts. To ensure a balance, we look for environmental constraints, such as resource carrying capacity and pollution assimilation limits, that should be integrated into economic appraisals and project selection. Multi-objective planning models balancing economic, social and environmental goals help decision-makers to assess trade-offs and design projects that serve the public while preserving the environment. Legally factoring in key ecological limits into planning projects using biodiversity credits can aid in influencing economic decisions while also promoting sustainable infrastructure.

In practical terms, investing in green technologies and renewable energy illustrates the synergy between economic growth and environmental protection. Energy non-governmental organisations (NGOs) can spearhead projects that reduce emissions and create jobs by promoting projects like hydropower, which ensure clean energy and also create employment opportunities. For instance, Germany's *Energiewende* (energy transition) initiative has significantly increased the country's share of renewable energy in electricity generation while supporting economic growth. Investing in green technologies and renewable energy is an effective strategy for both progress and preservation. Similarly, in Kenya, the Lake Turkana Wind Power Project (310 MW) and the country's 988 MW geothermal capacity exemplify how legal frameworks can drive sustainable infrastructure. These cases demonstrate that investing in renewable energy can ensure economic growth and environmental protection.

Beyond large-scale projects, supporting social entrepreneurs who fuse their business ideas and initiatives with environmental protection can be achieved through grants, tax incentives and special opportunities. Business models that aim at solving waste or energy problems combine profit with purpose. Promoting their craft creates a well-balanced result of economic growth and environmental sustainability. For example, SELCO India, founded by Harish Hande, provides solar power solutions to rural communities with clean energy access where conventional electricity is scarce. Investing in initiatives and supporting these businesses would help build more sustainable infrastructure and support every individual.

Moreover, governments must prevent environmental racism that disproportionately burdens marginalised communities. Addressing this requires deliberate policies and actions to prevent the disproportionate burden of pollution on those communities, which would require strong zoning regulations.

Conclusion and recommendation

Sustainable infrastructure requires reconciling economic, environmental and social imperatives, not trading them off. Legal frameworks are the mechanism that turns this potential conflict into synergy. This is achieved by providing compulsory direction through zoning laws and EIAs, creating incentives through instruments like the Inflation Reduction Act, and ensuring participatory channels grounded in principles such as the Aarhus Convention. By internalising environmental and social costs, the law brings sustainability from the margins to the centre of economic planning. Balance, however, demands an integrated legal ecosystem, in which environmental assessments trigger equity reviews. PPP contracts require validated community benefit agreements. This ensures that infrastructure is judged not only by costs and speed but also by its carbon footprint and accessibility to marginalised communities. To cement this integration, I recommend inclusion of a UNEP sustainability undertaking clause in contracts that legally bind projects to core environmental principles, turning global ethics into non-negotiables.

Notes

1 Paris Agreement (also called the Paris Accords or the Paris Climate Accords) (adopted 12 December 2015, entered into force 4 November 2016) 3156 UNTS 79, Art 2(1)(b)-(c).
2 CNN Editorial Research, 'Flint Water Crisis Fast Facts' (CNN, 4 March 2016) https://edition.cnn.com/us/flint-water-crisis-fast-facts accessed 23 December 2025.
3 UNEP, Environmental Rule of Law: First Global Report (UNEP 2019) at: https://wedocs.unep.org/handle/20.500.11822/27376 accessed 30 November 2025.
4 What is the Global Pact?, at: https://globalpactenvironment.org/en/.
5 UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention), UNTS Vol. 2161, p. 447.
6 UNEP Montevideo Programmes for the Development and Periodic Review of Environmental Law, see, https://www.unep.org/topics/environmental-law-and-governance/promoting-environmental-rule-law/montevideo-environmental.
7 Philippe Sands and Jacqueline Peel, *Principles of International Environmental Law* (4th edn, Cambridge University Press 2018).
8 Clive Hamilton and Simone Bastianoni, 'Environmental Protection' in Brian Fath (ed), *Encyclopedia of Ecology* (2nd edn, Elsevier 2019) 350–357.
9 World Bank, 2008.
10 Nicholas Gregory Mankiw, *Principles of Economics* (9th edn, Cengage 2021).
11 Shukhrat Sherkulovich Shadmanov, 'Infrastructure and Economic Growth' (2019) 2(41) International Journal of Economics and Commerce Research.
12 Tyrone P Dooley, 'Searching for Social Equity among Public Administration Mission Statements' (2019) *Teaching Public Administration* https://napawash.org/uploads/P05_Dooley_-_Searching_for_social_equity_among_public_administration_mission_statements_2019.pdf (viewed 1 December 2025).
13 UNGA, 'Transforming Our World: The 2030 Agenda for Sustainable Development' (25 September 2015) UN Doc A/RES/70/1; UN, SDG 10: reduce inequality https://sdgs.un.org/goals/goal10, and SDG 11: sustainable cities https://sdgs.un.org/goals/goal11 (viewed 1 December 2025).
14 Paris Agreement (UNFCCC), at: https://un.org/en/climatechange/paris-agreement (viewed 1 December 2025). Paragraph on long-term goals (limiting warming to well below 2°C and pursuing efforts to 1.5°C).
15 UN Climate Change, 'Paris Agreement Showed the World That Multilateralism Can Deliver: UN Climate Chief Speech' (UNFCCC, 21 June 2025) at https://unfccc.int/news/parisagreement-showed-the-world-thatmultilateralism-can-deliver-un-climate-chief-speech (viewed 1 December 2025).
16 UN Office for Sustainable Development, SDGs: The 2030 Agenda for Sustainable Development, at: https://unosd.un.org/content/sustainable-development-goals-sdgs (viewed 1 December 2025).
17 Economist Intelligence Unit, 'The Critical Role of Infrastructure for the Sustainable Development Goals' (UNOPS, 2019) at https://content.unops.org/publications/The-critical-role-of-infrastructure-for-theSDGs_EN.pdf (viewed 1 December 2025).
18 *Ibid.*
19 UN Conference on Environment and Development (UNCED), Rio Declaration on Environment and Development (1992) principle 10, at: www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_CONF_26_Vol.I.pdf (viewed 1 December 2025).
20 Stephen Axon, 'Unveiling Understandings of the Rio Declaration's Sustainability Principles: A Case of Alternative Concepts, Misaligned (Dis)Connections, and Terminological Evolution' (2024) 16(6) Sustainability 2600.
21 Kyoto Protocol to the United Nations Framework Convention on Climate Change (adopted 11 December 1997, entered into force 16 February 2005) UN Doc FCCC/CP/1997/7/Add.1.
22 Global Infrastructure Hub, Infrastructure Monitor 2022 (GI Hub 2023) https://cdn.gihub.org/umbraco/media/5264/gih-infrastructure-monitor-2022-report-private-investment-may2023.pdf (viewed 1 December 2025).
23 Environmental Protection Agency Act, 2025 (Act 1124) (Ghana) https://ghalii.org/akn/gh/act/2025/1124 accessed 1 December 2025.
24 Barcelona 2030 Agenda: Advancing Sustainable Development (Promote Barcelona) https://promote.barcelona/barcelona-2030-agenda (viewed 1 December 2025).
25 UN Commission on International Trade Law (UNCITRAL) Model Legislative Provisions on Public–Private Partnerships (2019) and Legislative Guide on Public–Private Partnerships (2019) https://uncitral.un.org/en/texts/ppp (viewed 1 December 2025).
26 World Bank, Country Guidance: Public–Private Partnerships for Sustainable Development in Asia and the Pacific (World Bank PPP Resource Center, 2017) at https://ppp.worldbank.org/public-privatepartnership/sites/ppp.worldbank.org/files/2022-02/PPP_and_SDGs_Draft_20_ December.pdf (viewed 1 December 2025).
27 United Nations, New Urban Agenda (Habitat III, Quito, 20-22 October 2016), at: https://unhabitat.org/sites/default/files/2020/12/nua_handbook_14dec2020_2.pdf (viewed 1 December 2025).
28 Prince Tabiri, 'Understanding Ghana's Land Use and Planning Laws: A Guide to Zoning, Building Permits, and Environmental Regulations' (The Business & Financial Times, 30 May 2023), https://thebftonline.com/2023/05/30/understanding-land-use-and-planning-laws/ (viewed 1 December 2025).
29 United States, Inflation Reduction Act of 2022 (HR 5376, 117th Cong, 2022) (clean energy tax credits and incentives).

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Tanzania's legal framework for mining: balancing economic growth, the environment and social justice

Introduction

The mining sector is a foundation of Tanzania's economy, contributing to the country's gross domestic product (GDP), to foreign exchange earnings and to employment levels. The extraction of valuable resources however like gold, diamonds and copper raises concerns about environmental degradation, community displacement and the distribution of benefits.[1] To manage these concerns, Tanzania has enacted and periodically reviews the legal frameworks it has adopted to address these challenges and ensure that the mining sector contributes to rather than undermines the country's development. This essay examines the role and effectiveness of such frameworks in balancing economic growth, environmental sustainability and social justice while highlighting the challenges that persist in achieving these competing objectives.

Legal frameworks governing the mining sector in Tanzania

The principal legislation governing the mining sector is the Mining Act, most recently revised in 2023.[2] The Mining Act sets a framework for mining endeavours while safeguarding national interests. It establishes licensing procedures, local content requirements, environmental protection standards and community development agreements. It also established the Mining Commission to regulate the industry and resolve disputes.[3] The 2017 and 2023 amendments reshaped the sector introducing stronger provisions on local participation, transparency and accountability.[4] These changes enhanced state control over natural resources and strengthened benefits-sharing requirements with local communities.

Complementing the Mining Act is the 2004 Environmental Management Act (EMA).[5] Applicable to the mining and other sectors, the EMA establishes a legal and institutional framework to ensure sustainable environmental management.[6] The Act requires all mining projects to undergo environmental impact assessments (EIAs) and to develop environmental protection plans (EPPs) to mitigate harmful impacts on ecosystems.[7]

The 1999 Land Act and the Village Land Act of the same year, each as amended, regulate land tenure and provide that individuals and communities whose land is expropriated for mining projects must receive fair, prompt and adequate compensation.[8] This is critical in ensuring that citizens displaced for infrastructure projects linked to mining, including roads, power plants or processing facilities, are not left worse off.

At the Constitutional level, the 2023 Mining Act Amendment reinforced oversight powers of the Tanzanian Parliament under Article 63(3)(e) of the country's Constitution,[9] granting the assembly explicit authority to review agreements with national economic significance including natural resources contracts, the Act working with provisions of the Natural Wealth and Resources Contracts (Review and Re-negotiation of Unconscionable Terms) Act [Cap 450 Revised Edition 2023][10] together with the Natural Wealth and Resources (Permanent Sovereignty) Act [Cap 499 Revised Edition 2023].[11] The Act also ensures that infrastructure projects funded through mining revenue are held to accountability standards.

Balancing the three pillars of sustainability

1. Economic growth dimension

Mining is a significant source of foreign direct investment (FDI) in Tanzania, and the revenue generated supports large-scale infrastructure projects including roads, ports and the generation of electricity that are vital for sustainable development. The 2023 Mining Act Amendment emphasises local content, compelling mining companies to prioritise the use of Tanzanian goods,

services and employment levels.[12] Where services are unavailable locally, mining companies are required to form a joint venture with Tanzanian entities with at least 25 per cent equity. They must also submit a five-year procurement plan, which has to be updated annually, and report on local content performance.[13]

These provisions foster skill development, technology transfer and industrial growth, underpinning Tanzania's infrastructure agenda under its Development Vision 2025. The Act's enforcement challenges persist however in ensuring that revenue is equitably distributed to fund schools, hospitals and transport networks that benefit all citizens.

2. Environmental protection dimension

The Environment Management Act and the Mining Act each require that mining companies conduct EIAs and implement EPPs before commencing operations.[14] Mining companies are further obliged to prepare rehabilitation plans to restore mining sites after closure, thereby minimising long-term environmental degradation. These measures are important to protecting the ecosystems on which infrastructure projects depend, such as water sources used in hydroelectric power plants and in preventing or managing deforestation that could undermine road stability. The Tanzanian Mining Commission monitors compliance with the National Environmental Management Council (NEMC). Non-compliance may result in fines, or the suspension or revocation of licenses.[15] Despite these safeguards, enforcement remains weak and inconsistently applied, particularly in the artisanal and small-scale mining sectors, and the continued use of harmful practices, such as that of mercury in gold extraction, poses risks not only to the environment but also to the sustainability of health and sanitation infrastructure.

Legal frameworks notwithstanding, serious environmental challenges persist. A prominent example is the incident at the Williamson diamond mine in Shinyanga, Tanzania, where the tailings dam collapsed in November 2022, resulting in widespread pollution and damage. The breach released a large volume of mud-like slurry that contaminated both land and water resources, leading to the significant displacement of local communities and a loss of livelihoods. The incident highlights the critical gap between environmental regulations and their enforcement, underscoring the need for more stringent oversight and corporate accountability to prevent such ecological disasters.[16]

Social Justice and Community Development

Social justice in the mining sector is pursued through compensation schemes, community development agreements and corporate social responsibility (CSR) obligations. Under the Tanzanian Mining (Corporate Social Responsibility) Regulations 2023, companies are responsible for developing annual CSR plans in consultation with local authorities.[17] Where the law requires 40 per cent CSR resources to be directed to projects within the directly affected community, with 60 per cent supporting district-wide development initiatives, these projects often involve constructing schools, clinics, water systems and rural roads, which are core elements of sustainable infrastructure.

CSR committees provide oversight at the local government level, reviewing reports and ensuring accountability. The mining companies must submit quarterly and annual reports detailing CSR expenditure and activities, subject to audit by the Mining Commission.[18] While these measures have strengthened community participation, concerns remain about the adequacy of compensation for displaced populations and whether vulnerable groups such as women and children are sufficiently represented in decision-making processes. The Williamson diamond mine incident again exposes significant shortcomings. Despite receiving some compensation, many residents were prohibited from returning to their land, even where it was only partially damaged. The case highlights a lack of transparency and communication from the company that deepened social divides and exposed the risk of involuntary displacement without proper legal clarity, demonstrating that current regulations still fail to protect the rights of affected communities fully.[19]

Challenges in balancing growth, environmental protection and justice

Despite progress, Tanzania faces challenges in balancing economic growth, environmental protection and social justice. Weak institutional capacity, corruption and overlapping regulations often undermine

effective enforcement.

At the international level, disputes between Tanzania and foreign investors highlight the tension between state sovereignty and investor rights. For example, in the case of *Stirling Civil Engineering Ltd v Tanzania*,[20] the central conflict was between Tanzania's sovereign right to terminate a contract for public interest reasons, specifically to address corruption, and that of the foreign investor (Stirling) to be protected from expropriation and unfair treatment. The tribunal upheld the state's right to terminate a contract in the public interest, showing that investor protection is not absolute when weighed against legitimate state regulation.

These challenges reveal that while Tanzania has robust legal frameworks, their implementation is inconsistent, limiting their impact on sustainable infrastructure outcomes.

Recommendations for strengthening legal frameworks for sustainable infrastructure

To better align Tanzania's legal framework to promote sustainable infrastructure, several reforms are recommended:

1. Improved enforcement mechanisms, establishing stronger monitoring bodies, independent audit bodies and introducing stricter penalties for non-compliance with local content, CSR and environmental obligations;
2. The integration of digital transparency tools, such as public online registers and the use of Blockchain to track mining revenue, procurement and CSR expenditure;
3. Mainstreaming infrastructure planning into mining agreements to require CSR plans to explicitly prioritise infrastructure developments such as roads, schools and emergency facilities; and
4. Adopting comparative best practices that the Tanzanian Government can draw from countries like Ghana, South Africa and Kenya, with firm CSR guidelines, broad-based empowerment models and transparent land compensation frameworks.

Conclusion

Tanzania's legal frameworks provide a strong foundation for promoting sustainable mining by integrating economic, environmental and social considerations. By linking mining revenues and obligations to financing infrastructure projects, these frameworks contribute directly to sustainable development. However, the most significant challenges remain in their practical implementation.

Strengthening enforcement, enhancing transparency and prioritising infrastructure in mining agreements will ensure that the sector delivers inclusive and lasting benefits. If these measures are effectively implemented, they can transform Tanzania's mineral wealth into sustainable infrastructure that supports future generations.

Notes

1 Staff, 'Tanzania's Mining Act Amendments: Navigating Future Prospects and Challenges,' Exchange, 28 February 2024, at https://theexchange.africa/tanzanias-mining-act/ (viewed 5 September 2025; 30 May 2026).
2 The Mining Act [Cap 123 Revised Edition 2023].
3 *Ibid*, ss 38-118, 133–37 and 138-144.
4 The Written Laws (Miscellaneous Amendments) Act No 7 of 201, s 10.
5 The Constitution of the United Republic of Tanzania of 1977 Amendment of 2023, Art 63(3)(e).
6 United Republic of Tanzania, Environmental Management Act 2004 (No. 20 of 2004), at www.ecolex.org/details/legislation/environmental-management-act-2004-no-20-of-2004-lex-faoc061491/?q=environment+2004&type=legislation&xdate_min=&xdate_max= (viewed 4 September 2025; 30 May 2026); Environmental Management Act [Cap 191 Revised Edition 2023].
7 The Environmental Management Act [Cap 191 Revised Edition 2023], ss 81-100.
8 The Land Act [Cap 113 Revised Edition 2023], ss 3(1)(g), 4(1) and 156; The Village Land Act [Cap 114 Revised Edition 2023, ss 3(1)(i), 28(4) and 29(1)(g).
9 The Constitution of the United Republic of Tanzania of 1977 Amendments of 2023.
10 See, the Land Act (n8) ss 4-7.
11 See, the Land Act (n8) s 12.
12 The Mining Act [Cap 123 Revised Edition 2023], s 102.
13 *Ibid*, ss 104-107.
14 The Environmental Management Act [Cap 191 Revised Edition 2025], s 81.
15 The Mining Act [Cap 123 Revised Edition 2023], s 110.
16 Business & Human Rights Resource Centre, 'Tanzania: Community Perspectives on Compensation and Restoration at the Pink Diamond (Formerly Williamson Diamond) Mine After the Tailings Dam Collapse' www.business-humanrights.org/my/%E1%80%9E%E1%80%90%E1%80%84/tanzania-communities-decry-inadequate-compensation-and-lost-trust-two-years-after-williamson-diamond-mine-collapse/ (viewed 5 September 2025).
17 The Mining (Corporate Social Responsibility) Regulation of 2023, reg 6.
18 *Ibid*, reg 11.
19 See n 16 above.
20 [2002] ICSID Case No ARB/02/18.

How can legal frameworks promote sustainable infrastructure while balancing economic growth, environmental protection and social equity?

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Introduction

Infrastructure shapes civilisation for generations, yet its development has forced false choices between economic prosperity, environmental integrity and social justice. The global infrastructure deficit, projected at US$97 trillion by 2040, coincides with climate crises, biodiversity collapse and entrenched inequality.[1] Africa alone faces an annual infrastructure gap of between US$130-170 billion.[2] This challenge demands legal frameworks that transcend fragmented approaches, recognising that economic, environmental and social objectives are interdependent rather than in competition. When properly structured, law can make sustainable infrastructure the profitable, legally mandated default, delivering superior economic returns, environmental outcomes and social benefits together.

From this background, this essay proposes integrated legal mechanisms to promote sustainable infrastructure while maintaining equilibrium between growth, the environment and equity. It advances concrete solutions: mandated life-cycle thinking, performance-based regulation enabling innovation, economic instruments harnessing market forces, reformed governance structures and enforcement mechanisms ensuring accountability. These solutions draw on successful implementation while proposing adaptations for contexts like Ghana and Africa more generally where infrastructure deficits are among the most severe.

Foundation: redefining the framework

Sustainable infrastructure must encompass its economic viability, environmental integrity and social inclusivity across complete project life-cycles, from planning to decommissioning.[3] Legal frameworks constitute the architecture of laws, regulations, institutions and enforcement mechanisms that govern infrastructure. Economic growth means sustained improvements in productive capacity and prosperity that are inclusive and environmentally responsible.[4] Environmental protection requires preserving natural systems while actively restoring degraded ecosystems and building climate resilience.[5] Social equity demands a fair distribution of benefits and burdens, meaningful participation in decisions, and the redress of historic injustice.[6] These objectives should support rather than undermine each other. Infrastructure that supports an improved environment proves more economically valuable over its full life-cycle. Equitable development processes generate broader social support, enabling efficient implementation. Legal frameworks must support integration by mandating the simultaneous consideration of all three dimensions from inception.

The challenge: scale and urgency

Africa's infrastructure needs are staggering. Rapid urbanisation has outpaced any concurrent infrastructure development, leaving deficits in power, transport, sanitation and water, affecting health, productivity and environmental quality.[7] Climate change compounds these challenges: economic losses from climate disasters increased sevenfold over the 40 years between 1970 and 2010, with infrastructure assets causing substantial damage.[8] Developing countries face climate exposure damages 10-30 times greater than wealthier Organisation for Economic Co-operation and Development (OECD) nations, yet possess far fewer resources for resilient construction.[9]

Traditional approaches treating economic, environmental and social concerns as separate problems have failed. Environmental reviews delay beneficial projects. Social safeguards increase costs. Economic pressures

override sustainability. Such fragmentation produces highways that destroy wetlands and displace communities; energy projects that power industries while poisoning environments; and digital networks that serve affluent populations while leaving billions behind. Legal frameworks must transcend this fragmentation through integrated solutions.

How legal frameworks can promote sustainable infrastructure

Mandatory integrated assessment from inception

Legal frameworks must require the simultaneous evaluation of economic, environmental and social dimensions at the planning stage. A strategic environmental assessment at the policy level, not just a project-level review, can ensure that environmental factors shape infrastructure planning from inception.[10] Ghana's Environmental Protection Act 2025 advances this by mandating strategic assessment for policies with significant environmental effects.[11]

Proposed enhancements—Sustainability impact assessments should become legally mandatory for all infrastructure projects above specified thresholds, requiring demonstration of positive contributions across economic, environmental and social dimensions, not merely minimal harm. Canada's Impact Assessment Act exemplifies this, explicitly including effects on indigenous peoples, on climate, gender equity and the economy as interconnected factors.[12] Assessments must occur early when design remains flexible, enabling improvement rather than merely reviewing locked-in decisions.

Participation requirements—The Aarhus Convention establishes international standards for transparency and participation.[13] For example, Ghana's Environmental Protection Act 2025 requires public participation, including notification, hearings and input considerations.[14] Implementation however often proves perfunctory. Legal frameworks should mandate meaningful participation including the provision of technical information in accessible formats, adequate time for community analysis, legal standing for affected communities to challenge inadequate assessments and requirements that decision-makers explain how public input influenced outcomes. Communities possessing enforcement rights transform participation from the consultation theatre into genuine power-sharing.

Performance-based regulation driving innovation—Prescriptive regulations specifying exact methods stifle innovation. Performance-based frameworks establish clear outcomes while allowing flexibility in achieving them, driving technological advancement and cost reduction. California's Title 24 sets energy performance targets that buildings must meet while allowing developers to choose compliance pathways.[15] This flexibility has driven dramatic efficiency improvements as markets discover optimal solutions.

Life-cycle performance standards—Legal requirements should extend beyond initial construction to operational lifespan. By way of another example, the Netherlands' flood protection law establishes protection levels that must be maintained over time, empowering innovative approaches like room for river strategies working with natural systems.[16] African nations should adopt similar frameworks for critical infrastructure, requiring maintained performance levels under projected climate conditions rather than prescribing engineering solutions.

