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Beyond Command-and-Control: Reimagining Environmental Governance Through Rights-Based and Market-Driven Legal Frameworks

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Abstract

Contemporary environmental governance is increasingly characterized by a dual dissatisfaction: first, with the rigidity and enforcement fragilities of "command-and-control" regulation (standards, permits, prohibitions enforced by administrative sanctions); second, with the legitimacy deficits and distributive controversies surrounding purely market-driven environmental instruments (tradable permits, carbon taxes, and payments for ecosystem services). This paper argues that neither paradigm, command-and-control nor market-based governance, can, by itself, constitute an adequate legal response to polycentric, science-intensive, distribution-sensitive environmental crises. Instead, it develops an integrated model in which rights-based environmental law supplies enforceable normative baselines and institutional duties, while market-driven instruments operate as conditional implementation mechanisms constrained by those baselines.

The analysis proceeds from three premises. The first is conceptual: market mechanisms are not "alternatives" to legal command, but depend upon prior public choices about ecological limits, monitoring regimes, compliance institutions, and remedies. This dependence is reflected in the legal architecture of emissions trading (cap setting, allowance allocation, registries, monitoring/reporting/verification rules, and penalty structures), as well as in carbon taxes (tax base design, rate trajectories, exemptions, and revenue recycling). The second is normative: environmental governance allocates burdens and benefits across persons, generations, and territories; therefore, legitimacy requires an account of substantive and procedural justice that cannot be reduced to efficiency criteria. Rights-based environmental law, through constitutional rights, public trust duties over commons, and environmental human rights, supplies such an account by establishing minimum floors of protection and state obligations, and by enabling reason-giving, participation, and judicial review. The third is institutional: "really responsive" regulation and related theories emphasize that effective governance requires responsiveness not only to regulated actors but also to institutional capacities, tool logics, and dynamic conditions, an insight directly applicable to environmental regulation's recurrent compliance and implementation pathologies .

Comparatively, the paper examines the European Union, the Republic of India, and the United States as three high-variation jurisdictions in which command-and-control regulation remains foundational but has been partially reconfigured by (i) rights-oriented judicial and constitutional developments and/or (ii) market instruments for emissions and resource governance. In the European Union, Article 191(2) TFEU constitutionalizes major environmental principles (precaution, prevention, rectification at source, polluter pays) [1], and the EU ETS,

industrial emissions controls, environmental liability, and procedural access rights exhibit robust legal-institutional integration. In India, the constitutionalization of environmental protection through Article 21 jurisprudence (right to life) alongside explicit constitutional directives and duties, and the development of public trust and polluter pays doctrines, coexist with a predominantly administrative command framework supplemented by selective market pilots (e.g., energy efficiency trading and environmental cesses). In the United States, a mature command-and-control system (Clean Air Act and NEPA) combines with litigation-enabling procedural mechanisms (citizen suits), and with historically influential cap-and-trade programs (Acid Rain Program) alongside state-level carbon markets (RGGI; California)

The paper's central contribution is an analytically specified "rights-anchored market governance" model. It proposes that rights-based environmental law should structure market instruments through: (i) rights-compatible ecological ceilings (caps or standards derived from environmental quality and health baselines); (ii) public trust constraints on alienation and on "offset" substitutability where commons integrity is threatened; (iii) participatory and transparency duties (access to information and justice); and (iv) distributive safeguards, including revenue recycling and targeted protections for vulnerable communities. The paper concludes with reform proposals tailored to the studied jurisdictions: strengthening rights-informed guardrails for trading and taxation instruments; codifying non-regression and minimum environmental quality baselines; aligning liability and remediation duties with market incentives; and improving monitoring and enforcement capacities that are preconditions for credible markets.

Keywords*: Environmental Governance; Command-and-Control Regulation; Rights-Based Environmental Law; Market-Based Instrument*

Introduction

Environmental law's modern trajectory has been shaped by the proliferation of specialized command-and-control instruments (licensing, technology standards, and prohibitions), whose design presupposes a relatively stable causal model from regulated activity to environmental harm and a state apparatus capable of monitoring and enforcement. Yet environmental governance now faces problems with high scientific uncertainty and cross-border spillovers (climate change), high cumulative and diffuse causation (air pollution, biodiversity loss), and high distributional salience (who bears costs, who benefits, and who is protected). These characteristics expose the limits of a purely technocratic, sectoral command model, while also revealing the normative insufficiency of a purely marketized model.

