FROM FOREST TO DUST

Socioeconomic and environmental impacts of the prohibition of the coca and cocaine production chain in the Amazon Basin and Brazil

OCTOBER, 2025

Erythroxylum coca

INTERSECÇÃO

DRUG POLICY REFORM
& ENVIROMENTAL JUSTICE
INTERNATIONAL COALITION

INICIATIVA NEGRA
POR UMA NOVA POLÍTICA SOBRE DROGAS
10 ANOS

PHOTO: JORGE PANCHOAGA

A PROJECT BY

INTERSECÇÃO
LAND USE, DRUG POLICY AND CLIMATE JUSTICE

EXECUTION

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About this publication
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About Intersection - Drug Policy, Land Use and Climate Justice
Since 2024, the Intersection project has been promoting rounds of active listening and diagnosis of the overlaps between socio-environmental crimes, armed violence, violations of territorial rights, mass incarceration, and drug prohibition, engaging stakeholders and social movements that work on land use, sociobioeconomies, climate adaptation, reparations, racism, and human rights.

About Iniciativa Negra
*Iniciativa Negra is a civil society organization that works to promote racial justice, focusing on political advocacy, creative development, and knowledge production. Since 2015, it has led actions and campaigns on drug policy, human rights, culture, popular education, and economy, highlighting experiences from Black territories with a focus on strengthening organized civil society. **Overview by: Dandara Rudsan, Dudu Ribeiro, and Nathalia Oliveira.***

About the International Coalition on Drug Policy Reform and Environmental Justice
An interdisciplinary and independent network of researchers, experts, activists, artists and journalists created in 2022, that brings together around 100 people from more than 15 countries, and believes that drug policy reform is essential to achieving climate justice.

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This publication is dedicated to all the people, communities, and landscapes affected by the war policies resulting from drug prohibition and the impacts of the climate crisis. We continue to stand in solidarity in the defense of territories, human rights, and life on the planet.

FOTO: Jorge Panchoaga

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EXECUTIVE SUMMARY

The publication From Forest to Dust presents a diagnosis with unprecedented data on the dynamics and the socioeconomic and environmental impacts of the prohibition of the coca and cocaine production chain in the Amazon Basin and in Brazil. By naming prohibition as a driver of the climate crisis, it warns of the urgency of incorporating drug policy reform and ecological harm reduction into mitigation, adaptation and territorial justice strategies.

PHOTO: Gena Steffens

Drug Prohibition: A System of Ecological Harm

Over the last one hundred years, the global drug prohibition regime has established an innovative, resilient, corrupt, extractivist and transnational economic system.

By criminalizing plants of traditional use and their users, prohibitionist policy ensures that the violence of repression and environmental destruction remain localized in certain territories and social groups, while financial profits circulate across borders.

It is a system that rewards logistical control, territorial monopoly and infrastructural camouflage while punishing transparency and community governance. Its intersectional effects are particularly visible in Latin America due to the geographic concentration of coca and cocaine production.

Prohibition transformed coca, a sacred Indigenous plant, into the raw material of a war economy — without ever reducing the production or use of cocaine. Instead, supply and demand continue to break historical records.

Context

Until the 1980s, it was estimated that 90% of coca leaf cultivation occurred in Peru and Bolivia, from where the pressed raw material was transported to Colombia to be refined and exported mainly to markets in the Global North[1].

Colombia's strategic location as a continental crossroads, combined with smuggling networks and internal conflicts, made the country the ideal setting for the capture and industrial expansion of the cocaine production chain. The Cali and Medellín cartels built vertically integrated operations, purchasing "pasta base" (cocaine base paste) from areas controlled by Sendero Luminoso in Peru to be processed in Colombian laboratories, in a centralized, corporate and highly profitable model.

However, crop eradication policies and increased monitoring of trafficking routes led to important changes in the drug's logistics chain. From the 1990s onward, coca leaf cultivation migrated to Colombia itself, where it grew to the point that the country became the world's largest producer[2].

The dismantling of the large Colombian cartels — through killings, extraditions and seizures — did not interrupt the supply of the drug. In practice, repression fractured the high command of the production chain and redistributed authority to armed groups. In the new arrangement, guerrillas and paramilitary organizations consolidated parallel rural governance as a business strategy: by taxing farmers, regulating cultivation zones and ensuring trafficking corridors, they structurally tied the coca and cocaine economy to territorial control.

Today, practically all coca plant production is concentrated in Colombia (66%), Peru (23%) and Bolivia (11%)[3]. Despite the continuous oppression in Andean countries, agricultural productivity has increased and the cultivation model has changed, with small-scale family farms gradually being replaced by an agro-industry capable of investing in fertilizers and pesticides[4].

The expansion of coca cultivation is a direct driver of deforestation in the Andean valleys and the Colombian Amazon. Forest cover loss related to coca doubled in the last decade, with some annual rates above 20,000 hectares.

The Balloon Effect and Brazil

One of the main results of eradication efforts in coca-growing areas and the splintering of armed groups was the relocation of large laboratories and the increased complexity of the cocaine production chain in neighboring countries, the so-called "balloon effect" of prohibition. Although drug processing still occurs in forested regions at the Amazon triple frontier (Colombia-Peru-Brazil), and, to a lesser extent, in Bolivia, Venezuela and Paraguay, Brazil's role as a global hub for cocaine refining and distribution has grown significantly in recent years.

A report by Fórum Brasileiro de Segurança Pública (the Brazilian Forum on Public Security - FBSP) - and Instituto Esfera published in 2024 estimates that the cocaine market generates a revenue of R$335 billion (US$65.7 billion) in Brazil, equivalent to 3.98% of the GDP (values for 2021).

The risk involved in transporting the drug, by itself, makes this a profitable activity, increasing the product's price by up to 290%[5]; however, part of the high revenue indicated by FBSP can be explained by the value added to the drug through refining and adulteration processes[6].

Value-chain analyses of the cocaine industry in Latin America identify significant concentration in wholesale distribution logistics, which retains about 60% of all revenue. Retail-level groups operating street sales keep around 20% of profits. In this division, transforming pasta base into cocaine base and the subsequent production of hydrochloride (powder) and crack, represent 9% of total revenue.

1 Gootenberg, 2009
2 UNODC, 2023.
3 UNODC, 2023b.
4 UNODC, Gobierno de Colombia, 2025.
5 CdE & SIMCI, 2022, p. 63.
6 Vellinga, 2007; Bergman, 2018.

UNPUBLISHED DATA: Refining activity in Brazil

Despite the frequent media reports of police operations raiding "home laboratories" in urban areas and refining structures producing cocaine for export, there is no consolidated data on this activity in the country.

To begin filling this gap, the unprecedented mapping presented in this publication identified 550 laboratories for refining and/or adulteration between January 2019 and July 2025. On average, it is estimated that police seizures affect only between 10% and 20% of the global drugs market[7]. By applying this rate to project the total number of processing structures, one can extrapolate that more than 5,000 laboratories are in operation in Brazil.

Considering the estimate that the cocaine industry generated US$65.7 billion in turnover in 2024[8], Brazil's refining activity alone (9% of the value chain) could move approximately US$6 billion per year — revenue comparable to companies such as Embraer (the national leading aerospace company) and Grupo Boticário (one of the largest cosmetics Brazilian companies). The amount is also more than five times the entire US$1.05 billion target of Fundo Amazônia (Amazon Fund), the main financial mechanism to curb deforestation in the country[9].

Intersections

Illegal practices associated with drug prohibition and land use policies have expanded in exchange for the high socio-environmental and climate costs of deforestation. Over the past 40 years, Brazil has lost 111.7 million hectares of forest cover, which corresponds to 13% of the national territory[10].

The consequences of the economic power of the cocaine industry and distribution chain in Brazil are exacerbated by its strong convergence with the expansion of other licit and illicit activities. The financial, political and logistical resources of drug markets feed an extractivist model that not only launders trafficking proceeds, but also reinvests profits in the control and amplification of various chains of legal and illegal goods[11].

This intersection, although affecting biomes and communities across the country, is especially visible in the Brazilian Amazon, where the overlap between drug-related crimes, land grabbing, gold mining, illegal logging and fishing has led to the adoption of terms such as narco-deforestation and narco-mining. A symbiosis that is not new but that intensified during Jair Bolsonaro's government (2019—2022), with the dismantling of environmental oversight agencies, political incentives for mining and general land tenure chaos. During this period, deforestation in the Brazilian Amazon registered a 73% increase[12].

In this context, the gold economy — a fragile, polluting, exceptionally illegal and high-value-added chain — and the fraudulent appropriation and purchase of land to boost agribusiness and mining sectors, have become attractive alternatives for laundering money from drug markets. In addition to financial crimes, logistics are also integrated: roads, airstrips, means of transport and corruption schemes are shared by the multi-trafficking networks that operate in the region.

Whether by air, land or water, hundreds of tons of "pasta base" and cocaine hydrochloride are moved through the Brazilian Amazon, where seizures tripled between 2019 and 2023[13].

Fueled by profits from the cocaine trade, criminal organizations such as the Primeiro Comando da Capital (PCC) and Comando Vermelho (CV) actively dispute routes, often with the support of Colombian, Bolivian and Venezuelan cartels, expanding the complexity and reach of trafficking in the Amazon Basin.

Under the justification of combating this dynamic, there has been a significant increase in the militarization of the State's presence in the Brazilian Amazon with operations conducted by the Federal Police and the Military forces. In attempting to dismantle trafficking routes, these measures reproduce the balloon effect: when one route is squeezed, the flow shifts to more remote and less monitored areas, causing geographic dispersion of criminal factions and worsening territorial conflicts.

With growing tensions among the population, organized crime and security forces, the *quilombola* and riverine communities, Indigenous peoples, and residents of urban favelas in Amazonian cities are disproportionately affected. These communities face constant risks of criminalization, social and economic insecurity and invasion of their territories by armed groups. The increases of 67.3% in incarceration rates and 76.7% in intentional violent death rates in the Brazilian Amazon over the past decade illustrate these impacts[14].

7 CdE & SIMCI, 2022.
8 FBSP & Instituto Esfera, 2024.
9 Development comparison based on data available in CNN (2025) and G1 (2025). https://www.fundoamazonia.gov.br/en/home/
10 MapBiomas 2025
11 Soares et al., 2021; Barros, 2021; UNODC, 2023b; Risso et al., 2024a, 2024b.
12 Infoamazonia 2022
13 Cartografias da Violência na Amazônia - FBSP 2023
14 Cartografias da Violência na Amazônia - FBSP 2023

The cocaine economy goes far beyond the substance itself: like gold mining and other short-cycle economies, it generates territorial movements, catalyzes illegal activities, encourages predatory exploitation, facilitates corruption and promotes violence.

In cities and metropolitan areas, the phenomenon manifests starkly in the proliferation of public crack (and other drugs) use scenes among people experiencing homelessness, who are mostly victims of housing shortages and racial and gendered violence. Crack, "the rock" — in Brazil, a cheaper, lower-quality version of cocaine — is offered to users in extreme social vulnerability, in a perverse market logic that serves the financial interests of both trafficking networks and real estate speculation.

The crisis resulting from drug policies is even more evident in national public security indicators. Brazil is approaching the mark of 1 million people incarcerated, with approximately 30% convicted for drug-related crimes[15]. The warlike practices of prohibition are also associated with high rates of homicides resulting from security forces operations: in 2024, 6,243 people were killed by police while on duty in the country[16].

Rising consumption

On the demand side, the cocaine market has also shifted. According to the UNODC, the estimated number of cocaine users worldwide has increased steadily over the past 15 years[17]. Although the United States remains the leading market, Brazil has become the second-largest global consumer. According to the National Survey on Alcohol and Drugs (LENAD)[18], around 11.4 million Brazilians, or 6.6% of the population, have used cocaine/crack at least once in their lifetime.

In Europe, between 2005 and 2012, criminal organizations from the Balkans took control of cocaine markets in much of the continent and established direct links with Brazilian and other Latin American groups. In doing so, they verticalized supply chains, removing intermediaries, reducing wholesale costs and maintaining profit margins while offering consumers a purer and cheaper product. As a result, retail data indicate a saturated environment of accessible, higher-quality cocaine, with an upward trend in use, making the drug the second most consumed illicit substance in Europe, after cannabis[19].

Routes and Markets

Brazil's extensive port, maritime and air infrastructure, combined with the adaptability of trafficking networks, contributed to the country becoming a central hub for the transatlantic cocaine economy. The Port of Santos (São Paulo) is the world's second-largest exporter of the drug[20]. Between 2020 and 2024, ports in Brazil's Northeast region consolidated as important logistical corridors for shipping cocaine destined for Europe and West Africa. Meanwhile, the Brazilian Amazon configured itself as a transit area for the flow of the Andean commodity toward Atlantic ports.

Only in 2020, approximately 71 tons of cocaine linked to Brazil and destined for Europe were seized, compared with 67.5 tons from Ecuador and 32 tons from Colombia[21], positioning Brazil as a primary supplier of the drug to the European continent.

In West Africa, the Gulf of Guinea emerges as the main contemporary corridor for narcotrafficking. Strategic ports in Nigeria, Ghana and Côte d'Ivoire have been incorporated into logistics networks controlled by Brazilian factions in partnership with African and European criminal groups and Latin American cartels.

What the United Nations Office on Drugs and Crime (UNODC) calls the nexus between cocaine trafficking, corruption and financing of extractive industries in Latin America, also takes place in West African countries. The same corrosive dynamic that generates severe socio-environmental impacts has drug prohibition as its common denominator.

15 ObservaDH 2024
16 19º Anuário Brasileiro de Segurança Pública/ FBSP 2024 (Brazilian Public Security Yearbook / FBSP 2024)
17 UNODC 2023
18 Levantamento Nacional de Álcool e Drogas (Lenad, 2025) / National Alcohol and Drug Survey (Lenad, 2025)
19 GI-TOC, 2025.
20 EUDA 2020
21 EMCDDA and Europol, Europe and the Global Cocaine Trade, 24

Reform: drug policies.
Restore: rights.
Recover: nature.

As this report describes, the overlaps between the climate crisis and the violence resulting from drug prohibition may be ignored or minimized by decision-makers and public managers, but their impacts are evident.

The criminalization of the coca plant has triggered a devastating domino effect for the countries of the Amazon Basin and Latin America, which live daily with territorial conflicts, illegal deforestation, armed violence and corruption scandals involving state agents. Recognizing prohibition as a driver of the governance crises and the climate emergency is unavoidable to prevent systemic chaos from expanding in these regions.

For Amazonian and Latin American countries to meet their national land-use greenhouse gas reduction targets, promote the transition to a low-carbon sociobioeconomy and protect their Indigenous and traditional communities, it is necessary to dismantle the criminal networks that control these territories. **Without breaking the prohibitionist paradigm, this will not be possible.**

In this scenario, Ecological Harm Reduction (EHR) is introduced as a concept that links drug policies to broader socio-environmental and climate objectives. EHR proposes reclassifying prohibited plants no longer as threats, but as agents of socioeconomic prosperity, racial justice and ecological balance. This shift should be led by the principles of Indigenous and community governance, restoring and protecting traditional rights to use, cultivate and commercialize this biological heritage.

When ecological rights are incorporated into economic and social reforms of drug policy, territories and people historically most affected by prohibition are decriminalized, opening the possibility to develop sustainable systems that preserve human dignity and biodiversity. A system of reparations and *Buen Vivir* (good living), that replaces prohibition and its extractivist bias to ensure that plants and ecosystems are protected as living entities with intrinsic value, while generating development opportunities and contributing to communities resilient to the impacts of climate change.

There will be no zero deforestation while there is an ongoing war against plant-based drugs.

PHOTO: Gena Steffens

HIGHLIGHTS:

This publication is composed of six exclusive articles produced by an international team of researchers and specialists.

I - ORIGINS

Written by researcher David Restrepo of the Centro de Estudios sobre Seguridad y Drogas (Cesed) at Universidad de los Andes (Cali, Colombia), the chapter recapitulates the Indigenous origins of the coca plant, contrasting ecological and cosmological functions with the nexus of smuggling and commodity imposed on this production chain by prohibition. By tracing the history of the cocaine economy in cultivating countries, it analyzes how armed control, market fragmentation and ecological damage became structurally interconnected. It also details the transformation of coca into "pasta base" from territorial, value-added and violence dynamics perspectives. The chapter presents Indigenous governance systems for coca cultivation that model ecological and socioeconomic transitions aligned with climate justice.

II- PATHWAYS

Chapter 1 - Timeline: Brazilian researcher Thiago Calil, psychologist and postdoctoral fellow in Human/Urban Geography (FCT/UNESP) and PhD in Global Health and Sustainability (FSP/USP), addresses the traces left by the cocaine cycle, outlining the social, environmental and health consequences of this economy in the country. From mass incarceration to police violence, through the consolidation of major routes, usage patterns, environmental impacts and legislative landmarks, as well as the birth and strengthening of major criminal factions, the text presents a timeline of the intersectional effects associated with cocaine prohibition in Brazil.

Chapter 2 - Routes: The team at Instituto Mãe Crioula (Belém, Pará/ Brazil), coordinated by researcher Aiala Couto, provides a series of maps and updated thematic analyses on cocaine transshipment and distribution routes, with a cartography of the effects of prohibition in the Amazon, in Brazil, in Latin America and worldwide. By identifying predominant trajectories, transit corridors and points of interconnection between different countries and regions, the approach makes it possible to visualize how illicit circuits are organized and operate at multiple scales.

Chapter 3 - Refining: A team from Instituto Fogo Cruzado (Rio de Janeiro, Brazil), coordinated by researcher Daniel Edler, carried out the unprecedented mapping of the cocaine processing infrastructure in Brazil. In addition to responses to Freedom of Information requests to government bodies, the database was built from public digital sources reporting police actions to dismantle such equipment. The chapter presents maps and charts, categorizing the structures as refining or adulteration/augmentation and wholesale or retail, as well as a ranking by state, analyzing the geography of refining and the environmental impacts of the activity in the country.

III- DESTINATIONS

Developed by the NGO Transform Drug Policy (United Kingdom), coordinated by Steve Rolles and Mary Ryder, the chapter analyzes the growing consumer market for cocaine in Europe, detailing Brazil's crucial role as a primary exporter and the various transatlantic trafficking routes and methods, including via West African countries. The complex alliances between Brazilian criminal organizations and European and African groups are described, as are the environmental damages and threats to governance in transit countries. The article presents the emerging debate led by European mayors on models for responsible regulation of stimulants.

IV - THE FUTURE IN A LEAF

Articulated by Maori indigenous researcher Jenna Rose Astwood (New Zealand) and specialist Clemmie James (United Kingdom), both from the International Coalition for Drug Policy Reform and Environmental Justice, with collaboration from Iniciativa Negra (Brazil), the chapter introduces the concept of Ecological Harm Reduction (EHR). In addition to systematizing premises and criteria for regulated markets of controlled substances, including measures for transition, reparation, protection of Indigenous intellectual property and territorial guarantees, the text presents various case studies of ecological best practices and traditional community governance.

Editor's Note: Researchers and specialists who contributed to this publication had full autonomy over language and investigative methodologies. Methodological notes are available in the corresponding chapters

I— ORIGINS

PHOTO: Jorge Panchoaga

PHOTO: Jorge Panchoaga

COCA: How the prohibition of an indigenous plant fuels the war on nature

David Restrepo

Introduction

Coca is one of the most important yet misunderstood plants in the Andean-Amazonian region. For millennia, it has sustained Indigenous lifeways, facilitated trade, and anchored governance systems rooted in reciprocity and ecological care. In the modern era, it has been re-defined—first as a commodity, and later as the raw material of the illi-cit global cocaine industry. But it is not the plant itself that produces harm. It is the legal and political system that governs its circulation.

After nearly fifty years of militarized drug control, the prohibitionist regime has failed to reduce the global supply or demand for cocaine. Instead, it has entrenched a political economy of extraction and proliferating harm, where violence and environmental risk are pushed onto rural and marginalized communities, while profits flow toward an ever more fragmentary patchwork of armed groups and transnational trafficking. At the origin of this system is the coca plant—cultivated legitimately and legally by Indigenous peoples for generations, yet criminalized in practice through a supply chain governed by illegality.

This chapter draws on field testimony, territorial analysis, and political economy research conducted through the Global Coca Map project and its community-based network. It combines ground-level experience with systemic insight, building from interviews, economic data, an extensive interdisciplinary literature review, and the lived realities of growers, transporters, and territorial defenders. The intention is to clarify the systems that have shaped our toxic relationship with coca and cocaine—and to highlight the actors who are now transforming those systems from within.

Coca Before Cocaine – Ancestral Knowledge, Ecosystem Care and Community Governance

Long before coca became the raw material for the global cocaine trade, it served as a foundation for social and ecological order across the Andes and Amazon. Coca's importance to the region's Indigenous peoples is difficult to exaggerate: there is evidence of its use going back at least 8,000 years, making coca one of humanity's most ancient cultivated plants[1].

Archaeobotanical findings from the Nanchoc Valley in northern Peru suggest early domestication in this region, while recent genomic studies indicate that coca was likely domesticated independently at least twice — possibly three times — across different ecological zones[2]. Such convergent evolution points to the plant's deep functional value within diverse cultural systems.

Among the millions of people across South America who continue to chew, cultivate, and revere coca today, the leaf is not considered an intoxicant but a vital substance for social cohesion and balance with the natural world.

Its traditional use spans from the northern Sierra Nevada mountains of Colombia to Peru and Bolivia, south to regions of Chile, Argentina and Paraguay, and east into the northwest Amazon basin — including Ecuador, southern Venezuela and north-western Brazil. Coca use censuses, which are only conducted in Peru and Bolivia, indicate that as many as 10 million people may use coca in traditional forms[3].

PHOTO: Jorge Panchoaga

1 Restrepo, D. A., E. Saenz, O. A. Jara-Muñoz, I. F. Calixto-Botia, S. Rodriguez-Suarez, P. Zuleta, B. G. Chavez, J. A. Sánchez, and J. C. D'Auria. "Erythroxylum in Focus: An Interdisciplinary Review of an Overlooked Genus." Molecules 24, no. 20 (2019): 3788. https://doi.org/10.3390/molecules24203788

2 Dawson M. White, "The Origins of Coca: Museum Genomics Reveals Multiple Independent Domestications from Progenitor Erythroxylum gracilipes," Systematic Biology 70, no. 1 (2021). https://academic.oup.com/sysbio/article/70/1/1/5912027?utm_source=chatgpt.com&login=false

3 Instituto Nacional de Estadística e Informática (INEI), Encuesta de Consumo de Hoja de Coca en Hogares (Lima: INEI, various years); Consejo Nacional de Lucha contra el Tráfico Ilícito de Drogas (CONALTID), Encuesta de Consumo de Coca (La Paz: CONALTID, various years).

Physiologically, coca acts as a mild stimulant, with effects more akin to coffee than to refined cocaine. The alkaloid content in the raw leaf is low—about 0.25% to 1%—and the process of chewing or consuming coca with alkaline adjuvants releases these alkaloids gradually. Users report sustained alertness, appetite suppression, enhanced oxygen uptake at high altitudes, and reduced physical fatigue[4].

The plant's cultural and relational effects are just as important: coca enables long conversations, structured reflection, and ceremonial gathering. It is as much a technology of attention and dialogue as it is of bodily endurance.

Coca provides a reminder across a person's day that human life depends on maintaining good relations with others — and with the ecosystem that sustains us all.

- In Nasa communities in Colombia, coca plays a central role in the practice of Tegualas—spiritual and medicinal guides responsible for diagnosing not just individual ailments, but broader imbalances within the community. According to testimonies from elders like Fabiola Piñacué, coca provides the energetic and sensory foundation for Nasa medics to carry out their healing work, which includes not just treatment, but also social mediation and cosmological alignment[5].

- In the North-Western Amazon, the preparation and consumption of *mambe* (roasted and ground coca leaf mixed with the alkaline ashes of yarumo) is a collective ritual of storytelling and knowledge transmission. *Mambe* circles create the conditions for elders to narrate origin stories, resolve disputes, teach language, and build intergenerational trust. The process of making *mambe* itself—collectively picking, toasting, pounding, sifting, and mixing leaves and ash—models the attentiveness and collaboration required for community stewardship[6].

- In Quechua-speaking regions of highland Peru and Bolivia, coca has historically served as a medium of reciprocity between people and with the natural world. As described in Catherine Allen's The Hold Life Has, coca chewing structures community life. It is offered during ceremonies, shared in negotiations, and used to mark agricultural and spiritual cycles. Its consumption is regulated by custom, and bound to larger cosmological narratives that centre Pachamama and natural deities — such as the snow-capped Apus and the sacred sites that are treated as protectors of a community's territory[7].

PHOTO: Jorge Panchoaga

Across these geographies, coca is not cultivated for maximum alkaloid yield. Instead, it is intercropped in the Chagra, Nasa Tul, and other traditional agroforestry systems, often alongside yuca, plantain, medicinal herbs, and fruit trees. These mixed systems promote biodiversity, reduce erosion, and maintain long-term fertility—functioning as ecological knowledge infrastructures that centre coca as a stabilising perennial crop.

The presence of coca often signals not just spiritual vitality but also territorial continuity: its cultivation marks landscapes where communities have resisted displacement and defended customary land use for generations.

4 Restrepo, DA et al (2019)

5 Anthony Henman, Mama Coca (Harmondsworth: Penguin Books, 1978); Testimony of Fabiola Piñacué, Nasa elder and community leader, interviews with the author, 2023—2025.

6 Juan Álvaro Echeverry, Mambear no es pintarse la boca de verde (Leticia, Colombia: Universidad Nacional de Colombia, Sede Amazonia, 1997); Testimony of Aicome Moreno and Esteban Carrillo, Origen Amazonía, interviews with the author, 2023—2024.

7 Catherine J. Allen, The Hold Life Has: Coca and Cultural Identity in an Andean Community (Washington, DC: Smithsonian Institution Press, 1988).

Coca as Relational Value, Not Commodity

While coca may circulate in markets, it is often not treated as a conventional commodity. Its value is rarely defined by just its volume or price per kilo. Instead, its quality is judged by origin—who grew it, how it was harvested, and what ceremonial or medicinal context it serves. In Nasa territories, for example, coca grown for *mambeo* — a popular term in Colombian for coca-chewing — and traditional medicine is selected from specific plots and handled with care distinct from commercial harvests[8]. This relational valuation system contrasts sharply with the anonymous, fungible trade of coca paste or cocaine.

Coca is also a governance instrument. It plays a central role in assemblies, healing rituals, and traditional justice mechanisms. *Mambeo* slows time, enhances attentiveness, and enables consensus-building. In these settings, coca is not consumed to escape reality, but to engage more deeply with it.

From Commodity to Contraband

The colonial era marked the beginning of coca's transition from a sacred plant embedded in Indigenous lifeways to a commodified input in extractive economies. Spanish authorities quickly recognized that coca played a vital functional role among Andean peoples—not only as a ritual element, but as a tool for endurance, health, and labour in harsh mountain conditions[9].

Initially, the Catholic Church and colonial officials attempted to suppress coca use, associating it with Indigenous spirituality, idolatry, and resistance. Yet this attempt at prohibition proved short-lived. Attitudes shifted when coca showed itself to be indispensable for sustaining forced labour, such as in the silver mines of Potosí: the very backbone of Spain's imperial wealth[10].

Coca's ability to suppress hunger, reduce fatigue, and enhance stamina made it essential for colonial administrators seeking to maximize extraction of natural resources.

The Church reversed its stance, and the Crown introduced a taxation regime—transforming coca into an early example of a state-regulated Indigenous commodity. Over time, coca chewing became stigmatized as the practice of the Indigenous and peasant "underclass," even as its medicinal uses for pain and illness gained acceptance across colonial society.

By the mid-19th century, coca had become the subject of intense interest among European chemists, physicians, and entrepreneurs. It marked the beginning of coca's transformation into a raw material for emergent global industries—valued not for its cultural, ecological, and spiritual roles, but for its extractable alkaloid: cocaine.

In 1859, German chemist Albert Niemann isolated cocaine for the first time, sparking a wave of experimentation. German pharmaceutical company Merck soon industrialized production, marketing cocaine as a medical panacea. Figures such as Sigmund Freud praised its "exhilarating" properties and recommended it for a range of ailments[11].

Commercial enthusiasm expanded rapidly. Vin Mariani, a French tonic wine infused with coca leaf extract, became a sensation among elites, from royalty to popes. In the United States, coca extract was incorporated into the original formula of Coca-Cola, marketed as both stimulant and therapeutic (the company continues to use de-cocainized coca extract today)[12].

PHOTO: Jorge Panchoaga

Parallel to this, Peruvian pharmacist Alfredo Bignon developed the method for producing coca paste in the 1880s. This innovation allowed for more efficient extraction of cocaine alkaloid and created a storable, transportable intermediate product — enabling the globalization and scaling-up of the cocaine industry.

8 Testimony of Juan Piñacué, Nasa Indigenous leader, interviews with the author, 2023—2025.
9 Hurtado, Jorge. Cocaine The Legend, About Coca and Cocaine. (La Paz: Hisbol, 1995); Henman, Anthony. Mama Coca. Harmondsworth: Penguin Books, 1978; Cáceres, Baldomero. La coca, el mundo andino y los extirpadores de idolatrías del siglo XX. América Indígena, Vol. 38 No. 4 (Oct.-Dic. 1978)
10 Ibid.
11 Davis, Wade. One River: Explorations and Discoveries in the Amazon Rain Forest. New York: Simon & Schuster, 1996.
12 Gootenberg, Paul. Andean Cocaine: The Making of a Global Drug. Chapel Hill: University of North Carolina Press, 2008.

With coca paste, production could be decentralized: leaves could be processed in rural areas, with paste shipped to urban centers or abroad for refinement into cocaine. Corporate pharmaceutical interests quickly drove the expansion of coca cultivation into Asia-Pacific colonies such as Java and Taiwan. By the early 20th century, Andean producers lost ground as multinational companies built vertically integrated supply chains that fed an international cocaine market.

This phase of global commodification marked a decisive break. Coca was no longer treated as part of a governance system or ecological matrix — it was reduced to chemical yield. Indigenous peoples were neither consulted nor compensated. Their relationships with the plant were systematically erased from medical, legal, and commercial narratives, except when selectively invoked as exotic ornamentation in marketing campaigns.

By the early 20th century, rising concerns over addiction and abuse generated the first international drug control frameworks.

The Temperance movement in the United States — initially focused on alcohol — helped shape a broader momentum of prohibition[13]. The 1912 Hague Opium Convention, followed by the 1931 Geneva Convention and the 1936 Trafficking Convention, laid the groundwork for a global prohibitionist system.

This trajectory was reinforced by the work of the 1950 "Fonda Commission," a World Health Organization study mission in Peru and Bolivia. Its report — based on thin evidence and steeped in colonial and racist assumptions — concluded that coca chewing was a harmful, degenerate practice, ignoring centuries of evidence to the contrary. This unscientific framing cleared the way for coca to be classified as a dangerous narcotic in the 1961 United Nations Single Convention on Narcotic Drugs, which placed coca leaf, cocaine, and heroin together in Schedule I. In one biased stroke, coca was legally defined as addictive and without medicinal value[14].

The prohibitionist net widened further with the 1971 Convention on Psychotropic Substances, which expanded international control to synthetic drugs, and with the 1988 United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances. The latter included, partly due to diplomatic pressure from Peru and Bolivia, Article 14.2 — allowing for the recognition of traditional uses of plants like coca. Through reservations, national legislation, litigation and jurisprudence, the Indigenous and campesino movements in Bolivia, Peru, and later Colombia carved out limited legal spaces for national coca cultivation and consumption[15].

Within a reductionist legal framework, coca was recast as a global threat to be eradicated. Coca growers were treated as suspects, and their fields as targets of international eradication campaigns. Far from curbing cocaine use, prohibition criminalized the very communities that had grown and consumed the coca plant responsibly for centuries.

By collapsing coca into cocaine, international law rendered the plant effectively ungovernable — not because of its properties, but because the global system designed to control it had erased its social, cultural, and ecological contexts.

PHOTO: Jorge Panchoaga

13 Prohibition. Directed by Ken Burns and Lynn Novick. PBS, 2011. Documentary series.

14 See Wade Davis, One River: Explorations and Discoveries in the Amazon Rain Forest (New York: Simon & Schuster, 1996), 171—176; Martin Jelsma and Pien Metaal, "Coca Yes, Cocaine No? Legal Options for the Coca Leaf," TNI Briefing Series no. 2010/2 (Amsterdam: Transnational Institute, 2006).

15 Bewley-Taylor, Dave and Jelsma, Martin. "The UN Drug Control Conventions: The Limits of Latitude." Series on Legislative Reform of Drug Policies 18. Amsterdam: Transnational Institute & IDPC 2012;

Coca and the International Drug Control Regime[16]

1912 Hague Opium Convention	First international agreement to regulate narcotic substances. Coca leaf and cocaine are placed under initial scrutiny, but no outright bans are established.
1931 & 1936 Geneva and Trafficking Conventions	Expand controls over narcotics and criminalize unauthorized trafficking. Coca-related substances receive growing attention but remain loosely controlled.
1961 United Nations Single Convention on Narcotic Drugs	Turning point: Coca leaf is placed in Schedule I, alongside cocaine and heroin. Signatory countries are required to eliminate coca leaf chewing and cultivation for non-medical purposes within 25 years. No cultural or Indigenous use exemptions are granted.
1971 Convention on Psychotropic Substances	While focused on synthetic drugs, reinforces the punitive logic of the 1961 framework.
1988 United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances:	Extends the criminalization mandate, but includes a key clause — Article 14.2 allows countries to exempt "traditional uses" of plants like coca from prohibition if there is historical evidence to support this. This clause was the result of successful diplomatic efforts by Peru and Bolivia, though it has not led to coca's reclassification.

Prohibition as a System: Fragmentation and Proliferation

The First Trafficking Networks

As historian Paul Gootenberg documents in Andean Cocaine, the earliest contraband networks arose from the remnants of Peru's legal cocaine industry in Huánuco. In the mid-20th century, illicit cocaine moved in small shipments to niche markets in New York and Havana, supplying underground pharmaceutical circuits and recreational users. The trade was modest in scale but resilient.

Prohibition, even in its infancy, generated adaptive supply: when one route closed, another emerged.

By the 1970s, global demand surged. Colombia's location as a continental crossroads, entrenched contraband networks, and internal conflict made it the ideal staging ground for capturing and then scaling up the industrial supply chain of illicit cocaine. The Medellín and Cali cartels constructed vertically integrated operations, sourcing coca paste from Peru's Huallaga Valley—often via Sendero Luminoso guerrilla-controlled zones—processing it in Colombian laboratories, and exporting cocaine to the United States through Caribbean routes. The model was centralized, corporate, and spectacularly profitable[17].

16 Sources: Gootenberg (2008); Bewley-Taylor and Jelsma (2012); Jelsma & Metaal (2006).
17 Thoumi, Francisco E. Illegal Drugs, Economy, and Society in the Andes. Washington, DC: Woodrow Wilson Center Press / Johns Hopkins University Press, 2003; Clawson, Patrick L., and Rensselaer W. Lee. The Andean Cocaine Industry. New York: St. Martin's Press, 1998

From Cartels to Armed Groups in Colombia

The dismantling of Colombia's cartels in the early 1990s—through killings, extraditions, and asset seizures—did not reduce global supply. Instead, it fractured the upper tier of the trade and redistributed authority to territorial armed groups.

Guerrillas such as the FARC and ELN, and paramilitary structures like the AUC, based their core business not on transnational trafficking but rural governance: taxing producers, regulating cultivation zones, and securing corridors. They operated as parallel "statelets," linking the cocaine economy with territorial control[18].

In cities, cartel remnants spawned oficinas—hybrid structures of gangs, militias, and brokers that dominated neighbourhoods through a mix of retail drug sales, extortion, contract killing, robbery, and legal front businesses. Their authority was rooted in localized neighbourhood control via armed intimidation, with revenues sustained by small-scale trafficking: a relatively low-margin but stable business[19].

Drug control militarization, particularly under Plan Colombia (2000—2015), reinforced these dynamics. Aerial fumigation campaigns sprayed over 2 million hectares of coca between 1994 and the suspension of spraying in 2015. Tens of thousands of eradication operations were carried out, often accompanied by military occupation. These measures did not dismantle the economy, but instead displaced production into new, pristine jungle regions, diversifying trafficking routes, and deepening the role of armed actors as regulators of prohibition[20].

Crop substitution programs, introduced as a softer counterpart, faced inadequate technical support, poor market access, and the absence of land tenure guarantees. Communities often replanted coca after substitution failed. The cycle of eradication, repression, and replanting entrenched mistrust vis-à-vis the central state.

The 2016 peace agreement between the Colombian government and the FARC inaugurated a new phase of fragmentation. Absent a strategy of state-based coca and cocaine regulation, the exit of a centralized armed actor led to dissident factions, paramilitary successors, and criminal entrepreneurs filling the authority gap.

Nowadays, a single shipment of coca paste might traverse three or four jurisdictions, each extracting tolls and enforcing distinct rules. Communities describe the current period as one of cascading unpredictability, marked by resurging violence, volatile alliances, and unstable prices.

- Processing infrastructure has shifted. Smaller labs now operate closer to towns, protected by local gangs, politicians, and rogue security forces
- Production hubs in areas under armed-group control have invested in agro-industrial practices—new seed varieties, more intensive fertilization, pesticide and herbicide use, and systematic pruning—that dramatically increase yields.
- Alongside this agro-industrialization, there has been a marked shift toward farm-level paste production, tightening the direct link between growers and traffickers.

PHOTO: Gena Steffens

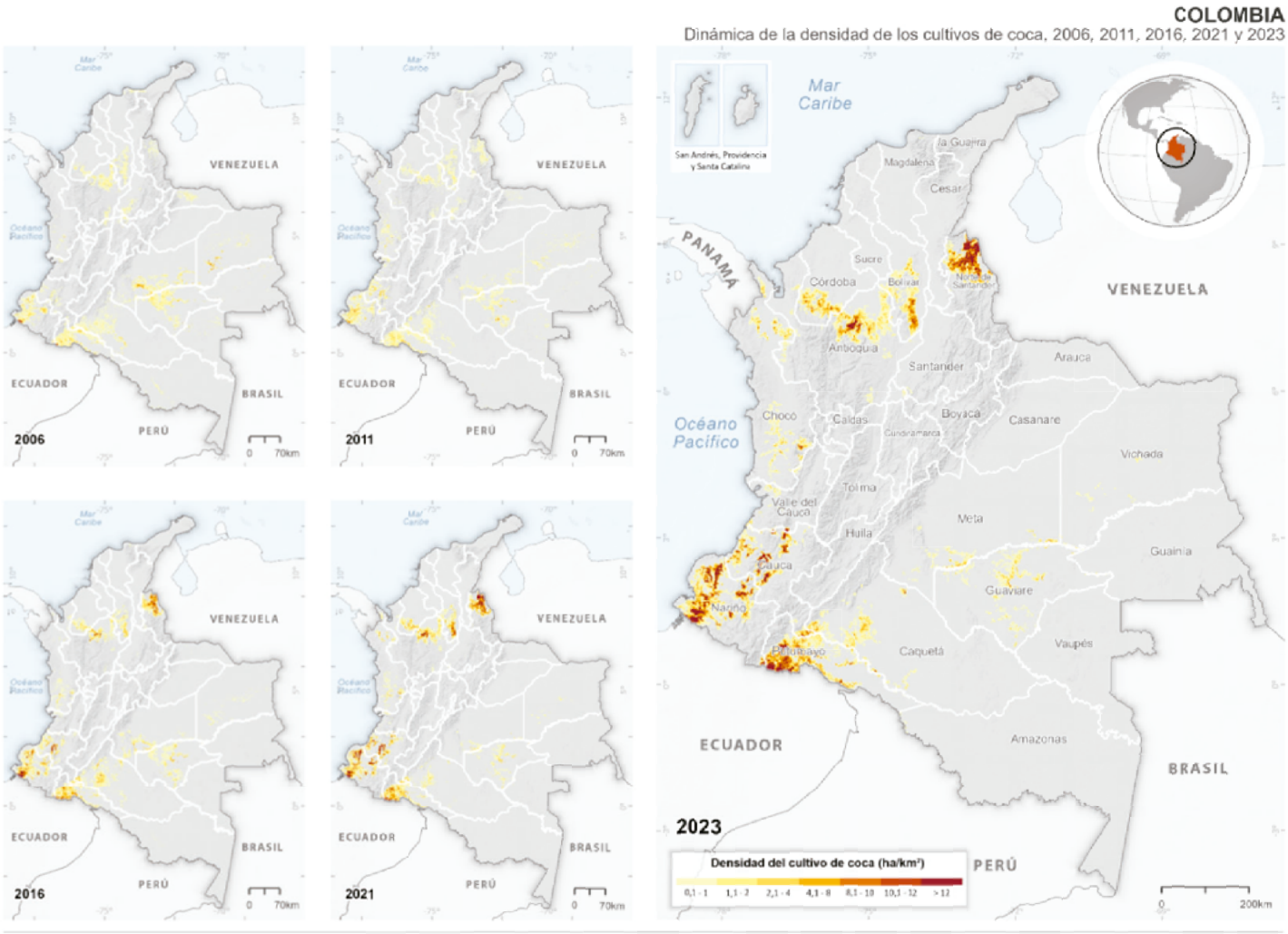
18 See Gustavo Duncan, Los señores de la guerra: De paramilitares, mafiosos y autodefensas en Colombia (Bogotá: Planeta, 2006); Francisco E. Thoumi, Illegal Drugs, Economy, and Society in the Andes (Washington, DC: Woodrow Wilson Center Press / Johns Hopkins University Press, 2003); María Teresa Ronderos, Guerras recicladas: Una historia periodística del paramilitarismo en Colombia (Bogotá: Aguilar, 2014)

19 See Juan Carlos Garzón, Mafia & Co.: The Criminal Networks in Mexico, Brazil, and Colombia (Washington, DC: Woodrow Wilson Center, 2008); David Restrepo and Luisa Cuéllar, El sistema productivo del cannabis recreativo en Colombia: cadena de valor, actores y alternativas de política, Documento Temático #52 (Bogotá: Centro de Estudios sobre Seguridad y Drogas, Universidad de los Andes, 2025)

20 See María Alejandra Vélez Lesmes et al., Environmental Impacts and Transitions across Illicit, Informal and Licit Economies in Colombia: Coca-Cocaine, Gold, and Cattle, Documento temático no. 54 (Bogotá: CESED—Universidad de los Andes, 2025); Daniel Mejía, Plan Colombia: An Analysis of Effectiveness and Costs (Washington, DC: Brookings Institution, 2015)

The result is a bifurcated coca economy in Colombia: industrialized zones under armed-group control with high yields and capital inputs, and more artisanal zones where production remains rudimentary and vulnerable[21].

Map. Colombia Coca Crop Density (2006-2023)



Fuentes: Gobierno de Colombia - Sistema de Monitoreo apoyado por UNODC.
Los límites, nombres y títulos usados en este mapa no constituyen un reconocimiento o aceptación por parte de las Naciones Unidas

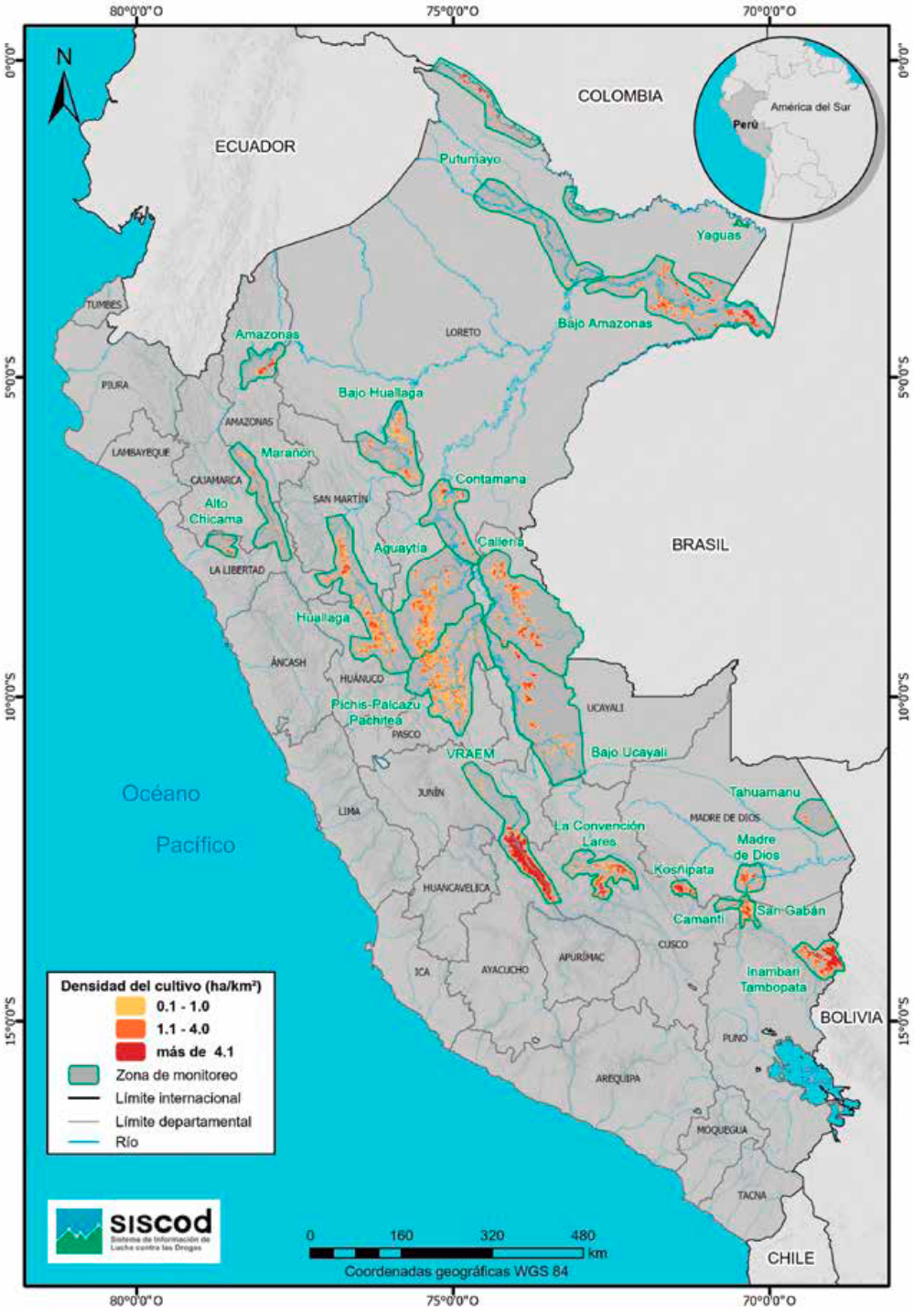
Source: Oficina de las Naciones Unidas contra la Droga y el Delito (UNODC)-Sistema Integrado de Monitoreo de Cultivos Ilícitos (SIMCI), Monitoreo de territorios con presencia de cultivos de coca 2023 (Bogotá: UNODC-SIMCI, 2025). https://www.biesimci.org/index.php?id=62

21 See UNODC, Colombia: Monitoreo de territorios con presencia de cultivos de coca 2023 (Bogotá: UNODC, 2025), especially sections on regional production differences and cultivation profiles.

Peru and Bolivia: Regional Rebound

As Colombia's cocaine economy fragmented in the 2000s-10s, Peru and Bolivia rebounded. In Peru, coca cultivation reached 95,000 hectares in 2023, with roughly 62% concentrated in the VRAEM (Apurímac, Ene, and Mantaro valleys). The region hosts a mix of Sendero Luminoso guerrilla remnants, regional mafias, and illicit transport operators who rely on clandestine airstrips and fluvial routes. Nearly all coca grown there is destined for paste production and trafficking—via Pacific ports, Bolivia, and Brazil. Localized eradication and substitution efforts have achieved temporary reductions in some valleys, but overall cultivation remains resilient, shifting into new territories when repression intensifies.