Social equity performance—Legal frameworks can require measurable inclusive benefits. South Africa's Broad-Based Black Economic Empowerment regulations mandate infrastructure projects that demonstrate black economic participation through employment, skills development and ownership.[16] Countries could adapt this model, requiring infrastructure projects to achieve quantified targets for local employment (e.g., 60 per cent of construction jobs to district residents), skills transfer (apprenticeships for youth), small enterprise development (subcontracting to local firms) and community ownership stakes. Performance-based approaches avoid prescribing how inclusion occurs while ensuring progress.

Climate resilience standards—All infrastructure should legally comply with climate projections rather than historical baselines. The Netherlands' Deltawet requires infrastructure to withstand conditions anticipated under climate scenarios, with regular standard updates as projections evolve.[17] Ghana's National Climate Change Adaptation Strategy establishes resilience requirements for transport infrastructure.[18] These should become legally enforceable

standards, with penalties for non-compliance, ensuring developers cannot externalise climate risks onto future generations.

Economic instruments aligning profit with sustainability

Legal frameworks shape markets through incentives and disincentives. Well-designed economic instruments align private interests with public goods, harnessing market forces rather than fighting them. These include:

Carbon pricing–Legal mechanisms internalising environmental costs through carbon pricing schemes can transform infrastructure investment. The European Union (EU) Emissions Trading System caps total emissions and allows permit trading, creating carbon prices that influence decisions economy-wide.[19] Ghana should implement carbon pricing through the Carbon Markets Office established by the Environmental Protection Act 2025,[20] with revenue dedicated to sustainable infrastructure financing. Initial prices can start low to allow adjustment while sending clear signals that carbon-intensive infrastructure becomes progressively uncompetitive.

Green finance regulation–The EU Taxonomy Regulation creates legally binding definitions of environmentally sustainable economic activities, preventing greenwashing while channelling investment towards genuine sustainability.[21] Ghana's securities regulations incorporating environmental, social and governance (ESG) disclosure requirements represent progress,[22] but should be strengthened through mandatory climate risk disclosure for all listed infrastructure developers; legal standards defining green bonds preventing fraudulent sustainability claims; and preferential regulatory treatment (expedited approvals and tax incentives) for projects meeting rigorous sustainability criteria.

Payment for ecosystem services–Legal frameworks can compensate communities maintaining environmental services infrastructure that they depend upon. New York's watershed protection programme legally secured forest and farm protection naturally filtering water supply, costing $1.5bn versus US$8-10 billion for filtration plants.[23] African nations should establish payments for ecosystem services (PES) legal frameworks compensating communities for watershed protection, forest conservation and landscape restoration, recognising that healthy ecosystems provide flood control, water regulation and climate moderation that infrastructure depends upon. The African Forest Landscape Restoration Initiative provides continental frameworks requiring domestic legal implementation.[24]

Reformed public-private partnerships (PPP)

PPPs have proliferated as governments seek private capital and expertise. However, traditional frameworks prioritised cost minimisation over sustainability. Legal reforms can embed sustainability throughout PPP structures.

Sustainability-linked concessions–Concession agreements should include specific, enforceable environmental and social performance requirements with financial consequences. Legal frameworks should mandate that PPP contracts establish quantified emission reduction targets with bonus payments for exceeding and penalties for missing targets; biodiversity net-gain requirements obligating restoration exceeding the habitat lost; community engagement plans with legally binding commitments; and adaptive management clauses requiring operational modifications based on monitoring results. Florida's I-4 Ultimate project demonstrates this approach with environmental restoration requirements and financial incentives for superior performance.[25]

Life-cycle value procurement–Legal requirements for life-cycle costing fundamentally alter procurement by evaluating total costs over the operational life rather than upfront construction expenses. The United Kingdom's Green Book mandates life-cycle value assessment,[26] an approach Ghana and other African nations should legally require for all major infrastructure. The evaluation criteria should weight capital costs (30 per cent), operational and maintenance costs (30 per cent), environmental impacts including carbon emissions (20 per cent) and social benefits including local employment and community development (20 per cent). This transforms incentives; winning bids deliver genuine long-term value rather than the false economy of cheap construction generating high operating costs.

Community ownership models–Legal frameworks should facilitate community ownership stakes in infrastructure.

Denmark's renewable energy law mandates that developers offer local ownership opportunities,[27] transforming opposition into support as residents become co-owners sharing economic returns. Countries should adopt similar requirements for renewable energy, water systems and digital infrastructure, mandating that developers offer community ownership of 15-25 per cent equity through accessible investment mechanisms. Legal structures enabling cooperatives, community trusts or municipal ownership vehicles would operationalise this, keeping investment and benefits local rather than extracting wealth to distant shareholders.

Robust enforcement and accountability

Legal frameworks fail without effective enforcement. Multiple, reinforcing accountability mechanisms prove necessary.

Independent regulatory agencies–Effective enforcement requires agencies with adequate resources, technical capacity, genuine authority and insulation from political pressure. Ghana's Environmental Protection Agency, strengthened by the Environmental Protection Act 2025 with expanded enforcement powers,[29] requires sustained resourcing and political support. Legal frameworks should establish dedicated funding streams (e.g., infrastructure levies) preventing budget manipulation; statutory protection for agency leadership against arbitrary removal; transparent decision-making with reasoned explanations for enforcement actions; and technical capacity building through international partnerships.

Citizen enforcement–Legal standing for communities to enforce protections creates accountability when agencies fail. The United States Clean Water Act's citizen suit provision has proven critical to its enforcement.[28] Ghana's Environmental Protection Act 2025 expands citizen enforcement by providing that any person may bring actions enforcing environmental rights.[29] This should be further strengthened through the elimination of restrictive standing requirements, legal aid provisions enabling communities to have greater access to courts, fee-shifting requiring violators to pay successful plaintiffs' legal costs, and protection for whistleblowers exposing non-compliance.

Calibrated penalties and incentives–Violations must generate consequences sufficient to deter non-compliance. Germany's environmental criminal law establishes imprisonment for serious violations,30 creating genuine deterrence. Countries should establish administrative fines scaled to project value (e.g., 2-10 per cent of total project cost); criminal liability for corporate officers in cases of deliberate or reckless violations; debarment from future government contracts for repeated violators; and conversely, regulatory benefits, including expedited approvals for developers with records of superior sustainability performance. This combination of punishment and reward shapes behaviour more effectively than either alone.

Overcoming implementation challenges

These solutions face implementation challenges requiring direct address. Capacity constraints in developing countries limit the enforcement of sophisticated requirements. International cooperation including technology transfer, capacity building and technical partnerships can address gaps. African nations should leverage continental frameworks, including the Programme for Infrastructure Development in Africa (PIDA) and the African Union (AU) Climate Change Strategy to demand systematic capacity support as legal obligations rather than voluntary aid. Financing challenges arise from sustainable infrastructure's higher upfront costs despite lower life-cycle expenses. Blended finance regulations combining concessional public capital with commercial investment can bridge gaps. For example, participation in the Renewable Energy Performance Platform demonstrates this approach.[31] Legal innovations should include infrastructure banks capitalised through carbon revenue and international climate finance; de-risking mechanisms including guarantees for early-stage sustainable projects; and mandatory sustainable infrastructure allocation requirements for pension funds and sovereign wealth funds. Political economy obstacles including powerful economic interests resisting sustainability requirements demand anti-corruption provisions: transparent procurement with public contract registries; conflict of interest rules for officials; beneficial ownership disclosure preventing hidden interests; whistleblower protections; and robust enforcement through independent agencies.

Conclusion

Legal frameworks have substantial capacity to promote sustainable infrastructure, balancing important factors such as economic growth, environmental protection and social equity. The solutions advanced here, including mandatory integrated assessments from project inception, performance-based regulation enabling innovation, economic instruments aligning profit with sustainability, reformed PPPs embedding sustainability requirements, adaptive governance accommodating change and robust enforcement ensuring accountability, demonstrate that integration is both possible and pragmatic. The infrastructure built today determines possibilities for generations. Climate change demands rapid transformation towards resilient systems. Persistent inequality requires development serving excluded populations. These imperatives coincide with history's largest infrastructure build-out. Legal frameworks occupy critical space where challenges converge with opportunities. By establishing clear requirements, creating aligned incentives, empowering effective institutions and ensuring accountability, law can channel unprecedented infrastructure investment towards sustainability.

Notes

1 Global Infrastructure Hub, *Global Infrastructure Outlook* (Oxford Economics 2017) 12.
2 African Development Bank, *Africa Infrastructure Development Index* 2020 (AfDB 2020) 23.
3 World Bank, 'Sustainable Infrastructure Principles' (World Bank 2019).
4 Organisation for Economic Co-operation and Development (OECD), *Beyond Growth: Towards a New Economic Approach* (OECD Publishing 2020) 45-67.
5 World Commission on Environment and Development, *Our Common Future* (Oxford University Press 1987) 43.
6 African Development Bank, 'High 5s Framework' (AfDB 2024).
7 Coalition for Urban Transitions, *Finance Landscape in Ghana* (CUT 2019) 5-7.
8 OECD, *Infrastructure for a Climate-Resilient Future* (OECD Publishing 2024) 22.
9 *Ibid*, 34.
10 Directive 2001/42/EC [2001] OJ L197/30, Art 4.
11 Environmental Protection Act 2025 (Ghana) Act 1124, s 82.
12 *Impact Assessment Act* SC 2019 c 28 ss 1 and 22.
13 Aarhus Convention (adopted 25 June 1998, entered into force 30 October 2001) 2161 UNTS 447.
14 Environmental Protection Act 2025 (Ghana) Act 1124, s 85.
15 California Code of Regulations Title 24 Part 6. *Waterwet* (Netherlands) Stb 2009, 519.
16 Broad-Based Black Economic Empowerment Act 53 of 2003 (South Africa).
17 *Deltawet* (Netherlands) Stb 2012, 162, Art 2.2.
18 Republic of Ghana, *National Climate Change Adaptation Strategy* (EPA 2021) 45-52.
19 Directive 2003/87/EC [2003] OJ L275/32.
20 Environmental Protection Act 2025 (Ghana) Act 1124, ss 47-52.
21 Regulation (EU) 2020/852 [2020] OJ L198/13.
22 Securities and Exchange Commission (Ghana), Corporate Governance Code (SEC 2020).
23 NYC Department of Environmental Protection, *Drinking Water Supply Report* 2023 (NYC DEP 2023) 12-15.
24 AUDA-NEPAD, African Forest Landscape Restoration Initiative (AUDA-NEPAD 2024).
25 Florida Department of Transportation, I-4 Ultimate Project Agreement (FDOT 2014) Schedule 15.
26 His Majesty's Treasury, *The Green Book* (London 2022) 11-15.
27 *Lov om fremme af vedvarende energi* (Denmark) LBK nr 125 af 07/02/2020, s 13.
28 *Clean Water Act* 33 USC s 1365 (1972) and s 505.
29 Environmental Protection Act 2025 (Ghana) Act 1124, s 5.
30 *Umweltstrafrecht* (Germany), Strafgesetzbuch ss 324–330d.
31 GET.invest, *REPP Ghana* (GET.invest 2023).

How can legal frameworks be strengthened to promote sustainable infrastructure while balancing economic growth, environmental protection and social equity?

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Introduction

Infrastructure includes systems for energy, water, waste management, transportation and telecommunications, among other things.[1] It is central to many services that promote development, such as the provision of water for domestic and industrial uses; eco-friendly disposal of waste products;

transport and communication systems that connect people to services and to each other; and the buildings that house these social and economic services. Despite infrastructure's relevance to our society, a failure to integrate economic, environmental and social sustainability into infrastructural development can exacerbate existing economic and environmental issues, as well as worsen social inequalities. Improving the existing legal framework to provide sustainable solutions to infrastructural needs can address this, ensuring balanced economic growth, conserving and restoring the environment, and protecting equal opportunities and inclusion of all persons, including disadvantaged groups in society.

This essay analyses how laws governing infrastructure can champion economic, environmental and social interests in working toward sustainable infrastructure to support societal needs holistically. It commences by generally discussing sustainable infrastructure, economic growth, environmental protection and social equity. It establishes the nexus between sustainable infrastructure and the three pillars economic growth, environmental protection and social equity, and examines the risks associated with infrastructural development that lacks sustainability elements. Finally, it discusses how legal frameworks can promote sustainable infrastructure while balancing and protecting these factors.

Sustainable infrastructure

Infrastructure projects are sustainable if planned, designed, constructed, operated and ultimately decommissioned in a manner protecting economic and financial, social, environmental and institutional interests over the project's full lifespan.[2] Infrastructure is an important vehicle for achieving inclusive and sustainable growth, working toward the UN Sustainable Development Goals (SDGs) and meeting the climate change targets set by the Paris Agreement and the United Nations Framework Convention on Climate Change (UNFCCC).[3] From the 17 SDGs, infrastructure directly or indirectly influences 92 per cent of the 169 targets.[4] Sustainable infrastructure plays a direct, general role in SDG 9 (industry, innovation and infrastructure) in enhancing resilient infrastructure and innovation. It also has a direct influence on other goals, such as increasing the accessibility of clean water and sanitation (SDG 6), and promoting renewable energy (SDG 7 (affordable and clean energy)).

The growing discussion of sustainable infrastructure reflects the realisation that current infrastructure systems, responsible for an alarming 79 per cent of global carbon emissions,[5] were not designed to balance present and future needs. The neglect of sustainability is also evident in the exponential increase of global emissions from approximately six billion tonnes in the 1950s to 35 billion tonnes annually today.[6] Insufficient investment into sustainable infrastructure remains a major obstacle to reversing this trend of increased emissions and achieving the SDGs; accordingly, the World Bank's Public-Private Infrastructure Advisory estimates that an annual investment of around US$2.6 trillion is required through 2030 to meet the SDGs and remain on a pathway to net zero emissions by 2050.[7] More than three times the current amount of investment in clean energy is required to be made,[8] and 70 per cent of additional spending is needed in emerging market and developing economies to spur clean energy and sustainable infrastructure projects globally.[9]

Economic growth

Economic growth has been defined as an increase in the production of economic goods and services in one period compared to a previous period.[10] Economist and philosopher, Max Roser, defines economic growth as 'an increase in the quantity and quality of the economic goods and services that a society produces.'[11] Economic growth occurs where there is a rise in the production of goods, technology or human capital that in turn leads to an increase in national income. Indicators such as gross domestic product (GDP) and gross national product (GNP) are used to measure economic growth.

Infrastructure is influential in promoting economic growth. The quality of infrastructure in a country influences the increase in productivity, reduction of production costs, reduction of reliance on the primary sector and creation of employment by increasing demand for goods and services.[12] Thus, the construction and operation of infrastructure with the aim of ensuring economic, social and environmental stability will result in steadier and longer-lasting economic growth. Regions with more

sustainable infrastructure tend to attract greater investment than regions lacking such infrastructure.[13] The existence of sustainable infrastructure not only promotes the increased production of goods and services but also attracts more investment, which promotes further economic growth.

Environmental protection

The environment is the sum total of all living and non-living elements and their effects that influence human life.[14] The UN Economic and Social Commission for Western Asia (UNESCWA) defines environmental protection as any activity to maintain or restore the quality of environmental media through preventing the emission of pollutants or reducing the presence of polluting substances in environmental media. It may consist of changes to the characteristics of goods and services, consumption patterns, production techniques and treatment, or the disposal of residuals in separate environmental protection facilities, recycling and prevention of degradation of the landscape and ecosystems.[15] It involves the preservation and restoration of natural resources and ecosystems. Environmental protection is foundational to the achievement of the SDGs. It directly influences the achievement of SDGs 13 (climate action), 14 (life below water) and 15 (life on land), which cover climate action, aquatic life and terrestrial life, respectively.[16] The global community commenced its efforts to tackle environmental problems in 1972 with the Stockholm Conference, which lead to the formation of the UN Environment Programme (UNEP). Currently, the UNEP has outlined climate change, pollution and waste, and biodiversity and nature loss as the three interconnected crises negatively affecting the state of our environment today.[17]

Social equity

Social equity refers to the equitable distribution of inclusive benefits and opportunities across various societal groups.[18] A developed society must also be a truly equitable society, where access to quality education, economic opportunities, political and cultural participation is available to all persons, including the marginalised and vulnerable, not the preserve of a privileged class of persons. It is for this reason that the UN 2030 Agenda for Sustainable Development emphasises that its targets should be met for all segments of society, especially vulnerable groups such as children, youth, persons with disabilities, people living with HIV, older persons, indigenous peoples, refugees, internally displaced persons and migrants.[19] Furthermore, the principles of social equity are reflected in several of the SDGs, notably SDGs 8 (decent work and economic growth), 11 (sustainable cities and communities) and 16 (peace, justice and strong institutions), which address inclusive and sustainable economic growth, inclusive and sustainable cities, and just, peaceful and inclusive societies, respectively. Poor and vulnerable societal groups rarely benefit equally from infrastructure projects, while often suffering the brunt of the adverse impacts of infrastructure development, such as forced resettlement and displacement.[20] Sustainable infrastructure is crucial in reversing this phenomenon because it ensures long-lasting infrastructural development without sacrificing the peculiar needs and wellbeing of members of each marginalised group.

The relationship between sustainable infrastructure, economic growth, environmental protection and social equity

Sustainable infrastructure and economic growth, environmental protection and social equity are interconnected. The sustainability of an infrastructure project is judged based on its ability to simultaneously promote economic viability, protect the environment and ensure social equity. Failing to develop infrastructure projects that balance these three principles will result in slower economic growth concentrated within a smaller segment of the population, hindering the government's ability to provide widespread access to quality education, healthcare and employment opportunities. Infrastructure projects undertaken without taking environmental sustainability into consideration leads to environmental degradation in forms such as air and water pollution, land degradation and deforestation. This disproportionately disrupts the livelihoods of disadvantaged groups such as rural dwellers and negatively impacts their health and wellbeing, and creates a vicious cycle of widening inequality of opportunities and outcomes.[21]

How can legal frameworks be strengthened to promote sustainable infrastructure while balancing economic growth, environmental protection and social equity?

Legal frameworks, which include international agreements, legislation, policies, regulations and regulatory bodies are instrumental in engineering a global shift towards sustainable infrastructure and restoring economic, environmental and social balance in the infrastructure sector. A watertight legal framework will encourage strict compliance to sustainability in the development of infrastructure projects by relevant stakeholders; this will lead to a marked reduction in global carbon emissions and other forms of environmental pollution, leading to the conservation and rehabilitation of the environment, while ensuring all persons, including members of marginalised groups, benefit from all the opportunities created by infrastructure.

Existing infrastructure laws must be strengthened with legal provisions that ensure private infrastructure projects align with sustainability goals, while also encouraging private investment in public sustainable infrastructure projects. Laws must mandate environmental impact assessments, which may include climate change impact analyses, to be undertaken during project development, and ensure that all issues and opportunities identified through the assessment are reflected in the project design and implementation.[22] The UN Economic Commission for Europe (UNECE) proposes a People-First Private–Public Partnership (PPP) model, which involves the institution of a Project Facilitation Hub consisting of a dedicated fund and facilitation entity. This Hub will offer advice to governments on standards for proposed projects and offer funding for its completion.[23] Countries such as the Philippines have implemented PPP resolutions requiring that environmental safeguards and climate change hazards are incorporated into project designs;[24] they have also included the design of preventive, mitigative and enhancement measures such as Climate Change Adaptation measures and Disaster Risk Reduction into their environmental impact assessments to address the current environmental risks and protect the welfare of communities within which potential projects will be situated.[25]

Governments can encourage sustainable infrastructure through incorporating corporate social responsibility (CSR) regulations into their existing infrastructure laws. CSR dictates that companies must serve the communities that they operate from by addressing key environmental or social concerns within those communities. Placing mandates on corporations to exercise these responsibilities while creating regulatory bodies that will examine the sustainability of proposed infrastructure projects, as well as their implementation upon approval, will not only ensure economic, environmental and social issues are addressed but also ensure those issues are addressed with long-lasting, sustainable projects. The Indian government became the first to legally mandate CSR on companies through its Companies Act (2013), mandating companies with a net worth of about US$550 million dollars or more to spend at least two per cent of their average net profit from the previous three years on CSR.[26] This formalisation transformed the performance of CSR from a sporadic donation-based activity to a long-term programmatic intervention.[27] CSR initiatives in India have ranged from different environmental and social matters, including education and skill development in remote regions, the restoration of degraded forest lands and initiatives to empower women.[28] This has spurred sustainable infrastructure in the country while addressing various environmental and social equity issues and opening the potential for otherwise underprivileged people to contribute to the overall economic growth of India.

Countries must lay down strategies for sustainable development and implement them in all public infrastructure legislation and policies in the country. This will provide a clear, coherent framework for all infrastructure projects undertaken in the country and boost overall investor confidence. Countries are advised to clearly articulate their sustainability goals in line with their nationally determined contributions (NDCs) under the Paris Agreement and incorporate them into their national policy by creating a national strategy on issues such as climate resilience and carbon emission reduction. They must also address unclear regulations and outmoded policy directives to ensure a universal direction towards sustainability in infrastructure.[29] The New Zealand government has set out to establish a National Infrastructure Plan reflective of various

issues that it has identified with respect to infrastructure and its sustainability. These include high expenditure on infrastructure, low return of infrastructure quality on investment, and difficulty in maintaining and operating infrastructure.[30] The plan proposes a coordinated view of how much money to invest in different sectors, how to build the capacity of their infrastructure workforce, and the need to invest in the maintenance and renewal of existing infrastructure.[31] New Zealand has also reaffirmed its commitment to protect the interests of marginalised groups, such as the elderly, as well as slashing its carbon emissions.[32] A coordinated national framework for infrastructural practice allows countries to protect their own economic interests by ensuring all infrastructural developments to be commenced are sustainable, and developed to be resilient, environmentally friendly and responsive to the needs of their underprivileged citizens.

Conclusion

Legal frameworks have the potential to promote sustainable infrastructure and protect the economic, environmental and social interests of the countries they serve if they are thoughtfully strengthened for that purpose.

First, the legal frameworks governing infrastructure across the world must ensure that comprehensive environmental impact assessments are undertaken to examine their positive or negative impact on the economic and social life of the people, as well as their environment. Second, governments must mandate companies to observe their CSRs in line with prevailing economic, environmental and social issues. Finally, governments must incorporate a unified sustainable infrastructure plan into all infrastructure legislation and policies in their countries to ensure that all projects undertaken satisfy their economic, environmental and social goals.

To conclude, existing legal frameworks can be transformed from mere regulatory devices into powerful tools for encouraging investment and the development of sustainable infrastructure. This will create a virtuous cycle of stable economic growth, environmental protection and true social inclusion and equity.

