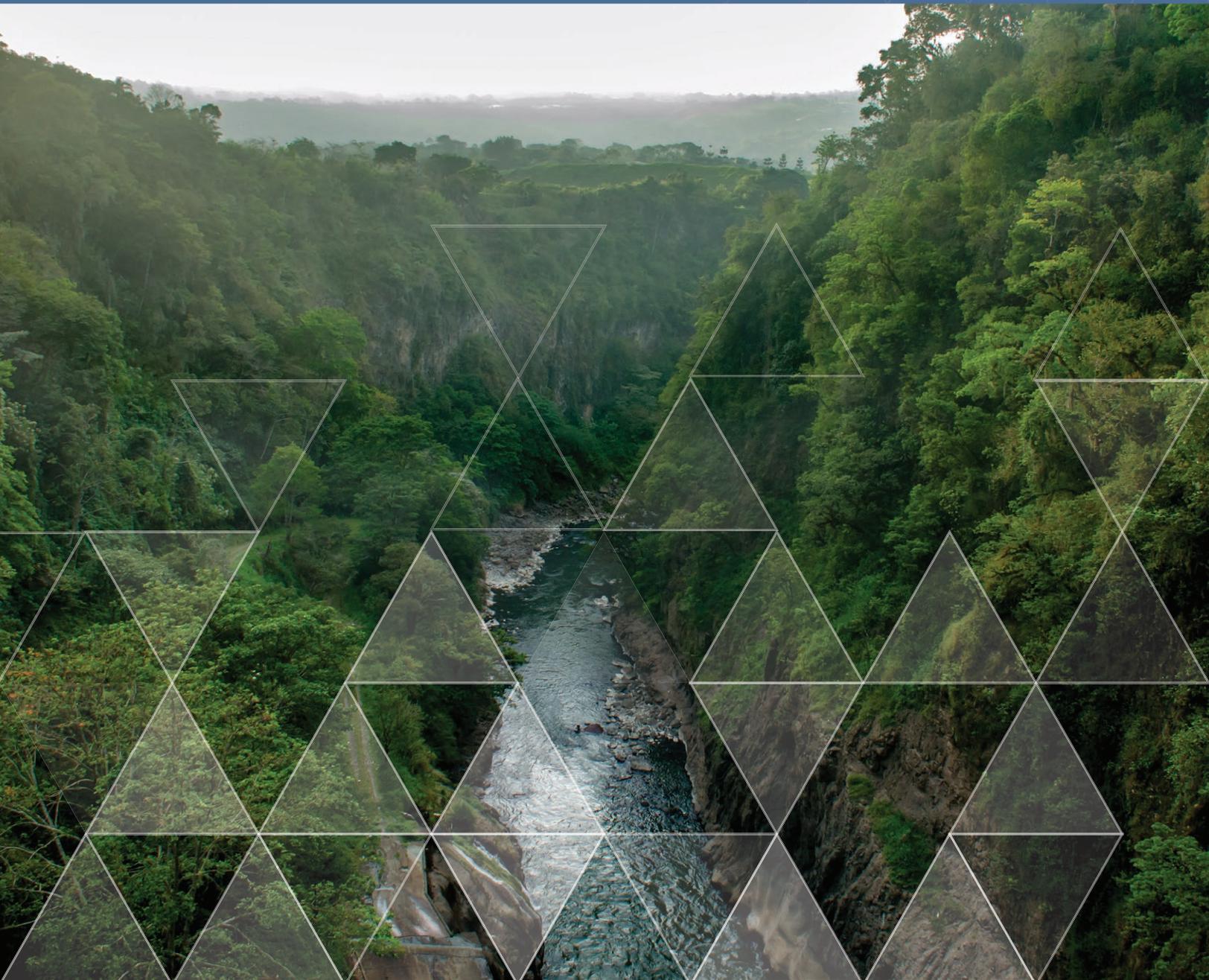


IMPACTS OF EXTRACTIVE INDUSTRY AND INFRASTRUCTURE ON FORESTS

CENTRAL AMERICA



Laura Aileen Sauls and Herman Rosa

Assessment and Scoping of Extractive Industries and Infrastructure in Relation to Deforestation: Central America

