

RESEARCH

Introduction Special Issue: Environmental Impacts of Illicit Economies

Daniel Brombacher¹, Juan Carlos Garzón² and María Alejandra Vélez³¹ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, DE² Fundación Ideas para la Paz (FIP), CO³ School of Economics and Center for the Study of Security and Drugs (CESED), Universidad de los Andes, COCorresponding author: Daniel Brombacher (daniel.brombacher@giz.de)

For decades, illicit economies have predominantly been studied and debated as a security problem with social and development consequences. However, the interaction between illicit economies and the environment, in cases such as illicit drug crop cultivation and drugs production, is more recent and a rather unexplored discussion—despite that it is not a new phenomenon. From an environmental standpoint, illicit economies can lead to a broad array of negative impacts, with complex interactions. This Special Issue of the *Journal of Illicit Economies and Development* seeks to enhance the evidence basis and understanding of the environmental impacts of illicit economies beyond traditional crime-focused indicators. The special issue pursues to shed more light on the manifold interlinkages between illicit economies and the environment, contributing to a growing body of research of a rather young branch of research in the field of illicit economies. The special issue gathers a broad array of phenomena, perspectives, and disciplines, combining original research and policy considerations. The Special Issue includes contributions on the environmental impacts of illicit drug crop cultivation, drug trafficking, drug production, illicit trade in bushmeat and wildlife in general, land grabbing and illicit sand mining, covering a broad range of regions and continents.

Keywords: Illicit economies; environment; green criminology; drug policies; alternative development; organized crime; environmental crimes

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For decades, illicit economies have predominantly been studied and debated as a security problem with social and development consequences. However, the interaction between illicit economies and the environment, in cases such as illicit drug crop cultivation and drugs production, is a more recent and rather unexplored discussion—despite that it is not a new phenomenon.

Amid the calls for urgent action to address climate change, habitat destruction, deforestation, land degradation and the extinction of species, illicit economies emerge as one of the keys yet understudied push factors for these challenges. These are global problems that affect all countries to a certain degree, but especially states affected by fragility and instability in the global south.

From an environmental standpoint, illicit economies can lead to a broad array of negative impacts, with complex interactions. For example, illicit drug crop cultivation, drug production and the linkages with other illicit economies such as illegal mining, wildlife trafficking, illegal logging, and land grabbing have serious environmental implications, not only for the ecosystems affected, but also for environmental governance systems (and community-based governance systems) in several regions around the world.

Illicit economies tend to be intertwined not only with other illicit economies but also with licit economies and value chains. The different levels of prohibition applied to different sets of illegal value chains directly affect the potential consequences on the environment, nature and the climate.

In some countries there is evidence of a close relationship between drug economies, land use change for extensive agriculture, and livestock farming, exacerbating the environmental harms of both the illicit

and licit value chains (See for example the work by Tellman et al. and Davalos et al. in this volume). While the nexus between illicit economies, armed conflict, insecurity, and violence is well studied, this is not the case for the manifold relationships between illicit economies and the environment and the linkages among them. The need for evidence on the more complex nature of the nexus between illicit economies and the environment is also eminent in policy debates on the issue. While the general interest in the potential environmental harms of illicit economies has grown with the pace of the evolving global debate on climate change and biodiversity, the debate is frequently based on anecdotal insights and single-case studies, lacking comparative evidence or cross-cutting empirical analysis.

However, global decision-making bodies on drugs and crime issues at the UN level as well as civil society actors have indeed recently picked up environmental concerns related to illicit economies, but there is little progress so far in nurturing crime prevention, crime control, and drug policies with empirically tested instruments and evidence-based policy interventions. Traditional indicators applied in the fields of crime and drug control heavily rely on supply control-oriented approaches, usually measuring seizures of illegal goods, interdiction efforts, or the destruction of illicit drug crops. There is no set of globally agreed upon indicators to measure the environmental impact of illicit economies, despite an abundance of potential quantitative and qualitative markers.

This Special Issue of the *Journal of Illicit Economies and Development* seeks to enhance the evidence basis and understanding of the environmental impacts of illicit economies beyond traditional crime-focused indicators. The special issue pursues to shed more light on the manifold interlinkages between illegal economies and the environment, contributing to a growing body of research of a rather young branch of research in the field of illicit economies. The special issue gathers a broad array of phenomena, perspectives, and disciplines, combining original research and policy considerations. The Special Issue includes contributions on the environmental impacts of illicit drug crop cultivation, drug trafficking, drug production, illicit trade in bushmeat and wildlife in general, land grabbing and illicit sand mining, covering a broad range of regions and continents.

