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NATURE'S BLACK MARKETS: HOW ENVIRONMENTAL CRIME UNDERMINES CLIMATE, CAPITAL, AND SUSTAINABLE DEVELOPMENT

Robert Muggah and Ilona Szabó de Carvalho

Environmental crime is a structural constraint

Environmental crime is a neglected structural constraint on sustainable development. Progress on protecting forests, oceans, and terrestrial ecosystems is badly off track. Yet standard explanations of financing gaps, weak institutions, and climate shocks capture only part of the problem. Environmental crime cuts across nearly every relevant goal but remains largely absent from Sustainable Development Goal (SDG) reviews, national reporting, and development strategies. This is not simply a matter for police and customs. Environmental crime is embedded in the political economies where development institutions operate. It weakens regulation, raises investment risk, and allows illegal commodities to undercut the incentives created by climate and biodiversity finance.

The chapter develops a three-tier account of the damage. Environmental crime first destroys ecosystems and contaminates food and water systems. It then corrodes governance as criminal actors use coercion and collusion to weaken oversight and launder proceeds. The damage ultimately reaches markets and public finance by undercutting compliant producers, deterring investment, and obstructing development goals. These effects occur together and reinforce one another. Strategies confined to interdiction and prosecution therefore underperform. A key recommendation is that enforcement be aligned with market governance and finance.

The chapter is divided into five sections. The first sets out the scale and structure of environmental crime and its links to illicit finance. The second distinguishes survival-driven illegality from organized criminal enterprise. The third explains how ecological damage travels through institutions, markets, and public finances. The fourth compares how these dynamics manifest across the Americas, Africa, Asia, and Europe. The final section proposes an integrated response agenda built around territorial de-risking, targeted deterrence, tighter market gates, and crime-sensitive finance.

The scale and structure of environmental crime

Environmental crime is best understood as a set of interlocking illicit markets that thrive where governance is weak, borders are porous, and commodity prices are high.¹ These include land grabbing and illegal logging, illicit mining including artisanal and small-scale gold mining and illegal industrial extraction, large-scale illegal, unreported, and unregulated (IUU) fishing, wildlife trade across both iconic and lesser-known species, and trade in waste and hazardous material.² Their proceeds mingle with corruption, fraud, and violence, with proceeds laundered through the formal economy, which is why they now appear more often in financial crime typologies and risk assessments.³ Environmental crime therefore acts simultaneously as an ecological driver of climate change and biodiversity loss and as a political-economic mechanism that corrodes state capacity and deters lawful investment in frontier jurisdictions.

The climate and biodiversity implications of environmental crime are immediate and measurable. In major tropical biomes, a large share of deforestation is illegal and linked to land grabbing, timber extraction, illicit mining, and illegalities related to agriculture and cattle ranching. Recent years have brought exceptionally high losses of humid tropical primary forest. Fires and land conversion have inflicted particularly severe damage in Amazonia, while agricultural clearing, charcoal production, and increasingly frequent fires are placing sustained pressure on the Congo Basin.⁴

These dynamics erode the conditions required to deliver forest protection commitments, biodiversity targets, and nationally determined contributions (NDCs). They also undermine the credibility of market-based and results-based climate finance by increasing uncertainty over permanence, leakage, and governance quality in high-risk jurisdictions. Environmental crime directly affects the bankability of climate and nature investments, especially where land tenure is contested and enforcement is inconsistent.

These markets survive because supply chains convert remote extraction into commodities that can be moved, financed, processed, and exported. Frontier extraction zones are connected to transport corridors, ports, and financial centers through mechanisms that are organized and central to how illicit value is created. This connectivity stabilizes and scales illicit rents while linking environmental crime to the formal economy through laundering and the use of legal corporate vehicles.⁵ In such settings, compliance becomes a competitive disadvantage, and development finance confronts risks that field enforcement alone cannot remove.

1 UNEP and INTERPOL (2016); UNODC (2024).

2 FATF (2021); Europol (2025a); Muggah and Szabó de Carvalho (2025).

3 FATF (2020; 2021); Waisbich et al. (2022b).

4 Goldman, Carter, and Sims (2025); Shapiro et al. (2023); Potapov et al. (2025).

5 FATF (2020; 2021).

The scale of illicit nature-harmful finance changes how environmental crime should be understood. A widely cited estimate placed annual criminal proceeds from environmental crime between \$110 billion and \$281 billion.⁶ The true figure may be higher, although the available estimates remain uncertain. Environmentally harmful subsidies are larger still. A 2022 assessment put them at no less than \$1.8 trillion annually across sectors ranging from fossil fuels and agriculture to transport and construction. An updated estimate put the total at roughly \$2.6 trillion in 2023 when other environmentally damaging activities were included.⁷

Environmental crime is therefore part of a wider incentive failure in global commodity and financial systems. It is the least governed and most extreme expression of a structural misalignment that formal finance has not yet corrected, and in some cases continues to reproduce through commodity lending, subsidies, and infrastructure investments that open frontier regions to extraction before governance systems can manage the resulting pressures.

Survival and enterprise

Environmental crime follows two overlapping logics that are frequently conflated in policy discourse. Survival-driven illegality occurs when people enter prohibited activities because lawful alternatives are absent or cannot meet basic needs.⁸ Enterprise-driven criminality is different: Organized networks deliberately exploit natural resources and governance failures to generate and launder illicit rents at scale.⁹ Both can lead to deforestation, depleted fisheries, and poisoned rivers, but they arise from different incentives. Treating them alike produces responses suited to neither.

Survival-driven illegality is widespread across frontier regions and often draws communities into illicit economies. A smallholder may clear protected forest because tenure is insecure and legal agriculture cannot absorb a failed season. An artisanal miner may use mercury because safer technologies and formalization support are unavailable.¹⁰ Fishers may ignore seasonal restrictions when legal catches no longer sustain a household.¹¹ In each case, illegality is situational rather than vocational. It is a rational response to structural conditions rather than an expression of criminal disposition. That distinction should determine whom policy targets and whether enforcement is likely to work.