At the international level, the foundational normative vocabulary of environmental governance, human well-being, intergenerational equity, precaution, and participation, has been articulated since Stockholm (1972) and Rio (1992) . Within climate governance, the UNFCCC (1992) and Kyoto Protocol (1997) institutionalized cooperative architecture and opened the door to market mechanisms, while the Paris Agreement (2015) further enabled cooperative approaches and mechanisms under Article 6[1]. Simultaneously, procedural environmental rights regimes, most notably through the Aarhus Convention (1998), established structured duties regarding access to information, public participation, and access to justice[2].

Against this backdrop, this paper frames "beyond command-and-control" not as deregulation or displacement of administrative law, but as a reconstruction of governance architecture: command instruments become one layer within a rights-informed, market-capable institutional design.

Research questions

First, what structural limitations of command-and-control regulation motivate the search for complementary rights-based and market-based approaches? Second, how do rights-based environmental law frameworks, constitutional rights, public trust duties, and environmental human rights, establish enforceable baselines and shape institutional legitimacy? Third, under what legal and institutional conditions do market-driven instruments (emissions trading, carbon taxes, payments for ecosystem services) enhance environmental governance rather than undermine rights, equity, or ecological integrity? Fourth, what comparative lessons emerge from the European Union, India, and the United States regarding the integration of rights-based doctrines with market tools? Fifth, what reform pathways can operationalize an integrated governance model in contemporary environmental law?

Objectives

The objectives are: (i) to synthesize doctrinal and theoretical literatures on command-and-control, rights-based environmental law, and market-based instruments; (ii) to develop a rigorous theoretical framework describing how rights-based baselines and market tools can be institutionally integrated; (iii) to conduct doctrinally grounded comparative case studies across the selected jurisdictions; and (iv) to propose policy recommendations and legal reforms that advance a rights-anchored, market-capable environmental governance architecture.

Literature review

The literature relevant to this paper is best understood as three overlapping bodies of work: (a) studies of command-and-control environmental regulation and its limits; (b) rights-based environmental law, including constitutional environmental rights, public trust doctrines, and environmental human rights; and (c) market-driven instruments, including emissions trading, carbon taxes, and payments for ecosystem services.

Command-and-control regulation refers to legal strategies that impose direct requirements, such as emission limits, technology mandates, siting prohibitions, or permit conditions, backed by administrative and criminal sanctions. While command-and-control can be indispensable for setting baselines (e.g., environmental quality standards and best-available-technology requirements), the literature identifies recurring

[1] Paris Agreement (2015).

[2] Convention on Access to Information, Public Participation in Decision-Making and Access

weaknesses: informational demands on regulators, inflexibility across heterogeneous firms, and enforcement vulnerabilities when monitoring is weak or captured. Even where command instruments remain central, scholarship on "responsive" and "really responsive" regulation emphasizes that effective compliance systems require scalable escalation, credible enforcement, and tool selection that matches institutional capacity and regulated behavior[3].

Rights-based environmental law literature emphasizes that environmental governance cannot be reduced to an engineering-procurement model because it implicates fundamental interests (life, health, dignity, home, culture) and collective resources (air, waters, forests) whose protection requires enforceable duties and remedies. Constitutional environmental rights scholarship documents the diffusion of constitutional or quasi-constitutional rights to a healthy environment across jurisdictions and argues that such rights can reshape administrative discretion, judicial remedies, and legislative priorities . In the Indian context, constitutional interpretation under Article 21 has expanded the right to life to include pollution-free water and air, enabling the Supreme Court's environmental jurisprudence, while other cases articulate doctrinal commitments to precaution, polluter pays, and sustainable development. The public trust doctrine, revitalized in modern environmental law by scholarship and case law, frames certain natural resources as held by the state in trust for the public, limiting alienation and requiring stewardship; the doctrine is rooted in U.S. jurisprudence and has been adapted in other jurisdictions. In India, the Supreme Court explicitly deploys public trust reasoning and cites the doctrine's conceptual restrictions on governmental authority[4].