Notes

1 Scott Thacker, et al, Infrastructure for Sustainable Development, at www.greenpolicyplatform.org/sites/default/files/downloads/resource/Thackeretal_NS_2019.pdf#:~:text=Water%20infrastructure%20includes%20wastewater%20and%20sanitation%20services%2C,when%20indirect%20effects%20are%20taken%20into%20account (viewed 24 April 2026).
2 Inter-American Development Bank (IDB), What is Sustainable Development? A Framework to Guide Sustainability Across the Project Cycle, at https://publications.iadb.org/en/publications/english/viewer/What_is_Sustainable_Infrastructure__A_Framework_to_Guide_Sustainability_Across_the_Project_Cycle.pdf (viewed 24 April 2026).
3 IDB, Attributes and Framework for Sustainable Infrastructure.
4 Scott Thacker, et al., Infrastructure for Climate Action (2021), UN Office for Project Services, Copenhagen, Denmark.
5 *Ibid.*
6 Global Carbon Budget (2025), at www.ourworldindata.org/co2-and-greenhouse-gas-emissions (viewed 24 April 2026).
7 See www.gihub.org/sustainable-infrastructure/ (viewed 24 April 2026).
8 International Energy Agency (IEA), Net Zero by 2050: A Roadmap for the Global Energy Sector.
9 IEA, World Energy Outlook 2021, at https://iea.blob.core.windows.net/assets/4ed140c1-c3f3-4fd9-acae-789a4e14a23c/WorldEnergyOutlook2021.pdf (viewed 24 April 2026).
10 See, Investopia, at www.investopia.com/terms/e/economicgrowth.asp (viewed 24 April 2026).
11 Max Roser, What Is Economic Growth? And Why Is it so Important? (2021), at https://archive.ourworldindata.org/20251220-152415/what-is-economic-growth.html (viewed 24 April 2026).
12 DB, Sustainable Infrastructure for Competitiveness and Inclusive Growth.
13 B Srinivasu and P Srinivasa Rao, Infrastructure Development and Economic Growth: Prospects and Perspective.
14 Admin, 'Environment – Meaning, Definition, Function, Example' (BYJUS, 13 July 2021), at https://byjus.com/commerce/meaning-and-functionsof-environment (viewed 19 April 2025).
15 UN Economic and Social Commission for Western Asia, at www.unescwa.org/sd-glossary/environmental-protection (viewed 24 April 2026).
16 See, RELX: SDG Resource Centre, at www.sdgresources.relx.com/environmental-protection (viewed 24 April 2026).
17 UNEP, For People and Planet. Medium-Term Strategy 2022-2025 content.
18 Global Infrastructure Hub, Inclusive Infrastructure and Social Equity https://content.gihub.org/live/media/1546/gih_inclusive-infrastructure-and-social-equity_aug2019.pdf (viewed 24 April 2026).
19 UN General Assembly, 70/1, Transforming Our World: The 2030 Agenda for Sustainable Development, Resolution adopted by the General Assembly on 25 September 2015 https://docs.un.org/en/A/RES/70/1 (viewed 24 April 2026).
20 See, Sustainable Infrastructure Tool Navigator, https://sustainable-infrastructure-tools.org/social-inclusion/#:~:text=It%20is%20estimated%20that%20every,equality%20in%20the%20long%20term (viewed 24 April 2026.
21 UN Economic and Social Commission for Asia and the Pacific (UNESCAP), c 3, Inequality of Impact: Environment and Inequality www.unescap.org/sites/default/d8files/05Chapter3.pdf (viewed 24 April 2026).

22 See World Bank Group, Public-Private Partnership Resource Center, at https://ppp.worldbank.org/climate-smart/climate-smart-clean-technology-ppps/climate-smart-ppp-legal-and-regulatory-framework (viewed 24 April 2026).
23 UN Economic Commission for Europe, People-first PPP Model Law, at: https://unece.org/fileadmin/DAM/ceci/documents/2019/PPP/WP/ECE_CECI_WP_PPP_2019_INF.7.pdf (viewed 24 April 2026.
24 Public-Private Partnership Governing Board, Resolution No 2018-12-02, at https://ppp.gov.ph/wp-content/uploads/2019/01/PPPC_PPPGB_Reso-Safeguards-in-PPP.pdf (viewed 24 April 2026).
25 National Government Public-Private Partnership Manual, at https://ppp.worldbank.org/sites/default/files/2024-07/Philippines_NGA-PPP-Manual-VOL-4.pdf (viewed 24 April 2026).
26 S 135 of the Companies Act, 2013 of the Republic of India.
27 See, How CSR is Driving Sustainable Development in India (SoulAce, undated), at www.soulace.in/how-csr-is-driving-sustainable-development-in-india.php (viewed 24 April 2026).
28 *Ibid.*
29 Zia Qureshi, The Role of Public Policy in Sustainable Infrastructure.
30 See, National Infrastructure Plan (New Zealand Infrastructure Commission, undated), at tewaihanga.govt.nz/draft-national-infrastructure-plan/executive-summary (viewed 24 April 2026).
31 *Ibid.*
32 *Ibid.*

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How can legal frameworks be strengthened to promote sustainable infrastructure while balancing economic growth, environmental protection and social equity?

Introduction: what is sustainable infrastructure?

Sustainable infrastructure (also referred to as green infrastructure) includes transportation, water, energy and housing systems that are planned, designed, built, managed and ultimately decommissioned in a way that ensures economic and social, environmental and institutional sustainability over the project life cycle.[1] Sustainable infrastructure may include built, natural, or hybrid infrastructures that contain elements of both.[2]

Sustainable infrastructure ultimately safeguards future generations by prioritising long-term, inclusive development rooted in human and environmental longevity. As the United Nations Environment Programme observes, infrastructure is 'central to sustainable development, underpins economic growth and delivers the services that are essential to improve livelihoods and wellbeing. At the same time, unsustainable, poorly planned and delivered infrastructure can have disastrous effects on the environment and societies.'[3]

Sustainable infrastructure entails preserving the environment while developing systems that not only avoid harm but also actively foster ecological regeneration. It requires designing and implementing facilities that drive economic growth while supporting vulnerable members of society. Achieving this balance is a pressing challenge, heightened by climate change, natural disasters and mass migration, particularly in the 'global south.' Although laws and policies are vital to this process, many legal frameworks either overlook or inadequately address sustainable infrastructure. This essay thus recommends ways in which legal frameworks can be strengthened to promote sustainable infrastructure while balancing economic growth, environmental protection and social equity.

This essay has four parts: the introduction; key terms; current legal frameworks for sustainable infrastructure; and, finally, recommendations for strengthening these frameworks, including principles, mechanisms, examples and potential challenges.

Terms: economic growth, environmental protection and social equity

Economic growth is the sustained increase in a country's capacity to produce goods and services, typically measured by the country's gross domestic product (GDP). Since the mid-20th century, GDP has been a key benchmark to measure national economic progress across governments and institutions alike such as the World Bank and International Monetary Fund.[4] Domestic laws and policies are often designed to cut costs, raise productivity and boost revenue, with the overarching goal of accelerating economic growth, as reflected in indicators such as GDP and revenue.

Environmental protection refers to the policies, practices and actions taken by individuals, governments and organisations to safeguard the natural environment from degradation, pollution and overexploitation. It can also include ensuring the sustainable use of resources for present and future generations.

Social equity ensures that all individuals, regardless of social status, have fair access to opportunities, resources and outcomes.[5] This concept goes beyond formal equality by addressing systemic disadvantages that create barriers, particularly for marginalised groups.[6] Traditional development models often prioritise economic growth over environmental protection and social equity, minimising production costs at the expense of sustainability.[7] This unidimensional view has been replaced by a multidimensional focus on sustainable development, integrating growth, environmental preservation and equity, and embodied in the modern understanding of sustainable infrastructure as a key vehicle for achieving it.

Legal frameworks governing sustainable infrastructure

The UN Sustainable Development Goals (SDGs) regulate sustainable infrastructure through globally agreed targets, notably SDG 9 (industry, innovation and infrastructure) on resilient, inclusive and environmentally responsible systems.[8] As a normative framework, the SDGs guide laws, policies and financing toward low-carbon, resource-efficient and socially inclusive infrastructures. International cooperation across interrelated goals, especially SDG 7 (clean energy), SDG 9 (infrastructure), SDG 11 (cities), SDG 12 (consumption) and SDG 13 (climate action), is essential to achieve sustainable infrastructures worldwide.[9] Additionally, the Paris Agreement embeds climate goals into finance, national commitments, adaptation and accountability. Article 2.1(c) of the Paris Agreement requires the alignment of financial flows with low-emission, climate-resilient development, while its Article 4 obliges parties to submit nationally determined contributions (NDCs), often incorporating infrastructure measures, such as renewable energy, sustainable transport, and efficient buildings.[10] Kenya's updated NDC (2020-2030), for instance, pledges geothermal, wind and solar expansion, bus rapid transit in Nairobi and electric mobility.[11]

Despite their important normative role, these agreements often reflect developed countries' priorities, shaped by international power imbalances that limit developing countries' influence over goals, pathways and timelines. Even when developing countries are engaged in negotiations, their lower financial capacity constrains their ability to transition from carbon-intensive economies, hindering target achievement. For instance, there is estimated to be an infrastructure financing gap between US$68 billion and US$108 billion per year on the African continent, with the largest gap estimated to be in the water sector.[12] The gap underscores the need for deeper developing country participation, international financing and a radical restructuring of global power relations, particularly within international organisations such as the UN through which such agreements are negotiated.

Furthermore, regional instruments are critical to promoting viable sustainable infrastructure practices, as they set shared standards, financing frameworks, and regulatory norms across states. Unlike global frameworks such as the Paris Agreement or the SDGs, regional instruments are closer to domestic implementation and often easier to enforce. For instance, the European Union Green Deal, enshrined in the European Climate Law, commits to carbon neutrality by 2050, while the African Charter on Human and Peoples' Rights (particularly Article 24) affirms the right to a satisfactory environment, providing a normative basis for infrastructure that safeguards ecology, advances sustainable development and respects human rights.[13] Slow regional integration, however, especially across Africa,

where intra-regional trade and sectoral cooperation remain limited, undermines the effectiveness of such instruments in the developing world.

Domestic legislation also translates international and regional commitments into binding national rules, providing the framework to regulate, finance and monitor infrastructure for environmental sustainability, social inclusion and economic viability. For example, Ghana's new Environmental Protection Act 2025 mandates environmental impact assessments (EIAs) for activities that are likely to have adverse effects on the environment, effectively providing a key safeguard regulating infrastructure projects within the country.[14] Such domestic laws would, however, be more successfully implemented if they tailored commitments to each country's economic, environmental, social and cultural context rather than adopting international practices wholesale.

How legal frameworks can be strengthened to promote sustainable infrastructure

Legal frameworks can be strengthened to promote sustainable infrastructure in the following ways:

Incentivising greater private and public sector investment in sustainable infrastructure projects

Laws can be strengthened to better promote sustainable infrastructure by embedding fiscal incentives such as tax rebates, holidays, accelerated depreciation and feed-in tariffs that lower the cost of private investment in renewable energy and green infrastructure. This encourages greater investment by private individuals and firms in such sustainable infrastructure projects, increasing their scale and the ability of the public to access and use such projects as a result of reduced cost. Brazil's Law No 14,300/2022 for example sets incentives for renewable energy, including tax exemptions on equipment imports and preferential financing.[15] The incentives enable countries to attract foreign direct investment and help close the US$15 trillion sustainable infrastructure finance gap by 2040, as institutional investors who now allocate only five per cent of their portfolios to sustainable infrastructure financing are expected to increase commitments, with rising demand for sustainable assets.[16]

For legal tools to work as intended, policy-makers must ensure that incentives are tied to sustained regulatory oversight, making compliance a precondition for access, so that outcomes will be fairer for businesses, communities and the environment. Furthermore, countries can strengthen domestic legal frameworks by increasing public sector investment in sustainable infrastructure projects within their countries. They can do this by allocating a greater portion of their national budgets to building more renewable energy plants, resilient transport systems and sustainable housing. An example is China's Renewable Energy Law (2005, amended 2009), which enabled massive state investment of over US$625 billion in clean energy, such as solar and wind farms, in 2024, which has contributed to creating the world's largest renewable energy market.[17] It must be observed that combining laws that set out tax incentives with regulations mandating greater public investment is likely to be more effective in promoting sustainable infrastructure. The United States' Inflation Reduction Act 2022 however pairs federal tax credits with around US$369 billion in public funding for clean energy infrastructure.[18]

Laws can require government agencies to undertake green procurement

Laws introduced that require their governments to undertake 'green' procurement can mean, for example, the acquisition of energy-efficient and low-carbon materials for buildings and low-carbon transport systems where the need to acquire such infrastructure arises. Norway offers an illustration of how such legal mandates can be operationalised. Under its Public Procurement Act, government agencies are obliged to integrate environmental and climate considerations into procurement decisions.[19] This has led to the systematic use of low-carbon concrete, sustainably sourced timber and advanced insulation technologies in public construction projects, ensuring that buildings meet stringent energy-efficiency standards.[20] Such 'green' procurement processes will, however, not yield the most efficient and inclusive results if they are not open and transparent. It is thus essential that corruption in the public sector, which is particularly prevalent in developing countries, is dealt with so as to improve the contexts within which such procurement processes occur.

Setting out EIAs, climate resilience standards and enforcement mechanisms

Laws can mandate EIAs to evaluate infrastructure projects for environmental and social consequences before approval. Regulators can then block harmful projects or impose mitigation measures, such as reforestation and pollution control, to protect ecosystems and communities. India's Environment Protection Act 1986 and its EIA Notification 2006 for example require EIAs in industrial, mining and infrastructure projects, while the European Union's Directive 2011/92/EU mandates them for major projects across Member States.[21] Laws can also require infrastructure such as buildings and bridges to be carbon-efficient and to withstand climate risks such as floods, droughts, heatwaves and rising sea levels, with compliance subject to regular review. The United Kingdom's Climate Change Act 2008 mandates a five-yearly climate change risk assessment and a national adaptation programme to address identified risks to infrastructure, ecosystems and the economy.[22] However, without enforcement mechanisms, such as license and permit suspensions, and the imposition of criminal liability where violation occurs, as well as the empowerment of environmental protection agencies and climate commissions, these regulatory measures risk becoming mere box-ticking exercises.

Mandating inclusivity and accessibility standards and community participation

Laws should guarantee the introduction of inclusive infrastructures as appropriate for example through ramps, tactile paving, accessible transport and digital access, taking steps to ensure equity for all, especially vulnerable groups such as disabled persons. Consultations with local communities must go beyond mere symbolism, with insights meaningfully incorporated into project design and implementation. Communities should also be empowered through mechanisms such as participatory budgeting and advisory boards to shape and oversee infrastructure, ensuring projects genuinely serve their environmental and livelihood needs. In 2019, for instance, Penalolén, a commune in Argentina, allocated US$662,515 through participatory budgeting, funding the two most popular neighbourhood proposals and distributing resources equally across capped initiatives to improve infrastructure and public spaces.[23]

Fostering technological advancement and resource-efficiency in infrastructure engineering

Laws can drive technological advancement by setting benchmarks for resource-efficient design, mandating energy-efficient technologies and promoting sustainable materials, such as recycled aggregates, low-carbon concrete and bio-based composites. Grounded in circular economy principles, these standards promote reuse and adaptability. In the Netherlands, digital building passports track material origin, composition and reuse, enabling regulators and companies to ensure compliance and prevent waste.[24] Such laws should also encourage indigenous ideas and technology that promote sustainable infrastructure so as to accelerate the domestic adoption of circular economy principles in infrastructure engineering.

International collaboration and information sharing

Laws that promote sustainable international collaboration and information sharing are essential for advancing sustainable infrastructure, as they allow countries to pool expertise, harmonise standards and share best practices that accelerate the transition to low-carbon, resilient systems. Cooperation across scales builds capacity and spreads good practice: Amsterdam's Circular City Deal (2016) links cities with the national government and Scotland's Zero Waste Scotland coordinates cross-regional projects among cities including Edinburgh, Glasgow and Tayside.[25]

Balancing economic growth, environmental protection and social equity: tensions and trade-offs

As acknowledged in this essay, balancing economic growth, social equity and environmental protection is challenging. Economic growth strategies may displace communities or concentrate wealth, while strict environmental safeguards raise costs for businesses, potentially limiting job creation or increasing consumer prices. Conversely, weak environmental safeguards disproportionately harm marginalised

groups, such as low-income urban residents, indigenous peoples and rural communities, who are more exposed to pollution and resource degradation, while performative environmental and social regulatory measures often leave marginalised communities bearing the costs of economic growth. For example, in India, rapid industrial expansion has fuelled growth, but caused severe pollution in cities like Delhi, disproportionately harming poorer households, women and informal workers.[26]

Conclusion

To strengthen legal frameworks for sustainable infrastructure, power structures at the international, regional and domestic levels must be realigned to grant greater financing and negotiating power to developing countries and marginalised communities, while remaining adaptive to technological and social change. This will position the global community to harness often-overlooked innovations from the global south that will help build infrastructure that drives economic growth, enhances quality of life and protects our planet.

Notes

1 United Nations Environment Programme, International Good Practice Principles for Sustainable Infrastructure: Integrated, Systems-level Approaches for Policymakers (UNEP 2021) 9.
2 *Ibid.*
3 *Ibid*, 11.
4 International Monetary Fund, 'The World Economy in the Twentieth Century: Striking Developments and Policy Lessons' (IMF 1999)149–162 www.elibrary.imf.org/downloadpdf/display/book/9781557759368/ch005.pdf (viewed 24 December 2025.
5 H George Frederickson, *Social Equity and Public Administration: Origins, Developments, and Applications* (Routledge 2010) 44.
6 *Ibid.*
7 Joseph E Stiglitz, Amartya Sen and Jean-Paul Fitoussi, *Report by the Commission on the Measurement of Economic Performance and Social Progress* (Paris 2009) 12.
8 UN General Assembly, Transforming Our World: the 2030 Agenda for Sustainable Development, UN Doc A/RES/70/1 (25 September 2015, adopted 21 October 2015) https://sdgs.un.org/2030agenda (viewed 25 December 2025).
9 *Ibid*, SDGs 7, 9, 11, 12 and 13.
10 Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016), 3156 UNTS 3, at https://unfccc.int/sites/default/files/english_paris_agreement.pdf (viewed 25 December 2025), Art 2.1(c) and Art 4.
11 Republic of Kenya, Updated Nationally Determined Contribution (2020–2030) (FAOLEX, 2020) 8 https://faolex.fao.org/docs/pdf/KEN210108.pdf (viewed 24 December 2025).
12 S Hanje, Samson Mbewe and Aimee Tredoux, Exploring Operational Pathways for Article 2.1(c) of the Paris Agreement in Africa: The Case of Financing Climate Resilient Infrastructure in Africa (SouthSouthNorth, Working Paper, May 2024) 8.
13 See Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality (European Climate Law). African Charter on Human and Peoples' Rights (adopted 27 June 1981, entered into force 21 October 1986), OAU Doc CAB/LEG/67/3 rev 5, 21 I.L.M. 58 (1982), Art 24.
14 Republic of Ghana, Environmental Protection Act 2025 (Act 1124) s 29 www.brr.gov.gh/acc/registry/docs/Environmental-Protection-Act-2025-Act-1124.pdf (viewed 27 December 2025).
15 Law No 14,300/2022. ICLG, *Renewable Energy Laws and Regulations Report 2026: Brazil* (22 September 2025) https://iclg.com/practice-areas/renewable-energy-laws-and-regulations/brazil (viewed 24 December 2025).
16 World Economic Forum, 'Why Investment in Sustainable Infrastructure Is Key to Financial Resilience in a Changing Climate' (World Economic Forum, 24 April 2025) www.weforum.org/stories/2025/04/why-investment-in-sustainable-infrastructure-is-key-to-financial-resilience-in-a-changing-climate/ (viewed 26 December 2025).
17 Renewable Energy Law of the People's Republic of China (adopted 28 February 2005, amended 26 December 2009), Art 24. International Energy Agency, World Energy Investment 2025: China (IEA 2025) www.iea.org/reports/world-energy-investment-2025/china (viewed 26 December 2025).
18 US Environmental Protection Agency, Summary of Inflation Reduction Act Provisions Related to Renewable Energy www.epa.gov/green-power-markets/summary-inflation-reduction-act-provisions-related-renewable-energy (viewed 26 December 2025).
19 Government of Norway, Lov om offentlige anskaffelser (Public Procurement Act), Act No 73 of 17 June 2016 (entered into force 1 January 2017), s 5 https://lovdata.no/dokument/NL/lov/2016-06-17-73 (viewed 26 December 2025).
20 Business Norway, 'Norway is Greening the Construction Industry' (Business Norway, 27 March 2023, updated 3 January 2025) https://businessnorway.com/articles/norway-is-greening-the-construction-industry (viewed 26 December 2025).
21 See India's Environment (Protection) Act 1986, ss 3(1) and 3(2)(v) together with EIA Notification 1994 (later replaced by the EIA Notification 2006). Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment [2012] OJ L26/1, as amended by Directive 2014/52/EU [2014] OJ L124/1.
22 UK Climate Change Act, 2008, ss 57 and 58.
23 GoVocal, 'Participatory Budgeting in 3 Case Studies' (GoVocal, 2025) www.govocal.com/case-studies/participatory-budgeting-in-3-case-studies (viewed 25 December 2025).
24 Holland Circular Hotspot, 'Circular Buildings: Constructing a Sustainable Future' (October 2022) 45 https://hollandcircularhotspot.nl/wp-content/uploads/2022/10/Circular-Buildings-constructing-a-sustainable-future.pdf (viewed 25 December 2025).
25 Organisation for Economic Co-operation and Development (OECD), 'The Circular Economy in Cities and Regions' (OECD 2020) 64, at www.oecd.org/content/dam/oecd/en/publications/reports/2020/10/the-circular-economy-in-cities-and-regions_dd1348ed/10ac6ae4-en.pdf (viewed 26 December 2025).
26 UNEP, 'Air Pollution in Asia and the Pacific: Science-Based Solutions' (UNEP 2019) 20 www.unep.org/resources/report/air-pollution-asia-and-pacific-science-based-solutions (viewed 26 December 2025).

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Introduction

Infrastructure is recognised as essential to economic growth, social progress, industrialisation, poverty reduction and integration into global markets.[1] Roads, energy systems, mining infrastructure, water supplies, sanitation and urban services support production, employment, investment and improved living standards, particularly in developing economies and resource-dependent states. Across the Southern African Development Community (SADC) region,[2] infrastructure determines whether mineral wealth can be exported, agriculture commercialised or cities function.

Infrastructure development has also generated environmental, social and governance challenges. Growth-orientated projects have destroyed habitats and forests, polluted rivers, displaced communities, disrupted livelihoods and altered ecosystems, particularly in mining, transportation and the energy sector. These harms are not inevitable: they result from poor infrastructure planning, governance and regulation. Where laws are weak, outdated, poorly enforced or overridden by short-term economic interests, development proceeds without protecting the environment or affected communities. The main challenge is therefore achieving a balance between economic growth, investment and service provision on the one hand, and environmental protection and social equity on the other. Unchecked development risks undermining long-term prosperity, raising the legal question of how legal frameworks can be strengthened to promote sustainable infrastructure while balancing these competing interests.

This essay argues that the problem lies not in the absence of legal frameworks, but in fragmented application, weak enforcement and failure to modernise existing laws. It contends that sustainable infrastructure requires stronger environmental impact assessment (EIA) regimes, meaningful public participation, protection of land and water resources, clear maintenance obligations, responsible investment regulation and strategic use of the Sustainable Development Goals (SDGs) as tools for legal interpretation and reform, using Zambia as a case study.

Zambia's legal and policy framework governing infrastructure

Infrastructure development in Zambia is governed by the country's Constitution[3] along with sector-specific statutes. Environmental protection has Constitutional recognition in the right to a clean and healthy environment and in statutes including the Environmental Management Act that set mandatory EIAs. A starting point in assessing Zambia's infrastructure framework is the distinction between infrastructure development and sustainable infrastructure development. Infrastructure development focuses primarily on the construction of physical assets such as roads, mines, power plants and public facilities in order to support economic activity and service delivery. Sustainable infrastructure development, as reflected in international frameworks such as the SDGs, requires that infrastructure be planned, implemented and maintained in a manner that integrates environmental protection, social equity and long-term resilience alongside economic growth.