Organized criminal networks systematically exploit survival-driven illegality. Networks recruit labor from economically marginal communities by offering cash advances and equipment together with protection unavailable from legal employers or public programs. They launder organized extraction through the cover of subsistence activity, deliberately blurring the boundary between community-level illegality and coordinated criminal enterprise.¹² Where livelihoods are tied to illegal economies, communities face strong incentives to withhold information from authorities and absorb enforcement risk on behalf of organizing actors. These mechanisms are central to the durability of illegal economies.

6 Nellemann et al. (2018), 15.

7 Koplow and Steenblik (2022), 6; (2024), 5.

8 Hübschle (2025).

9 van Uhm and Nijman (2022).

10 Ayambire et al. (2024); UNEP (2018; 2025).

11 See more information on fisheries in FAO (2024).

12 Waisbich et al. (2022b).

Interdiction that dismantles an organized network without altering the survival conditions sustaining participation usually displaces environmental crime rather than reducing it. When a logging operation is closed or a mining network disrupted, the underlying labor force and economic logic remain intact. Activity migrates to adjacent territories, and successor networks reconstitute. In many cases, the same actors resume operations once enforcement pressure recedes. This displacement or “balloon” effect is well documented across commodity frontiers and helps explain why intense enforcement often fails to produce durable reductions.¹³ Displacement is the predictable structural outcome of strategies that target organized supply without addressing the conditions that make illegal economies the rational choice for frontier communities.

Understanding the incentive environment that makes environmental crime durable matters for market governance. Due diligence regimes such as the EU Deforestation Regulation (EUDR) and traceability frameworks such as the Lacey Act are not extensions of enforcement into trade.¹⁴ They are attempts to correct a structural market failure in which formal finance and trade have long been complicit in nature-harmful outcomes. The implication for development practitioners and financiers is direct. Secure tenure, mining formalization, community fisheries management, and rural investment are not ancillary complements to an enforcement agenda. They are among the most powerful instruments available for altering the survival incentives on which organized environmental crime depends.

Measuring the impacts of environmental crime

The three-tier framework that follows distinguishes three categories of causal mechanism through which environmental crime damages development prospects: ecological damage, governance failure, and economic loss (see table 7.1). The layers operate simultaneously. Environmental crime can destroy an ecosystem, compromise the regulator meant to protect it, and distort the surrounding market at the same time. Addressing only one layer leaves the system that reproduces the harm largely intact.

FIRST-ORDER EFFECTS

First-order effects are ecological and climatic. Environmental crime accelerates the destruction of high-carbon forests, pollutes soils and waterways, and depletes marine resources through illegal extraction and pollution.¹⁵ Illegal land conversion and illegal logging reduce carbon sinks, increase land-use emissions, and weaken hydrological recycling that supports regional rainfall patterns. These processes increase susceptibility to fire and drought, triggering feedback loops that undermine ecosystem stability.¹⁶ In marine environments, illegal, unreported, and unregulated fishing reduces the resilience of fish stocks and disrupts trophic dynamics, while waste trafficking and pollution degrade coastal ecosystems that provide storm protection and carbon sequestration functions.

Forest-related crimes illustrate this with clarity. Where land grabbing and illegal logging enable rapid conversion, they generate a pathway from forest loss to emissions, weaker rainfall, and greater fire risk. Illegal conversion also tends to follow rather than precede the licit financial signals—roads, credit, and land speculation—that open frontier

13 UNODC (2024).

14 European Commission (2025); Lacey Act (1981; 2008).

15 UNODC (2024); UNEP and INTERPOL (2016).

16 Bernstein and Muggah (2025); Muggah (2022).

regions to extraction. Enforcement strategies that target illegal activity while leaving this illicit financial infrastructure intact address the margin of the problem, not its structural roots.

Illicit mining and toxic pollution illustrate another pathway for first-order harm. Mercury from artisanal and small-scale gold mining bioaccumulates through aquatic food webs, exposing miners and riverine communities while degrading biodiversity in watersheds that are often central to nature-based climate solutions.¹⁷ The result is a degradation of ecosystem services on which livelihoods and public revenues depend. In many emerging market and developing economies, artisanal mining, fisheries, and forest industries are macro-critical sectors. Where illegal extraction dominates, royalties go uncollected, export revenues are laundered offshore, and governments inherit the health and remediation costs that illegal operators externalize onto frontier communities. Wildlife trafficking compounds these harms by removing keystone species and weakening ecosystem resilience.¹⁸

SECOND-ORDER EFFECTS

Second-order effects operate through governance and institutional integrity. Illicit timber, gold, land conversion, and waste schemes depend on bribery, intimidation, fraudulent permits, and corporate fronts to launder proceeds and insulate organizers from accountability.¹⁹ These dynamics weaken regulators and courts, compromise licensing, and reduce the chance that monitoring signals will translate into successful prosecutions. They also increase risks to environmental defenders and community leaders, shrinking civic space in precisely those territories where enforcement and community governance are most needed.²⁰

The Amazon Basin illustrates how these second-order impacts manifest on the ground. Frontier extraction is embedded in broader logistical and financial ecosystems that connect forest edges to processing hubs, export corridors, and finance nodes.²¹ Decisive leverage sits at chokepoints such as mills, ports, traders, and financiers, rather than only at the forest edge, which helps explain why site-level enforcement so often fails to produce durable results.²² Proceeds from environmental crime move through the same channels used for fraud and narcotics, making this a financial integrity and rule-of-law challenge as much as an environmental compliance issue.²³

THIRD-ORDER EFFECTS

Third-order effects extend into markets and public finance. Illicit commodity supplies undercut compliant producers, distort prices, and raise jurisdictional risk, deterring long-term capital and raising the cost of finance for legitimate firms in frontier territories.²⁴ The result includes fewer formal jobs, weaker value chains, and less public revenue. Land grabbing and illegal conversion also affect food security by displacing communities and degrading the land, water, and ecosystem services that underpin agricultural productivity.