The layers of the interaction between illicit economies and the environment

One of the first challenges in the discussion about the nexus between illicit economies and environmental impacts is the conceptualization of illegal vs. illicit. Categorizing an activity or behavior as 'licit/illicit' or 'legal/illegal' is quite a complex matter, socially defined and subject to change in different time and places (Portes & Haller 2005). In a trap of insecurity, criminality and marginalization, 'order' and 'authority' are contested, especially in contexts of weak state presence, as well as in frontier economies or landscapes where communities may recognize an activity as illegal but may still see such behavior as legitimate (Felbab-Brown, 2018).

Other definitions embrace the term illegal as referring to activities or goods prohibited by law, while illicit is coining socially unacceptable practices (De Theije et al. 2014). In contexts such as small-scale gold mining, for example, the academic debate refers to the notion of legal pluralism that recognizes the presence of more than one regulatory order in the same socio-political space where state legislation operates together with social regulations, discretionary arrangements, and traditional or informal systems (De Theije et al. 2014). Thus, although sometimes the limits between and labels of informality and illegality are fluid, it is analytically important to differentiate informal activities carried out as part of livelihood strategies from activities carried out by illegal armed and organized crime groups.

According to this approach, an illegal activity is it not merely characterized by its legal status but depends on the objectives for obtaining the resource rents and the mechanisms of appropriation which might include armed groups or organized crime (Rettberg, Cárdenas & Ortiz-Riomalo 2016; Rubiano et al. 2020). While this differentiation appears to be mostly well established in global drug policy or small-scale mining, it is not quite sharp in other illicit economies where the evidence basis is rather weak. Still, it seems to be relevant in areas such as wildlife trafficking and timber exploitation, among others. As in the case of drug production, at the early stage of several environmentally relevant illicit value chains, marginalized groups such as farmers, miners, and wage laborers do not tend to be part of organized crime groups. Therefore, to define the scope of illegality requires a differentiation within the illicit supply chains.

Given the current conceptual debates as well as competing usages of the key terminology, for this special issue, we have opted not to impose a single definition of the terms illicit and illegal use to the contributing authors. Therefore, the concepts of 'illicit' or 'illegal' economies are sometimes understood in the special issue as synonymous terms, referring to an economic activity formally classified as illegal by national and or international legislation and normative frameworks (Gillies, Collins, & Soderholm 2019). This definition

includes illicit goods and services and illicit transactions, accompanied by some means of enforcing mechanisms, usually by the use of threat, force, or corruption (Portes & Haller 2005).

To organize the contributions of this special issue and as a framework to analyze the interactions between illicit economies and environment, we conceptualize these interactions in three dimensions or layers (**Figure 1**).

First, *extractive illicit economies that harm the environment*, e.g., through poaching, trafficking, and illegal extraction and commercialization of natural resources. This includes trafficking in flora and fauna, but also hunting and fishery crimes, illegal mining, and illegal logging and timber trafficking. These activities are sometimes categorized as environmental crimes. However, these extractive patterns are difficult to define as they involve a broad range of activities along the continuum of de facto legal but illicit activities to de facto illegal but perceived-to-be licit activities (Nellemann et al. 2014).

The second dimension embraces *non-extractive illicit economies that harm the environment*. The best studied case is the environmental damage related to the illicit cultivation, production and trafficking of illicit drugs. While most of the documented harmful effects are related to illicit drug crop cultivation such as coca bush, opium poppy, cannabis, or khat, there is growing evidence of the environmental harms of synthetic drug production and consumption as displayed by the contribution of Pardal and Coleman (2021) to this volume, or recent studies exploring the effect of methamphetamine pollution on fish populations (Horký et al. 2021). Deforestation, the growing of drug crops as monocultures, pollution of waters, and illegal dumping sites of precursor chemicals, as well as the high carbon footprint of inhouse cultivation, are some of the most eminent effects of illicit drug economies.

In both cases—the first and the second layer—value chains towards consumer markets are frequently intertwined with legal supply chains and markets, depending on the legal status of the product, i.e., timber vs. illegal drugs. For both dimensions there are well documented links with other forms of organized crime, including firearms smuggling, human trafficking, maritime piracy and money laundering, in complex and local and global networks (Andriani 2017). Both dimensions are frequently embedded in armed conflict, controlled or taxed by insurgents, criminal groups, or corrupt officials along the way (Walker 2021). Furthermore, within the range of both dimensions, marginalized communities tend to participate in the market as cheap labor force, for example by cultivating illegal drug crops, or by providing inputs for goods and services.