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Acronyms and Abbreviations

| Acronym | |
|---------|---|
| APP | Alliance for Prosperity (Alianza para la Prosperidad) |
| ASM | artisanal small-scale mining |
| BNDES | Brazilian National Development Bank |
| CAFTA | Central American Free Trade Agreement |
| CELAC | Community of Latin American and Caribbean States |
| CSR | corporate social responsibility |
| EII | extractive industry and infrastructure |
| EITI | Extractive Industries Transparency Initiative |
| FDI | foreign direct investment |
| FPIC | free, prior and informed consent |
| GIS | geographic information system |
| ha | hectare |
| IACHR | Inter-American Court of Human Rights |
| ICSID | International Centre for the Settlement of Investment Disputes |
| IDB | Inter-American Development Bank |
| IFI | International Financial Institution |
| ILO | International Labor Organization |
| MIDP | Mesoamerican Integration and Development Project (also known as Proyecto Mesoamérica) |
| PPP | public-private partnership |
| REDD+ | Reducing Emissions from Deforestation and Forest Degradation |
| UNDRIP | United Nations Declaration on the Rights of Indigenous People |
| UNFCCC | United Nations Framework Convention on Climate Change |

Executive Summary

This report is part of a larger study commissioned by the Climate and Land Use Alliance (CLUA) to explore the impacts of extractive industries and infrastructure (EII) on forest loss and degradation and community rights in the Amazon, Mexico and Central America, and Indonesia.

Forest conversion for agriculture expansion, cattle ranching, timber production, and hydrocarbon and mineral extraction has long played, and continues to play, a central role in the economies of Central America. While agriculture and livestock expansion is by far the largest direct driver of forest loss, the effects of extractive industry and infrastructure (EII) are important considerations in understanding threats to forest maintenance, emissions avoided and community rights. Many of these effects are indirect, and it is not always the largest scale projects that pose the greatest threat to forests. Local access and feeder roads, which in isolation may not seem noteworthy, cumulatively create conditions for significant deforestation and an increased threat to Indigenous and community land rights. In addition, frontier zones between neighboring countries can be sites where lack of spatial planning and clear control over resources may lead to rapid degradation and deforestation.

Evidence in the region, from the 1990s onwards, shows that road expansion has correlated directly with forest clearing. Roads have played a clear role in facilitating agricultural expansion of oil palm and livestock. Road expansion data from northern Guatemala suggest that in addition to large-scale planned roads, smaller-scale and local road building is influencing forest cover change, especially along the border with Mexico. Large increases in both planned larger-scale and local road building in the Mosquitia in Honduras and Nicaragua thus may also have high potential for forest loss. In some regions, road building interacts in dangerous ways with the narco-economy, facilitating its growth and laundering of profits in land, plantations and ranching – often involving further forest clearing and weakening community-based resource management institutions, both Indigenous rights and forestry enterprises. This type of infrastructure expansion can also have significant impacts on biodiversity, especially on megafauna and key predators.

Dams have had significant impacts on community land rights in Honduras and Panama, and lack of consultation has led to conflict in some cases. Dams also open up areas to further colonization, and this is of particular concern for the Patuca dam complex in eastern Honduras.

Literature on metallic and non-metallic mining is dominated by discussion of Guatemala, and often in less forested areas in the western part of the country. Our analysis, and what little the literature reveals, suggests this mining does not have a high level of direct impact on deforestation, except in a few key cases – the nearly on-line Cobre Panamá project, for example, could lead to significant deforestation and emissions increases. Even in areas where the direct impact of mining is low, there could be significant impacts on community-level rights and environmental protection. In addition, large-scale and artisanal, small-scale extractives expansion in certain areas threatens community-based forestry experiences.

Beyond global prices for minerals and petroleum, national and regional political and policy contexts also drive increasing investment in EII. Regional integration plans (especially around energy, ports, and roads) together with national concerns for increased generation of and access to energy shape public and external infrastructure investment. National policy reforms in Honduras and the pre-April 2018 political context in Nicaragua have been especially favorable to investment in mining and hydrocarbon extraction – large-scale in Honduras and smaller-scale and artisanal in Nicaragua.