17 UNEP (2018; 2025).

18 UNODC (2024).

19 FATF (2020; 2021); Igarapé Institute (2026).

20 Global Witness (2025).

21 Nobre, Muggah and Szabó de Carvalho (2026).

22 Igarapé Institute (2024; 2026).

23 FATF (2020; 2021).

24 World Bank (2019).

Environmental crime lowers the ceiling on what development finance can achieve, even when climate and biodiversity projects are technically sound. Blended finance may crowd in private capital, but it cannot by itself correct markets where illicit supply makes compliance uncompetitive. The damage is therefore larger than an environmental externality: It distorts markets and weakens institutions, redirecting development trajectories in ways that aggregate fiscal data rarely capture.

The fiscal consequences extend well beyond damage to the investment climate. In several resource-rich economies, illegal or informal extraction supplies a substantial share of nationally important export industries and sustains entire local commercial ecosystems. Estimates suggest that illegal gold production in Peru has approached the scale of legal output, that artisanal and small-scale mining supplies roughly 40% of Ghana's gold, and that illicit production may account for most Colombian gold.²⁵ In the Solomon Islands, a logging industry marked by widespread illegality has at times generated about 70% of goods exports and supported a significant share of employment.²⁶

Much of this production escapes royalties and payroll contributions, although some is laundered through formal exporters and may generate limited customs or tax receipts. Governments meanwhile absorb the costs of enforcement and environmental restoration, together with damaged infrastructure. The resulting loss is therefore twofold: foregone revenue from resources that should contribute to the public budget and additional expenditure to repair the harms created by their extraction. In mineral-rich and forest-rich developing economies, this can materially weaken the domestic revenue base available for public services and social protection.

The destruction of natural assets deepens the fiscal damage by eroding the productive base from which future revenues flow. Fisheries pushed beyond recovery thresholds stop generating license fees or export earnings. Cleared forests lose their capacity to support concession income or emerging payments for carbon and ecosystem services. Mercury-contaminated soils and waterways can remain impaired for decades. For sovereign borrowers in the Amazon Basin, Congo Basin, and coastal West Africa, environmental loss becomes fiscal loss.²⁷ It can durably reduce the productive asset base that underpins fiscal resilience and debt serviceability. Development finance institutions that ignore the pace of natural-asset liquidation risk understating sovereign vulnerability in precisely the jurisdictions where their exposure is greatest.

25 Chin et al. (2026); Akeliwira (2026); OAS (2022).

26 Cruz and Tozaka (2023).

27 Agarwala et al. (2026).

TABLE 7.1

Impacts of environmental crime on SDGs

Impacts	Mechanism	Measurable indicators
First-order	Illegal land conversion, logging, artisanal and small-scale gold mining (ASGM) mercury releases, wildlife trafficking, illegal, unreported, and unregulated (IUU) fishing, waste dumping	Hectares of tree cover loss and primary forest loss per year; fire-linked loss share; CO ₂ emissions from land-use change; river mercury concentrations; number of keystone species poached or seized; fish stock status and IUU share of catch; volume of hazardous waste intercepted
Second-order	Corruption, intimidation, permit fraud, money laundering, institutional or state capture, criminal use of corporate fronts	Number of corruption cases and asset freezes; beneficial ownership disclosures for high-risk firms; suspicious activity reports linked to timber, gold, wildlife, waste; joint operations and prosecutions; protection for whistleblowers and environmental defenders; time to adjudicate eco-crime cases
Third-order	Price undercutting by illicit supply, capital flight from frontier regions, higher risk premiums, disrupted value chains	Private investment volume in forest and coastal jurisdictions; cost of capital spread for compliant producers; formal job creation in bioeconomy and legal fisheries; share of procurement and lending using geolocation and traceability; Taskforce on Nature-related Financial Disclosures (TNFD) adoption; coverage of material sites

SOURCE: Authors' own compilation.

The geography of environmental crime

THE AMERICAS

The impact framework developed above finds its most acute expression in the Americas, where environmental crime has undergone a structural transformation over the past decade. It has shifted from opportunistic extraction toward the deliberate integration of illicit natural-resource economies into broader organized-crime portfolios.²⁸ Criminal networks once associated primarily with drug trafficking have diversified into illegal logging, gold mining, and land grabbing, attracted by high commodity prices, lower enforcement risk, and the ease with which natural-resource revenues can be laundered through land and commodity markets. The convergence of drug trafficking organizations and environmental crime networks is now well documented in Brazil, Colombia, Peru, and Venezuela, where the same corridors, financial intermediaries, and political protection structures serve multiple illicit markets simultaneously.²⁹ This changes the policy diagnosis. In the Americas, environmental crime is increasingly an organized criminal economy that requires disruption strategies calibrated to networked, adaptive adversaries.

First-order impacts are severe and compounding. Forest crime accelerates land conversion and degrades high-carbon ecosystems central to climate stability, contributing directly to record tropical primary-forest loss in Amazonia in recent years.³⁰ Illegal gold mining generates elevated mercury concentrations in sediments and fish across impacted river systems, linking illicit extraction to biodiversity loss, food-web contamination, and the degradation of watersheds central to nature-based climate solutions.³¹ These harms are reproduced through durable networked systems that connect remote frontiers to national and international markets, making first-order damage spatially extensive and structurally persistent.³²

Second-order harms follow from the political protection and institutional capture on which these markets depend. Illegal operations rely on falsified documentation, corruption, coercion, and the co-optation of local regulatory and judicial structures to insulate organizers from accountability.³³ The result is a governance environment in which legal firms face higher compliance costs and higher risks, while illegal firms externalize costs and use bribery or violence to protect rents. Environmental defenders and community leaders operate under sustained threat in precisely the territories where enforcement and community governance are most needed, and where development finance most needs them to function.