The third dimension comprises the impacts *of the State's responses to illicit economies*. A case that illustrates this interaction is the forced eradication of illicit drug crops, most notably in the case of aerial spraying of drug crops with potent herbicides. The use of agrochemicals includes risks for the health and food security of affected communities and for the environment. Potential non-intended consequences to the environment include water pollution, deforestation and negative impacts on biodiversity. Other drug policy interventions, including alternative development programs, might also have harmful effects on the environment depending on the alternative sources of income promoted and if monocropping is being applied (Barrera-Ramirez

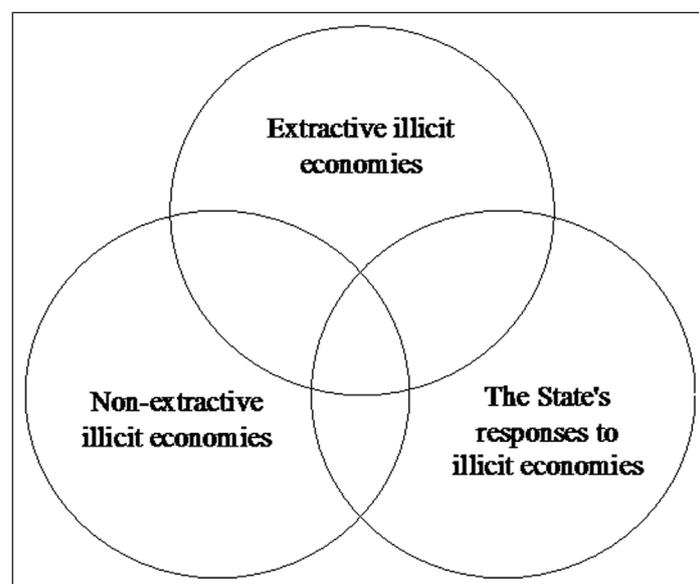


Figure 1: The layers of the interaction between illicit economies and the environment.

et al. 2019, Kramer et al. 2014). In other illicit economies enforcement efforts have also replicated the trend towards enforcement and militarized responses, promoting a ‘fences, fines, and arrests’ approach, potentially weakening or excluding decentralized conservation models based on the collaborative work with communities (Duffy 2016).

Towards a better understanding of impact

While there is a growing recognition that the extractive illicit economies of the first layer have reached significant global proportions and a devastating impact, it is less clear what are the harms and impacts inflicted by the second and third layers previously described. While there is a certain understanding *that* illicit drug crop cultivation or the production of synthetic drugs cause impacts on ecosystems and biodiversity, there is little understanding and poor evidence on *how* they do so and how those effects may be measured and addressed. The same is true when seeking to identify the (non-intended) environmental effects of government interventions in addressing illegal economies.

This challenge is exemplary in the case of drug crop growing and its effect on the environment: Academic literature has discussed the complex relationship between coca crops and deforestation, contributing to a more nuanced understanding of its effects. Recent research shows that coca crops are not necessarily the most important *direct* driver of deforestation, as commonly assumed for quite some while. Instead, coca crops are a key *indirect* determinant of deforestation since they create a permissive environment for the establishment of other legal and illegal activities in sensitive environmental settings, such as roads and cattle ranching, that directly affect deforestation (Erasso & Vélez 2020). For the case of Colombia, some scholars argue that the presence of illicit coca crops is to be understood as a symptom, not a driver of the expansion of the agricultural frontier (Dávalos et al. 2011). Prem et al. (2020) find that the effect of the demobilization of the Revolutionary Armed Forces of Colombia (FARC, by its acronym in Spanish) on deforestation cannot be explained by the higher prevalence of coca growing in the affected communities, but that deforestation is exacerbated by land intensive economic activities. Negret et al. (2019) report that the proximity to coca plantations exhibited at the grid level a positive relationship with deforestation between 2000 and 2010, but its predictive power only generated a loss of 3% in the predictive capacity of the model when excluding this and the variable ‘armed conflict.’