The public sector's capacity to regulate EII is uneven and is generally quite limited – either because of resource constraints or political choice. Guatemala and Panama currently have some form of moratoria on mining, offering a window of opportunity to develop safeguards, licensing procedures, and laws and mechanisms for consultation. El Salvador has had a full moratorium on mining in place since March 2017. Room for maneuver is much more limited in Honduras and Nicaragua due to the legal and political contexts. In those instances, company corporate social responsibility (CSR) and reputational initiatives, as well as with international financial institutions (IFIs), in particular the Inter-American Development Bank and World Bank, may offer higher potential and safer modes of engagement toward improving governance of EII.

The remaining forested areas in Central America, mostly along the Caribbean/Atlantic coast and in highland areas, significantly overlap with Indigenous and traditional communities, many of which practice lower impact forest-based livelihood strategies. New roads, new opportunities for electricity generation and for new migration are pushing into these areas. Thus, while mining and hydrocarbon extraction may not directly drive deforestation in Central America, the displacement and conflict that surrounds them could influence the future of forest cover in the region, aided and abetted by infrastructure development, and in particular local road building. In that context, the following areas seem especially important in considering the extraction-infrastructure-deforestation complex and the implications for Indigenous and community forest users' claims:

- Guatemala: Petén (especially along the borders with Mexico and Belize), far western Highlands (San Marcos, Quetzaltenango) for mining/protected area overlap and infrastructure expansion
- Honduras: the Mosquitia (Gracias a Dios, Olancho), especially Sico-Paulaya watershed for infrastructure expansion and community lands, the Northern Triangle border area
- Nicaragua: Northern and Southern Caribbean Coast Autonomous Regions (RACCN and RACCS) for infrastructure expansion and mining
- Panama: Chiriquí region for planned infrastructure development, Comarca Ngäbe-Buglé (adjacent to dam areas), Darién peninsula for electricity integration infrastructure.

A. Introduction

Background/context

Central America extends geographically from the southern border of Mexico through Panama in the south (Figure 1). The countries in this region have historically derived a significant portion of their income from commodity and extractive industry exports. Today, agricultural conversion and expansion, cattle ranching, timber production, and hydrocarbon and mineral extraction continue to play important roles in the economies of Central America, with migrant remittances primarily from the United States as a newer and important source of income. These sources of income have been historically associated with land cover conversion from forest or mosaicked landscape into more monoculture or urban uses.