Map. Coca Crop Density in Peru (2023)

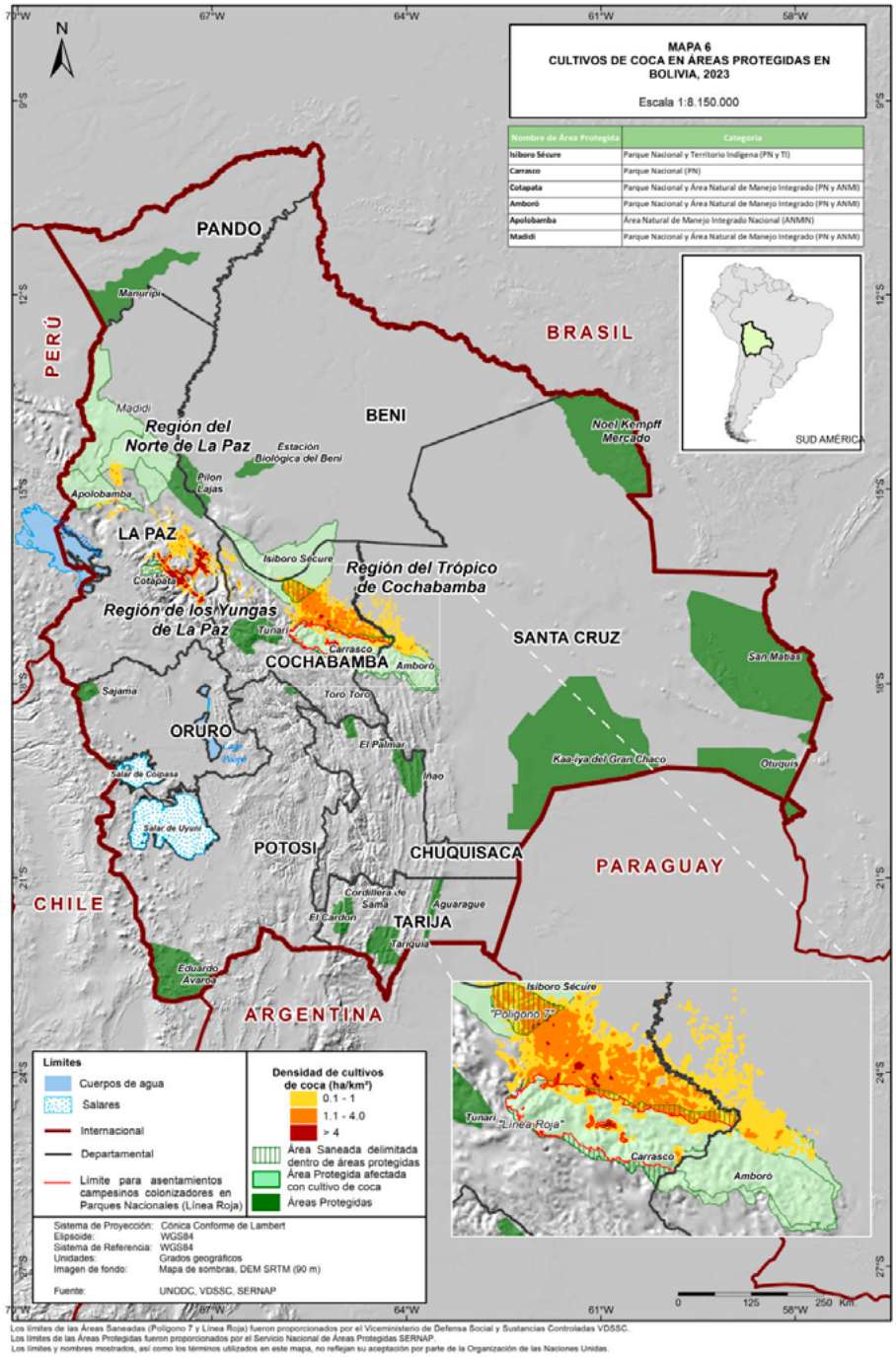


Source: https://www.unodc.org/unodc/en/crop-monitoring/index.html?tag=Peru (p. 19)

Bolivia has pursued a different path. Since the 2004 Cato Accord, coca cultivation has been regulated through a social control model in which grower federations in Yungas and Chapare self-manage production quotas, with traditional use legalized for domestic markets. This policy combination has secured higher farm-gate prices than in Peru and Colombia, while reducing violence in coca zones. However, overproduction and diversion into the illicit economy are still routine, proving difficult to sustain the slogan "Coca Sí, Cocaína No" as global prohibition incentivizes coca expansion into unregulated zones. While Bolivia's approach reduced harm relative to top-down eradication, it didn't insulate coca-growing communities from the structural pressures of the cocaine market[22].

Across both Andean countries, prohibition does not eliminate supply. It reshuffles and disperses it, often into ecologically fragile regions where state presence is weak. Similar patterns now appear in Central America and Mexico, where small-scale coca fields have emerged in response to enforcement pressure further south.

Map. Bolivia Coca Crop Density 2023



Source: Bolivia Monitoreo de Cultivos de coca https://www.unodc.org/unodc/en/crop-monitoring/index.html?tag=Bolivia (p. 44)

22 Ledebur, Kathryn, and Linda Farthing. To the Beat of a Different Drum: Bolivia's Community Coca Control. Washington, DC: Andean Information Network (AIN) & Open Society Foundations, 2019; Ramos Torres, B, Benavides, J, Vélez Lesmes, M, Jauregui, G y Restrepo Díaz, D. (2023). Control social de la producción de coca: Lecciones del Trópico de Cochabamba (Bolivia) para Colombia. Universidad de los Andes. Disponible en: https://hdl.handle.net/1992/69610

Vertical Fragmentation: A Diversified Transnational Economy[23].

While ground-level production has become unstable and dispersed, the upper tiers of the trade have diversified.

- Mexican cartels such as Sinaloa and CJNG dominate wholesale corridors into the U.S.
- Central American groups and Ecuadorian ports have become key trans-shipment nodes.
- Brazilian organizations—including the Primeiro Comando da Capital (PCC) and Comando Vermelho—manage Amazon riverine routes and control exports through Atlantic ports.
- West African states such as Ghana and Nigeria, are cocaine gateways for a growing local consumer base and for Europe.

The cocaine economy is now a node-driven system: decentralized, subcontracted, and adaptive. The proliferation of laboratories across Latin America—and increasingly in Europe and Australia—reflects both the globalization of technical knowledge and the logic of reducing transport risks by refining closer to markets.

With a diversified portfolio, armed groups and criminal organizations in Colombia now traffic synthetic drugs and high-potency cannabis, expanding revenue streams while intensifying environmental impacts.

Demand has also shifted. While the United States remains the largest market, Brazil has become the second-largest consumer globally. Cocaine use is climbing steadily across Latin America, West Africa, Europe, and Asia-Pacific—where higher prices generate higher margins. Export and financial strategies have grown more sophisticated: semi-submersibles and fast boats, containerized shipping through major ports, encrypted digital logistics, and layered money-laundering schemes using real estate, commodities, and crypto.

Brazil's Emergence[24].

Brazil's role is central to the prohibition-built economy. Enforcement pressure in the Andes during the 1990s and 2000s created openings for Brazilian criminal networks to capture greater value along the supply chain. Groups like the PCC integrated vertically, from refining paste in the Amazon, Pantanal and Cerrado borderlands to exporting via Santos and other Atlantic ports. Their dominance over logistics and domestic consumption has made Brazil not only a corridor but a consumer epicentre.

This dynamic has been reinforced by the opening of northern Amazonian fluvial networks. As Colombian enforcement displaced trafficking into novel routes, river corridors into Brazil became vital arteries. This appears to have promoted similar armed-group governance models in Brazilian territory, where they were absorbed and adapted by PCC and Comando Vermelho. These same corridors are now being used to traffic Colombian-sourced cannabis, extending the criminal footprint of the prohibition system

Prohibition has built a system that is innovative, resilient, extractive, and transnational. Its logic is not to stop drugs but to offload costs: ensuring that violence and environmental destruction remain localized, while profits circulate across borders.

The system rewards logistical control, territorial monopoly, and infrastructural camouflage. It punishes transparency and community governance. It has turned coca from a sacred Indigenous plant into the raw material of a global war economy. And it has done so without ever meaningfully reducing the trade or use of cocaine.

22 22 Ledebur, Kathryn, and Linda Farthing. To the Beat of a Different Drum: Bolivia's Community Coca Control. Washington, DC: Andean Information Network (AIN) & Open Society Foundations, 2019; Ramos Torres, B, Benavides, J, Vélez Lesmes, M, Jauregui, G y Restrepo Díaz, D. (2023). Control social de la producción de coca: Lecciones del Trópico de Cochabamba (Bolivia) para Colombia. Universidad de los Andes. Disponible en: https://hdl.handle.net/1992/69610

23 See UNODC, Global Report on Cocaine 2023 (Vienna: United Nations, 2023); UNODC, Cocaine Insights 2023: The Supply Chain (Vienna: United Nations, 2023); UNODC, World Drug Report 2023 (Vienna: United Nations, 2023)

24 Ibid.

From Leaf to Powder: Extraction, Logistics, and Profit

Every kilo of cocaine starts with a green shrub tended in remote fields. But the step from coca leaf to cocaine hydrochloride is not a simple chain of cultivation and refinement—it is a system built under prohibition. At the foundation of the trade, the imbalance is stark: growers and laborers face low margins, constant insecurity, and exposure to toxic chemicals, while the profits accumulate far from the territories that bear the greatest burdens.

Coca Cultivation: Land, Labor, and Informality[25].

Coca is typically cultivated in remote rural zones, carved into forest edges, abandoned cattle pastures, or transitional spaces at the margins of agricultural frontiers. Productivity varies widely across contexts, reflecting differences in capital investment, technical assistance, and the intensity of armed group involvement.

In Colombia, according to UNODC's most recent data, potential leaf yields have doubled in the past decade: from around 4.1 tonnes per hectare per year in 2013 to about 8.5 tonnes per hectare per year in 2023.

This national average masks significant variation, with high-yield enclaves performing above the mean and many smallholder plots remaining below it. For comparison, UNODC surveys indicate average yields in Peru of 2.2—2.8 tonnes/ha/year, while in Bolivia the range is typically 1.5—2.0 tonnes/ha/year, reflecting more traditional cultivation systems with lower capital investment.

Plot sizes also differ. In Colombia, the average coca plot is about 1.3 hectares, though this masks significant variation. Many smallholders manage 0.5—2 hectares, providing supplementary income rather than full subsistence. Larger investors or absentee landowners may consolidate 5—10 hectares or more, often through arrangements with local intermediaries who supply precursors and guarantee purchase of the leaf or paste.

Colombia offers the most reliable data on planting density. Modern production fields typically contain 9,000—11,000 plants per hectare, supported by pruning and fertilization to maximize leaf turnover. By contrast, traditional coca fields grown for *mambeo* are much smaller and far less dense. Traditional indigenous plots often contain just a few hundred bushes, widely spaced in garden plots. Lower density reduces the risk of pests and disease, while prioritizing leaf quality over sheer volume. Such plots are cultivated for family, communal, or ritual use rather than integration into the paste economy.

The structural differences matter: while industrialized enclaves push yields higher and lock growers into chemical-dependent systems under armed-group oversight, the traditional plots maintain low-density practices that emphasize cultural continuity over output.

In terms of income, the economics of coca cultivation are surprisingly precarious. Using Colombia's 2023 farm-gate prices of roughly $0.50—$0.90 per kilo of fresh leaf, a smallholder with one hectare producing the national average of 8.5 tonnes annually could gross between $4,200 and $7,700 per year from leaf sales[26]. In less productive plots closer to 3 tonnes per hectare, annual gross income falls to $1,500—2,700. Out of this, growers must pay for agricultural inputs, transport, and the obligatory "taxes" imposed by armed groups, which significantly reduce net returns.

For harvesters, or *raspachines*, income is even more precarious. Paid by weight at around $6.25 per arroba (11.5 kg), a *raspachín* harvesting in a zone that yields the national average of 8.5 tonnes per hectare annually might earn the equivalent of $250—350 per month, assuming steady work. In less productive areas, monthly earnings fall closer to $150—200. Employment is irregular, subject to seasonal demand, eradication campaigns, and price collapses, and is offered with no contracts or benefits. The combination of low margins, informality, and constant risk underscores how the foundations of the cocaine economy are built on economic precarity at the bottom of the chain[27].

The bifurcation between industrialized enclaves and artisanal plots illustrates how prohibition reshapes coca agriculture: pushing communities toward higher yields, greater chemical dependence, and tighter integration with armed-group governance, while eroding older, ceremonial cultivation practices.

25 For coca and cocaine production data in the Andean region, see UNODC (2025) reports for Colombia, Peru and Bolivia. For pricing data in Colombia, see Dirección de Sustitución de Cultivos Ilícitos (DSCI) and Observatorio de Drogas de Colombia (ODC), Ministerio de Justicia y del Derecho. Boletín técnico: precios de hoja y derivados de coca en Colombia, julio—septiembre 2024. Bogotá: Ministerio de Justicia y del Derecho, 2024.

26 All currency conversions are based on an exchange rate of 4,000 COP = 1 USD (roughly the 2023—2024 average). Only US dollar values are reported for consistency.

27 UNODC. Colombia: Coca Cultivation Survey 2013. Bogotá: UNODC, 2014.

Cultivation Economics at a Glance (Colombia, 2023)

Average plot size	Leaf yiel	Farm-gate price	Gross revenue per ha/year *avg yield (8.5 t)*	Net income
~1,3 ha	National avg 8.5 t/ha/year	US$ 0,50-0,90/kg	$4,250—7,650	Reduced by inputs, transport, and armed group "taxes"

Primary Processing: Coca Paste as the First Value Threshold

According to UNODC's 2023 data for Colombia, roughly 457 kilos of fresh coca leaf are required to produce one kilo of coca paste. In practice, this means that a single hectare yielding 8.5 tonnes of leaf could be converted into about 18—19 kilos of paste annually[28].

The process is chemically intensive but technically simple: fresh leaves are chopped and soaked in gasoline, and cement is added as a binding agent. The mixture is agitated to extract alkaloids, and other chemicals are added to precipitate the solution into a yellowish paste which is then pressed into bricks.

The resulting coca paste bricks typically sell for around $640 per kilo (Q3 2024 national average), with significant regional variation driven by access to precursors, armed-group control, and corridor risk. An average Colombian coca plot of 1.3 hectares, yielding roughly 24 kilos of coca paste, can generate roughly $15,000 annually in gross income from coca paste production—about $1,250 per month.

For paste producers, gross returns may seem attractive, but production is cost-heavy and risky. Inputs—gasoline, sulfuric acid, cement, and other reagents—account for 30—40% of non-leaf operating costs, while armed groups typically levy $12—25 per kilo. At Colombia's average conversion rate (≈457 kg of fresh leaf → 1 kg of paste), and a leaf purchase price of about $0.56/kg, raw material alone costs around $260 per kilo of paste. After factoring in operating expenses and armed-group "taxes," profit is about 30—50% of the sale price—roughly $190—320 per kilo at a price of $640. On a per-hectare basis, this yields $4,600—7,700 annually, slightly below Colombia's 2024 GDP per capita of $7,900[29].

For growers, transforming leaf into paste represents the highest value their crop can command. Yet the risks are steep: possession of paste carries heavier legal penalties, armed groups tightly control local markets, and any disruption in precursor supply can halt production entirely — not to mention the occupational risks from handling toxic agents and hazardous processing equipment.

Paste Economics at a Glance (Colombia, Q3 2024)

Leaf price	Conversion ratio	Operating costs *(chemicals, labour)*	Armed group tax	Typical sale price
~US$ 0,56/quilo	457 kg fresh leaf ↓ *1 kg paste (UNODC 2023)*	~30—40% of non-leaf costs	$12—25/kg	~$640/kg

Net margins	If buying leaf: $150—280/kg If integrated: $225—330/kg

28 Actual outcomes vary depending on local conditions, processing methods, and precursor availability.

29 World Bank. "World Development Indicators: Colombia." Washington, DC: World Bank, 2024.

Transport: Corridors of Territorial Control

Once processed, coca paste enters a logistics system shaped by armed governance.

In Colombia, consolidation hubs differ by region—Puerto Asís and Leticia in the Amazon, Tumaco on the Pacific coast, or Catatumbo in Norte de Santander bordering Venezuela. Paste is moved in cars, buses, or taxis, concealed in luggage or containers. Armed groups tax each shipment, whether per kilo or per vehicle.

A critical shift has been the increasingly decentralized landscape of secondary transformation—the conversion of coca paste into cocaine base or hydrochloride. This step, once concentrated in large laboratories, is now more distributed across the Andean-Amazonian region. Many territories host small-scale crystallization facilities, reflecting the decentralization of processing and tighter integration of armed actors into every link of the chain.

From consolidation points, shipments move along overland and river corridors: westward toward the Pacific for maritime export, north toward Venezuela for Caribbean routes, or east into Brazil. Products are transported by mixed overland and fluvial corridors, eventually converging at tri-border hubs like Leticia—Tabatinga or further east in Manaus. From there, they are inserted into containerized exports headed to Spain, Ghana, Nigeria, or South Africa.

While Colombia remains central, transport corridors from Peru and Bolivia also play an important role. From Peru's VRAEM, coca paste and base are moved eastward by river and road into Brazil and Bolivia. In Bolivia, Chapare and Yungas production flows southward: some enters Argentina, while another stream moves through Paraguay, where supply chains increasingly overlap with cannabis production and distribution.

Paraguayan corridors then channel cocaine and cannabis together toward Brazil's PCC-controlled logistics hubs and onward to Atlantic ports. These southern routes highlight how cocaine distribution often converges with other illicit economies, reinforcing armed governance and expanding environmental impacts.

Crystallization: From Paste to Cocaine[30].

Conversion of paste into cocaine base and cocaine hydrochloride occurs in clandestine labs located on urban peripheries or hidden in forested rural territories. The process requires acetone, potassium permanganate, and hydrochloric acid. One kilo of paste yields about 900—950 grams of cocaine. The final product is compressed into bricks and prepared for maritime containers, fast boats, or overland routes.

Crystallization is capital-intensive, usually managed by different actors than those involved in leaf cultivation.

While a grower may earn USD $450 for half a ton of coca leaf, that same volume is transformed into a kilogram of cocaine worth USD $20,000—30,000 in wholesale markets—and upward of USD $100,000 in retail sales. The markup is extreme, but the profits are not shared. The burdens of violence, health risk, and environmental damage concentrate overwhelmingly in producing and transit territories.

PHOTO: Gena Steffens

30 UNODC. World Drug Report 2023. Vienna: United Nations, 2023.

Crystallization Economics at a Glance (Colombia/Brazil, 2024)

Conversion	Precursors	Operating costs	Wholesale in Colombia
1 kg paste ↓ 0.9—0.95 kg cocaine HCl	acetone, potassium permanganate, hydrochloric acid	capital-intensive labs, skilled chemists	USD $640 / kg coca paste

Wholesale in Brazil border *Tabatinga*	Export *Europe/Africa*	Margins
USD $1K for coca paste, 3K cocaine HCl[31]	USD $ 25k—30k/kg	Concentrated among actors with capital & logistics capacity; far above cultivation/paste

By the time cocaine reaches international wholesale markets, its price has multiplied many times over, yet the burdens of violence, criminal taxation, and insecurity remain concentrated in the rural and transit territories where the chain begins.

PHOTO: Gena Steffens

31 At the Peru—Brazil border, especially in Tabatinga, cocaine base paste may fetch around USD 1,000/kg, with refined cocaine selling for USD 2,500—3,000/kg.^[InfoAmazonia, "The Poorest Narcos in the Drug Trafficking Chain," August 10, 2023, https://infoamazonia.org/en/2023/08/10/the-poorest-narcos-in-the-drug-trafficking-chain/]

The Environmental Footprint of Prohibition[32].

Contrary to popular belief, where moral panic around cocaine consumption rules the political debate, the cocaine economy leaves its deepest marks in the ecosystems where coca is cultivated and processed. Under prohibition, the expansion of coca crops, the chemicals used in processing, and the violent dynamics of eradication have converged to produce a profound environmental footprint.

Coca expansion is a consistent direct driver of deforestation in Colombia's Amazon and Andean foothills. Coca-related forest loss has doubled over the past decade, with annual rates exceeding 20,000 hectares in some years.

Hotspots include Caquetá, Putumayo, and Guaviare, where coca fields often overlap with biodiversity hotspots such as Chiribiquete National Park. By 2020, coca crops had been detected in 14% of Colombia's national parks, accelerating the fragmentation of some of the most biodiverse ecosystems on the planet.

The ecological toll goes beyond hectares lost. Research shows that coca cultivation acts as a "frontier crop," opening access for cattle ranching and illegal logging. Once forest is cleared for coca, subsequent waves of pasture and settlement magnify deforestation impacts. Coca-driven deforestation rarely occurs in isolation. In many regions, the clearing of forest for coca accelerates parallel extractive economies. In Guaviare and Putumayo, coca plots often serve as precursors to illegal gold mining or cattle pasture. Once state presence is further weakened by eradication or conflict, larger-scale actors move in.

The processing of coca into paste, base and cocaine hydrochloride introduces large volumes of toxic substances into fragile ecosystems. A single kilo of cocaine requires multiple liters of gasoline and significant quantities of sulfuric acid, ammonia, potassium permanganate, and acetone. With no formal waste management, most residues are dumped directly into rivers, streams, or open pits. Contamination is exacerbated by enforcement measures such as in situ incineration. Communities downstream from processing zones frequently report fish kills, polluted waters, and rising health complaints.

Field studies in Putumayo and Caquetá have documented elevated concentrations of heavy metals and acid residues in soils and waterways near processing sites. Amphibians and freshwater fish—already vulnerable due to habitat loss—are particularly affected, with evidence of population decline in coca-processing corridors.

Eradication and Its Consequences

Policies aimed at eliminating coca have often intensified ecological damage. Aerial fumigation campaigns using glyphosate not only targeted coca but also destroyed food crops, degraded soils, and contaminated water sources. Communities report links between glyphosate exposure and skin lesions, respiratory problems, livestock deaths and miscarriages.

Manual eradication, while less chemically destructive, also carries ecological costs. Armed groups frequently force replanting deeper into forest reserves, pushing coca cultivation further into ecologically sensitive zones. This "balloon effect" means that even when eradication reduces local coca hectares, it simultaneously extends the ecological frontier into more pristine environments.

Coca thrives in zones of weak governance, armed conflict, and high biodiversity value. Criminalization ensures that production is pushed into remote, unregulated territories where enforcement is episodic and ecologically blind. In this way, the system of prohibition generates not just criminal markets but also environmental sacrifice zones.

The environmental footprint of prohibition mirrors the commodity chain: localized harm, externalized profit, while the socioenvironmental costs remain invisible to the consumers who ultimately finance the trade. Prohibition has constructed not only a war economy but fostered an ecological crisis that extends far beyond coca and cocaine.

Coca Futures: Reclaiming the Plant, Rebuilding the Territory

The corrupt and extractive system built around coca paste due to prohibition is not inevitable. Nor is it the final expression of what the coca plant can offer. Across the Andes and Amazon, communities are quietly proposing - and in some cases implementing- radically different ways of relating to coca: not as a raw material for criminal economies, but as the center of territorial care, cultural survival, and legal economic transition.

Indigenous and campesino organizations have begun to reassert the plant's original meaning, not only as a cultural symbol, but as a platform for legal autonomy. Their models reject the framing of coca as an illicit precursor; instead, they defend its governance as a form of climate adaptation, food sovereignty, and post-conflict repair.

32 See María Alejandra Vélez Lesmes et al., Environmental Impacts and Transitions across Illicit, Informal and Licit Economies in Colombia: Coca-Cocaine, Gold, and Cattle, Documento temático no. 54 (Bogotá: CESED—Universidad de los Andes, 2025)

Legal Shifts: The 2024 WHO Critical Review[33].

A key development in reframing the coca leaf is the critical review initiated by the World Health Organization's Expert Committee on Drug Dependence (ECDD), following formal submissions from Bolivia and Colombia in 2023-2024.

Both countries argued that the inclusion of coca leaf in Schedule I of the 1961 UN Single Convention is scientifically unfounded, culturally biased, and legally incoherent. The review - which could result in coca being removed or re-classified - represents the most serious challenge to the prohibition framework in over sixty years.

With final outcomes still pending, the review process has created a new diplomatic space for countries to rethink how coca is governed-and who gets to make that decision.

In Bolivia, legal coca cultivation is organized under the social control model, where registered growers in the Yungas and Chapare regions operate within a state-recognized system that includes monitoring, limits, and alternative development pathways. While not without challenges, the model offers a legal framework that limits armed control and allows for diversified coca use beyond paste for cocaine.

In Colombia, recent years have seen the emergence of new initiatives like FEDECOCA, a national Indigenous and campesino network that proposes a framework for coca governance based on territorial assemblies, ecological certification, and narrative repair. Other local initiatives are experimenting with coca as input for legal medicine, community nutrition, and ecosystem restoration.

Transition away from the paste economy will not come from enforcement or crop substitution, or from abstract policy items. Groups working on this transition, often with limited resources and in direct resistance to armed actors, are investing in:

- **Education:** restoring ancestral coca knowledge and building new skills for community governance
- **Cultural revitalization:** reconnecting younger generations to coca's ceremonial and agricultural role
- **Legal accompaniment:** supporting territorial actors to navigate emerging national and international frameworks
- **Harm reduction:** addressing local consumption and addressing community-level risks
- **Economic repair:** developing localized value chains that honor coca's complexity and legality

Coca futures are not about inventing a new system. They are about returning to what coca already was before prohibition.

Indigenous Elders and Organizations as Custodians of Coca's Future

The revaluation of coca begins with the knowledge held by Indigenous elders and the organizations that represent them. Across the Andes and Amazon, sabedores, taitas, and mayores safeguard the spiritual and ecological teachings that frame coca not as commodity but as kin. Their guidance informs how coca is planted, harvested, and shared, anchoring the plant in systems of reciprocity that predate the modern state.

In many territories, elders are also political actors. They lead assemblies, advise councils, and define the principles that underpin community-based models of coca governance. By articulating coca's future in both spiritual and institutional terms, they ensure that transitions away from the paste economy remain grounded in cultural continuity rather than imposed technocratic design.

The role of collective organizations is equally critical. Territorial platforms across the Andes and Amazon have consistently defended coca's legitimacy, building alliances with campesino, Afro-descendant, and environmental movements. These bodies amplify coca's redefinition as a tool for autonomy, adaptation, and peacebuilding.

Any serious future for coca must therefore recognize elders and organizations as the primary custodians of its meaning. Their authority cannot be substituted by external agencies, nor bypassed by market logic. The plant's future—as medicine, as food, as ritual, as livelihood—will depend on the continuity of this intergenerational transmission of knowledge.

PHOTO: Jorge Panchoaga

33 International Drug Policy Consortium (IDPC), "The UN Review of the International Status of the Coca Leaf," July 2023, https://idpc.net/coca-leaf-review-23; WOLA & TNI, "Coca Chronicles: Bolivia Challenges Coca Leaf Ban," Washington Office on Latin America, 2023, https://www.wola.org/analysis/coca-chronicles-bolivia-challenges-coca-leaf-ban/

Conclusion: Infrastructures of repair

This chapter has shown how the prohibition economy operates as a system: one that externalizes risk and environmental cost, consolidates profit through territorial control, and criminalizes forms of knowledge that could otherwise guide a transition. But it has also identified sites of resistance—initiatives that reject the assumption that coca must be illicit to be economically viable.

In Colombia, long lagging Peru and Bolivia in the coca resistance, these alternatives are no longer abstract.

- Coca Nasa, founded by Fabiola Piñacué, stands as the first Indigenous-owned and led legal coca enterprise in the country. Alongside organizations like ONIC and CRIC, its work demonstrates how strategic litigation and advocacy across Indigenous and national jurisdictions can carve out windows of legality for coca—anchored in the recognition of Indigenous cultural rights and autonomy, and in the effort to harmonize those rights with ordinary Colombian law. One notable example is the agreement between Coca Nasa, CRIC, and Universidad de los Andes, which establishes research on coca carried out under Indigenous jurisdiction.

- Other Indigenous enterprises, such as Origen Amazonía and Comuna Koripampa, have affirmed that coca leaf is part of Indigenous biocultural patrimony, and that regulated market development must remain under indigenous guidance.

- In the campesino sphere, the Escuela Agroambiental El Arraigo and the community brand Hayu Guas, rooted in the Macizo Colombiano, sustain an unbroken cultural and spiritual relationship with the coca leaf. They too uphold the principle of biocultural patrimony, placing coca's governance firmly within community systems of knowledge and belonging.

Alongside these community-driven initiatives, Colombia has also seen regulatory experiments at the national level. The shelved 2020 bill to regulate coca and cocaine marked the first serious attempt by the legislature to design a comprehensive legal framework. Inspired by Peru's ENACO model, the bill proposed a state monopoly over cocaine production, with regulated cocaine made available through a harm reduction system. Importantly, the draft also acknowledged that coca governance could not be separated from Indigenous rights frameworks. Although the bill did not advance, it became a key precedent[34].

These initiatives illustrate that the goal now is not simply to end prohibition, but to build the infrastructures of repair. Coca has taught many lessons—some violent, some healing. It was made criminal not because of what it is, but because of what it was forced to become. That transformation can be reversed—not by erasing the past, but by listening to those who never stopped growing coca because the plant is inseparable from their existence.

If prohibition taught us how to destroy, coca can teach us how to rebuild.

For a detailed overview on leverage points for territorial, ecological and social repair for transition and coca regulation, see PART IV - The Future in a Leaf of this publication.

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A complete list of references and works cited is available as an annex at the end of this publication.

34 Restrepo Diaz, D. (2022). Daring to regulate coca and cocaine: Lessons from Colombia's drug war trenches. Universidad de los Andes. Disponible en: https://hdl.handle.net/1992/69575

PHOTO: Gena Steffens

Step-by-step: the cocaine refining process

The chemical refining of coca leaves has been going on since the late 19th century, when the construction of a global production chain linked cultivation in the Andean countries to the nascent pharmaceutical industry in the United States and Europe, feeding a market geared towards medical and recreational consumption[1].

Currently, the refining process requires a huge organizational structure, including investment capital, safety nets, specialized labor and transport logistics. It's a production chain marked by the policy of prohibition, which heightens risks and increases the added value.

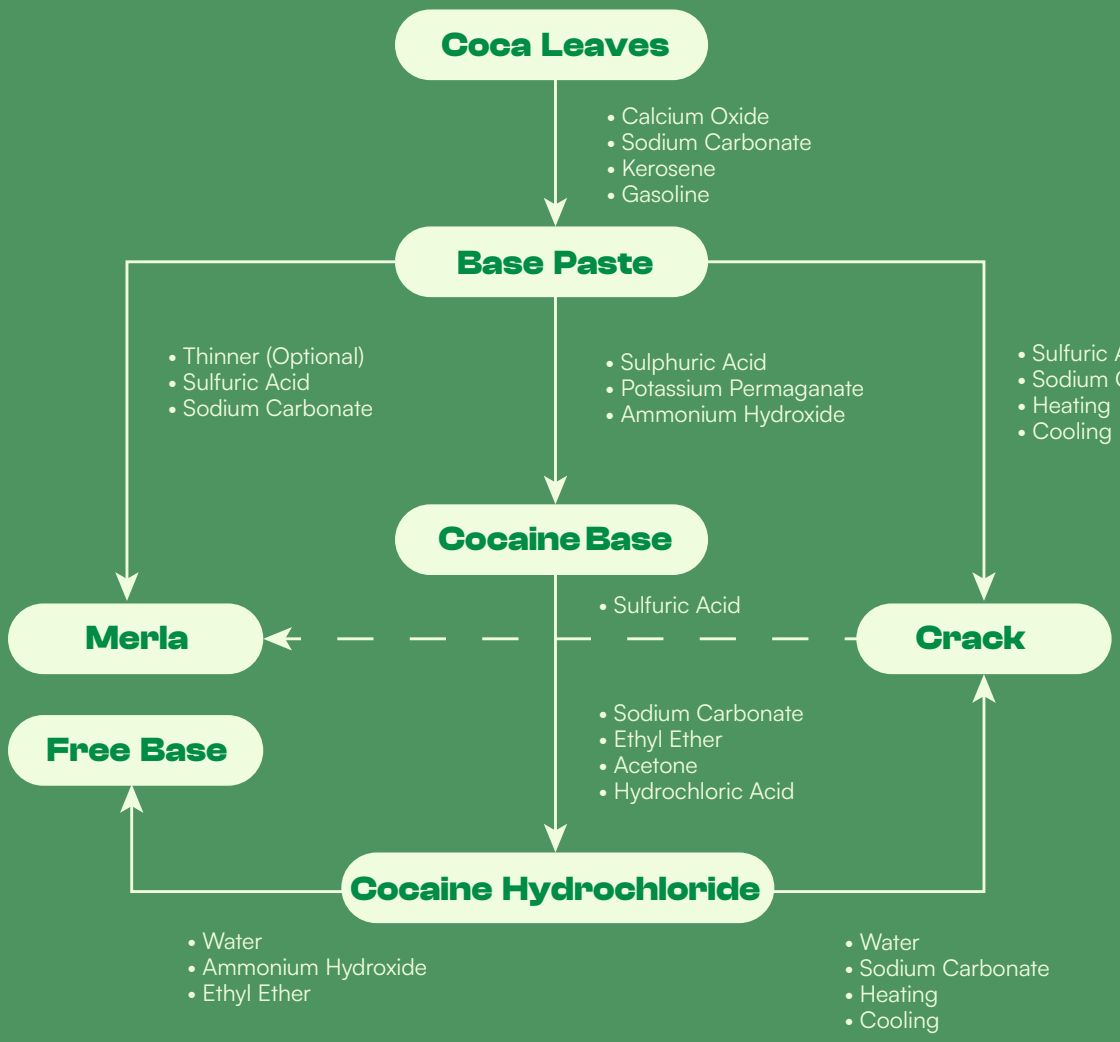
1 For a history of the construction of global chains of cocaine cultivation, refining and consumption, see: Gootenberg, 2008.

Over time, the activity has undergone various transformations, responding to market demands, legal restrictions and waves of police repression, resulting in the disappearance and emergence of areas where laboratories are concentrated. Another aspect of this illicit industry is the constant need to access and adapt to the availability of chemical precursors - many of which are for controlled use and need to be smuggled in.

Just to extract the alkaloids, it is estimated that the production of one kilo of "base paste" requires around 1,000 liters of ammonia and 320 liters of gasoline[2].

Today, there is a variety of cocaine-derived substances on offer at the retail level (see box), resulting from different production methods, transportation routes and forms of consumption. Although this is an activity that adds enormous value to cocaine and generates significant socio-environmental impacts, it is perhaps one of the least documented stages in the production chain of this illicit commodity.

Inputs needed to process cocaine (and derivatives) by stage



Franchi & Rodrigues, 2024, p. 73. https://imazon.org.br/wp-content/uploads/2024/10/Revista-Dialogos-Soberania-e-Clima-Setembro-2024.pdf (adaptado de Vargas, R. M. Determinação do DNA da Cocaína. Perícia Federal. Brasília, 2001. p. 16-21.)

2 UNODC, 2023a.

According to the UNODC (2023), a kilo of cocaine can cost US$ 10,000 in South America, US$ 84,000 in Europe, US$ 188,000 in Japan, US$ 241,000 in Australia and US$ 533,000 in Saudi Arabia.

5 MAIN STAGES OF COCAINE REFINING

1. Growing the "coca leaf"

There are around 250 plants of the genus Erythroxylon (popularly known as "coca leaves"), but the most used for the production of cocaine are *Erythroxylum coca* and *Erythroxylum novogranatense*[3]. Farmers harvest the first crop about 15 months after planting, but the bush reaches maturity in two or three years. After this period, the plant survives for up to 15 years, generating three to four harvests a year[4].

2. Extraction of alkaloids and production of "base paste"

After harvesting, the coca leaves undergo a maceration process, and the resulting juice is soaked in chemical solutions to extract the alkaloids (cocaine is just one of the alkaloids present in the leaves). In general, fuels such as gasoline and kerosene are used, but sulfuric acid, quicklime, cement, caustic soda, urea and ammonia are also utilized[5]. After soaking the leaves, they are filtered and dried. The result of this process is a "crude" cocaine paste or "base paste", which still has a brownish appearance and many impurities such as organic residues, sugars, tannins and other substances[6].

Given the low concentration of alkaloids (between 0.2% and 0.8% of the plant's weight), around 700 kilos of leaves need to be processed to produce one kilo of cocaine, which makes the extraction process extremely polluting[7]. This stage of the process usually takes place close to the growing areas, generally in rudimentary structures such as wooden huts with dirt floors.

According to data from the United Nations Office on Drugs and Crime, "base paste" usually has purity levels of between 50% and 65%[8], and a value 5 to 6 times higher than the raw material harvested by farmers[9].

3. Purification: from "base paste" to cocaine base

The "base paste" goes through a second refining process, in which it is "washed" and oxidized. At this stage, various substances are mixed with it to reduce impurities, such as potassium permanganate and ethyl alcohol; sulphuric acid is also commonly used, as well as organic solvents, salts and bases. The result is cocaine base, with a concentration of alkaloids ranging from 80% to 95%[10].

This process requires a more elaborate infrastructure, such as washing machines, distillers, filtering equipment, various types of heaters (including "gusanos", which heat in a water bath, and microwaves) and rustic drying kilns (wooden boxes with large lamps covered with thick cloths). According to data from the CDESC (2023), the large refining laboratories are usually concentrated in forested areas, far from the cultivation zones, and have communication equipment, solar panels, electrical plants, water pumps, warehouses, dormitories and kitchens, as well as being accessible by airstrips and open dirt roads in the forest, or by river transportation.

The evidence shows that the production of cocaine base is more integrated into the logistics chain for storing and transporting large quantities of drugs[11]. Frequent seizures of vacuum packers, metal molds, hydraulic presses, air compressors, scales and machines for marking drug bricks indicate preparations to distribute wholesale cocaine

Because they require more infrastructure and store large quantities of drugs with a high added value, cocaine base refining laboratories are also usually more protected by armed groups, which poses a greater risk to the surrounding communities and the operation of the security forces.

4. Re-oxidization or crystallization: refining for the consumer market

Both "base paste" and cocaine base can be transformed into different products for final consumption, such as cocaine hydrochloride (the powder), crack (rocks/ stones that undergo a chemical process that varies depending on the location) and merla (a smokable product made from the residues of "base paste" production)[12].

To produce the hydrochloride, the cocaine base goes through a precipitation process and the addition of chemical reagents that alter its pH, such as a mixture of hydrochloric acid and hydrogen chloride, generating the crystallization of the alkaloid. This process can occur both in large refining plants and at other stages in the supply chain.

3 In Brazil, there is evidence of residual cocaine production from the "epadu" leaf, one of the variants of the "coca leaf" with a lower concentration of alkaloids. Its cultivation was more significant in the early 1980s, but it still occurs today in the state of Amazonas, even if its identification is less frequent. For more information, see: Jornal da Tarde (1983); G1 (2014). For more on varieties of "coca leaves" and cultivation details, see: UNODC , 2021.

4 Vellinga, 2007.

5 UNODC, 2021.

6 Center for Drug and Development Studies (CDESC), 20237 UNODC, 2023b.

8 UNODC, 2023b.

9 European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) & European Union Agency for Law Enforcement Cooperation (Europol), 2022.

10 UNODC 2021

11 CDESC, 2023.

12 Categorizing the spectrum of cocaine-derived products represents a challenge for the authorities for two reasons. Firstly, the production process itself varies locally, with the addition of chemical reagents and adulterants that are not standardized. Secondly, similar products receive different names depending on the country (and the opposite also occurs, with different products receiving the same name, as in the case of crack consumed in Brazil and Europe). It is common, for example, for the press to announce that a new drug is being consumed in a country when, in fact, it is just a different name for the same substance or for a set of substances already consumed (as in the case of "Oxi") (UNODC, 2021).

Crack, especially that consumed in Brazil, is generally produced from "base paste" or cocaine base dissolved in sodium bicarbonate and ammonia. The liquid is boiled down to an oily substance, which is then cooled and dried in microwaves or makeshift ovens, resulting in stones with a high degree of impurity. The crack consumed in Europe is usually produced from cocaine hydrochloride (powder), which is purified and results in stones with a high concentration of cocaine alkaloids[13].

5. Addition of adulterants or diluents

The final stage in the refining chain corresponds to the adulteration and dilution processes, also called "cutting".

In adulteration, the substances that are added alter the effect of the drug, such as painkillers, stimulants or other illicit drugs. In Brazil, mixing with caffeine or lidocaine is common. In Europe, laboratory research indicates that the drug is mixed with heroin, hashish, buprenorphine, methadone or cathinone[14].

In the case of "cutting", substances that resemble cocaine hydrochloride or crack are added to increase the volume sold at the retail level. To do this, "inert" substances such as sugars, starches and bicarbonates are used. It's a retail strategy that basically serves to reduce the final cost of the product and increase the profits of the drug trade.

This last stage of the production chain is more decentralized and takes place close to the areas of consumption. It's common for laboratories to be set up in apartments or houses in big cities, but the infrastructure, chemical reagents and dilution materials used vary depending on which substance is being produced[15].

PHOTOS: Gena Steffens

13 UNODC, 2021.

14 UNODC, 2021.

15 Yagoub, 2016.

Groups of cocaine derivatives
(adapted from UNODC 2021)

Products manufactured from cocaine paste or cocaine base (MCP)	They are consumed through smoking and can be mixed with tobacco. Within this group, there is variation depending on the chemical mixtures made and the place of consumption. In Brazil, crack is the most common variety and can be imported in its final form or refined in the country.
Free-standing consumer products (FCP)	They include both “freebase” and crack (despite the same name, this is not the crack most consumed in Brazil), commonly found on the markets of Europe and North America. They are smokable forms produced by converting powder cocaine into its basic form, free of hydrochloric acid. The “freebase” undergoes an additional purification stage using a flammable organic solvent such as diethyl ether, resulting in a purer product, but one that is more dangerous to refine and consume. Crack, on the other hand, is simpler and safer to manufacture in “home” laboratories, which explains its wide dissemination.
Cocaine hydrochloride (powder)	The most common form of global consumption, it is presented as a powder with a certain impurity (alkaloids, solvents, cocaine base). In general, the powder is also mixed with diluents or adulterants. The adulteration process adapts to the global market and takes place at different stages in the distribution chain.

II — PATHWAYS

PHOTO: Andres Cardona

PHOTO: Andres Cardona

Chapter 1

Traces of an illegal South American commodity: the cocaine cycle in the bowels of Brazil

Thiago Godoi Calil

With the isolation of the active ingredient in cocaine in the 19th century[1], the history of coca changed radically. It went beyond the cultural, symbolic and mythological values associated with indigenous culture and entered the market, becoming one of the most valuable products in circulation on the planet. In 1937, the international ban on cocaine by the Geneva Convention[2] created another break in history. In the 1970s and 1980s, the intensification of the War on Drugs policy and neoliberal logic established the global illicit cocaine market.

1 The active ingredient was isolated between 1859 and 1860 by the German chemist Albert Niemann. ARAÚJO, T. Almanaque das drogas. São Paulo: Leya, 2012.
2 Ibidem.

Since then, the consequences of prohibition have spread across the planet, aggravated by doses of greed, power and violence. Whether it's the high financial gains or the associated violence, the criminalization of the cocaine production chain generates economic movement and territorial disputes, leaving a trail of corruption and human rights violations.

Despite not being known as a producer, Brazil is the second largest consumer of cocaine in the world. In 2024, around 138 tons of cocaine were seized in the country[3]. The amount not seized is certainly higher. River dwellers, settlers, *caipiras*, and *matutos* (rural Brazilian with deep traditional roots) are attracted or coerced by its economy. Others find in the dynamics of trafficking an alternative for social mobility, prestige and survival. Money seduces and, coupled with prohibition, produces a logic of criminalization and violence with social, economic, political and environmental implications.

It is an illicit economy that grows with unquestionable vigor while truculence and repression accompany it. The cycle is vicious: profits remain in the hands of a few at the expense of socio-environmental crises in the cities or countryside that affect thousands of people in their search for better living conditions. The knot is broad: an intersection of complex forces that is atrociously entangled throughout Brazil.

This article sheds light on the social, environmental and health consequences that the prohibition of the cocaine production chain produces and reinforces in Brazil. It contributes to breaking the hypocrisy and silencing that permeates the history of coca in South America and denounces the tools of oppression against people who have been, and still are, massacred by the racial and classist exploitation renewed by current drug policies.

While considering the necessary differentiation of the cultural and symbolic values attributed to the coca leaf, it is a fact that cocaine does not exist without the plant.

Aware of the complexity surrounding the issue, it is in this spirit that this text presents a brief overview of the effects of the illicit cocaine economy in Brazil. A recognition of its consequences as a denunciation, alerting us to the need to rethink the relationship between drug policies, society and the environment.

Domestic Consumption

Brazil is the second largest global consumer of cocaine, behind only the United States.

At the turn of the 20th to the 21st century, the increase in the presence of crack cocaine (cocaine in the form of stones for smoking) in Brazilian cities meant that injectable consumption lost momentum, giving rise to new concerns and care perspectives for smoked use.

Currently, the smoked and inhaled routes are the main forms of consumption in the country. According to the National Survey of Alcohol and Drugs (Lenad)[5], the number of people aged 14 or over who have used cocaine/crack at least once in their lives corresponds to approximately 11.4 million Brazilians, or 6.6% of the total population. The number of people who have used cocaine/crack in the last year, and represent regular use, totals 3.8 million, or 2.20% of the total population. Despite being a parameter of the reality of consumption, the number is underestimated, as the survey was of a household nature and hardly reflects the proportion of homeless people who also use these substances.

PHOTO: Rafael Vilela

3 According to national public security data. Brazil. National public security data. Available at: https://app.powerbi.com/view?r=eyJrIjoiYThmMDBkNTYtOGU0Zi00MjUxLWJiMzAtZjFlMmYzYTgwOTBlIiwidCI6ImViMDkwNDIwLTQ0NGMtNDNmNy05MWYyLTRiOGRhNmJmZThlMSJ9 Accessed on August 21, 2025.
5 Thematic booklet on cocaine and crack cocaine from the National Survey on Alcohol and Drugs (Lenad, 2025). The survey was carried out by probabilistic sampling with the participation of 16,608 participants aged 14 or over in all regions of the country. Available at: https://lenad.uniad.org.br/cadernos-lenad/cocaina_crack_vf_03_020725.pdf

Cocaine - Use and Effects

In addition to organic factors, it is important to note that the effects associated with using a substance are also related to the context, the meaning attributed to consumption and the psychological conditions of consumers - it is a biopsychosocial phenomenon.

The reasons that lead someone to consume cocaine can be various: recreational use, improvement in social or work performance, alternative self-medication for psychological distress, among others.

In terms of the effects on the central nervous system that influence behavior and perception, cocaine is considered a stimulant substance that speeds up the body's functioning. The main effects are feelings of euphoria, increased alertness and loss of appetite and sleep. However, the intensity and duration of these effects depend on the quantity and quality of the substance (concentration of cocaine), as well as the different routes of administration, as these are determining factors for variation in the levels of effects and their associated risks.

Cocaine is a versatile substance, and its alkaloid (active ingredient) can be absorbed by the body via different routes.

In addition to the traditional forms of use such as chewing (insalivation) and the ingestion[6] of teas, flour, cookies, oils and other products based on coca leaves, processed cocaine can be consumed by three main routes:

1

Injectable

(cocaine hydrochloride)

effects appear seconds after use and last about 30 to 60 minutes, with the peak in the first few minutes after use

2

Inhalable

(cocaine hydrochloride)

effects appear between three and five minutes after inhalation and last between 60 and 90 minutes with a peak ten minutes after use

3

Smokable

(base paste and crack)

effects appear between five and ten seconds after smoking and last for about 30 minutes with a peak in the first five minutes after use

The different forms of use present risks, the main ones being cardiorespiratory arrest, increased blood pressure, convulsions, strokes and heart attacks.

The lack of standards and quality control in the illicit cocaine market aggravates and makes the risks unpredictable due to the mixture of adulterants. The constant ingestion of smoke can cause serious damage to the lungs and respiratory tract. Sharing objects for consumption, such as pipes, syringes and straws for inhaling, are ways of transmitting serious infections such as tuberculosis, HIV and hepatitis, respectively[7].

6 In 1975, Harvard University published a study on the nutritional value of coca leaves and found that they had a high nutritional value compared to the average of 50 other Latin American vegetables per 100 grams consumed. Coca leaves are a rich source of calories, protein, calcium, carbohydrates, fiber, phosphorus, iron, vitamin B2, and especially vitamin A. See more information in: James, A.; Aulik, D.; Plowman, T. NUTRITIONAL VALUE OF COCA. Botanical Museum Leaflets, Harvard University, Vol. 24, No. 6, pp. 113-119, 1975. Available at: https://cocaciencia.gob.bo/documentos/46-nutritional-value-of-coca.pdf

7 Sources consulted: ARAÚJO, T. Almanaque das drogas. São Paulo: Leya, 2012. e ESCOHOTADO, A. O livro das drogas: usos e abusos, desafios e preconceitos. São Paulo: Dynamis Editorial, 1997.

Cocaine Diffusion - The Expansion of Routes

As well as being a consumer market par excellence, Brazil is a strategic transshipment and export point for this illegal commodity through international trafficking networks, mainly to Europe and Africa.

The more difficult the route, whether due to distance or inspection, the higher the price. Profit is proportional to risk. The more investment in the fight against drugs, the greater the profits for organized crime entrepreneurs - this is the contradiction of prohibitionism[8].

Brazil is one of the only countries bordering the three largest producers of coca leaf and cocaine: Bolivia, Peru and Colombia. To supply the lucrative domestic and foreign markets, cocaine enters the country via multiple routes, the main ones being:

1. through Paraguay, on the borders with Paraná and Mato Grosso do Sul.

2. through Bolivia, on the borders with Mato Grosso, Rondônia and Acre.

3. through the Amazon, on the borders with Colombia, Peru, Venezuela and Guyana.

Below is a brief contextualization of the main entry and distribution routes *(see more details and maps on the routes in the next chapter).*

The Caipira Route

Originating on the borders with Bolivia and Paraguay, the main destinations of the Caipira Route are the metropolises, especially those in the Southeast, and the country's largest port, in the city of Santos, São Paulo. The route is old. In 1928, the Gambling and Customs delegate of São Paulo already warned about the entry of cocaine through the Paraguayan border with the former state of Mato Grosso[9]. Despite being a hundred years old, the Caipira Route grew from the 1970s onwards, when so-called *sacoleiros* (smugglers) started bringing marijuana from Paraguay to São Paulo along with other smuggled goods such as clothes, alcoholic beverages and cigarettes[10].

Between 1972 and 1978, the Army and Air Force intelligence services pointed to the possible transportation of illicit drugs by road and air through the interior of the state of São Paulo. In the 1980s, the route began to be occupied by migrants attracted by the new agricultural frontier associated with the economic expansion of agribusiness in the Brazilian Midwest.

In parallel with its position as a grain depot, the region quickly established itself as a hub for powder cocaine, loaded onto vehicles and aircrafts from Bolivia and Paraguay, bringing in shipments produced in Colombia and Peru[11]. In 2000, chemical inputs for cocaine refinement were seized in the interior of São Paulo[12]. The route diversified and became more dynamic, moving millions of reais a month and consolidating itself as the main pathway for the entry and distribution of cocaine in Brazil.

Landings on clandestine airstrips in the states of São Paulo, Goiás, Minas Gerais, Mato Grosso do Sul and Paraná occur almost daily. The extensive road network favors distribution through Brazilian cities, ports and airports. The interior of São Paulo has favorable conditions such as good weather and flat terrain for building airstrips amidst of sugar cane fields.