Environmental human rights literature overlaps with constitutional rights but extends beyond domestic constitutionalism to international and regional human rights systems. Landmark jurisprudence of the European Court of Human Rights, including López Ostra v Spain, has treated severe environmental nuisance as implicating rights protections (notably private and family life), underscoring that environmental protection can be operationalized through human rights adjudication even where no explicit right to environment exists . At the global level, human rights instruments and interpretive materials, including CESCR General Comment No. 15 on the right to water and UN General Assembly Resolution 64/292, reflect the articulation of environment-adjacent rights that are increasingly relevant for environmental governance .[5] The 2018 Framework Principles on Human Rights and the Environment consolidate duties of states on information, participation, protection of defenders, and effective remedies, thereby supplying an analytically usable bridge between human rights law and environmental governance design .

Market-driven instruments are often framed as efficiency-enhancing alternatives to command-and-control, but the core theoretical literature stresses that the choice between price instruments (taxes) and quantity instruments (caps) depends on uncertainty, abatement cost structure, and institutional choices. Foundational policy analysis argues that market-based instruments can reduce compliance costs, spur innovation, and harness decentralized information, but also warns that they can fail when monitoring is weak or when political economy compromises degrade environmental ambition. The institutional maturity of emissions trading is reflected in international instruments (Kyoto's emissions trading concept) and in major regional applications (EU ETS; U.S. Acid Rain Program), which provide the most instructive legal templates, . Carbon tax scholarship emphasizes that design details, rate path, tax base, border adjustments, and revenue use, shape both environmental effectiveness and distributive outcomes. Payments for ecosystem services (PES) literature conceptualizes PES as conditional compensation for ecological services provision, often grounded in beneficiary-pays logic rather than polluter-pays logic; design issues include

[3] Subhash Kumar v State of Bihar and Ors (Supreme Court of India, 1991) (Article 21 includes right to pollution-free water and air).

[4] M.C. Mehta v Kamal Nath (Supreme Court of India, 1996) (public trust doctrine).

[5] UN General Assembly Resolution 64/292: The Human Right to Water and Sanitation (UN Doc. A/RES/64/292) (2010).

additionality, conditionality verification, transaction costs, and equity effects.[6]

This paper's analytic stance is that the literature is correct to treat both command-and-control and market instruments as incomplete without institutional and normative integration. What remains under-specified, particularly in legal scholarship, is a governance model that makes rights-based baselines and public trust duties operational constraints on market design, thereby connecting legitimacy and effectiveness.

Theoretical framework

This paper adopts and refines a "rights-anchored market governance" (RAMG) framework: environmental rights and public trust duties /establish non-derogable governance constraints and accountability pathways, while market instruments function as contingent implementation technologies for achieving those rights-consistent constraints at lower cost and with higher innovation potential.

The framework rests on four interlocking propositions.

First, environmental rights should be treated as "governance-setting" norms rather than merely adjudicatory afterthoughts. Constitutional rights and human rights norms operate as interpretive constraints on administrative discretion and legislative design, defining minimum baselines of acceptable environmental harm and shaping remedy structures .[7]

Second, public trust doctrine supplies an institutional theory of commons governance that is especially relevant to tradable entitlements: where resources are held in trust, the state's ability to convert protection duties into alienable property-like instruments is constrained by fiduciary obligations. This is visible in U.S. doctrine (Illinois Central) and in public trust scholarship that frames the doctrine as a tool for judicial intervention and citizen accountability.

Third, market instruments have distinct "tool logics" that must be respected in design. Cap-and-trade is a quantity instrument relying on scarcity, credible caps, and enforceable monitoring; carbon taxes are price instruments relying on administratively feasible tax bases and credible rate paths; PES instruments rely on conditional contracting and credible verification of services provision[8].

Fourth, governance effectiveness depends on institutional responsiveness and adaptive capacity. The "really responsive regulation" approach emphasizes responsiveness to changes in regulated behavior, institutional environments, and tool performance, implying that environmental governance must include feedback loops, escalation ladders, and periodic recalibration mechanisms .