The SDGs,[4] particularly SDG 9 (industry, innovation and infrastructure), SDG 6 (clean water and sanitation), SDG 11 (sustainable cities and communities) and SDG 13 (climate action), reflect a modern understanding of infrastructure that goes beyond physical construction. These SDGs set environmental safeguards, inclusive planning, protection of natural resources,

public participation and sustainability over the lifecycle of infrastructure projects. While these goals are not legally binding, Zambia has committed to their implementation, and they provide an important benchmark against which domestic legal frameworks can be assessed.[5] Zambia's legal framework remains orientated toward facilitating infrastructure development rather than ensuring its sustainability. Although environmental protection and planning laws are in place, their scope, implementation and enforcement often fall short of addressing the sustainability requirements. This misalignment becomes evident when examining how EIAs, town and country planning, sanitation infrastructure and large-scale development projects operate in practice.

A requirement under the Environmental Management Act, EIAs are intended to identify environmental risks and prescribe mitigation measures before project approval. In theory, EIAs serve as a key legal mechanism for integrating environmental considerations into infrastructure development. In practice, however, EIAs are frequently treated as procedural steps rather than substantive constraints on development. High profile projects illustrate these challenges. Proposed mining in the Lower Zambezi National Park raised concerns about water pollution, habitat destruction, tourism and downstream livelihoods, prompting sustained opposition and legal challenges that highlight the gap between legal standards and their enforcement. Similarly, the collapse of a tailings dam in the Kafue River basin released toxic waste into the river system, contaminating water supplies and demonstrating the real consequences of regulatory failure.[6]

Similar shortcomings are evident in the application of town and country planning law. Zambia's Urban and Regional Planning Act provides a legal basis for coordinated land use, zoning and development control. However, weak enforcement and limited institutional capacity have resulted in poorly planned settlements, inadequate road networks, and the absence of integrated sanitation and drainage systems in many towns. The widespread reliance on pit latrines and soakaways, rather than sewerage networks, poses significant risks to groundwater and public health, which shows that infrastructure development has occurred without meeting the standards of sustainable urban planning envisaged under modern sustainability frameworks.

The environmental consequences of mining-related infrastructure failures further expose gaps in legal frameworks. Incidents involving industrial waste and pollution, including contamination associated with mining operations, highlight limitations in enforcement mechanisms and regulatory oversight. Despite the existence of environmental laws, failures in monitoring, compliance and accountability have allowed environmental harm to occur, reinforcing the perception that legal standards are insufficiently aligned with sustainability objectives. Taken together, these examples demonstrate that, while Zambia has laws that support infrastructure development, the laws do not consistently reflect or uphold the broader requirements of sustainable infrastructure development. The gap lies not only in enforcement but also in the extent to which existing legal frameworks incorporate environmental resilience, social equity, sanitation and long-term planning as central legal obligations. This disconnect underscores the need to strengthen and realign legal frameworks to reflect contemporary sustainability standards, a task that requires both legal reform and more effective implementation.

The other issue that comes with infrastructure development is of public participation or its lack thereof; the weaknesses in environmental regulation do not exist in isolation. They are closely connected to land laws. Large infrastructure projects often require the compulsory acquisition of land, and in many cases this land is held under customary tenure. Although the law requires compensation, disputes over valuation and long delays in payment are common. As a result, affected communities are left feeling dispossessed and excluded from the benefits of development. This has fuelled social conflict and reinforced the perception that infrastructure projects serve political and economic elites while rural communities bear the brunt of social and environmental costs. For infrastructure development to be truly sustainable, legal protections for customary land rights must be strengthened, and compensation processes must be fair, transparent and timely. These social tensions can also help explain why public infrastructure is often poorly protected and vulnerable to vandalism. When communities feel excluded from

decision-making or unfairly treated during land acquisition, they are less likely to see infrastructure as something that belongs to them or serves their interests. In some cases, this results in deliberate damage, theft of materials or neglect of public facilities. The protection and maintenance of public infrastructure is therefore not just a security or policing issue; it is a key part of sustainability. Infrastructure that is repeatedly vandalised or poorly maintained becomes costly, inefficient and environmentally wasteful. Sustainable development requires not only building infrastructure but also ensuring that legal frameworks promote community inclusion, ownership and the long-term protection of these public assets.

How legal frameworks can be strengthened to promote sustainable infrastructure

The examples discussed demonstrate that the challenge facing infrastructure development in Zambia is not the absence of law, but the fragmentation or weak implementation of existing legal frameworks. Strengthening these frameworks therefore requires an integrated approach that reinforces environmental protection while simultaneously addressing land governance, planning, investment, sanitation and long-term infrastructure maintenance.

First, EIAs must be restored to their central role in infrastructure governance. The Environmental Management Act already requires EIAs for major projects, particularly in environmentally sensitive areas such as river systems and protected zones.[6] Legal reform and regulatory practice however must ensure that EIAs function as binding decision-making instruments rather than procedural checkpoints. Authorities should be legally required to justify departures from EIA recommendations, and post-approval monitoring should be strengthened through clearer enforcement powers, periodic compliance audits and meaningful sanctions for non-compliance. Without effective enforcement, infrastructure development continues to externalise environmental costs, undermining sustainability at its foundation.

Second, environmental governance must be linked more closely to land acquisition and community rights. Infrastructure projects that displace communities or disrupt livelihoods without fair compensation weaken public trust and fuel resistance, vandalism and neglect of public infrastructure. Strengthening legal protections for customary landholders, ensuring timely and fair compensation, and integrating community participation into EIA and licensing processes would promote social equity while also improving environmental outcomes. Communities that are meaningfully involved are more likely to support, protect and sustainably use infrastructure.

Third, town and country planning law must operate in tandem with environmental regulation. The Urban and Regional Planning Act provides a framework for orderly land use and development control, yet weak implementation has allowed environmentally harmful and poorly serviced settlements to emerge. Planning decisions should be legally required to align with approved EIAs, water protection standards and climate resilience considerations. Strengthening coordination between planning authorities, environmental regulators and local councils would ensure that infrastructure development is environmentally sound, spatially coherent and socially inclusive.

Fourth, sanitation infrastructure must be treated as a core environmental issue rather than a peripheral service. The widespread reliance on pit latrines and soakaways, particularly in urban and peri-urban areas, poses serious risks to groundwater quality and public health. Legal frameworks governing environmental protection, water resources and public health should be amended to prioritise the expansion of sewerage systems and regulated waste management infrastructure. Integrating sanitation planning into EIA requirements and urban development approvals would directly address pollution risks and protect water sources, reinforcing environmental sustainability. In addition, foreign direct investment (FDI) in infrastructure-intensive sectors, especially mining, must be environmentally conditioned. While Zambia requires investment to develop roads, schools, energy systems and other infrastructure, investment laws and licensing regimes should impose enforceable environmental and social obligations. Mining-related infrastructure should be required to meet strict environmental standards, contribute to local public infrastructure and support post-closure environmental restoration. This will ensure that economic growth driven by FDI does not

compromise environmental integrity or social equity. The SDGs should guide both legal reform and legal interpretation. Although not legally binding, the SDGs provide a coherent framework that reflects Zambia's constitutional commitments to sustainable development and intergenerational equity. Courts, regulators and policy-makers can use the SDGs as interpretive tools when applying constitutional provisions, environmental statutes and planning laws. Embedding SDG principles into legislative amendments, administrative decision-making and judicial reasoning would promote coherence across sectors and help to bridge the persistent gap between legal standards and implementation.

Finally, the main weakness in the current environmental governance framework lies in the limited consequences faced by decision-makers and project proponents who knowingly act contrary to approved EIA reports. While the Environmental Management Act provides for EIAs, sustainability cannot be achieved where compliance is optional in practice. Legal frameworks should therefore impose clear penalties, compensation obligations, and, where appropriate, criminal liability on principal officers and developers who deliberately disregard EIA findings or fail to implement approved mitigation measures. Holding individuals, rather than only corporate entities, accountable would significantly strengthen deterrence and promote a culture of environmental responsibility.

In addition to enforcement, public access to EIA reports must be guaranteed. EIAs directly affect communities, ecosystems and public health, yet they are often treated as technical documents accessible only to regulators and developers. Legal reform should require all approved EIA reports, including mitigation plans and monitoring conditions, to be made publicly available in accessible formats. This would enable communities, civil society and local authorities to understand the environmental risks involved, and to monitor whether mitigation measures are being implemented as approved. Transparency strengthens compliance and reinforces public trust in environmental decision-making. Where penalties or offences already exist under the Environmental Management Act, enforcement must be significantly strengthened. Regulatory authorities should be required to actively investigate breaches of EIA conditions and to impose sanctions consistently and without political or economic interference. Where such penalties are inadequate or poorly defined, legislative amendments should clarify offences, expand enforcement powers and provide for compensation to affected communities and environmental restoration. Without meaningful sanctions and transparency, EIAs cannot function as effective tools for sustainable infrastructure governance.

Conclusion

Infrastructure will continue to shape Zambia's development trajectory and the future of the SADC region. The challenge is not whether to build, but how to build. Economic growth, environmental protection and social equity are not mutually exclusive objectives. Through strong, well enforced and coordinated legal frameworks, infrastructure development can drive growth while preserving natural resources and promoting social justice. Law, when properly designed and applied, becomes the mechanism through which development ambition is transformed into sustainable reality.

Notes

1 United Nations, Industry, Innovation and Infrastructure – UN SDGs www.un.org/sustainabledevelopment/infrastructure-industrialization/ (viewed 22 December 2025).

2 The Southern African Development Community (SADC) is a Regional Economic Community comprising 16 Member States; Angola, Botswana, Comoros, Democratic Republic of Congo, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, United Republic of Tanzania, Zambia and Zimbabwe. See, Member States, Southern African Development Community (SADC), at https://www.sadc.int/member-states (viewed 7 June 2026).

3 Arts 245 and 255, Construction of Zambia (Amendment) Act No 2 of 2016, c 1 of the Laws of Zambia.

4 Global Goals, Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization, at https://globalgoals.org/goals/9-industry-innovation-and-infrastructure/ (viewed 24 December 2025).

5 Zambia Statistics Agency (2021) Zambia SDGs Baseline Report 2021, ZamStats, at www.zamstats.gov.zm and UN Zambia – Sustainable Development Knowledge Platform at https://sustainabledevelopment.un.org/memberstates/zambia (viewed 15 December 2025).

6 Zambezi Network (2022), Kangaluwi Copper Mine in the Lower Zambezi National Park threatens the Zambezi Valley Basin, Zambezi Network at https://www.zambezinetwork.org/2022/12/kangaluwi-copper-mine-in-the-lower-zambezi-national-park-threatens-the-zambezi-valley-basin/ (viewed 22 December 2025).

How can legal frameworks be strengthened to promote sustainable infrastructure while balancing economic growth, environmental protection and social equity?

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Introduction

> 'We look at infrastructure primarily from the point of view of providing services to people. That's the end goal, and the hope is that we can do that in a way that will be resilient and sustainable in all three dimensions of sustainability: economic, environmental, and social.'
> *Marianne Fay, Chief Economist for Climate Change, World Bank*

Infrastructure is central to sustainable development, underpins economic growth, and delivers services essential to the livelihoods and wellbeing of people.[1] Unsustainable, poorly planned and poorly delivered infrastructure can have disastrous effects on the environment and societies.[2] The challenge, therefore, is not whether infrastructure should be built, but how it can be developed in a manner that also promotes economic growth, protects the environment and advances social equity.[3] This essay argues that legal frameworks are the primary mechanism through which the competing imperatives of economic growth, environmental protection and social equity can be balanced in infrastructure development.

The purpose of this essay is to explore how legal frameworks can be strengthened to promote sustainable infrastructure while balancing economic growth, environmental protection and social equity. To achieve this, the essay starts by defining the concepts of sustainable infrastructure and its connection to these three pillars of sustainability. It then assesses the role of legal frameworks in promoting sustainable infrastructure while maintaining a balance among these priorities. Next, it proposes four major strategies for strengthening legal frameworks. By embedding sustainability as a binding design principle, strengthening environmental impact assessment (EIA), enhancing institutional coordination and capacity, and aligning financial regulation with sustainability goals, legal frameworks can transform infrastructure development into a driver of inclusive, resilient and long-term economic growth.

Sustainable infrastructure and its relation to the three pillars of sustainability

The concept of sustainability refers to the need to balance socio-environmental and economic development to guarantee a common sustainable future.[4] The Inter-American Development Bank (IDB) defines sustainable infrastructure as an infrastructural project that is planned, designed, constructed, operated and decommissioned in a manner to ensure economic and financial, social, environmental (including climate resilience) and institutional sustainability over the entire life cycle of the project.[5]

Further, the New Climate Economy (NCE) report defines sustainable infrastructure using three criteria: social, economic and environmental.[6] Building on the traditional three-pillar definition of sustainability, the term sustainable infrastructure refers to infrastructure projects that are economically, socially and environmentally sustainable.[7] Infrastructure is considered socially sustainable when it is inclusive; it serves all, not just a select few, and contributes to enhanced livelihoods and social wellbeing.[8] It stimulates the reduction of poverty and allows people to access the services they need. Infrastructure becomes economically sustainable when it does not burden governments with unpayable debt or impose painfully high costs on users but helps create

jobs and boost gross domestic product (GDP), and may include opportunities to build capacity among local suppliers and developers, and strengthen livelihoods.[9]

According to this report, infrastructure is environmentally sustainable when it limits pollution at all stages of a project's life cycle and conserves natural resources.[10] Based on these definitions, sustainable infrastructure is understood as a legally and normatively integrated concept encompassing social inclusion, economic viability and environmental protection across the entire project life cycle. Therefore, to achieve the Sustainable Development Goals (SDGs) and climate change objectives, the infrastructure upgraded and built must be sustainable, specifically designed to mitigate economic, social and environmental risks, and to generate economic, social and environmental co-benefits.[11]

Legal frameworks in promoting sustainable infrastructure balancing economic growth, environmental protection and social equity

Although we demonstrate that providing infrastructure systems and services is essential for achieving the SDGs, infrastructure development must be considered alongside environmental and social impacts.[12] Poorly planned infrastructure can harm people's health (SDG 3), for example, through air pollution, water and soil contamination, or disease transmission. Infrastructure such as road construction often causes significant change to ecosystems, including loss of habitat, pollution and alterations in hydrological patterns.[13] To promote and encourage the level of investment in sustainable infrastructure necessary to achieve the SDGs, an enabling environment must be established.[14] Critical to this is the legal framework that governs investment in general and infrastructure investment in particular. These frameworks consist of laws, regulations, policies and guidelines that govern the planning, implementation and operation of infrastructure projects with a focus on environmental, social and economic sustainability. The objective of such frameworks is to ensure that infrastructure projects align with sustainability goals, minimise negative impacts on the environment and communities, and promote long-term resilience. The Paris Agreement, from the 2030 Agenda for Sustainable Development which supports the SDGs, the New Urban Agenda, and the Sendai Framework for Disaster Risk Reduction all require investments that deliver climate-resilient infrastructure that supports sustainable development.[15] In this context, legal frameworks do not merely facilitate infrastructure development; they determine how competing interests are prioritised, constrained, and reconciled through binding rules and enforceable standards.

To this end, the International Good Practice Principles for Sustainable Infrastructure are intended to guide global use on the integration of sustainability throughout the entire infrastructure life cycle, with the focus 'upstream' of the project level.[16] It aims to assist high-level policy and decision-makers in governments in creating the enabling environment for sustainable infrastructure that is needed to achieve the SDGs and the objectives of the Paris Climate Agreement, while respecting existing international conventions and internationally agreed standards.[17] At the domestic level, legislation across various sectors such as planning, health and safety, forestry, EIA, electricity acts and investment acts can restrict, authorise or facilitate certain behaviours in developing infrastructure because they are sources of binding law. Consequently, fiscal reforms and pricing policies in the water sector can help to generate domestic resources for investing in water infrastructure, expanding coverage, enhancing water quality and increasing access for poor communities.[18] Generally, the legal framework has a crucial role to play in designing a solid foundation for the effective utilisation and management of infrastructure in ways that balance environmental, social and economic interests so as to contribute towards sustainable development.[19]

Strategies for strengthening legal frameworks

Strengthening legal frameworks to promote sustainable infrastructure requires more than the expansion of environmental regulation or the mobilisation of additional financing: it requires laws as a coordinating mechanism that structures trade-offs among economic growth, environmental protection and social equity. In this section, the essay discusses four major ways to strengthen the legal framework.

First, embedding sustainability as a binding legal design principle

Legal frameworks should move beyond treating sustainability as a policy aspiration and instead establish it as a binding design principle governing infrastructure decision-making. Integrated approaches to infrastructure seek an optimal balance between the social, environmental and economic aspects of sustainability by considering these interconnections for all phases of the infrastructure development cycle, and they do so as far upstream in the decision-making process as possible.[20] Integrating sustainability into the legal framework is not simply a technical requirement; it is a structural transformation of how societies plan, build and finance infrastructure. Public procurement and public–private partnerships (PPPs) are among the modes under which the government can structure infrastructure projects.[21] Consequently, the PPP contract becomes a central component of the legal framework governing this relationship as it allocates responsibilities and risks between the public authority and the private partner. Treating sustainability as a binding legal principle ensures that infrastructure decisions are subject to legal accountability rather than discretionary policy preferences.

Accordingly, infrastructure contracts should embed environmental and social safeguards or, more broadly stated, sustainability considerations in their goals, designs and specifications, along with tender evaluation, supplier selection, and monitoring and contracting functions.[22] In sum, sustainability elements must be provided not only in the text of public-private contracts but also in all relevant documents applicable throughout the infrastructure contracting process.[23] By embedding sustainability directly into legal decision points, the law prevents short-term economic gains from systematically overriding environmental protection and social inclusion.

Second, strengthening EIAs

EIAs are among the most effective legislative tools for aligning development projects with sustainability goals. They are comprehensive evaluations of the environmental, social and economic impacts of policies or projects, conducted before implementation.[24] This tool helps to identify potential impacts beforehand, guiding decision-making to favour projects based on sustainable development principles and enabling the mitigation of adverse effects through proactive and rational measures.[25] Legal frameworks typically require EIAs to include public consultations, thereby enhancing transparency and inclusivity in infrastructural planning.[26] By involving communities at the earliest stages, EIAs help to address local concerns, reduce opposition and strengthen project legitimacy. They ensure that projects align with global sustainability principles while providing domestic regulators with a legal instrument to monitor compliance over time.

Third, enhancing institutional coordination and capacity

While legal frameworks are vital, their success depends on institutional capacity. To enable integrated and sustainable infrastructure planning, delivery and management, institutional coordination is necessary, both vertically (from national to sub-national levels) and horizontally among different ministries and administrative jurisdictions, at all levels of government. Coordination failures can delay project approvals or create conflicting requirements, reducing investor confidence.[27] Policies and regulations at various levels must be harmonised so they do not contradict each other or give opposing incentives or market signals. Interdisciplinary and intersectoral coordination among and within institutions also ensures that all aspects of sustainability are duly considered from the earliest stages of infrastructure planning. Capacity-building provisions, such as specialised regulatory units or inter-agency committees, should be embedded within legal frameworks to ensure the consistent application of sustainability standards.

Fourth, promoting green and climate-resilient financing mechanisms

Financial regulation plays a decisive role in shaping infrastructure choices. Legal frameworks should align financial incentives with sustainability goals by promoting green and climate-resilient financing mechanisms. Historically, sustainable infrastructure finance initiatives have tended to focus on incentivising private sector investment. This has resulted in infrastructure investment

that is poorly aligned with the SDGs. Strengthening legal frameworks should include incentives for sustainable investment, such as tax benefits for renewable energy projects, green bonds and climate finance mechanisms. Establishing transparent standards for green finance reduces the risk of 'green washing' and ensures that funds are directed to genuinely sustainable projects.[28] In developing countries, legal provisions enabling access to international climate finance, including the Green Climate Fund, can help to bridge infrastructure financing gaps. By integrating financial regulation into the broader sustainability framework, law can channel investment towards infrastructure that delivers long-term economic and social returns.

Conclusion

This essay discussed how the legal framework can be strengthened to promote sustainable infrastructure while balancing economic growth, environmental protection and social equity. It has demonstrated that infrastructure development, while essential to economic advancement, poses significant environmental and social risks when pursued without coherent legal oversight. Sustainable infrastructure therefore requires an integrated legal approach that treats economic efficiency, environmental stewardship and social inclusion not as competing objectives but as interdependent legal priorities. It has shown that strengthening legal frameworks demands more than the proliferation of regulatory instruments. It requires embedding sustainability as a binding legal principle within infrastructure decision-making, ensuring robust and participatory EIA processes, fostering effective institutional coordination across sectors and levels of governance, and aligning financial regulation with climate and sustainability objectives.

Notes

1 Devashree Roy, 'The Multiple Benefits of Natural Infrastructure' (International Institute for Sustainable Development Blog, 27 August 2018).
2 Dipti Saha, 'Low Carbon Infrastructure: An Essential Solution to Climate Change?' (World Bank Blogs, 18 April 2018).
3 Vector Globe, 'Why Is Sustainable Infrastructure Important for Economic Growth?' at https://vectorglobe.com/why-is-sustainable-infrastructure-important/ (viewed 10 December 2025).
4 Oscar González-Morales, et al, 'Regulatory Framework and Public Policies for Sustainability in the Construction Sector,' Sustainable Development at https://doi.org/10.1002/sd.70499 (viewed 24 April 2026).
5 IDB and *IDB Invest*, 'What Is Sustainable Infrastructure? A Framework to Guide Sustainability across the Project Cycle' (IDB 2018), at https://doi.org/10.18235/0001043 (viewed 24 April 2026).
6 NCE, 'The Sustainable Infrastructure Imperative' (Global Commission on the Economy and Climate 2016).
7 Amar Bhattacharya, et al, 'Delivering on Sustainable Infrastructure for Better Development and Better Climate' (Brookings Institution 2016).
8 United Nations Environment Programme (UNEP), International Good Practice Principles for Sustainable Infrastructure (UNEP 2021).
9 Amar Bhattacharya, et al, 'Driving Sustainable Development through Better Infrastructure: Key Elements of a Transformational Programme' (2015) Brookings Global Working Paper No 91.
10 *Ibid*, para 22.
11 Maruf Ahmad and Naznin Islam, 'Environmental Consideration of Infrastructure Projects under Public-Private Partnership: A Sustainable Development Perspective' (2022).
12 Richard Jones and John Llewellyn, 'Improving Infrastructure' (2019) 250(1) National Institute Economic Review *R61–R68* https://doi.org/10.1177/002795011925000119 (viewed 24 April 2026).
13 *Ibid.*
14 Martin D Brauch, 'Contracts for Sustainable Infrastructure: Ensuring the Economic, Social and Environmental Co-Benefits of Infrastructure Investment Projects' (UN Environment Programme, December 2017).
15 UN Framework Convention on Climate Change, Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016); UN, Sendai Framework for Disaster Risk Reduction 2015-2030 (UN 2015).
16 UNEP, International Good Practice Principles for Sustainable Infrastructure (2021).
17 *Ibid.*
18 Global Commission on the Economy and Climate, 'The Sustainable Infrastructure Imperative: Financing for Better Growth and Development' (2016) at https://newclimateeconomy.net/sites/default/files/2023-11/NCE_2016Report_6.pdf (viewed 25 December 2025).
19 Luke Danielson and Patricio Layton, 'Sustainable Development: Emerging Concepts of Governance in the Minerals Industries' (RMMLF Paper No 9, 2001).
20 See n 16 above.
21 Philippe Burger and Ian Hawkesworth, 'How to Attain Value for Money: Comparing PPP and Traditional Infrastructure Public Procurement' (2011) OECD Journal on Budgeting 1.
22 Samuel Colverson and Oshani Perera, 'Sustainable Development: Is There a Role for Public-Private Partnerships?' (International Institute for Sustainable Development (IISD) 2011), at www.iisd.org/library/sustainable-development-there-role-public-private-partnerships-summary-iisd-preliminary (viewed 25 December 2025).
23 World Bank Group, Guidance on PPP Contractual Provisions (2017 edn), at https://pubdocs.worldbank.org/en/217281498617774364/Guidance-on-PPP-Contractual-Provisions-2017-edition.pdf (viewed 25 December 2025).
24 UNEP, Guidebook on National Legislation for Adaptation to Climate Change (2011) 177, at www.unep.org/delc/Portals/119/UNEP_Guidebook_National_Legislation_Adaptation.pdf (viewed 25 December 2025).
25 Attaullah Shah, et al, 'Environmental Impact Assessment (EIA) of Infrastructure Development Projects in

Developing Countries' (2010) 1(4) OIDA International Journal of Sustainable Development 47.