In 2002, the Parliamentary Commission of Inquiry (CPI) into Drug Trafficking registered 390 clandestine airstrips in São Paulo, showing a consolidated infrastructure at the service of drug trafficking activities[13]. In 2007, reports emerged about the intensification of crack cocaine use among sugar cane cutters in the interior of São Paulo[14]. In 2012, the Federal Senate opened an investigation into allegations that crack stones were being used as payment for rural workers[15]. In 2011, more cocaine was seized in the north of the state of São Paulo than the combined seizures from other 23 Brazilian states.

The Caipira Route is one of the key protagonists in the local and global logistics of this illicit economy

Under the control of the Primeiro Comando da Capital (PCC), one of the largest criminal organizations in Brazil, the Caipira Route manages the borders with Paraguay and Bolivia, mainly in the cities of Ponta Porã and Corumbá, in Mato Grosso do Sul. Between Ponta Porã and Pedro Juan Caballero, on the border with Paraguay, various conflicts linked to illicit economies have made this one of the most dangerous frontier points in the country[16].

Amazon Route

In the Amazon Basin, national borders are blurred between the indigenous territories and cultures that have historically occupied the region. In these tropical jungles, criminal organizations also blend into the transnational structure of cocaine trafficking.

The phenomenon goes hand in hand with the complicated history of short-cycle economies in the Amazon, such as the rubber cycle during the 19th and 20th centuries, experienced by people in search of better living conditions and/or the illusion of easy enrichment via local exploitation of global export goods, in which most of the capital generated does not remain in the territories of production. With illicit cocaine, the scenario is aggravated by criminalization.

Brazil has recently risen from tenth to third place in terms of the volume of cocaine seized, and the Amazon has become an important part of this scenario[17]. The implementation of Law No. 9.614 in 2004, known as the Law of *Abate* (shoot down), allowed the Air Forces to interdict aircraft considered suspicious, causing rapid logistical adaptation in the transportation of narcotics and increasing the flow through other routes. Thus, the federal government's strategy has created new challenges, as it has stimulated the intensification of operations along the rivers of the Amazon, whose extensive and irrigated geography has consolidated numerous routes that are difficult to monitor, along the navigable waterways that connect the Andean region to Brazil's urban cen-

8 BERGMAN, M. Drogas, narcotráfico y poder en América Latina. Buenos Aires: Fondo de Cultura Económica, 2016.
9 Galvão, A. Toxicomanias. Arquivos Rio Grandenses de Medicina. Ano VII, n 6, p. 11-16, 1928.
10 ABREU, A. Cocaína — a rota caipira: o narcotráfico no principal corredor de drogas do Brasil. 2.ed. Rio de Janeiro: Record, 2017.
11 The police estimate that at least twenty people a day leave Corumbá by bus bound for the interior of São Paulo with cocaine hidden in them. Op. cit. Abreu, 2017.
12 CPI on Drug Trafficking, 2002. Available at: https://www.al.sp.gov.br/repositorio/arquivoWeb/com/cpi_narcotrafico_relatorio_final.pdf
13 Ibidem.
14 https://www1.folha.uol.com.br/fsp/cotidian/ff1410200716.htm
15 Source: Agência Senado. https://www12.senado.leg.br/noticias/materias/2012/05/03/comissao-pede-investigacao-de-2018crack-salario2019-para-cortadores-de-cana
16 https://www.cnnbrasil.com.br/nacional/guerrilhas-sequestros-e-luta-por-terra-a-tensao-na-fronteira-brasil-paraguai/
17 Pontes, N. A origem dos "rios de cocaína" na Amazônia. Revista Piauí - Questões do Narcotráfico, January 30th, 2025. Available at: https://piaui.folha.uol.com.br/a-origem-dos-rios-de-cocaina-na-amazonia/#:~:text=S%C3%A3o%20eles%3A%20Abuna%2C%20Acre%2C,%2C%20Tarauac%C3%A1%2C%20Uaup%C3%A9s%20e%20Xi%C3%AA.

ters. A study published in 2024[18] points out that the Amazon region currently has at least 16 "cocaine rivers", all flowing towards Manaus and Belém[19].

Several cities along the rivers have been exposed to illicit activities, the forces of organized crime and the rapid growth of violence. The Amazon Route has become the second main entry point for drugs into Brazil

Whether by air or water, hundreds of tons of cocaine hydrochloride and base paste cross the Brazilian Amazon, where seizures grew by 94% between 2023 and 2024[20]. In the border state of Rondônia, between 2019 and 2023, the increase was 1,031.8%[21].

On the rivers, transportation is preferably carried out at night, including with the use of advanced technological resources. On the so-called triple border (the territorial confluence between Brazil, Colombia and Peru), there are records of drones being used to monitor the police and decide the best time to cross[22]. From the rivers, the cocaine circulates along highways that connect and spread the merchandise across the road network of the southwestern Amazon in different directions: north, northeast, federal district and southeast. Clandestine airstrips near the rivers defy legislation and boost transport to urban centers.

To meet domestic consumption and international demand, cocaine enters and circulates throughout the country, linking up with other economies in different territorial contexts. Wherever it goes, the cocaine chain leaves its mark with tragedies associated with prohibitionist drug policy.

With solid global demand, the cocaine market fluctuates little, making it an ideal commodity with high liquidity and added value.

Organized Crime and Drug Trafficking

The cocaine economy goes far beyond the substance: just like gold mining and other short-cycle economies, it creates movements, catalyzes illegalities, predatory exploitation, corruption and violence.

The notion of organized crime is a complex system with different scales, and which is not limited to the trade in criminalized narcotics. Trafficking resulting from cocaine prohibition, however, is one of the main sources of criminal income and a growing threat to governance in the country.

It is estimated that there are approximately 72 criminal factions in the country linked to drug trafficking[23], bringing together a wide constellation of actors who make the chain work[24]. The structure of drug trafficking has entrepreneurial traits and can be described as a line-up of "doctors, policemen, politicians, lawyers and judges in a single line at the service of the powder"[25].

In addition to those who move the pieces on the board, there are a huge number of people involved on the front line of these operations, often in conditions of social vulnerability and who enter crime in search of job and income opportunities.

In Brazil, the Comando Vermelho (CV), which originated in Rio de Janeiro at the end of the 1970s and is now present in 20 states, mainly in the North and Northeast; and the Primeiro Comando da Capital (PCC), which originated in São Paulo in the 1990s and operates in 23 states, with greater influence in the Southeast, South and Midwest, are the main leaders and financiers of illicit drug trafficking, serving national consumption and acting transnationally in the global distribution of powder cocaine[26].

PHOTO: Andres Cardona

18 Pereira et al. Aterrizando na Água: Interdição Aérea, Tráfico de Drogas e Violência na Amazônia Brasileira, produced by researchers from Insper and the School of Economics, Administration and Accounting at the University of São Paulo (FEA-USP), 2025.
19 These are the rivers: Abuna, Acre, Amazonas, Caquetá, Envira, Içá, Japurá, Javari, Juruá, Madeira, Mamoré, Negro, Purus, Tarauacá, Uaupés and Xié.
20 States that make up the Legal Amazon: Acre, Amapá, Amazonas, Maranhão, Mato Grosso, Pará, Rondônia, Roraima and Tocantins.
21 FBSP. Fórum Brasileiro de Segurança Pública. Cartografias da violência na Amazônia. Vol. 3. São Paulo: Fórum Brasileiro de Segurança Pública, 2024.
Available at: https://publicacoes.forumseguranca.org.br/items/c86febd3-e26f-487f-a561-623ac825863a . Acesso em: 26 de agosto de 2025.
22 Pedroso, R; Amancio, N. L. Frontera Amazónica: grupos criminales de Brasil toman el control de la producción de coca en Perú. Ojo Público, 2023.
Available at: https://ojo-publico.com/4545/triple-frontera-mafias-brasil-toman-control-produccion-coca acesso em: 07/08/2025.
23 FBSP. Fórum Brasileiro de Segurança Pública. Segurança Pública e Crime Organizado no Brasil. Esfera Brasil. Coleção Democracia e segurança pública, 2024.
Available at: https://publicacoes.forumseguranca.org.br/handle/123456789/252
24 UNODC. The Drugs-Crime Nexus In The Amazon Basin. United Nations Office on Drugs and Crime. Extracted from the UNODC's 2023 World Drug Report: Viena, 2023.
25 Ibidem note 10.
26 Ibidem note 23.

It is worth noting that the advance of the illegal cocaine market in Brazil is closely intertwined with the practice of corruption through support for politicians and authorities who make law and crime go hand in hand. Bribes play an important role in buying protection and obtaining advantages, exploiting the economic and social vulnerability of some and the sense of impunity of others, corroborating the corruptive logic within the public machine.

Like a cog in the wheel, corruption promotes violence and injustice against people, wildlife and the territories crossed by the illicit cocaine chain.

The direction of prison policies has also contributed to the expansion of crime. At the beginning of the 21st century, the practice of transferring prisoners considered to be dangerous led to the PCC and CV branching out into prisons in different parts of the country.

The PCC has instituted the order of "procedure" through physical and moral coercion, causing changes in the dynamics of drug trafficking with impacts on community social interactions. The PCC participates in and controls all parts of the chain: planting, transportation and retail and international wholesale. The CV, on the other hand, expanded into the northern region in 2016 due to disputes with the PCC over control of the Caipira Route[27].

The multiplication of members of both factions has used social belonging as a fundamental element for the success and expansion of clandestine negotiations[28]. Through the control of information, the expectation of loyalty and threats, these groups dominate territories. To reach users, trafficking depends on micro-retailing, which is why it continues to recruit new workers, mainly young people, in structured local and transnational networks. In 2021, the National Council of Justice named illicit drug trafficking as one of the worst forms of child labor[29].

The penetration of organized crime in society is as extensive as the profits from the illicit market. In retail, for example, in 2022, the São Paulo State Department of Narcotics Investigations (Denarc)[30] located pump houses with industrial machines for dosing and packaging approximately 150,000 portions of cocaine a day. In money laundering, crime operates in the control of gas stations linked to assets in investment funds that move tens of billions of reais[31].

PHOTO: Gui Crist

Between 2019 and 2024, the total amount raised solely at auctions of assets seized from organized crime across the country represented around R$675 million[32].

27 CDESC — Centro de Estudos sobre Drogas e Desenvolvimento Social Comunitário. Tráfico de drogas na Amazônia e efeitos no meio ambiente: Uma análise exploratória — Relatório final. Brasília: Senad/MJSP; PNUD; UNODC, 2025.

28 OLIVEIRA, G. F.; DA COSTA, G. V. L. "Nós somos o Crime na Fronteira" As Bocas Familiares e o PCC "correndo junto" em Corumbá (MS). Revista Territórios e Fronteiras, [S. l.], v. 14, n[] 2, p. 322—346, 2022. Available at: https://periodicoscientificos.ufmt.br/territoriosefronteiras/index.php/v03n02/article/view/1088.

29 https://www.cnj.jus.br/cnj-lanca-manual-sobre-trafico-de-drogas-como-uma-das-piores-formas-de-trabalho-infantil/

30 Investigações da 2ª Divisão de Investigações sobre Entorpecentes (Dise) do Denarc. Fonte: Museu do Denarc em São Paulo.

31 CNN, 2025. Megaoperação: Entenda como PCC controlava fundos de investimentos. August 28, 2025. Available at:

https://www.cnnbrasil.com.br/economia/megaoperacao-entenda-como-pcc-controlava-fundos-de-investimentos/

32 Ibidem note 27.

PHOTO: Andres Cardona

Criminal Web in the Amazon

In the Amazon, there are multiple matrices of authority in the control of territories, in a hybrid governance disputed by different actors. Except for Amapá, the presence of factions such as the PCC and CV can be seen in all the states of the Brazilian Amazon[33]. These nationwide groups have come to instrumentalize local groups in a web of illicit activities and territorial conflicts. At least 80 municipalities in the Brazilian Amazon register territorial disputes between factions[34]. According to the National Secretariat for Penal Policies[35], the Brazilian Amazon is affected by the activities of 15 criminal groups, two national, four regional and nine local, with the states of Roraima and Mato Grosso being strictly dominated by national factions such as the PCC and CV, respectively.

Violence has intensified since 2016 with the strengthening of the CV in the north of the country. Disputes over territorial dominance are exacerbating social and environmental damage with alarming rates of violence. In 2023, the index of intentional deaths per 100,000 inhabitants in the Brazilian Amazon was 41.5% higher than the national average[36]. In the state of Amazonas, 80% of homicides are related to the drug trade[37]. In some localities, the violence associated with the illicit drug trade is extreme. In Rio Preto da Eva, where the dispute between CV and PCC is flagrant, the rate of intentional violent deaths was 168.4/100,000 inhabitants in 2023, well above the national average of 22.8/100,000 inhabitants[38].

To make matters worse, intimidation, harassment and threats to local communities have weakened reporting mechanisms. A study by Global Witness[39] points out that in 2023, Brazil ranked second in the number of murders of environmentalists, and that most of the deaths occurred in conflict zones triggered by the dynamics of drug trafficking. Between 2012 and 2023, 401 activists were killed for their defense of the environment in Brazil, not counting the missing, wounded and threatened.

Among the killings, the murders of journalist Dom Phillips and indigenous expert Bruno Pereira in 2022 were widely publicized, standing out in the scenario of violence associated with the multiplicity of illegal practices in the forest.

A 2025 investigation coordinated by the Transfronteriza Network of the Peruvian newspaper Ojo Público[40] analyzed 75 locations in the Amazon region between Brazil, Colombia, Peru and Ecuador. Of these, 72% show dynamics associated with cocaine trafficking, generally in cross-border coordination that permeates conflicts and alliances between local, regional and national factions. On the Brazilian side, of the 25 municipalities analyzed, 84% were involved in the coca-cocaine economy.

The Amazon triple border is one of the critical points of dispute where in recent years the CV has been gaining strength beyond national boundaries. According to Ojo Público, before 2019 the CV's activities were restricted to buying cocaine and cocaine paste produced in Peru. However, in alliance with the Comando de la Frontera, the main Colombian criminal organization operating in the area, they began to command the production of cocaine in Peruvian lands.

33 Ibid. note 27.

34 Ibid. note 21

35 Secretaria Nacional de Políticas Penais (Senappen) https://www.gov.br/senappen/pt-br/servicos/sisdepen/bases-de-dados

36 Ibid. note 21.

37 Borges, 2025. Como o tráfico transformou a Amazônia na maior rota da exportação de cocaína. Veja, April 11, 2025.
Available at: https://veja.abril.com.br/brasil/como-o-trafico-transformou-a-amazonia-na-principal-rota-de-exportacao-de-cocaina/

38 Ibidem note 21.

39 Global Witness, September 2024. Available at: https://www.globalwitness.org/pt/missing-voices-pt/

40 Castro, et al. Territorio Narco: cocaína domina más del 70% de las fronteras amazónicas. Ojo Público, April 2025.
Available at: https://ojo-publico.com/5569/territorio-narco-el-70-las-fronteras-amazonicas

Among other factors, the advance of the CV in the region can be explained by the decrease in environmental oversight during the Bolsonaro government and the lack of economic opportunities for the local youth population[41].

Despite the CV's dominance, control of the territory is not hegemonic. In Tabatinga, Amazonas, Os Crias, a local organization allied to the PCC, disputes territorial control on the triple border. To make matters worse, there are reports that Mexicans from the Sinaloa cartel go into the region. The financial gains are significant: the Tabatinga police department estimates that a kilo of cocaine sells for around US$ 1,000 in the border area[42]. In Manaus, capital of the state, it varies between US$8,000 and US$10,000.

Criminal connections between Brazilian and foreign groups mean that those responsible for trafficking and violence are dispersed in border areas. In September 2025, to curb the advance of crime in the Amazon countries, the inauguration of the Amazon Center for International Police Cooperation was announced with the participation of nine countries[43].

Drug Policy and Incarceration in Brazil

The number of people deprived of their liberty in Brazil reached 909,594 in December 2024[44]. The global prison population was 11.7 million at the end of 2023[45]. In absolute numbers, Brazil ranks third in the world, behind only the USA and China, with approximately 7.2% of the world's prison population.

In Latin America, the prison population has almost tripled in recent decades and is shaping up as a "new zone of mass incarceration"[46]. According to a report by the Institute for Crime & Justice Policy Research (ICPR), published in 2024, since 2000 the global prison population has grown by 27%, which is close to the general population growth. However, in South America, the prison population has grown by 224%[47]. Brazil is in line with this trend, with the highest incarceration rate on the continent[48].

The current mass incarceration is another explicit consequence of Brazil's drug policy. According to the Bulletin of the Brazilian Institute of Criminal Sciences (IBCCRIM), it is essentially associated with the public security and criminal justice policies of recent decades[49]. The application of Law No. 11.343/2006, known as the Drug Law, sustains conservative criminal justice practices that result in the imprisonment of thousands of consumers and retail sellers. In 2001, the rate of prisoners per 100,000 inhabitants in the country was 125; in 2021, it jumped to 322, an increase of approximately 157% in 20 years[50].

The culture of criminalization established in Brazil has fostered the physical expansion of the prison system, which, combined with the institutional violence of the lack of structure in jails, has led to rebellions, increased the number of prisoners and facilitated the branching out of criminal factions within the various prison units. In other words: paradoxically, imprisonment has fed organized crime.

Based on data from 2023, when there were approximately 850,000 prisoners in Brazil, the National Human Rights Observatory found that 28.6% of arrests were related to drug trafficking, second only to robbery and theft (39.3%)[51]. Experts point out that part of Brazil's prison growth is the result of the way in which the country conducts its war on drugs policy[52], acting in the opposite direction to countries that have reduced the number of prisoners with drug policies focused on care and guaranteeing rights[53].

41 Pedroso, R; Amancio, N. L. Frontera Amazónica: grupos criminales de Brasil toman el control de la producción de coca en Perú. Ojo Público, 2023. Available at: https://ojo-publico.com/4545/triple-frontera-mafias-brasil-toman-control-produccion-coca Access on: 07/08/2025.

42 Ibidem.

43 Brasil. Pronunciamento do presidente Lula durante encontro com a sociedade civil no âmbito da Cúpula da OTCA. Planalto. August 23, 2025. Available at: https://www.gov.br/planalto/pt-br/acompanhe-o-planalto/discursos-e-pronunciamentos/2025/08/pronunciamento-do-presidente-lula-durante-encontro-com-a-sociedade-civil-no-ambito-da-cupula-da-otca

44 Segundo a 19ª edição do Anuário Brasileiro de Segurança Pública. FBSP - Anuário Brasileiro de Segurança Pública / Fórum Brasileiro de Segurança Pública. — 1. 2006. São Paulo: FBSP, 2025. Available at: https://forumseguranca.org.br/wp-content/uploads/2025/07/anuario-2025.pdf

45 UNODC, Prison Matters 2025: Global Prison Population and Trends; A Focus on Rehabilitative Environments, United Nations, 2025. Available at: https://www.unodc.org/documents/data-and-analysis/prison/Prison_brief_2025.pdf

46 According to Sacha Darke, professor of criminology and specialist in prison systems in Latin America at the University of Westminster in the UK, in Smink, V. Onde ficam as prisões mais superlotadas da América Latina. BBC News Brasil. October 12, 2021. Available at: https://www.bbc.com/portuguese/internacional-58851195

47 ICPR. World Prison Brief - World Prison Population List. Institute for Crime & Justice Policy Research. Birkbeck, University of London, 2024.

Available at: : https://www.prisonstudies.org/sites/default/files/resources/downloads/world_prison_population_list_14th_edition.pdf

48 Instituto Igarapé. C. Vilalta;. G. Fondevila, Populismo Penal na América Latina: A Dinâmica de Crescimento da População Carcerária. Nota Estratégica 32. Instituto Igarapé, 2019. Available at: https://igarape.org.br/wp-content/uploads/2019/04/2019-03-29-NE-32_Prision-Growth-PT.pdf

49 Silvestre, G.; Melo, F. A. Encarceramento em massa e a tragédia prisional brasileira. Boletim - 293 - Instituto Brasileiro de Ciências Criminais - IBCCRIM, 2017. Available at: https://arquivo.ibccrim.org.br/boletim_artigo/5947-Encarceramento-em-massa-e-a-tragedia-prisional-brasileira

50 Ibidem note 49.

51 ObservaDH. Pessoas Privadas de Liberdade no Sistema Prisional. August 12, 2024. Available at: https://experience.arcgis.com/experience/54febd2948d54d68a1a462581f89d920/page/PPL---Quem-s%C3%A3o-as-pessoas-privadas-de-liberdade-no-Brasil%3F

52 Carvalho, 2024. População carcerária cresce nos EUA e no Brasil. Poder 360. March 10, 2024. Available at: https://www.poder360.com.br/seguranca-publica/populacao-carceraria-cresce-nos-eua-e-no-brasil/

53 Penal Reform International. Global Prison Trends 2024. Available at: https://cdn.penalreform.org/wp-content/uploads/2024/09/PRI_Global-prison-trends-report-2024_EN.pdf

Among women, the situation is even worse. Although they represent just over 5% of the total prison population, 52.5% of them are criminally responsible for drug trafficking[54].

Furthermore, since 2006 there has been a significant and disproportionate increase in the number of black people in prison. Currently, they represent almost 70% of the total, making it blatant that there is a racial over-representation supported by the Drug Law and penal selectivity. It is also noteworthy that the states with the highest incarceration rates are located on the borders, with Acre and Mato Grosso do Sul leading the way in terms of prison rates in recent years[55].

According to a report by the National Secretariat for Penal Policies (SENAPPEN), the number of prisoners held in penitentiaries for the crimes listed in the Drug Law at the end of 2024[56] was around 205,000 people[57]. It is impossible to consider that all these people are involved in the upper echelons of the drug trafficking chain in the country.

Regarding custody hearings, according to the National Council of Justice Bulletin[58] from February 2024, 28% of the hearings in the country involved drug-related offenses. It is worth noting that around 60% of these hearings result in pre-trial detention. According to ObservaDH, "the high number of pre-trial detainees (around 24%) exacerbates the challenges of prison overcrowding and rights violations"[59]. Of the 41% who were granted provisional release for drug offenses, only 4.7% were referred for psychosocial care. The Justa 2023[60] report, on the other hand, points out the disproportionate political and budgetary priorities: out of R$5,000 spent on the police, only R$1.00 is spent on resocialization policies for ex-offenders, in violation of the recommendations of the UN's Prisons Matter 2025 report[61], which emphasizes preparation for freedom as fundamental to a process of genuine social reintegration.

The data shows that the Brazilian prison system is marked by selective incarceration, especially of the black, young[62] and poorly educated population. The directions followed by the state's repressive apparatus show that penal selectivity is based on race, class and political ideology in the control of part of the population[63]. Whether through mass incarceration in the macro sphere or daily violence in the micro sphere, this control, among other factors, is materialized through punitivism associated with racist drug policies of colonial heritage.

To reverse this situation, there is an urgent need to revise the criminal legislation on drugs, as well as redirect investments to shift "resources from the gateway to the exit door"[64]. Thinking about political, educational and citizenship-restoring alternatives is essential to curb the very high and unjustifiable rate of people imprisoned for drug prohibition.

PHOTO: Gui Crist

54 Ibidem note 51.
55 Velasco, C. et al. Caesar, G.; Reis, T. Brasil tem 338 encarcerados a cada 100 mil habitantes; taxa coloca país na 26ª posição do mundo. G1, 19/02/2020. Available at: https://g1.globo.com/monitor-da-violencia/noticia/2020/02/19/brasil-tem-338-encarcerados-a-cada-100-mil-habitantes-taxa-coloca-pais-na-26a-posicao-do-mundo.ghtml e, Silva, C. R.; Grandin, F.; Caesar, G.; Reis, T. Com 322 encarcerados a cada 100 mil habitantes, Brasil se mantém na 26ª posição em ranking dos países que mais prendem no mundo. G1, 17/05/2021. Available at: https://g1.globo.com/monitor-da-violencia/noticia/2021/05/17/com-322-encarcerados-a-cada-100-mil-habitantes-brasil-se-mantem-na-26a-posicao-em-ranking-dos-paises-que-mais-prendem-no-mundo.ghtml
56 People under house arrest are not taken into account.
57 Senappen. Relatório de Informações Penais 17º ciclo. Sistema Nacional de Informações Penais (Sisdepen). Secretaria Nacional de Políticas Penais - Diretoria de Inteligência Penitenciária. July to December 2024. Available at: https://www.gov.br/senappen/pt-br/servicos/sisdepen/relatorios/relipen/relipen-2o-semestre-de-2024.pdf
58 https://www.cnj.jus.br/wp-content/uploads/2024/09/boletim-audiencias-custodia-n1.pdf
59 Ibidem note 51
60 Justa. O funil de investimento da segurança pública e prisional em 2023.
Available at: https://www.justa.org.br/wp-content/uploads/2024/10/Resumo-executivo_-Funil-de-investimentos_2023-2-2.pdf
61 Ibid. note 45.
62 https://www.cnj.jus.br/trafico-de-drogas-e-o-crime-mais-cometido-pelos-menores-infratores/
63 Israel, V. N.; Pereira, N. B. Estudo sobre a distribuição das taxas de encarceramento nos estados brasileiros e principais variáveis associadas: Influências socioeconômicas. DILEMAS: Revista de Estudos de Conflito e Controle Social — Rio de Janeiro — Vol. 11 — nº 3 — SET-DEZ, pp. 385-411, 2018.
64 Ibid. note 60.

Intersection Between Drug Trafficking and the Environment

Beyond the Andes, the Pacific coast and the Caribbean, the traditional consumption of coca leaves has historically also spread throughout the Amazon biome. The humidity of the rivers, which carried cultural values and seeds through the waters, is the same that has made it difficult to preserve and recover evidence of indigenous coca consumption in what we now call the Brazilian Amazon[65].

Currently, it is the trafficking of illicit cocaine that leaves its traces in the rivers of the forest. Drug trafficking and environmental concerns are cross-cutting themes and the consequences of drug policies in the Amazon basin are quite complex, imposing intersectional challenges in the protection of people and biodiversity.

The region is crossed by "criminal convergence", characterized by the intersection of different illegal economies that benefit from the same structures in the illicit market flows[66]. The increase in drug trafficking is connected to other crimes such as illegal mining, land grabbing, logging, smuggling, wildlife trafficking, illegal fishing, sexual exploitation, arms and wildlife trafficking and deforestation. These practices are accompanied by corruption, fraud in environmental licensing, intimidation and armed violence. Between 2017 and 2021, 16 major seizures totaled 9 tons of cocaine found in shipments of illicit timber bound for Europe by sea[67]. A panacea of illegalities that led to the emergence of the terms narco-deforestation and/or narco-mining.

In the Amazon, the incidences of environmental crime and money laundering are, respectively, four and two times higher than the country's average[68], feeding back into a cycle that intensifies environmental, social and cultural impacts.

Since 2018, there has been clear evidence of connections between drug trafficking activities and illegal gold mining in the Roraima state region. As a result of this alliance, the number of weapons and cases of violence have skyrocketed. It is assumed that former prisoners and PCC members have introduced the logic of armed mining into an association in which the social complex of wildcat gold mining is convenient for the interests and needs of drug trafficking[69]. Shared air logistics serves both commodities and compensates for possible losses in each trade.

The gold economy, a fragile and high-value chain, and the purchase of land and activities in the agribusiness sector have become great alternatives for laundering money from the drug market. The structures and consequences of illegal practices expand in exchange for the high socio-environmental costs of deforestation.

PHOTO: Gena Steffens

Indigenous Lands and Deforestation

Indigenous leaders in Pará associate the growth in trafficking with illegal mining and point out that the more intense the mining, the greater the social challenges in relation to illicit drugs: abuse, threats, recruitment, sexual exploitation and incarceration. The criminal justice system in the state of Amazonas[70] points out that the number of indigenous people of various ethnicities[71] deprived of their liberty doubled between 2021 and 2023. It is estimated that 2 out of every 100 people imprisoned are indigenous. The violations are aggravated by the lack of interpreters in indigenous languages at custody hearings.

In addition to the growing presence of factions on indigenous lands and the recruitment of indigenous people into crime, the increase in deaths due to alcohol and other drug abuse is evidence of the growth in local consumption[72]. The situation is worsened by the insufficient coverage of basic and psychosocial care services in the region.

65 Khoka Project - https://khokaproject.com/documental/ipadu/

66 Ibid. note 27.

67 Ciro Barros, "A íntima relação entre cocaína e madeira ilegal na Amazônia," Agência Pública, August 16, 2021. Available at: https://apublica.org/2021/08/a-intima-relacao-entre-cocaina-e-madeira-ilegal-na-amazonia/#:~:text=Os%20produtos%20florestais%2C%20frequentemente%20oriundos,enviados%20do%20Brasil%20%C3%A0%20Europa. The destinations for the wood and cocaine were European countries such as Spain, Belgium, France, Germany, Portugal, Italy and Slovenia

68 Ibid. note 27.

69 FBSP. Fórum Brasileiro de Segurança Pública. A nova corrida do ouro na Amazônia [livro eletrônico] : garimpo ilegal e violência na floresta / coordenação geral Renato Sérgio de Lima, Samira Bueno, Aiala Colares Couto.— São Paulo: Fórum Brasileiro de Segurança Pública, 2024

70 According to data from the Amazonas State Court of Justice -

https://www.tjam.jus.br/index.php/relatorios/relatorios-estatisticos/45212-relatorio-estatistico-indigenas-e-justica-criminal-no-amazonas/file

71 Tenharim - Ticuna - Mayoruna - Kokama - Apurinãbaniwa - Maragua - Baré - Munduruku - Turanotariana - Curipaco - Kulina - Kanamari - Caixanadesana - Miramha - Murá - Sateré Mawé - Madiha Kulina - Pira Tapuya.

72 Ibid. note 18.

Drug abuse can put urban, rural, riverside and indigenous populations in situations of physical and social vulnerability, also due to the low quality of substances subject to adulterants when supplied to popular classes.

Between 2019 and 2024, it is estimated that 6.5 million hectares of native vegetation were lost in the Brazilian Amazon[73], mainly in states with the highest cocaine seizure volumes, reinforcing "the hypothesis of territorial convergence between environmental degradation and trafficking dynamics"[74]. The deforested areas are concentrated on the banks of rivers, close to international border areas, and may be associated with coca cultivation.

In Peru, evidence has recently been found of genetic improvements so that the shrub can adapt and grow at different altitudes[75], such as in the lowlands of the Amazon. In 2014, the Brazilian Army already found a plantation with 1,200 coca seedlings in the municipality of Amaturá[76], on the banks of the Amazon River, close to the triple border, with enough inputs to produce approximately 50 kilos of cocaine[77]. Between 2018 and 2022, coca growing areas in the border area between Brazil and Peru multiplied almost fourfold, along with seizures of chemicals for macerating the leaves in the so-called *cristalizaderos* (crystallizer plants)[78].

However, it would be simplistic to blame coca plantations exclusively for deforestation. Coca crops promote transformations in land use in remote areas and thus attract logistical and subsistence infrastructures for people seeking better living conditions. This is an important concern in relation to the deforestation potential of illicit crops, since they also materialize as a symptom of social inequalities in contexts of territorial and economic insecurity. Failed public policies, drug prohibition and conflicts over land use linked to mining and agribusiness are the main deforestation drivers[79].

Indigenous lands and agro-extractivist communities suffer from deforestation to build airstrips and clandestine roads used by multi-trafficking networks. MapBiomas (2024) carried out a survey of registered and unregistered airstrips in Amazonas and Pará according to Anac (National Aviation Agency) figures[80]. The data is alarming. In Amazonas, in 2023, 28% of the airstrips identified were located in indigenous lands, with 75 airstrips in Yanomami territories alone, where there is clear evidence of the confluence between drug trafficking and illegal mining. In Pará state, of the 882 airstrips identified, 687 were clandestine in areas close to or inside indigenous lands and protected reserves[81].

The invasion of the illicit cocaine cycle updates oppressions over nature and traditional and indigenous territories in the Brazilian Amazon in the 21st century.

Cocaine and Cities

The negative side effects of the prohibition of the cocaine chain also appear in urban contexts. The concentration of people in social vulnerability, associated with the dynamics surrounding smoked cocaine (crack), is a reality in several Brazilian cities. In addition to the social and health consequences for users and their families, crack consumption, which is often visible on the streets, produces social imaginaries associated with fear and insecurity. These new representations of space play into the process of urban and social degradation, configuring territories of exception where what is lawful or unlawful becomes arbitrary, including when the State enforces urban legislation.

The morals associated with illegality endorse popular support for urgent revitalization interventions, and the dynamics of crack cocaine become a central element in the process of devaluation-revaluation of urban land.

The public scenes of cocaine consumption in cities have become urban assets that attract private investment to "transform" these spaces. Certain territories and their populations selectively become victims of opportunistic processes in which real estate speculation and urban hygienist policies use drug control to produce and transform cities through racial and gender violence, mass incarceration, police brutality, demolitions[82] and evictions[83].

Far beyond the interfaces between the health, social and criminal areas, the crack issue, through the instrumentalization of morality and fear, calls on society to broaden the debate between drug policies and the production of the urban environment. The ambivalence of the State's role is put to the test as it becomes associated with the real state market, and both legally benefit from the financial utilitarianism justified by the "repression" against an illicit economy[84].

73 RAD. Relatório Anual do Desmatamento no Brasil 2024 - São Paulo, Brasil - MapBiomas, 2025 - 209 pages DOI: DOI 10.1088/1748-9326/ac5193 - https://alerta.mapbiomas.org/wp-content/uploads/sites/17/2025/05/RAD2024_15.05.pdf

74 Op. cit. p. 27. CDESC — Centro de Estudos sobre Drogas e Desenvolvimento Social Comunitário. Tráfico de drogas na Amazônia e efeitos no meio ambiente: Uma análise exploratória — Relatório final. Brasília: Senad/MJSP; PNUD; UNODC, 2025.

75 Montaño, F. Mejoras genéticas en cultivos de hoja de coca aumentan la producción mundial de cocaína. Ojo Público, July 10, 2022.

Available at: https://ojo-publico.com/sala-del-poder/crimen-organizado/mejoras-geneticas-la-hoja-coca-aumentan-la-produccion-cocaina

76 https://www.defesaaereanaval.com.br/exercito/exercito-encontra-plantacao-de-epadu-no-interior-da-amazonia

77 https://g1.globo.com/am/amazonas/noticia/2014/08/exercito-descobre-mais-12-mil-mudas-de-folha-de-coca-no-interior-do-am.html

78 Ibid. note 40.

79 Dávalos, L. M. Los fantasmas del desarollo passado — Deforestación y coca em la Amazonía occidental. In Gootenberg, P.; Dávalos, L. M. Los orígenes de la cocaína: colonización y desarollo falido em los andes Amazônicos. Bogotá: Ediciones Uniandes, 2021.

80 National Civil Aviation Agency.

81 Ibid. note 27.

82 Between September and November 2022, in 66 days, 841 people were arrested simply for carrying pipes in one of the phases of Operation Caronte in downtown São Paulo. Mass arrests for merely carrying a pipe are illegal and show selectivity in the management of people and territory. Subsequently, most of the cases were dismissed by the judiciary due to the illegality of the arrests. For more information: https://www.defensoria.sp.def.br/documents/20122/b559c1be-dbc2-fa0b-0da5-b2392762725a.

83 Calil, T. G. As drogas, as pessoas e as cidades: consumo do espaço e efeitos sociais em cidades latinoamericanas — aproximações entre São Paulo, Bogotá e Medellín. São Paulo, Editora Unesp.

84 Calil, T. G.; Marino, A. Caos como estratégia e a 'proteção' como mercadoria na 'Cracolândia' paulistana. Cadernos Metrópole, V. 26, n. 51, p.e6164811, 2024.

Available at: https://www.scielo.br/j/cm/a/4VcKZNhJZBY4GCGvsQc9Mmk/?format=html&lang=pt

PHOTO: Yael Martinez

Conclusion

If, on the one hand, the profits from drug trafficking are concentrated in the pockets of a few, the social and territorial consequences of prohibition directly and indirectly affect millions of people that live in the pathways of the coca-cocaine economy in South America.

The intersectionalities exposed in this chapter are important analysis on the effects of the illicit cocaine economy and the various oppressions that impact people and the environment. Paying attention to these intersections is an ethical and political commitment to understanding socioeconomic relations in the pursuit of environmental and social justice.

We need to develop and implement alternative policies to deal with drugs from perspectives other than public safety and health. Legislative and territorial measures, linked to the possibilities of identity building, economic development, environmental protection and climate justice, are indispensable.

PHOTO: Rafael Vilela

Timeline:
Cocaine Prohibition in Brazil and its Associated Effects.

1921 Enactment of Decree 4294, which penalizes sellers and provides for the hospitalization of consumers. Influenced by US interests, Brazil adopts tougher drug laws[85].

1970S Army and Air Force documents point to cocaine transportation routes through Mato Grosso state and the interior of São Paulo state, which would become known as the Caipira Route[86].

1979 Emergence of the Comando Vermelho (CV) at the Cândido Mendes Penal Institute on Ilha Grande, Rio de Janeiro).

1983 Federal Police eradicate 200,000 coca plants (epadu variety) in Amazonas[87].

1989 First crack seizure in the city of São Paulo[88].

Early 1990s Sudden increase in the number of pharmacies in Corumbá, Mato Grosso do Sul state, associated with the supply of acetone, ether and sulphuric acid for cocaine refining on the Bolivian border.[89].

1994 Major cocaine seizure in Guaraí, Tocantins state, with 7.2 tons, until then considered one of the largest seizures in the country[90].

1999 Capture and imprisonment of Marcola, leader of the PCC, for drug trafficking, robberies, murder, involvement with organized crime and narco-terrorism. His sentence exceeds 300 years.

Between 1999 and 2001 Establishment of the Parliamentary Commission of Inquiry (CPI) on Drug Trafficking to investigate drug trafficking organizations in the state of São Paulo[91].

85 Torcato, C. E. M. História das drogas e sua proibição no Brasil: da colônia à República. PhD thesis in History - FFLCH/USP, 2016.

86 ABREU, A. Cocaína — a rota caipira: o narcotráfico no principal corredor de drogas do Brasil. 2.ed. Rio de Janeiro: Record, 2017.

87 https://www.estadao.com.br/brasil/jt/guerra-ao-epadu-a-coca-da-amazonia-plantada-por-caboclos-e-indigenas-cobicada-pelo-trafico/?srsltid=AfmBOoqtujT1XHQWMH7AIVycs5sAcMAA3rMILqRfoqk5HblYjyW6gDkl

88 UCHÔA, M. Crack: o caminho das pedras. São Paulo: Editora Ática, 1996.

89 Ibidem note 86.

90 Filho, A. B. Operação Alpha, a rota da cocaína de Cali no Barsi. Juiz de Fora: Editar, 2018.

91 https://www.al.sp.gov.br/repositorio/arquivoWeb/com/cpi_narcotrafico_relatorio_final.pdf

2000 Seizure of chemical inputs for cocaine refining in São João de Iracema, in the region of São José do Rio Preto, São Paulo state[92].

2002 CPI on Drug Trafficking identifies 390[93] clandestine airstrips in São Paulo.

2002 The use of injectable cocaine begins to lose ground, and new dynamics of crack cocaine consumption emerge.

2004 Implementation of Law No. 9.614, the Law of *Abate* (Shooting Down), which allows the Air Forces to interdict aircraft considered suspicious, and the beginning of the "cocaine rivers" era[94].

2005 *Cracolândia* in São Paulo is now considered a public problem, and its elimination is incorporated into electoral debates[95].

2006 Promulgation of Drug Law No. 11.343, with subjective criteria to differentiate users from traffickers, leading to the expansion of selective incarceration of black people.

2006 Transfer of prisoners considered dangerous (including Marcola) to maximum security penitentiaries across the country. PCC rebellions and attacks, and subsequent branching out of the organization within the national prison system[96].

2007 Intensification of crack consumption among sugarcane cutters (*bóias-frias*) in the interior of São Paulo, along the Caipira Route[97].

Between 2010 and 2012 The São Paulo Public Security Department arrested 1,216 civil and military police officers for corruption[98].

2012 Senate committee opens investigation into allegations that crack rocks were used as payment for rural workers (cane cutters)[99].

2012 Police identify links between São Paulo drug traffickers and the Italian 'Ndrangheta mafia. Estimates point to a turnover of 45 billion euros a year, most of which comes from the cocaine market.[100].

2013 The then senator and presidential candidate, Aécio Neves, came under investigation after the police seized a helicopter with 445 kilos of cocaine in Afonso Cláudio, Espiríto Santo state, which had been refueled on a farm owned by Aécio's family[101].

2013 New techniques for exporting cocaine have been detected, such as liquid cocaine diluted in oil or olive oil[102].

2013 Federal police discover a cocaine bunker in Piracicaba, in the interior of São Paulo. There, under a 3.2-tonne door, is a 60-square-metre air-conditioned room with a stove and chemical inputs for refining, as well as 462 kilos of cocaine base paste and hydrochloride[103].

92 Ibidem.

93 Ibidem.

94 Pereira, Leila and Pucci, Rafael and Soares, Rodrigo R., Landing on Water: Air Interdiction, Drug-Trafficking Displacement, and Violence in the Brazilian Amazon. IZA Discussion Paper nº 17425, October 2024. Available at SSRN: https://ssrn.com/abstract=5009812

95 CALIL, T. G. Condições do lugar: relações entre saúde e ambiente para pessoas que usam crack no bairro da Luz, especificamente na região denominada Cracolândia. 2015. Dissertação (Mestrado) — Faculdade de Saúde Pública, Universidade de São Paulo, São Paulo, 2015.

96 https://g1.globo.com/sp/sao-paulo/noticia/2021/05/15/ha-15-anos-sao-paulo-teve-lockdown-durante-ataques-de-faccao-e-revide-de-policiais.ghtml

97 https://www1.folha.uol.com.br/fsp/cotidian/ff14102007l6.htm

98 Ibidem note 86.

99 Source: Agência Senado.

https://www12.senado.leg.br/noticias/materias/2012/05/03/comissao-pede-investigacao-de-2018crack-salario2019-para-cortadores-de-cana

100 Ibidem note 86.

101 https://www.pragmatismopolitico.com.br/2014/08/trafico-de-cocaina-e-o-aeroporto-de-claudio-mg.html

102 Ibidem note 86.

103 Ibidem.

2014 The Brazilian Army found 1,200 coca seedlings (epadu variety) growing in Amaturá, Amazonas, near the triple border, enough to produce around 50 kilos of cocaine[104].

2015 Nine years after the new Drug Law, Brazil has overtaken Russia and ranks third in the world for the number of people in prison, behind only the United States and China.

2016 Comando Vermelho expands its territory in Brazil and establishes itself on the Amazon Route[105].

2017 The states of São Paulo and Rio de Janeiro spent around R$5.2 billion on drug law enforcement in a single year, and showed no significant impact on reducing crime rates. The data points to the high public cost and socio-economic failure of the drug prohibition model. The money spent on punitive drug policy could have been invested in various other public policies, such as education, health and housing[106].

2018 A milestone in the amalgamation of illicit drug trafficking connections and illegal mining, accentuating criminal convergences in the Amazon region[107].

2019 According to information from federal and state courts, 68% of people prosecuted for drug trafficking are registered as non-white, showing racial selectivity in incarceration and the need to promote racial justice[108].

Between 2021 and 2023 In the state of Amazonas, the number of indigenous people deprived of their liberty doubles; it is estimated that for every 100 people incarcerated, 2 are indigenous[109].

Between 2019 and 2023 the increase in cocaine seizures in Rondônia state was 1,031.8%[110].

2021 The National Council of Justice points to drug trafficking as one of the worst forms of child labor[111].

2023 According to the National Survey on Alcohol and Drugs (Lenad), in Brazil 11.4 million people aged 14 or over have used cocaine/crack at least once in their lives[112].

2023 In September there was the largest seizure of cocaine at sea in Brazil, with 3.6 tons embargoed off the coast of Pernambuco state[113].

2023 A report by the Brazilian Public Security Forum estimates that 72 criminal factions are active in drug trafficking in Brazil[114].

104 https://www.defesaaereanaval.com.br/exercito/exercito-encontra-plantacao-de-epadu-no-interior-da-amazonia

105 Silvestre, G.; Melo, F. A. L. Encarceramento em massa e a tragédia prisional brasileira. Boletim - 293 - Abril/2017, Instituto Brasileiro de Ciências Criminais - IBCCRIM, 2017. Available at: https://arquivo.ibccrim.org.br/boletim_artigo/5947-Encarceramento-em-massa-e-a-tragedia-prisional-brasileira

106 LEMGRUBER, Julita (coord.) et al. Um tiro no pé: Impactos da proibição das drogas no orçamento do sistema de justiça criminal do Rio de Janeiro e São Paulo. Relatório completo da primeira etapa do projeto "Drogas: Quanto custa proibir". Rio de Janeiro: CESeC, March 2021. Available at: https://cesecseguranca.com.br/wp2025/wp-content/uploads/2021/03/Um-Tiro-no-Pe_relatorio-completo.pdf

107 FBSP. Fórum Brasileiro de Segurança Pública. A nova corrida do ouro na Amazônia [livro eletrônico]: garimpo ilegal e violência na floresta / coordenação geral Renato Sérgio de Lima, Samira Bueno, Aiala Colares Couto.— São Paulo: Fórum Brasileiro de Segurança Pública, 2024.

108 https://www.ipea.gov.br/portal/categorias/45-todas-as-noticias/noticias/13984-mjsp-e-ipea-lancam-pesquisa-sobre-o-perfil-de-pessoas-processadas-em-acoes-criminais-por-trafico-de-drogas

109 According to data from the Amazonas State Court of Justice - https://www.tjam.jus.br/index.php/relatorios/relatorios-estatisticos/45212-relatorio-estatistico-indigenas-e-justica-criminal-no-amazonas/file

110 FBSP, Fórum Brasileiro de Segurança Pública. Cartografias da violência na Amazônia. Vol. 3. São Paulo: Fórum Brasileiro de Segurança Pública, 2024. Available at: https://publicacoes.forumseguranca.org.br/items/c86febd3-e26f-487f-a561-623ac825863a . Accessed on: August 26, 2025.

111 https://www.cnj.jus.br/cnj-lanca-manual-sobre-trafico-de-drogas-como-uma-das-piores-formas-de-trabalho-infantil/

112 Thematic booklet on cocaine and crack cocaine from the National Survey on Alcohol and Drugs (Lenad, 2025). The survey was carried out using probabilistic sampling with the participation of 16,608 participants aged 14 or over in 300 randomly selected households in all regions of the country. Available at: https://lenad.uniad.org.br/cadernos-lenad/cocaina_crack_vf_03_020725.pdf

113 https://www.agencia.marinha.mil.br/index.php/defesa-naval/acao-da-marinha-e-da-pf-apreende-36-toneladas-de-cocaina-na-costa-de-pernambuco

114 FBSP. Fórum Brasileiro de Segurança Pública. Segurança Pública e Crime Organizado no Brasil. Esfera Brasil. Coleção Democracia e segurança pública, 2024. Available at: https://publicacoes.forumseguranca.org.br/handle/123456789/252

2023 The São Paulo Military Police launched Operation Shield (*Escudo*) in the Baixada Santista, with the aim of fighting organized crime and drug trafficking. Considered one of the most lethal actions carried out by the state in recent history, it left 28 dead in just over a month. An analysis by the New Illegalisms Study Group (Geni/UFF), in partnership with the São Paulo Public Defender's Office, pointed to abuse of police power and vengeance against poor and black youths[115].

2024 Consolidation of the so-called cocaine rivers in the Brazilian Amazon[116] and 138 tons of cocaine seized throughout the country[117].

2024 Brazil has reached 909,594 incarcerated people; around 28% of convictions are for drug-related offenses[118].

2025 In one of the largest operations against organized crime in Brazil, six people were arrested for their involvement in a mega-scheme of tax evasion, fuel adulteration and money laundering from drug trafficking. It is estimated that PCC leaders owned at least five ethanol plants in the interior of São Paulo, and controlled at least 1,200 gas service stations in the country, worth tens of billions of reais[119].

115 G1, 28/07/2025 - https://g1.globo.com/sp/santos-regiao/noticia/2025/07/28/dois-anos-da-operacao-escudo-relatorio-revela-abuso-na-acao-policial-e-vinganca-contra-jovens-negros-e-pobres.ghtml

116 Ibidem note 18.

117 Brazil. National public security data. Available at: https://app.powerbi.com/w?r=eyJrIjoiYThmMDBkNTYtOGU0ZiO0MjUxLWJiMzAtZjFlMmYzYTgwOTBlIiwidCI6ImViMDkwNDIwLTQ0NGMtNDNmNy05MWYyLTRiOGRhNmJmZThlMSJ9 Accessed on: 21 de agosto de 2025.