Methodology

This paper uses a non-empirical legal methodology combining doctrinal analysis, comparative analysis, and policy analysis, with triangulation across primary legal texts and authoritative secondary literature.

Doctrinal analysis focuses on the internal logic of legal sources: constitutional texts, major statutes, treaties, and landmark cases. For example, the paper examines how Article 191(2) TFEU encodes environmental principles, how India's constitutional jurisprudence under Article 21 expands environmental protection, and how citizen suit provisions in U.S. environmental statutes enable public enforcement.[9]

Comparative analysis applies a "most different systems" rationale. The European Union, India, and the United States differ significantly across: constitutional environmental rights density, administrative state capacity, market instrument maturity, and the role of courts. These differences enable identification of structural conditions under which rights and markets integrate effectively.

Policy analysis evaluates instrument choice and reform proposals using: (i) effectiveness (ability to achieve ecological goals), (ii) legitimacy

[6] Sven Wunder, Payments for Environmental Services: Some Nuts and Bolts (CIFOR Occasional Paper No. 42) (2005).
[7] Vellore Citizens Welfare Forum v Union of India (Supreme Court of India, 1996) (polluter pays, precaution, sustainable development).
[8] Martin L. Weitzman, "Prices vs. Quantities" (1974) 41(4) Review of Economic Studies 477.
[9] Clean Water Act citizen suits, 33 U.S.C. § 1365.

(participation, transparency, justification), (iii) distributive justice (burden sharing, vulnerability), and (iv) administrative feasibility (monitoring, enforcement, institutional capacity). The paper does not claim causal estimation of policy outcomes (no primary empirical data are assumed), but draws from officially published program descriptions, legal texts, and selected authoritative reports where needed (e.g., program design and descriptive emissions trends).[10]

Comparative case studies

The case studies assess how each jurisdiction combines (a) command-and-control regulation, (b) rights-based environmental law, and (c) market-driven instruments, and what institutional constraints and opportunities follow.

In the European Commission's environmental governance framework, EU treaty law provides foundational principles and an express "high level of protection" orientation. Article 191(2) TFEU grounds EU environmental policy in precaution, prevention, rectification at source, and polluter pays. The EU operationalizes these principles through layered directives and regulations: the Industrial Emissions Directive establishes integrated pollution prevention and control rules for industrial installations, while the Environmental Liability Directive explicitly adopts a polluter-pays framework for prevention and remediation of environmental damage . Procedural rights are institutionalized through the Aarhus Convention (to which the EU is a party) and through internal EU law applying Aarhus pillars to EU institutions . The EU's rights-adjacent layer is further underscored by Article 37 of the EU Charter, which requires integration of environmental protection into EU policies in accordance with sustainable development.[11]

Market-driven governance in the EU is exemplified by the EU Emissions Trading System, established by Directive 2003/87/EC as a cap-and-trade scheme for greenhouse gas allowances. The legal design of the EU ETS, cap setting, allocation, monitoring, compliance penalties, illustrates the core claim that "market" tools are legally constituted by command structures. The EU also supplies doctrinal and institutional integration points: EU ETS design is linked to broader EU environmental principles and to policy integration obligations. Descriptive monitoring of emissions trends under the EU ETS has been published by the European Environment Agency, including analyses of historical verified emissions and projections .[12]

In India, the constitutional and judicial development of environmental rights is central. The Constitution includes directive principles and fundamental duties relevant to environmental protection, and judicial interpretation has extended the right to life to include the enjoyment of pollution-free water and air. The Supreme Court case Subhash Kumar v State of Bihar articulates that Article 21 includes the right to enjoy pollution-free water and air for full enjoyment of life. The Supreme Court of India has also institutionalized core environmental principles (precaution, polluter pays, sustainable development) in Vellore Citizens Welfare Forum v Union of India , and has recognized public trust duties in M.C. Mehta v Kamal Nath . It has further articulated robust fault standards for hazardous activities, developing the doctrine of absolute liability in M.C. Mehta v Union of India (Oleum Gas Leak) . These judge-made doctrines operate as functional rights-based constraints and duties that shape administrative action, compensation, and remediation.