Third-order effects become visible as illicit supply chains reach consumer markets and financial centers. Investigative reporting has traced allegedly illegal timber from Pará through laundering mechanisms to buyers in the European Union and the United States, illustrating how frontier illegality is monetized through global trade channels and how third-order market distortions connect directly to consumption economies.³⁴ Multilateral development banks and regional lenders have expanded blended finance and technical assistance tools aimed at frontier investment constraints, while jurisdictional forest carbon approaches are testing results-based payments designed to shift

28 Muggah (2025b); Muggah, Abdenur, and Szabó de Carvalho (2019); Waisbich et al. (2022b).

29 Muggah (2023).

30 Goldman, Carter, and Sims (2025).

31 Risso et al. (2021).

32 Waisbich et al. (2022a).

33 FATF (2020; 2021).

34 EIA (2025).

incentives at scale.³⁵ Enforcement can disrupt flows. But durable progress requires territorial de-risking through tenure security, transparent permitting, and viable legal livelihoods—conditions that organized crime actively works to prevent from taking hold.

AFRICA

Africa's environmental crime challenge is shaped by the interaction of fragile institutions, fiscal leakage, and survival-driven illegality at scale. The distinction between subsistence and enterprise matters especially where state capacity is thin and public budgets are already constrained. Illegal extraction in mining, forestry, and fisheries can leave a large hole in the revenue base while shifting remediation, security, and health costs onto government.³⁶ The first-, second-, and third-order consequences are mutually reinforcing and collectively undermine food security, public revenues, and coastal livelihoods across the continent.

First-order impacts are most visible in fisheries depletion and ecosystem degradation. West Africa is a major and persistent hotspot for IUU fishing, with weaknesses in monitoring, control, and surveillance, and transshipment practices carrying serious implications for fish stock resilience and the food systems coastal communities depend on.³⁷ Wildlife trafficking compounds these ecological harms. For example, sustained pressure on species such as pangolins and elephants removes keystone species from ecosystems already under stress from land conversion and climate variability, making landscapes less able to absorb shocks and recover from droughts, fires, and floods.³⁸ Illegal extraction of gold and a growing range of critical energy transition minerals introduces mercury and other contaminants into watersheds, degrading the ecosystem services on which livelihoods and public revenue depend.³⁹

Much of this first-order damage is generated by structural constraint rather than criminal intent. Artisanal miners in the Democratic Republic of Congo, Mali, and Zimbabwe engage in unlicensed extraction because formal tenure and licensing systems are inaccessible, prohibitively costly, or captured by elites who exclude small operators.⁴⁰ Farming communities clear protected land at forest edges because tenure insecurity, failed seasons, and the absence of viable legal livelihoods leave no credible alternative.⁴¹ Fishing communities in West Africa exceed catch limits or operate in restricted zones because industrial-scale illegal fishing has already degraded the legal economy they once depended on.⁴² These actors are embedded in illegal economies by structural condition, not criminal vocation.

That distinction has direct consequences for the design of conservation finance instruments. The Tropical Forest Forever Facility (TFFF), the LEAF Coalition, and jurisdictional Reducing Emissions from Deforestation and Forest Degradation (REDD+) programs all need credible institutions that connect performance payments to action on the ground.⁴³ LEAF and other jurisdictional REDD+ mechanisms explicitly require safeguards, participation, benefit

35 World Bank (2019); ART (2024a); LEAF Coalition and Emergent (2023a; 2025).

36 World Bank (2019); UNODC (2024).

37 Doumbouya et al. (2017).

38 UNODC (2024).

39 UNODC (2025).

40 Ngwerume and Muchemwa (2025).

41 Robinson, Holland, and Naughton-Treves (2011).

42 Environmental Justice Foundation (2017).

43 See more on the Tropical Forest Forever Facility at <https://tfff.earth/about-tfff>; see more on the LEAF Coalition at <https://www.leafcoalition.org/home>; see more on REDD+ at <https://unfccc.int/topics/land-use/workstreams/redd/what-is-redd>.

sharing, and respect for tenure rights, whereas the TFFF's legitimacy and durability depend on channeling benefits to Indigenous Peoples and local communities. Where illegal activity is rooted in survival, finance that ignores those incentives may displace people, produce paper compliance, and weaken claims of additionality or permanence.

Second-order harms arise where organized networks layer onto survival-driven illegality. Where port controls are weak, inspection regimes are under-resourced, and political protection is purchasable, wildlife traffickers normalize bribery and permit fraud, weakening oversight across entire regulatory systems.⁴⁴ Illicit wildlife, extractives, and other criminal markets intersect with drugs and human smuggling across East and Southern African corridors and hubs, increasing the probability of violence and institutional capture.⁴⁵

Third-order impacts follow as illicit extraction siphons value offshore, destabilizes legal commodity markets, and reduces fiscal space for development investment. The fiscal resilience implication is direct and politically significant. As illegal economies reproduce themselves within the revenue base of already fragile states, they reinforce the conditions for continued crime and constrained public investment.⁴⁶ For development finance institutions operating in these jurisdictions, fiscal leakage is not a background condition to be noted and set aside. It is a primary constraint on the governance quality and investment returns on which their instruments depend.

ASIA

Asia's role in environmental crime is shaped by end-market demand and the laundering of commodities through dense manufacturing, shipping, and trade-finance systems. Wildlife products, luxury timber, seafood, and minerals extracted illegally in Asia and elsewhere can be processed, repackaged, and sold into formal supply chains with relative ease.⁴⁷ Border control alone cannot solve this. The deeper problem is persistent consumer and industrial demand for commodities whose provenance regulators and buyers do not consistently verify. In this sense, Asia sits at the downstream end of supply chains whose upstream harms have been documented in the preceding sections.