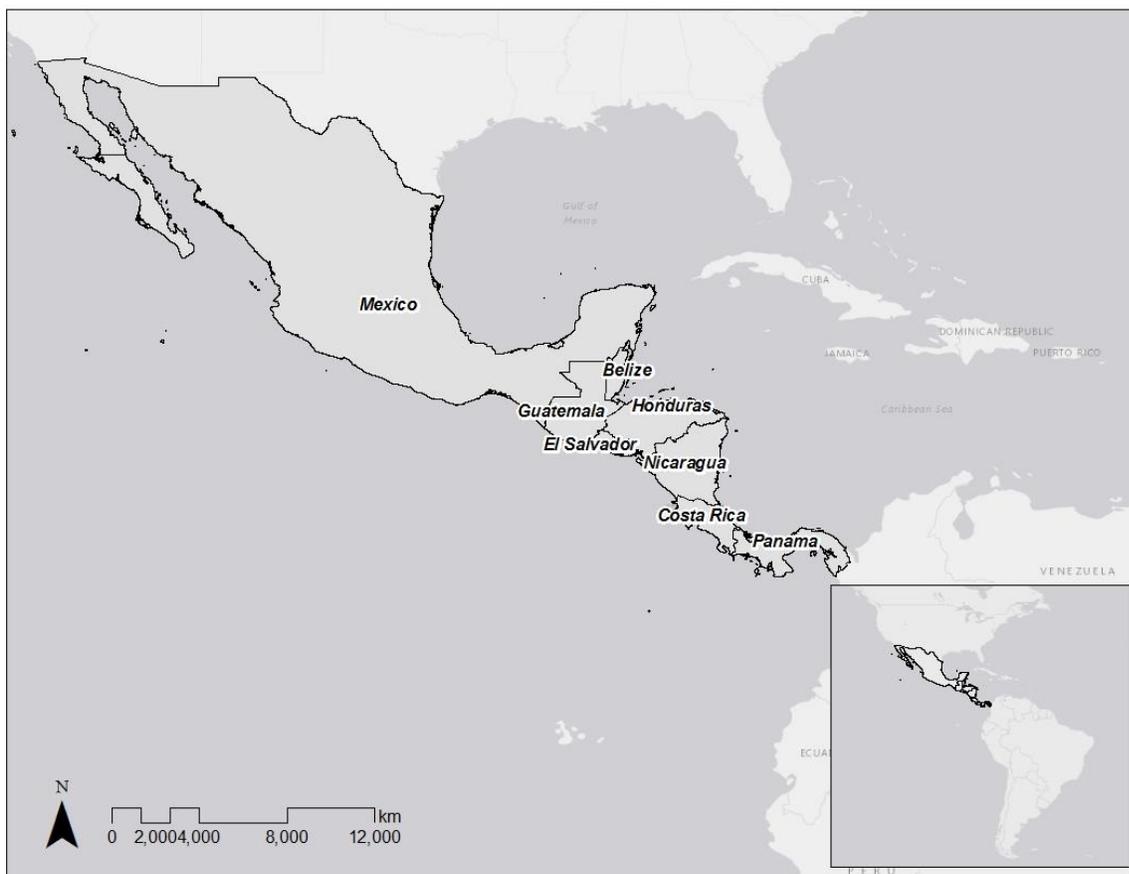


Figure 1. Map of Central America, showing land cover and national boundaries. Forested areas are primarily on the Atlantic/Caribbean side.

While a growing concern with the conservation of nature and traditional livelihoods over the past 30 years has led Central American governments to set aside large protected areas, most governments also continue to opt for the liberalization of investment for both primary products

and industrial exports as core economic growth strategies (1). Governments like those of Honduras have pushed for liberalization (i.e., removing or reducing restrictions on trade between nations) and opening the economy to foreign capital, offering competitive tax and royalty incentives to attract investors in a ‘race to the bottom’ (2). The Porfirio Lobo government’s “Honduras is Open for Business” motto is indicative of this approach to economic growth (3).

Although global prices have varied in the past 15 years, demand for petroleum products and high-value minerals like gold, silver, and copper remains high and a key part of some countries’ development strategies (4). The liberalization of these industries in Central America incentivizes certain types of behaviors by ‘junior’ companies that can lead to negative impacts on forests and communities. “Juniors” are foreign-run, private, and often Canadian companies that intend to sell out to large ‘globals’ upon securing a deposit and consequently have little immediate incentive to undertake due diligence and outreach to affected communities around potential concession sites (2). Ultimately, the fact that many powerful actors have incentives to see extraction proceed, including international financial institutions, foreign companies and host governments, has contributed to a sense of unruliness around extraction in the region (5).

Across changing administrations, government commitments to regional integration through infrastructure remain strong, with the Plan Pueblo-Panama – now the Mesoamerican Integration and Development Project (MIDP, also known as Proyecto Mesoamérica) – a key example (6). Often attributed to the political agenda of then-Mexican President Vicente Fox, the Plan Pueblo-Panama reflected the efforts of national and international policymakers, with the Inter-American Development Bank (IDB) as a strong supporter, to jumpstart economic development post-Hurricane Mitch (7). In theory, greater integration – through transportation, energy, and communications integration – in the region could support recovery and development and expand the reach of local markets in a context where trade protectionism was increasingly on the wane; however, this integration process started and continues to be implemented through fairly top-down mechanisms (6). Although local communities often support transportation infrastructure improvements due to the new opportunities they bring, the effects on forests are typically negative (8).

All countries in the region have signed the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC),¹ but recent reforms in sectors like oil and gas and investment incentives may lead to increased emissions from land cover conversion as well as direct emissions (9). Coal-fired power plants continue to come online as well, in stark contrast to these climate commitments (10). Displacement of small-scale agricultural producers from their lands can also contribute to deforestation as these people find themselves pushed toward the agricultural frontier as corporations acquire their lands for the production of palm oil (11, 12). Further, the expansion of the electric grid and energy access is a key priority for the

¹ While Nicaragua initially refused to join the Paris Agreement, arguing that the voluntary nature of the agreement and its structure were not sufficient to confront climate change, the country reversed course in late 2017 and is now a signatory. Updated information is available: <http://climateanalytics.org/hot-topics/ratification-tracker.html> (Last accessed 29 Jan. 2018).

region's countries. This dual attention to climate change mitigation and electricity generation has renewed interest in dams and hydropower despite many negative reports of its historical impact (13, 14). The World Bank, IDB, and national governments continue to support expansion of large-scale hydroelectric investments, both to meet domestic demand and with an eye toward export through the regional energy interconnection system, which aspires to provide a single energy market (15). Wind and geothermal energy have also received increasing attention, which may compete for land with small-scale agriculturalists (16).