India's statutory framework remains largely command-and-control and permit-centric, including the Water Act (1974), Air Act (1981), and Environment (Protection) Act (1986). The EIA Notification (2006), issued under the Environment (Protection) Act, establishes prior environmental clearance requirements and institutional appraisal structures, illustrating procedural governance and administrative discretion under legal constraints . The creation of the National Green Tribunal through the National Green Tribunal Act, 2010 forms an institutional bridge between rights and enforcement by enabling specialized adjudication and relief for environmental harms .[13]

[10] ropean Environment Agency, Trends and Projections in the EU ETS in 2015 (2015).

[11] Charter of Fundamental Rights of the European Union, Art. 37 (Environmental protection).

[12] European Environment Agency, The EU Emissions Trading System in 2019: Trends and Projections (2019).

[13] Environmental Impact Assessment Notification, 2006 (S.O. 1533(E), 14 Sept 2006) (India).

Market-driven instruments in India are selective and frequently hybridized. A prominent example is the energy efficiency trading mechanism under the PAT scheme administered by the Bureau of Energy Efficiency, which combines regulatory targets with tradable Energy Saving Certificates, aiming to improve cost-effectiveness of energy reduction obligations . India has also used fiscal instruments aligned with polluter-pays logic, such as the coal cess funding the National Clean Energy and Environment Fund . Pilot cap-and-trade initiatives for local industrial air pollution have emerged (e.g., Surat's particulate trading project), reflecting experimentation with market structures in a context of enforcement constraints; early descriptive accounts predate later evaluation work and indicate a policy objective of reducing particulate pollution through tradable permits .[14]

In the United States, the legal architecture of environmental governance has long been structured by federal command-and-control statutes supplemented by litigation-enabling procedural rights. The Clean Air Act's congressional findings and purposes codify federal authority and objectives for air quality protection and pollution control . NEPA establishes a national policy to encourage "productive and enjoyable harmony" between humans and the environment and institutionalizes environmental impact assessment processes in federal decision-making. The enforcement ecosystem is materially shaped by citizen suit provisions, which allow private persons to bring civil actions under specified conditions (e.g., Clean Air Act citizen suits) and thereby supplement administrative enforcement.[15]

Market-driven instruments in the United States have had influential sectoral applications. The U.S. Environmental Protection Agency describes the Acid Rain Program as a Title IV Clean Air Act program requiring major SO_2 and NO_x reductions, using a cap-and-trade design for SO_2. A key official report explains that SO_2 reductions were "largely achieved through a market-based cap and trade program" under Title IV, illustrating how legal design structures market trading as a compliance pathway [31]. State-level carbon markets include the Regional Greenhouse Gas Initiative, structured through model rules establishing monitoring and compliance and beginning compliance in 2009 [35]. California's cap-and-trade program began in 2013 under AB 32 implementation, as described by the California Air Resources Board .[16]

Rights-based environmental law in the U.S. is more fragmentary at the federal level but exists through public trust doctrinal roots and through state constitutional developments. Illinois Central Railroad v Illinois remains foundational for the notion that certain submerged lands and analogous resources are held in trust, limiting alienation inconsistent with public use. Contemporary rights-based constitutional reasoning in some U.S. states is exemplified by Robinson Township v Commonwealth of Pennsylvania, which invigorated the Environmental Rights Amendment and framed constitutional environmental obligations as constraints on statutory choices. Climate-change-related governance development is also shaped by judicial interpretation of statutory authority: Massachusetts v EPA held that greenhouse gases fall within the Clean Air Act's concept of "air pollutant" for purposes of EPA regulatory authority and addressed standing and reviewability.[17]

The three jurisdictions thus display different "integration profiles": the EU's strong supranational administrative architecture and treaty principles; India's rights-driven judicial development and hybridization under administrative capacity constraints; and the U.S. combination of statutory command frameworks, procedural litigation, and selective market instruments.

[14] IndiaSpend, "Surat's Emission Trading Project…" (2019) (descriptive account of particulate trading pilot).
[15] Robert Baldwin; Julia Black, "Really Responsive Regulation" (2008) 71(1) Modern Law
[16] California Air Resources Board, AB 32 Global Warming Solutions Act of 2006 (Fact sheet, 2018) (cap-and-trade begins 2013).
[17] Massachusetts v EPA, 549 U.S. 497 (2007).