In Bolivia, on the other hand, regarding the effect of the State response to illicit economies, Bradley & Millington (2008) report lower forest cover losses’ rates in presence of coca crops but an increase in those rates when legal substitutes for the illegal crops became dominant given policy interventions. The authors suggest two potential mechanisms to explain their results: Firstly, labor force in coca substitutes could be less demanding and enable growers to allocate time to deforestation. Secondly, coca substitutes do not produce the same income nor economic stability, thus, growers look for alternative income sources. In fact, in terms of the effect of forced eradication, studies for the Colombian case found an expansion of coca crops to more remote areas and strategic environmental areas in the aftermath of eradication campaigns (Dávalos et al. 2016; Rincón-Ruíz & Kallis 2013; Rincón-Ruiz et al. 2013). This outlook into this strand of research clearly shows how complex the interplay between illicit economies and the environment appears is, how the different layers introduced here interact and how limited simplistic assumptions may appear to be.

A global discussion has been gaining momentum as concerns about climate change and environmental degradation grow. In the field of public policy, while there are already multilateral agendas and regime-building efforts in place—such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora—the responses to prevent and contain the impact of illicit economies on the environment is given yet a high priority while facing many obstacles. As the Global Initiative Against the Transnational Organized Crime states, ‘national law enforcement agencies, non-governmental organizations and international bodies work apparently tirelessly to find solutions, but all indications are that the problems go beyond both conservation measures and criminal justice responses.’ While political will has been growing, policies are frequently rather poorly developed.

This challenge becomes quite apparent at the technical level of how the success of counterefforts is measured and which target indicators are picked. The traditional set of indicators to measure the performance and development of illicit economies and related countermeasures are mostly focused on crime-inherent and law enforcement related aspects: Illicit drug economies are measured and analyzed against illicit drug crop monitoring data, seizures of illicit drugs, arrests of traffickers, or seized assets. A similar pattern is seen in other related economies in the realm of nature: the analysis of illicit wildlife trafficking focusses on seized rhino horn or pangolins, logging on cleared forests or seized timber and predatory mining by the number of identified digging sites.

However, this exemplary set of indicators does not allow to measure the environmental *impact* of illicit economies. Most of those indicators are a direct function of law enforcement efforts or do only superficially shed light on potential degradation effects of illicit economies. The secondary effects—such as the carbon footprint of illicit economies, the loss of biodiversity, socio-environmental effects, land use change, and the pollution of waters or the degradation of soils are still rather poorly understood.

The discussion about the environmental impacts of illicit economies has been strongly driven by environmental activism and civil society organizations. The *green criminological perspective* has focused on conceptualizing the environmental crimes, exploring and uncovering various types of environmental crimes, and analyzing the environmental policing and enforcement (Walters 2014). Additionally, different articles and reports, with an interdisciplinary approach, identify the rather obvious impacts of the first-layer environmental crimes but they frequently do not address other illegal economies and their interactions.

Outline of the Special Issue

Given the apparent lack of evidence and sound policy responses to address the three dimensions of the linkages between illicit economies and the environment, this Special Issue seeks to make a contribution to overcome the massive breaches in studying the nexus between illicit economies and the environment.

After an open call and a multi-stage peer review and editorial process, in this special issue we gather articles that address this emerging discussion from different perspectives, covering all three above-mentioned dimensions of the linkages between the environment and illicit economies, spanning a broad range of illicit and illegal economies as well as geographical regions and environmental systems. We sought to establish a broad array of methodologies in order to identify potential future research approaches that may be helpful in filling the evident empirical gaps on the nexus at stake here. This research agenda is still under construction, with manifold challenges and uncertainties regarding data availability. Due to the clandestine character of illicit economies and actors subject of study primary data is highly relevant, but scarce.

First-layer studies are more developed as a research agenda, given the direct impact of extractive illicit economies on nature and the better data availability in this field. Therefore, an important focus of the selected articles lies on the second layer phenomena, notably the diverse impacts of illicit drug production and drug trafficking, mainly exploring the effect of coca crop cultivation and trafficking on the environment. This is not a surprising focus, given the market size of this activity and the location of coca crops in highly fragile ecosystems in the Andean-Amazon countries. For the same reason, research on the nexus of illicit economies and the environment has also been focusing on drug economies, notably on coca crops cultivation and cocaine production.