In Central America, roads, hydroelectric dams, and mining and oil extraction have tended to trigger deforestation when they overlap with forested areas. They also threaten Indigenous and community land rights when those areas come under the control of extractive or infrastructure companies with authorization to develop projects, especially in the context of weak consultation and consent mechanisms (17). Our findings confirm that extractive industry and infrastructure (EII) expansion contributes to deforestation, forest degradation, and associated emissions in Central America, and it is not only the large-scale projects that pose a direct threat. Beyond large projects and investments that attract national and international attention, smaller and less visible initiatives also play an important role, particularly the building of local access and feeder roads that in isolation may not amount to much, but that cumulatively create conditions for significant deforestation and an increased threat to Indigenous and community land rights. In addition, frontier zones between neighboring countries are sites where lack of spatial planning and clear control over resources may lead to rapid degradation and deforestation.

The landscape of EII in this region is rapidly changing: laws are shifting to accommodate more private investment in extraction in some areas (Honduras, Panama), while closing the door on the industry in other parts (El Salvador); Indigenous and civil society groups are effectively putting a stop to some large-scale infrastructure projects, while project-related criminalization of environmental defenders is destabilizing community security and trust (both seen in the case of the Agua Zarca dam project in Honduras).

Because of the concerns regarding frontier zones and infrastructure connectivity projects, the separate report on Mexico complements this analysis of Central America, and this report makes some reference to common trends within the Central American region as a whole. Due to ongoing trends related to forest cover and EII investment, our analysis focuses more on Costa Rica, Guatemala, Honduras, Nicaragua, and Panama, with reference to El Salvador regarding civil society and government action on mining.

Purpose and structure of report

This report was commissioned in 2016-17 by the Climate and Land Use Alliance to provide scoping of the relationships between investments in extractive industries and infrastructure, patterns of deforestation, and the rights of forest dependent communities, especially of Indigenous Peoples. The scoping also considered ways in which different organizations have responded to these relationships, with a particular focus on civil society responses. This report on Central America is one of three separate regional reports and one global/synthesis report.

The report takes as a given that the expansion of the agricultural frontier, including for cattle ranching, commodity production, and small-scale subsistence, serves as the principal proximate driver of land cover change across Central America. However, we ask to what extent investments in extractive industry and infrastructure (EII) are also important drivers of forest loss, related greenhouse gas emissions, and rights infringement in forest communities. We consider the potential role of extractives and infrastructure not just as *proximate* drivers, but also as *underlying* drivers that may, in some cases, enable or incentivize conversion of forests.

Specifically, the report addresses: the current status of these two sectors (Part B); the factors driving increased investment in extractives and infrastructure (Part C); evidence on the actual and potential impacts of these sectors on forests and forest peoples (Part D); regulators of EII expansion (Part E); and different ways in which state and civil society bodies have responded to these impacts (Part F). As the purpose of the paper is to scope, not to recommend, these different responses are not evaluated for their relative merits, and the paper does not make policy proposals.

In examining “extractive industry” the paper focuses on industrial metals mining, artisanal and small-scale gold mining (ASGM), and some hydrocarbon development, as these are presumed to be the extractive activities most likely to have significant impacts on forest cover. For “infrastructure,” the report considers large-scale infrastructure investment (primarily roads, dams and power generation infrastructure, and energy transmission) and smaller scale, sometimes informal, transportation network expansion.

The report is based on a review of the academic literature; a review of policy documents; key informant interviews with civil society and public sector informants; geographic information systems (GIS) and remote sensing analysis of concessions and forest cover; and a workshop in San Salvador, El Salvador, to discuss initial arguments and ideas.²

B. Extractive industry and infrastructure in Central America

This section provides an overview of historic, existing, and planned extractive industry and infrastructure investments and their overlaps with forested areas in the region. It draws on original research undertaken by the team, including new analysis of the geographic overlaps of concessions, forests, and protected areas, as well as secondary sources.

² The paper also benefitted from comments from staff and program officers in the Climate and Land Use Alliance.