26 Zhong Xiang Zhang, 'Asian Energy and Environmental Policy: Promoting Growth While Preserving the Environment' (2008) 36(10) Energy Policy 3905.

27 Chitra Sriyani Lokuwaduge and Kumudini Heenetigala, 'Integrating Environmental, Social and Governance (ESG) Disclosure for Sustainable Development: An Australian Study' (2017) 26(4) Business Strategy and the Environment 438.

28 International Finance Corporation (IFC), Green Bond Principles: Guidelines for Issuers (2020).

How can legal frameworks be strengthened to promote sustainable infrastructure while balancing economic growth, environmental protection and social equity?

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> Sustainable development is the pathway to the future we want for all. It offers a framework to generate economic growth, achieve social justice, exercise environmental stewardship and strengthen governance.
>
> *Ban Ki-moon, Eighth United Nations Secretary-General*

Infrastructure as the life of society

Infrastructure is a cornerstone of economic growth and social development. As noted by the World Bank, it improves living standards through job creation, greater access to healthcare and schooling, and linking producers with consumers.[1] Infrastructure includes fundamental physical and organisational systems, such as transportation networks, utilities and social services, that support economic activity and daily life.[2] Sustainable infrastructure goes a step further by ensuring that these systems are planned, designed, constructed and operated in a manner that ensures economic, social and environmental sustainability throughout their lifecycle.3 For Ghana, sustainable infrastructural development remains at the heart of national aspirations. This can be gleaned from the Ghana Infrastructure Plan – the 'Big Push'4 – and aimed at constructing and rebuilding both old and new road projects across Ghana, highlighting the country's commitment to sustainable infrastructure development.

Infrastructure driving economic growth

Economic growth refers to the expansion of a society's productive capacity, better enabling the production of goods, services and providing employment opportunities, ultimately improving living standards. In Ghana, for instance, initiatives like the 'Big Push' aim to generate more goods, services and employment opportunities, which in turn stimulate investment, promote productivity, and provide a stable and conducive business environment. The improvement and construction of road networks would have immense potential to enhance the overall efficiency of trade and offer jobs to thousands of people. Smaller businesses would ordinarily find it difficult to reach the market without the provision of basic infrastructure, like electricity and road networks, underscoring the fundamental significance of infrastructure in economic activities on a daily basis. Job creation and the ability to reduce poverty have the overall effect of ensuring that the country remains competitive in the international market.[5]

Protecting the environment and communities

Inasmuch as infrastructural development is needed, the process must be sustainable and environmentally friendly. To understand this, a distinction between environmental protection and infrastructure is critical. Environmental protection refers to any activity to maintain or restore the quality

of the environment such as preventing the emission of or reducing pollutants in environmental media.[6] Large-scale infrastructure projects often present environmental risks and adversely affect vulnerable communities. Approximately, 79 per cent of global greenhouse gas emissions are linked to infrastructure, and climate change is expected to reduce the global gross domestic product by four per cent annually by 2050, rising to 20 per cent by 2100, a contraction comparable to that experienced by the United States during the Great Depression.[7] These statistics are of particular importance in Africa, where attempts at development through infrastructure has left some adverse consequences on the environment. For instance, in the *Endorois*[8] and *Ogoni*[9] cases, the Kenyan and Nigerian governments, in pursuing development through the establishment of a game reserve in Kenya (in *Endorois*) and an oil drilling concession to Shell in Nigeria (in *Ogoni*), displaced indigenous communities, oil spills caused environmental degradation, and both projects violated international obligations, including the African Charter on Human and Peoples' Rights.

Social equity has been defined by the Social Infrastructure Hub as the equitable distribution of inclusive benefits and opportunities across various societal groups.[10] Tying this back to the *Ogoni* and *Endorois* examples, the infrastructural changes neither benefitted nor included the indigenous groups on whose lands these projects were initiated. Instead, it displaced them with no compensation. Sustainable infrastructure deals with these challenges by giving all people access to necessary services, such as energy, water and transportation. This reduces inequality and makes sure that disadvantaged people benefit from development, and that social cohesion, and economic development and growth are improved, thus emphasising the link between sustainability and social equity.[11]

Legal frameworks as a guide

Legal and regulatory frameworks are important in governing sustainable infrastructure development, as such frameworks ensure that economic growth is sought factoring in environmental concerns. In Ghana, these frameworks set out clear rules, responsibilities and standards to ensure that economic growth takes place alongside environmental protection and social fairness. It is important to note that environmental issues are frequently ignored in the context of infrastructural development on the grounds of them being setbacks and 'unnecessary roadblocks.' On the contrary, legal frameworks require that environmental concerns, especially those resulting from infrastructural development, be taken into consideration and protected. Governments play a pivotal role, aided by international bodies, in formulating adequate legal frameworks governing sustainable development.[12] Ghana's existing framework, including the Environmental Protection Agency Act 1994 (Act 490), provides a foundation for this governance.

Existing international norms and principles

As a starting point, legal frameworks should not merely permit or block infrastructure projects. Rather, they should guide decision-making, assign responsibilities and define consequences when obligations are not met. In global affairs, through its Sustainable Development Goals (SDGs), the UN supports construction-advancing prosperity, while preserving nature and including all communities. These sustainable goals appear to have evolved from past actions and observations, most notably Agenda 21, agreed upon by nearly 179 nations during the 1992 environmental meeting held in Rio de Janeiro, Brazil. Agenda 21 outlined a broad strategy urging nations to weave together goals for growth, nature conservation and societal needs within policy choices.[13] International agreements like these often shift how countries set their laws, guiding what issues receive attention and how rules are shaped. At the heart of sustainable development legal frameworks are two major principles: the precautionary principle and the 'polluter pays' principle.

Precautionary principle – The precautionary principle requires that, where an activity might seriously harm the environment or people, action should be taken to prevent that harm, even if there is as yet no complete scientific proof of the damage feared. It hinges on the famous saying 'better safe than sorry'. In Ghana, for example, developers of the Bui Dam project conducted thorough environmental assessments to comply with the precautionary principle, ensuring that local communities and ecosystems were protected during construction. The

precautionary principle obliges policy-makers and infrastructure developers to take proactive measures to protect ecological and human health during infrastructure development projects. This principle ensures that development does not come at the expense of people or the environment, even when scientists are not entirely certain about the risks.

'Polluter pays' principle – The 'polluter pays' principle, on the other hand, requires the perpetrators of environmental degradation and damage to be held responsible in its reparation and in paying the costs, rather than leaving the public or the state to bear the burden of the harm caused. The 'polluter pays' principle similarly requires the developer of any infrastructure to prepare for any consequences associated with environmental concerns that might result from the development. This approach encourages responsible development and avoids passing hidden costs onto society.[14]

Procedural safeguards

Before any project gains approval, laws should and ordinarily do demand reviews of the environmental and social consequences, pushing officials to weigh harm to ecosystems, economies and local groups. These rules give communities a recognised role in choices affecting their futures. At the national level, legal frameworks such as Ghana's Environmental Protection Agency Act, 1994 (Act 490) and the associated Environmental Assessment Regulations, 1999 (LI 1652) demonstrate how statutory law can institutionalise sustainable infrastructure planning. Act 490 establishes an Environmental Protection Agency with powers to monitor, enforce and regulate compliance with environmental standards, and ensures that infrastructure projects undergo environmental assessments before they proceed.[15] The Environmental Assessment Regulations further mandate that developers obtain permits and submit environmental impact assessments, providing a clear legal mechanism to evaluate environmental, social and economic effects prior to project approval.[16]

Designing legal frameworks to promote sustainable infrastructure

Effective legal frameworks are essential for guiding the development of infrastructure that is not only economically viable but also environmentally sustainable and socially inclusive. By establishing clear rules, responsibilities and incentives, laws can shape decision-making, coordinate actors across sectors, and embed long-term sustainability objectives into every stage of infrastructure planning and implementation. This can be achieved as follows.

Linking global action and local action

Beyond regulatory standards, legal frameworks can be reinforced by aligning domestic law with the SDGs articulated in major international instruments and policy frameworks. The 2015 UN 2030 Agenda for Sustainable Development sets out goals such as SDG 9 on industry, innovation and infrastructure, and SDG 11 on sustainable cities and communities, emphasising the need for legal and policy reforms that integrate economic growth with environmental stewardship and social inclusion.[17] Embedding global norms into national legal frameworks helps countries to design infrastructure laws that are forward-looking and consistent with international sustainability commitments.

Ghana's commitment to SDG 9 and SDG 11 is evident in its 'Big Push' initiative. At the national level, legal frameworks can mandate collaboration between national, regional and local authorities to ensure that planning, funding and implementation are harmonised across jurisdictions. Additionally, laws should encourage partnerships between government agencies, private investors and civil society organisations, recognising that sustainable infrastructure requires shared responsibility, technical expertise and community engagement.18 Using Ghana as a case in point, these will facilitate partnerships for ensuring coordination between the Ministry of Finance, the National Development Planning Commission (NDPC), sector ministries and private investors. This approach prevents contradictory decision-making and supports solutions that address multiple objectives simultaneously, such as reducing carbon emissions while promoting economic growth and expanding access to essential services. By combining enforceable principles, social safeguards and governance mechanisms, legal frameworks can create an environment where sustainable infrastructure is not an afterthought but a guiding standard that shapes development pathways over the long term.

Incentives and regulation

Legal frameworks can foster sustainable infrastructure by combining regulatory standards with financial incentives.

Governments may enact laws that enable the issuance of green bonds, offer tax credits or provide subsidies to encourage the private sector to invest in projects that reduce environmental harm and promote energy efficiency, renewable energy integration or low-carbon transport solutions.[19] When embedded in legislation, such incentives align economic growth with environmental objectives, ensuring that development projects contribute to national sustainability goals while remaining financially viable. Concurrently, regulatory frameworks are necessary to prevent the overexploitation of natural resources and to ensure that development occurs within ecofriendly limits. Here, national laws should mandate the efficient use of materials and adherence to environmental performance standards across sectors such as energy, transportation and water infrastructure. In Ghana, for instance, legal instruments such as the Public Financial Management Act 2016 (Act 921), the Environmental Protection Agency Act 1994 (Act 490) and the Environmental Assessment Regulations 1999 (LI 1652) provide structured mechanisms to monitor, regulate and enforce compliance, ensuring that infrastructure investments advance economic objectives without compromising environmental integrity.[20]

Collectively, these laws illustrate how domestic legislation translates international sustainability principles into practical tools for enforcement and accountability.

Promoting social equity

Social equity is a fundamental objective that legal frameworks must embed in sustainable infrastructure development.[21] Laws should require that infrastructure projects explicitly address the needs of vulnerable populations, including low-income households, women, people with disabilities and marginalised rural communities. Provisions may cover affordable housing, accessible transportation and equitable distribution of project benefits, ensuring that infrastructure development reduces rather than exacerbates social inequalities. At the very least, where these laws do not provide for these, they should ensure that the already existent benefits are not eradicated by the advent of developmental projects. By granting affected communities formal rights to participate in consultations, challenge project decisions or influence planning outcomes, legislation empowers citizens to hold developers accountable and ensures that projects reflect local priorities. Finally, embedding social equity within law enhances the legitimacy of infrastructure initiatives, strengthens social cohesion and minimises the likelihood of conflict or opposition that could undermine project delivery.

Challenges and remedies for sustainable infrastructure legal frameworks

Despite the pivotal role of legal frameworks in promoting sustainable infrastructure, several challenges limit their full effectiveness.

One major issue is the limited institutional capacity and resources available to regulate agencies, which can weaken the enforcement of environmental and social standards, leading to non-compliance or delays in project approvals. This can be addressed by investing in institutional capacity, providing training for officials and ensuring adequate funding for oversight agencies.

Furthermore, a lack of awareness or technical expertise among policy-makers, developers and local communities can reduce the effectiveness of legal frameworks. While officials often struggle to enforce regulations properly, developers may also overlook best practices and communities may not know their rights or how to participate. Without this knowledge, even well-crafted laws risk being ignored or applied inconsistently. This challenge can be addressed through targeted capacity-building, technical training and stakeholder education programmes that empower all parties to understand and apply sustainability requirements effectively.

In addition, the fragmentation of authority across national, regional and local levels often creates inconsistent planning, overlapping mandates and delays in implementation. Clear legal mandates for intergovernmental coordination, joint planning committees, and harmonised policies can reduce fragmentation and ensure cohesive decision-making across jurisdictions.

Finally, resistance from private-sector actors prioritising short-term profits over long-term sustainability can limit the uptake of green projects and regulatory measures. Combining enforceable regulatory obligations with

incentives, transparent monitoring and penalties for non-compliance can help to overcome this resistance and ensure that infrastructure projects meet environmental, social and economic standards.[22]

Recommendations and conclusion

Infrastructure is undeniably the backbone of economic growth and social development, but its benefits cannot be realised without careful planning and oversight. To strengthen the impact of legal frameworks on sustainable infrastructure, laws should align with international standards, such as the SDGs, ensuring that planning integrates economic growth, environmental protection and social inclusion.[23] Governments should invest in institutional capacity, provide technical guidance to developers and embed financial incentives, such as green bonds and tax credits, to encourage sustainable projects while maintaining accountability.[24] Additionally, clear coordination between national, regional and local authorities is essential to prevent fragmented decision-making,[25] and active stakeholder engagement ensures that communities can influence planning and benefit equitably from development.[26]

When effectively designed and implemented, legal frameworks provide standards, assign responsibilities and embed principles such as the precautionary and polluter pays principles.[27] Addressing challenges such as weak enforcement, conflicting priorities, technical knowledge gaps and private-sector resistance through capacity building, incentives, coordination and community engagement ensures that infrastructure development is sustainable, inclusive and resilient. Ultimately, sustainable growth and development is not merely a technical ambition but a moral choice. As former UN Secretary General Ban Ki-moon reminds us, it is the pathway to the future we want for all, a future in which economic progress does not eclipse social justice and growth does not come at the expense of environmental stewardship. Strong legal frameworks give this vision form and force, anchoring development in accountability, equity and foresight. In doing so, they ensure that the infrastructure we construct today stands not only as concrete and steel but also as a living testament to our collective commitment to dignity, responsibility and the wellbeing of generations yet to come.

Notes

1 World Bank Group, Sustainable Infrastructure Finance Overview (12 September 2025), at www.worldbank.org/en/topic/sustainableinfrastructurefinance/overview (viewed 28 December 2025).
2 Organisation for Economic Co-operation and Development (OECD), Infrastructure (OECD Policy Issues) www.oecd.org/en/topics/policy-issues/infrastructure.html (viewed 28 December 2025).
3 UN Environmental Program (UNEP), 'International Good Practice Principles for Sustainable Infrastructure: Integrated, Systems-level Approaches for Policymakers' (2021) www.unep.org/topics/finance-and-economic-transformations/transformingeconomies/sustainable-infrastructure (viewed 28 December 2025).
4 National Development Planning Commission, President Mahama Launches Ghana Infrastructure Plan, Emphasises Need for Collective Commitment (22 October 2025), at https://ndpc.gov.gh/media_center/blog_details/president-mahama-launches-ghana-infrastructure-planenphasises-need-collective-commitment (viewed 28 December 2025).
5 Heavy Vehicle Inspection (Learning Centre), The Key Role of Infrastructure Development in Economic Growth https://heavyvehicleinspection.com/learning-center/infrastructure-development-economic-growth (viewed 28 December 2025).
6 OECD, OECD Glossary of Statistical Terms (OECD Publishing 2008), at https://doi.org/10.1787/9789264055087-en (viewed 28 December 2025).
7 UNEP, 'Without Big Changes, This Is What the Environment Could Look Like by 2050' (2021) at www.unep.org/news-and-stories/story/without-big-changes-whatenvironment-will-look-2050 (viewed 28 December 2025).
8 Centre for Minority Rights Development (Kenya) and Minority Rights Group International on behalf of *Endorois Welfare Council v Kenya*, Communication No 276/2003, 2009/2010.
9 *Social and Economic Rights Action Center (SERAC) and the Center for Economic and Social Rights (CESR) v Nigeria, ACHPR/COMM/A044/1*, October 2001.
10 Global Infrastructure Hub, Inclusive Infrastructure and Social Equity (August 2019) 231.
11 Prime Group, 'Why Sustainable Infrastructure is Key for Economic Growth' https://weareprimegroup.com/insights/why-sustainable-infrastructure-is-key-for-economic-growth/ (viewed 28 December 2025).
12 Global Infrastructure Hub, 'Sustainable Infrastructure' www.gihub.org/sustainable-infrastructure/ (viewed 28 December 2025).
13 The 17 UN SDGs https://sdgs.un.org/goals (viewed 28 December 2025).
14 For a conceptual discussion of the precautionary and polluter pays principles, see Stakeholder Forum, 'Concepts for Sustainable Development Governance' www.stakeholderforum.org (viewed 29 December 2025).
15 Environmental Protection Agency Act, 1994 (Act 490) (Ghana).
16 Environmental Assessment Regulations, 1999 (LI 1652) (Ghana).
17 Marie-Claire Cordonier Segger and Damilola S Olawuyi (eds), *Sustainable Development Law: Principles, Practices, and Prospects* (2nd edn, Oxford University Press 2025).
18 See n 13 above.
19 Climate Bonds Initiative, Green Bond Principles and Financing Sustainable Infrastructure (2022) www.climatebonds.net/ (viewed 28 December 2025).
20 Public Financial Management Act 2016 (Ghana), Act 921; Environmental Protection Agency Act 1994 (Ghana), Act 490; and Environmental Assessment Regulations 1999 (Ghana), LI 1652.

21 *Ibid.*
22 See n 13 above.
23 *Ibid.*
24 See n 19 above.
25 UN Economic Commission for Europe, Promoting Nature-Based Solutions and Sustainable Infrastructure in the ECE Region: Environmental and Health Co-benefits (2025).
26 UNEP, Capacity Building for Sustainable Development: An Overview of UNEP Environmental Capacity Development Initiatives (December 2002).
27 See n 14 above.

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Strengthening legal frameworks for sustainable infrastructure: balancing economic growth, environmental protection and social equity?

Introduction

The challenge of constructing legal frameworks that promote sustainable infrastructure development while harmonising the objectives of economic growth, environmental protection and social equity represents one of the most complex contemporary issues. As International Court of Justice Vice-President Judge Weeramantry observed in his dissenting opinion in the Gabčíkovo-Nagymaros Project (*Hungary v Slovakia*),[1] sustainable development represents 'more than a mere concept, but a principle with normative value which is crucial for determining how development is to be reconciled with environmental protection'.[2] This principle provides the conceptual foundation upon which contemporary legal frameworks must be constructed.

Sustainable development as a legal principle

The principle of sustainable development, first articulated in the 1987 Brundtland Report[3] and subsequently enshrined in the Rio Declaration on Environment and Development,[4] provides the foundational framework for reconciling competing interests in infrastructure development. Principle 3 of the Rio Declaration explicitly recognises that 'the right to development must be fulfilled so as to equitably meet the developmental and environmental needs of present and future generations'.[5] Sands and Peel characterised sustainable development as encompassing intergenerational equity, intragenerational equity, the precautionary principle, the polluter pays principle, public participation and the integration principle.[6]

The juridical evolution of sustainable development from soft law to hard law obligation is evident in both international and domestic jurisprudence. In *Vellore Citizens Welfare Forum v Union of India*,[7] the Indian Supreme Court declared that sustainable development, the precautionary principle and the 'polluter pays' principle constitute integral components of environmental law, establishing strict liability for hazardous activities.[8] This judicial recognition transforms sustainable development from a hortatory principle to justiciable right, creating enforceable obligations upon state and non-state actors alike.

Integrating comprehensive environmental assessment requirements

Environmental impact assessment (EIA) regimes constitute critical procedural mechanisms for ensuring that environmental considerations inform infrastructure decisions from project inception. The European Union's EIA Directive[9] provides a robust model requiring the assessment of direct and indirect, cumulative, transboundary, short-term, medium-term and long-term effects on biodiversity, population, human health, climate and the interaction between these factors.[10]

However, project-level EIA proves insufficient without strategic environmental assessment (SEA) for policies, plans and programmes. The European SEA Directive[11]

exemplifies this hierarchical approach, requiring environmental assessment of plans and programmes in sectors including energy, transport and spatial planning.[12] The South African case of *Earthlife Africa Johannesburg v Minister of Environmental Affairs*[13] demonstrates progressive judicial interpretation, holding that climate change impacts must be considered in environmental authorisations.[14]

Reforming planning and land use legal frameworks

Planning law represents another critical domain requiring fundamental reform. Traditional planning frameworks often prioritise economic considerations while treating environmental and social factors as constraints rather than co-equal objectives. The German Federal Spatial Planning Act[15] provides an instructive precedent, requiring spatial planning to balance competing demands while giving priority to sustainable spatial development and establishing principles, including resource efficiency, climate protection and preservation of ecosystem services.[16] Legal frameworks should mandate integrative spatial planning approaches that coordinate land use, transportation, energy, water and telecoms infrastructure holistically rather than by sector.

Establishing mandatory sustainable public procurement regimes

Public procurement represents enormous economic leverage that legal systems can harness to drive sustainable infrastructure. The Organisation for Economic Co-operation and Development (OECD) estimates that public procurement accounts for approximately 12 per cent of gross domestic product (GDP) in OECD countries and up to 30 per cent in developing nations.[17] The EU Public Procurement Directives[18] explicitly authorise and encourage the consideration of environmental and social factors throughout procurement processes. However, permissive frameworks prove insufficient; procurement law must move towards mandatory sustainability requirements.[19]

Legal reforms should require contracting authorities to evaluate whole-life costs including carbon emissions, resource consumption, waste generation and social impacts. The Norwegian Public Procurement Act[20] provides a progressive model, requiring environmental considerations in all significant procurements and mandating climate gas accounting for major contracts. Contract performance clauses should include enforceable sustainability obligations with meaningful penalties for non-compliance.

Strengthening environmental liability and compensation regimes

Effective liability regimes provide essential incentives for sustainable infrastructure development by internalising environmental costs. The EU Environmental Liability Directive[21] establishes a framework based on the polluter pays principle, though it contains significant limitations.[22] Legal reform should establish strict liability for infrastructure projects involving inherently hazardous activities. The Indian Supreme Court's articulation of the absolute liability principle in *MC Mehta v Union of India*[23] provides an instructive precedent, holding that enterprises engaged in hazardous industries owe 'an absolute and non-delegable duty to the community to ensure that no harm results to anyone'.[24] Moreover, legal frameworks should extend limitation periods for environmental claims, recognising that harm from infrastructure projects may manifest over extended timeframes, with liability extending throughout infrastructure lifecycles, including decommissioning phases.