Directly in line with the second dimension is the contribution by Dávalos et al., who explore the frontier dynamics of forests, coca, and conflict as key variables to understand the deforestation of the Colombian Amazon area. Based on a longitudinal analysis, the authors seek to analyze through structural equation models the effects of different variables on deforestation, measured by the shifting deforestation frontier. A key finding is that both the spatial congruence of armed conflict and infrastructure development are associated with growing deforestation, even though this is exceeded by the impact of grassland growth. The authors conclude that illicit coca cultivation is indeed directly associated with the proliferation of armed conflict and grassland growth; however, according to the authors, the relationship between coca cultivation and deforestation is therefore indirect and secondary to the overall push of the agricultural frontier into pristine forests. Dávalos et al also contributes to the understanding of the impacts of the State's responses to illicit economies by showing how eradication by aerial fumigation (but not manual eradication) increase conflict, and conflict promotes deforestation. They argue that aerial fumigation is both a direct driver of conflict and an indirect driver deforestation via conflict victims. On the other hand, they show how other State's responses such as infrastructure spending, reduces coca cultivation.

Kendra et al. on the other hand, build their analysis on qualitative research in two of the most notorious coca growing regions in Peru, the Upper Huallaga and the Monzón valley. The authors explore the socio-environmental challenges and unintended consequences of supply control efforts, ranging from forced eradication of coca crops to development-oriented interventions, making a qualitative contribution to our understanding of the third, response-oriented dimension of the nexus at stake here. The authors argue that while overall coca cultivation has been reduced through a decade-long combination of forced eradication and alternative development efforts, these policies tend to reproduce structural social and environmental deficits. According to their fieldwork-based findings, the authors conclude that alternative development interventions were not inclusive, that eradication efforts exacerbated precarity for already marginalized farmers and contributed to displace them into remote and environmentally sensitive forests to evade state control and reinitialize coca growing.

Tellmann et al. further develop our understanding of illicit drug economies and land use change beyond the traditional drug crop cultivating areas, exploring a rather understudied nexus pattern in the second dimension of illicit economies and the environment. While there is evidence on the relationship of massive drug trafficking, deforestation, and loss of biodiversity in Central America, the understanding of the long-term impact on territorial control and land ownership is still poor. Using a mixed method approach and rich data set, the authors contribute to the understanding of the patterns of shifting land control in areas heavily affected by drug trafficking in Guatemala and Honduras. Tellman and coauthors propose a typology of land control and use it to estimate how drug trafficking initiates shifts from public lands and indigenous territories to private large holdings. They estimate that over 1,600,000 ha of forest were often converted to pastures for cattle in Guatemala and Honduras, between 2000 and 2019, across regions where land control shifted away from state, communal, and smallholders to private large holders.

In order to enhance our understanding of policies in the third dimension of this issue, the policy commentaries from Santos et al. and Bernal et al. deliver practical insights from development and policy interventions on the complex linkage of coca cultivation and deforestation in Colombia. Both commentaries provide direct implications for similar contexts in Latin America, Southeast Europe, Asia and North Africa, suggesting evidence-based policies in order to enhance the environmental effectiveness of state responses to illicit economies. Based on the experience of innovative alternative development interventions in protected areas, Santos et al. suggest aligning drug control and environmental policies towards a green concept of alternative development, embracing interventions such as agroforestry, community-led forest governance, and payments for ecosystem services, a novel approach in the field of drug policy that requires impact evaluations. Bernal et al. provide a policy analysis and recommendations for areas classified as national parks under Colombian law, increasingly affected by illicit coca cultivation as well and where currently more than 4% of total coca crops in the country are located. With a critical analysis of the public policies to address rampant illicit coca cultivation in national parks, they conclude that neither the environmental nor the drug control interventions have managed to address the issue in a sustainable manner, lacking an appropriate level of coherence between both strands of public policy formulation and implementation. The authors identify an almost complete absence of joint indicators, strategies, and goals between the realms of environment and of drug control, developing a set of recommendations on how to harmonize the conflicting agendas.

Moving from coca crops and cocaine trafficking in Latin America, Pardal and Colman analyze the synthetic drug economy in Flanders/Belgium, and in particular how MDMA has increasingly led to massive environmental damage through illegal dumping sites and practices, also a rather understudied phenomenon within the range of the second dimension of the nexus approach taken here. Their analysis use a cross-comparative analysis of media coverage of dumping sites for residual waste from synthetic drug production and data on this issue published by the Belgian Federal Police. While there is broad evidence on a growing level of synthetic drug production in Flanders and surrounding areas in the Netherlands, the research shows that the real scope of the environmental damage inflicted by the illegal dumping sites and practices is poorly understood and systemized.