1. Extractive Industry

Minerals extraction has accounted for less than 3 percent of GDP of Central American countries since 1990, with the sector having the most significance in Guatemala and Panama (18). The oil and gas sector typically contributes much less, as Guatemala and neighboring Belize are the only countries in the region with commercial production, though exploration activities are ongoing in Honduras, Nicaragua, and Panama (19). Despite the limited contribution of these sectors to the overall economy – and of these countries to global minerals production – all countries in the region with the exception of Costa Rica have historically privileged the extractives sector, in part because of the important government revenues and foreign direct investment (FDI) that EI can generate. The extractives sector has provided an important source of FDI, even as its contribution to GDP is low; Aguilar-Støen (20) notes that in 2013, 45 percent of Guatemala’s FDI came from mining alone. Canadian companies play an outsized role in the region’s mining, and the structure of the industry in Guatemala and Honduras has privileged “junior” firms, which are less well capitalized, less incorporated into voluntary regulatory efforts at the global level and significantly financed from the Toronto and Vancouver stock exchanges (2, 21, 22).

As of 2011, more than 14 percent of all land in the northern part of Central America (El Salvador, Guatemala, Honduras, and Nicaragua) was under mineral concession (23). The most significant mineral concessions tend to be for gold and silver, which are often co-located and found with other minerals of interest, such as zinc, nickel, and lead. In Guatemala, the government began large-scale concessions for gold and silver after the 1996 Peace Accords, with exploration advancing from about 2004 onwards. Gold production peaked in 2011, although the amount of silver extracted in Guatemala continues to trend upwards (23). Honduras nearly doubled the area under mineral concessions over the first half of this decade, with favorable legal reforms in 1998 and 2013 paving the way for increased gold mining in particular. In Panama, gold mining in the contemporary era began in the mid-1990s, although with little regulation and limited impact on global production levels, leading to minimal industrial gold production (24); however, the country’s vast copper reserves are of great interest to investors, and there has been a resurgence in activity since the 1990s (Table 1)(18). The large upfront investment required to exploit these copper reserves has made it the purview of major mining companies, rather than junior firms, although no new licenses have been granted in the past five years. El Salvador encouraged mineral extraction projects through the 1990s and early 2000s, until concerns over the social and especially environmental impacts led the government to issue a moratorium in 2008 that was subsequently enshrined in law (25, 26).

Table 1. Value of proven mineral reserves (at \$3.00/lb CU and \$1,000/oz AU) and mineral resources (probable reserves at \$800/oz), in millions of US\$, by project name. Source: Morales (27).

| 1. Copper (Cu) | Reserves (million lbs) | Value (million US\$) |
|-----------------------------------|-------------------------------|-----------------------------|
| Cerro Colorado | 25,000+ | 75,000 |
| Cobre Panamá | 26,000 | 78,000 |
| Chorcha | 2,200 | 6,600 |
| Sub-total | 53,200 | 159,600.00 |
| 2. Gold (Au) | Reserves (Ounces) | |
| Cobre Panamá | 7,300,000 | 10,950 |
| Molejón | 500,000 | 750 |
| Cerro Quema | 750,000 | 1,125 |
| Santa Rosa | 750,000 | 1,125 |
| Remance | 100,000 | 150 |
| Sub-total | 9,400,000 | 14,100 |
| 3. Probable Gold Resources | Resources (Ounces) | |
| Cerro Pelado | 115,000 | 115.0 |
| C. Dorada | 40,000 | 60.0 |
| Viento Frio | 125,000 | 187.5 |
| Zioro | 75,000 | 112.5 |
| Other | 1,000,000 | 1,000.0 |
| Sub-total | 1,355,000 | 2,032.5 |
| Total | | 175,733.00 |

Currently known concession areas for minerals and hydrocarbons overlap with both protected areas and Indigenous and communal lands across the region, though particularly in Guatemala, Honduras, and Panama. Nicaragua's second largest minerals mining complex, in Bonanza, is located adjacent to the Bosawas Biosphere Reserve and Mayangna and Miskitu Indigenous territories. While the cases illustrated in Figures 2, 3, and 4 suggest that the most significant areas of extant forest do not necessarily overlap with known mineral mining concessions, hydrocarbon extraction and infrastructure are known to overlap with key forest areas, such as in the Guatemalan Petén. Here, the existing Xan oil field is the major producer of petroleum in the region and in 2013 the Government of Guatemala granted new exploration and exploitation permissions in six areas across five departments in the country's north. While none of the new fields had achieved commercial-scale production by late 2017, several fields that overlap with protected areas came online, including the Ocutun field within the Maya Biosphere Reserve (28, 29).