118 According to the 19th edition of the Brazilian Public Security Yearbook. FBSP - Anuário Brasileiro de Segurança Pública / Fórum Brasileiro de Segurança Pública. — 1. 2006 - . — São Paulo: FBSP, 2025. Available at: https://forumseguranca.org.br/wp-content/uploads/2025/07/anuario-2025.pdf

119 G1, 01/09/2025 - https://g1.globo.com/fantastico/noticia/2025/09/01/pistola-na-cintura-e-diesel-como-funcionava-esquema-bilionario-do-pcc-que-envolvia-postos-e-a-faria-lima-veja-etapas.ghtml

Thiago Godoi Calil *Harm Reduction worker, psychologist and post-doctoral student in Human/Urban Geography at the Sciences and Technology University at Unesp - FCT-Unesp. PhD in Global Health and Sustainability from the School of Public Health at the University of São Paulo - FSP/USP. He has been working since 2004 from the perspective of reducing social and health risks and harms in various contexts of drug use, seeking to promote the ethics of care, especially with people in conditions of social vulnerability and political and economic inequality. He investigates spaces that concentrate drug use in Latin American cities, proposing a confluence between the area of health and the production of space, including the various forces that affect this field, such as: public policies, drug policies, stigma, the criminalization of poverty, state violence, socio-environmental crises, markets, as well as possible strategies for guaranteeing rights. His work pays attention to the complexities of the social, spatial, environmental and health consequences in territories critically affected by the production and/or presence of illicit markets and crime.*

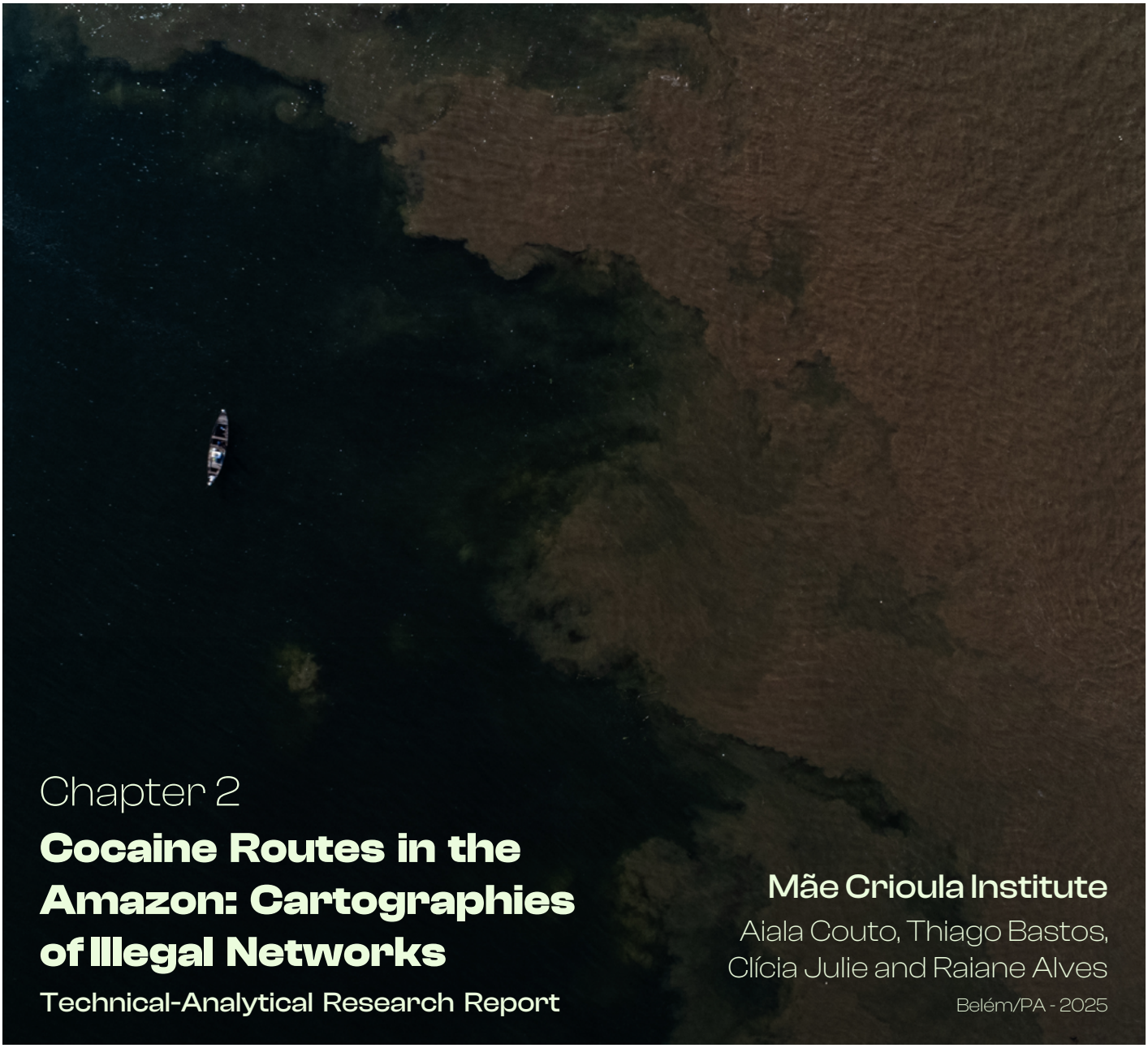


PHOTO: Andres Cardona

Chapter 2

Cocaine Routes in the Amazon: Cartographies of Illegal Networks

Technical-Analytical Research Report

Mãe Crioula Institute
Aiala Couto, Thiago Bastos, Clícia Julie and Raiane Alves

Belém/PA - 2025

Introduction

The current socio-spatial dynamics of organized crime, particularly drug trafficking, are intrinsically linked to the context of prohibitionist policies and the punitive model that guides the so-called war on drugs.

The drug prohibitionist policy adopted in Latin America, largely inspired by the US anti-drug strategy implemented in the 1970s, is based on the premise that the severe criminalization of the use, production and trade of illicit substances would result in a reduction in the supply and consumption of drugs.

However, the practical effects of this approach have shown opposite results, materializing a set of structural challenges that exacerbate the problem of drug trafficking in the region.

Focused on combating the production, trafficking and consumption of illicit substances through criminalization and repression, prohibition has generated a series of perverse effects with significant impacts throughout Latin America.

One of the most notable consequences of prohibition policies is the emergence and consolidation of cartels and criminal factions, financed and strengthened by the increased profitability associated with the trafficking of prohibited drugs.

By banning production and trade and criminalizing consumption, the State transfers control of illicit substances to criminal networks, which operate in a highly lucrative and unregulated market. In this way, factions and cartels control the production, transportation and distribution of drugs, creating increasingly sophisticated and complex transnational logistical chains.

In addition, the punitive model of imposing harsh sentences and mass incarceration of users and micro-traffickers has led to a saturated prison system. Currently, more than 30% of the prison population in Brazil is deprived of their liberty for drug-related crimes, according to the National Penitentiary Department (Sisdepen, 2023). Most of these people are young, with low levels of education, poor, black, brown and indigenous, who crowd the prison system and reveal the classist and racist nature of prohibitionism.

This overcrowding not only violates human rights but also turns prisons into places where criminal factions recruit and are consolidated. Within the prisons, the organizations coordinate territorial control strategies that perpetuate the expansion of drug trafficking and violence both nationally and internationally.

Police violence is another direct consequence of this context, with often militarized, disproportionate and abusive operations targeting vulnerable communities, generating a climate of fear and insecurity and culminating in social conflicts. With the intensification of tensions between the population and the security forces, already marginalized populations, such as people living on the streets and/or in poverty, *quilombolas* and riverside dwellers, are particularly affected, facing not only the risk of criminalization, but also social and economic exclusion and the invasion of their territories by armed factions.

This phenomenon is particularly visible in the Amazon, where prohibition results in the creation of an extremely profitable clandestine market for factions such as the Primeiro Comando da Capital (PCC) and the Comando Vermelho (CV). These organizations actively compete for river, air and road routes, often with the support of Colombian, Bolivian and Venezuelan cartels, intensifying the complexity and extent of trafficking in the region.

Another relevant aspect of this scenario is the growing militarization of the state's presence in the Amazon, as a result of anti-drug trafficking operations carried out by the Federal Police and the Armed Forces. Although these actions aim to dismantle trafficking routes, they repeatedly produce the so-called balloon effect: by choking off a route, the flow of drug trafficking moves to less monitored areas, increasing the geographical dispersion of organized crime.

Examples of this include the increase in river traffic on the Madeira and Negro rivers following greater control on the Solimões river, as well as the growth in air transportation on the triple border between Brazil, Bolivia and Paraguay, in response to the closure of clandestine airstrips.

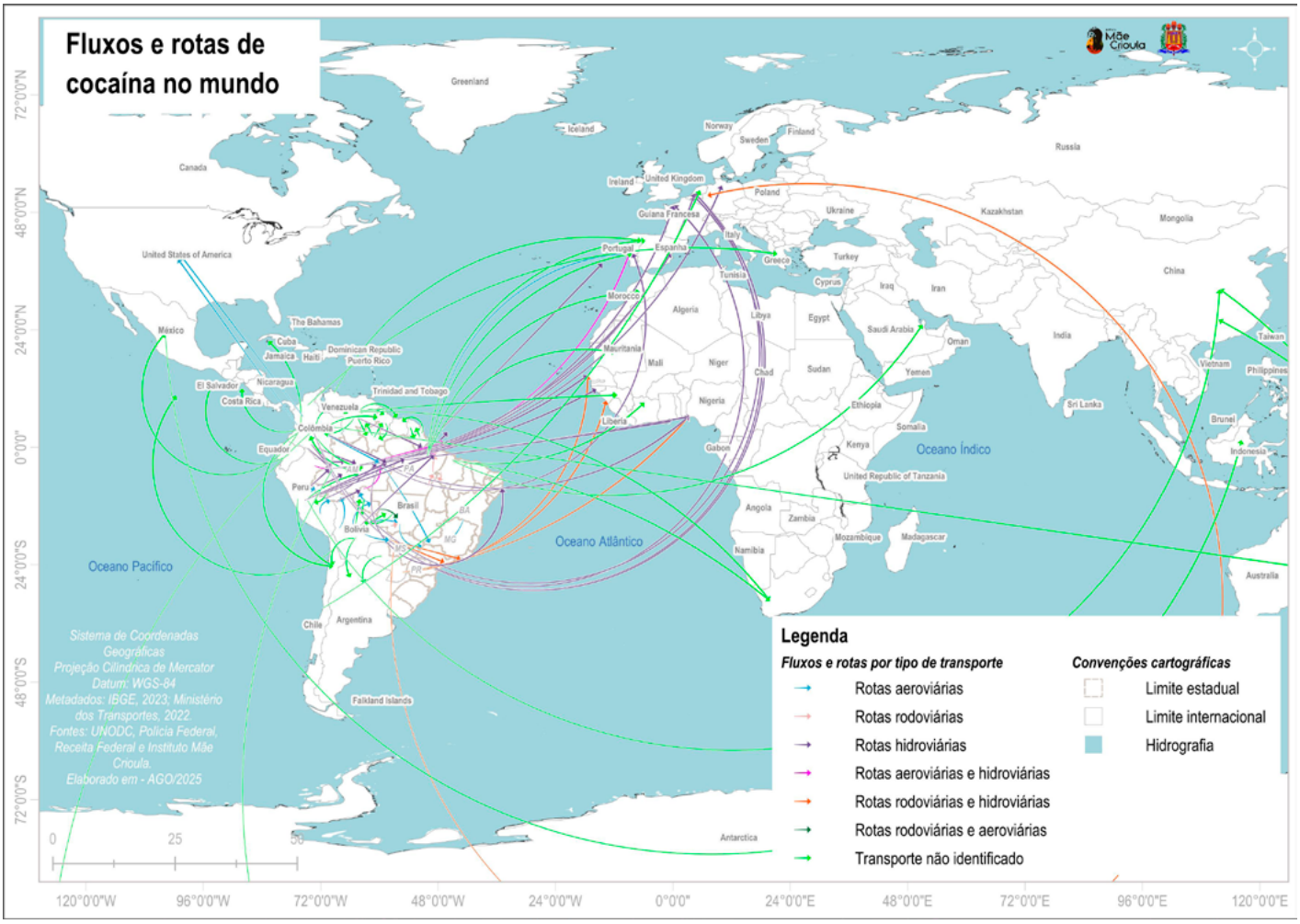
Therefore, the intersection between prohibitionism and punitivism not only fails to dismantle drug trafficking, but, paradoxically, structurally strengthens organized crime.

This dynamic concentrates income and logistical power in the hands of factions and cartels, stimulates the professionalization of illicit networks, and encourages territorial violence with armed disputes between rival groups, as well as fragmenting public policies. Investments in security are made without proper coordination with prevention, education and harm reduction strategies.

The maps and analyses of cocaine transshipment and distribution routes in this chapter present a cartography of the effects of prohibition in the Amazon, Brazil, Latin America and the world, drawn up by transnational criminal networks.

THE COCAINE ROUTE AROUND THE WORLD

Figure 1 - Cocaine trafficking flows on a global scale



Source: UNODC (2024) adapted Instituto Mãe Crioula (2025).

As can be seen in figure 1, Latin America occupies a central and strategic position in the global cocaine market, both due to its concentrated production and its importance as a logistical hub for supplying the main consumer markets.

The countries that make up the so-called Coca Triangle (Colombia, Peru and Bolivia) account for around 90% of the cocaine produced in the world (UNODC, 2024). It should be noted that production is mainly concentrated in forest areas, mountain ranges and borders with little state presence, favoring the work of transnational criminal organizations, which articulate multiple territorial scales.

The geographical concentration at the source is an aspect that differentiates the global cocaine chain from that of other prohibited plant-based drugs, such as marijuana and heroin.

The main flows of cocaine are distributed as follows:

Flows to the United States

The US market continues to be one of the largest global consumers of cocaine, with trafficking routes predominantly concentrated in Central America and the Caribbean. Among the main corridors for the drug to enter the United States are the **Pacific Corridor** and the **Caribbean Corridor.**

The Pacific Corridor involves maritime shipments from Colombia, Ecuador and Peru, which make their way to Mexico. There, the drug is distributed by local cartels, such as Sinaloa and Jalisco Nueva Generación, reaching the entire US territory. This flow shows the integration of Latin American transnational organizations with North American trafficking networks, guaranteeing the continuous supply of the market.

The Caribbean Corridor is made up of smaller routes that connect Venezuela, the Dominican Republic, Haiti and Jamaica, acting as warehouses before the cocaine reaches Florida and the East Coast of the United States. These routes, although smaller in scale, are strategic, as they diversify the entry routes and make state repression more difficult.

Taken together, these flows reveal the complexity and sophistication of drug trafficking routes towards the United States, highlighting the importance of multi-scalar approaches that consider not only producer countries, but also transit territories and final consumer markets.

Flows towards Europe

Between 2020 and 2024, the ports of the Northeast region of Brazil became important logistical corridors for the export of cocaine and, to a lesser extent, pressed marijuana and skunk, with priority destinations in Europe and West Africa.

This dynamic is directly related to increased surveillance in Brazilian ports traditionally used by drug traffickers, such as Santos (São Paulo) and Paranaguá (Paraná), which resulted in the migration of routes to areas under less institutional surveillance. In this context, the northeastern region has become strategic because it combines three fundamental factors: a privileged geographical position, modernized port infrastructure and links between national factions, regional criminal organizations and international cartels.

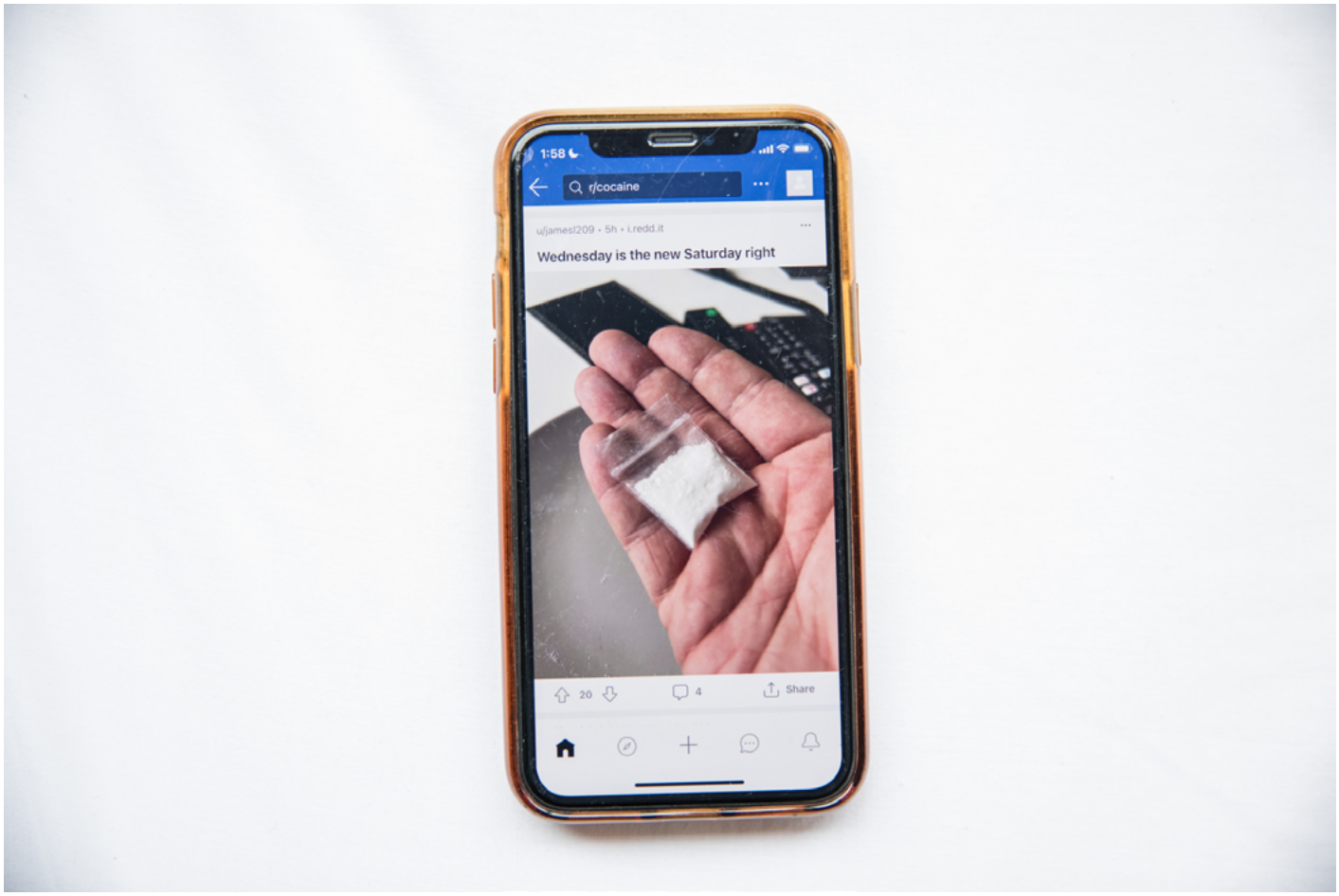


PHOTO: Gena Steffens

PERNAMBUCO

The Port of Suape, in Pernambuco state, stands out as one of the main outlets for cocaine, especially from Peru, Bolivia and Colombia. The illicit cargo arrives at the port terminal via federal highways such as BR-232 and BR-101 and is shipped mainly in fruit and sugar containers bound for Rotterdam (Holland), Antwerp (Belgium) and Hamburg (Germany).

In recent years, the Federal Police have recorded significant seizures such as 1.3 tons of cocaine in 2021, and 745 kilos intercepted in 2023, both destined for Europe. The activities of the Primeiro Comando da Capital (PCC), the Comando Vermelho (CV) and local groups show the level of logistical and financial integration that sustains trafficking in the region.

CEARÁ

Another key gateway is the Port of Pecém, in Ceará state, which has been consolidating itself as an emerging route for cocaine exports, taking advantage of the modernization of its structure and the growing movement of high value-added cargo. The terminal connects to land routes that cross Maranhão and Piauí states and, to a lesser extent, use waterways from the eastern Amazon.

The main destinations for the drugs shipped through Pecém are Spain, Portugal and Belgium, often camouflaged in cargoes of fruit and plaster. In 2022, a joint operation between the Federal Police and the Internal Revenue Service seized 800 kilos of cocaine in a container bound for Antwerp, revealing the involvement of transnational networks associated with Colombian cartels. Local factions, such as the Guardiões do Estado (GDE), work in partnership with the PCC, controlling part of internal logistics.

RIO GRANDE DO NORTE

The Port of Natal, in Rio Grande do Norte state, is also a strategic hub for international trafficking, mainly due to its proximity to Europe and direct fruit export lines to Rotterdam, Lisbon and Hamburg. In 2020, one of the biggest seizures in the state's history was recorded: 1.5 tons of cocaine hidden in melon containers. Two years later, new operations identified branches of the PCC and the Crime Syndicate, a faction from Rio Grande do Norte state that disputes territory and routes with São Paulo organizations.

In addition to these terminals, the ports of Maceió (Alagoas), Salvador (Bahia) and Fortaleza (Ceará), although with a lower volume of seizures, are gradually being incorporated into the trafficking routes. Illicit cargo often uses containers of legal products, such as coffee, soy and sugar, which makes inspection difficult.

In Salvador, for example, the seizure of 400 kilograms of cocaine in 2022, hidden in a cargo of coffee, revealed connections between the Bahian faction Bonde do Maluco (BDM) and European redistribution networks. In Maceió, recent investigations point to the use of the port to send smaller loads, especially to Lisbon and Antwerp, with a strong influence from the PCC in logistics and financing.

An integrated analysis of these flows shows a process of territorial reconfiguration of drug trafficking in the Northeast region, in which ports play a central role in the internationalization of criminal networks.

This change is not limited to the displacement of routes; it also involves the diversification of front merchandise, the sophistication of concealment methods and the formation of illicit consortia between Brazilian factions and foreign cartels. Among the main destinations identified are Western Europe, especially the Netherlands, Belgium, Germany, Spain and Portugal and, more recently, West African countries, which act as intermediate hubs for redistribution.

Finally, it is important to note that the intensification of the presence of national factions, such as the PCC and CV, combined with the work of regional groups, has strengthened the logistical and financial capacity of these networks. The strategic choice of northeastern ports is therefore the result of a combination of geographical factors, weaknesses in surveillance and transnational alliances, creating a scenario of increasing complexity in the fight against international drug trafficking.

The integration of data from the Federal Police, the Brazilian Public Security Forum, UNODC and journalistic investigations is essential to understanding the new dynamics of illicit circulation and subsidizing public security, intelligence and port control policies.

Africa as a Strategic Hub for Global Drug Trafficking and Connections with Brazil (2020-2024)

In recent years, Africa has established itself as one of the most important cocaine redistribution hubs in the world, playing a central role in the link between Andean production, Brazilian logistics and the consumer markets of Europe, the Middle East and Asia.

This transformation is directly related to the growing enforcement pressure on traditional routes in South America and the strengthening of transnational criminal networks, which have begun to exploit institutional vulnerabilities, high-capacity ports and parallel redistribution markets on the African continent, in yet another balloon effect of prohibitionism.

The Gulf of Guinea is emerging as the main contemporary drug trafficking corridor. Strategic ports such as Lagos (Nigeria), Tema (Ghana) and Abidjan (Ivory Coast) have been incorporated into sophisticated logistics networks controlled by Brazilian factions, notably the Primeiro Comando da Capital (PCC), in partnership with Nigerian criminal organizations and Colombian cartels.

In this circuit, the Brazilian ports of Santos (São Paulo), Paranaguá (Paraná) and Suape (Pernambuco) play a central role in the flow of large consignments, often hidden in cargoes of fruit, coffee, frozen meat and industrialized products. The presence of front companies and financial intermediaries facilitates money laundering and increases the capacity of illicit networks to infiltrate global trade.

Another key axis runs along the Central Atlantic, involving Cape Verde, Senegal and Guinea-Bissau. On this route, geographical position and institutional fragility are determining factors. Guinea-Bissau, considered a narco-state in recent UNODC reports, has become a storage and transshipment point for cocaine destined mainly for the Iberian Peninsula and northern Europe. Ports such as Praia (Cape Verde) and Dakar (Senegal) receive cargo mainly from Natal (Rio Grande do Norte), Pecém (Ceará) and Salvador (Bahia), which shows the growing importance of the northeastern ports for this transatlantic connection.

On these routes, Brazilian factions find strategic partners in local networks and operate in cooperation with Portuguese and Spanish intermediaries, who are responsible for getting the drugs into European markets.

In Southern Africa, countries like Mozambique, South Africa and Namibia are taking on increasingly important roles. The Port of Durban (South Africa), for example, has become a distribution platform for multiple destinations, including Europe, the Middle East and Southeast Asia. The presence of the Portuguese language facilitates the articulation of routes via Maputo (Mozambique) and Luanda (Angola), establishing trade corridors that are intertwined with formal export flows.

Recent investigations by the Brazilian Federal Police, in partnership with South African authorities, revealed cocaine shipment schemes from the Port of Santos camouflaged in coffee containers, highlighting the growing integration between Brazilian networks and African operators.

In addition, North Africa has been progressively incorporated into global cocaine routes, especially via Morocco, Algeria and Tunisia. In this region, the ports of Casablanca and Algiers act as redistribution platforms for the Mediterranean, linking Brazilian networks to European mafia groups, such as the Italian Ndrangheta, and Moroccan networks specializing in the trafficking of hashish and cocaine.

This dynamic creates a hybrid system of illicit exchanges: cocaine sent from Brazil is often traded in criminal barter, being exchanged for hashish, which is then clandestinely returned to the Brazilian and European markets.

An integrated analysis of these routes reveals that Africa is no longer just a transit point, but a highly functional logistical hub within the global drug trafficking network. Brazilian ports, especially those in the Northeast, play a strategic role in this scenario, providing direct access to African corridors with low surveillance and high capillarity. This trend also indicates a process of diversification of final destinations, with expansion into markets in the Middle East (via Dubai) and Asia (via Singapore and India), from consolidated African platforms.

Cooperation between Brazilian factions, African organizations, Andean cartels and European mafias points to the formation of transnational criminal consortia, capable of moving large volumes of cocaine, operating money laundering systems and exploiting institutional weaknesses in multiple countries.

To understand and tackle this phenomenon, it is essential to integrate data from different spheres (Federal Police, UNODC, Europol and Interpol), and make progress in articulating joint strategies between Brazil, African countries and European partners.

Flows to Asia: an Expanding Market

The Asian cocaine market, although still smaller than Europe's, is growing rapidly, driven by increased consumption in countries like China, the Philippines, Malaysia, Indonesia and India. Among the main trafficking corridors identified, the flows from Peru and Ecuador towards China and Southeast Asia stand out, using predominantly maritime transportation and, to a lesser extent, cargo planes.

Another important route connects Latin America to the Middle East, via the United Arab Emirates, Oman and Qatar, taking advantage of the major logistics centers in Dubai and Abu Dhabi. This dynamic shows that the Asian market is set to expand even further, favored by the sophistication of logistics networks and the growing connectivity between Latin American and Asian ports.

In the Brazilian context, these dynamics are especially visible in the Amazon region, where organized crime operates through two types of territoriality:

- network territories, characterized by mobility and interconnection that support transnational circuits and distribute drugs to different continents.
- zone territories, in which criminal organizations establish localized control, their own norms, logistical structures and direct power over communities, often replacing the presence of the State.

COCAINE FLOWS IN LATIN AMERICA

The geographical analysis of cocaine trafficking in Latin America reveals the centrality of the region in the global scenario of this phenomenon, where an intricate system of production, distribution and export is articulated to connect various countries and markets.

The Andean countries, particularly Colombia, Peru and Bolivia, concentrate most of the world's drug production, while nations such as Brazil, Venezuela, Ecuador, Chile, Argentina, Suriname and Guyana play strategic roles as transit, distribution and disposal corridors.

These transnational dynamics make up a highly organized illicit network, whose operations extend beyond national borders, mobilizing territories, resources and actors on multiple scales. Cocaine flows in Latin America are structured through interconnected routes that reveal the breadth and complexity of criminal networks.

The Brazilian Amazon has emerged as a key point of convergence in this context, due to its strategic geographical position and its extensive borders with producer countries such as Colombia, Peru and Bolivia, as well as with nations that act as transit routes, such as Venezuela, Guyana and Suriname.

The Amazon region is a privileged corridor through which significant volumes of cocaine transit. The land, river and air routes head towards Brazilian urban centers and strategic ports located in the Southeast, North and Northeast regions, from where the drug is later exported to markets in Europe, Africa and Asia. In addition, there are alternative routes that directly connect the Andean countries to the Caribbean, providing access to markets in the United States, Mexico and Central America.

The Brazilian Amazon is a transit area for cocaine produced in the Coca Triangle (Peru, Colombia and Bolivia) to Atlantic ports such as Santarém (Pará), Itacoatiara (Amazonas), Vila do Conde (Pará) and Itaqui (Maranhão), as well as river routes to the Caribbean.

The strengthening of Brazilian criminal factions, such as the PCC and CV, plays a decisive role in consolidating these routes. These organizations establish alliances with Colombian, Venezuelan and Bolivian cartels, ensuring greater logistical control over transnational flows.

The interconnection of illicit organizations not only highlights the strategic position of the Amazon in trafficking networks but also illustrates how local dynamics are integrated into a broader context of drug circulation, where territorial disputes, pressures on traditional communities and significant socio-environmental impacts become a reality. These conditions create a panorama of complex challenges for public security and national sovereignty.

In this scenario, geospatial analysis of cocaine flows is an indispensable tool for understanding the scale of the phenomenon and its implications.

By identifying the predominant routes, transit corridors and interconnection points between different countries and regions, this approach makes it possible to visualize how illicit circuits are organized and operate on multiple scales.

This perspective not only reveals the extent to which the Amazon is part of trafficking networks but also helps to formulate integrated strategies to address the problem, combining international cooperation, public security, national defense and the protection of Amazonian territories.

Figure 2 - Cocaine trafficking flows in Latin America

Locais de entrada de drogas

Nº	Local de entrada	23	Uberaba	47	Chile
0	Tabatinga	24	Caracaraí	48	Foz do Iguaçu
1	Benjamin Constant	25	Mucajaí	49	São Paulo
2	Atalaia do Norte	26	Paracaíma	50	Rio de Janeiro
3	São Gabriel da Cachoeira	27	Iranduba	51	Suape
4	Marabá	28	Itacoatiara	52	São Luís
5	Altamira	29	Tapuauá	53	Breves
6	Lábrea	30	Alter do Chão	54	Vigia
7	Humaitá	31	Santarém	55	Barcarena
8	Porto Velho	32	Conceição do Araguaia	56	Igarapé-Miri
9	Peru	33	Palmas	57	Belém
10	Amazônia	34	Piauí	58	Marituba
11	Bolívia	35	Cuiabá	59	Santa Bárbara do Pará
12	Mato Grosso	36	Nova Mamoré	60	Santana
13	Venezuela	37	Jaci Paraná	61	Macapá
14	Colômbia	38	Assis Brasil	62	Serra do Navio
15	Guiana	39	Rio Branco	63	Bonfim
16	Suriname	40	Porto Walter	64	Fonte Boa
17	Foz do Jutaí	41	Sapezal	65	Coari
18	Uneiuxi	42	Corumbá	66	Georgetown
19	Careiro	43	Cacoal	67	Guiana Francesa
20	Manaus	44	Minas Gerais	68	México
21	Tefé	45	Sudeste brasileiro	69	Caribe
22	Manaquiri	46	Argentina	70	América Central

Source: UNODC (2024) adapted Instituto Mãe Crioula (2025).

The map under analysis reveals the flows and movement routes of cocaine in Latin America and is a relevant geospatial tool for understanding the dynamics of illicit trafficking. Geospatial analysis provides a more comprehensive view of the routes taken in Brazilian states, highlighting the interconnection between local dynamics and the trafficking of illicit substances originating in Andean countries.

From a geospatial analysis perspective, the flow of cocaine destined for Brazil and other Latin American states has the Andean countries as its main points of origin, especially Colombia and Venezuela. The map shows that both countries have multiple distribution sites which have facilitated the spread of the drug into Brazilian territory and to other South American nations.

A representative example is the route that connects Colombia to the state of Amazonas, as well as to Chile and Guyana. Paradoxically, the exit points located in Venezuela also stand out, directing the drug to Amapá, Suriname and Colombia itself.

In certain circumstances, the mapping identifies cocaine routes that cross intercontinental borders between South American nations. The distribution of narcotics from Colombia to Chile serves as a significant example. Similarly, it is possible to observe the flow that originates in Bolivia towards Argentina and the complex dynamic established between Venezuela and Suriname.

In addition, the cartographic analysis shows that cocaine trafficking is not restricted to South America but extends to the whole of Latin America. Thus, there are routes from Ecuador and Chile to Caribbean countries, as well as those from Colombia to El Salvador, Cuba and Mexico.

This expansion of cocaine flows on a continental scale denotes the complexity and interconnectedness of trafficking networks, revealing a phenomenon that transcends national borders and requires an integrated approach in coping strategies and analysis.

COCAINE FLOWS IN BRAZIL

In the intricate and multifaceted scenario of international cocaine trafficking, Brazil stands out, with a strategic position not only because of its vast territorial dimensions and extensive waterway network, but also because it borders the three largest global producers (Colombia, Peru and Bolivia), as well as sharing borders with Venezuela, Guyana, Suriname and French Guiana.

Cities like Tabatinga, Benjamin Constant, São Gabriel da Cachoeira and Atalaia do Norte, located on the border between Brazil, Colombia and Peru, have emerged as key corridors for the movement of Colombian and Peruvian cocaine.

Similar situations occur in Guajará-Mirim, Cáceres and Corumbá, on the border with Bolivia, where a significant volume of drugs originating in the Chapare region pass through.

In addition, flows from Venezuela and Guyana have gained importance in recent years, taking advantage of routes that connect northern Brazil to Caribbean countries and, later, to the North American market. After entering the country, cocaine moves through internal corridors using different modes of transportation (river, road and air), demonstrating the high logistical capacity of criminal networks.

One of the main routes is the Solimões-Amazonas corridor, which connects Tabatinga to Manaus, Santarém and Belém, using the rivers as natural transportation routes.

Another significant corridor is the one that connects the states of Acre and Rondônia to Mato Grosso, integrating Bolivian and Peruvian production into the highway network that crosses the Midwest towards the Southeast and South.

Finally, there is the consolidation of land and air routes that converge on large urban centers such as São Paulo, Rio de Janeiro and Curitiba, from where the drug is distributed to the domestic market and mainly exported through strategic ports.

Internationally, Brazil has become increasingly important as an export platform for cocaine produced in the Andean countries. The map shows that:

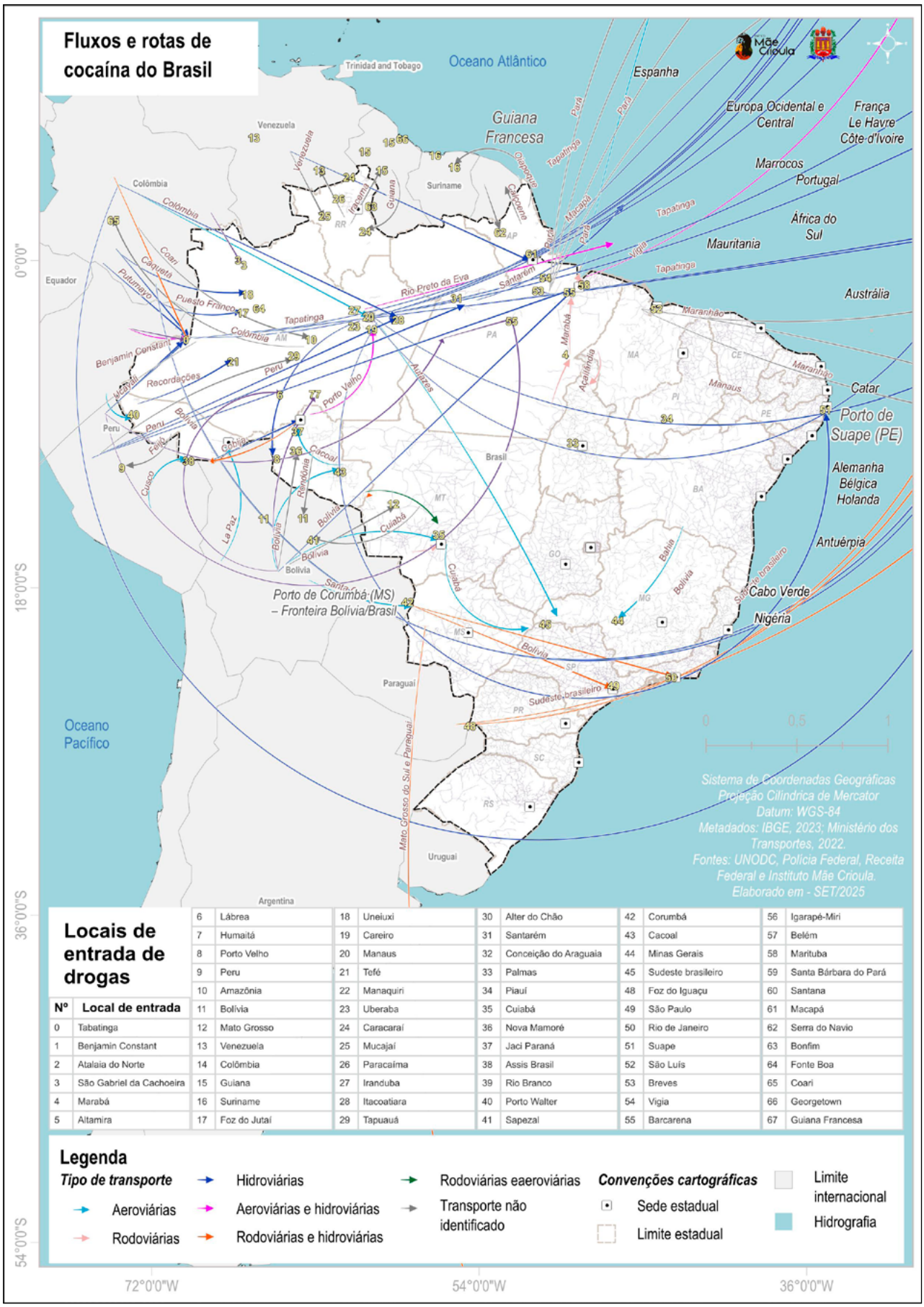
- The main Brazilian ports, such as Santos (São Paulo), Paranaguá (Paraná), Itajaí (Santa Catarina), Suape (Pernambuco), Belém (Pará) and Santarém (Pará), are used to send shipments to Western and Central Europe, with an emphasis on Portugal, Spain, France, Belgium, Holland and Germany.

- At the same time, routes across the Atlantic have been consolidated, connecting Brazil to West African countries such as Cape Verde, Nigeria, Mauritania and Morocco, serving as transshipment points for the European market.

- The Amazon region, in turn, also acts as a link to the Caribbean, facilitating the entry of cocaine into Trinidad and Tobago, Cuba, the Dominican Republic and Suriname, from where the drug makes its way to Mexico and the United States.

Given this reality, the analysis of cocaine flows and routes in Brazil shows that tackling trafficking requires integrated strategies and international cooperation. Understanding the territorial dimension, logistical connections and the country's insertion into transnational illicit networks is fundamental to supporting public policies on security, national defense and the protection of traditional territories.

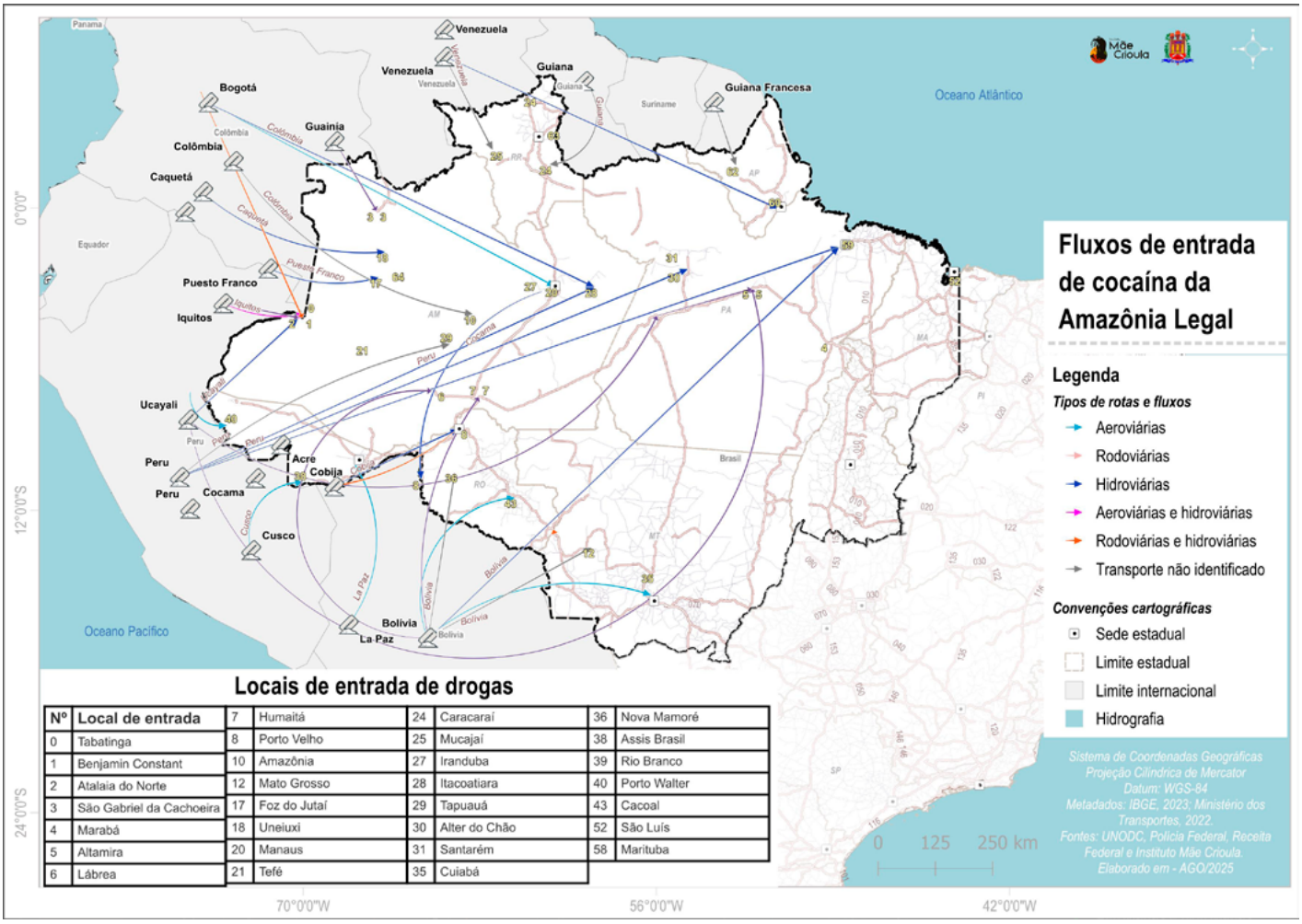
Figure 3 - Cocaine trafficking flows in Brazil



Source: IMC/LABGEO — UEPA (2025).

COCAINE ENTERING THE BRAZILIAN AMAZON

Figure 4 - Flows of cocaine into the Brazilian Amazon



Source: UNODC (2024) adapted Instituto Mãe Crioula (2025).

The map shows the complex network of routes used for cocaine to enter the Brazilian Amazon, highlighting the work of different transnational corridors that connect the region to the main production centers in South America, especially Colombia, Peru and Bolivia.

The geographical position of the Brazilian Amazon, together with the extensive dry and river border, favors the multiplicity of routes and the capillarity of illicit networks, advancing into areas that are difficult to monitor and have little state presence.

Five types of routes have been identified:

- aerial
- waterway
- road
- multimodal (air-hydro and road-hydro)
- unidentified transport routes.

The map shows the predominance of waterway and multimodal routes, demonstrating how the Amazon rivers are a strategic infrastructure for drug trafficking logistics.

Important points, such as Tabatinga (Amazonas), Atalaia do Norte (Amazonas), São Gabriel da Cachoeira (Amazonas) and Assis Brasil (Acre), act as entry and dispersal corridors for the drug, linking up with larger cities such as Manaus (Amazonas), Santarém (Pará), Porto Velho (Rondônia) and Barcarena (Pará), the latter acting as export warehouses.

Another important aspect is the strong connection between the Amazonian borders and the strategic ports where cocaine leaves for Europe and Africa, especially Barcarena (Pará), Santarém (Pará) and Macapá/Santana (Amapá).

From these ports, illicit cargo is often camouflaged in containers of legal commodities, such as grains and minerals, making it difficult for customs authorities to detect it.

The flows illustrated also show the overlapping of critical areas: illegal mining regions, conservation units, indigenous and *quilombola* territories, as well as areas marked by land conflicts. This overlap fuels socio-environmental impacts and contributes to an increase in armed violence, environmental degradation and the vulnerability of traditional populations.

In Pará state, cocaine trafficking occurs mainly via waterway routes, due to the geographical configuration of the state, which is strongly marked by rivers. The route from the Andean countries stands out above all. The map shows, for example, routes where the drug enters from Peru, heading for Barcarena (Pará), as well as flows from Bolivia to the same city in Pará.

In a different manner, the state of Amazonas has a diversity of flows that go beyond waterway routes. The map shows air, waterway and road routes in some of Amazonas' municipalities. In Itacoatiara, for example, cocaine flows in from Bogotá, the capital of Colombia. In Manaus, the flow comes from the Guainía region also in Colombia.

Colombia is one of the main points of origin and distribution. Cities such as Bogotá and Caquetá have flows to Itacoatiara (air and waterway routes) and Tabatinga respectively, the latter being the municipality with the highest concentration of routes for cocaine to enter the Amazon, mainly by waterway, but also by air, coming from both Colombia and Peru.

In other states of the Legal Amazon, such as Acre and Rondônia, most of the cocaine comes from Peru and Bolivia. The map shows, for example, a route from La Paz (Bolivia) to Rio Branco (Acre), or flows from the same Bolivian capital to Nova Mamoré (Rondônia).

On the other hand, in Roraima and Amapá, the main sources of entry are the Guianas (Guyana and French Guiana) and Venezuela. This is the case of the cocaine routes that leave both Venezuela and Guyana in the direction of Mucajaí (Roraima), or even those that link these countries to Santana (Amapá), via waterway routes.

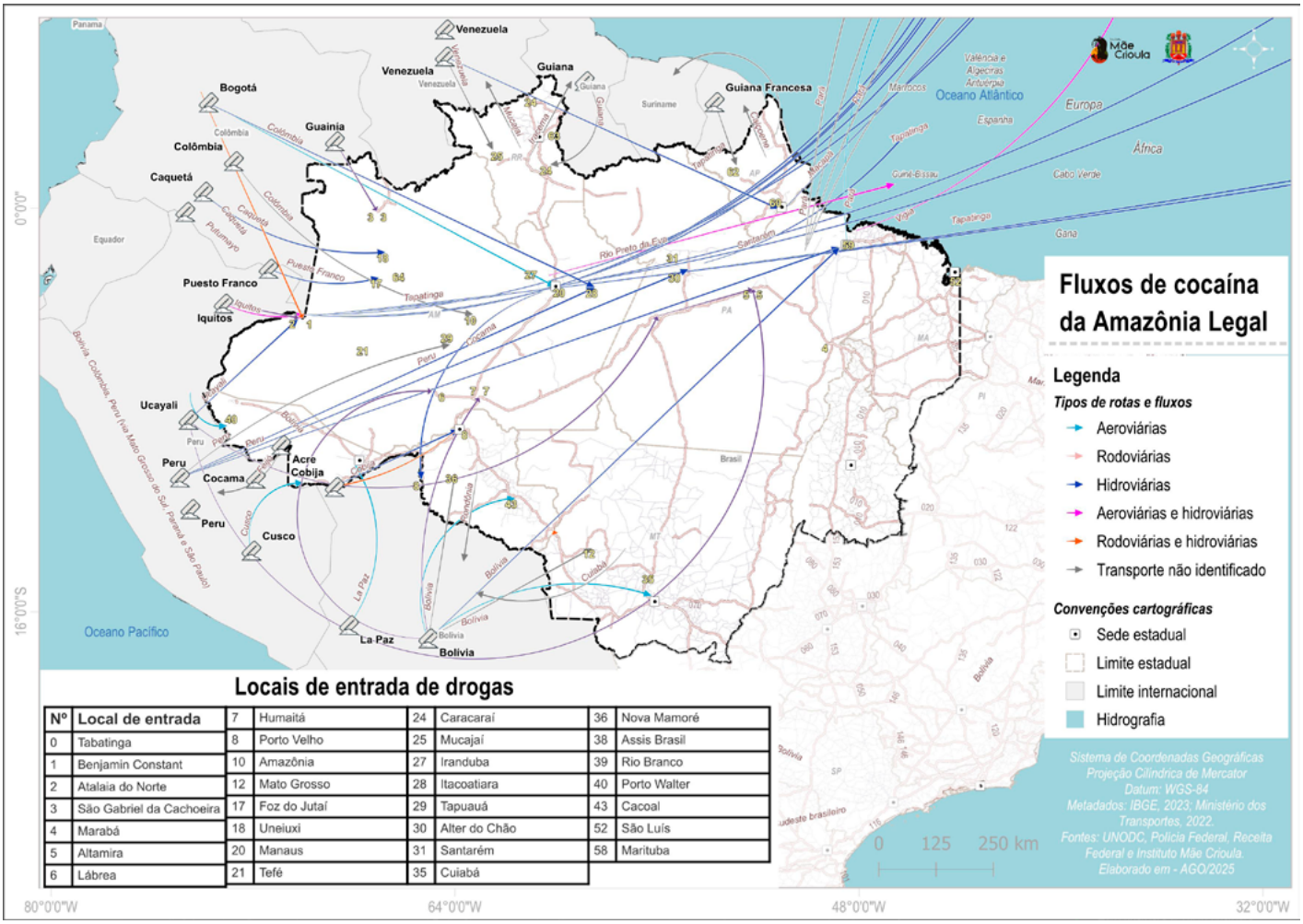
In general, the map shows that Amazonas is the state in the Brazilian Amazon with the highest concentration of cocaine flows from different Andean countries. In contrast, Mato Grosso has a low intensity of these routes, as can be seen on the map, which shows only one air route to Mato Grosso.

In summary, the mapping reveals that the Brazilian Legal Amazon plays a central role in the international logistics of cocaine trafficking, becoming a strategic area for transit, storage and export. The use of river and multimodal routes shows the sophistication of the criminal networks, which exploit the fragility of the state presence and the geographical complexity of the region.

Amazonian cities act as logistical hubs, linking up with international borders and ports of exit, consolidating a scenario of growing interconnection between drug trafficking, illegal economies and socio-environmental vulnerability.

COCAINE OUTFLOWS VIA THE BRAZILIAN AMAZON

Figure 5 - Cocaine flows in the Amazon



Source: Instituto Mãe Crioula (2025).

The map shows the main cocaine routes in the Brazilian Amazon, highlighting a network of outflows that cross land, air and river borders. The Amazon region functions both as a gateway for drugs produced in neighboring countries and as a strategic corridor for their redistribution in Brazil and export to other continents.

The image shows the export points, with emphasis on the ports and logistical corridors that direct the drug to Europe and West Africa.