First-order ecological harms are extensive and varied. High-value timbers remain central to trafficking flows, while significant Asian demand and transit roles across multiple wildlife taxa contribute to biodiversity loss in producer regions across Southeast Asia, Africa, and the Americas.⁴⁸ Illegal sand mining adds a further under-governed dimension, generating riverbank erosion, habitat degradation, and community displacement in support of construction booms rarely subject to provenance scrutiny.⁴⁹ Artisanal and small-scale gold mining hotspots in parts of Indonesia and the Philippines introduce mercury into stressed watersheds, with bioaccumulation risks that degrade ecosystem services and compromise food security for riverine communities.⁵⁰ Regional fisheries remain under severe pressure, with repeated calls for stronger monitoring, control, and surveillance reflecting the persistent gap between regulatory ambition and enforcement capacity.⁵¹

44 FATF (2020; 2021).

45 Global Initiative Against Transnational Organized Crime (2025); UNODC (2025).

46 World Bank (2019).

47 UNODC (2024); FATF (2021).

48 UNODC (2024).

49 UNEP (2019).

50 UNEP (2018).

51 Saraphaivanich, Suthipol, and Imsamrarn (2024); Yleaña and Velasco (2012).

Second-order harms operate through the laundering mechanisms that are among Asia's most distinctive contributions to global environmental crime. Illegal commodities enter legitimate trade flows at sawmills, fish processing facilities, refining operations, and trade finance channels that provide the documentary cover required for cross-border movement.⁵² This deliberately obscures provenance, weakens regulatory oversight, normalizes document fraud, and erodes the credibility of certification systems that markets and financiers rely on to distinguish legal from illegal supply. Where these second-order governance harms are entrenched, the cost of compliance rises for legitimate producers while the returns to laundering remain high, a dynamic that persistently concentrates market share in the hands of actors willing to falsify provenance.

Third-order consequences extend through the same supply chains into consumer markets and investment portfolios. Illicit timber, fish, and minerals undercut compliant producers and increase trade disruption risks for firms exposed to due-diligence regimes and buyer requirements. Where illegal extraction dominates macro-critical sectors, royalties go uncollected, and export revenues are misdeclared, constraining domestic resource mobilization in the jurisdictions that need it most. The region's growing share of Taskforce on Nature-related Financial Disclosures (TNFD) early adopters suggests increasing recognition among financial institutions that nature-related risks and illicit exposure are financially material.⁵³ Adopter status, however, reflects a disclosure commitment rather than proof of implementation quality or full site-level coverage.⁵⁴ Nevertheless, if sustained, this shift could raise the reputational and regulatory cost of association with unverified provenance and begin to alter the incentive conditions that make supply chain laundering so durable.

EUROPE

Europe lies at the consumption end of the supply chains whose ecological costs have been documented across the Americas, Africa, and Asia. It is therefore both part of the problem and a potentially decisive market gate. European demand for soy, palm oil, cocoa, cattle, timber, seafood, and increasingly critical minerals has often absorbed illegally sourced or nature-harmful production without systematic provenance checks. The financial flows that supported that production, and the trade infrastructure that moved it, operated within the formal European economy. That history matters for designing future policy. The EUDR and related due-diligence rules mark a significant change because they move responsibility upstream from the border to the operator placing goods on the market.

The first-order ecological consequences of European consumption-side complicity are felt primarily in producer regions rather than on European territory. European demand for agricultural commodities has been materially connected to tropical deforestation in the Amazon, the Congo Basin, and Southeast Asia, contributing to primary forest loss that directly undermines climate mitigation, biodiversity commitments, and the hydrological stability on which regional agriculture depends.⁵⁵ At home, waste trafficking illustrates a domestically generated dimension of first-order harm. Organized networks exploit cross-border loopholes and legal business structures to move hazardous waste across jurisdictions, externalizing disposal costs onto communities and ecosystems.⁵⁶ A Europol-supported operation in Croatia in February 2025 targeted a network suspected of illegally disposing of 35,000 metric tons of

⁵² APG (2023); FATF (2020; 2021); EIA (2019; 2017).

⁵³ See more on TNFD adopters at <https://tnfd.global/engage/tnfd-adopters/tnfd-adopters-list/>.

⁵⁴ TNFD (2024).

⁵⁵ Pendrill et al. (2019).

⁵⁶ Europol (2025a).

hazardous waste imported across borders, illustrating precisely how legal logistics infrastructure is repurposed for environmental crime when regulatory arbitrage creates the opportunity.⁵⁷

Second-order governance harms in Europe manifest differently from how they do in frontier regions but are analytically equivalent. The use of corporate fronts, document fraud, and regulatory arbitrage to move illegal commodities and hazardous waste through European markets corrodes the integrity of customs, certification, and financial oversight systems on which the single market depends.⁵⁸ Financial crime units across European countries have increasingly incorporated environmental commodity typologies, reflecting the finding by the Financial Action Task Force (FATF) that proceeds from environmental crime move through the same channels as fraud and narcotics.⁵⁹ The mechanism of using legal business structures to externalize costs and obscure provenance is the same political economy of regulatory arbitrage visible in Asia's supply chain laundering and the Americas' frontier extraction. The geography changes, but the logic does not.

Third-order consequences follow through supply chains and investment portfolios. Where European trade and finance have persistently failed to distinguish legal from illegal provenance, compliant producers in frontier jurisdictions have faced a structural competitive disadvantage, investment in legal alternatives has been suppressed, and the fiscal and governance conditions in producer countries have been weakened by the demand pull that European markets helped create. Tightening market access standards through the EUDR and related instruments can shift those dynamics. Regulation (EU) 2025/2650 postponed full application to December 2026 for large operators and June 2027 for small enterprises, meaning the practical test of these instruments lies immediately ahead.⁶⁰ Europe's most consequential contribution to reducing global environmental crime lies in market access discipline, alongside enforcement assistance to producer countries. Rigorous implementation of demand-side measures can close the market access that makes environmental crime globally profitable.