Comparative doctrine table

Doctrinal element	European Union	India	United States
Constitutional / quasi-constitutional environmental principles	Treaty principles (precaution, prevention, polluter pays) and policy integration obligations	Constitutional directives/duties and Article 21 jurisprudence (right to pollution-free air/water)	No federal constitutional environmental right; state-level rights in some jurisdictions
Public trust governance of commons	Present but mediated through EU institutional structure; trust-like principles arise in environmental integration and liability norms	Expressly adopted in Supreme Court jurisprudence (e.g., M.C. Mehta v Kamal Nath)	Foundational doctrine in Illinois Central; variable state development
Procedural environmental rights	Aarhus Convention and EU implementing regulation for EU bodies	EIA clearance regime and tribunalization (NGT)	NEPA procedural duties; broad citizen suits in major statutes
Market instruments' legal dependence on command structures	EU ETS directive constitutes "market" via cap, allocation, MRV, penalties	PAT scheme constitutes market within regulatory target system	Acid Rain Program regulations and statutory architecture constitute trading market

Critical analysis and reform agenda

The comparative analysis supports three core claims: (i) command-and-control is necessary to constitute markets and to establish enforceable baselines; (ii) rights-based law is necessary to legitimize baselines and to constrain markets against commodification and distributive injustice; and (iii) market instruments can substantially improve cost-effectiveness and innovation incentives when embedded within credible monitoring and rights constraints.

Command-and-control as the constitutive substrate of markets

Cap-and-trade instruments are frequently described as "market approaches," but legally and institutionally they are command models that use trading as a compliance mechanism. The EU ETS Directive establishes a scheme whose existence depends on legal determinations of scope, cap logic, allowance definition, allocation, and enforcement.[18] Similarly, the U.S. Acid Rain Program's cap-and-trade operation is disclosed in official reporting as a designed program with permanent emissions caps and regulatory obligations.[19]This matters normatively: without command-set caps or enforceable measurement, markets cannot be said to "solve" pollution problems; they operationalize public choices about permissible pollution and how costs of abatement are distributed.

The implication for legal design is that reform debates should not pose "command" versus "market" as mutually exclusive alternatives. Instead, the relevant question is how to construct a command baseline that is rights-consistent and then whether trading or taxation can meet that baseline more efficiently and with greater innovation incentives.[20]

Rights-based constraints as legitimacy conditions for market instruments

Rights-based environmental law influences governance through at least four channels.

First, it supplies substantive floors: in India, Article 21 jurisprudence explicitly ties environmental quality to the right to life, which functionally constrains administrative toleration of pollution . In the EU, treaty principles demand a high level of protection and embed precaution and polluter pays as policy foundations.[21] Such floors are not equivalent to specific numerical standards, but they

[18] Directive 2003/87/EC (EU ETS Directive) (2003).
[19] U.S. Environmental Protection Agency, Acid Rain Program: 2005 Progress Report (2005).
[20] Robert N. Stavins, "Market-Based Environmental Policies" (Resources for the Future Discussion Paper 98-26) (1998).
[21] Treaty on the Functioning of the European Union, Art. 191 (environmental principles).

supply legal reasons that can be invoked to challenge under-protective regulatory choices or weak enforcement.

Second, it supplies fiduciary constraints through the public trust doctrine. Illinois Central frames a category of state-held resources as subject to trust obligations that cannot be irrepealably conveyed contrary to public benefits ; Sax's scholarship conceptualizes public trust as a doctrinal vehicle for effective judicial intervention where agencies fail to protect public resources . In India, the doctrine is explicitly adopted and articulated as restricting governmental authority to alienate or privatize resources that should remain for public enjoyment . This trust logic interacts problematically with market entitlements: tradable permits risk being treated as quasi-property and may entrench expectations against tightening. A rights-anchored model therefore requires explicit legal clauses clarifying the revocability and non-proprietary character of allowances and limiting the use of "offsets" where they would enable rights-violating local pollution hotspots.