Routes from the Macapá/Santana region (Amapá) and areas near the mouth of the Amazon River appear to be connected to destinations in the Atlantic, such as Cape Verde, Guinea-Bissau, Ghana and Nigeria. There are also land and air connections to the Southeast and the port of Suape (Pernambuco), suggesting internal redistribution and export via the coast.

Unlike the previous map (flows of cocaine into the Brazilian Amazon), it is possible to understand how each state that makes up the Brazilian Amazon Region is characterized by being home to some of the main routes and flows not only for this drug to enter Brazil, but also as a transit region for cocaine produced in the Andes.

- In Pará, similarly to the first map analyzing the main flows of cocaine coming in by waterways, it can be seen that cocaine is also trafficked out of the state by river, from where the drug is exported mainly to countries on the African continent, especially Ghana and Nigeria.

- The state of Amazonas, on the other hand, stands out for not only exporting cocaine to the African continent by river, but also by waterway to European countries and by road to Andean countries. This is the case of cocaine trafficking from Itacoatiara to Europe, as well as from the municipality of Coari (Amazonas) to Colombia.

- In other states of the Brazilian Amazon, such as Acre and Rondônia, there are border dynamics based on the flow of cocaine in and out of Bolivia and Peru, and vice versa. This is the case with the cocaine route that comes from Peru to Porto Valter (Acre) and from Bolivia to Porto Branco (Acre), where there is the opposite movement, i.e. attempts to export the drug from the state of Acre to the Peruvian country.

- A similar movement can be observed in the state of Mato Grosso. While there is an influx of drugs from Bolivia into Mato Grosso - both via the air route and the unidentified route - there is an export flow to the Bolivian country.

- In Roraima and Amapá, the flow of drugs in and out is similar to that analyzed in the first map, in which the two states have a strong correlation of cocaine entering from Venezuela and the two Guianas (Guyana and French Guiana). The difference with this second map is that there is an exit route for cocaine from Amapá towards Suriname, the border country between Guyana and French Guiana.

- Another pertinent observation is the flow of unidentified transportation in and out of Roraima to Venezuela and Guyana, as well as from Amapá to French Guiana. Apart from this interpretation, there is a flow of cocaine from both Venezuela and Guyana to the municipality of Santana (Amapá), via waterway routes.

PHOTO: Andres Cardona

CONCLUSION

As has already been pointed out, the prohibitionist logic and penal punitivism that underpin the war on drugs have a direct impact on the territorialization of violence and organized crime. By criminalizing certain substances and prioritizing militarized repression, states end up increasing the economic value of drugs, encouraging logistical sophistication and the diversification of illicit routes.

This strategy generates significant side effects, including:

- the increase in armed violence, with massacres and intense conflicts in border municipalities and riverside communities.
- the selective criminalization of indigenous, *quilombola*, river dwellers and peasant populations.
- territorial fragmentation and the erosion of sovereignty, with the imposition of parallel governance by criminal networks.
- socio-environmental pressure, since drug trafficking corridors often overlap with conservation units, indigenous lands and *quilombola* territories, intensifying deforestation, environmental degradation and land violence.

The punitivism associated with the war on drugs also perpetuates the criminalization of poverty, disproportionately affecting vulnerable populations, such as black youth from the peripheries, indigenous people, *quilombolas*, river dwellers and peasants. This approach generates social tensions and exacerbates local conflicts, fostering a scenario of violence that weakens traditional populations in the Amazon region and other parts of the country, often victims of coercion, threats and forced displacement.

The Brazilian Amazon is a strategic territory for international cocaine trafficking, operating simultaneously as a gateway, redistribution corridor and exit point abroad. Waterway and multimodal routes predominate, taking advantage of the region's extensive river network, while border cities, ports and logistics corridors function as central transportation spaces, connecting the region to other Brazilian states and to international markets in Europe and West Africa.

The geospatial analysis presented in this chapter not only makes it possible to map the drug routes but also reveals the strategic nodes where coordinated interventions could reduce the operational capacity of organized crime in Latin America. It also shows that the interrelationship between prohibitionist policies, the punitive model and the evolution of organized crime goes beyond a mere question of public security.

In view of this, it is imperative to rethink policies to combat drug trafficking. It is necessary to understand these dynamics as part of a complex social phenomenon that requires multifaceted and sustainable approaches that consider not only repression, but also the promotion of inclusion, education and harm reduction policies.

By recognizing the totality of this situation, it is possible to envision more humane and efficient approaches to dealing with the drug issue in the Amazon, Brazil and Latin America.

NOTE FROM THE EDITOR: The Legal Amazon is an area of 5.014 million km² (59% of Brazil's territory) that encompasses the states of Acre, Amapá, Amazonas, Pará, Rondônia, Roraima, Tocantins, and the western part of Maranhão. It was established by specific legislation. For clarity, in this report, we translate Legal Amazon as Brazilian Amazon.

Instituto Mãe Crioula (IMC) is an eminently Amazonian entity built by Amazonians, dedicated to developing research in the areas of public security, environmental crimes, climate justice, territorial identities and social movements, as well as implementing actions in the areas of education, arts and culture that deal with ancestry, ethnicity and territorialities.

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ANNEX - REFERENCES

COUTO, Aiala. Geopolítica ou geografia política do narcotráfico? Facções criminosas e disputas territoriais na Amazônia. In: GeoTextos, vol. 21, nº 1, Julho 2025.

COUTO, Aiala. Escalas e Geometrias de Poder do Narcotráfico na Amazônia Brasileira. In: Rev. Susp, Brasília, v. 4, nº 1, jan./jun. 2025

FÓRUM BRASILEIRO DE SEGURANÇA PÚBLICA (FBSP). Cartografias da violência na Amazônia. Fórum Brasileiro de Segurança Pública/Instituto Mãe Crioula. São Paulo. Relatório de pesquisa, 2023. Disponível em https://publicacoes.forumseguranca.org.br/items/c86febd3-e26f-487f-a561-623ac825863a

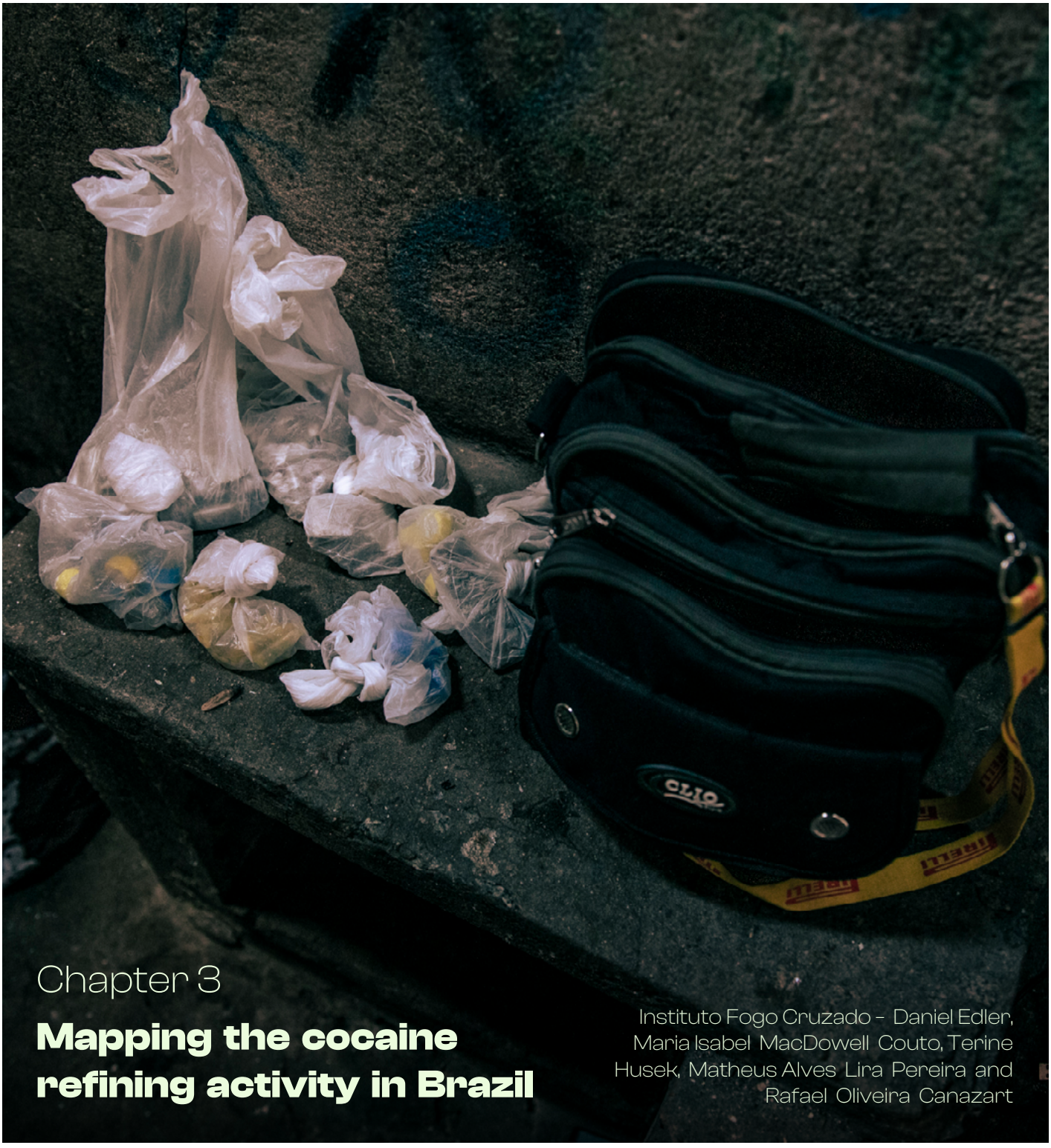
FÓRUM BRASILEIRO DE SEGURANÇA PÚBLICA (FBSP). Cartografias da violência na Amazônia. Fórum Brasileiro de Segurança Pública/Instituto Mãe Crioula. São Paulo. Relatório de pesquisa, 2024. Disponível em https://publicacoes.forumseguranca.org.br/items/c86febd3-e26f-487f-a561-623ac825863a

FÓRUM BRASILEIRO DE SEGURANÇA PÚBLICA. A geografia da violência na região amazônica: Anuário brasileiro de segurança pública, edição 2024.

FÓRUM BRASILEIRO DE SEGURANÇA PÚBLICA. Um retrato da violência contra negros no Brasil 2024. Disponível em: <https://publicacoes.forumseguranca.org.br/server/api/core/bitstreams/a22af5b3-3ca3-4125-823c-d3c5d76d327f/content>. Publicado em: 19.09.2024. Acesso em: 25.01.2025. 2024

UNODC. O relatório mundial sobre drogas. Washington: UNODC, 2024. Disponível em: https://www.unodc.org/unodc/data-and-analysis/world-drug-report-2024.html. Acesso em: 12 Ago. 2025.

www.sisdepen.mj.gov.br



Chapter 3

Mapping the cocaine refining activity in Brazil

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PHOTO: Gui Crist

Introduction

In recent years, research into the illicit cocaine economy has characterized Brazil as a major consumer market[1] and an export depot for the drug grown in the Andean countries and heading for Europe[2]. In general, research has focused on territorial control exercised by armed groups and the multiple criminal activities that accompany international trafficking routes[3].

1 According to the National Survey on Alcohol and Drugs, there are between 3 and 4 million users in Brazil - 1.78% of the population has used cocaine in the last year and 0.48% has used crack. These figures make the country the second largest consumer market in the world (Laranjeira, 2025).

2 According to data from the Federal Revenue Service, between 2016 and 2022, the ports of Santos and Paranaguá were the most relevant for international drug trafficking, accounting for 54% and 15% of total seizures respectively (Patriarca & Adorno, 2025). Other relevant ports are those of: Bahia, Santa Catarina, Recife, Natal, Fortaleza, Pará and Rio de Janeiro. For more details on the logistics of international trafficking, see: Rodrigues et al, 2018; CLALS & InsightCrime, 2020; McDermott et al, 2021; UNODC & CoE Brazil, 2022; UNODC, 2023.

3 Leeds, 1996; Machado, 2014; Neves et al, 2016; Abreu, 2017; Dias & Manso, 2018; Sousa & Pfrimer, 2021; Pinho et al., 2023; Feltran et al., 2023; Rodrigues et al., 2024.

However, this narrative fails to consider the entire cocaine production chain. While the focus is on the retail dynamics in big cities and the logistics of wholesale distribution, Brazil's role in the drug refining process is neglected.

Since the 1980s, police operations have identified not only the presence of clandestine laboratories on national territory, but also the trafficking of controlled substances - chemical precursors and adulterating drugs - used in the production of cocaine[4].

However, if refining activity previously seemed to be only residual, recent evidence points to a change in scenario. Interviews with police forces and members of criminal organizations suggest that more base paste is entering the country and then being refined for both domestic consumption and export[5].

The hypothesis raised by field research is corroborated by data from the National Institute of Criminalistics, which indicates a higher degree of purity in cocaine seized at ports on the Atlantic coast, compared to shipments confiscated in states close to the countries where it is grown[6]. According to the Institute, the cocaine seized in the states of Mato Grosso, Mato Grosso do Sul, Amazonas, Acre and Rondônia has more impurities than the drug seized in Paraná, Santa Catarina, São Paulo, Pará and Bahia.

This trend is also substantiated by information on the dismantling of clandestine laboratories in Peru and Bolivia. According to UNODC reports (2022a, 2023), the drop in the number of refining facilities detected in both countries (22% in Peru and 48% in Bolivia) indicates that part of the activity may have migrated to other regions.

The evidence is even stronger when we consider the current size of the cocaine market in Brazil. A report by the Brazilian Public Security Forum (FBSP) and the Instituto Esfera (2024) estimates that cocaine trafficking generates revenues of R$ 335 billion, equivalent to 3.98% of GDP.

Although the risk involved in drug transportation alone makes it a profitable activity, increasing the price of the product by up to 290%[7], the high turnover indicated by the FBSP can be explained, at least in part, by the value added to the drug through the refining and adulteration processes[8].

Despite growing evidence that a part of the cocaine production has migrated to Brazil, there is a lack of consolidated information on the matter. Although security forces frequently report identifying laboratories, there is, for example, no government data to provide an overview of the refining structure in the country[9]. Records or surveys on laboratories seizures are also often missing from reports by researchers, journalists and Brazilian and international organizations[10].

During this survey, it was found that most of the institutions consulted do not aggregate or consolidate information on operations involving the detection of cocaine laboratories. Even though security forces regularly dismantle these facilities, many agencies said they did not have the information requested, while others said they did not categorize the information, which would make it impossible for them to provide the data requested, and some claimed secrecy[11]. There was also frequent confusion between refining laboratories and drug distribution points, highlighting conceptual flaws that make it impossible to carry out precise analyses of the cocaine production chain.

More than undermining national drug policy, the lack of mapping of this activity weakens analyses of its overlaps to other illicit markets and its socio-environmental consequences. As presented in other chapters of this publication and corroborated by vast evidence, drug trafficking finances and provides logistical support for illegal mining operations in the Amazon, including in protected territories[12], as well as establishing a strong relationship with land grabbing, predatory fishing and wildlife trafficking[13]. Thus, the lack of knowledge about refining activities in Brazil directly impacts the effectiveness of land and environmental protection policies.

4 Procópio Filho and Vaz (1997) state that there is a pendulum movement in the refining process. In the 1980s, when it was difficult to obtain precursor chemicals in other South American countries, Brazil (which had its own production) took part in the processing of the drug. In the 1990s, when it became easier to access these products in regions close to the cultivation areas, the refining laboratories were concentrated in Colombia, Peru and Bolivia. Machado (2001) confirms that at the end of the 1980s the Federal Police identified the presence of refining laboratories throughout the country, but with a concentration in the states of Mato Grosso and Mato Grosso do Sul. See also: Vellinga, 2007.

5 INCB, 2020; Pinho et al., 2023; Lien & Feltran, 2025.

6 Also analyzing the material resulting from large seizures (over 20 kilos), the Federal Police's forensic service points out that the seizure of more cocaine without oxidation indicates that there is more base paste entering the country, which can either be refined to produce crack for domestic consumption or refined to produce hydrochloride, serving the local market and export demand. In other words, although the report does not provide data on the refining activity itself, it indicates that Brazil is becoming a relevant player in this stage of the cocaine supply chain (not just in the adulteration of the drug in home laboratories, but in the previous stages of refining - the transformation of base paste into "cocaine base" and then into hydrochloride or crack) (Polícia Federal, 2025).

7 CdE & SIMCI, 2022, p. 63.

8 Vellinga, 2007; Bergman, 2018.

9 The CDESC report (2023), points out that there is little information on the structure of drug refining and adulteration laboratories in Brazil, which makes it difficult to understand the cocaine market for both domestic consumption and export. According to the authors, "the structure of clandestine laboratories existing in the country in these identified adulteration processes may be a topic of interest for future studies on the subject" (CDESC, 2023, p. 89).

10 In general, surveys of refining laboratories in South America do not indicate a significant presence on national territory. Recent mapping by InsightCrime and the Global Initiative Against Transnational Crime, for example, identifies the presence of refining activities in Colombia, Peru, Ecuador, Bolivia and Chile, but provides no evidence about Brazil (McDermott et al., 2021). Even reports that delve into the relationship between drug trafficking and other illicit activities in the region and that seek to gather evidence about the cocaine supply chain also do not usually provide details about refining laboratories in Brazil (Ramírez et al., 2022). For more information on government data and the difficulty of putting together an accurate picture of the country's refining activity, see: CdE, 2022; CDESC, 2023

11 It would be necessary to search for the information individually in the database, which would mean a lot of extra work for the bodies in question.

12 Risso et al., 2021.

13 UNODC, 2022b. Risso et a., 2024.

From a land use perspective, the very construction of the large laboratories that operate in the first stages of refining has environmental impacts: to evade police surveillance, criminal groups look for remote places in rural areas or with forest cover, including protected areas and indigenous lands. To integrate the laboratories into the trafficking logistics chains, it is necessary to open roads or clandestine airstrips - infrastructures which, in turn, are shared with other extractive industries, increasing deforestation[14].

Furthermore, the refining activity itself is polluting. Laboratories use vast quantities of chemical products, which are generally administered without control. Chemical solvents are poured into water, soil or evaporate, contaminating the surroundings of the laboratories. The production of cocaine base also generates toxic waste - such as sludge rich in manganite, manganates and sodium metabisulphite - which is discharged untreated into sewage systems, rivers and springs[15]. The other stages of the cocaine crystallization and adulteration process also use large quantities of acidic solvents, which increase the risk of accidents and environmental contamination.

Refining adds value to the drug and, consequently, generates huge profits for those who control this stage of the production chain. Data collected by Bergman (2018) shows that the value of refined cocaine is up to four times higher, which, added to the profits made in transportation and export, generates an extremely attractive market. Compared to cultivation and retail, production at the refining stage is usually more concentrated, which gives criminal organizations enormous economic power.

If cocaine refining increases the economic power of armed groups linked to drug trafficking, it is to be expected that the growth of this activity on national territory will aggravate the crisis of governance and public security resulting from current drug policies in Brazil.

The illegal drug economy is often accompanied by converging crimes, ranging from bribery, extortion, fraud and money laundering to murder, sexual violence and forced labor[16].

For all these reasons, it is important to map the laboratories operating in Brazil, as well as their direct and indirect impacts. This is the gap that this chapter seeks to fill.

The illegal cocaine market in Brazil and the refining activity

One of the results of the repression in the Andean countries and the fragmentation of the armed groups has been the relocation of the large laboratories and the complexification of the production chain. Although drug processing still takes place in regions with forest cover on the triple Amazonian border (Colombia-Peru-Brazil), and to a lesser extent in Bolivia, Venezuela and Paraguay, security forces have increasingly found "home laboratories" that carry out the final stage of refining in locations close to the areas of consumption in the main South American cities[17] and around the ports through which the drug enters Europe[18].

According to Bergman (2018), in addition to distributing production, making law enforcement more difficult and increasing productivity resilience, this pulverization has had an impact on the quality of the cocaine consumed. In South America, the analysis of the seized material indicates greater variation in both the purity content and the diluents and adulterants included in the drug, indicating the use of different refining techniques and an adaptation to the logistical dynamics and demands of the local market[19]. In Europe, retail seizure data suggests that in the last decade cocaine has become purer and cheaper[20].

It is in this context that Brazil experiences a transformation in the cocaine production chains in its territory, moving from being just a transit country to playing a more central role in refining the drug, especially on the routes that come from Bolivia and Paraguay with shipments of cocaine paste or cocaine base[21].

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Despite frequent evidence of police operations that find "home laboratories" in urban areas and laboratories with greater refining capacity that generally produce cocaine for export, there is no consolidated survey of this activity in the country.

14 Andreoni et al., 2022.

15 EMCDDA & EUROPOL, 2016

16 UNODC, 2023.

17 There are indications that the dismantling of the FARC since 2016 has changed the local dynamic, with part of the routes and refining migrating to other countries - notably Ecuador, which has become the main exporter of cocaine to the US (Pichel, 2021). However, there is still some controversy over the shift in refining activity. A UNODC report (2023, p. 50) points out that, even with the dismantling of some organized crime networks in Colombia, the country would still be responsible for between 60% and 70% of the cocaine refined globally. On the spreading of "home laboratories", see: Vice, 2014; Yagoub, 2016.

18 Evidence from police operations points to a growth in the number of laboratories in Europe, especially in the Netherlands and Spain (EMCDDA & EUROPOL 2022). These have spread into small laboratories in cities with large numbers of consumers. However, laboratories are also often found in more remote areas, where they can produce a larger quantity of drugs without arousing the suspicion of neighbors (Vugts, 2019).

19 CDESC, 2023.

20 GI-TOC, 2025.

21 EMCDDA & EUROPOL, 2022; UNODC, 2023; Pinho et al., 2023; Lien & Feltran, 2025.

Mapping cocaine refining in Brazil

The data obtained in our research confirms the hypothesis of the spatial dispersion of refining laboratories. In addition to the responses obtained from a series of formal requests made via the Access to Information Act (LAI) to government agencies, a database was built with information collected through a systematic approach to searching public digital sources that report police actions to dismantle such equipment *(see full methodological note at the end of this chapter).*

The survey of different sources identified a total of 550 laboratories between January 2019 and July 2025, a figure 32.4 times higher than the 17 laboratories officially reported by the security agencies consulted.

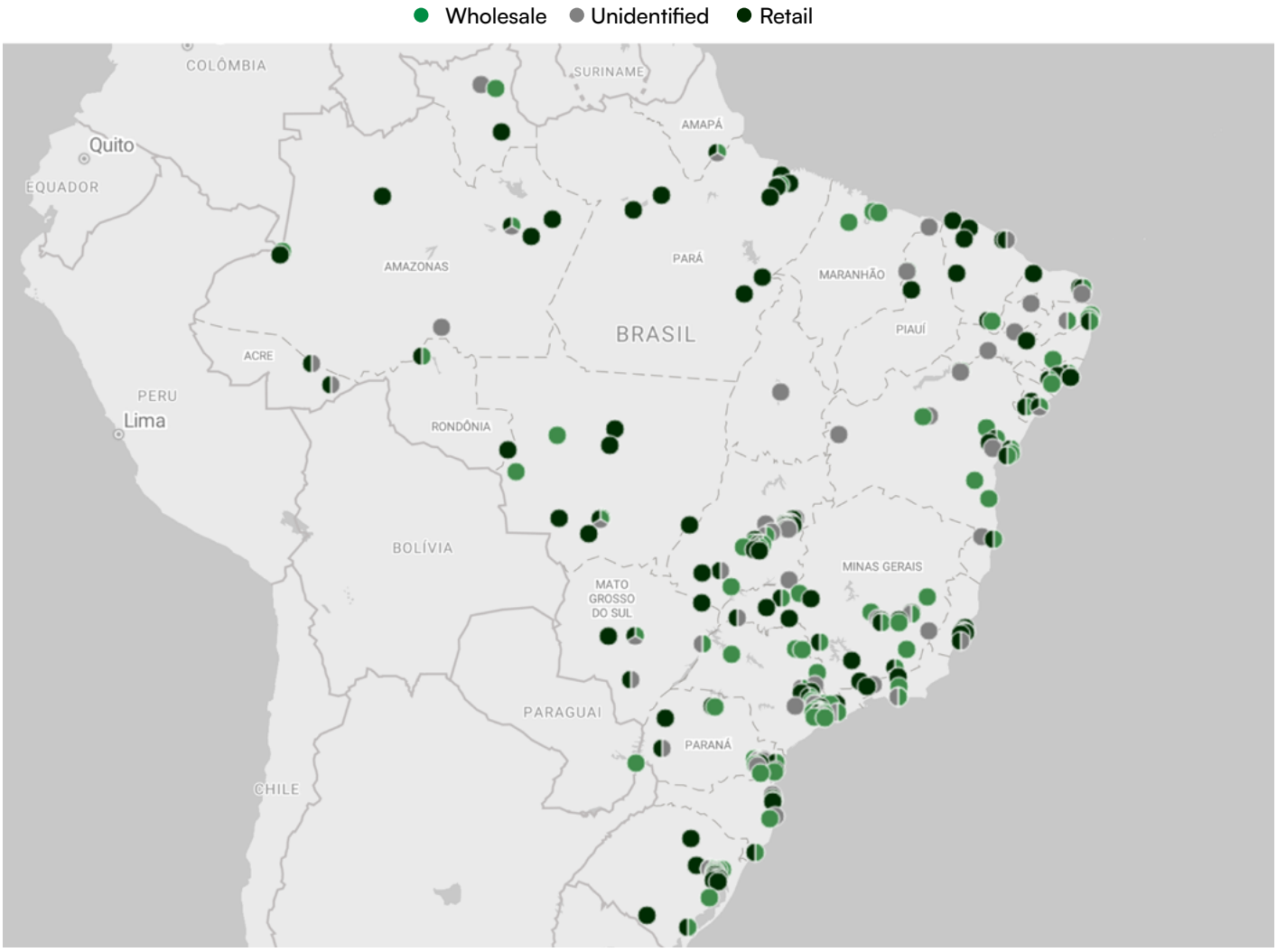
It's safe to say that the survey was able to catalog only a fraction of the existing laboratories. There are two reasons for this. Firstly, despite the research effort to navigate multiple sources, it is possible that a proportion of laboratories were not registered. This is a problem that must have affected small retail laboratories more significantly, since the detection of large refining structures is usually widely publicized by the press and the security forces themselves. Secondly, since this is an illegal activity, obviously only the laboratories identified by state police forces were reported.

On average, it is estimated that police seizures only affect between 10% and 20% of the global drug market[22]. By adopting this index as a benchmark for cocaine refining and adulteration structures, we can extrapolate that there are more than 5,000 laboratories in operation in the country.

Map 1. Refining laboratories and adulteration or "cutting" laboratories

Source: Instituto Fogo Cruzado

22 CdE & SIMCI, 2022.



Map 2. Laboratories linked to the "wholesale" and "retail" of cocaine

Source: Instituto Fogo Cruzado

Table 1.
Cocaine laboratories in Brazil (2019-2025*): activity and logistics

TYPE OF LABORATORY	WHOLESALE	RETAIL	UNIDENTIFIED	TOTAL
REFINING	91	34	18	159
ADULTERATION OR "CUTTING"	84	198	34	370
UNIDENTIFIED	5	3	9	21
TOTAL	180	235	61	550

(*) The year 2025 refers to data gathered until the month of July

Source: Instituto Fogo Cruzado

Table 2.
Cocaine laboratories in Brazil (2019-2025*): activity and location

TYPE OF LABORATORY	URBAN	RURAL	FLOREST	UNIDENTIFIED	TOTAL
REFINING	121	31	4	3	159
ADULTERATION OR "CUTTING"	333	29	2	6	370
UNIDENTIFIED	17	3	0	1	21
TOTAL	471	63	6	10	550

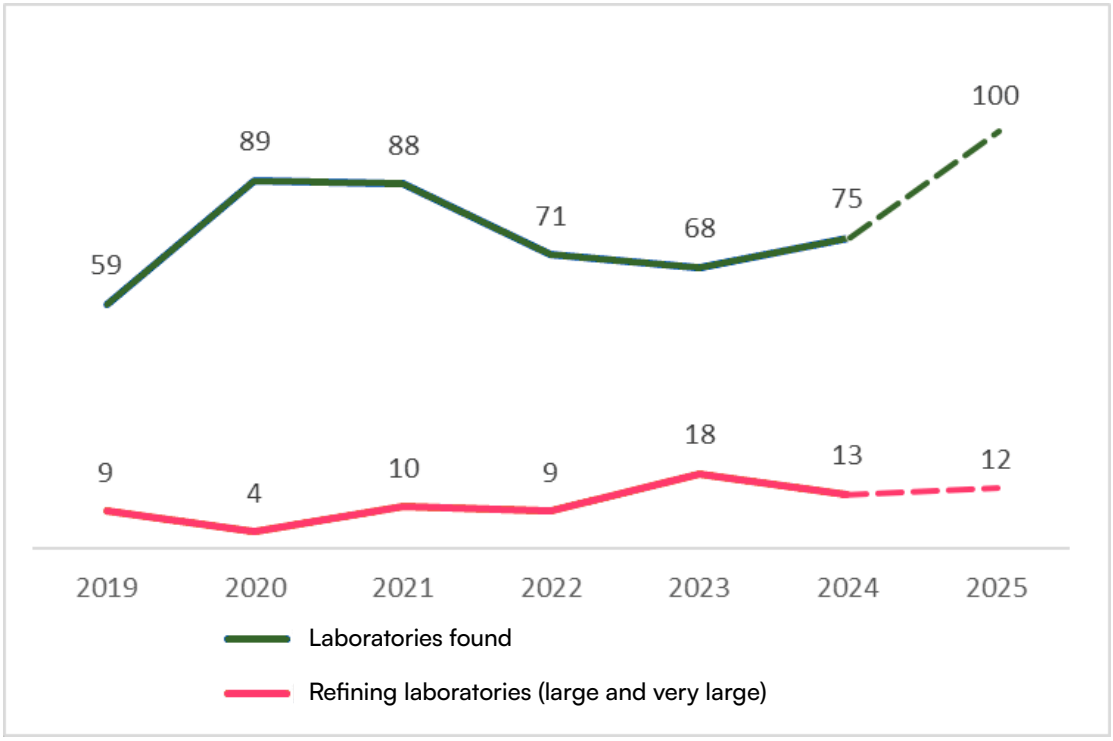
(*) The year 2025 refers to data gathered until the month of July
Source: Instituto Fogo Cruzado

What does the data say about the dynamics of cocaine refining in Brazil?

Based on the data obtained, we have identified some patterns in the cocaine production chain in Brazil. After a period of relative stability, the growth in the number of dismantled laboratories between January and July 2025 is striking *(see graph 1)*. However, definitive conclusions about the temporal evolution of refining activity in the country would be hasty, since the behavior of the curve can occur for several reasons.

In addition to the hypothesis of a real increase in the number of laboratories, it is possible, for example, that the security forces have adopted more robust strategies to crack down on refining, which would reduce underreporting. The sources consulted may have started to inform more consistently on police operations that led to the identification of laboratories, increasing the volume of data available for collection. Finally, there may have been a bias in the methodology, with web search engines (e.g. Google) showing greater accuracy in identifying sources due to their proximity in time.

Graph 1. Historical series of dismantled laboratories (2019-2025*)



(*) The year 2025 refers to data gathered until the month of July
Source: Instituto Fogo Cruzado

Despite the methodological caveats, we can say that refining in Brazil has two central dynamics (*see graph 2*):

- small or medium production - usually of crack - linked to local retail (39.6% of refining laboratories);
- large-scale wholesale production of cocaine base or cocaine hydrochloride (47.1% of refining laboratories).

Although the number of "very large" refining labs represents only 5.2% of the total number of labs identified, their production capacity - up to 1 ton of cocaine - and their concentration near the main international trafficking routes indicate that they are central equipment in the logistics chain for drugs destined for export.

Adulteration or "cutting" of cocaine is much more common than refining (67% of the total) and tends to be a retail activity, but not exclusively. Of the 39 "very large" laboratories identified in the survey, 10 were focused on the addition of adulterants and diluents (the "cutting agents") (see graph 2). The number may be even higher, due to indications that this activity also took place in some of the refining laboratories[23].

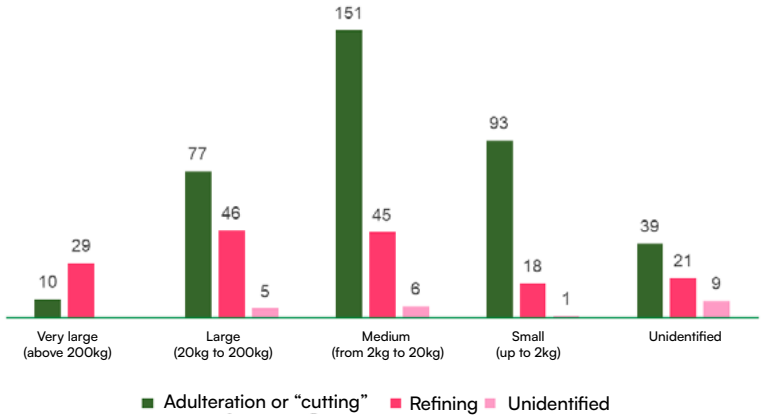
The analysis of the territorial distribution of the adulteration and "cutting" laboratories and the contextual information taken from the sources, as well as data from research into the purity of the drugs seized in the country[24], indicates that these structures tend to operate as distribution centers for local consumption.

As expected, the survey shows a prevalence of retail laboratories in urban areas (39% of the total) (*see tables 1 and 2*). Looking at the context of the seizures, we realize that many of the laboratories are also drug sales points, especially crack.

Most of these facilities were located in poor neighborhoods on the outskirts or in *favelas*, but we also found retail laboratories in more affluent neighborhoods, where seizures often revealed the presence of cocaine hydrochloride and synthetic drugs.

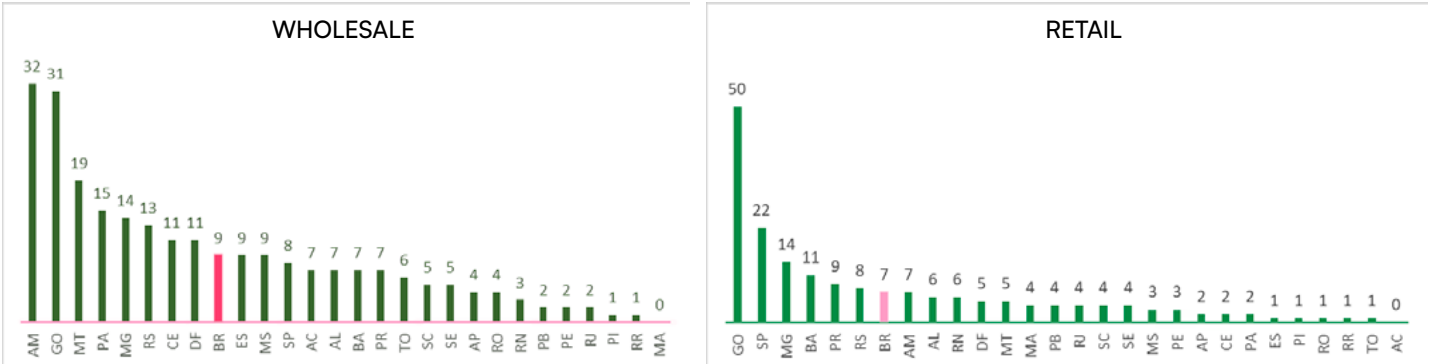
The laboratories with the largest production capacity are generally located in rural areas or in small towns close to large urban centers, which indicates that they function as supply centers both for the domestic market, especially in the case of adulteration or "cutting" laboratories, and for export, especially in the case of refining laboratories.

Graph 2. Type of laboratory by activity and size



Source: Instituto Fogo Cruzado

Graph 3. Distribution of laboratories linked to wholesale and retail by Brazilian state



Source: Instituto Fogo Cruzado

23 For methodological reasons, we chose to classify the laboratories based on their "main" activity, ranking them between "refining" and "adulteration". In other words, whenever there was evidence of "refining" and "adulteration or cutting", the laboratory was classified as "refining".

24 CDESC, 2023; Polícia Federal, 2025

Of the 550 laboratories identified, it was only possible to carry out a complete classification using the four stipulated parameters - kind of activity carried out, type of location, logistics chain and size - in 377 cases.

Despite the search for more than one source per occurrence, an absence of details prevails about the police operations that led to the detection of this facilities. This limitation is especially problematic in the case of identifying the chemical products used to refine or "cut" cocaine. It is common for the information released to be only that the police seized "substances" or "inputs"[25]. This fact, coupled with the scarcity of chemical analyses carried out on the seized materials, is an obstacle to drawing up more qualified overviews and appropriate public policies around the cocaine economy in the country.

Finally, the discovery of large laboratories also led to the arrest of some individuals described as "chemists", specialized workers who took care of local refining and trained the workforce to scale up cocaine production. In two cases, the sources indicated that the "chemists" were of Colombian nationality, which not only corroborates the hypothesis that these laboratories were integrated into international trafficking logistics, but also - considering the large number of laboratories dismantled between 2019 and 2025 - supports the hypothesis that the fragmentation of Colombian armed groups since 2016 has led to dispersion of the production chain.

The geography of refining

Some research indicates that the "Caipira Route" has seen the entry of a greater volume of base paste, mainly via Bolivia and Paraguay, to be refined in national territory[26]. However, the states of Mato Grosso and Mato Grosso do Sul, two strategic states for drug trafficking logistics in Brazil, do not appear to play a central role in terms of wholesale refining activity. Among the laboratories with high production capacity, only four were in Mato Grosso and two in Mato Grosso do Sul (see map 3).

A similar scenario occurs in Amazonas and Pará, states that are part of the so-called "Solimões Route". In Pará, we identified only one large laboratory, but it was dedicated to adulterating or "cutting" cocaine, probably for domestic consumption. In Amazonas, we identified a police operation in 2023 that dismantled two laboratories in Tabatinga and led to the seizure of around 680 kgs of base paste in the process of being refined (see map 3). In addition, three "large" laboratories dedicated to adulterating or "cutting" the drug were dismantled.

This data points to two scenarios: there may be an underreporting of refining laboratories in the northern states, which would be understandable given the vast territorial extension with forest cover and the limited number of security forces operating in the region, and/or it may be that the cocaine that enters Brazil through the triple border (Colombia-Peru-Brazil) is still refined in the countries of origin.

The low concentration of large laboratories in the border states can also be explained by the importance of two other states: São Paulo and Goiás.

At least 14 large-scale refining laboratories were identified in São Paulo[27], most of them close to the state capital's metropolitan region (see map 3.1.). Four adulteration or "cutting" laboratories with large production capacities were also found in the state.

This scenario is explained not only by the consumption in the country's largest city, but also by its proximity to the Port of Santos, the main place where the drug is exported[28]. While São Paulo's role had already been documented in recent research[29], Goiás' participation in cocaine processing was more surprising.

In Goiás, 44 laboratories with large production capacities were identified, of which 20 were refining laboratories and 24 were adulteration or "cutting" laboratories.

This concentration is related to two distinct dynamics in the cocaine market. The base paste that enters Brazil through the states of Mato Grosso and Mato Grosso do Sul is partly transported for refining in Goiás and then on to ports in the Northeast and Southeast. The adulteration or "cutting" laboratories feed a large retail market for crack and cocaine hydrochloride in Goiás and neighboring states, especially in Brasília (Distrito Federal).

The ranking of states with wholesale laboratories also helps to elucidate some of the hypotheses already raised about drug trafficking routes in the country (see graph 3):

- **Minas Gerais**, with 8 "large" or "very large" refining laboratories, is part of two of the main drug distribution routes, being a transit state for shipments arriving from Goiás and heading for ports in the southeast and Bahia. However, the presence of large cocaine-consuming cities and the proximity of other markets also explains the concentration of adulteration or "cutting" laboratories.

- **Bahia**, the fourth state in the ranking, is the end point of some of the trafficking routes, especially the drugs that enter through the states of Mato Grosso and Mato Grosso do Sul and cross through Goiás or Minas Gerais. The presence of 3 major refining laboratories indicates that this activity is distributed along the logistics chain, even occurring close to the export sites.

- In the case of **Paraná**, fifth in the ranking, preliminary analyses suggested that the state could play a more strategic role in cocaine refining due to trafficking activity near the Port of Paranaguá. However, during the survey, only one large-scale refining laboratory was found. The other wholesale laborato-

25 Among the substances mentioned are: acetone, boric acid, ammonia, sodium bicarbonate, caffeine, creatine and ether.

26 Neves et al., 2016; INCB, 2020; Pinho et al., 2023; Lien & Feltran, 2025.

27 The number could be even higher, since it was not possible to identify the activity carried out (refining or adulteration) in some "large or very large" laboratories identified in the state.

28 A report by the CDESC (2023) on the purity of cocaine seized in Brazil already indicated this hypothesis. In addition to a large quantity of cocaine base and cocaine paste, the drugs seized in São Paulo were divided between seizures with a low degree of purity (crack or hydrochloride that had already been refined and adulterated) and seizures with a high degree of purity (possibly destined for export through the Port of Santos, but also with a residual quantity for domestic consumption).

29 Feltran et al., 2023; Lien & Feltran, 2025.

ries in the state were adulterating or "cutting". This could indicate either a relevance of the local consumption market or a change in the export pattern, with drugs already being sent with "cutting agents" to the European market.

- In **Rio de Janeiro**, despite the long history of territorial control exercised by armed groups directly linked to drug trafficking, only two retail laboratories were identified, both for refining. The small number of these laboratories is unexpected in a state with a high population density but can be explained by the historical fear of local factions to commercialize crack[30]. It is also possible that police action does not prioritize the dismantling of these facilities; that media coverage of these specific events is reduced, or that the way in which police operations in these locations are publicized makes it difficult to identify and account for laboratories. In addition, the presence of several major ports and the strong role of the Comando Vermelho in international trafficking could also indicate that Rio de Janeiro plays a central role in refining exported cocaine.

However, only four wholesale laboratories were found and only one "very large" one in Rio de Janeiro. This can be explained both by the fact that part of the cocaine arrives in the state already refined and by the low effectiveness of official security forces in repressing laboratories.

Finally, the survey points to the relevance of the northeastern states in the cocaine production chain. Although data from drug seizures and field research indicate the importance of the southern and southeastern states in export logistics - with the ports of Itajaí (Santa Catarina) and Paranaguá (Paraná) second only to the Port of Santos (São Paulo) in terms of the volume of drugs found - the mapping of laboratories brings new nuances to the analysis.

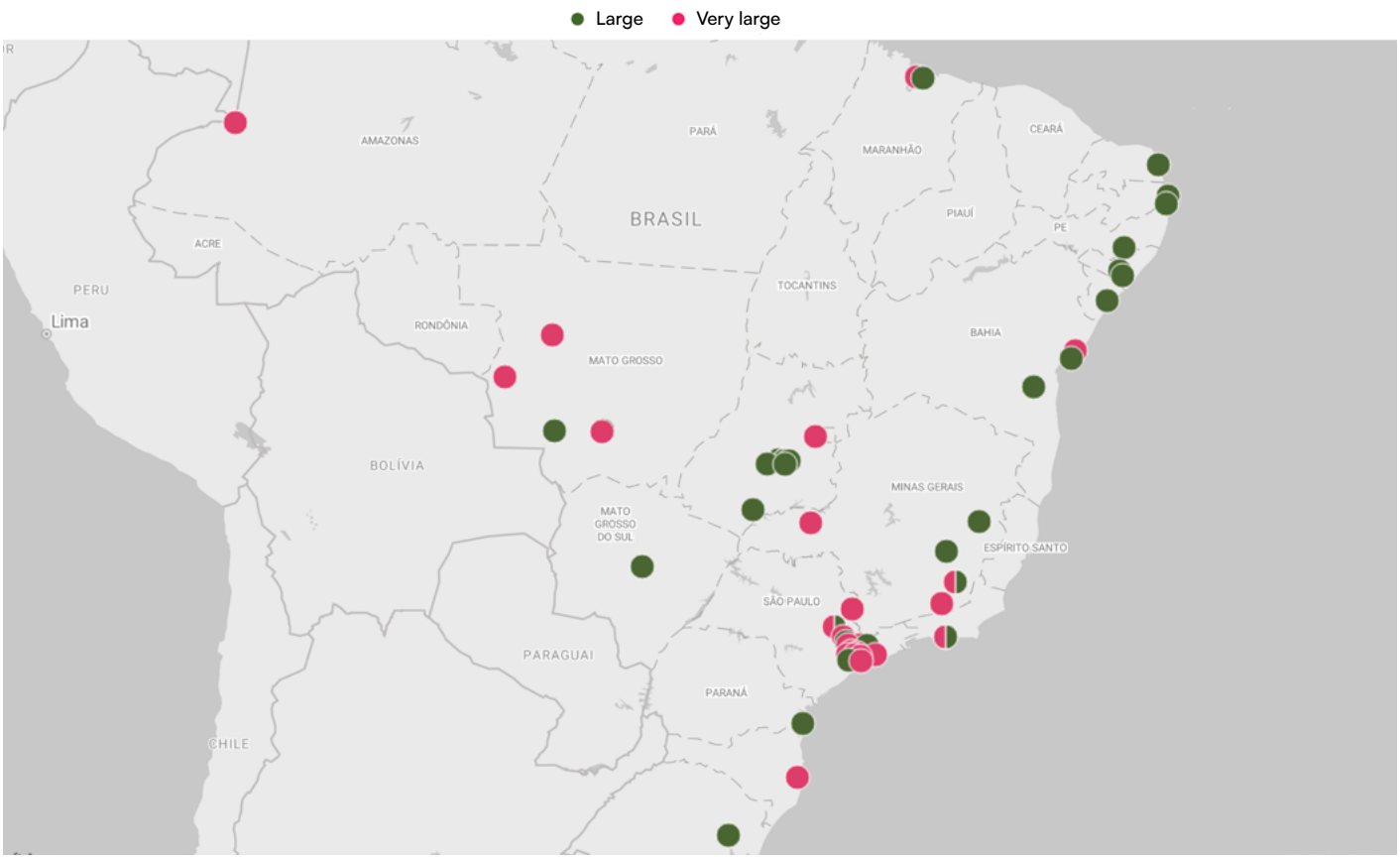
While 58 laboratories were identified in the South, of which only 4 focused on large-scale refining, the survey identified 109 laboratories in the Northeast, of which at least 37 had large production capacities. In addition to the state of Bahia, which has already been mentioned, **Ceará** stands out, with 15 laboratories, and **Alagoas, Paraíba and Sergipe**, with 14 laboratories each.

The case of the Northeast is even more alarming due to the recent growth in the number of laboratories. In the first few months of 2025 alone, the security forces have already detected 8 large-scale laboratories, the highest annual figure in the historical series.

PHOTO: Yael Martínez

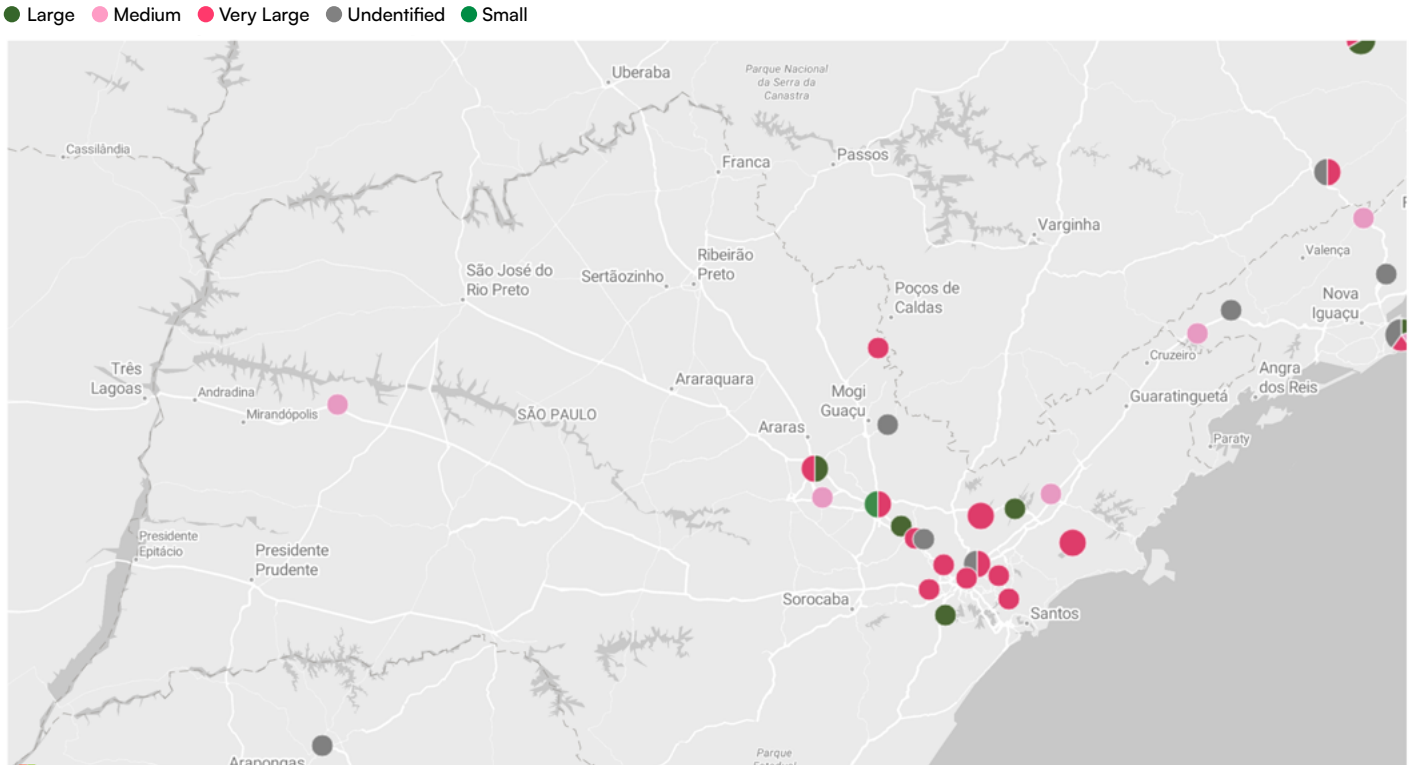
30 There have been records of crack being sold in Brazil since the 1980s, but armed groups linked to drug trafficking in the state resisted the sale of the drug until the mid-2000s. As recently as 2012, there were reports of the drug being banned in some regions because it caused problems for the other illicit activities carried out by the armed groups (Vettorazzo, 2012).