Enhancing public participation and access to justice

The Aarhus Convention[25] establishes that sustainable development requires the involvement of all stakeholders. Article 6 requires public participation occurring 'early in an environmental decision-making procedure, that is, when all options are open'.[26] Legal frameworks require strengthening through several mechanisms. First, legislation must mandate early and meaningful consultation at strategic planning stages. The New Zealand Resource Management Act 1991[27] provides a model requiring consultation with affected communities and indigenous peoples from policy formulation through to specific consents. Second, legal frameworks must ensure comprehensive access to information, with Sweden's Environmental Code[28] exemplifying robust transparency.

Third, access to justice provisions require fundamental strengthening. Many jurisdictions impose prohibitive costs or restrictive standing requirements that prevent public-interest environmental litigation. The Philippine Rules of Procedure for Environmental Cases[29] establish liberal standing rules permitting suits by citizens, organisations and representatives of future generations, alongside specialised environmental courts, demonstrating institutional innovation facilitating access to justice.

Integrating social equity and human rights protections

Sustainable infrastructure requires explicit legal protection for social equity and human rights. The United Nations Guiding Principles on Business and Human Rights[30] establish that states must protect against human rights abuses by businesses through effective policies and regulation. Legal frameworks should mandate comprehensive social impact assessments addressing distributional effects, forced displacement, impacts on indigenous peoples, gender dimensions and effects on livelihoods.

Specific legislative protections for indigenous peoples are essential. The UN Declaration on the Rights of Indigenous Peoples[31] establishes requirements for free, prior and informed consent (FPIC) before projects affecting indigenous lands. The Inter-American Court in *Saramaka People v Suriname*[32] held that large-scale projects significantly affecting indigenous territories require FPIC, not merely consultation.[33] Legal frameworks should prohibit forced evictions without due process, adequate compensation and provision of alternative accommodation, with the South African Prevention of Illegal Eviction from and Unlawful Occupation of Land Act[34] exemplifying legislative protection.

Deploying fiscal and economic instruments

Legal frameworks should authorise fiscal instruments promoting sustainable infrastructure through market mechanisms. Carbon pricing mechanisms internalise climate costs and incentivise low-carbon infrastructure, with the EU Emissions Trading System[35] demonstrating large-scale implementation. Legal frameworks should authorise green bonds, with clear standards and verification requirements preventing greenwashing. The EU Green Bond Regulation[36] exemplifies emerging regulation, establishing criteria for environmentally sustainable projects aligned with the EU Taxonomy Regulation.[37] Tax incentives and subsidies require reorientation towards sustainable outcomes, mandating phase-out of fossil fuel subsidies while establishing incentives for renewable energy infrastructure and green infrastructure.

Institutional reform and capacity building

Effective implementation requires institutional capacity and coordination mechanisms. Legal frameworks should establish clear institutional mandates, adequate resources, technical expertise and genuine independence. Independent environmental agencies with enforcement powers, such as the United States Environmental Protection Agency,[38] demonstrate the importance of specialised institutions with regulatory authority independent from development-orientated ministries. Legal frameworks should mandate interagency coordination for infrastructure planning and approval through statutory coordinating bodies with genuine decision-making authority.

Conclusion

Strengthening legal frameworks to promote sustainable infrastructure while balancing economic growth, environmental protection and social equity requires comprehensive, systemic reform transcending traditional regulatory approaches. This necessitates embedding sustainability principles within constitutional and legislative frameworks; enhancing environmental assessment requirements; reforming planning laws; mandating sustainable public procurement; strengthening liability regimes; ensuring meaningful public participation and access to justice; protecting human rights and social equity; deploying fiscal instruments effectively; and establishing robust institutional structures. As Judge Weeramantry stated, the law must recognise that 'the environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn'.[39] Legal frameworks capable of achieving this vision require political will, adequate resources

and sustained commitment to integrating economic, environmental and social dimensions of sustainability.

Notes

1 Gabčíkovo-Nagymaros Project (*Hungary v Slovakia*) [1997] ICJ Rep 7.
2 *Ibid*, Separate Opinion of Vice-President Weeramantry, 88.
3 World Commission on Environment and Development, Our Common Future (Oxford University Press 1987).
4 Rio Declaration on Environment and Development, UN Doc A/CONF.151/26/Rev.1 (Vol I) (12 August 1992).
5 *Ibid*, Principle 3.
6 Philippe Sands and Jacqueline Peel, *Principles of International Environmental Law* (4th edn, Cambridge University Press 2018) 206-217.
7 *Vellore Citizens Welfare Forum v Union of India* (1996) 5 SCC 647.
8 *Ibid*, [10].
9 Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment [2012] OJ L26/1, as amended.
10 *Ibid*, Art 3.
11 Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment [2001] OJ L197/30.
12 *Ibid*, Art 3(2).
13 *Earthlife Africa Johannesburg v Minister of Environmental Affairs and Others* [2017] ZAGPPHC 58.
14 *Ibid* [88]–[91].
15 German Federal Spatial Planning Act (Raumordnungsgesetz) 2008.
16 *Ibid*, s 2.
17 OECD, Government at a Glance 2021 (OECD Publishing 2021) 176.
18 Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement [2014] OJ L94/65.
19 Christopher McCrudden, *Buying Social Justice: Equality, Government Procurement and Legal Change* (Oxford University Press 2007) 405–428.
20 Norwegian Public Procurement Act (Lov om offentlige anskaffelser) 2016.
21 Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability [2004] OJ L143/56.
22 Gerd Winter (ed), *European Environmental Law: A Comparative Perspective* (Dartmouth 1996) 189-192.
23 *MC Mehta v Union of India AIR* 1987 SC 1086.
24 *Ibid* [31].
25 Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (adopted 25 June 1998, entered into force 30 October 2001) 2161 UNTS 447.
26 *Ibid*, Art 6(4).
27 Resource Management Act 1991 (New Zealand).
28 Swedish Environmental Code (Miljöbalken) 1998:808, c 2.
29 Rules of Procedure for Environmental Cases, AM No 09-6-8-SC (Philippines, 13 April 2010).
30 UN Guiding Principles on Business and Human Rights: Implementing the United Nations 'Protect, Respect and Remedy' Framework, UN Doc A/HRC/17/31 (21 March 2011).
31 UN Declaration on the Rights of Indigenous Peoples, UNGA Res 61/295 (13 September 2007).
32 *Saramaka People v Suriname* (Preliminary Objections, Merits, Reparations, and Costs) Inter-American Court of Human Rights Series C No 172 (28 November 2007).
33 *Ibid* [134].
34 Prevention of Illegal Eviction from and Unlawful Occupation of Land Act 19 of 1998 (South Africa).
35 Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading [2003] OJ L275/32, as amended.
36 Proposal for a Regulation of the European Parliament and of the Council on European Green Bonds, COM (2021) 391 final.
37 Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment [2020] OJ L198/13.
38 See the Environmental Protection Agency's statutory authorities under the Clean Air Act, 42 USC ss 7401–7671q. Clean Water Act, 33 USC ss 1251-1387.
39 See n 1 above, Separate Opinion of Vice-President Weeramantry, 91.

Strengthening legal frameworks for sustainable infrastructure: balancing economic growth, environmental protection and social equity

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Introduction

As the deadline for Agenda 2030 rapidly approaches,[1] states' progress in sustainable development continues to inch forward. Such slow movement heightens the urgency for states to accelerate to sustainable practices. This need was recognised during the fifth session of the United Nations Environment Assembly in Nairobi in 2022 where Member States adopted a resolution acknowledging the critical role of infrastructure in achieving environmental sustainability.

'Infrastructure' as a term typically evokes imagery of physical assets and structures, such as buildings and bridges. However, this

characterisation does not fully explain what infrastructure is. Beeferman and Wain define infrastructure as facilities that are important to society.[2] It includes transportation networks, energy systems, water and sanitation facilities as well as amenities such as schools and hospitals.[3] As infrastructure assets are long-lasting and capital-intensive, decisions made today concerning their planning, financing and construction influence economic, environmental and social conditions for decades.[4] Legal frameworks such as laws, regulations, policies, institutions and enforcement systems that guide infrastructure projects can improve the sustainability of infrastructure; yet existing legal frameworks governing infrastructure development have been insufficient in promoting sustainability.

This paper examines how legal frameworks can be strengthened to promote sustainable infrastructure while balancing environmental protection, economic growth and social equity. In doing so, this article argues that sustainable infrastructure is a practical tool for governments to achieve their Sustainable Development Goals (SDGs) while reconciling objectives that are often assumed to be conflicting or mutually exclusive.

The need for 'sustainable infrastructure'

Before addressing how legal frameworks can be strengthened to promote sustainable infrastructure, we answer a critical question: why does infrastructure need to be sustainable? The World Commission on Environment and Development defines sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.[5] The three dimensions of sustainable development – the economy, society and the environment – are closely connected with infrastructure and its development.

First, infrastructure projects are opportunities to foster economic growth. A bridge linking a rural area to urban markets for example can stimulate trade and generate income. By contrast, poor infrastructure can result in economic losses by limiting access to such economic opportunities; or can exacerbate natural disasters such as floods and a reduced quality of life.[6] Infrastructure can also affect employment and job creation. The construction sector accounts for approximately 13 per cent of global gross domestic product (GDP) projected to rise to 14.7 per cent by 2030.[7] Infrastructure can therefore be a tool to lift the estimated nine per cent of the global population primarily in Sub-Saharan Africa out of extreme poverty.[8] Infrastructure can also serve as a catalyst for economic diversification which helps developing countries reduce vulnerability to external shocks. Telecoms and transport systems can improve the ability of a country to provide services and goods at a high quality and affordable cost.[9] This ultimately facilitates innovation and economic resilience.

Second, infrastructure influences natural resource conservation, biodiversity and climate change mitigation. Well-designed infrastructure projects can produce positive environmental impacts, such as mitigating climate change effects or reducing pollution.[10] Conversely, infrastructure can have adverse environmental consequences on the environment, such as deforestation and acid rain, if left unregulated. Infrastructure is responsible for close to 80 per cent of global greenhouse gas emissions, spanning energy, transport, water, waste management sectors and buildings.[11] Last, infrastructure advances social equity and inclusion. A reliable public transport system helps women in rural areas participate in the workforce. Clean water and sanitation facilities reduce maternal mortality and improve overall community health outcomes.[12] Poor infrastructure can also reinforce structural inequalities if it is not equitably distributed or inclusive, for example where workplaces lack accessibility features, such as ramps and elevators, for people with disabilities.

It is undeniable that the condition of both existing and future infrastructure is instrumental, directly and indirectly, to the achievement of all 17 SDGs. As such, there is a critical need for sustainable infrastructure to maximise humanity's development in terms of the environment, society and the economy.

Definitions

This article adopts a definition of sustainable infrastructure adapted from the Asian Development Bank.[13] Sustainable infrastructure is infrastructure that advances economic growth, social equity and environmental protection. Economic growth refers to an increase in the total economic output of a country.[14] This is measured by a year-on-year increase in

GDP. Social equity refers to the fair and just distribution of resources in society.[15] Environmental protection refers to measures taken to safeguard the environment.[16] The core principles of sustainable infrastructure include improving access for poor and marginalised populations to education, health services and basic assets, promoting inclusive economic growth through productivity, job creation and long-term value, and supporting climate-resilient, low-carbon solutions that protect communities and ecosystems.[17] An example of sustainable infrastructure is China's Urumqi Urban Transport Project II, which introduced a Bus Rapid Transit system with modern transport hubs and management systems to reduce traffic congestion, lower emissions and provide affordable, accessible mobility for all residents.

The way forward: how can legal frameworks be strengthened?

To identify ways to strengthen legal frameworks for sustainable infrastructure, we first identify existing international and domestic laws that form the legal framework for sustainable infrastructure. While there is no single treaty focused entirely on sustainable infrastructure, instruments like the UN Framework Convention on Climate Change (UNFCCC) and the Paris Agreement require states to consider sustainability and climate mitigation in their infrastructure planning. Article 3.4 of the UNFCCC provides for sustainable development, requiring that climate policies be integrated with national development programmes so that economic growth and sustainability go hand in hand.[18] Article 2 of the Paris Agreement sets the goal of limiting global temperature rise while linking climate action to sustainable development and poverty reduction.[19] In addition to these treaties, soft law instruments and international standards further guide sustainable infrastructure. The UN Commission for Sustainable Development indicators, the World Bank Sustainable Infrastructure Action Plan and the G7 Ise-Shima Principles offer practical guidance on integrating environmental protection, social inclusion, economic efficiency and good governance into infrastructure planning.[20] Moreover, domestic legal frameworks translate these international and regional commitments into operational laws through planning, land-use and environmental legislation, including mandatory environmental impact assessment (EIA) regulations. Sector-specific laws, such as renewable energy laws, alongside building codes and fiscal incentives, also support sustainable infrastructure development.

Despite existing legal frameworks, poor-quality infrastructure projects remain frequent, especially in developing countries. Projects often harm the environment, displace communities and provide limited social or economic benefits in return. An example is the Karuma Hydroelectric Power Plant in Uganda, which resulted in the displacement of communities in Awoo village and surrounding areas. These problems arose from a lack of adequate infrastructure investment, challenges in managing private sector participation, weak integration of environmental and social considerations, and poor enforcement and compliance.[21] To strengthen legal frameworks, governments and policy-makers must address these challenges. This article proposes the following reforms: (1) governments should leverage and regulate public-private partnerships (PPPs) in accordance with internationally recognised best practices for sustainability; (2) governments should mandate environment and social impact assessments; and (3) governments should strengthen enforcement mechanisms to ensure compliance with existing laws.

Leveraging PPPs

By 2040, global infrastructure needs are projected to reach US$106 trillion, leaving an estimated gap of US$15 trillion that national budgets alone cannot fill, especially for high-quality, sustainable infrastructure.[22] Achieving net zero emissions by 2050 will require US$139 trillion in global infrastructure investment, making private capital essential. PPPs offer a practical solution by allowing governments to leverage private finance, technical expertise and innovation while maintaining oversight.[23] Existing PPPs, however, do not sufficiently advance sustainable infrastructure and institutional investors allocate only a little of their portfolios to infrastructure. Private capital remains heavily concentrated in high-income countries, while investments in low-income and middle-income countries remain relatively minimal. Closing this gap is critical as states work to meet global net-zero goals.[24]

This lack of investment is a result of

a lack of transparency and consistency. Emerging economies, for example, lack a consistent definition for 'sustainable infrastructure', exposing investors to concerns of greenwashing and broader environmental, social and regulatory concerns.[25] Governments can build investor confidence by establishing consistent definitions and metrics for sustainable infrastructure. As such, governments must adopt laws that leverage PPPs in line with international best practices. For example, the UN Economic Commission for Europe Standard on PPPs for the SDGs provides guidance on structuring PPPs to achieve these objectives.[26] It sets out rules for project selection, appraisal, procurement, risk allocation and stakeholder engagement, promoting outcomes such as improved access to essential services, reduced social inequality, environmental responsibility, economic efficiency and replicability of successful projects. When properly structured and regulated, PPPs can attract investment for infrastructure, create jobs and contribute meaningfully to long-term sustainable development and the achievement of the UN SDGs. An example of this is the Philippines' Build-Operate-Transfer (BOT) Law, which allows PPPs to develop infrastructure projects that meet environmental standards, undergo environmental impact assessments (EIAs) and include provisions to benefit local communities.[27]

Mandatory environment and social impact assessments

Governments should mandate comprehensive environmental and social impact assessments (ESIAs) for all major infrastructure projects to ensure their sustainability. These assessments are widely recognised as essential tools for understanding and managing the full range of impacts that infrastructure can have on people, communities, and ecosystems.[28] ESIAs go beyond traditional EIAs by systematically analysing both environmental effects (on air, water, soil, biodiversity and climate) and social effects (on livelihoods, health, cultural heritage, displacement and community wellbeing) throughout the life cycle of a project, from planning through construction, operation and decommissioning.[29] Moreover, ESIAs should include social inclusion clauses mandating developers to involve indigenous peoples and social minorities, such as women and disabled people, in the infrastructure development process. International guidance notes that ESIAs should be undertaken through a formal, staged process that includes screening, scoping, baseline studies, impact analysis, mitigation and monitoring plans, and public consultation to ensure that both positive and negative impacts are identified early and transparently before project approval.[30] This would ensure that infrastructure projects are carried out only if they have a positive impact on the environment and society.

Improve enforcement and compliance

Laws and policies alone are insufficient without effective enforcement. Strong enforcement and compliance mechanisms are critical to ensure that environmental and social laws governing infrastructure projects achieve their intended impact. Governments should impose stricter penalties for non-compliance and foster transparency by mandating public disclosure of ESIA assessments, PPP contracts and monitoring reports. Governments should also promote public interest litigation to strengthen accountability. Several cases have emerged around the world in which individuals or non-governmental organisations (NGOs) have pursued lawsuits and class actions against corporations and bodies that were endangering the environment. For example, in Ghana, the case of *CEPIL v EPA*,[31] where an NGO successfully challenged the Environmental Protection Agency (EPA) and its approval of a mining project that did not comply with the procedures required by the EIA regulation. Such litigation can be encouraged by lowering financial barriers and expanding legal standing to allow individuals and directly affected persons to take action. This would allow individuals and NGOs to hold developers accountable if they fail to meet legal sustainability requirements. It would also allow them to hold governmental authorities accountable if they fail to enforce compliance. This approach would strengthen existing legal frameworks to promote sustainable infrastructure.

Sustainable infrastructure: the balancing tool

The objectives of environmental protection, economic growth and social equity are often

perceived as conflicting, with progress in one area assumed to come at the expense of the others. Environmental degradation is frequently seen as an inevitable consequence of economic growth, while social equity is considered unattainable in a system that relies on exploitation or uneven distribution of resources. However, the proposed reforms promoting sustainable infrastructure demonstrate that these objectives need not be mutually exclusive. Economically, sustainable infrastructure can drive job creation, boost productivity and strengthen both local and national economies. Socially, it can reduce inequalities and promote gender equality, ensuring that the benefits of development are shared more equitably across society. Environmentally, sustainable infrastructure is crucial for reducing greenhouse gas emissions and protecting biodiversity, safeguarding the planet for future generations. Moreover, these benefits reinforce one another. For example, economic benefits like jobs can improve social equity; social improvements like better access to services can increase productivity; and environmental benefits can secure natural resources for long-term economic growth. By integrating economic, social and environmental considerations, sustainable infrastructure is a viable tool to reconcile objectives that are often viewed as trade-offs into a coherent development strategy.

Challenges to implementation and solutions

In implementing these reforms, governments are likely to face certain challenges. This section identifies such challenges and proposes solutions.

One challenge is the lack of institutional capacity and technical expertise within regulatory agencies, which limits the effective implementation of complex reforms such as mandatory ESIAs and PPP standards aligned with international best practices. Another challenge is weak stakeholder engagement and low public awareness, which can lead to resistance or non-compliance, reducing the overall impact of legal reforms. To overcome these challenges, this article recommends that governments invest in capacity-building for regulators, including specialised training on ESIAs, sustainability assessments and PPP legal standards. Funding for such initiatives in developing nations can be secured through international cooperation and support from international financial institutions, such as the Green Climate Fund. Additionally, governments must undertake inclusive stakeholder engagement and public awareness campaigns to help communities, civil society, and investors to understand their rights and responsibilities. By addressing these challenges, governments can effectively implement the proposed reforms to strengthen their legal frameworks.

Conclusion

This article has proposed ways in which legal frameworks can be strengthened to promote sustainable infrastructure while balancing economic growth, environmental protection and social equity. It recommends that governments leverage and regulate PPPs in accordance with internationally recognised best practices for sustainability, mandate comprehensive ESIAs, and strengthen enforcement mechanisms through stricter penalties and public interest litigation to ensure compliance with existing laws. These reforms should be implemented alongside targeted capacity-building initiatives for public institutions, regulatory agencies and local stakeholders to ensure effective implementation. These measures demonstrate that sustainable infrastructure can be a tool for governments to reconcile and meet their environmental, social and economic development needs.

Notes

1 Agenda 30 refers to the United Nations Sustainable Development Goals. See United Nations General Assembly, Our World: the 2030 Agenda for Sustainable Development (UN Doc A/RES/70/1, 2015).
2 Larry Beeferman and Allan Wain, 'Infrastructure: Defining Matters' [2016] SSRN Electronic Journal 15 https://ssrn.com/abstract=2714308 (viewed 26 December 2026).
3 The Economist Intelligence Unit Limited, 'The Critical Role of Infrastructure for the Sustainable Development Goals' (supported by UNOPS, 2019), at https://content.unops.org/publications/The-critical-role-of-infrastructure-for-the-SDGs_EN.pdf (viewed 11 December 2025).
4 *Ibid.*
5 UN World Commission on Environment and Development (ed), *Our Common Future* (Oxford University Press 1987).
6 Muhammad Tariq Iqbal Khan, et al., 'Do Natural Disasters Affect Economic Growth? The Role of Human Capital, Foreign Direct Investment, and Infrastructure Dynamics' (2023) 9(1) Heliyon e12911.
7 UK Green Cities and Infrastructure, 'Construction sector employment in low-income countries: size of the sector' (29 August 2018) at https://ukgreencitiesandinfrastructure.org/resource/construction-sector-employment-low-income-countries-size/ (viewed 26 December 2025).

8 World Bank, 'Poverty, Prosperity, and Planet Report 2024: Pathways Out of the Polycrisis' (2024), at www.worldbank.org/en/publication/poverty-prosperity-and-planet (viewed 26 December 2026).
9 UN Conference on Trade and Development (UNCTAD), 'Leveraging Services, Including Infrastructure Services, to Achieve the Sustainable Development Goals,' note by the UNCTAD Secretariat (25 February 2020) at https://unctad.org/system/files/official-document/c1mem4d23_en.pdf (viewed 11 December 2025).
10 Evaluation Cooperation Group of the International Financial Institutions, 'The Nexus Between Infrastructure and Environment, Evaluation Brief 5' (Independent Evaluation Group, June 2007), p 1, at www.cbd.int/financial/doc/infrastructure_environment.pdf (viewed 26 December 2025).
11 See n 3 above, pp 1 and 5.
12 *Ibid*, 5.
13 Srinivas Yanamandra, 'Sustainable Infrastructure: An Overview – Placing Infrastructure in the Context of Sustainable Development' (University of Cambridge Institute for Sustainability Leadership 2025) p 5.
14 Doina Drăgoi, 'Economic Growth versus Economic Development' (2020) 4(1) Atlantic Review of Economics 34.
15 Mary E Guy and Sean A McCandless, 'Social Equity: Its Legacy, Its Promise' (2012) 72 Public Administration Review.
16 Souvik Sur, 'Environmental Protection and Sustainable Development' (2022) 11(3) International Journal of Food and Nutritional Sciences 649.
17 See n 13 above.
18 UNFCCC (adopted 9 May 1992, entered into force 21 March 1994) UNTS 1771, Art 3.
19 Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016) 3156 UNTS 54113, Art 2.
20 Office of the UN High Commissioner for Human Rights and Heinrich-Böll-Stiftung, The Other Infrastructure Gap: Sustainability, Human Rights and Environmental Perspectives (2018) HR/PUB/18/5, ISBN 978-3-86928-185-8.
21 *Ibid*, 14.
22 McKinsey & Company, The Infrastructure Moment: Investing in the Expanding Foundations of Modern Society (September 2025), p 2 www.mckinsey.com/~/media/mckinsey/industries/infrastructure/our%20insights/the%20infrastructure%20moment/the-infrastructure-moment-investing-in-the-expanding-foundations-of-modern-society.pdf accessed 11 December 2026.
23 UNCTAD, International Investment in Sustainable Infrastructure: The Role of Public-Private Partnerships (UNCTAD/DIAE/2025/6, advance copy, 14 Nov 2025) pp 7 and 10 https://unctad.org/system/files/official-document/diae2025d6_en.pdf (viewed 11 December 2025).
24 'Making sustainable infrastructure a unique asset class is key to the net zero transition' (Environmental Finance, 24 September 2024) www.environmental-finance.com/content/market-insight/making-sustainable-infrastructure-a-unique-asset-class-is-key-to-the-net-zero-transition.html (viewed 27 December 2025).
25 *Ibid.*
26 UN Economic Commission for Europe, Standard on Public-Private Partnerships (PPPs) for the Sustainable Development Goals (2022).
27 See n 23 above.
28 C40 Cities Finance Facility, Embedding Equity and Inclusivity in Sustainable Infrastructure: A Guidance Note for Cities (2023).
29 Inter-American Development Bank, 'What is Sustainable Infrastructure? A Framework to Guide Sustainability Across the Project Cycle', p 10 (IDB Invest 2018).
30 *Ibid.*
31 *Centre for Public Interest Law v Environmental Protection Agency & Ors* (High Court, Accra, Suit No A(EN)1/2005, judgment 27 March 2009).