Third, rights-based law institutionalizes procedural legitimacy. Aarhus-style access rights recognize that environmental governance decisions are information-intensive and value-laden; access to information, participation, and justice are therefore legally required to reduce arbitrariness and improve decision quality. The EU's internal application of Aarhus pillars to EU institutions illustrates how procedural regimes can be legally codified and institutionalized . India's EIA clearance regime similarly structures participation and appraisal, albeit under recurring critiques not addressed here empirically; doctrinally, it illustrates the state's recognition that environmental decisions require structured processes rather than purely discretionary administrative action.[22]

Fourth, rights-based law facilitates remedies and accountability. Citizen suit provisions in U.S. environmental statutes illustrate how procedural rights can make enforcement more credible by enabling private attorneys general to compel compliance where agencies are inactive .[23] This enforcement channel is especially relevant for market instruments because market credibility depends on compliance expectations; weak enforcement collapses allowance scarcity and price signals.

Market instruments as constrained implementation technologies

Market instruments offer two principal governance advantages when appropriately constrained: informational decentralization and innovation incentives. Stavins' analysis summarizes how market-based instruments can provide continuing incentives for firms to identify lower-cost abatement and technological improvements, in contrast to many technology standards that can lock in compliance pathways. Yet the rights-anchored model requires additional design constraints: (i) transparency and participation in cap-setting, (ii) distributional safeguards (especially where costs are passed through to consumers), and (iii) liability regimes that prevent markets from substituting away from remediation duties.

Carbon taxes and cap-and-trade instruments also reflect different risk allocations under uncertainty. Weitzman's "prices vs quantities" framework shows that the welfare properties of price instruments versus quantity instruments depend on relative slopes and uncertainty of marginal abatement costs and damages; a rights-based framing alters this calculus by treating some harm levels as unacceptable irrespective of welfare tradeoff. Therefore, where environmental rights are interpreted as imposing non-negotiable minima (e.g., local air quality standards linked to health rights), quantity-based constraints with local non-attainment protections may be preferable to purely price-based instruments.

For PES, the design literature highlights that PES is a tool tailored to contexts where ecosystem services are underprovided due to externalities and where conditional payments can realign incentives. Engel–Pagiola–Wunder stress that effectiveness depends crucially on design and that PES is not a universal solution;[24] Wunder's earlier "nuts and bolts" similarly emphasizes definitional and implementation issues including conditionality,

[22] NEPA, 42 U.S.C. § 4321 (Congressional declaration of purpose).

[23] to Justice in Environmental Matters (Aarhus Convention) (1998).

[24] Stefanie Engel; Stefano Pagiola; Sven Wunder, "Designing Payments for Environmental Services in Theory and Practice: An Overview of the Issues" (2008) 65(4) Ecological Economics 663.

monitoring, and social effects . Within a rights-anchored model, PES must be designed to avoid dispossession, ensure free and informed participation, and coordinate with public trust

constraints on commons

Instrument comparison table

Instrument Type	Core Legal Structure	Main Advantage	Main Legal Risk	Rights-Anchored Safeguard
Command-and-control regulation	Statutory permits, standards, inspections, sanctions	Clear baseline control of pollution	Rigidity and uneven enforcement	Judicial oversight and constitutional rights review
Emissions Trading (ETS)	Legally fixed cap, tradable permits, monitoring and penalties	Cost-efficient pollution reduction	Weak caps and localized pollution hotspots	Ecological limits and local non-degradation safeguards
Carbon Taxes	Statutory tax rates, collection and revenue rules	Administrative simplicity and predictable pricing	Regressive impacts and political resistance	Revenue recycling and targeted rebates
Payments for Ecosystem Services (PES)	Contracts rewarding verified environmental services	Incentivizes conservation	Additionality failures and land conflicts	Equity safeguards, consent, and verification mechanisms

Jurisdictional outcomes table

Given the non-empirical methodological constraints of this paper, "outcomes" are treated descriptively and institutionally (design features and reported trends), rather than as causal estimates.

Jurisdiction	Market Instrument Example	Reported Trend / Claim	Rights & Accountability Link
EU	EU Emissions Trading System (ETS)	Verified emissions declines in the power sector since 2005	Treaty principles (precaution, polluter pays); Aarhus procedural rights
US	Acid Rain Program (SO_2 trading)	Major SO_2 reductions from 1980 levels through cap-and-trade	Citizen suits and judicial review mechanisms
India	PAT scheme (energy efficiency trading); coal cess	Tradable efficiency certificates and polluter-pays fiscal tool	Article 21 environmental rights and NGT remedies

Policy recommendations and legal reform proposals

The rights-anchored market governance model suggests reforms at three levels: constitutional/rights baseline articulation, market instrument design guardrails, and enforcement/institution building.