As Magliocca et al. show, the environmental damage caused by drug crop cultivation, drug production, and badly informed drug policies is partly replicated in the interplay of prohibition and criminal markets in other illicit economies. Based on a global commodity chain and complex adaptive systems foundation, the authors apply a comparative approach to three different illicit supply networks from the first and second layer, i.e., cocaine, illegal wildlife trade, and illegal sand mining, developing a conceptual framework to analyze and compare the functional, spatial and temporal natures of highly diverse illicit supply networks. The authors establish a set of descriptors, including geographical space, value variation, and levels of prohibition, described as 'relative illicitness.' Based on the suggested classification system of illicit supply networks, the authors seek to analyze the potential adaptive behaviors of those networks. A key conclusion from the comparative analysis is that the stronger the level of prohibition that applies of an illicit supply network, the higher the potential geographic displacement of illicit economies, associated with increased environmental harms, as mentioned by Kendra et al. as well.

To the global comparative analysis of Magliocca et al. on adaptive behavior in illegal wildlife trafficking and other illicit markets, the contribution of Gore et al. adds a local perspective on the extractive urban wild meat supply chain and sanction avoidance in the Republic of Congo. With the growing scope of global illegal wildlife trade and the environmental and public health-related harms associated with it, a key concern is the identification of sound countermeasures. Enforcement tends to be interpreted as the silver bullet in both the fields of drug control and wildlife trafficking, despite the above-mentioned shortfalls of such an approach and its potential harms in the logic of the third dimension of this chapter. However, the role of development in global drug policies has steadily enhanced in the past years (Brombacher & Westerbarkei

2019), while in the field of wildlife trafficking a strong focus on interdiction efforts prevails. Given the rather livelihood-oriented character of the bushmeat value chain studies in this piece, deterrence and enforcement may not be the most effective approach to tackle all stages of this market, as in other first layer cases in this volume. The authors offer fieldwork-based insights into the impacts of deterrence efforts in the case of wild meat supply chains. They showcase which patterns of adaptive behavior are developed by different actors involved in this illicit economy, applying the concept of restrictive deterrence in order to contribute to a better understanding of how participants in the illegal wildlife economy respond to sanction threats.

Conclusion and the future agenda

This overview introduced key themes of the discussion on the environmental impacts of illicit economies, proposing a novel framework based on the contribution of the authors and the current academic and political state of debate. A major share of the literature on the interactions between illicit economies, organized crime, and environmental impacts focuses on specific 'environmental crimes' of the first layer outlined here. This is an agenda that has gained traction amid the discussions on climate change and the protection of the planet.

However, it is less clear how non-extractive illicit economies within the second dimension, such as illicit drug production, inflict direct and indirect negative consequences on biodiversity and ecosystems. By addressing this perspective, this Special Issue provides insights into this field.

In conceptual and methodological terms, the study of the interactions between illegal economies and the environment requires an interdisciplinary approach, innovation, and openness to experimentation, not least because of the clandestine character of the markets at stake. Readers will find that authors deal with this complexity through a diverse set of multiple variables that influence each other and are often part of a *feedback loop*—a vicious or virtuous circle that accelerates or decelerates a specific trend. This approach contributes to revealing unknown and inconspicuous connections. This may both be found in the case of synthetic drug production and its massive environmental damage in Flanders, and in gauging the more realistic dimensions of the effects of illicit coca growing on deforestation. This framework is not only relevant for illicit drugs, but it can also be useful for other illegal economies such as illicit mining.

One of the major challenges is the lack of robust data and information. This seems to be one of the major reasons why the study of the nexus at stake here still relies heavily on a traditional set of law enforcement related indicators, while environmental indicators are not systemically monitored nor coherently defined. This challenge is exacerbated by the tendency that both scholars and policymakers in the field of illicit economies in their majority still originate in the realm of security with a rather modest level of familiarity of environmental research and indicators. Vice versa, environmentalist scholars frequently struggle with the study of illicit economies, organized crime groups, and the clandestine nature of the subject at stake.

While data and environmental indicators appear to be more accessible and better understood in the first-dimension framework of extractive crimes, second layer phenomena still lack this basis. Green criminology and the emerging global attention to the matters may help to further develop this research agenda. This Special Issue seeks to contribute to address this challenge. The authors offer a wide range of data and information sources and methodologies, ranging from the use of satellite images to interviews with farmers and media monitoring. At the current stage of the debate, it is considered to be relevant to allow for a highly diverse of methodologies and approaches and to promote mutual responsiveness.