Map 3. Refining laboratories over 20 kg (“large” and “very large”)



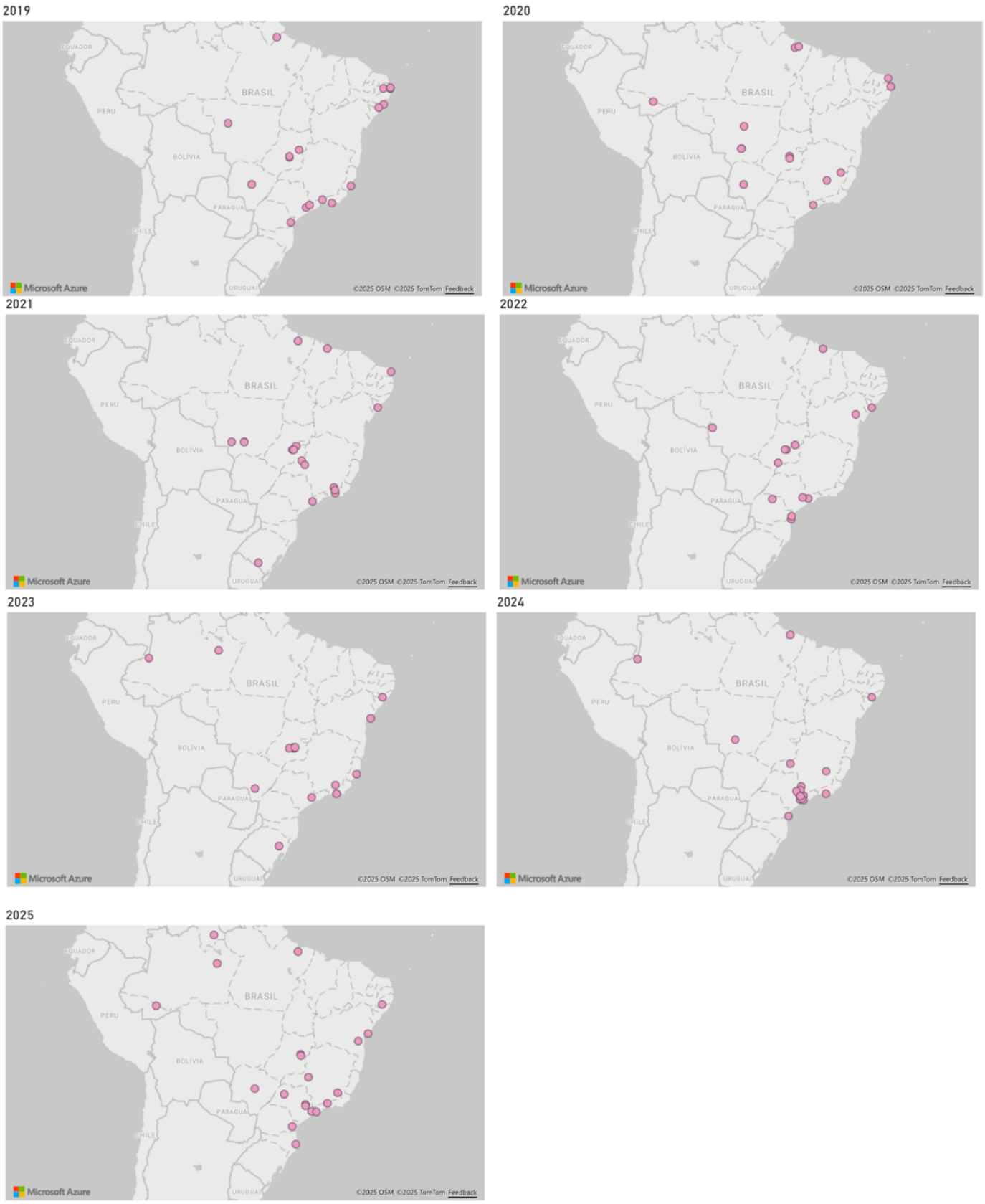
Source: Instituto Fogo Cruzado

Map 3.1. Southeast region



Source: Instituto Fogo Cruzado

Map 4. Temporal and spatial evolution of cocaine refining in Brazil (2019-2025*)



Source: Instituto Fogo Cruzado
(*) The year 2025 refers to data gathered until the month of July

PHOTO: Gena Steffens

"Direct" effects of cocaine refining on the environment

The identification of such a high number of clandestine refining laboratories in Brazil raises alarm bells about the effects of this activity on the environment and on the health of the populations living in the surrounding areas.

1. Greenhouse gas emissions

In 2023, global cocaine production reached a record of 3,708 tons, which represented, according to conservative estimates by the UNODC (2022, 2025), the emission of 2,190 million tons of CO_2 into the atmosphere[31].

If the effects of possible deforestation in forest areas for cultivation or construction of laboratories, roads and clandestine airstrips are included in the calculation, the release of CO_2 reaches 22.2 million tons, or the equivalent of burning 9.5 billion liters of gasoline, about 35% of Brazil's annual consumption[32].

Considering that extracting the alkaloids, purifying the base paste and disposing of the waste account for around 40% of the CO_2 emitted throughout the cocaine production chain[33], the refining process itself releases between 880,000 and 8.8 million tons of CO_2 every year.

2. Risk of accidents, fires and poisoning

Based on the mapping carried out, we can estimate that thousands of small laboratories operate in Brazil with improvised infrastructure in urban areas, which increases the risks of drug processing.

Laboratories require intensive use of electricity for drug drying ovens and for handling equipment such as presses and microwaves. As many labs are set up in temporary structures or previously empty dwellings, they operate with clandestine power connections, which, combined with the storage of flammable chemicals, can cause fires. It is not uncommon for firefighters to discover refining laboratories after responding to calls of fires in houses and apartments[34].

In addition, the handling of chemical products by individuals who do not have the knowledge to do so increases the risk of poisoning, which has already caused the death of people working in cocaine production[35].

The dispersion of the refining activity also increases the risks for consumers. The adoption of less safe techniques, as well as the use of more toxic chemical diluents, and the addition of inappropriate adulterants increase the risk of convulsions and cardiac arrests. The worsening quality of the drug leads to more frequent cases of intoxication, overdose and death of users[36].

3. Contamination of Water Resources

The proliferation of laboratories in urban areas (85.6% of laboratories identified in Brazil) also increases contamination from the uncontrolled disposal of packaging, chemical waste and drug residues into sewage systems. This practice damages or eliminates the bacterial growth responsible for treating waste, making the entire sanitation system less effective[37].

UNODC (2015) estimates that every year, millions of tons of toxic waste from the production of illicit substances are dumped directly into rivers, lakes and springs, contributing to

31 Considering only its direct impact, UNODC estimates (2022) that the production of 1 kg of cocaine releases around 590 kg of CO_2 into the atmosphere, or the equivalent of burning 250 liters of gasoline.
32 The sum of these activities would increase the impact of producing 1 kg of cocaine to up to 6 tons of CO_2 (UNODC, 2022). Data on consumption of type A gasoline (before blending with other fuels) for 2019, the last in the UNICAdata historical series. Available at: https://unicadata.com.br/historico-de-consumo-de-combustiveis.php?idMn=11&tipoHistorico=10&acao=visualizar&idTabela=2484&produto=Gasolina%2BA&nivelAgregacao=1
33 UNODC, 2022.
34 SPTV 2017; G1, 2011; Menezes, 2021.
35 Experts point out that a common mistake is to use microwaves to dry mixtures of cocaine and acetone, which can cause an explosion. It is also common for refining to be carried out in poorly ventilated areas to avoid the smell of the chemicals arousing the suspicions of neighbors. However, without air circulation, the risk of poisoning also increases (Vugts, 2019).
36 In February 2022, at least 20 people died and 74 were hospitalized after using cocaine refined with highly toxic adulterants in the province of Buenos Aires, Argentina. It is suspected that a local refining laboratory mistakenly included large quantities of the opiate fentanyl, which caused respiratory arrest (Carmo, 2022).
37 UNODC, 2022.

the contamination of local fauna and flora, as well as the people who live in the vicinity of cocaine processing facilities. There is evidence of contamination in aquifers used to produce drinking water in different countries[38]. The problem is so significant that the UNODC has created environmental safety guidelines for police forces working to crack down on refining, defining appropriate ways of storing and disposing of seized substances[39].

4. Destruction of biomes and impacts on biodiversity

In Brazil, traces of cocaine have already been found, for example, in sharks off the coast of Rio de Janeiro, where 13 individuals of an endangered species, the Brazilian beaked shark, showed concentrations of the drug capable of affecting their heart rate, swimming behavior, vision and hunting ability[40]. Concentrations of cocaine in the waters and in marine fauna have also been detected in Baía de Santos[41], in the state of São Paulo, and in Lagoa da Conceição[42], in Santa Catarina state[43].

The identification of cocaine also in fish and mussel organisms strengthens the evidence that the waste from the refining laboratories is poisoning the marine fauna that inhabits the country's coastal zones on a large scale.

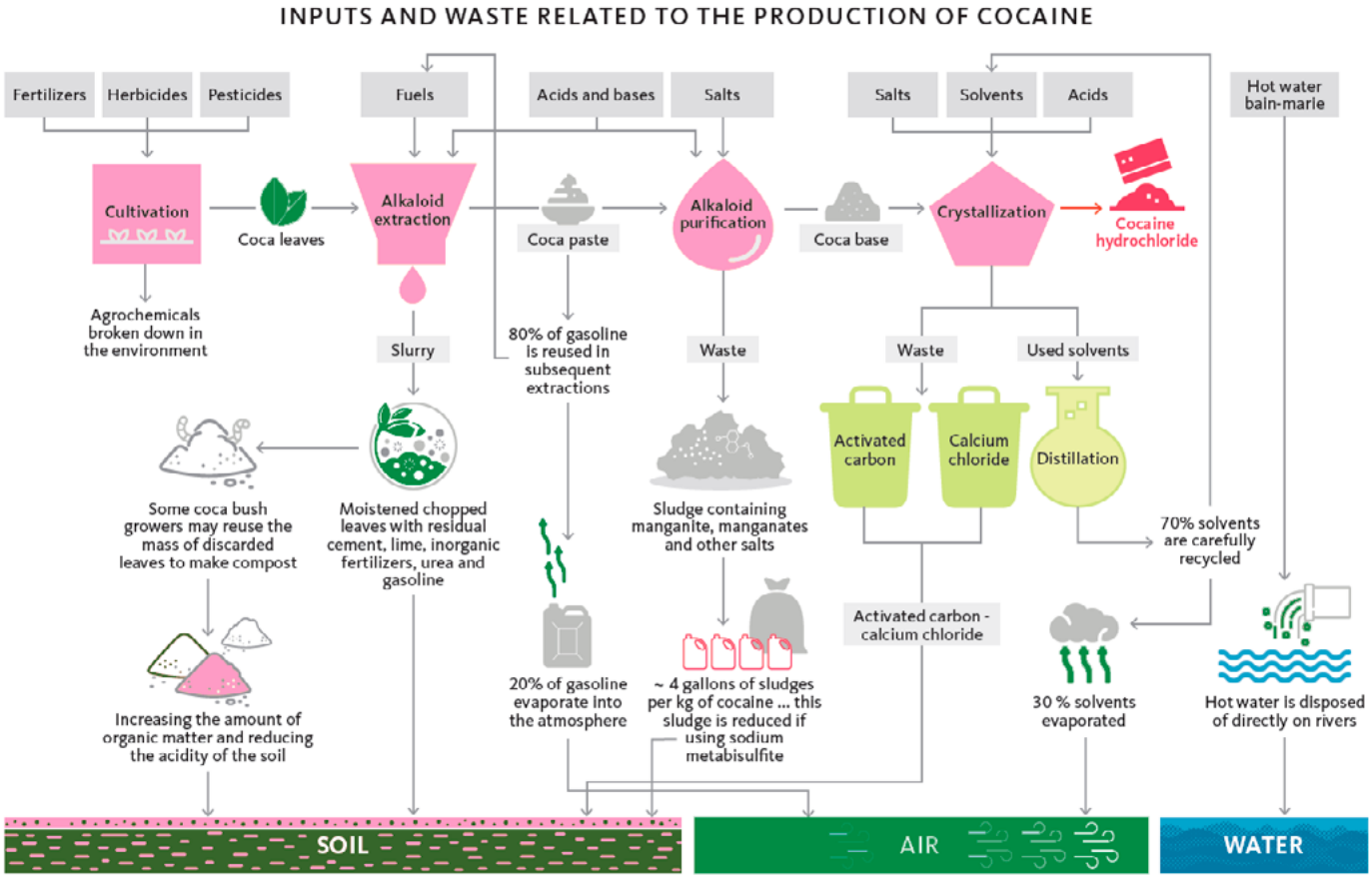
As the concentration levels of the substance increase along the food chain, the contamination also represents a risk to public health, as many affected animals end up being consumed by Brazilian families.

The survey identified the construction of laboratories in sensitive areas, such as mangroves and forests, or in areas with a high degree of degradation, such as urban forest areas or near rural areas, which further increases the environmental risks.

There is evidence, for example, that the refining activity has led to deforestation and pollution of water bodies in previously preserved areas of the Atlantic Forest where jaguars were present. Studies indicate that the destruction of the local ecosystem has reduced the genetic variety of the species and increased the number of attacks on cattle and domestic animals, creating risks for residents and losses for the region's ranchers[44].

Six laboratories were found in areas with forest cover and 63 in rural areas.

Figura x. The cocaine refining process and its toxic residues (UNODC, 2023, p. 77)



38 UNODC, 2022.
39 UNODC, 2011.
40 Esteves & Abreu (2024).
41 Alisson, 2024.
42 Silva et al., 2025.
43 According to research, contamination has occurred in two ways: by drug users dumping waste into the sewage system and by clandestine laboratories dumping cocaine and other toxic substances used for refining into sewage pipelines or directly into rivers and springs (Learn, 2024). Esteves & Abreu (2024) also raise the hypothesis that part of the contamination occurs through the dispersal of cocaine that is shipped to Europe. Specifically in the case of Rio de Janeiro, the authors argue that it is possible that part of a shipment attached to the hull of ships came loose during transportation and contaminated the region's waters.
44 Benavalli, 2025

"Indirect" effects of cocaine refining: the investment bank of illegal extractivism

The main "indirect" effects of the prohibition associated with this refining structure are related to the financing of other illegal activities and the use of political influence and the armed branches of the drug trade to corrupt public agents and avoid oversight. For communities and environmental defenders, this translates into an increase in deaths and threats.

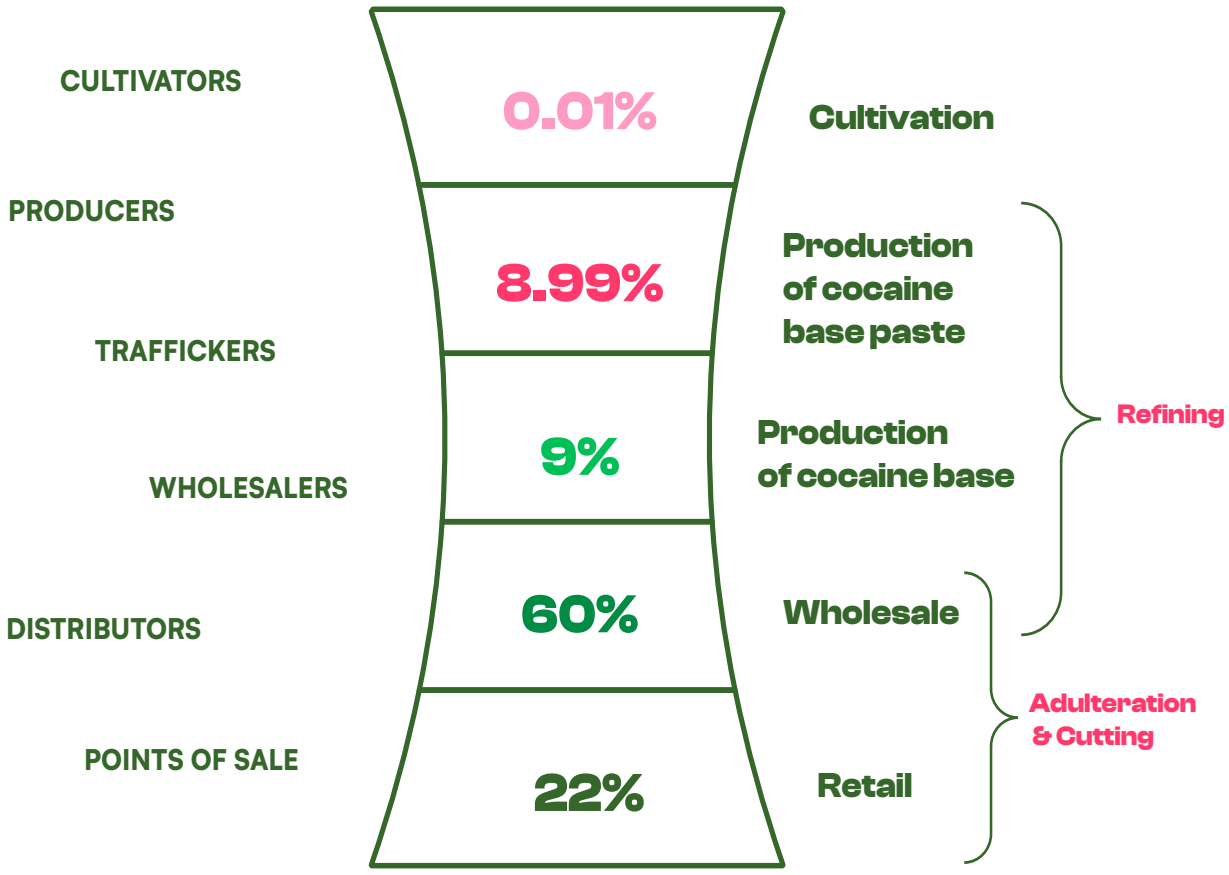
Analyzing the value chain of the cocaine industry in Latin America, Menno Vellinga (2007) identifies a significant concentration of revenues in the hands of the groups that control the logistics of wholesale drug distribution.

According to the author, those who manage to connect cultivation in the Andean countries to the traffickers who sell the drug in the continent's big cities, but also to the organizations that control the final stage of the market in the Global North, keep around 60% of all sales.

In second place, with 20%, are the groups that control the retail drug trade, operating street-level dealing points which supply the domestic market. It's not surprising, then, that the security forces' targets are mainly these two activities.

The transformation of base paste into cocaine base and the production of hydrochloride and crack account for 9% of the industry's total turnover.

Distribution of actors and aggregated values in the cocaine production chain



Own elaboration - adapted from Bergman 2018 and Vellinga 2007

There is no government data on the amounts moved specifically by refining, but it is possible to estimate from information produced by recent surveys:

According to a report by Global Financial Integrity, in 2017 the global cocaine market had a turnover of between US$ 426 billion and US$ 652 billion[45], which would indicate that refining alone would generate around US$ 48 billion.

Considering that after the Covid-19 pandemic there was a strong growth in both global cocaine production and consumption - data from UNODC (2025) indicates a growth from 17 million to 25 million users between 2014 and 2023 - it is safe to say that refining revenues have also increased significantly.

In the case of Brazil, considering that the cocaine industry had an estimated turnover of US$ 65.7 billion in 2024[46], the refining activity alone could generate around US$ 6 billion a year, a turnover similar to that of companies like Embraer and Grupo Boticário. The amount is also equivalent to more than five times the total target of the Amazon Fund (US$ 1.05 billion), the main financial mechanism for combating deforestation in the country[47].

As refining activity increases, so do the resources available for reinvestment in other criminal activities. This convergence indicates that a large part of the illegal extractive economy no longer has a purely local dynamic, carried out by small entrepreneurs in search of a basic income, but has become an integral link in a web of crimes with global ramifications[48].

The consequences can be seen in the unbridled expansion in recent years of mining, deforestation and land grabbing, with a strong environmental impact, and in the high rates of violence that are concentrated in nearby areas[49].

***"The vast profits generated by the illicit drug trade act as an investment bank for other environmental crimes, fueling violence and destruction in fragile ecosystems and vulnerable communities around the world."* — McSweeney et al., (2023, p. 36)**

Although we didn't find many refining laboratories on the "Solimões Route", recent data on cocaine seizures in the Alto Solimões river region and the Javari Valley (around 43 tons in 2024) indicate that the triple border (Colombia-Peru-Brazil) has become a key area for international trafficking[50].

PHOTO: Rafael Vilela

If we consider again the security forces' calculations that only 10% to 20% of the volume trafficked is seized and an average value of US$84,000 per kilo of drug in Europe[51], its main export destination, we can estimate that the triple border is a link in a chain that generates up to US$36 billion a year.

45 May, 2017.
46 FBSP & Instituto Esfera, 2024.
47 Comparison of turnover based on data available on CNN (2025) and G1 (2025).
48 Risso et al., 2024a, 2024b.
49 Soares et al., 2021.
50 Borges, 2025.
51 UNODC, 2023a.

Conclusions and Recommendations

Prohibitionism and the "war on drugs" policy have generated several serious effects over the years, perhaps the most basic of which is the difficulty in properly understanding the production scenario of illegal substances, their economic aspects and their direct and indirect socio-environmental impacts. This limitation stems largely from the clandestinity imposed by criminalization, which obscures fundamental data on the productive and financial dynamics of this market.

Previous research into the cocaine economy in Brazil had already indicated the existence of a consumer market with around 3 million to 4 million users[52], as well as a series of trafficking routes that cross national territory to link the countries where the coca leaf is grown to the export warehouses for the Global North. However, there was still little information on other stages of the cocaine logistics chain in the country.

Some recent studies and chemical analysis data on the purity of the drugs seized suggested that, after 2016, part of the refining activity migrated to Brazil, supplying both domestic demand and international trafficking. The survey presented in this chapter confirms this hypothesis.

The data collected from security force operations shows a concentration of laboratories with large production capacities along the main trafficking routes and around the ports where shipments move to other markets. In addition, we also identified a proliferation of smaller laboratories - both for refining and adulteration or "cutting" - close to the big cities, which suggests they prepare the drugs that are consumed in the country.

Based on the survey carried out, we estimate that there should be around 5,000 cocaine processing laboratories in operation in Brazil, generating annual revenues of up to US$6 billion.

If we consider that cocaine often functions as a "steroid" for other illicit activities and that refining adds value to the drug, increasing the income of the groups that control this stage of the production chain, the mapping presented here is a wake-up call for the Brazilian authorities.

To produce better diagnoses of refining activity and its influence on the actions of armed groups, public bodies need to systematize and make available better data on laboratories and associated discoveries. Forensic institutes need to invest in chemical analysis of seized materials and drugs. Information on the purity of cocaine and the substances used to process the drug can help provide a more detailed picture of the cocaine production chain.

Without quality subsidies, it is not possible to develop public policies capable of reducing the socio-environmental damage caused by this illicit economy.

Instituto Fogo Cruzado - uses technology to produce and disseminate open and collaborative data on armed violence, strengthening democracy through social transformation and the preservation of life. With its own innovative methodology, the institution's data laboratory, the largest bank on armed violence in Latin America, produces more than 50 unprecedented indicators on violence in the metropolitan regions of Rio, Recife, Salvador and Belém.

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52 Laranjeira, 2025.

Methodology

The first step in the survey on the presence of cocaine laboratories in the country was to submit requests for access to information (LAI, 12527/2011) to the main public agencies that work to suppress drug trafficking, including state police (civil and military), public security departments and federal agencies, such as the Federal Police, the Federal Highway Police, the Ministry of Justice and Public Security (with emphasis on the National Secretariat for Drug Policy and Asset Management), the Ministry of Defense, FUNAI and IBAMA.

The responses received indicated that most institutions do not aggregate and consolidate information on operations involving the detection of cocaine laboratories. Even though security forces regularly dismantle such equipment, many agencies categorically replied that they did not have the information requested, while others claimed not to categorize the information, which would make it impossible for them to provide the data requested[53]. There are also those who claimed secrecy, which, in addition to the excessive and inadequate application of the law, does not allow us to know whether or not they have this type of information. In addition, there was frequent confusion between refining laboratories and drug distribution points, showing not only conceptual flaws, but also the impossibility of carrying out precise analyses on different aspects of the cocaine production chain.

Of the few agencies that sent data, we were able to list 99 cases throughout the country between 2019 and July 2025. After reading the documents submitted, we filtered out those places that processed cocaine, which resulted in only 17 laboratories.

Since it is not possible to gather more information about cocaine refining laboratories from government sources, it was decided to complement the LAI responses with a database built from public information. Data collection was carried out through a systematic approach of searching public digital sources that report police actions to dismantle these facilities. The methodology used web search engines (such as Google) to identify and map relevant sources on the subject, including press outlets, specialized blogs, social media profiles with news coverage and official press office pages of government agencies.

The search process was structured based on specific keywords that made it possible to locate news and reports on the subject, such as: “Cocaine Refining Laboratory”, “Drug laboratory”, “Refining of substances”, “Clandestine laboratory” and “Processing of narcotics”. To ensure the reliability of the information, each occurrence was verified in multiple sources before being incorporated into the database.

The resulting database was structured into hierarchical levels, with the main unit being the police operations that resulted in the dismantling of the laboratories. From the main database, specialized secondary databases were developed detailing specific aspects: dismantled laboratories (with location data, typology, characteristics of the area, characteristics of the logistics chain); chemical substances seized; arms and ammunition; laboratory equipment; and people arrested or victimized. After the initial mapping, the laboratories were categorized, especially considering the type of substances and equipment seized, thus enabling a more precise analysis of the laboratories identified.

The main challenge in this process was to separate laboratories that refined the drug (for example, transforming cocaine base paste or cocaine base into hydrochloride or crack) from laboratories that worked on the final stage of adulteration or “cutting”. To do this, we created a list of chemical products used in the different stages of refining[54] and stipulated classification rules. For example, when the source indicated the discovery of base paste and chemical precursors such as ammonia and potassium permanganate, we classified it as “refining”. In cases where the drug was found with diluents or “inert” substances, such as creatine and boric acid, we classified it as “adulteration or cutting”. We created other codes to separate laboratories linked to wholesale (for example, large quantities of drugs in tablets or bars and the seizure of equipment such as hydraulic presses) from those with indications of working in retail (smaller quantities of drugs, often already divided into street-level portions — commonly referred to as ‘rocks’, ‘bags’, or ‘stones’).”

Finally, we also divided the laboratories by the size of the seizure and estimated production capacity, which helped to indicate their connection to the wholesale (probably for export) or retail logistics chains. Therefore, the laboratories are divided into very large (over 200 kilos), large (between 20 and 200 kilos), medium (between 2 and 20 kilos) and small (under 2 kilos). In cases where the sources did not provide enough information to define the different categories mentioned, we opted to classify them as “unidentified”. This limitation was especially relevant for laboratories categorized based on LAI responses provided by public bodies

The full references for this chapter are available as an appendix at the end of the publication.

53 It would be necessary to search for the information individually in the database, which would mean a lot of extra work for the bodies in question.

54 The list of chemicals was based on information available on EUDA & EUROPOL, 2022; UNODC, 2021; CDESC, 2023.

III — DESTINATIONS

PHOTO: Victor Moriyama

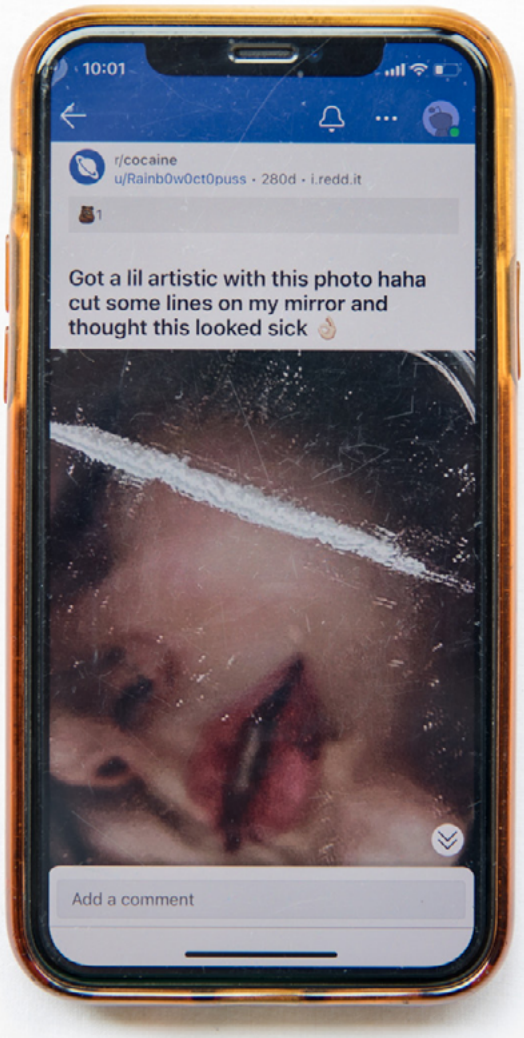


PHOTO: Gena Steffens

The evolving cocaine market in Europe and the UK

Mary Ryder and Steve Rolles

Over the past three decades, Brazil has emerged as a key hub in the global cocaine trade to Europe. Its developed commercial infrastructure has made it an attractive transit point for organised crime groups seeking to evade pressure on traditional routes, often using West Africa as an intermediate staging ground, where the trade corrodes governance and drives environmental harm in ways that mirror Latin America. In parallel, debates on alternatives to the "war on drugs" have been advancing in Europe - where cocaine is now cheaper, more available and of higher purity than ever before - as recognition grows that prohibitionist enforcement has failed to halt supply or reduce harm. This chapter interrogates these developments.

Cocaine is categorised in the highest harm schedule/classification under both international law[1], and domestic legislation across the EU, and is consequently associated with the harshest sanctions for possession or supply.

Despite the concerted punitive enforcement efforts spanning multiple decades, cocaine has risen to become the most popular illicit stimulant in the EU, and the second most popular of all illegal drugs, after cannabis[2].

What was once seen as a more exclusive and glamorous drug has, since the 1990s, increasingly penetrated a much wider set of demographics and social environments. UK data, for example, highlights that cocaine use in 2000 was twice as prevalent in London as elsewhere in the UK, but rates had equalised a decade later[3].

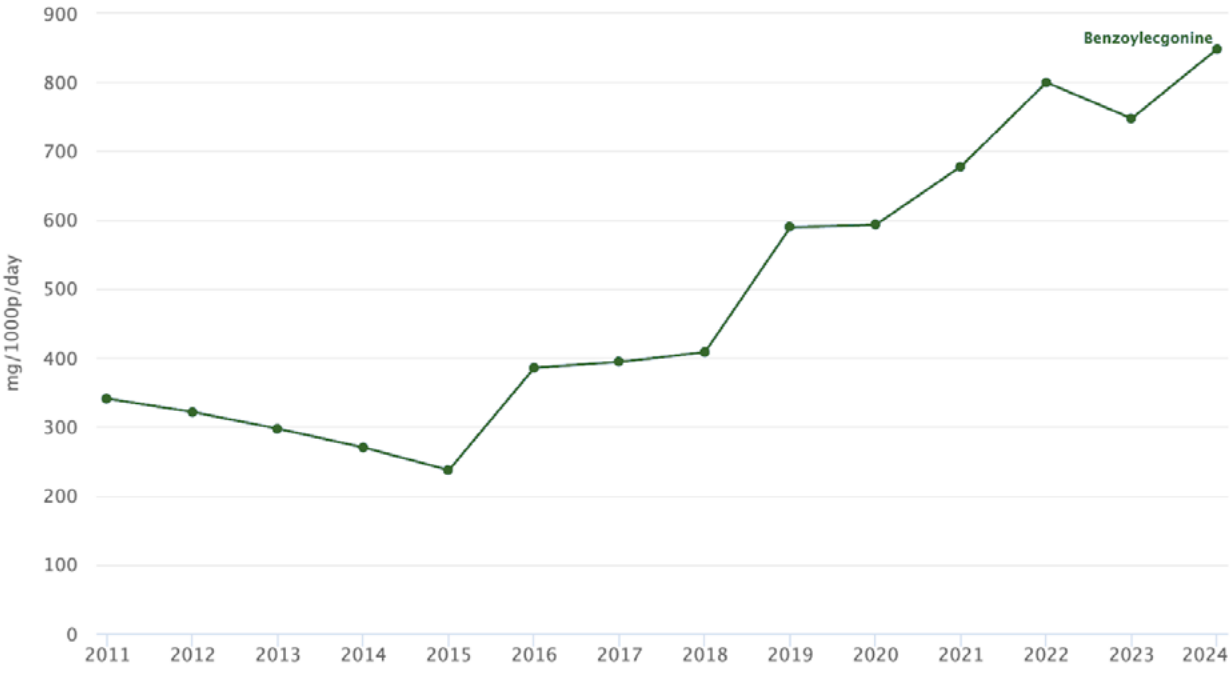
Gathering EU-wide data on illegal drug consumption remains methodologically challenging and something of an imprecise science (*see methodological note at the end of this chapter*). However, data compiled by the EU Drug Agency (EUDA, formerly EMCDDA) from two key sources, urban wastewater analysis, and national consumer surveys, shows how cocaine's popularity has surged in the EU over the past two decades, even in the face of the vast and growing resources directed towards user-level enforcement and supply side interdiction.

Between 2023 and 2024, cocaine residues (the metabolite benzoylecgonine) in municipal wastewater rose in 39 of the 72 cities studied, while 17 cities showed no change and only 16 recorded a decrease[4]. While aggregated cocaine residues across the cities were relatively stable in the first years of the study, beginning in 2011, there has been a steady increase since 2015. The strongest upward trends have been in Western and Southern European cities.

This rapidly expanding market trend is echoed in consumer survey data gathered nationally and compiled by EUDA:

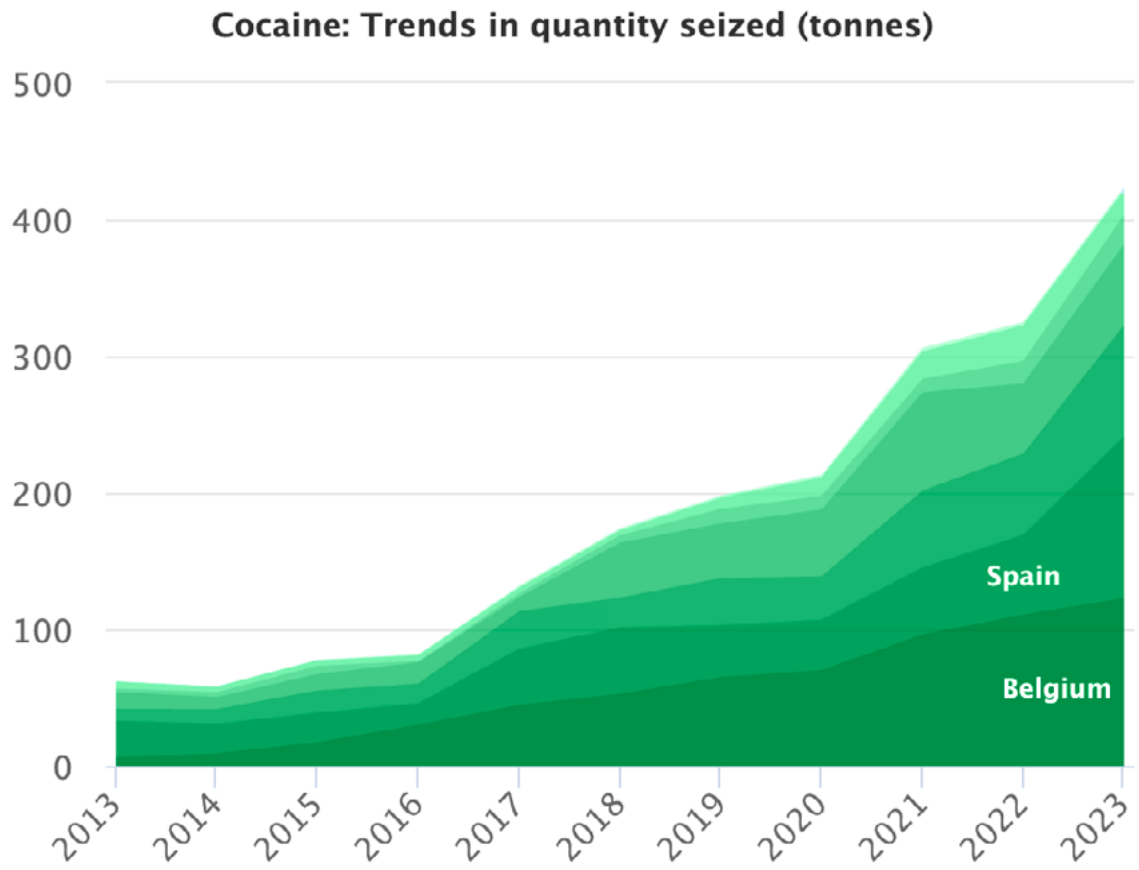
- Prevalence of cocaine use has more than doubled over the past two decades, with the increase accelerating since 2012-15, albeit generally more quickly in Western and Southern Europe.
- EUDA's most recent data suggests that 3.5 million adults used cocaine in the last year, concentrated amongst younger adults, with 2.7 million of this total being 15- to 34-year-olds.
- EUDA estimates that almost 5% of EU adults, around 14 million people, have used cocaine at some point in their lives. The highest lifetime use prevalence reported is for Spanish adult males, at over 18%[5].

Aggregated trends in cocaine residues in 7 EU cities, 2011 to 2024



1 The UN drug conventions https://docs.un.org/en/st/CND/1
2 https://www.euda.europa.eu/publications/european-drug-report/2025/cocaine_en
3 London Health Observatory (2000, archived 2013). Drug use reported in the British Crime Survey 2000. Archived at: webarchive.nationalarchives.gov.uk/20130315185742/www.lho.org.uk/viewResource.aspx?id=7752
4 https://www.euda.europa.eu/publications/html/pods/waste-water-analysis_en
5 https://www.euda.europa.eu/data/stats2025/gps_en

The longer term trend in cocaine EU seizures, dramatically rising by more than 400% between 2013 and 2023, reinforces the picture of rapidly expanding market availability.



The rise in cocaine use is driven by a mix of supply and demand factors. Increasing availability has been a consistent pattern in this evolving market, including for vulnerable youth populations. The European Union's 2024 ESPAD school survey observed that cocaine was now 'easily obtainable' for 13% of the 15- to 16-year-old students, higher than for any drug except cannabis[6].

The emergence of dark web mail-order sales and crypto-currencies, alongside new encrypted messaging app-driven delivery services, has created convenient and accessible new retail supply models able to evade almost all traditional user-level enforcement. The stereotype of the sinister drug dealer lurking on street corners or outside school gates is even less true today than it has ever been. Cocaine is now readily available, with fewer obstacles, for anyone who wants it; one 2018 consumer survey found cocaine orders in the UK were delivered faster than a pizza[7].

Rising availability of cocaine has come hand in hand with falling price, and rising purity - the *precise opposite* of the outcomes sought by supply side enforcement.

Between around 2005 and 2012, insurgent Balkan (predominantly Albanian) based organised crime groups (OCGs) staged a remarkable takeover of cocaine markets in large parts of Europe. Forging direct links with Brazilian and other Latin American OCGs, they vertically integrated the supply chain, cutting out the 'middle men', reducing wholesale costs, and increasing their margins.

This savvy business move enabled them to maintain or increase profits at the same time as offering a cheaper, higher purity, and a more reliable quality product to consumers. The result was a rapid displacement of existing supply chains and a market saturated with accessible cocaine - naturally increasing its consumer appeal and feeding into the rising use.

6 https://www.euda.europa.eu/publications/data-factsheets/espad-2024-key-findings_en
7 www.globaldrugsurvey.com/gds-2018/cokeinoes-cocaine-delivered-faster-than-pizza/

Data collated from national sources by EUDA and UNODC suggests that cocaine 'street' prices paid by consumers per gram have stayed fairly stable over the past 10-15 years in Europe - falling by around 12% between 2013 and 2023, most of that fall occurring after 2021.

Prices naturally vary between different markets, but EUDA reports per-gram prices generally ranging from 40-80 Euros for the 2018-2023 period[8], with somewhat lower prices, around 10 euros per gram less, in key port cities such as Antwerp and Barcelona reported in a 2024 analysis from GITOC, presumably due to the proximity to maritime importation sources[9].

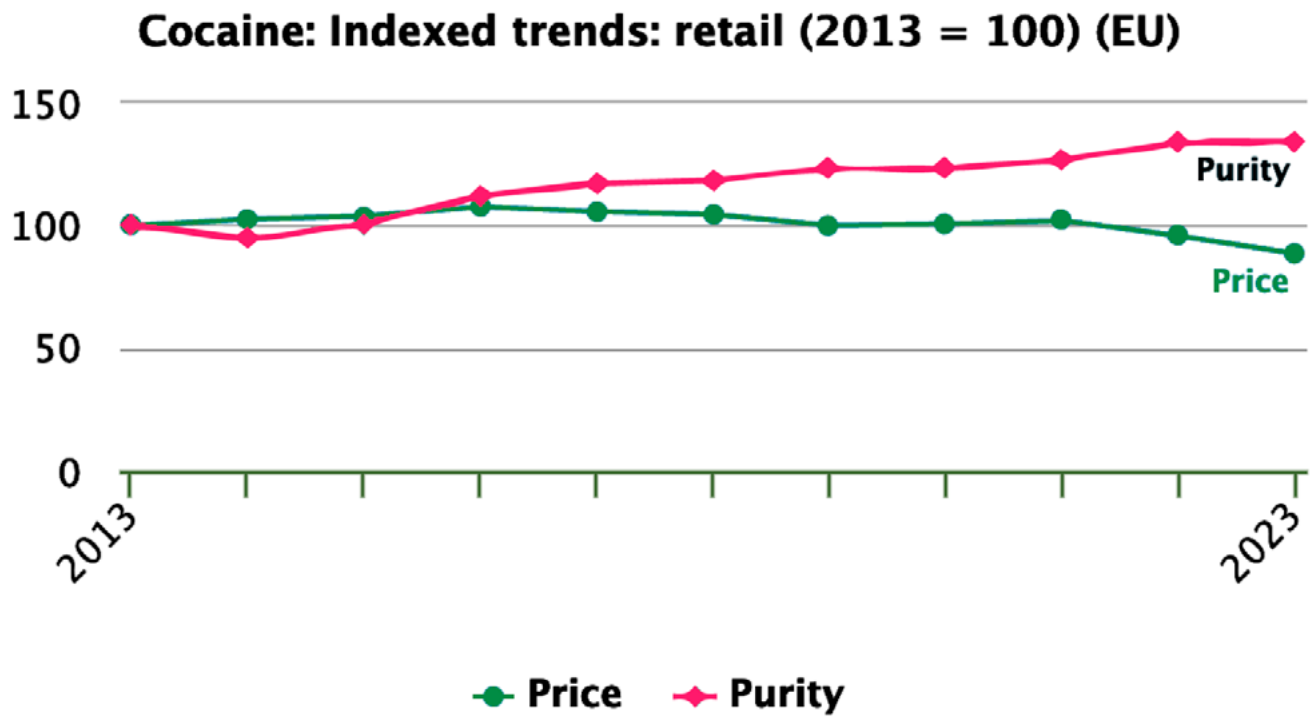
These seemingly stable retail prices, however, obscure a more dramatic change in *purity adjusted prices* - which reveal purity having risen by 40% over the same 10 year period from the 2013 baseline[10].

This means consumers are getting substantially more actual cocaine (and correspondingly less cutting agents / adulterants) in each purchased gram today than they did a decade ago, but for the same money; thus, each mg of cocaine effectively costs significantly less.

There is less reliable data on wholesale prices per kilogram of cocaine arriving in Europe, which can be more volatile, especially in the last 5 years, with prices impacted by localised market disruption from large seizures, and the impacts of COVID on shipping between 2020-2022. Overall, a similar pattern to street prices has been witnessed on wholesale trends, with relatively stable prices alongside rising purity.

GITOC analysis suggests that wholesale prices are generally higher in Europe than in the US. In 2021, GITOC reported a wholesale kilogram of cocaine in the US being worth up to US$28 000, but worth around US$40 000 *on average*, in Europe and as much as US$80 000 in some European markets[11]. The latest data reported by EUDA for 2023 was that most estimates were in the range of 30-40,000 Euros[12] per wholesale kilo in Europe[13].

However, whilst both EUDA and UNODC reporting for the late-2010s to early-2020s suggests wholesale prices per kilogram staying fairly stable across Europe, purity-adjusted price actually fell in many markets, as purity increased alongside total supply, reflecting other evolving market dynamics.



Source: https://www.euda.europa.eu/media-library/cocaine-market-europe-2013-2023_en

8 https://www.euda.europa.eu/media-library/cocaine-market-europe-2013-2023_en
9 https://globalinitiative.net/wp-content/uploads/2024/12/Observatory-of-Organized-Crime-in-Europe-European-Drug-Trends-Monitor-Issue-1-GI-TOC-December-2024.v4.pdf
10 https://www.euda.europa.eu/media-library/cocaine-market-europe-2013-2023_en
11 https://globalinitiative.net/analysis/cocaine-to-europe
12 This range reflects the 25% to 75% range from the total data set https://www.euda.europa.eu/media-library/cocaine-market-europe-2013-2023_en
13 note that comparing euro and dollar values is difficult given shifting exchange rates

Changing patterns of use

As cocaine has become more affordable and better quality, there has also been a related and concurrent rise in higher risk consumption, specifically smoked crack-cocaine use, and injection use of cocaine (more viable as route of administration with higher purity powder or crack). These higher risk forms of cocaine use have been concentrated amongst socially and economically marginalised populations in Europe, in particular people living with homelessness, poverty, insecure migrant status, and existing opioid or other forms of high risk drug use.

As higher risk cocaine use has increased so inevitably has the burden of associated health harms. Cocaine related treatment admissions, and hospital emergency visits have risen.

EUDA data also suggests cocaine was involved in approximately one quarter (1,051 or 26 %) of EU drug-related deaths in 2023. Almost all cocaine related deaths involve polydrug use, most commonly with opioids, benzodiazepines, and/or alcohol.

While forensic toxicology cannot distinguish between powder and crack cocaine, other sources make it clear that cocaine related mortality is concentrated amongst high risk smoked crack and injection use. As cocaine can negatively impact underlying cardiovascular conditions, it is likely that the overall contribution to mortality has been underestimated.

Data from the UK is no longer included in the EUDA reports (post -Brexit), but cocaine-related deaths from England and Wales alone are higher than the entire EU total. There were 1,118 deaths involving cocaine registered in 2023 in England and Wales, 30.5% higher than in 2022 (857 deaths), and nearly ten times higher than in 2011 (112 deaths)[14].

In Scotland (where data is collected separately from England and Wales), cocaine-related death-rates were higher still, reaching a new record of 479, or 41% of all drug related deaths, in 2023[15].

The rapid emergence of cocaine injecting in recent years has created new challenges for health services oriented towards dealing with intravenous or smoked opioid-use. Treatment modalities for high risk stimulant use are strikingly underdeveloped by comparison - with little research on potential for substitute or maintenance prescribing that is the mainstay of opioid treatment responses. The UK's first supervised drug consumption facility in Glasgow, Scotland, reflects this; designed to cater for people who inject heroin, the service has, in reality, had over 80% of injections involving cocaine, a pattern echoed in many SDCFs in other cities across Europe in recent years.

Understanding the role of Brazil in the European cocaine supply chain

In Europe, cultural perceptions of cocaine's illegal origins remain largely in Colombia, embedded through the multitude of cocaine & cartel-based movies and TV shows that have permeated over recent decades.

Brazil's growing role in cocaine exportation to European markets has been both overlooked and understudied.

Diversion of illicit cocaine flows from coca/cocaine production regions in Colombia, Peru and Bolivia to old and new routes via Brazil came as a response to heightened enforcement along older established trafficking routes. As so often happens with politically driven drug enforcement strategies, rather than disappear, the cartels mutated and evolved into smaller, more discrete organised crime networks.

In this context, West Africa also emerged as a crucial transit hub, as nascent African organised crime groups that were smaller, adaptive, and less visible, also found new opportunities to expand and gain control over the cocaine market[16].

Brazilian and Nigerian OCGs had already established working relationships in the 1970s, yet the cocaine trade between Brazil and West Africa consolidated significantly from the late 1990s onward. This reflected both a "southern shift" in the commodity chain, and a diversification of the actors, nationalities, and routes involved[17]. West Africa became not only a transit zone but also a site of experimentation in trafficking practices, creating new logistical and criminal interdependencies between South America, Africa, and Europe.

The scale of this transformation was dramatic. In the 1990s, annual seizures of heroin or cocaine in African trading hubs such as Lagos rarely exceeded 200 kilograms, and in 1996 the entire continent accounted for less than 1% of global seizures. By 2006, however, the UN estimated that roughly one-quarter of all cocaine consumed in Europe - around 40 tonnes - was being shipped through West Africa[18,19].

Methodological challenges notwithstanding, available data, even if unable to map the precise contours of the trade, can unambiguously confirm Brazil's central role in cocaine trafficking to Europe. According to Europol and the EUDA, over the years, Brazil has consistently been one of the top three departure points for the commodity, alongside Ecuador and Colombia.

Cocaine trafficking logistics have become increasingly dispersed across multiple Brazilian cities and ports. Santos and Paranaguá remain the main exit points, but seizures also implicate Salvador, Belem, Vila do Condé, Bahia, and Santa Catarina, showing an increasing diversification of routes[20].