Uneven progress

Environmental crime takes different forms across regions, but familiar conditions recur: weak governance, fiscal leakage, and demand that ignores provenance. International responses have addressed only fragments of this system. Despite growing awareness, environmental crime remains marginal to the mainstream SDG agenda and is seldom treated in national reporting as a cross-cutting constraint. Multilateral engagement has grown over the past decade, yet it remains partial and uneven. Environmental crime is still frequently treated as a specialized enforcement domain rather than as a structural driver of governance degradation, illicit financial flows, and investment deterrence that shapes development trajectories.⁶¹

Normative progress is also moving through the U.N. crime prevention system. In 2021, U.N. General Assembly resolution 76/185 recognized that the U.N. Transnational Organized Crime Convention (UNTOC) and the U.N. Convention Against Corruption (UNCAC) can be used to combat environmental crimes and the corruption that enables

57 Europol (2025b).

58 FATF (2020; 2021).

59 FATF (2021).

60 Regulation (EU) 2025/2650 (2025).

61 Muggah (2025d; 2026); Scanlon and Motamayor (2026).

them.⁶² This matters because it shifts the response beyond environmental cooperation alone and toward tools with greater deterrent value, including mutual legal assistance, asset recovery, and financial investigation. Momentum has continued under UNTOC. In October 2024, Parties adopted Resolution 12/4, asking UNODC to convene an expert group to assess how the Convention applies to crimes that affect the environment, identify legal gaps, and consider options including a possible protocol.⁶³ Sessions held in mid-2025 and early 2026 suggest growing political attention and a pathway toward stronger international cooperation.⁶⁴ Civil society and expert legal networks are also helping turn legal debates over definitions, liability, and jurisdiction into practical options for governments.

Operational cooperation has also intensified through law enforcement coalitions and intergovernmental bodies. Coordinated operations jointly led by INTERPOL and the World Customs Organization have become major vehicles for synchronized action. For example, Operation Thunder resulted in the seizure of close to 20,000 live animals and the arrest of 365 suspects through coordinated action from customs, police, and wildlife authorities across 138 countries and regions.⁶⁵ The significance lies in the institutionalization of intelligence sharing and multi-agency coordination across dozens of jurisdictions, capabilities that compound over time when properly resourced.

Since a regional agreement in Belém in 2023, there has been a steady stream of police operations targeting environmental crime across Latin America.⁶⁶ Operation Madre Tierra VII involved hundreds of arrests and seizures spanning logging, mining, wildlife trafficking, and pollution across Latin America, reinforcing the inference that environmental crime is a networked set of markets most efficiently degraded by targeting chokepoints rather than dispersed field operations.⁶⁷ Similar dynamics are visible in Europe through Europol-supported coordination and the EU EMPACT framework, where waste and pollution crime have been elevated as priority organized crime threats.⁶⁸ Cooperation has improved while remaining uneven across regions and commodities, constrained by legal gaps, limited investigative capacity, and weak financial investigations.

Market access has tightened significantly through due diligence and traceability requirements. The EUDR, the U.K. forest risk commodity approach, and the U.S. Lacey Act framework are emblematic of demand-side strategies intended to reduce facilitation of illegal conversion and laundering by requiring operators to demonstrate legality and provenance.⁶⁹ These regimes do not substitute for enforcement on the ground, but they alter incentives along supply chains, particularly when paired with customs targeting and satellite-based monitoring. Their effectiveness depends on implementation capacity and on whether compliance pathways are accessible to small and medium enterprises and smallholders.

Traceability-based enforcement has expanded beyond forests into waste and climate-relevant pollutants. Specifically, the World Customs Organization's Operation DEMETER XI illustrates the use of customs-led interventions to intercept illegal shipments of hazardous waste and illicit trade in ozone-depleting substances and hydrofluorocarbons, including cases involving misdeclaration and concealment.⁷⁰ States increasingly combine trade data and

62 Muggah (2025b; 2026); U.N. General Assembly (2021).

63 Conference of the Parties to the United Nations Convention against Transnational Organized Crime (2024).

64 Muggah (2025c; 2026); UNODC (2026).

65 Interpol (2025a).

66 Muggah (2024a; 2024b).

67 Muggah (2026); Interpol (2025b).

68 See more on the EU EMPACT at https://home-affairs.ec.europa.eu/policies/internal-security/law-enforcement-cooperation/empact-fighting-crime-together_en.

69 Barclay (2023).

70 World Customs Organization (2026).

customs risk engines with field patrols to identify high-yield chokepoints, an approach with direct spillover benefits for climate objectives where illegal trade includes climate-forcing substances.

Financial and integrity-based approaches have expanded markedly, shaped by FATF typologies and a growing emphasis on beneficial ownership transparency. Following the money remains the highest-leverage strategy for identifying networks and stripping illicit profits, while beneficial ownership transparency reduces the use of anonymous corporate vehicles that facilitate laundering across timber, gold, waste, and wildlife supply chains.⁷¹ The U.S. Department of the Treasury's Amazon Region Initiative Against Illicit Finance, launched in 2024, offered a prototype for linking finance and enforcement through training and information sharing among Amazon countries.⁷² Beyond political disruption in the U.S. since 2025, persistent constraints include uneven capacity and the failure to turn intelligence into prosecutions.