Within the third dimension, as suggested here, the debate appears to be even more incipient. Alerts for the impact of environmental crimes and illegal economies have led to calls for the state to act urgently across different countries and regions as well as at the global stage. However, there are still few studies on the consequences of government crackdowns and other interventions on the environment, potentially with the exception of aerial spraying of drug crops where a certain evidence basis has emerged. In a difficult balance of costs and benefits, with many trade-offs, negative consequences for biodiversity and ecosystems rarely enter the equation. There is an emerging debate about what has been called green militarization—the use of military personnel, training, technologies, and partnerships in the pursuit of conservation efforts—and its unforeseen effects (Lunstrum 2014). This is an evolving agenda, which has been gaining strength in the global south, e.g., in Brazil and Colombia.

Finally, research and global debate has been rather regionalized, as also clear in this Special Issue. While a major share of the debate on second- and third-layer phenomena from the realm of drugs has been dedicated to Latin America and only to a smaller degree on Asia, first-layer studies have also focused on Africa, notably in the case of wildlife. While there is anecdotal evidence and single case studies that many of the direct linkages between drug economies and the environment can also be found in Asia, Southeast Europe, and Northern Africa, there is little systematic research as compared to Latin America. At the same time, illicit

trafficking of flora and fauna is a major challenge in Latin America, but research has been more extensive in Africa and partly Asia as destination region.

In the face of climate change, biodiversity loss, and increasing deforestation, environmental impacts of illicit economies are not a minor issue. Further, traditional enforcement strategies have not managed yet to internalize the negative externalities on the environment. To address these challenges in a more evidence-based and integrated fashion, there is a need to promote a reinvigorated academic debate and an empirically better-informed set of indicators and regulatory policies that are nurtured by *both* environmental and crime control considerations, not *either or*.

This special edition seeks to contribute to this endeavor, creating a platform for the exchange of knowledge, methodologies and perspectives around the complex relationship between the licit and illicit economies and their impacts on the environment.

Competing Interests

The authors have no competing interests to declare.

Author Information

Daniel Brombacher, Head, Global Partnership on Drug Policies and Development (GPDPD) at Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Berlin, Germany. The article reflects exclusively the opinions of the authors and not those of the Federal Ministry of Economic Cooperation and Development (BMZ) or GIZ GmbH.

Juan Carlos Garzón, Researcher at Fundación Ideas para la Paz (FIP – Ideas for Peace Foundation), Bogotá, Colombia.

María Alejandra Vélez, Associate Professor, School of Economics and Center for the Study of Security and Drugs (CESED), Universidad de los Andes, Bogotá, Colombia.

References

- Andriani, R.** 2017. Serious, and growing. Environmental crime is a threat to peace and security and requires an organised response. *OurPlanet, the magazine of UN Environment*. Nairobi, Kenya.
- Barrera-Ramírez, J, Prado, J and Solheim, H.** 2019. Life cycle assessment and socioeconomic evaluation of the illicit crop substitution policy in Colombia. *Journal of Industrial Ecology*, 23(5): 1237–125. DOI: <https://doi.org/10.1111/jiec.12917>
- Bradley, AV and Millington, AC.** 2008. Coca and Colonists: Quantifying and Explaining Forest Clearance under Coca and Anti-Narcotics Policy Regimes. *Ecology and Society*, 13(1). DOI: <https://doi.org/10.5751/ES-02435-130131>
- Brombacher, D and Westerbarkei, J.** 2019. From Alternative Development to Sustainable Development: The Role of Development Within the Global Drug Control Regime. *Journal of Illicit Economies and Development*, 1(1): 89–98. DOI: <https://doi.org/10.31389/jied.12>
- Dávalos, LM, et al.** 2011. Forests and Drugs: Coca-Driven Deforestation in Tropical Biodiversity Hotspots. *Environmental Science & Technology*, 45(4): 1219–1227. DOI: <https://doi.org/10.1021/es102373d>
- Dávalos, LM, Sánchez, KM and Armenteras, D.** 2016. Deforestation and Coca cultivation Rooted in Twentieth-Century Development Projects. *BioScience*, 66(11): 974–982. DOI: <https://doi.org/10.1093/biosci/biw118>
- De Theije, MEM, et al.** 2014. Engaging legal systems in small scale gold mining conflicts in three South American countries. In: Bavinck, M, Mostert, E and Pellegrini, L (eds.), *Conflict over natural resources in the global south – conceptual approaches*, 129–146. London: CRC Press (Taylor & Francis).
- Duffy, R.** 2016. War, by Conservation. *Geoforum*, 69: 238–248. DOI: <https://doi.org/10.1016/j.geoforum.2015.09.014>
- Erasso, C and Vélez, MA.** 2020. *¿Los cultivos de coca causan deforestación en Colombia?* Documento Temático #5, Universidad de Los Andes – CESED. Available at: <https://cesed.uniandes.edu.co/los-cultivos-de-coca-causan-deforestacion-en-colombia/>.
- Felbab-Brown, V.** 2018. The Threat of Illicit Economies and the Complex Relations with State and Society. In Comolli, V (ed.). *Organized Crime and Illicit Trade*. eBook: Palgrave Macmillan. DOI: https://doi.org/10.1007/978-3-319-72968-8_1
- Gillies, A, Collins, J and Soderholm, A.** 2019. Addressing the Development Implications of Illicit Economies: The Rise of a Policy and Research Agenda. *Journal of Illicit Economies and Development*, 1(1): 1–8. DOI: <https://doi.org/10.31389/jied.17>