14 https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/deathsrelatedtodrugpoisoninginenglandandwales/2023registrations
15 https://www.crew.scot/wp-content/uploads/2025/03/Drugs-at-Crew-Trend-Report-2023-2024.pdf
16 Gernot Klantschnig, "West Africa and the Global Illegal Drug Trade," in The Oxford Handbook of Global Drug History, ed. Paul Gootenberg (Oxford: Oxford University Press, 2022), 6, https://doi.org/10.1093/oxfordhb/9780190842642.013.34
17 Klantsching, West Africa and the Global Illegal Drug Trade, 7
18 UNODC, Cocaine Trafficking in West Africa: The Threat to Stability and Development (Vienna: United Nations Office on Drugs and Crime, 2007), http://www.unodc.org/documents/data-and-analysis/west_africa_cocaine_report_2007-12_en.pdf.
19 These estimates depend on seizure data combined with assumptions relating to interception rates. For example, the still widely quoted 40tonnes transiting through West Africa statistic is based on average seizures of around 15 tonnes between 2019 and 2022#, and an assumed interception rate of 30-40%. If the interception rate is 10%-20% this gives much higher figures of 75-150 tonnes. The literature captures the acute uncertainty around these numbers.
20 UNODC, Global Report on Cocaine — Local Dynamics, Global Challenges (Vienna: United Nations Publications, 2023), 59, 70, https://www.unodc.org/documents/data-and-analysis/cocaine/Global_cocaine_report_2023.pdf; European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and Europol, Europe and the Global Cocaine Trade: In-depth Analysis, EU Drug Markets: Cocaine (Luxembourg: Publications Office of the European Union, 2022), 36, https://www.euda.europa.eu/publications/eu-drug-markets/cocaine/europe-and-global-cocaine-trade_en

In 2020 alone, around 71 tonnes of cocaine linked to Brazil, and destined for Europe, were seized (whether in country, Europe, or en route), compared with 67.5 tonnes linked to Ecuador and 32 tonnes to Colombia[21], indicating that Brazil has become the single most significant departure country for Europe-bound cocaine.

As the largest destination for Brazilian cocaine exports, the European destination points of entry have shifted over time. Whereas Spain and Portugal once dominated, today Belgium and the Netherlands—particularly the port cities of Antwerp and Rotterdam—have eclipsed the Iberian Peninsula as the primary gateways. Brazilian shipments have also been linked to secondary ports, such as Bristol in the United Kingdom[22].

Brazil's developed maritime and air infrastructure, coupled with the adaptability of trafficking networks, has enabled it to become the central hub in the transatlantic cocaine economy, with Europe as its principal market.

Trafficking routes and modalities

What makes Brazil so crucial in the cocaine market is its highly developed infrastructure and global trade connectivity[23]. Criminal networks are able to exploit the same maritime, air, and road corridors that sustain Brazil's legal economy with relative ease. The Port of Santos in São Paulo state exemplifies this role. It is among the largest container terminals in the world, moving 4.2 million containers in 2020 alone. Similarly, Brazil's major international airports have frequent long-haul flights to Africa and Europe.

The dominant route for transporting cocaine from Brazil to Europe is maritime trade. This takes place either by concealing cocaine in legitimate cargo shipments or by pirating containers within ports, a method known as the 'rip-off'. The latter tactic requires greater logistical capacity to intercept and unload the drugs before the container leaves the arrival port. Shipments often move to Europe directly across the Atlantic, but some go via the Caribbean, West Africa, or other parts of Africa[24]. In the case of West Africa, in order to continue towards their destination, cocaine may be reloaded onto a container and shipped onwards to Europe, or unloaded and trafficked by land through North Africa.

Private jets are also commonly used in the cocaine trade from Brazil to Europe. In February 2021, 578 kg were seized from a Falcon 900 bound for Portugal; in July 2021 the same jet was caught again, loaded with cocaine at Tires, Portugal; in Aug 2021, 1.3 tonnes (with a retail value of around 65 million euros, was seized on a Gulfstream IV at Fortaleza, Brazil, bound for Brussels[25]. *(see image below)*

One implication of Brazil's unique evolving position in the global cocaine supply chain is that the focus of drug trafficking towards external markets, where there are greater profits than the internal market produces, enables extremely rapid capital accumulation[26].

Source: reproduction - Polícia Federal do Brasil

21 EMCDDA and Europol, Europe and the Global Cocaine Trade, 24
22 "Drugs Worth £4 M Found on Boat Carrying Fruit Juice," BBC News, November 12, 2021, accessed September 2, 2025, https://www.bbc.co.uk/news/uk-england-bristol-59258957.
23 Feltran, Gabriel, Isabela Vianna, and Lucia Ruiz-Benitez de Lugo Bird. "Atlantic connections-The PCC and the Brazil-West Africa cocaine trade." PhD diss., Global Initiative Against Transnational Organized Crime, 2023. https://globalinitiative.net/analysis/brazil-west-africa-cocaine-trade/
24 EMCDDA and Europol, Europe and the Global Cocaine Trade, 26
25 EMCDDA and Europol, Europe and the Global Cocaine Trade, 42 - 43.
26 Cohen, Corentin. "Development of the Brazilian drug market toward Africa: myths, evidence and theoretical questions: Desenvolvimento do mercado de drogas brasileiro em direção à África: mitos, evidências e questões teóricas." Journal of Illicit Economies and Development 1, no. 2 (2019): 137.

The "Mule" Economy

Brazil is not only a transit and processing country for cocaine bound for Europe either directly, or via West Africa; it is also a recruitment and human trafficking hub. Airports play a central role in sustaining what Cohen terms the "mule economy."[27]

According to the UNODC, Nigerian OCGs are the main players in trafficking small quantities of cocaine from Brazil using people recruited as drug couriers on passenger flights[28]. Yet interviews in São Paulo reveal that most of the drug couriers recruited by Nigerians are not Nigerian, but also include people from Brazil, South Africa, Congo, and Senegal[29]. Research further shows how the commodification of Nigerian couriers gave rise to new connections between Brazilian and African OCGs.

The significant profits generated from cocaine fostered a market in which criminal entrepreneurs initially acted as subcontractors in recruiting drug couriers, before assuming more central roles in the trade[30]. These networks have diversified to include "low-cost" couriers, often Brazilians and Nigerians hired for small payments to carry limited quantities, and "higher-profile" couriers, such as businesspeople, relatives of elites, or individuals with diplomatic passports.

Brazil's large and busy airports allowed traffickers to test different courier profiles in order to minimise detection, consolidating the country's role as a hub of experimentation within the transatlantic cocaine economy[31].

Alongside shipping containers, private jets and drug couriers, semi-submersibles are another new option for traffickers; custom-built vessels designed for maritime drug smuggling. With all or most of their hull submerged below the waterline, such seacraft are difficult to detect, enabling the clandestine transport of multi-tonne cocaine shipments across long distances. Over the past decade, most seizures of such vessels have been in the Americas, where they were built in remote Amazonian areas, particularly Colombia, and used to move cocaine across the Pacific Ocean from Colombia and Ecuador towards Central America and Mexico.

Until relatively recently, none had ever been intercepted on European waters. However, two cases demonstrate how this new option is opening up, one in 2019 and another in 2021, when Spanish authorities captured a 20 meter (65ft) semi-submersible carrying three tonnes of cocaine hydrochloride off the Galician coast. The vessel had begun its one-month voyage deep in the Amazon River Basin, sailing through Brazil before entering the Atlantic and making the transatlantic crossing to Europe[32].

Source: https://commons.wikimedia.org/wiki/File:Submarino_requisado_01_by-dpc.jpg

27 The term 'drug mule' has been rightly critiqued as dehumanising and stigmatising - particularly as people recruited into drug courier activities are often from situations of acute economic vulnerability. For this chapter we are using the terms 'drug courier' or 'people recruited as drug couriers''
28 UNODC, *Global Report on Cocaine — Local Dynamics, Global Challenges.*
29 Cohen, *Development of the Brazilian drug market toward Africa*, 193
30 Cohen, *Development of the Brazilian drug market toward Africa*, 135
31 Cohen, *Development of the Brazilian drug market toward Africa*, 140
32 EMCDDA and Europol, Europe and the Global Cocaine Trade, 29

Brazilian organised crime networks

Intelligence sources suggest that the PCC (Primeiro Comando da Capital), Comando Vermelho, and Família do Norte are the key organised crime groups involved in cocaine exports from Brazil to Europe[33]. The PCC has expanded its presence in other South American countries and beyond, in Africa and Europe, and dominates several stages of the cocaine supply chain[34]. Investigations have uncovered growing connections between Brazil-based OCGs and European-based OCG actors including the Italian 'Ndrangheta mafia, various Portuguese networks, and Balkan (Albanian-speaking) groups[35].

Illustrating the depth of these new alliances and networks, in September 2018, Brazilian authorities intercepted 1.2 tons of cocaine concealed in a shipment of heavy machinery departing from the port of Santos and destined for a company in Abidjan, Côte d'Ivoire. According to court records, Italian custody orders, and interviews with law enforcement, the operation was coordinated by a member of the Romeo-Staccu clan of the 'Ndrangheta mafia organisation. It worked in partnership with intermediaries in Abidjan, including Italian businessmen linked to the Italian Camorra mafia organisation. On the Brazilian side, the supply arrangements appear to have involved an individual associated with the PCC, facilitated by an 'Ndrangheta broker. Investigators suspect that this criminal consortium had been using heavy machinery shipments to smuggle cocaine since at least July 2017[36].

Brazil's organised crime groups have become central players in the globalisation of the cocaine trade, forging durable partnerships with European mafias and developing increasingly sophisticated and adaptable trafficking operations.

Brazil and West African Drug Routes: overlaps with extractive industries and ecological damage

West Africa has emerged as a central hub in the transatlantic cocaine trade, particularly as a staging point for shipments leaving Brazil en route to European markets. For example, during 2021, 3 cocaine consignments in excess of 500 kg each, amounting to 2.9 tons, were seized in Brazil with destinations in Ghana, in addition to smaller consignments destined for Nigeria and Sierra Leone; and in March 2022, 1 ton of cocaine was seized in the Brazilian port of Santos from containers on their way to Belgium via Cote d'ivoire[37].

According to the UNODC, approximately 70% of cocaine seized in Africa between 2015 and 2021 originated in Brazil[38].

This pattern is not new: by the late 1990s, the Colombian Norte del Valle cartel is said to have been the first to establish the South America-West Africa passage, which then rapidly expanded during the 2000s. The South America-West Africa route is widely known among scholars and maritime officials as the *Highway 10 transatlantic route*, which became infamous centuries earlier as the path along which millions of enslaved Africans were transported in the opposite direction to the Americas. It offers the shortest and most navigable route across the Atlantic for those moving commodities or people, legal or illegal.

Contemporary trafficking now exploits these structural and historical linkages. The Lusophone corridor connects Brazil to Guinea-Bissau, Cape Verde and Angola, where shared language, political, and commercial ties facilitate illicit as well as licit trade[39]. More recently, Mozambique and Nigeria have also become significant entry points for Brazilian cocaine shipments to Africa[40]. According to UNODC, Nigerian groups dominate trafficking routes across Africa. Alongside maritime cargo, air couriers departing São Paulo and Rio de Janeiro also supply West African cities.

As in Brazil itself, the entanglement of cocaine trafficking, corruption, and extractive industries is central to the political economy of West African transit states. In Mozambique, for example, political elites have facilitated cocaine flows through their control of ports, customs and policing, often in exchange for bribes, while simultaneously overseeing other lucrative trades such as timber, ivory and rhino horn[41].

These dynamics echo those in Brazil, where cocaine profits are routinely laundered into legal, quasi-legal and illegal extractive sectors and agribusiness, including land grabbing, ranching, timber and mining. Both regions are experiencing rapid deforestation and the commodification of valuable ecosystems.

The 2021 Organized Crime Index highlights how connected and widespread environmental crimes are across the region:

- Illicit gold mining across the Sahel and coastal West Africa exacerbates instability, corruption, and severe environmental degradation;
- Illegal oil trade and wildlife poaching supplies Asian markets;
- Illegal logging threatens already fragile forests[42].

33 EMCDDA and Europol, Europe and the Global Cocaine Trade, 52-53
34 Cohen, *Development of the Brazilian drug market toward Africa*, 25
35 EMCDDA and Europol, Europe and the Global Cocaine Trade
36 Cecilia Anesi and Giulio Rubino, "Catch Me If You Can," Correctiv, August 13, 2016, https://correctiv.org/en/latest-stories/mafia-en/2016/08/13/catch-me-if-you-can/
37 UNODC, *Global Report on Cocaine — Local Dynamics, Global Challenges.*, 106
38 UNODC and CoE Brazil, Brazil in the regional and transatlantic cocaine supply chain: The impact of Covid-19, Cocaine Insights 4, UNODC, Vienna, July 2022. https://www.unodc.org/documents/data-and-analysis/cocaine/Cocaine_Insights4_2022.pdf
39 UNODC, Global Report on Cocaine — Local Dynamics, Global Challenges (Vienna: United Nations Publications, 2023), 23 unodc.org/documents/data-and-analysis/cocaine/Global_cocaine_report_2023.pdf
40 Jesperson, S. and Verrier, M., 2024. Capitalising on criminality: a new lusophone route through Mozambique. *Journal of Illicit Economies and Development*, 5(3), pp.37-46; Cohen, *Development of the Brazilian drug market toward Africa*, 25
41 Jesperson and Verrier, Capitalising on criminality.
42 Tagziria, Lyes, and Lucia Bird Ruiz Benitez de Lugo. "2023 West Africa Organised Crime Resilience Framework."2023 West Africa Organised Crime Resilience Framework | Global Initiative

The environmental impacts of these illicit economies compound the harms of climate change. What the UNODC refers to as the 'nexus'[43] between cocaine trafficking, corruption, and financing of environmentally damaging extractive industries is less well documented in Africa than in South America, but the corrosive dynamics appear remarkably similar - and drug prohibition is the common denominator.

According to the 2021 Organized Crime Index, the cocaine market is not only among the most prominent criminal economies in West Africa but is the one that registered the greatest increase in pervasiveness between 2019 and 2021[44].

Corruption emerges as a defining feature of this expansion, more so than in any other criminal market. Because cocaine is a high-value transit commodity, its trafficking fosters structured protection economies that extend to senior levels of the state. Officials at ports, airports, customs, and within law enforcement often play enabling roles, creating dense networks of complicity that compromise governance and political stability. In Guinea-Bissau, for example, the cocaine trade has been linked to a reported coup attempt in February 2023.

Environmental impacts of illicit economies are increasingly shaping community tensions, resource scarcity, and displacement across West Africa[45]. As ecosystems collapse under the pressures of extractive industries and climate impacts, criminal groups are able to exploit the vacuum by assuming responsibility for basic needs such as water, further embedding themselves into local political economies.

The cocaine trade not only links Brazil and Europe through West Africa but also reveals how transnational organised crime, corruption, and environmental harm are mutually constitutive.

Drug enforcement resources

Over the past several decades, drug law enforcement budgets have increased dramatically, both nationally and internationally. These budgets remain highly opaque in terms of where and how they are spent[46], so it is not possible to provide detailed breakdowns of European spending targeting cocaine markets specifically[47].

The trajectory of spending of public funds on enforcement, however, seems clear. EU's Internal Security Fund (ISF) 2023—2025 work programme, establishes EU system for law-enforcement cooperation, including the targeting of organised crime and drugs with a budget of €222.4million Euros. It explicitly incorporates direct awards to the Maritime Analysis and Operations Centre — Narcotics (MAOC-N) "to disrupt maritime and air drug trafficking routes to the EU," but does not detail a drugs-only subtotal, or breakdown by drug. More dramatically, in the United States, the Drug Enforcement Administration's (DEA) budget rose from $65 million in 1972 to $3.28 billion in 2021.[48]

The figures underscore a persistent pattern: the illegal cocaine market has expanded alongside growing investment in enforcement designed to reduce or eradicate it.

The emerging European debate on alternatives to drug prohibition

As the failures of supply side drug enforcement have become more evident, despite the increasing resources being directed towards it, so the calls for exploring new policies - that can more effectively deliver on the shared aspirations of the global community to protect and enhance the 'health and wellbeing' of humankind - have grown in volume.

As in much of the world, in Europe there has been a growing acceptance that criminalisation of people who use drugs has been ineffective as a form of deterrence, that it diverts resources away from proven public health interventions, and is actively harmful in terms of the human cost of arbitrary mass criminalisation. There has correspondingly been a general trend away from punitive user-level enforcement towards various forms of depenalisation/decriminalisation to reduce or end criminal sanctions for possession of small amounts of drugs for personal use; and an increasing emphasis on public health-led treatment and harm reduction approaches.

Perhaps the most well known such reform has been in Portugal - where personal possession of all drugs was decriminalised as part of a wider shift towards a public health led model, and similar reforms have since spread across much of the continent[49]. This evolution in policy thinking seeks to pragmatically manage the realities of drug use in society rather than to continue demonstrably counterproductive efforts to eradicate them by force.

It is a stance now proactively endorsed by all UN agencies (including the WHO, UNOHCHR, UNODC, UNICEF etc.) in the 2019 'Common Position Statement' on drugs, which called on member states "to promote .....the decriminalization of drug possession for personal use" and to "to call for changes in laws, policies and practices that threaten the health and human rights of people"[50].

43 https://www.unodc.org/res/WDR-2023/WDR23_B3_CH4_Amazon.pdf
44 2023 West Africa Organised Crime Resilience Framework | Global Initiative
45 Brombacher, D., Garzón-Vergara, J.C. and Vélez, M.A., 2021. Introduction special issue: environmental impacts of illicit economies. *Journal of Illicit Economies and Development* (JIED), 3(1), pp.1-9.
46 As the Pompidou group have noted, at least in part, to avoid unwanted scrutiny. https://rm.coe.int/public-expenditure-on-supply-reduction-policies/168075b9dd
47 https://rm.coe.int/public-expenditure-on-supply-reduction-policies/168075b9dd?
48 DEA, 2025 https://www.dea.gov/data-and-statistics/staffing-and-budget
49 https://transformdrugs.org/assets/files/PDFs/Drug-decriminalisation-in-Portugal-setting-the-record-straight.pdf
50 https://www.unodc.org/res/un-common-position-drugs/index_html/2315371E-eBook.pdf

A new discussion document from the UN Development Program has highlighted that: *'...most drug markets remain prohibited and, by default, under the control of OCGs, limiting the impacts of decriminalization on the harms associated with illegal drug production, transit and supply'* and that *'There has consequently been a growing trend towards extending the pragmatism of harm reduction and decriminalization into supply-side drug policy; legally regulated markets for formerly prohibited drugs'*[51]

CANNABIS REGULATION AS AN EXIT DOOR TO PROHIBITION

This emerging drug policy reform trend has, thus far, mostly manifested with changes to domestic cannabis markets for non-medical use, with more than half a billion people globally now living in jurisdictions with some form of legally regulated adult access.

In Europe, cannabis reforms that enable legal adult access for non medical use are being implemented in Germany, Luxembourg, Malta, Switzerland, Czechia, and the Netherlands. These cannabis reforms have created space for similar policy debates to play out for other drugs widely considered more risky, such as cocaine.

In recent years, a nascent debate on the possibilities for legal regulation of cocaine markets has begun in Europe, largely driven by political leaders at a municipal level.

Cities have always been on the front line of the violence of the 'war on drugs', where prohibition's systemic failures have been most visible and acutely felt. On the other hand, cities have also been where key alternative responses and reforms have been pioneered. From the early harm reduction interventions in the 1980s in response to the HIV crisis, through innovations such as supervised drug consumption facilities and drug checking, to law reforms including decriminalisation, and more recently cannabis regulation, drug policy history shows that change, in Europe and indeed globally, has almost always been a bottom-up process.

Leadership has rarely been shown by national governments or multilateral bodies. Instead, it has been local actors; activists, local agencies, NGOs, local councils, and municipal governments that have driven change. They have shouldered the political, reputational and legal risks, and weathered the media storms, to gather the data, establish best practice, and win over the public by making communities safer for everyone. Only after protracted public battles have these initially controversial innovations slowly percolated up into national and eventually international best practice guidelines.

This pattern seems to be repeating itself with the debate around legal regulation of drugs other than cannabis, including coca and cocaine.

In the Netherlands, Amsterdam's mayor, Femke Haslema, has been a high profile reform advocate, highlighting the links between prohibition and local harms of the illegal drug market, particularly associated with organised crime related violence in the Netherlands[52] cocaine market.

***"It's time to explore the possibilities of sensible, legal regulation of substances, to take control instead of leaving it to criminal markets"*- Femke Haslema, Mayor of Amsterdam.'[53]**

The Amsterdam mayor has been joined by a growing list of other European municipal leaders - including Mayors of Brussels (Belgium), Warsaw (Poland) and Bern (Switzerland) in supporting this public debate on how alternatives to stimulant prohibition might function.

Both Bern[54] and Amsterdam are exploring models for medically prescribed cocaine preparations, somewhat similar to the heroin prescribing models pioneered in Switzerland in the 1990s[55]. Such provision of cocaine - which has been long available as a medical substance, used as a local anaesthetic - is technically legal under international law as a clinical intervention within a harm reduction context, although the treatment modalities for stimulant prescribing are underdeveloped.

The possibility of pilot models for legally regulated availability of cocaine powder for adult recreational use have also been explored - although these innovative proposals face technical challenges, as well as multiple political and legal obstacles from national governments and multilateral institutions.

51 UN Development Programme, 2025, Development Dimensions of Drug Policy: Assessing New Challenges, Uncovering Opportunities, and Addressing Emerging Issues
52 https://www.theguardian.com/commentisfree/2024/jan/05/amsterdam-netherlands-drugs-policy-trade
53 https://www.amsterdam.nl/dealingwithdrugs/
54 https://www.reuters.com/world/europe/swiss-capital-bern-considers-legal-cocaine-project-2023-12-20/
55 https://transformdrugs.org/blog/heroin-assisted-treatment-in-switzerland-successfully-regulating-the-supply-and-use-of-a-high-risk-injectable-drug

More realistic in the short term, perhaps, is the possibility for coca based products, such as coca tea, coca leaf or *mambe* (that only contain a small amount of the active cocaine alkaloid) to be imported and sold in European markets - particularly if coca's legal status under the UN conventions is revisited.

The emerging coca/cocaine policy and law reform debate in Europe obviously overlaps similar debates happening in South America - most notably in Colombia, but also in Brazil and elsewhere[56] - but has distinct dynamics, reflecting differing local challenges and priorities.

In Europe, public health concerns, particularly around visible street drug use and drug related deaths, have a higher profile in driving the reform debate. By contrast, security issues relating to cartel violence and corruption, as well as indigenous rights, traditional use of coca, and environmental impacts of the illicit trade have a relatively much higher profile in parallel public debates in South America.

Crucial to finding meaningful solutions to the problems associated with the illicit trade will be understanding the interconnected and global nature of both the cocaine supply chain, and the international legal and policy instruments that have so dramatically failed to control it. Punitive enforcement designed to address problems on the streets of European cities can have perverse impacts in empowering and enriching organised crime groups, undermining rights, and fueling environmental destruction on the other side of the world.

Brazil has an urgent role to play in shaping reform. Given the profound and ongoing social, environmental, and governance crises driven by prohibition, Brazil, like Colombia, cannot remain on the sidelines of global drug policy debates. Its frontline experience with the devastating impacts of the cocaine trade gives it both the legitimacy and authority to advocate for change.

Solutions, however, can also be global in their scope and impact - but require the global community to work together. As the UNDP have noted *'there is a strong argument that the concept of 'shared responsibility' in addressing global drug-related challenges applies to mitigating the harms of the war on drugs as much as fighting it in the first place.'*

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Steve Rolles is the Senior Policy Analyst for Transform Drug Policy Foundation, a UK based think tank and charity focused on drug policy and law reform, where he has worked for over 20 years. Steve is extensively published on the subject of drug law reform and drug regulation, including 2020 'How to regulate stimulants; A practical guide.' He has served as an adviser for the Global Commission on Drugs (drafting the 2014 Pathways report, and 2018 regulation report) and acted as an adviser to Governments on drug regulation including Uruguay, Canada, Germany, Malta and Luxembourg. He has recently worked as a consultant for the UNDP drafting their upcoming report in the impacts of drug market reforms on sustainable development.

56 https://transformdrugs.org/blog/lessons-from-colombia-from-harm-reduction-to-legal-regulation

Methodological notes

The available data on cocaine trafficking between Brazil and Europe (and via West Africa) is fragmentary and should therefore be interpreted with care. Key statistics on illegal drug markets come from law enforcement agencies, and are shaped by the resources, political priorities, and strategies of state governments and agencies. They are also attempting to surveil ever-shifting trafficking routes and market actors, constantly adapting to interdiction pressures and new opportunities, so analysis and established assumptions can date rapidly. Academic research on this supply chain remains even more scarce and lacking in fieldwork-based data[57]. On top of the challenges intrinsic to studying illegal markets, researchers often struggle to gain access to key sites, such as ports, that might allow them to trace these flows empirically[58], and additionally have to contend with the reluctance of government actors to open themselves to, or fund, independent critical scrutiny of a historically failing policy model.

In this context there is an overreliance on data and market analysis from government and related institutional sources, particularly outputs produced by UN Office on Drugs and Crime that oversees the international drug control system, and other state agencies (that supply UNODC with national data, and in many cases also provide its funding) with long term institutional and political investments in maintaining the 'war on drugs' status quo. Data from member states, received and compiled by the UNODC, has already been shaped by domestic political and institutional forces that may seek to over- or under-estimate markets depending on the prevailing political narrative (for example, to and justify calls for more enforcement spending, or to demonstrate success).

Furthermore, there has been a long term focus on enforcement-led data, such as drug seizures and arrests. This is problematic as these are process indicators that can often reflect enforcement activity rather than providing an accurate picture of the market of supply chain dynamics. Enforcement indicators can often be misleadingly used to demonstrate 'success', providing support for 'tough on drugs' political narratives, and diverting attention from more systemic failures on health and other outcomes. Seizures are a good example; proclaiming record seizures, with the political theatre of enforcers posing with photos of huge cocaine hauls that have 'preventing x tonnes of cocaine from reaching the streets', can conveniently obscure more meaningful public health outcome measures around, for example rising use of cheaper, purer, more available cocaine, and related health harms, as outlined above.

57 Klantschnig, Gernot, Philippe M. Frowd, Elodie Apard, Tarela Ike, and Georgios A. Antonopoulos. 'Rethinking Organized Crime in Africa'. Trends in Organized Crime 26, no. 4 (2023): 331. https://doi.org/10.1007/s12117-023-09519-9.

58 Cohen, C., 2019. Development of the Brazilian drug market toward Africa: myths, evidence and theoretical questions: Desenvolvimento do mercado de drogas brasileiro em direção à África: mitos, evidências e questões teóricas. Journal of Illicit Economies and Development, 1(2), pp.133-144.

IV — THE FUTURE IN A LEAF

PHOTO: Jorge Panchoaga

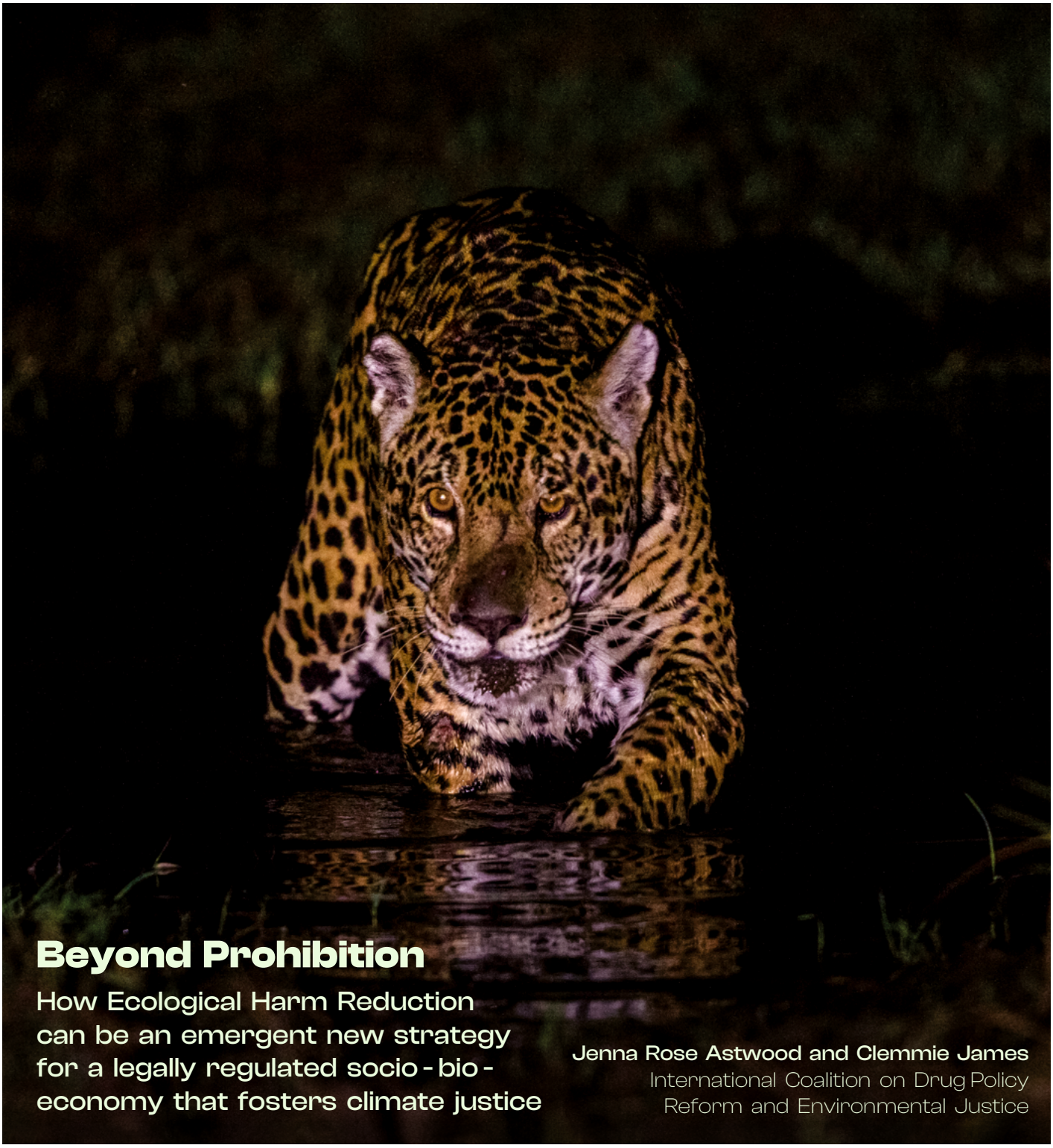


PHOTO: Victor Moriyama

Beyond Prohibition

How Ecological Harm Reduction can be an emergent new strategy for a legally regulated socio-bio-economy that fosters climate justice

Jenna Rose Astwood and Clemmie James
International Coalition on Drug Policy Reform and Environmental Justice

Introduction

The Prohibition of coca and cocaine is an economic and political system that has created a multi billion dollar unregulated market. It is a system that provides the financial resources and moral distraction for high rates of deforestation, Indigenous and smallholder dispossession, and brutal violence in environmentally fragile territories. These dynamics create the opposite conditions to build community resilience in the face of increasing climate catastrophes and biodiversity loss.

Prohibition's defenders say the drug war is about public health and safety. But human rights advocates have long known it is also a tool of social control, criminalizing poor and marginalized communities for minor, non-violent offenses, while those higher up the trade remain untouched.

Increasingly, the evidence shows that prohibition actually functions as a political cover for Extractivism.

The question is no longer *why the drug war has failed — but why it persists.* The answer: it enables illegal, unregulated extraction in biodiversity-rich forests vital to our climate future.

Decades of efforts by forest dwellers and their allies in the climate and conservation communities have focused on saving these homelands, which are not only central to rural livelihoods but crucial for capturing carbon, conserving biodiversity and mitigating climate change. However, as shown in the previous chapters of this publication, the so-called 'war on drugs' is systematically undermining these efforts.

Despite these impacts, drug policy reform is almost entirely absent from the climate policy agenda. This omission is dangerous. It is not possible to protect the Amazon, or meet climate goals, while ignoring one of the biggest forces driving its destruction.

Addressing drug reform as part of mitigating the climate crisis means designing reform policies and new laws with multi-sector, multi-species perspectives, ensuring harm is reduced for human and more-than-human stakeholders. Communities most impacted by decades of drug wars must play a central role in this process to create a future that rigorously promotes and protects indigenous and traditional rights and practices, agroecology and land justice in an urgent attempt to deliver climate justice. Ending prohibition offers an opportunity to prioritize transitional justice to address decades of violence, corruption, and dispossession.

It also means safeguarding against corporate monopolies. As we've seen with other cash crops, transnational agribusinesses will quickly dominate unless protections are built in. A beyond-prohibition phase of the coca economy must stay within planetary boundaries, because while the planet cannot withstand the current unregulated cocaine industry, "Big Cocaine" will never deliver ecological justice.

The overlaps between the climate and drug prohibition crisis might be overlooked, but their impact is clear. To avoid wider systemic and governance chaos in these vulnerable regions and to support communities into securing climate resilient development - drug policy reform must be central to the climate justice agenda.

Ecological Harm Reduction: Leading Environmental Justice and Social Equity in Drug Reform

Ecological Harm Reduction (EHR) recognises that drug policy does not exist in social, health, or economic isolation; it is deeply intertwined with broader issues of environmental justice.

The impact of extractivist activities in areas of global biodiversity is immense, with their connection to illicit economies becoming increasingly visible. Drug economies both fuel and are sustained by these activities, intensifying land degradation, biodiversity loss, and territorial violence, especially in a time of fragile global climate health.

Drug prohibition's focus on criminalisation fails to deter illicit extractivist actors or drug cartels. Instead, it incentivises them by creating an incubation chamber of opportunity, where profits from illegal activities far exceed those from legal means. A continued punitive approach only drives illicit actors to adapt and expand operations in increasingly harmful and exploitative ways. Simultaneously, social and economic disparities drive marginalised communities into illicit economies as survival strategies, especially where legal livelihoods are inaccessible. This underscores the necessity for an integrated social, economic, and environmental approach to drug reform.

In addition to extractivist harms, current drug policy prohibits plants without recognising their vital roles in sustaining both people and the planet. EHR reframes prohibited plants not as threats, but as agents of social, economic, and ecological prosperity, unlocking their positive contributions to global health and environmental wellbeing.

EHR aims to embed ecological rights alongside social and economic reform in drug policy. Installing ecological rights would empower those most affected to participate in a just, sustainable system supporting both human dignity and ecological wellbeing and ensure plants and ecosystems are protected as living entities with intrinsic value, steering drug reform toward climate-resilient development and offering more effective mechanisms to counteract drug-fuelled extractivism.

Indigenous Worldviews as a basis for Ecological Rights

Indigenous Peoples manage around 25% of the world's land, containing much of the planet's biodiversity and carbon storage[1]. Research shows that ecosystems within Indigenous-managed areas are healthier than those outside. Why is this?

Indigenous Peoples apply an integrated approach rooted in ecological interdependence, grounded in kinship ideologies that recognise humans and non-human beings as descended from nature. A kinship lens recognises that harming nature is harming ourselves, cultivating moral responsibility and conscious relationality. This worldview intertwines community and environmental wellbeing, promoting reciprocal social and economic practices.

The philosophy of ecological interdependence came under threat with the rise of imperialist expansion. Kinship narratives were delegitimised as myth, transforming the Earth from a living being into a symbolic figure to be dominated and exploited. This erasure objectifies nature and subjugates those whose realities are grounded in kinship ideologies, weakening Indigenous agency to act against exploitation. Prohibition, rooted in environmental objectification, is a tool of imperial control that demonises plants and those who use them, especially Indigenous and marginalised communities who engage with these plants for health, functional, or recreational purposes.

Despite enduring systemic oppression, Indigenous communities continue to uphold ecological interdependence. How can we support Indigenous land defenders and the environment in reclaiming mutual agency? How can we apply these philosophies to reform drug policy, taking greater accountability for environmental harm, promoting climate resilience, and guiding reciprocal, sustainable practices grounded in ecological interdependence?

"Reform must restore Indigenous rights to use, cultivate, and commercialize their biological heritage, including plants that have been prohibited and are associated with Indigenous communities."(HRI)

Ecological Rights: A New Paradigm for Drug Reform

The concept of Ecological Rights emerged in the Rights of Nature movement, first articulated in Christopher D. Stone's 1972 essay, which argued that natural entities (such as trees and rivers) should be granted rights to exist and flourish. This idea gained legal recognition in the U.S. Supreme Court's 1972 *Sierra Club v. Morton* case, though it took decades to be formally recognised in law.

In 2008, Ecuador became the first country to enshrine the Rights of Nature in its Constitution, granting ecosystems legal protection and enabling citizens to defend them. In the 2011 case *Huddle v. Provincial Government of Loja*, the court upheld the Vilcabamba River's right to flourish by ruling that environmental damage caused by the construction of new roads harmed present and future generations, prioritising ecological integrity over infrastructure development.

Over 40 countries have enacted Rights of Nature measures, with approximately 500 legal cases globally (Boyd, 2017; CELDF, 2023). Many initiatives emerged from Indigenous-led resistance to extractivist environmental destruction, such as *Lago Agrio vs. Chevron* (Ecuador, 2011, affirmed 2013) over Amazon oil pollution, and Bolivia's *Ley de Derechos de la Madre Tierra* (2010), which followed mass resistance to mining and water privatisation during the Cochabamba Water War (2000—2001).

Legal Empowerment of Plants and Ecosystems

Recognising legal rights for prohibited plants can involve extending legal personhood, as seen in the *Te Awa Tupua* (*Whanganui River Claims Settlement*) Act (2017) in New Zealand. This act recognises the Whanganui River as the source of spiritual and physical sustenance that sustains both the life and natural resources within the river and the well-being of Indigenous and other communities of the river. The act granted the river legal status as a living entity, setting a transformative precedent for acknowledging the intrinsic rights of non-human beings within legal systems.

1 Indigenous knowledge is crucial in the fight against climate change — here's why. (2024, August 1). UNDP Climate Promise. https://climatepromise.undp.org/news-and-stories/indigenous-knowledge-crucial-fight-against-climate-change-heres-why

Ecological rights for plants are particularly important for those with cultural, medicinal, or ecological significance. Plants and fungi under prohibition like coca, peyote, and psilocybin mushrooms are central to cultural spiritual and healing practices, and essential to biodiversity. In cases where this is overlooked to grant license for extractivist activities, it threatens sustainability and endangers the plant's survival.

This challenge was illustrated when the Wixárika (Huichol) people of Mexico filed a constitutional injunction[2] in 2011 contesting mining licenses granted by the Mexican government to First Majestic Silver and Associated. The central focus was safeguarding the endangered peyote cactus (*Lophophora williamsii*) and to preserve both cultural rituals and vulnerable ecosystems of the culturally sacred Wirikuta desert. Despite 14 years of litigation and the temporary suspension of all mining activity in the Wirikuta desert, there remains no definitive verdict. If Ecological Rights were installed for the peyote cactus, the Wixárika could apply these rights and proceedings could be expedited with an outcome that protects ecological biodiversity and traditional wellbeing practices.

Legal rights for such plants can also serve as protective mechanisms against biopiracy and the appropriation of traditional ecological knowledge, as seen in cases when pharmaceutical companies patent compounds derived from plants.

International frameworks like the Convention on Biological Diversity (CBD) and the Nagoya Protocol aim to prevent biopiracy by affirming state sovereignty over genetic resources and requiring prior informed consent and fair benefit-sharing with Indigenous communities. However, these protections remain limited, as the CBD recognises only state authority, thus undermining Indigenous Peoples' rights to self-determination and control over their own biological heritage. Strengthening Indigenous sovereignty within the CBD framework remains a critical gap to address.

However, integrating ecological rights into drug reform can strengthen these frameworks by shifting the legal focus from human ownership to ecological stewardship, ensuring long-term protection against corporate capture that moves beyond transactional approaches like benefit-sharing and prior informed consent.

Drug prohibition allows for the prospecting of prohibited plants for commercial exploitation under the guise of medical research, despite their traditional status recognised with reservations in International Drug Law.

PHOTO: Jorge Panchoaga

2 Comunidad Wixárika de San Sebastián Teponahuaxtlán y Tuxpan de Bolaños v. Secretaría de Economía y otros, Amparo en revisión 631/2012, Juzgado Primero de Distrito en Materia Administrativa y del Trabajo en el Estado de Jalisco, México.

In this context, granting legal rights to plants is not symbolic, it is a necessary foundation of a just system that is guided by the principles of social, economical and ecological justice.

Case Study: Applying the Rights of Nature in South America - The Atrato River and the Impact of Prohibition-Driven Extractivism

In November 2016, a landmark legal ruling emerged from the Atrato River Rights of Nature court case in Colombia. The decision recognised the Atrato River, along with its basin and tributaries, as a legal subject of rights, declaring the river's rights to protection, conservation, maintenance, and restoration in response to severe environmental degradation caused by large-scale illegal gold mining. Criminal groups exploited the gold trade as a vehicle for laundering drug profits, making this case a direct connection between environmental devastation and extractivist activities funded by drug cartels.

The court also recognised that pollution from these illegal activities violated the communities' fundamental rights, including rights to life, health, water, food security, a healthy environment, culture, and land. The Atrato River, located in Colombia's biodiverse and remote Chocó Department, is home to Indigenous and Afro-Colombian communities who have long faced displacement, territorial violence, and human rights abuses linked to narco-paramilitary groups controlling mining zones.

This case illustrates how the devastating consequences of prohibition-driven illegal economies extend far beyond human communities, threatening ecosystems and biodiversity. It also demonstrates the profound legal shift in environmental governance, by framing nature not as property but as a living entity with its own rights. These legal mechanisms can empower communities to confront and mitigate the intertwined social and environmental harms of extractivism linked to the illicit economy.

Case Study: Indigenous Leadership and Conservation in the Matsés Territory of the Peruvian Amazon

The Indigenous Matsés people of Peru are at the forefront of protecting one of the largest intact rainforest corridors in the Amazon, encompassing over 3.5 million acres of biodiverse territory[3]. Their efforts exemplify how Indigenous self-determination can drive cultural preservation alongside sustainable economic development, despite the vastness of their territory, and the significant challenges the Matsés face in monitoring and protecting their lands due to limited funding, support and illegal encroachment by outside actors.

In partnership with the Acaté Amazon Conservation organisation, Matsés communities have launched a range of sustainable economic initiatives, including permaculture, agroforestry, and harvesting of non-timber forest products. These economic activities are closely integrated with biodiversity conservation efforts, such as detailed territorial mapping, comprehensive surveys of local flora and fauna, and the creation of an Indigenous medicine encyclopedia that documents traditional knowledge. These programs reinforce the community's stewardship of their land while promoting ecological resilience.

However, existing challenges in the ongoing development of formal education to participate in legal systems, leaves the Matsés vulnerable to exploitation by outside actors. This gap has been exploited by extractive industries that engage in illegal logging and petroleum exploration within their territories. Additionally, the constant threat posed by illicit drug trafficking compounds the challenges to their territorial sovereignty and environmental protection.

This case study highlights the critical need to support Indigenous communities like the Matsés with resources, capacity-building, and legal protections to strengthen their ability to protect their territories from exploitation.

3 http://acateamazon.org/field-updates/december-2019-field-report-mapping/

Case Study: The Impact of Prohibition on Fauna Vital to Ecological Biodiversity. The Jaguar and Its Ecosystem

Recognising the connection between drug policy and environmental health requires looking beyond plants to the crucial role fauna play in maintaining biodiversity. While discussions often focus on soil, waterways, and flora, the importance of animals, insects, reptiles, and mammals tends to be overlooked. These creatures are essential as seed dispersers, natural fertilisers, and pest controllers; their presence is a key indicator of ecosystem health and resilience.

The jaguar, a top predator in many biodiverse regions, symbolises this connection. Although the jaguar itself cannot participate in consultations, human advocates have raised their "voice" to represent their rights and those of their habitat. As one environmental defender puts it, "The jaguar cannot participate in consultations, but someone can raise their voice."

Public awareness campaigns have underscored the jaguar's vital role in the food chain and the serious ecological consequences of its decline. Their absence disrupts the balance of entire ecosystems, threatening biodiversity at large. Programs like the Jaguar Monitoring Initiative provide employment opportunities for local communities to monitor jaguar populations, directly linking conservation with livelihoods.

Monitoring the presence or absence of jaguars throughout agricultural and cultivation areas, especially those affected by prohibition-related deforestation and land degradation, serves as a powerful indicator of biome health. Tracking jaguar movements, habitat use, and areas of decline allows for the development of evidence-based public policies aimed at protecting critical habitats and addressing the environmental damage tied to illicit crop cultivation and trafficking, and enforcement activities.

This case study demonstrates how drug prohibition policies indirectly threaten key species like the jaguar, whose survival is intertwined with the broader health of ecosystems. Elevating the voices of fauna through human advocacy not only defends their rights but also reinforces the urgent need for drug policies that integrate environmental and biodiversity protection at their core.

Precautionary Measures and Recommendations for a Regulated Drug Market

We must look to the future and emerging trends in drug reform that advocate for the regulation of drugs within a legal market, but this shift must be approached with caution. A legal market, if poorly implemented, can reproduce the harms of prohibition through unsustainable agricultural practices, corporate capture, land grabbing, and further marginalisation of those already embedded in the drug economy.

A just transition to a regulated drug market must reduce the influence of extractive and criminal economies by establishing safeguards to prevent exploitative actors from entering the legal space. Governments must implement enforceable penalties for environmental and labour law violations and create independent oversight to ensure transparency and accountability. Without these protections, new regulatory frameworks risk replicating the same inequities and harms of prohibition under a different name.

Shifting from criminalisation to regulation provides an opportunity not only to reduce harm and stigma, but also to restore the integrity of prohibited plants, people who use drugs, and communities long impacted by the drug war.

PHOTO: Jorge Panchoaga

Ecological Harm Reduction: A Rights-Based, Climate-Resilient approach to Drug Reform

With Guiding Principles for Market Regulation of Controlled Substances

An Ecological Harm Reduction framework integrates ecological rights with social, economic, and environmental policies to address the overlapping harms of prohibition. It intends to guide the development of regulatory systems that ensure equitable funding distribution for harm reduction, promote climate-resilient development and safeguards for ecological systems and communities vulnerable to absorption into the drug chain.

1. Inclusive Participation and Community Leadership

The participation of Indigenous Peoples and marginalised communities embedded in the drug chain is essential for meaningful drug reform. Their systematic exclusion only perpetuates harm.

- Incorporate knowledge, lived experiences, and practices of these communities to shape just and effective policies grounded in the realities of those most impacted.
- Community-led and co-created approaches to integrate this knowledge are needed. It is insufficient for states and organisations to implement this knowledge in isolation. Doing so risks repeating colonial patterns of control and further disempowerment.
- Investment in local knowledge sharing and cultural promotion to strengthen territorial identity and collective belonging in landscapes Indigenous and traditional communities seek to protect and cultivate.

Safely use and develop prohibited plants within traditional, cultural, health, and healing contexts.

- Support Indigenous and marginalised communities to use and develop these plants for social, economic and medicinal purposes.
- Recognise plant species' intrinsic role in global health by installing ecological rights.

A transparent, inclusive framework must incorporate voices from across the drug chain—including users, cultivators, environmental and drug reform advocates, governments, experts, and industry actors.

2. Implementing Territorial Land Rights

Implement agrarian reform to address territorial loss resulting from prohibition-driven displacement and land grabbing. Establish industry standards that support restorative justice.

- Return appropriated lands with fair compensation for lost livelihoods and land value depreciation.
- Enact protections to secure tenure and prevent future land grabbing.
- Provide resources for community-led land restitution and redevelopment.
- Introduce quotas for Indigenous, Afro-descendent, and traditional smallholder cultivators.
- Offer licensing waivers and development subsidies to support entry into regulated markets.
- Promote responsible and sustainable crop expansion.
- In urban settings and metropolitan regions, implement the Housing First model[4] as a fundamental harm reduction and public health policy.

Enhance Land Registration Systems

- Streamline land titling processes including demarcation of indigenous and traditional lands and the creation of conservation units, extractive reserves and agroforestry family systems at-conflict and risk areas.
- Integrate mapping technologies and local territorial knowledge to demarcate land effectively.
- Fund and support mediated land conflict resolution.
- Provide waivers for Indigenous land titling and resources to enable participation in registration systems.
- Create dedicated pathways for Afro-descendent and traditional smallholder communities to achieve land titling.

3. Equitable Transitional Justice Framework

Governments must take responsibility for the social harms and stigma caused by prohibitionist policies and actively work to repair this damage.

- Address the root causes of how criminal factions exploit environmental crimes to finance and sustain their illicit operations.
- Establish independent oversight bodies and external mechanisms to detect and minimise corruption, ensuring accountability and integrity.

Governments and international partners must provide dedicated funding to support legal processes for land and environmental defenders asserting ecological and territorial rights.

- Finance litigation, legal aid, and rights-based advocacy for communities facing land grabs and environmental destruction driven by illicit drug economies. Legal empowerment is essential for transforming ecological rights into tangible protections and holding those responsible accountable.

Funds such as the Amazon Fund play a crucial role in climate mitigation and adaptation, although contributions often come from countries that are themselves major polluters. Financial support alone cannot compensate for the environmental harms, and true climate reparation requires transformation.

4 Tsemberis, S. (2010). Housing First: The Pathways Model to End Homelessness for People with Mental Illness and Addiction. Hazelden.

- Shift toward climate-resilient development. The ongoing enforcement of prohibitionist drug policies undermines this progress; dismantling prohibition's harms is a transformative step toward climate justice.

4. Enforcing Sustainable Environmental Practices

Climate-resilient development should guide environmental standards and support community-led climate mitigation in the legal drug market transition.

- Cultivation must not lead to deforestation or land grabs.
- Promote permaculture and companion planting to support local biodiversity and avoid monocropping.
- Prioritise responsible use of land, water, and energy.
- Safeguard land to ensure food security and support rural livelihoods.
- Diversify agricultural systems to Indigenous and hybrid systems.