Civil society and research networks have become increasingly central to this ecosystem. Mapping and investigative journalism provide actionable intelligence that helps banks, buyers, and prosecutors identify priority nodes and typologies. In the Amazon, cartography of environmental crime networks provides the evidentiary foundation for financial investigations and targeted enforcement.⁷³ In Africa, corridor mapping identifies convergence among wildlife trafficking, extractives, and other illicit markets, enabling multi-benefit intervention designs.⁷⁴ These networks do not replace state capacity. But they increasingly provide the information and public pressure that make enforcement more precise and impunity harder to sustain.

A policy agenda that accounts for environmental crime

Effective responses to environmental crime require simultaneous action across several interconnected fronts. No single instrument can shift the system on its own. Enforcement without structural alternatives displaces criminal activity rather than ending it. Finance without integrity allows illicit proceeds to sustain the networks that enforcement is trying to dismantle. Development investment without market reform leaves compliant producers at a persistent competitive disadvantage. The agenda below is therefore organized around one practical test: whether it makes lawful activity more attractive than illegal extraction for communities, firms, and governments.

DE-RISK TERRITORIES

Narrow place-based enforcement rarely works where illegal economies are sustained by insecure tenure, weak state presence, and laundering channels. Criminals fill governance vacuums the state has not closed and offer economic returns that legal alternatives cannot yet match. A more effective strategy is territorial de-risking that includes deliberately reducing the conditions that make illegal activity more attractive or less risky than legal alternatives. This means treating tenure reform, public services, and formalization as the core of the prevention architecture itself.⁷⁵

⁷¹ Igarapé Institute (2023).

⁷² U.S. Department of the Treasury (2024).

⁷³ Waisbich et al. (2022a).

⁷⁴ Global Initiative Against Transnational Organized Crime (2025).

⁷⁵ FATF (2020); ART (2024a).

Territorial de-risking should create predictable lawful returns through secure tenure and community enterprises that reward stewardship. Jurisdictional carbon and nature finance can reinforce those returns when safeguards are credible and benefits reach the people whose land-use decisions matter.⁷⁶ Public services and connective infrastructure reduce dependence on illicit patronage. Financial controls must then close the channels through which commodities and proceeds are laundered.⁷⁷ TNFD-aligned disclosure can reinforce this architecture by making nature loss and exposure to environmental risk financially material to boards and lenders.⁷⁸

UPGRADE DETERRENCE WHERE IT COUNTS

Scarce enforcement capacity should be concentrated where it can raise costs sharply and disrupt the greatest volume of criminal activity. The highest-leverage points are usually not the forest edge or the fishing ground. They are along transport corridors, at mills and refineries, in ports and export terminals, in trade finance channels, and at the corporate and beneficial ownership nodes that conceal the organizers who profit most and risk least. Governments and enforcement agencies should invest in fusing satellite alerts, customs anomalies, and suspicious transactions into integrated prosecutable strategies rather than operating them as parallel information systems that never connect. The gap lies in converting intelligence into cases, asset freezes, and sanctions that reduce expected profitability for criminal networks.

International cooperation is indispensable to this agenda. This is because supply chains span producer, transit, and consumer countries that no single jurisdiction can police alone. Governments should prioritize joint intelligence, coordinated targeting, and cross-border prosecution. Operation Green Shield in mid-2025 mobilized more than 1,500 officers across Brazil, Colombia, Ecuador, and Peru, generating arrests, asset seizures, and recoveries across fuels, minerals, and wildlife—demonstrating that coordinated targeting can degrade multi-crime ecosystems rather than simply displacing activity from one jurisdiction to the next.⁷⁹

In Africa and Asia, INTERPOL and World Customs Organization operations such as Operation Thunder show what synchronized border and inland checks can achieve when intelligence is shared in real time. In Europe, joint investigations supported through Europol and EMPACT are the necessary model for tackling waste trafficking networks that exploit legal logistics infrastructure across multiple jurisdictions.⁸⁰ Chokepoint enforcement, asset recovery, and financial disruption can reduce the expected returns to environmental crime more effectively than dispersed field operations.

EMBED CRIME-SENSITIVE CLIMATE AND NATURE FINANCE

Development financiers are exposed to environmental crime through the jurisdictions and commodity systems in which they operate. Their instruments can either reinforce or undermine the conditions that make legal economies competitive. Environmental crime exposure should therefore be incorporated into project appraisal and lending conditions rather than treated as a reputational risk to be managed at the margins. Concrete tools are available. For example, integrity covenants can tie disbursement to measurable governance milestones such as land titling, mer-

76 ART (2024a); LEAF Coalition and Emergent (2023a; 2025).

77 FATF (2020).

78 TNFD (2023; 2024).

79 Muggah (2025d).

80 Europol (2025b).

cury phase-out, or fisheries monitoring. Beneficial ownership screening can be applied to counterparties in high-risk commodity sectors. Nature-related risk disclosure aligned with TNFD recommendations can make environmental crime exposure legible to boards and investors in ways that current reporting frameworks do not require. This would prevent development finance from operating blind to one of the structural conditions most likely to erode project viability and long-run returns.

The financial integrity dimension of this agenda deserves particular emphasis. Environmental crime proceeds move through the banking, trade finance, and corporate structures on which development finance institutions also rely. Institutions providing commodity-backed lending or sovereign budget support in high-exposure jurisdictions without adequate anti-money laundering controls and provenance checks are materially exposed to illicit financial flows whether or not they recognize it. The Amazon Region Initiative Against Illicit Finance, launched by the U.S. Treasury in 2024, offered a prototype for aligning finance and enforcement through training, intelligence sharing, and strengthened prosecutorial support.⁸¹ That model could be adapted and scaled across other high-risk basins and commodity systems. Development finance institutions that lead on this agenda can reduce their own exposure while helping close the financial infrastructure that makes environmental crime at scale economically rational.