At the baseline level, jurisdictions should codify (in constitutional interpretation, legislation, or

authoritative policy instruments) a "minimum environmental quality baseline" and a "non-regression" orientation: regulatory changes and market designs should not authorize deterioration below health- and ecosystem-consistent floors. In India, the existing Article 21 jurisprudence provides a basis for such baselines, but statutory articulation could reduce reliance on case-by-case judicialization and improve administrative consistency . In the EU, Article 191 principles already supply a constitutional vocabulary, but operationalizing those principles in market instruments should be made more explicit (e.g., formal rights-compatibility assessments for trading reforms) . In the United States, where federal constitutional environmental rights are absent, statutory rights-based baselines could be strengthened through clearer environmental justice and health-protective constraints within market schemes, plus explicit recognition of public trust–style duties for specified commons in federal lands and waters governance (a proposal consistent with existing trust doctrine roots).[25]

At the market design level, emissions trading systems should incorporate rights-compatible design features: (i) caps aligned with environmental quality and climate obligations, (ii) strict MRV and penalty structures, (iii) hotspot protections through spatial constraints or complementary local standards, and (iv) clear legal statements that allowances are compliance instruments, not vested property rights. The EU ETS directive structure illustrates how markets are legally constituted; reforms should explicitly integrate treaty principles and procedural rights into trading governance. For carbon taxes, design literature emphasizes that base and revenue use shape both feasibility and fairness, suggesting that rights-anchored carbon pricing should include revenue recycling and targeted protections. Global evidence synthesis on carbon pricing suggests that carbon pricing instruments have proliferated and evolved, underscoring the need for rights-compatible design rather than simple adoption.[26] For PES, the design literature stresses conditionality and verification and warns against treating PES as a universal remedy; rights-anchored PES must incorporate tenure safeguards, consent, and distributive criteria.

At the enforcement and institution level, the principal recommendation is to treat MRV and enforcement as constitutional and rights-relevant infrastructure rather than minor administrative details. The credibility of cap-and-trade in the Acid Rain Program is inseparable from monitoring and compliance institutions described in program documentation . The U.S. citizen suit model demonstrates one pathway for strengthening enforcement outside agency discretion, a lesson that can inform other jurisdictions' design of public enforcement rights and access-to-justice mechanisms. India's tribunalization through the National Green Tribunal offers a different institutional pathway for strengthening remedies and enforcement of environmental legal rights .[27]

Conclusion

This paper has argued that "beyond command-and-control" should be conceptualized as institutional integration rather than replacement: market instruments are legally constituted by command choices, and rights-based environmental law supplies the normative and accountability architecture necessary to legitimate and constrain both command baselines and market tools. Comparative analysis of the European Union, India, and the United States supports the claim that governance effectiveness and legitimacy increase when rights-based baselines (constitutional rights, public trust duties, and human rights norms) are made operational in the design of market instruments through enforceable caps/standards, transparency and participation duties, and robust remedies.

The paper's rights-anchored market governance framework offers a structured way to integrate three policy families: command instruments for baseline-setting and enforcement; market instruments for cost-effective compliance and innovation; and rights-based doctrines for legitimacy, distributive justice, and intergenerational stewardship. The central reform implication is not that markets should expand unchecked, but that markets should be

[25] Illinois Central Railroad v Illinois, 146 U.S. 387 (1892) (public trust constraints on alienation).
[26] World Bank, State and Trends of Carbon Pricing 2020 (2020).
[27] Air (Prevention and Control of Pollution) Act, 1981 (India).

redesigned explicitly as subordinate compliance tools for rights fulfillment, subject to public trust constraints, procedural environmental rights, and non-regression commitments.

Limitations include the paper's non-empirical methodology and reliance on doctrinal and descriptive sources rather than primary causal evaluation; nonetheless, the framework aims to provide a rigorous legal-analytical basis for future empirical and policy work.

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