The processing and manufacturing of controlled substances should be relocated away from biodiverse areas.

- Relocate to urban/semi-urban areas for better waste regulation and reduced waste into fragile ecosystems.
- Legal substance industries must comply with existing agricultural and environmental regulations.

Agricultural certifications set important benchmarks, but high costs and lack of cultural inclusion often make them inaccessible for small-scale producers and hinder market integration.

- Waive certification requirements for small-scale producers for the first five years.
- Diversify certification systems to include Indigenous, campesino, and Afro-descendant agroecological knowledge.
- Implement FPIC and benefit-sharing to support ethical, locally grounded market practices.

5. Protecting Labour Rights

Labour rights must be central to any regulatory framework, grounded in the principles of equality and non-discrimination in line with ILO conventions.

- Protect freedom of association, unionisation, and collective bargaining for all workers.
- Promote regional cooperation, fair wages, legal employment, and safe working conditions.
- Protections against forced and child labour.

Supporting small-scale, traditional, and Indigenous growers (especially those of illicit crops) requires clear safeguards to protect and empower their role in legal markets.

- Restore community agency through skills training, technical assistance, financial support, employment opportunities and inclusive, sustained leadership investment.

While certifications like GRASP (GLOBALG.A.P. Risk Assessment on Social Practice) offer some labour protections, they often overlook informal, seasonal, and communal labour systems practiced by Indigenous, campesino, and Afro-descendant communities. Protections must go beyond box-ticking and be shaped through direct dialogue to ensure rights are both legally recognised and culturally respected. Without this, legal transitions risk reinforcing inequalities and marginalising those most impacted by prohibition.

6. Safeguarding Markets from Corporate Domination

Corporate regulation must curb market monopolies.

- Establish mechanisms to limit corporate land capture, restrict grow site size, enforce land moratoriums, and ensure transparency.
- Strict limits on foreign ownership and investment.
- Introduced a 'buddy system' where established businesses partner with small businesses to support, share knowledge and technology.
- Restrict imports of seeds and promote sourcing locally.

Governments must take full responsibility for funding climate-resilient development in environmental areas damaged directly by prohibition policy.

- Redirect tax revenue from enforcing prohibition and new legal markets to long-term, climate-resilient development.
- Invest in essential infrastructure: public health, flood defences, emergency response, evacuation response, climate-resilient housing, and welfare services for those most affected by the climate crisis.
- Fund community-led reforestation, regenerative agriculture, waterway rehabilitation, and biodiversity conservation.
- Recognise ecological regeneration as both environmental necessity and form of reparative justice.

Reallocate Prohibition and Legal Drug Market Tax Revenues to Harm Reduction.

- Provide accessible, culturally appropriate treatment, mental health care, drug checking, safe supply, and consumption sites.
- Ensure approachable and non-judgemental services that meet immediate and long-term needs.
- Offer education, medical support, and transitional pathways to employment and housing.
- Reduce stigma through education on social and economic drivers of drug use.
- Use transparent feedback systems to adapt and improve harm reduction strategies.

What can be done right now

As part of a broader shift toward reparative justice, interim steps can be actioned:

- **Decriminalise drug use and small-scale trade to reduce immediate harm.**
- **Remove illicit crops from protected areas, creating jobs in ecosystem restoration.**
- **Build the evidence base— creating indicators and collecting data on prohibition's impacts, from deforestation to gender-based violence, to guide policy.**

For More information visit:
Health Poverty Action
The Legal Regulation of Drugs to Deliver Global Justice

Coca's Future: Traditional Wisdom, Modern Innovation, and Community Justice

A regulated system for coca and cocaine has the potential to positively transform territories historically affected by their illegality, especially in Latin America.

Central to this transformation is recognition of the ancestral relationship between coca, territory, and community—a relationship that sustains medicinal, nutritional, economic, social, and cultural uses of the plant.

A just regulatory framework must include explicit protections and allowances for traditional and non-cocaine uses of coca.

This requires investment in research, development, promotion, and communication strategies that highlight coca's beneficial uses, dismantle the stigma associated with cocaine, and restore the sacred status of the leaf in its cultural context.

Protecting Biocultural Patrimony

Effective regulation must embed strong safeguards for biological and cultural heritage. This means affirming collective intellectual property rights and developing geographical indications that honor coca's origins and cultural significance. International frameworks—the Convention on Biological Diversity (CBD), the Nagoya Protocol, and the 2024 WIPO Treaty on Genetic Resources and Associated Traditional Knowledge (GRATK)—offer a solid foundation. National precedents also provide lessons: Ecuador's Código de Ingenios (2016), Peru's Law 27811 (2001), and India's Biological Diversity Act (2002) demonstrate how traditional knowledge and biodiversity can be protected through registries, fair benefit-sharing, and legal redress mechanisms. A coca regulatory framework must adapt these lessons to ensure Indigenous and campesino custodians remain the primary rights-holders.

Land, Justice, and Demilitarization

Building on these protections, it is crucial to establish a clear system of redress for territorial displacement that reinforces Indigenous and campesino land rights and offers accessible avenues for compensation in cases of unjust dispossession. Regulation must also reduce militarisation and protect communities from armed interventions driven by market interests. Strong safeguards are needed to prevent corporate land grabbing, while promoting ethical free, prior, and informed consent (FPIC) and fair benefit-sharing partnerships with Indigenous and campesino landowners. Additionally, creating secure spaces for communication and collaboration across the Andes, Amazon, and Brazil will be essential. Strengthening territorial rights is not only a matter of justice but also a vital strategy to support Indigenous self-determination, as emphasised in ILO Convention 169, the International Guidelines on Human Rights and Drug Policy (2019), and the UN Declaration on the Rights of Indigenous Peoples (2007).

Leverage Points for Transition

Policy change is necessary but not sufficient. What matters is where change happens, and who gets to lead it. Testimonies and territorial initiatives point to key leverage points already in motion:

- Reclassification of the Coca Leaf: The WHO's critical review process opens the door to regulatory models grounded in science and cultural sovereignty.
- Legal Governance Experiments: Bolivia's social control system and Colombia's emerging community-led initiatives (e.g., FEDECOCA, Coca Nasa, Origen Amazonía) demonstrate frameworks for coca governance that resist criminal economies. Territorial Investment: Transition requires sustained funding for community infrastructure, not just crop substitution.
- Narrative Change: Ending coca stigma demands investment in media, education, and legal tools that reconnect the plant to culture and ecology.
- Localized Harm Reduction: Addressing the realities of local cocaine use—particularly among youth—demands public health interventions rooted in territory.
- International Advocacy: Shifting policy at the UN and regional level depends on the visibility and legitimacy of territorial voices.

Towards a Policy of Care

What emerges from these leverage points is not a blueprint, but a shift in orientation: from enforcement to accompaniment; from extractive logic to ecological constraint; from criminal suspicion to trust in local knowledge.

Coca-producing communities have lived through every iteration of the war on drugs. They know its costs. They also know the capacity of the coca plant to feed, teach, and restore. What they ask is not permission to break the rules—but recognition that the rules they follow are the same ones that have sustained their territories for millennia, and which now offer a pathway for just regulation.

Between the War on Drugs and Environmental Racism: Paths to Reparations in Brazil

By Iniciativa Negra for a New Drug Policy

Thinking about reparation policies in Brazil requires assuming that this debate is still in its infancy and that we are facing a field of political, conceptual and historical dispute. When this debate emerges in the public arena, it is often linked to the military dictatorship and the Amnesty Law, making the centrality of the black population invisible as a priority recipient of reparatory measures in the face of a past and present traversed by racial violence, slavery, mass incarceration and the so-called war on drugs.

Reparation policies also need to be thought of in the light of climate justice, since the effects of climate change are not evenly distributed and disproportionately affect black, peripheral and indigenous populations. Environmental racism is expressed in the greater exposure of these communities to environmental risks, such as floods, landslides, food insecurity, contamination by pesticides or lack of basic sanitation, which are ultimately extensions of the logic of necropolitics that organizes the Brazilian territory.

By overlapping structural racism with the climate crisis, a double process of precariousness becomes evident, where the same population that suffers from incarceration and the violence of the war on drugs is also the one that inhabits the most precarious territories and those most at risk from climate change.

Incorporating climate justice into the debate on reparations broadens the understanding of what state accountability means. Although it is necessary, it is not enough just to financially repair the damage caused by drug policy or criminal injustices, but also, and fundamentally, to invest in territorial reconstruction in the broadest sense, with decent housing, sanitation and a just energy transition. Reparations, in dialogue with climate justice, must ensure that black and peripheral territories are no longer seen as sacrificial zones, but are recognized as spaces of rights, memory and future.

These impacts go beyond the cities and urban peripheries. The same state apparatus that militarizes black and favela territories legitimizes predatory expansion over traditional and indigenous communities, feeding the advance of deforestation, illegal mining and land grabbing. Prohibitionist policies open the door to criminal networks, corporations and the violence of state agents who operate in synergy with environmental degradation.

Armed violence in urban peripheries and environmental destruction in Amazonian regions or *quilombola* territories are part of the same political-economic arrangement that naturalizes the death of racialized populations and the devastation of entire ecosystems.

This intersection makes it clear that reparations cannot be thought of in a compartmentalized way. Climate justice and racial justice meet in the perspective that it is impossible to think of a dignified future for black, indigenous, traditional, *quilombola* and peripheral communities without dismantling the gears that connect criminalization, environmental racism and illegal economies sustained by predatory extractivism.

In addition, these communities play an essential role in environmental preservation by living in balance with nature and practicing sustainable ways of using natural resources based on ancestral knowledge. Their way of life contributes directly to conserving biodiversity and tackling climate change. It is therefore essential that they are recognized not only as guardians of ecosystems, but also as **priority beneficiaries of reparation policies** - which must guarantee the demarcation of their territories, the strengthening of their socio-cultural and economic practices, and their active participation in the formulation of environmental policies, promoting social and environmental justice in an integrated manner.

The survey “Black Initiative for Rights, Reparation and Justice”, carried out by Iniciativa Negra in 2023, built from the perspective of victims of criminal injustice, relatives of murdered people, prison survivors and community leaders, points to five fundamental dimensions of the debate: public security, the war on drugs, public services, reparation and dreams for the future. Among the recommendations collected, the following stand out:

1. Building memory, justice and truth: Establish a truth commission on the war on drugs, capable of investigating state and private responsibilities, including cases of forced disappearance, executions and torture.

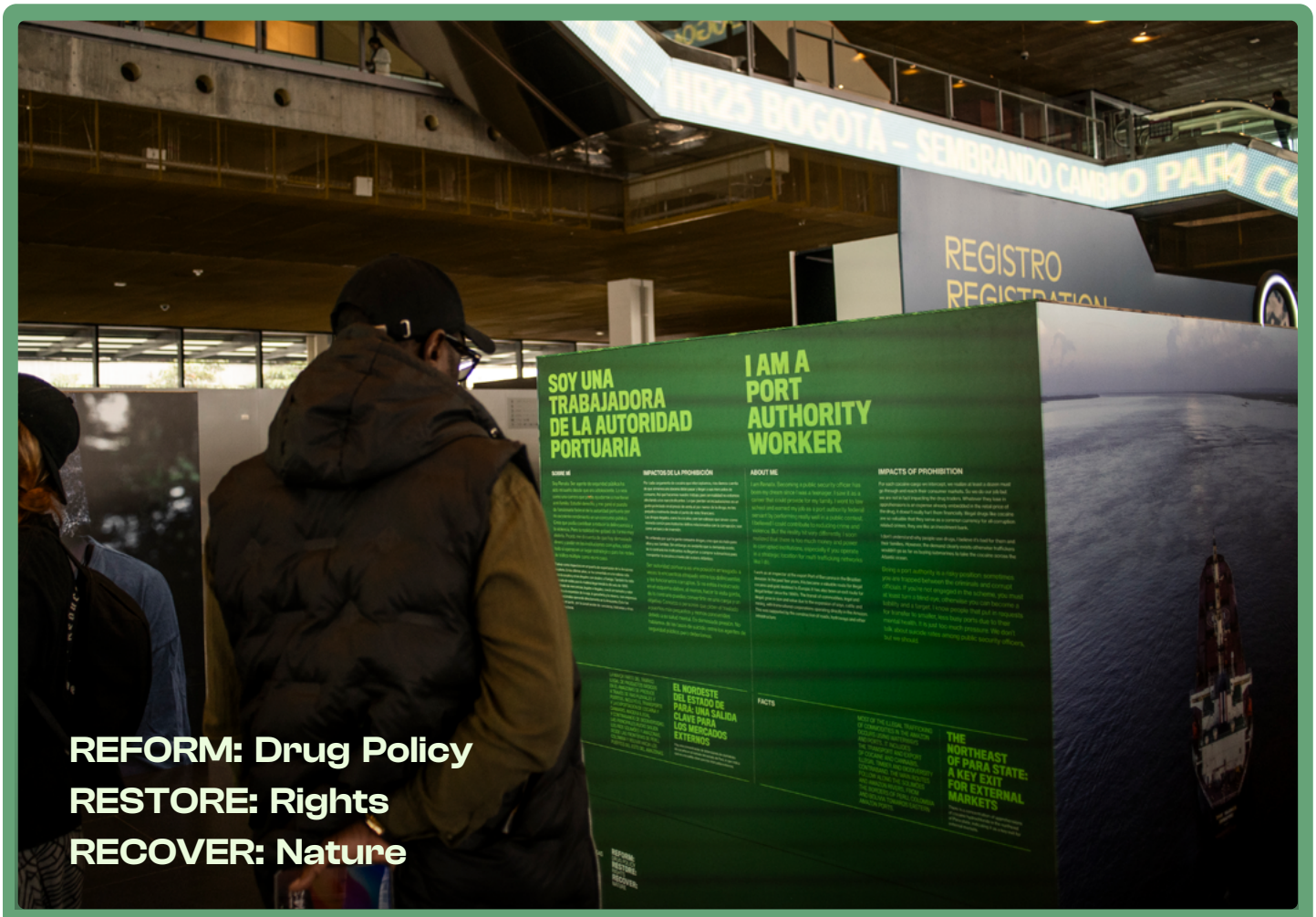
2. Reparations for affected communities: Reparation must be thought of collectively and include investments in health, education, social assistance and culture, aimed at rebuilding entire communities.

3. Amnesty and decarceration: To reduce the prison population, amnesty and the review of the convictions of hundreds of thousands of people for drug trafficking must be accompanied by community mediations and territorial reconciliation processes.

4. Legislative and institutional changes: Regulating the production and market of substances, starting with cannabis, can be an opportunity for economic redistribution, if it favors family farming and the inclusion of those most affected by the war on drugs.

5. Economic and redistributive reparations: Financial reparations to families who have had their loved ones murdered, to survivors of imprisonment for drug-related convictions, as well as social investment in historically affected territories.

6. Health and radical self-care: Investments in mental health policies and radical self-care practices that recognize the physical and psychological marks of police violence and imprisonment.



An interactive installation for democratic drug policy design

The Drug Policy Reform and Environmental Justice International Coalition - is an interdisciplinary group of advocates, researchers, activists, artists and journalists from around the world that believe that drug policy reform is central to delivering climate justice in our planet's most ecological fragile regions and beyond.

As a coalition, we are committed to bringing an intersectional, democratic and bottom- up approach to designing new drug policies, where community voices are centered and all aspects of ecology are taken into consideration, including plants and animals. To do this well we wanted to bring this design process into the cultural space.

In April 2025, we teamed up with award winning curators VIST PROJECTS and designed an interactive installation ' Reform: Restore: Recover " that brings visibility to 10 Human and More-Than-Human unique participants from different contexts and locations along the production, transit and consumption regions of the Coca & Cocaine value chain in Latin America. As a methodology of policy design, it seeks to break the siloed, top-down policymaking process and instead draws inspiration from indigenous governance councils that foster a multispecies approach to decision making.

Participants are invited to reimagine drug policy through the lens of *ecological* harm reduction for each stakeholder. They learn about each stakeholder and 'meet them where they are at' with empathy and curiosity- a key principle of Harm Reduction. Using their personal experience or their imagination, they envision how a different set of drug laws and regulations could cause less harm to the people and the environment at each stage of the value chain.

All the emerging ideas are being archived by the Coalition to feed into a community model of a regulated socio bio economy. Our Coalition is seeking to design a new legal and regulated drug economy, rooted in ecological sustainability, where the rights of vulnerable communities such as indigenous, peasant and Afro-descendant are enshrined, and climate justice is delivered. This method is now being used in community groups and cultural spaces in countries that are impacted by the drugs supply chain.

QUOTES FROM PARTICIPANTS IN COLOMBIA AND BRAZIL:

''Social, cultural, and ecological factors are interconnected, and these issues cannot be solved through punishment or criminalisation''

[HRI 2025 Attendee. Stakeholder: Cocaine User. Attributor Description: Mental health counselling harm reduction]

''The river and the jaguar were my favorite parts. It's important to shift this focus away from humans and include ecosystems.''

[HRI 2025 Attendee. Stakeholder: Jaguar. Attributor Description: No description. Original language: Spanish: *El río y el jaguar han sido las pares que mas me han gustado...Es importante descentrar este enfoque de los humanos e incluir a los ecosistemas.*]

''In some cases, cocaine use is related to the need to increase work performance, reflecting the precarization of labor relations and demands for exhausting work schedules''.

[Intersection: Drug Policy & Land Use in the Fight for Climate Justice in Brazil May 2025 Attendee, Attributor Description: Anonymous]

''This has been the fight of the Indigenous movement in Colombia for the past three decades: to recognize coca as cultural heritage and spiritual technology. Yes, technology—because it's a tool that transforms and empowers communities.''

[Intersection: Drug Policy & Land Use in the Fight for Climate Justice in Brazil May 2025 Attendee, Attributor Description: Colombian Researcher David Restrepo]

"Reform must restore Indigenous rights to use, cultivate, and commercialize their biological heritage, including plants that have been prohibited and are associated with Indigenous communities"

[HRI 2025 Attendee. Stakeholder: Coca Plant. Attributor Description: Indigenous and Environmental Rights Advocate]

''Accepting that there is a demand for cocaine and taking action to create a safe and regulated form of access can bring to the table other discussions, such as talking about consumption without receiving a criminal sanction'

[HRI 2025 Attendee. Stakeholder: Coca User. Attributor Description: istapalapa, CDMX. Original language: Spanish: *Aceptar que existe una demanda de cocaina y tomar acción para generar una forma de acceso seguro y regulado puede poner en la mesa otras discusiones como hablar del consumo sin recibir una sanción penal]*

"Coca - When respected and understood through an Indigenous lens, its harms are minimal or contextual. It's only when the plant is colonized, extracted, and purified that we begin to see associated harms"

[HRI 2025 Attendee. Stakeholder: Coca Plant. Attributor Description: Epidemiology, Yale school of public health]

"Drug reform must remove the prohibition on plants. It must end the war against nature."

[HRI 2025 Attendee. Stakeholder: Coca Plant. Attributor Description: Indigenous and Environmental Rights Advocate]

Jenna Rose Astwood

Jenna-Rose is an Indigenous Māori researcher and consultant from New Zealand. She specialises in Indigenous research methodologies, cultural frameworks, ethical engagement, Indigenous-led co-production with non-Indigenous organisations, and their intersection with environmental rights and social justice. With nearly a decade of experience working alongside Māori organisations and across the public and private sectors, Jenna-Rose applies her expertise to advocate for Indigenous rights and philosophies in transformative evidence-based studies, policy and regulation. Her focus in drug policy is to uphold Indigenous rights to utilise, develop, and preserve biocultural heritage, protect Indigenous knowledge systems, and align drug policy reform with environmental sustainability, climate action, and Indigenous-led harm reduction.

Clemmie James

Clemmie James is a human rights & environmental justice campaigner specialising in drug policy. She is Senior Policy & Campaigns officer at Health Policy Action and the co-founder and coordinator of the International Coalition Drug Policy Reform and Environmental Justice. She is a fellow at the Centre for Peace and Reconciliation at St Ethelburgs and alumni of Kincentric Leadership. She is a trustee for Palestinian Cultural Embassy in London - Palestine House.

ANNEX: References

Boyd, D. R. (2017). The rights of nature: A legal revolution that could save the world. ECW Press.

Community Environmental Legal Defense Fund. (2023). Rights of nature legal frameworks and cases. https://celdf.org/rights-of-nature/

Intersection: Drug Policy & Land Use in the Fight for Climate Justice. Brasil. Maio de 2025; reunião imersiva e workshop com +30 representantes da sociedade civil e da comunidade brasileira

Reform Restore Recover: Participatory intervention at the 28th International Conference on Harm Reduction. Bogotá, Colômbia. Abril de 2025

REFERENCES - INICIATIVA NEGRA TEXT

BARROS, Rachel. Vida militarizada: pontos sobre a violência urbana no Rio de Janeiro. *Proposta (Rio de Janeiro)*, v. 42, p. 52-57, 2019.

BELMONT, Mariana (org.). *Racismo ambiental e emergências climáticas no Brasil* [livro eletrônico]. São Paulo, SP: Oralituras: Instituto de Referência Negra Peregum, 2023. Available at: https://peregum.org.br/publicacao/racismo-ambiental-e-emergencias-climaticas-no-brasil/. Accessed: 8 Sept. 2025.

BRASIL. Law 11,343 of August 23, 2006. Establishes the National System of Public Policies on Drugs (SISNAD). It prescribes measures for the prevention of drug misuse, care, and social reintegration of drug users and addicts; establishes standards for the suppression of unauthorized production and illicit drug trafficking; defines crimes and provides other measures. Ministry of Health. Brasília, 2006.

DAVIS, Angela. *Estarão as prisões obsoletas?* Trad. Marina Vargas. 3. ed. Rio de Janeiro: Difel, 2019.

DE SANTIS FELTRAN, G. Das prisões às periferias: coexistência de regimes normativos na "Era PCC". *Revista Brasileira de Execução Penal*, [S. l.], v. 1, n. 2, p. 45—71, 2020. DOI: 10.1234/rbep.v1i2.223. Available at: https://rbepdepen.depen.gov.br/index.php/RBEP/article/view/dossie2. Accessed 8 Sept. 2025.

DOMINGUES, Petrônio. Agenciar raça, reinventar a nação: o Movimento Pelas Reparações no Brasil. *Análise Social*, n. 227, p. 332-361, 2018.

GUIMARÃES, Mariana Rezende. O estado de coisas inconstitucional: a perspectiva de atuação do Supremo Tribunal Federal a partir da experiência da Corte Constitucional colombiana. *Boletim Científico ESMPU*, Brasília, a. 16, n. 49, p. 79-111, jan./jun. 2017.

INICIATIVA NEGRA. I*niciativa Negra por Direitos, Reparação e Justiça.* 2023. Available at: https://iniciativanegra.org.br/publicacao/direito-reparacao-justica/. Accessed 8 Sept. 2025.

MBEMBE, Achille. *Necropolítica.* São Paulo: N-1 Edições, 2018.

PRADO, Monique. "As bocas de fumo devem ser tombadas?": o que significa reparação histórica para quem trabalha no narcotráfico? *Revista da Plataforma Brasileira de Política de Drogas*, São Paulo, v. 4, n. 4, 2020. Available at: https://pbpd.org.br/revistaplato/. Accessed 20 Jul. 2022.

RAMOS, Silvia. *A vida resiste* [livro eletrônico]: além dos dados da violência / Silvia Ramos [et al.]. Rio de Janeiro: CESeC, 2021.

RAMOS, Silvia; et al. *Pele-alvo: a cor da violência policial.* Rio de Janeiro: CESeC, dez. 2021.

ROSA, Lahis da Silva. *A política de reparação constitucional brasileira: uma análise da efetividade da transição democrática a partir da comissão da anistia.* 95 f., il. Dissertação (Mestrado em Direito) — Universidade de Brasília, Brasília, 2019.

SOUZA, Jessé. *Ralé brasileira: quem é e como vive* / Jessé Souza; colaboradores André Grillo ... [et al.]. Belo Horizonte: Editora UFMG, 2009. (Humanitas)

ANNEX

References

PHOTO: Jorge Panchoaga

I - ORIGINS

COCA: How the prohibition of an indigenous plant fuels the war on nature - David Restrepo

1. Allen, Catherine J. The Hold Life Has: Coca and Cultural Identity in an Andean Community (Washington, DC: Smithsonian Institution Press, 1988)
2. Burns, Ken and Novick, Lynn. Prohibition. PBS, 2011. Série documental.
3. Cáceres, Baldomero. La coca, el mundo andino y los extirpadores de idolatrías del siglo XX / Baldomero Cáceres en América Indígena, Vol. 38 No. 4 (Out -Dez, 1978)
4. Clawson, Patrick L., and Rensselaer W. Lee. The Andean Cocaine Industry. New York: St. Martin's Press, 1996.
5. Consejo Nacional de Lucha contra el Tráfico Ilícito de Drogas (CONALTID), Encuesta de Consumo de Coca (La Paz: CONALTID, various years)
6. Davis, Wade. One River: Explorations and Discoveries in the Amazon Rain Forest. New York: Simon & Schuster, 1996.
7. Dawson M. White, "The Origins of Coca: Museum Genomics Reveals Multiple Independent Domestications from Progenitor Erythroxylum gracilipes," Systematic Biology 70, no. 1 (2021). https://academic.oup.com/sysbio/article/70/1/1/5912027?utm_source=chatgpt.com&login=false
8. Dirección de Sustitución de Cultivos Ilícitos (DSCI), Observatorio de Drogas de Colombia (ODC). Boletín técnico: precios de hoja y derivados de coca en Colombia, Julho — Setembro de 2024. Bogotá: Ministerio de Justicia y del Derecho, 2024.
9. Duncan, Gustavo. Los señores de la guerra: De paramilitares, mafiosos y autodefensas en Colombia. Bogotá: Planeta, 2006.
10. Echeverry, Juan Álvaro & Pereira, E. Mambear no es pintarse la boca de verde. Leticia, Colombia: Universidad Nacional de Colombia, Sede Amazonia, 1997)
11. Farthing, Linda, and Kathryn Ledebur. "Coca Yes, Cocaine No? Legal Options for the Coca Leaf in the Andes." NACLA Report on the Americas 42, no. 3 (2009): 19—23.
12. Garzón, Juan Carlos. Mafia & Co.: The Criminal Networks in Mexico, Brazil, and Colombia. Washington, DC: Woodrow Wilson Center, 2008.
13. Gootenberg, Paul. Andean Cocaine: The Making of a Global Drug. Chapel Hill: University of North Carolina Press, 2008.
14. InfoAmazonia, "The Poorest Narcos in the Drug Trafficking Chain," 10 de agosto de 2023, https://infoamazonia.org/en/2023/08/10/the-poorest-narcos-in-the-drug-trafficking-chain/
15. International Drug Policy Consortium (IDPC). "The UN Review of the International Status of the Coca Leaf." July 2023. https://idpc.net/coca-leaf-review-23
16. Instituto Nacional de Estadística e Informática (INEI), Encuesta de Consumo de Hoja de Coca en Hogares (Lima: INEI, various years)
17. Jelsma, Martin. "The UN Drug Control Conventions: The Limits of Latitude." Series on Legislative Reform of Drug Policies 18. Amsterdam: Transnational Institute, 2011.
18. Jelsma, Martin, and Pien Metaal. "Coca Yes, Cocaine No? Legal Options for the Coca Leaf." TNI Briefing Series no. 2010/2. Amsterdam: Transnational Institute, 2010.
19. Ledebur, Kathryn, and Linda Farthing. To the Beat of a Different Drum: Bolivia's Community Coca Control. Washington, DC: Andean Information Network & Open Society Foundations, 2019.
20. Restrepo, David., E. Saenz, O. A. Jara-Muñoz, I. F. Calixto-Botia, S. Rodriguez-Suarez, P. Zuleta, B. G. Chavez, J. A. Sánchez, and J. C. D'Auria. "Erythroxylum in Focus: An Interdisciplinary Review of an Overlooked Genus." Molecules 24, no. 20 (2019): 3788. https://doi.org/10.3390/molecules24203788
21. Restrepo, David. "Daring to Regulate Coca and Cocaine." Bogotá: Centro de Estudios sobre Seguridad y Drogas (CESED), Universidad de los Andes, 2020.
22. Restrepo, David, and Luisa Cuéllar. El sistema productivo del cannabis recreativo en Colombia: cadena de valor, actores y alternativas de política. Documento Temático no. 52. Bogotá: Centro de Estudios sobre Seguridad y Drogas (CESED), Universidad de los Andes, 2025.
23. Ronderos, María Teresa. Guerras recicladas: Una historia periodística del paramilitarismo en Colombia. Bogotá: Aguilar, 2014.
24. Thoumi, Francisco E. Illegal Drugs, Economy, and Society in the Andes. Washington, DC: Woodrow Wilson Center Press / Johns Hopkins University Press, 2003.
25. United Nations Office on Drugs and Crime (UNODC). Colombia: Coca Cultivation Survey 2013. Bogotá: UNODC, 2014.
26. United Nations Office on Drugs and Crime (UNODC). Global Report on Cocaine 2023. Vienna: UNODC, 2023.
27. United Nations Office on Drugs and Crime (UNODC). World Drug Report 2023. Vienna: UNODC, 2023.
28. United Nations Office on Drugs and Crime (UNODC) and Government of Colombia. Colombia: Monitoreo de territorios afectados por cultivos ilícitos 2022. Bogotá: UNODC, 2023.
29. United Nations Office on Drugs and Crime (UNODC)-SIMCI. Colombia: Monitoreo de territorios con presencia de cultivos de coca 2023. Bogotá: UNODC, 2025. https://www.biesimci.org/index.php?id=62
30. Vélez Lesmes, María Alejandra, Beatriz Ramos Torres, Sandra Aguilar Gómez, Mauricio Velásquez Ospina, Lucas Marín Llanes, Diana Lorena Millán Orduz, and Estefanía Ospina Valderrama. Environmental Impacts and Transitions across Illicit, Informal and Licit Economies in Colombia: Coca-Cocaine, Gold, and Cattle. Documento Temático no. 54. Bogotá: CESED, Universidad de los Andes, 2025.
31. WOLA & TNI. "Coca Chronicles: Bolivia Challenges Coca Leaf Ban." Washington Office on Latin America, 2023. https://www.wola.org/analysis/coca-chronicles-bolivia-challenges-coca-leaf-ban/
32. World Bank. "World Development Indicators: Colombia." Washington, DC: World Bank, 2024.

ANNEX - PART II - PATHWAYS

Chapter 3: Mapping cocaine refining activity in Brazil
Instituto Fogo Cruzado

References

Abreu, A. (2017) Cocaína: A Rota Caipira. Rio de Janeiro: Editora Record.

Alisson, E. (2024) Cocaína é contaminante emergente preocupante na baía de Santos, afirma pesquisador. Agência FAPESP, 25 de abril. Disponível em: https://agencia.fapesp.br/cocaina-e-contaminante-emergente-preocupante-na-baia-de-santos-afirma-pesquisador/51489

Andreoni, M., Migliozzi, B., Robles, P., Lu, D. (2022) The Illegal Airstrips Bringing Toxic Mining to Brazil's Indigenous Land. The New York Times, 12 de Agosto. Disponível em: https://www.nytimes.com/interactive/2022/08/02/world/americas/brazil-airstrips-illegal-mining.html

Barros, C. (2021) The Intimate Relationship Between Cocaine and Illegal Timber in Brazil's Amazon. InsightCrime, 14 de outubro. Disponível em: https://insightcrime.org/news/intimate-relationship-between-cocaine-illegal-timber-brazil-amazon/

Benavalli, L. (2025) Conflitos territoriais e seus impactos na biodiversidade: como a exploração da terra ameaça a onça-pintada no Brasil. Revista Platô, 7(7), pp. 33-36.

Bergman, M. (2018) Illegal Drugs, Drug Trafficking and Violence in Latin America. Cham: Springer.

Borges, L. (2025) Como o tráfico transformou a Amazônia na principal rota de exportação de cocaína. Veja, 11 de abril. Disponível em: http://veja.abril.com.br/brasil/como-o-trafico-transformou-a-amazonia-na-principal-rota-de-exportacao-de-cocaina/

Carmo, M. (2022) O que se sabe até agora sobre morte de 20 pessoas por 'cocaína envenenada' na Argentina. BBC, 3 de fevereiro. Disponível em: https://www.bbc.com/portuguese/internacional-60241344

CdE (2021) Gestão de Ativos do Tráfico de Drogas — Descapitalização do crime organizado para fortalecer as políticas públicas no Brasil. 1º Boletim Temático. UNODC, PNUD, Ministério da Justiça e Segurança Pública.

CdE., SIMCI (2022) Dinâmicas do mercado de drogas ilícitas no Brasil: Análise comparativa dos preços de maconha, cocaína e outras drogas em quatro estados. Brasília: Ministério da Justiça e Segurança Pública, Programa das Nações Unidas para o Desenvolvimento, Escritório das Nações Unidas sobre Drogas e Crime.

CDESC (2023) Grau de pureza de cocaína em quatro estados. Brasília: Escritório das Nações Unidas sobre Drogas e Crime, Programa das Nações Unidas para o Desenvolvimento, Ministério da Justiça e Segurança Pública.

CLALS., InsightCrime (2020) The Rise of the PCC: How South America's Most Powerful Prison Gang is Spreading in Brazil and Beyond. CLALS Working Paper Series, nº 30. https://insightcrime.org/wp-content/uploads/2020/12/InSight-Crime_The-Rise-of-the-PCC-1.pdf

CNN (2015) Grupo Boticário registra vendas totais de R$ 35,7 bi em 2024. CNN, 27 de março. Disponível em: https://www.cnnbrasil.com.br/economia/negocios/grupo-boticario-registra-vendas-totais-de-r-357-bi-em-2024/

Dias, C., Manso, B. (2018) A Guerra: A Ascensão do PCC e o Mundo do Crime no Brasil. São Paulo: Todavia.

EMCDDA., EUROPOL (2016) 2016 EU Drug Markets Report: In-depth Analysis. European Union Drug Agency. Disponível em: https://www.euda.europa.eu/publications/joint-publications/eu-drug-markets-2016-in-depth-analysis_en

EMCDDA., EUROPOL (2022) EU Drug Market: Cocaine. European Union Drug Agency. Disponível em: https://www.euda.europa.eu/publications/eu-drug-markets/cocaine_en

Esteves, B., Abreu, A. (2024) Cocaína em tubarões é só a ponta do iceberg. Piauí, 25 de julho. Disponível em: https://piaui.folha.uol.com.br/cocaina-em-tubaroes-e-so-a-ponta-do-iceberg/

EUDA., EUROPOL (2022) Coca and cocaine production. European Union Drugs Agency. Disponível em: https://www.euda.europa.eu/publications/eu-drug-markets/cocaine/production_en

FBSP., Esfera (2024) Segurança Pública e Crime Organizado no Brasil. Disponível em: https://publicacoes.forumseguranca.org.br/items/fcb7e2a1-8f36-487e-9190-8ecf4d294747

Feltran, G., Pinho, I., Lugo, L. (2023) Atlantic Connections: The PCC and the Brazil-West Africa Cocaine Trade. Global Initiative Against Transnational Organized Crime. https://globalinitiative.net/wp-content/uploads/2023/08/Gabriel-Feltran-Isabela-Vianna-Pinho-and-Lucia-Bird-Atlantic-connections-The-PCC-and-the-Brazil%E2%80%93West-Africa-cocaine-trade-GI-TOC-August-2022.pdf

G1 (2011) Polícia investiga denúncia de explosão de refinaria de drogas na Rocinha. Globo.com, 12 de maio. Disponível em: https://g1.globo.com/rio-de-janeiro/noticia/2011/05/policia-investiga-denuncia-de-explosao-de-refinaria-de-drogas-na-rocinha.html

G1 (2014) Exército descobre 1,2 mil mudas de folha de coca durante operação no AM. Globo.com, 31 de Agosto. Disponível em: https://g1.globo.com/am/amazonas/noticia/2014/08/exercito-descobre-mais-12-mil-mudas-de-folha-de-coca-no-interior-do-am.html

G1 (2025) Embraer anuncia receita de R$ 35,4 bilhões em 2024, a maior da história da empresa. Globo.com, 27 de fevereiro. Disponível em: https://g1.globo.com/sp/vale-do-paraiba-regiao/noticia/2025/02/27/embraer-anuncia-receita-de-r-354-bilhoes-em-2024-a-maior-da-historia-da-empresa.ghtml

GI-TOC (2025) Evaluating Cocaine Market Interventions: How External Shocks and Disruption of Criminal Networks Impact the Cocaine Trade and Social Outcomes. European Commission, GI-TOC, RUSI Europe. Disponível em: https://globalinitiative.net/analysis/evaluating-cocaine-market-interventions-how-external-shocks-and-disruption-of-criminal-networks-impact-the-cocaine-trade-and-social-outcomes/

Global Witness (2024) Missing voices: The Violent Erasure Of Land And Environmental Defenders. https://gw.cdn.ngo/media/documents/Missing_Voices_-_Global_Witness_land_and_environmental_defenders_report.pdf

Gootenberg, P. (2008) Andean cocaine: the making of a global drug. Chapel Hill: The University of North Carolina Press.

INCB (2020) Report of the International Narcotics Control Board for 2019. E/INCB/2019/1. Vienna: United Nations.

Instituto Mãe Crioula., Fórum Brasileiro de Segurança Pública (2023) Cartografias da Violência na Amazônia. https://publicacoes.forumseguranca.org.br/items/ca0bcac7-31b6-4123-adb1-2a6fc5c0b95d

Jornal da Tarde (1983) Guerra ao epadu: a coca da Amazônia plantada por caboclos e indígenas cobiçada pelo tráfico. Jornal da Tarde, 29 de dezembro. Disponível em: https://www.estadao.com.br/brasil/jt/guerra-ao-epadu-a-coca-da-amazonia-plantada-por-caboclos-e-indigenas-cobicada-pelo-trafico/

Laranjeira, R. (2025) Caderno Temático LENAD III. Consumo De Cocaína E Crack Na População Brasileira. UNIFESP; SENAD/MJSP.

Lear, J. (2024) Tubarões da costa do Brasil são encontrados com cocaína em seus corpos. Como isso aconteceu? National Geographic, 24 de julho. Disponível em: https://www.nationalgeographicbrasil.com/animais/2024/07/tubaroes-da-costa-do-brasil-sao-encontrados-com-cocaina-em-seus-corpos-como-isso-aconteceu

Leeds, E. (1996) Cocaine and Parallel Polities in the Brazilian Urban Periphery: Constraints on Local-Level Democratization. Latin American Research Review, 31(3): 47-83. https://doi.org/10.1017/S0023879100018136

Lien, N., Feltran, G. (2025) (I)llicit Chains: Some New Hypotheses Regarding a Changing Global Cocaine Market. Journal of Illicit Economies and Development, 7(1), pp. 20—34. DOI: https://doi.org/10.31389/jied.274

Machado, L. (2001) The Eastern Amazon Basin and the Coca-Cocaine Complex. International Social Science Journal, 53(169), pp. 387-395. https://doi.org/10.1111/1468-2451.00326

Machado, L. (2014) Tráfico de drogas ilícitas e território: o caso do Brasil. Revista Segurança, Justiça e Cidadania, v. 8, pp. 123-139.

May, C. (2017) Transnational Crime and the Developing World. Global Financial Integrity. Disponível em: https://www.gfintegrity.org/wp-content/uploads/2017/03/Transnational_Crime-final.pdf

McDermott, J., Bargent, J., den Held, D., Ramírez, M. (2021) The Cocaine Pipeline to Europe. InsightCrime & Global Initiative Against Transnational Crime. https://insightcrime.org/investigations/cocaine-europe-underestimated-threat/

McSweeney, K., et al. (2023) Revealing the missing link to Climate Justice: Drug Policy. Drug Policy Reform & Environmental Justice International Coalition. https://www.healthpovertyaction.org/wp-content/uploads/2023/10/REPORT-Revealing-the-Missing-Link-to-Climate-Justice-Drug-Policy.pdf

Menezes, B. (2021) Laboratório do tráfico explode em favela no RJ e deixa 10 feridos. Metrópoles, 29 de outubro. Disponível em: https://www.metropoles.com/brasil/laboratorio-do-trafico-explode-em-favela-no-rj-e-deixa-10-feridos

Neves, A., Baptista, G., Engel, C., Misse, M. (2016) Segurança Pública nas Fronteiras: Arco Central. Estratégia Nacional de Segurança Pública nas Fronteiras (ENAFRON). Brasília/DF: Ministério da Justiça. Disponível em: https://necvu.com.br/wp-content/uploads/2020/11/2016-NECVU_UFRJ_Seguranca-Publica-nas-Fronteiras_ARCO-CENTRAL.pdf

Patriarca, G., Adorno, S. (2025) A dive ahead: the adaptive dimensions between cocaine smuggling and policing in major Brazilian ports. Global Crime, https://doi.org/10.1080/17440572.2025.2538073

Pichel, M. (2021) Cómo Ecuador pasó de ser país de tránsito a un centro de distribución de la droga en América Latina (y qué papel tienen los carteles mexicanos). BBC, 11 de outubro. Disponível em: https://www.bbc.com/mundo/noticias-america-latina-58829554

Pinho, I., Rodrigues, F., Zambon, G. (2023) Navegar é Preciso: As jornadas da cocaína e a expansão das facções pelo Brasil. Novos Estudos CEBRAP, 42(1), pp. 41-58. http://dx.doi.org/10.25091/S01013300202300010003

Pinto, J. (2022) Detection of Geospatial Objects Linked to Drug Trafficking Organizations: An Approach Based on Geospatial Intelligence and Artificial Intelligence. Tese de doutorado, Programa de Pós-Graduação em Ciências Geodésicas, Setor de Ciências da Terra da Universidade Federal do Paraná. Orientador: Prof. Dr. Jorge António Silva Centeno

Polícia Federal (2025) Perfil químico da cocaína apreendida pela Polícia Federal do Brasil entre 2015 e 2024. Serviço de Perícias de Laboratório, Instituto Nacional De Criminalística.

Pontes, N. (2021) Corte de verba reforça desmonte da fiscalização ambiental. DW Brasil, 25 de abril. Disponível em: https://www.dw.com/pt-br/corte-de-verba-refor%C3%A7a-desmonte-da-fiscaliza%C3%A7%C3%A3o-ambiental-no-brasil/a-57327500

Procópio Filho, A., Vaz, A. (1997) O Brasil no contexto do narcotráfico internacional. Revista Brasileira de Política Internacional, 40(1), pp. 75-122.

Ramírez, M. (2021) Cocaine: The Criminal Steroid. InsightCrime, 9 de fevereiro. Disponível em: https://insightcrime.org/investigations/cocaine-criminal-steroid/

Ramírez, M., Cárdenas, J., Jones, K., Lizcano, J., Mistler-Ferguson, S., Laan, N., Lovregio, J., Norris, I. (2022) Amazônia Saqueada: As Raízes do Crime Ambiental em Cinco Países Amazônicos. Instituto Igarapé & InsightCrime. https://igarape.org.br/wp-content/uploads/2022/11/Amazonia-saqueada_As-raizes-do-crime-ambiental-em-cinco-paises-amazonicos.pdf

Rapozo, P., Silva, R., Coutinho, T. (2024) Dinâmicas dos Mercados Ilegais, Criminalidade e Representações sobre a Violência: A Cartografia dos Conflitos na Faixa de Fronteira Brasil, Colômbia e Peru no Estado do Amazonas. Boletim de Análise Político-Institucional, "Dinâmicas da Violência na Região Norte, IPEA, nº 36, pp. 29-41. https://repositorio.ipea.gov.br/entities/publication/a2a18042-9332-4f0a-acf0-943e9c4c3a3e

Risso, M., Calderoni, V., Brasil, L., Husek, T., Sanches, R. (2024a) Siga o Dinheiro: crimes ambientais e ilícitos econômicos em cadeias produtivas na Amazônia brasileira. Artigo Estratégico, nº 63. Instituto Igarapé. Disponível em: https://igarape.org.br/siga-o-dinheiro-crimes-ambientais-e-ilicitos-economicos-em-cadeias-produtivas-na-amazonia-brasileira/

Risso, M., Risso, M., Calderoni, V., Brasil, L., Waisbich, L., Silva, P. (2024b). Dinâmicas do Ecossistema dos Crimes Ambientais na Amazônia Legal. Artigo Estratégico, nº 64. Instituto Igarapé. Disponível em: https://igarape.org.br/dinamicas-do-ecossistema-dos-crimes-ambientais-na-amazonia-legal/

Risso, M., Sekula, J., Brasil, L., Schmidt, P., Assis, M. (2021) Illegal Gold that Undermines Forests and Lives in the Amazon: an overview of irregular mining and its impacts on Indigenous populations. Strategic Paper, nº 53. Instituto Igarapé. Disponível em: https://igarape.org.br/wp-content/uploads/2021/04/2021-04-07_SP-

53_Illegal-Gold-Mining-in-Brazil.pdf

Rodrigues, L. B., Franchi, T., Paiva, A. (2024) Da Fronteira ao Litoral: a Dinâmica Terrestre do Narcotráfico de Cocaína no Brasil em 2022. Monções, 12(24), pp. 323—352. https://doi.org/10.30612/rmufgd.v12i24.17223

Rodrigues, T., Porto, V., Freixo, A. (2018) The Transatlantic Narco-Nexus: South America, Africa, and Europe in the Contemporary Drug-Trafficking Dynamics. Revista da Escola de Guerra Naval, 24(2), pp. 378-394. https://www.portaldeperiodicos.marinha.mil.br/index.php/revistadaegn/article/view/4404

Rueda, A. (2024) One year of a new drug policy in Colombia. What are the changes? Fundación Ideas para la Paz. Disponível em: https://ideaspaz.org/publicaciones/noticias/2024-12/one-year-of-a-new-drug-policy-in-colombia

Silva, A. et al., (2025) Suspect screening and quantitative analysis of 165 contaminants of emerging concern in water, sediments, and biota using LC-MS/MS: Ecotoxicological and human health risk assessment. Science of The Total Environment, v. 963. https://doi.org/10.1016/j.scitotenv.2025.178434

Soares, R., Pereira, L., Pucci, R. (2021) Ilegalidade e Violência na Amazônia. Amazônia 2030. http://doi.org/10.59346/report.amazonia2030.202112.ed26

Sousa, A., Pfrimer, M. (2021) Narcotráfico na América do Sul: uma análise sobre violência nas redes da cadeia logística do tráfico de drogas na América do Sul (2010 — 2015). Plural, 28(2), 257-271. https://doi.org/10.11606/issn.2176-8099.pcso.2021.172027

SPTV (2017) Dois traficantes são presos após explosão de laboratório de cocaína. Disponível em: https://g1.globo.com/sp/sao-paulo/sp2/video/dois-traficantes-sao-presos-apos-explosao-de-laboratorio-de-cocaina-4480371.ghtml

UNODC (2011) Guidelines for the Safe handling and disposal of chemicals used in the illicit manufacture of drugs. New York: United Nations. Disponível em: https://www.unodc.org/unodc/en/scientists/safe-handling-and-disposal-of-chemicals-used-in-the-illicit-manufacture-of-drugs.html

UNODC (2015) World Drug Report 2015. Vienna: United Nations. Disponível em: https://www.unodc.org/documents/wdr2015/World_Drug_Report_2015.pdf

UNODC (2021) Cocaine: A spectrum of products. Cocaine Insights, n° 2. Vienna: United Nations. Disponível em: https://www.unodc.org/documents/data-and-analysis/cocaine/Cocaine_Insights_2021_2.pdf

UNODC (2022) World Drug Report 2022: Drugs and the Environment. Vienna: United Nations

UNODC (2023a) Global Report on Cocaine: Global Dynamic, Local Challenges. https://www.unodc.org/documents/data-and-analysis/cocaine/Global_cocaine_report_2023.pdf

UNODC (2023b) The nexus between drugs and crimes that affect the environment and convergent crime in the amazon basin. World Drug Report 2023. Vienna: United Nations. https://doi.org/10.18356/9789210028233c025

UNODC (2025) World Drug Report 2025. Vienna: United Nations. Disponível em: https://www.unodc.org/documents/data-and-analysis/WDR_2025/WDR25_B1_Key_findings.pdf

UNODC., CoE Brazil (2022) Brazil in the regional and transatlantic cocaine supply chain: The impact of COVID-19. Cocaine Insights, n°4. https://www.unodc.org/documents/data-and-analysis/cocaine/Cocaine_Insights4_2022.pdf

UNODC., Gobierno de Colombia (2025) Colombia: Monitoring of territories with presence of coca crops 2023. UNODC Research, Integrated Illicit Crops Monitoring System (SIMCI). Disponível em: https://www.unodc.org/documents/crop-monitoring/Colombia/Colombia_survey_report_EN_2023.pdf

Vellinga, M. (2007) The Illegal Drug Industry in Latin America: The Coca-Cocaine Commodity Value Chain. Iberoamericana. Nordic Journal of Latin American and Caribbean Studies, 37(2), pp. 89-105.

VICE News (2014) The Gangs That Inherited Pablo Escobar's Drug Empire: Cooking with Cocaine. Vice, 29 de julho. Disponível em: https://www.youtube.com/watch?v=c1EHm2_CNkM

Vugts, P. (2019) As the number of coke labs increases, so does the danger. Het Parool, 18 de novembro. Disponível em: https://www.parool.nl/english/as-the-number-of-coke-labs-increases-so-does-the-danger~b416de8e/?referrer=https%3A%2F%2Fwww.google.com%2F

Yagoub, M. (2016). Colombia's Urban Cocaine Labs: A New Phenomenon? InsightCrime, 18 de julho. Disponível em: https://insightcrime.org/news/brief/colombia-s-urban-cocaine-labs-a-new-phenomenon/

Vettorazzo, L. (2012) Traficantes de favelas do Rio proíbem a venda de crack. Folha de São Paulo, 20 de junho. https://www1.folha.uol.com.br/cotidiano/2012/06/1107975-traficantes-de-favelas-do-rio-proibem-a-venda-de-crack.shtml