SCALE JURISDICTIONAL REWARDS

Changing land-use behavior at scale requires making legal stewardship more financially attractive than illegal extraction. Jurisdictional climate finance is one of the few mechanisms designed to shift incentives across entire landscapes. ART TREES (Architecture for REDD+ Transactions (ART) and its standard, the REDD+ Environmental Excellence Standard (TREES)) and LEAF Coalition results-based payments pay sovereign and subnational governments for verified reductions in deforestation and forest degradation, combining program-level integrity with advance payment mechanisms that fund the monitoring and governance systems that results-based systems require.⁸² Where they work, they create a direct financial incentive for governments to reduce illegal economies operating within their territories, align community interests with conservation, and generate public revenue that does not depend on extraction. That is precisely the incentive realignment that enforcement alone cannot achieve.

That potential depends on reforms often treated as secondary. Communities need enforceable tenure rights. Anti-corruption controls must prevent criminal capture, while independent monitoring gives buyers confidence. Benefit sharing must be transparent enough to ensure that financial rewards reach the communities whose land-use decisions determine outcomes on the ground rather than disappear through intermediaries.⁸³ Development finance institutions should make these conditions part of financing agreements, not leave them as aspirations.

TIGHTEN MARKET GATES AND TRACEABILITY

Demand-side measures matter because they function as trade controls and because they represent a structural correction to commodity markets. Formal commodity markets have long absorbed illegally sourced and nature-harmful production without systematic provenance verification, while the financial flows supporting that production operated within the formal economy. The EUDR, the UK forest risk commodity framework, and the Lacey Act are all attempts to correct decades of commodity lending and trade finance that rewarded expansion without requiring

81 Muggah (2024a); U.S. Department of the Treasury (2024).

82 ART (2024a); LEAF Coalition and Emergent (2023a; 2023b; 2025).

83 UNODC (2024).

producers to demonstrate legality or low-deforestation provenance. Governments and development finance institutions should treat these instruments as the most significant structural correction to commodity market incentives currently in force and push to extend their ambition to critical minerals, seafood, and livestock supply chains where provenance verification remains weak or absent.

Implementation will determine whether this agenda succeeds. Traceability systems and customs risk engines must let smallholders and smaller firms prove compliance without pricing them out of the market. Where the necessary infrastructure is weak, development finance institutions should help build it rather than assume that regulation will conjure it into existence. Traceability must also reach hazardous waste, ozone-depleting substances, and fluorinated greenhouse gases, where concealment and false declarations remain common.⁸⁴ The goal is a trading and finance system in which illegal or unverified provenance raises cost and risk for the operator rather than being absorbed invisibly into global supply chains at the expense of ecosystems, public revenue, and compliant producers.

SHARPEN THE FIGHT AGAINST MERCURY AND IUU FISHING

Artisanal and small-scale gold mining is among the world's largest sources of mercury pollution and one of the most entrenched forms of survival-driven illegality across the Amazon, West Africa, and Southeast Asia. Addressing it requires a development response alongside enforcement. Governments should accelerate Minamata-aligned national action plans that phase out mercury, formalize miners, and open access to safer extraction technologies and legal buyers.⁸⁵ Formalization reduces toxic emissions and can sever the supply chain relationships through which criminal networks provide mercury, purchase gold, and launder the proceeds through refining and export operations.⁸⁶ Development finance institutions could fund formalization programs as financial integrity investments as much as environmental ones and support the treatment of illegal mining operations as organized criminal enterprises subject to financial investigation as well as field enforcement.

IUU fishing imposes comparable ecological and fiscal damage in coastal economies where fisheries are macro-critical sectors and monitoring capacity is chronically under-resourced. Full implementation of the Agreement on Port State Measures (PSMA)⁸⁷ would significantly raise expected costs for illegal fishing operations at the point where they are most vulnerable. Strengthened monitoring and surveillance systems should be treated as sovereign fiscal investments rather than donor-funded technical assistance, given the royalty and export revenue at stake.⁸⁸ West Africa is an urgent priority because chronic governance gaps, industrial-scale foreign illegal fishing, and the displacement of small-scale livelihoods produce ecological, institutional, and fiscal harms at once. Development finance institutions should make fisheries monitoring capacity a standard component of blue economy lending and budget support conditionality.

84 European Union (2024); European Anti-Fraud Office (2025).

85 UNEP (2025).

86 UNEP (2018; 2025); Muggah (2025a).

87 See more on PSMA at <https://www.fao.org/port-state-measures/en/>.

88 FAO (2024); World Bank (2019).

A diagnostic imperative

Environmental crime is a structural constraint on climate action and development because its damage does not stop at the ecosystem. It corrodes institutions, distorts markets, weakens sovereign revenues, and reduces the returns to lawful investment. Criminal networks do not generate these harms alone. They emerge from a continuum of incentive failures in which harmful subsidies, poorly sequenced infrastructure, and commodity finance that ignores provenance create the conditions that illegal activity then exploits. A financial system still unable to exclude illicit proceeds then keeps that activity profitable.

A credible response must connect instruments that are too often applied to separate problems. Each element depends on the others to function. Enforcement works best at chokepoints, backed by financial investigation and asset recovery. Market reform works when due diligence and customs controls lower the value of unverifiable supply. Development policy works when tenure, formalization, and public services reduce dependence on illegal economies. Financial integrity binds the system together. Without it, illegal proceeds keep flowing, political protection can still be bought, and illegal extraction remains profitable whatever happens at the forest edge, the fishing ground, or the mine site.

For the development community, the central task is diagnostic. Environmental crime is a political-economy problem rooted in the same distorted incentives and weak fiscal systems that development institutions already spend billions trying to correct. The instruments needed to address it—land policy, livelihood finance, formalization, market access, and financial controls—are already within reach. The binding constraint is less a shortage of resources or technical capacity than a failure to deploy these instruments as one system. Used together, they offer a powerful and comparatively inexpensive way to reduce environmental crime. Durable progress begins with that recognition.

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