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How can legal frameworks be strengthened to promote sustainable infrastructure, while balancing economic growth, environmental protection and social equity?

Introduction

The industrial revolution, technological advancement and human invention have been both a blessing and a curse. While they have spurred humanity forward by making work more efficient, too often they also leave us with environmental and social degradation. Following technological advancement, we have to grapple with the difficulties of creating infrastructure that meets the triple bottom line criteria. This means that infrastructure must be planned, designed and operated to achieve economic development goals, while minimising environmental harm and ensuring social inclusion.

Sustainable infrastructure has been defined by stakeholders in different ways, the underlying tenets that sustainable infrastructure should be: (1) designed to achieve one or more of the Sustainable Development Goals (SDGs); (2)

developed with clear social and economic environmental objectives in mind, and commissioned with an institutional mechanism to manage or mitigate the adverse impacts of the project by monitoring the triple bottom line criteria throughout the course of the project; and (3) financially sustainable in that it is financed through a robust structure that achieves affordability for consumers without overburdening the government with long-term debt.[1]

This essay examines how legal tools, including international treaties, national statutes and regulations, can help in the design and implementation of sustainable infrastructure, and how they must reconcile trade-offs between growth, the environment and equity.

The sustainable development dilemma: how do states engage in trade-offs in the quest to implement sustainable infrastructure?

The difficulty in implementing sustainable infrastructure arises from the first primary problem of trade-offs that states must make. This then creates a secondary problem of cost and enforcement gaps due to lack of political will. The design and construction of infrastructure have the potential to either promote sustainable development or to detract from it. For example, most infrastructure provides essential services to people, such as energy, and water. In addition, through infrastructure, people have access to services such as healthcare and education, and access to markets through transport and telecoms.

On the flip side, however, there are adverse social and environmental impacts of infrastructure that are overlooked. The construction of infrastructure like housing, for example, without considering factors like rent affordability, potentially displaces people. This can creates ghost towns, given that inhabitants of the towns become incapable of affording housing in those areas. Similarly, industrialisation may, on the one hand, provide jobs and increase production in a country, but, on the other, is responsible for deteriorating air quality and greenhouse gas emissions. The construction of transport infrastructure, such as roads, railways, airports, ports and inland waterways, can destroy and fragment natural ecosystems, and overexploit natural resources.[2]

These harms have the greatest impact on the middle-class and lower-class populations in society, who have no insulation from the effects of unsustainable infrastructure. States must then recognise the primary trade-off that must be made: short-term and cheaper temporary solutions to problems are inherently more harmful than well-planned, long-term sustainable national infrastructure systems informed by SDGs, which may be, at the onset, more expensive to implement.

This introduces a secondary problem of cost. As at 2017, global capital investment was approximately US$2.3 trillion per year.[3] By 2040, an estimated US$94 trillion of capital investment will be required for both new and replacement infrastructure. This cost is more than the value of the world's existing infrastructure (approximately US$50 trillion).[4] However, places that are most in need of sustainable infrastructure are plagued with weak governance and the low purchasing power of citizens. These ultimately reduce investor confidence and limit investment in those places.

Beyond this, the design of sustainable infrastructure may determine the extent to which sustainability outcomes are reached, if at all. As most outcomes can only be achieved through complementary sets of policies, often a single modification will be insufficient to achieve sustainable development outcomes. Infrastructure therefore can encourage the economic and social recovery of deprived post-industrial regions, although its effectiveness is limited unless accompanied by complementary policies that address unemployment, education, housing and related social challenges.[5] This ultimately creates extra cost for states, which often engage in infrastructure projects as isolated interventions rather than holistic policies.

Legal frameworks: international frameworks and the implementation of national policies

Current legal frameworks do little to solve these problems. These include laws, regulations, policies and governance mechanisms that enforce or promote sustainable practices in infrastructure development. As development issues have gained recognition as international concerns and, in some cases, an extension of human and people's rights, international policies and treaties form the foundation for national laws seeking to implement sustainable development. For this reason, an assessment of the legal frameworks and their flaws will

be done in two ways: first, considering the international landscape, and second, based on the national policies of states, using specific examples as case studies.

International legal frameworks for sustainable infrastructure

Global policy frameworks are mostly aspirational or procedural rather than binding. For example, the 2030 Agenda for Sustainable Development[6] emphasises integrated goals, and calls for sustained, inclusive and sustainable economic growth. None however are binding targets. Moreover, the targets cannot exist in a set hierarchy, meaning that states must balance their priorities based on their specific contexts. States therefore pick and choose which SDGs to prioritise, and without penalty for lapses. This is also true for the Good Practice Principles for Sustainable Infrastructure. The best efforts of the international community to enforce these principles come through UN Environment Assembly (UNEA) resolutions, also non-binding. Even international treaties that are considered legally binding have weak enforcement mechanisms. The Paris Agreement, for example, is a global climate treaty. While the commitments are considered binding, parties have discretion to submit national climate plans, without penalties or sanctions for countries that fail to meet their targets. The Paris Agreement Implementation and Compliance Committee exists as a non-punitive body. It would seem therefore, that international agreements and treaties have no strict enforcement mechanisms. This ultimately translates into uneven national implementation.

National statutes and regulatory frameworks

National statutes and regulations are created to operationalise sustainable infrastructure. Most countries have environmental and planning laws that apply to projects. The United States, for example, requires its federal agencies to conduct environmental impact statements under the National Environmental Policy Act (NEPA). In the case of *Seven County Infrastructure Coalition v Eagle County*, the US Supreme Court confirmed that NEPA is purely procedural: agencies must disclose environmental effects, but NEPA does not mandate particular results.[7] The Court's decision illustrates the recurring theme of national trade-offs. Infrastructure approvals are expedited at the cost of potential environmental harm. In some instances, social harms are neglected. In Kenya, for example, the country's Energy Act 2019 focuses on the promotion of renewable energy. Under this framework, the Lake Turkana Wind Farm, Africa's largest, came online in 2019. While it dramatically cut Kenya's fossil fuel energy generation, local pastoralist communities were not properly consulted, creating concerns about human rights and land tenure violations.[8] Thus, in this case, while the primary focus was environmental protection, social impacts were heavily ignored.

In sum, both international and national frameworks have significant limitations. At the global level, instruments lack enforceable mechanisms. Thus, states have discretion over prioritisation and implementation. At the national level, statutes and regulatory regimes focus on procedural compliance and overlook social impacts. These collectively result in outcomes that are uneven among states and context-dependent, and it is for this reason that we need a coherent framework.

Proposed solutions: strengthening legal frameworks

Punitive enforcement mechanisms

International legal frameworks operate largely using a system of 'naming and shaming'. For these frameworks and policies to have any effect, they must be punitive. This may come in the form of monetary penalties for violating states, performance-based financing or any other sanctions that may be deemed appropriate. However, with this proposed solution emerges some preliminary concerns. First, what would an enforcement body look like and how will a violation be determined? Second, how do we address state concerns of sovereignty?

Enforcement bodies under international legal frameworks or organisations are not without flaws. Consider the Dispute Settlement System under the World Trade Organization (WTO), an enforcement body the structures and procedures of which may inform the establishment of this proposed body. Under the Dispute Settlement System, states can submit claims of violations of trade laws by other states, and because jurisdiction is compulsory, members cannot opt out of the dispute settlement process. However,

even within this system, because important decisions are made by positive consensus, Member States in an attempt to promote their state interests have blocked consensus building and stalled progress.

That notwithstanding, there are clear positive impacts that can still be derived. First is the creation of a body of law from litigation and dispute settlement that clearly spells out the scope of state obligations and establishes a much-needed guideline for states. Second, structures like this reinforce the narrative that issues of sustainable infrastructure should be seen as a global concern, and states must act as partners in achieving collective goals.

The next concern that comes with establishing punitive measures is state pull-out over claims of sovereignty. Most of the time, for governments to gain some public legitimacy for pulling out of such agreements, they make the punitive implications of these agreements a political issue. In most cases, pressure groups are created to question a state's decision to pull out and to force states to prioritise sustainable infrastructure. For example, in 2017, when US President Donald Trump pulled out of the Paris Agreement on the grounds of protecting American economic interests and sovereignty, several groups and coalitions emerged to maintain momentum on climate action. Notably, the 'We Are Still In' Coalition, 'America's Pledge' and other environmental non-governmental organisations (NGOs) mobilised local communities to uphold the Paris Agreement's goals domestically. Thus, even though international frameworks try to preserve state participation on a large scale, the threat of pull-out by states in this way is not net-negative. In the worst-case scenario, when states take such actions, civic conversations that would otherwise not have been had are started, albeit muddied by political conversations. This is extremely important because it makes issues such as climate change, equitable green transition and infrastructure development, which would otherwise have not been considered immediate concerns, voting issues.

Model legislation for states

The United Nations Commission on International Trade Law (UNCITRAL) Model Law is an example of model legislation created by an international organisation that gives states guidelines for the creation of national laws. Two specific problems will be addressed with this solution. First, a model law will address the disparity in the priorities of states and development standards. Second, the model law, if it properly considers the trade-offs that states may encounter and how to properly deal with those trade-offs, would give states some direction when important development decisions need to be made. To achieve this, the model law must require that projects: (1) be designed and implemented with the objective of contributing, in the long term to the achievement of one or more of the SDGs;[9] (2) be planned and commissioned pursuant to clearly defined social, economic and environmental objectives, and be supported by structural mechanisms that monitor projects to ensure that they continue to achieve outlined objectives;[10] and (3) be financially sustainable and ensure affordability for end-users without creating fiscal burdens for the state.[11]

Criminalisation of violations of sustainable development laws

Most national sustainable development laws mirror international laws. They are usually procedural and do not create criminal liabilities unless violation of those laws can be linked to another crime. States must enact laws that make it criminal to engage in projects that do not practically implement sustainable infrastructure. Even in situations where projects are state backed, laws should exist that make government officials that sign off on such projects criminally liable. Obviously, criminalisation in this way may come at the cost of immediate investment, but a proper approach would be to implement these laws in phases across various sectors over a period of time. In this way, states would have ample time to deal with the shocks of investor pull-out.

Conclusion

Existing legal frameworks suffer from one flaw: they only operate as aspirational guidelines. The result of this is that enforceable legal obligations do not exist for states nor do states implement these policies domestically in a way that mandates compliance. The problem is not oblivion regarding the problems that exist nor is it a dearth of solutions. If sustainable infrastructure should get implemented successfully, it will depend on the ability of the international community of states to create legal frameworks that provide

direction for states in arriving at practical outcomes while ensuring that states do not evade accountability.

Notes

1 Srinivas Yanamandra, *Sustainable Infrastructure: An Overview – Placing Infrastructure in the Context Of Sustainable Development* (University of Cambridge Institute for Sustainability Leadership 2020), www.cisl.cam.ac.uk/system/files/documents/sustainable-infrastructure-an-overview.pdf (viewed 14 December 2025).
2 Susan S Clark, et al., 'A Capabilities Approach to the Prioritization of Critical Infrastructure' (2018) 38 Environmental Systems and Decisions 339-352.
3 Global Infrastructure Hub and Oxford Economics, 'Global Infrastructure Outlook: Infrastructure Investment Needs – 50 Countries, 7 Sectors to 2040' (2017).
4 *Ibid.*
5 Scott Thacker, et al., 'Infrastructure for Sustainable Development' (2019) 2(4) Nature Sustainability 324-31 https://doi.org/10.1038/s41893-019-0256-8 (viewed 24 April 2026).
6 United Nations General Assembly (UNGA) Res 70/1, Transforming Our World: the 2030 Agenda for Sustainable Development, UN Doc A/Res/70/1 (25 September 2015).
7 *Seven County Infrastructure Coalition v Eagle County* 605 US 168 (2025) (US).
8 Nina Simberg-Koulumies, 'Just Sustainabilities: Lessons from the Lake Turkana Wind Power Project in Kenya' (2024) 29(1) Local Environment https://doi.org/10.1080/13549839.2023.2249497 (viewed 24 April 2026).
9 See n 1 above, which provides the requirements adopted.
10 *Ibid.*
11 *Ibid.*

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How can legal frameworks be strengthened to promote sustainable infrastructure while balancing economic growth, environmental protection and social equity?

Introduction

Sustainable infrastructure is framed as an engineering or financial challenge, reducible to questions of technology, capital or efficiency.[1] This framing is incomplete. Ultimately, infrastructure is a governance project. It reflects how societies allocate resources, distribute risks and benefits, and imagine their collective future.[2] Roads, energy systems, water networks and cities are not neutral assets: they are long-term legal commitments that lock in patterns of economic activity, environmental impacts and social inclusion for decades.[3] This is acknowledged in the United Nations 2030 Agenda for Sustainable Development[4] which frames infrastructure as integrating economic growth, environmental protection and social inclusion. It rejects development that sacrifices environmental integrity or social equity and calls for strong legal frameworks to manage long-term trade-offs. Sustainable infrastructure therefore depends on law that balances interests, not just on building assets.

At the heart of this challenge lies the triple bottom line of sustainable development: economic viability, environmental integrity and social equity.[5] These pillars are interdependent and non-negotiable.[6] Economic growth that degrades ecosystems undermines its own material foundations while environmental protection that ignores social distribution risks deepening inequality and political resistance.[7] The 1987 Brundtland Commission notably articulated sustainable development as meeting present needs without compromising future generations,[8] a principle later recognised by courts as requiring integration rather than prioritisation.

Despite this normative clarity, existing legal frameworks governing infrastructure remain reactive and largely isolated from each other.[9] Environmental law, investment law, land law, procurement rules and social safeguards often operate in parallel rather than in concert.[10] This fragmentation privileges short-term economic calculus, typically measured through immediate cost-benefit analysis, while externalising long-term environmental degradation and social displacement.[11] Large-scale infrastructure

projects illustrate this tension clearly. In addition, the regulatory uncertainty surrounding environmental permitting has exposed how weakly coordinated legal regimes can provoke conflict between investment protection and environmental governance.[12] More recently, disputes over energy and transport infrastructure across Europe and Africa demonstrate how inadequate legal integration fuels social opposition, delays and legitimacy crises rather than sustainable growth.

Judicial and scholarly opinion increasingly recognises that law must evolve from a peripheral constraint into a constitutive framework for sustainable development. The Colombian Constitutional Court held that environmental governance must account for the rights of future generations, explicitly linking infrastructure-related deforestation to constitutional obligations.[13] Scholars such as Duncan Kennedy and Joseph Stiglitz have similarly argued that legal structures shape market outcomes and distributive justice rather than merely correcting market failures.[14] Law, in this sense, is not reactive but productive.

This essay advances the thesis that promoting sustainable infrastructure requires a fundamental restructuring of legal frameworks into proactive, integrated systems. It argues that strengthening such frameworks depends on four interlocking strategies: mandating integrated economic, environmental and social analysis; leveraging procurement and finance law as tools of transformation; embedding spatial and procedural justice into infrastructure decision-making; and institutionalising adaptability to respond to scientific, economic and social change. Only by reimagining law as a central catalyst, rather than a peripheral regulator, can sustainable infrastructure genuinely balance economic growth, environmental protection and social equity.

Why balance matters?

The limits of single-pillar approaches

Sustainable infrastructure law fails when it treats economic growth, environmental protection and social equity as separable objectives. In reality, these pillars are legally and functionally interdependent. A framework that prioritises one while marginalising the others produces infrastructure that is economically fragile, environmentally destructive and socially contested.

Economic growth depends on environmental resilience and social stability

Conventional infrastructure policy often assumes that economic growth can be maximised independently of environmental and social concerns. This assumption is legally and empirically flawed. Climate-induced infrastructure failure illustrates the point. Roads, dams and energy systems that are not designed for climate resilience expose states to massive capital loss.[15] The World Bank estimates that climate-related infrastructure damage already costs billions annually, undermining long-term growth rather than supporting it.[16] Courts have increasingly recognised this link. In *Urgenda Foundation v State of the Netherlands*, the Dutch Supreme Court held that failure to address climate risks violates the state's duty of care, precisely because environmental harm threatens economic and social wellbeing.[17] The judgment confirms that economic policy detached from environmental protection is legally indefensible in an era of climate volatility.

Environmental protection as investment rather than cost

Environmental regulation is framed as an obstacle to development.[18] This view ignores the concept of natural capital, now widely accepted in law and economics.[19] Ecosystems provide legally relevant services, such as water regulation, climate stability and public health protection. Infrastructure that degrades these systems generates hidden costs transferred to future generations.[20] Similarly, the European Union Environmental Impact Assessment Directive embeds environmental reviews into economic decision-making, recognising prevention as cheaper and more effective than remediation.[21] Scholars such as Stiglitz argue that ignoring environmental externalities produces distorted markets and inefficient growth.[22] Law, therefore, must internalise environmental costs to protect both ecological and economic systems.

Social equity as a condition for legitimacy and durability

Social equity is not merely a moral concern; it is a legal and operational necessity. Infrastructure that displaces communities, ignores participation or concentrates benefits among elites faces resistance, litigation and instability. Major dam projects demonstrate that development pursued without proper consultation and resettlement leads to prolonged legal disputes and inefficiency.[23] Courts have made clear that rehabilitation and respect for indigenous and community rights are binding legal obligations.[24] These cases show that exclusion creates legal vulnerability and long-term economic loss.

What is going wrong? Weaknesses in existing legal frameworks

Despite the growing recognition of sustainable development, many legal systems continue to regulate infrastructure through fragmented and outdated approaches. Three systemic weaknesses explain why existing frameworks often fail to deliver balanced and sustainable outcomes.

The first weakness is regulatory fragmentation and sequential assessments: namely that a central problem lies in separated regulatory structures where environmental, planning and fiscal laws operate independently.[25] In many jurisdictions, environmental impact assessments (EIAs) are conducted as procedural steps after key economic and political decisions have already been made. As a result, assessments become formal compliance exercises rather than tools for integrated decision-making.[26] Courts have criticised this approach. The United Kingdom Supreme Court held that conducting environmental assessments after a project was effectively approved undermined the purpose of EU environmental law.[27] The case confirms that late-stage assessments promote proceduralism rather than meaningful evaluation. Scholars argue that this sequential model reflects a legal misconception that environmental and social considerations are external constraints rather than core determinants of project viability.[28] Without integration at the planning stage, law legitimises unsustainable outcomes under the guise of procedural legality.

The second weakness is perverse incentives and temporal mismatch in procurement and finance, that is, the misalignment between legal incentives and long-term sustainability. Procurement laws frequently prioritise the lowest initial cost, while public budgeting operates on short electoral and fiscal cycles.[29] This discourages investment in infrastructure that is more expensive upfront but cheaper, safer and more equitable over its lifetime.[30] The consequences are evident in repeated infrastructure failures caused by underinvestment in resilience. The collapse of public infrastructure following extreme weather events has exposed the false economy of short-term cost minimisation. The World Bank has shown that resilience investments yield significantly higher long-term returns, yet procurement laws often fail to reflect this reality.[31] EU law has begun to address this mismatch. The EU Public Procurement Directives allow contracting authorities to use 'most economically advantageous tender' criteria, including life-cycle costing.[32] However, where such tools are discretionary rather than mandatory, short-termism continues to dominate.

The third weakness is deficient participation and limited access to justice, that is, the marginalisation of public participation and justice mechanisms. Public consultation often occurs late in the decision-making process, after core project features are fixed.[33] This reduces participation to a symbolic exercise rather than a meaningful legal right. International law recognises this failure. The Aarhus Convention establishes rights to access information, participate in environmental decision-making and access justice.[34] Courts have reinforced these principles. In *Oposa v Factoran*, the Philippine Supreme Court allowed citizens, including future generations, to challenge environmentally harmful policies, emphasising that participation and standing are essential to accountability.[35] Scholars such as Amartya Sen argue that exclusion from decision-making undermines both justice and development effectiveness.[36] Infrastructure imposed without consent generates resistance, litigation and long-term instability.

Hence, regulatory fragmentation, short-term incentives, and weak participation mechanisms produce infrastructure that is legally compliant but substantively unsustainable. These failures are not accidental; they are embedded in how law structures decision-making. Strengthening legal frameworks therefore requires systemic reform, not marginal adjustment.

How can legal frameworks be strengthened to promote sustainable infrastructure while balancing the three pillars?

If sustainable infrastructure is to balance economic growth, environmental protection and social equity, law must move beyond fragmented regulation and actively structure decision-making. Strengthening legal frameworks therefore requires tools that integrate analysis, reshape incentives, embed justice and ensure adaptability over time.

Legislating holistic analysis by changing from fragmented licensure to integrated governance

A first reform shall be to replace fragmented environmental and social impact assessments with a unified sustainability impact assessment (USIA). Unlike traditional EIAs, which often focus narrowly on mitigation, a USIA would legally require project proponents to demonstrate optimisation across all three pillars from the earliest planning stage. Comparative practice supports this approach. EU environmental law already requires assessment before development consent to ensure sustainability concerns shape decisions, not merely validate them retrospectively.[37] More advanced jurisdictions have gone further by introducing 'net-gain' obligations, particularly in biodiversity law, shifting legal logic from damage control to positive contribution.[38] Embedding a presumption in favour of nature-based solutions would internalise long-term environmental and economic benefits, while independent oversight bodies would prevent procedural dilution.

Leveraging public spending by using procurement and finance as catalytic tools

Law also shapes sustainability through public spending. Traditional procurement regimes prioritising the lowest upfront cost systematically undermine life-cycle efficiency and social value. Strengthening legal frameworks therefore requires a mandatory life-cycle cost assessment (LCA) and sustainability-linked procurement criteria for major infrastructure. EU procurement law already permits contracting authorities to select tenders based on the most economically advantageous offer, including life-cycle costs.[39] However, where this remains discretionary, short-termism persists. Making an LCA mandatory and embedding equity and sustainability clauses in public-private partnership (PPP) contracts would realign private incentives with public goals. At the financial level, the EU Sustainable Finance Taxonomy and Green Bond Standard demonstrate how law can define sustainability and channel capital accordingly, reducing regulatory uncertainty while supporting long-term growth.[40] This shows that sustainability-orientated finance is not anti-growth, but growth-directing.