- Horký, P**, et al. 2021. Methamphetamine pollution elicits addiction in wild fish. *Journal of Experimental Biology*, 224: jeb242145. DOI: <https://doi.org/10.1242/jeb.242145>
- Kramer, T**, et al. 2014. *Bouncing Back. Relapse in the Golden Triangle*. Amsterdam: Transnational Institute.
- Lunstrum, E**. 2014. Green militarization: anti-poaching efforts and the spatial contours of Kruger National Park. *Annals of the Association of American Geographers*, 104(4): 816–832. DOI: <https://doi.org/10.1080/00045608.2014.912545>
- Negret, PJ**, et al. 2019. Emerging evidence that armed conflict and coca cultivation influence deforestation patterns. In *Biological Conservation*, July. DOI: <https://doi.org/10.1016/j.biocon.2019.07.021>
- Nellemann, C**, et al. (eds). 2014. *The Environmental Crime Crisis – Threats to Sustainable Development from Illegal Exploitation and Trade in Wildlife and Forest Resources*. A UNEP Rapid Response Assessment. United Nations Environment Programme and GRID-Arendal.
- Prem, M, Saavedra, S and Vargas, JF**. 2020. End-of-conflict deforestation: Evidence from Colombia's peace agreement. *World Development*, 129(84): 82–96. DOI: <https://doi.org/10.1016/j.biocon.2019.07.021>
- Portes, A and Haller, W**. 2005. The Informal Economy. In: Smelser, N and Swedberg, R (eds.), *The Handbook of Economic Sociology*, 403–425. 2nd edition, New York: Russell Sage Foundation.
- Retberg, A and Ortiz-Riomalo, JF**. 2016. Golden Opportunity, or a New Twist on the Resource Conflict Relationship: Links Between the Drug Trade and Illegal Gold Mining in Colombia. *World Development*, 18: 82–96. DOI: <https://doi.org/10.1016/j.worlddev.2016.03.020>
- Rincón-Ruiz, A and Kallis, G**. 2013. Caught in the middle, Colombia's war on drugs and its effects on forest and people. *Geoforum*, 46: 60–78. DOI: <https://doi.org/10.1016/j.geoforum.2012.12.009>
- Rincón-Ruiz, A, Pascual, U and Flantua, S**. 2013. Examining spatially varying relationships between coca crops and associated factors in Colombia, using geographically weight regression. *Applied Geography*, 37: 23–33. DOI: <https://doi.org/10.1016/j.apgeog.2012.10.009>
- Rubiano, MJ, Vélez, MA and Rueda, X**. 2020. *Minería de oro artesanal y de pequeña escala. Estrategias para su formalización y diferenciación de la minería ilegal*. Documento Temático #11, Universidad de Los Andes – CESED. Available at: <https://cesed.uniandes.edu.co/mineria-de-oro-artesanal-y-de-pequena-escala-estrategias-para-su-formalizacion-y-diferenciacion-de-la-mineria-ilegal/>.
- Walker, S**. 2021. *Expanding the toolkit to tackle organized environmental crime*. Geneva: Global Initiative Against Transnational Organized Crime.
- Walters, R**. 2014. Organized Crime and the Environment. In: Bruinsma, G and Weisburd, D (eds.), *Encyclopedia of Criminology and Criminal Justice*. New York, NY: Springer. DOI: https://doi.org/10.1007/978-1-4614-5690-2_285

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