Locking in fairness using spatial and procedural justice

Legal frameworks must also prevent infrastructure-led inequality. Strengthening land-use and planning laws through inclusive zoning, particularly around transit corridors, ensures access to infrastructure benefits rather than displacement, and this indicates anchoring equity. Comparative urban practice shows that Community Benefit Agreements and Community Land Trusts, when legally recognised, can secure affordable housing and local employment alongside development.[41] Procedurally, equity depends on access to justice. Courts across jurisdictions have recognised that narrow standing rules weaken accountability. Expanding *locus standi* for sustainability harms and establishing independent infrastructure ombudspersons would convert participation from symbolism into enforceable legal protection.[42]

Engineering for the future that is adaptive and circular infrastructure

Finally, sustainability requires adaptability. Legal frameworks should mandate climate resilience stress-tests as conditions for operating licences, coupled with enforceable adaptation plans. The Netherlands' Delta Programme provides a model, legally requiring the periodic reassessment of infrastructure in light of evolving climate risks.[43] At the material level, right-to-repair and material passport regulations embed circular economy principles into construction law, reducing waste, lowering long-term costs and supporting intergenerational equity.

Navigating implementation

Healthy legal frameworks are a necessary but insufficient condition for sustainable infrastructure. Implementation failure often arises not from legal gaps, but from political resistance, institutional capacity constraints and weak enforcement cultures. Bridging the divide between law on the books and law in action therefore requires strategies that explicitly engage political economy, administrative competence and iterative governance.

Strategy one: advocate for just transition frameworks

A central barrier to implementation is distributional conflict. Sustainability-orientated infrastructure reforms often disrupt entrenched economic interests and labour patterns, creating resistance that undermines enforcement. Legal frameworks must therefore incorporate just transition principles, ensuring that the costs and benefits of transformation are fairly allocated. At the global level, the concept of just transition has gained legal and normative recognition. The Paris Agreement explicitly acknowledges the imperatives of a just transition of the workforce in climate action, signalling that environmental regulation cannot be divorced from social stability.[44] Also, the International Labour Organization (ILO) Guidelines for a Just Transition provide a legal-policy framework linking environmental sustainability with labour protection and social dialogue.[45] Embedding these principles into domestic infrastructure and procurement laws can help build political coalitions, reduce backlash and enhance compliance by aligning sustainability with employment security and social protection.

Strategy two: emphasise the need for capacity building in the judiciary and public institutions

Even well-designed integrated laws fail where institutions lack the capacity to interpret and apply them. Unified sustainability assessments, life-cycle costing and resilience obligations demand technical, economic and environmental literacy that many regulatory agencies and courts currently lack. UN frameworks consistently emphasise capacity-building as a legal obligation rather than a discretionary add-on. SDG 16 highlights the need for effective, accountable institutions, while SDG 17 stresses capacity development as a condition for implementation.[46] Judicial capacity is particularly critical, as courts increasingly adjudicate infrastructure disputes involving climate risk, intergenerational equity and complex evidence. Without targeted training and institutional support, judges may revert to narrow formalism, weakening the transformative potential of sustainability laws.

Strategy three: phased implementation and independent monitoring

Implementation should be structured as a learning process. The immediate, uniform enforcement of complex sustainability regimes may overwhelm institutions and provoke resistance. Phased implementation, with clear timelines and escalating obligations, allows legal systems to adapt while preserving normative direction. In addition, independent monitoring bodies play a crucial role in this process. UN environmental governance practice increasingly relies on autonomous oversight institutions to assess compliance and generate feedback. The Aarhus Convention exemplifies this approach by combining access to information, participation and review mechanisms that enhance accountability without paralysing administration.[47] Independent bodies also help insulate enforcement from short-term political pressures and enable evidence-based legal refinement over time.

Conclusion

Sustainable infrastructure cannot be achieved through isolated rules or short-term policies. This essay has shown that lasting progress requires a coherent and integrated legal framework where economic growth, environmental protection and social equity are treated as connected legal objectives, not competing interests. Strengthening the law through integrated impact assessments, long-term value-based procurement, strong equity and participation safeguards, and adaptive, climate-resilient design rules allows sustainability to be built into infrastructure outcomes by default. Law then moves beyond damage control and becomes a tool for shaping better decisions from the start. In an age of climate change, inequality and economic uncertainty, infrastructure law

must respond to multiple crises at once. The states that succeed will be those that master the law of sustainable systems, using it to build infrastructure with communities, for the environment and for long-term prosperity rather than short-term gain alone.

Notes

1 World Commission on Environment and Development, Our Common Future (Oxford University Press 1987) 43-46 https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf (viewed 25 October 2025).
2 Neil Gunningham, 'Environment, Self-Regulation, and the Future of Environmental Governance' (1999) 21 Law & Policy 31, 37-39.
3 Brian Z Tamanaha, *Law as a Means to an End: Threat to the Rule of Law* (Cambridge University Press 2006) 1-4.
4 UN General Assembly, Transforming Our World: The 2030 Agenda for Sustainable Development (21 October 2015) UN Doc A/RES/70/1 https://undocs.org/A/RES/70/1 (viewed 2 December 2025).
5 John Elkington, *Cannibals with Forks: The Triple Bottom Line of 21st Century Business* (Capstone 1997) 70-73.
6 See n 1 above, 8-9, 43-46.
7 *Vellore Citizens' Welfare Forum v Union of India* (1996) 5 SCC 647 (Supreme Court of India). Amartya Sen, *Development as Freedom* (OUP 1999) 87-90.
8 See n 1 above.
9 Benedict Kingsbury, et al, 'The Emergence of Global Administrative Law' (2005) 68 Law and Contemporary Problems 15, 38-40.
10 UN Environment Programme, Environmental Rule of Law: First Global Report (2019) 125-129.
11 *Kivalina v ExxonMobil Corp* 696 F.3d 849 (9th Cir 2012). Nicholas Stern, *The Economics of Climate Change: The Stern Review* (Cambridge University Press 2007) 35-41.
12 *Metalclad Corporation v United Mexican States* (ICSID Case No ARB(AF)/97/1) Award (30 August 2000).
13 *Future Generations v Ministry of the Environment* (STC 4360-2018) Constitutional Court of Colombia.
14 Joseph E Stiglitz, *The Price of Inequality* (W.W. Norton 2012). Duncan Kennedy, 'The Stakes of Law, or Hale and Foucault!' (1991) 15 Legal Studies Forum 327.
15 Intergovernmental Panel on Climate Change (IPCC), AR6 Working Group II: Impacts, Adaptation and Vulnerability (Cambridge University Press 2022).
16 World Bank, 'Lifelines: The Resilient Infrastructure Opportunity' (World Bank 2019). IPCC, AR6 Working Group II: Impacts, Adaptation and Vulnerability (Cambridge University Press 2022), at www.worldbank.org/en/news/feature/2019/06/19/lifelines-for-better-development (viewed 25 October 2025).
17 *Urgenda Foundation v State of the Netherlands* [2019] ECLI:NL:HR:2019:2007 (Supreme Court).
18 See n 7 above, 'The Court explicitly rejected the idea that environmental regulation hinders development and held that sustainable development requires environmental protection as an integral part of economic decision-making'.
19 Partha Dasgupta, The Economics of Biodiversity: The Dasgupta Review (HM Treasury 2021), 'The Review formally recognizes ecosystems as natural capital and demonstrates that economic systems which fail to value nature generate long-term economic loss'.
20 Millennium Ecosystem Assessment, *Ecosystems and Human Well-being: Synthesis* (Island Press 2005), 'Establishes that ecosystems provide essential services including water regulation, climate regulation, and health protection, which are foundational to economic and social systems'.
21 Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment [2012] OJ L26/1.
22 Joseph E Stiglitz, *Economics of the Public Sector* (4th edn, W W Norton 2015).
23 *Narmada Bachao Andolan v Union of India* (2000) 10 SCC 664.
24 *Saramaka People v Suriname* (Judgment) IACtHR Series C No 172 (2007).
25 *R (Save Tara) v Secretary of State for Communities and Local Government* [2009] UKSC 10.
26 Neil Gunningham and Darren Sinclair, Leaders and Laggards: Next-Generation Environmental Regulation (Greenleaf 2017).
27 *R (Save Tara) v Secretary of State for Communities and Local Government* [2009] UKSC 10.
28 See n 26 above.
29 Directive 2014/24/EU on public procurement [2014] OJ L94/65.
30 William D Nordhaus, 'A Review of the Stern Review on the Economics of Climate Change' (2007) 45 Journal of Economic Literature 686.
31 See n 16 above.
32 Directive 2014/24/EU on public procurement [2014] OJ L94/65.
33 UNECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (adopted 25 June 1998, entered into force 30 October 2001) (the 'UNECE Aarhus Convention'), 'The Convention requires participation at an early stage, when all options are open, making late or symbolic consultation inconsistent with international environmental law'.
34 UNECE Aarhus Convention, Art 6(4).
35 *Oposa v Factoran* (1993) 224 SCRA 792 (Supreme Court of the Philippines).
36 Amartya Sen, *Development as Freedom* (Oxford University Press 1999).
37 Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment [2012] OJ L26/1.
38 Environment Act 2021 (UK), s 98 (biodiversity net gain).
39 Directive 2014/24/EU on public procurement [2014] OJ L94/65.
40 Regulation (EU) 2020/852 on the establishment of a framework to facilitate sustainable investment [2020] OJ L198/13.
41 Gerald E Frug and David J Barron, *City Bound: How States Stifle Urban Innovation* (Cornell University Press 2008).
42 See n 35 above.
43 Dutch Delta Act on Flood Risk Management and Freshwater Supply 2011.
44 Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016) UNTS vol 3156, Art 4(1).
45 ILO, Guidelines for a Just Transition towards Environmentally Sustainable Economies and Societies for All (2015).
46 See n 4 above.
47 UNECE Aarhus Convention.

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How can legal frameworks promote sustainable infrastructure while balancing economic growth, environmental protection and social equity?

Introduction

> '*A successful society is characterized by a rising living standard for its population, increasing investment in factories and basic infrastructure, and the generation of additional surplus, which is invested in generating new discoveries in science and technology*'.[1]

This statement by Robert Trout captures the indispensable role of infrastructure in human progress. Infrastructure development is a cornerstone that supports economic transformation by facilitating job creation, improving productivity and enhancing access to essential services. However, when infrastructure growth is pursued without adequate legal safeguards, it can lead to environmental degradation, displacement of communities and widening inequality.

Sustainable infrastructure refers to the planning, financing, construction and operation of infrastructure that meets present needs while safeguarding the ability of future generations to meet theirs.[2] It is grounded by the three interdependent pillars of development: economic growth, environmental protection and social equity.[3] The problem, however, is how to make laws or strengthen existing legal frameworks to balance these pillars effectively.

This essay argues that strengthening legal frameworks through integrated planning, binding impact assessments, financial institutional realignment, public participation and effective enforcement is essential to ensure that infrastructure development contributes to inclusive and resilient sustainable development.

Definitions

For legal frameworks to balance economic growth, environmental protection and social equity, the clarity of the key concepts is important. The following definition sets out how these terms are understood in this essay.

Sustainable infrastructure refers to infrastructure projects that deliver long-term economic, environmental and social values throughout their life cycle. It pursues the UN Sustainable Development Goals (SDGs), including mechanisms to prevent or mitigate negative impacts and remain financially feasible without overburdening the state or consumers throughout its life cycle.[4]

Economic growth is the sustained increase in per capita income, productivity and employment that leads to improved living standards.[5] In the context of sustainable infrastructure, economic growth must be pursued in ways that do not damage the environment or marginalise communities.

Environmental protection encompasses laws and policies aimed at conserving natural resources, reducing pollution and emissions, protecting ecosystems and ensuring resilience to climate risks.[6] Within infrastructure development, environmental protection functions as both a preventive and corrective mechanism to ensure that economic activity does not undermine the ecological systems on which long-term prosperity depends.

Social equity focuses on the fair distribution of both the benefits and burdens of infrastructure development. It requires that marginalised or vulnerable groups have access to infrastructure services; are protected from disproportionate harm; and that affected communities enjoy rights and compensation.[7] Social equity thus serves as the normative bridge linking economic efficiency and environmental sustainability.

Existing best practices and legal instruments

These are existing examples of legal frameworks currently that seek to protect and promote sustainable development.

International principles

At the international level, the United Nations Environmental Programme (UNEP) developed the International Good Practice Principles for Sustainable Infrastructure in response to the growing global demand for infrastructure that supports economic development without compromising environmental sustainability or social equity.[8] Recognising that infrastructure is responsible for a significant share of global greenhouse gas emissions, resource extraction and biodiversity loss, the UNEP convened experts, governments and stakeholders to establish shared standards for sustainable infrastructure.

These principles helped to establish a shared international understanding of sustainable infrastructure and now serve as a reference point for governments, development finance institutions and investors in shaping policy, financing and project appraisal. In practice, they have informed the inclusion of climate resilience environmental safeguards and social considerations in national infrastructure and green finance initiatives.[9]

National policies and legal instruments

At the national level, several jurisdictions have adopted legal and policy instruments that embed sustainability considerations into infrastructure governance. In Ghana, the Green Finance Taxonomy provides a framework for classifying environmentally sustainable economic activities, including infrastructure in sectors such as energy, transport, water and waste management. By aligning infrastructure investment with environmental and climate resilient standards, the taxonomy incentivises sustainable project design and financing.[10]

The United Kingdom offers another example through its national Green Finance Strategy and sovereign green bond programme. These initiatives integrate climate disclosure and sustainability criteria into public finance, mobilising private investments while strengthening environmental accountability.[11]

Similarly, Nigeria's Environmental Impact Assessments Act and Climate Change Act, 2021 require environmental review and climate considerations to be integrated into public decision-making, including infrastructure planning.

Senegal's *Plan Sénégal Émergent* links large-scale infrastructure development with environmental safeguards and social inclusion objectives. In the United States, the National Environmental Policy Act (NEPA) institutionalises environmental impact assessment and public participation as legally enforceable rights, with courts playing a central role in ensuring compliance. Together, these examples demonstrate that sustainability can be embedded within diverse legal systems through binding assessment, transparency, and accountability mechanisms.[12]

Challenges in current legal systems

Despite existing environmental and planning laws, significant weaknesses continue to undermine sustainable infrastructure development. One major challenge is weak enforcement of environmental regulations, particularly in resource-intensive sectors. In Ghana, the persistence of illegal mining (*galamsay*) has degraded river systems such as the Pra and Ankobra, damaging water infrastructure and ecosystems despite clear statutory prohibitions.[13]

Another challenge is insufficient environmental and social impact assessment. The decision in *Social and Economic Rights Action Centre (SERAC) v Nigeria*[14] illustrates the consequences of infrastructure activities proceeding without meaningful environmental assessment or community consultation. In this case, large-scale oil infrastructure development proceeded without meaningful environmental assessment or community consultation, resulting in environmental devastation and violations of socio-economic rights. The African Commission found that the failure to assess and mitigate environmental harm resulted in violations of social and economic rights, highlighting the need for stronger, binding impact assessment regimes. Furthermore, limited public participation and weak protection for affected communities undermine social equity. Large transport projects such as the Nairobi Expressway[15] have delivered economic benefits but displaced informal traders and roadside communities with minimal consultation and inadequate compensation. This reflects a legal gap where procedural compliance exists without substantive protection for vulnerable groups.

Finally, failure to integrate climate risk and life-cycle planning has resulted in infrastructure that is economically inefficient over time. Recurrent flood damage to roads and drainage systems across West Africa shows how infrastructure approved without climate resilience considerations imposes long-term fiscal and social costs.[16] World Bank assessments indicate that climate-related damage to infrastructure costs Sub-Saharan African economies billions of dollars annually, highlighting the economic consequences of weak legal requirements on climate resilience.[17]

These failures are worsened by fragmented governance and overlapping institutional mandates. Responsibilities for land use, environmental protection and infrastructure delivery are frequently dispersed across multiple agencies with limited coordination and accountability. This fragmentation creates regulatory gaps, delays enforcement and enables harmful practices to persist unchecked. As a result, infrastructure development often proceeds in a manner that is economically inefficient, environmentally destructive and socially inequitable.

Strengthening legal frameworks for sustainable infrastructure

To ensure that infrastructure development in Ghana is economically sound and socially inclusive, legal frameworks must be strengthened in key areas. To address the systemic weaknesses identified above, legal reform must move beyond procedural complaints and embed sustainability as a substantive obligation within infrastructure governance.

Environmental and planning laws must be transformed from declaratory standards into enforceable obligations. Regulatory agencies should be granted clear statutory powers, adequate resourcing and institutional independence to monitor compliance and impose sanctions for environmental and social harm. Although some existing legal frameworks, such as Ghana's Environmental Protection Act, 2025 (Act 1124), strengthen the regulatory powers of the Environmental Protection Agency, enforcement gaps persist in practice. Further legal reforms are therefore required to ensure consistent sanctions, judicial oversight and institutional independence. Where violations occur, penalties must be proportionate, deterrents and consistently applied, including administrative fines, suspension of licences and civil liability for environmental damage. When it comes to enforcement, courts also play a critical role in strengthening enforcement. Affected communities and civil society organisations should have the capacity to challenge infrastructure approvals that are granted in breach of environmental or planning standards.[18] Judicial oversight ensures that sustainability obligations are not left solely to executive discretion and reflect the preventive purpose of environmental law.

Making environmental and social impact assessment binding

Environmental and social impact assessments (ESIAs) must guide substantive decisions, not merely satisfy procedural requirements. Legal frameworks should require that project approval be conditional upon the demonstrable integration of ESIA findings into project design.[19] Where assessments identify significant environmental or social risks, decision-makers must be legally obliged to modify the project or refuse approval altogether. Strategic environmental assessments (SEAs) should also be mandated for sector-wide and long-term infrastructure planning to address cumulative impacts that individual project assessments often overlook. The failure to conduct meaningful assessments has led to serious human rights and environmental violations, as demonstrated in *Social and Economic Rights Action Centre (SERAC) v Nigeria*,[20] where oil infrastructure development proceeded without adequate environmental assessment or community consultation. Additionally, climate risk assessment and life-cycle costing should further be incorporated as mandatory components of both ESIAs and SEAs to ensure long-term economic and environmental sustainability.[21]

Embedding public participation and social equity

Public participation must be recognised as a legally enforceable right rather than a procedural step. Laws should require early, continuous and inclusive engagement with affected communities, particularly vulnerable and marginalised groups, with participation capable of influencing project outcomes.[22] Infrastructure projects that fail to protect affected communities risk entrenching inequality, as illustrated by large

transport developments, such as the Nairobi Expressway, where economic benefits were achieved alongside the displacement of informal traders with limited consultation and inadequate compensation mechanisms.[23] Legal frameworks must therefore mandate fair compensation, resettlement safeguards and livelihood restoration, supported by accessible remedies through administrative and judicial processes.

Integrating climate resilience and long-term planning

Existing legal regimes often fail to incorporate climate variability and long-term resilience into infrastructure planning and approval. Infrastructure designed without climate adaptation considerations often suffer repeated damage from flooding and extreme weather events, imposing recurring reconstruction costs on states and communities.[24] Legal frameworks should therefore require climate resilient standards, adaptive design and periodic review of infrastructure performance over its life cycle. Embedding resilience as a legal obligation protects public investment and aligns infrastructure development with long-term sustainability objectives.[25]

Enhancing institutional coordination and independence

Fragmented governance structures undermine the effective implementation of sustainability standards. Responsibilities for land use, environmental protection and infrastructure delivery are often divided among multiple agencies with limited coordination. Legal reform should therefore establish statutory duties of cooperation, joint approval mechanisms and shared accountability frameworks to ensure coherent decision-making.[26] Clear institutional coordination reduces regulatory gaps, strengthens enforcement and ensures that environmental protection, economic efficiency and social equity are pursued collectively rather than in isolation. In addition, regulatory institutions must enjoy a sufficient degree of independence to exercise their mandates effectively. Where oversight bodies lack institutional autonomy, particularly due to executive control over appointments and tenure, enforcement of environmental and social standards may be weakened. Strengthening institutional independence enhances regulatory credibility, enables agencies to act without undue influence and ensures that environmental protection, economic efficiency and social equity are pursued collectively rather than in isolation.

Conclusion

Strong legal frameworks are fundamental for ensuring that infrastructure development supports economic growth without sacrificing the environment or marginalising communities. By strengthening enforcement, making impact assessments binding, enhancing public participation, integrating climate resilience and enhancing institutional coordination, the law guides infrastructure development towards sustainability while balancing economic growth, environmental protection and social equity.

Notes

1 Robert Trout, quoted in Peter F Drucker, 'Managing in a Time of Great Change' (Butterworth-Heinemann 1995).
2 Organisation for Economic Co-operation and Development (OECD), Green Infrastructure in Development Co-operation (OECD Publishing 2019).
3 United Nations General Assembly, 'Transforming Our World: The 2030 Agenda for Sustainable Development' (21 October 2015) UN Doc A/RES/70/1.
4 Srinivas Yanamandra, 'Sustainable Infrastructure: An Overview – Placing Infrastructure in the Context of Sustainable Development' (University of Cambridge Institute for Sustainability Leadership 2020).
5 UN, Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (UN Sustainable Development Knowledge Platform 2023) https://sdgs.un.org/goals/goal8 (viewed 17 September 2025).
6 Institute for Environmental Research and Education, 'What is Environmental Protection?' (2025) https://iere.org/what-is-environmental-protection-act/ (viewed 17 September 2025).
7 UrbanFootprint, 'What is Social Equity? Definition, Examples and More' (2021).
8 UNEP, International Good Practice Principles for Sustainable Infrastructure (2nd edn, 2021).
9 *Ibid.*
10 Ministry of Finance and Securities and Exchange Commission, Ghana Green Finance Taxonomy (Version 1.0) (Government of Ghana 2024).
11 His Majesty's (HM) Treasury, Green Finance Strategy (HM Government 2019).
12 Environmental Impact Assessment Act (Cap E12 LFN 2004) (Nigeria); Climate Change Act 2021 (Nigeria); Government of Senegal, Plan Sénégal Émergent (2014); and National Environmental Policy Act of 1969, 42 USC 4321-4370h.
13 Environmental Protection Agency (Ghana), 'Illegal Mining and Environmental Degradation in Ghana; Government of Ghana, Inter-Ministerial Committee on Illegal Mining Reports' (2017-2021).
14 [2001] AHRLR 60 (ACHPR).
15 African Development Bank, 'Nairobi Expressway Project Appraisal Report' (2020); and Kenya National Human Rights Commission, Human Rights Implications of Large Infrastructure Projects (2022).

16 World Bank, 'Lifelines: The Resilient Infrastructure Opportunity' (2019); and UN Office for Disaster Risk Reduction, 'Global Assessment Report on Disaster Risk Reduction' (2022).
17 World Bank, 'Climate Change Adaptation and Resilience in Sub-Saharan Africa' (World Bank Group 2021).
18 Philippe Sands and Jacqueline Peel, 'Principles of International Environmental Law' (4th edn, Cambridge University Press 2018).
19 World Bank, Environmental and Social Framework (2017).
20 *SERAC v Nigeria* (2001) AHRLR 60 (ACHPR).
21 World Bank, 'Lifelines: The Resilient Infrastructure Opportunity' (2019).
22 UNEP, International Good Practice Principles for Sustainable Infrastructure (2021).
23 African Development Bank, 'Nairobi Expressway Project Appraisal Report' (2020).
24 UN Office for Disaster Risk Reduction, 'Global Assessment Report on Disaster Risk Reduction' (2022).
25 See n 24 above.
26 See n 25 above.