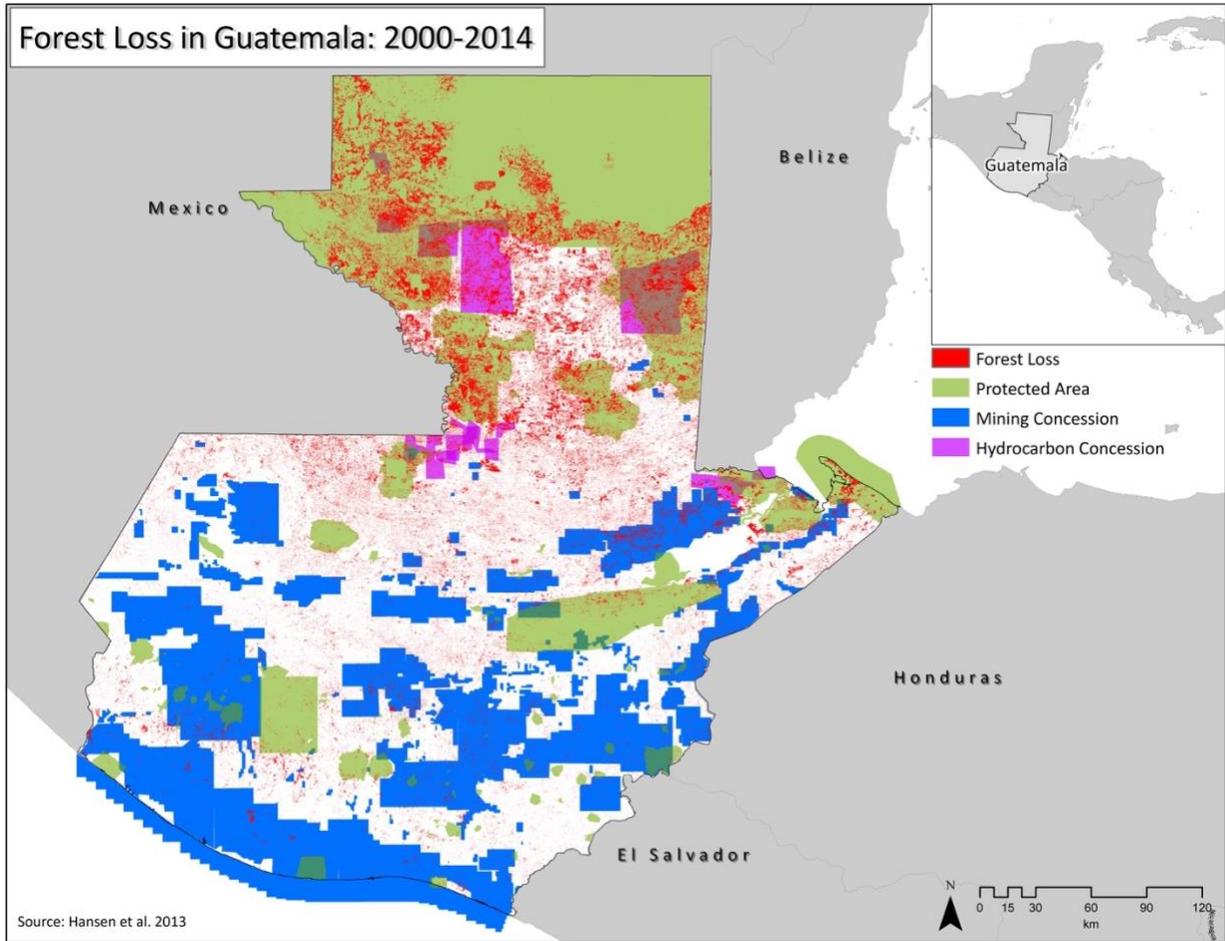


Figure 2. Mining and hydrocarbons concessions, protected areas, and forest loss in Guatemala. The significant exploited hydrocarbons deposit in the north-western corner of the country near the border with Mexico is shown in purple and overlaps with significant forest loss.

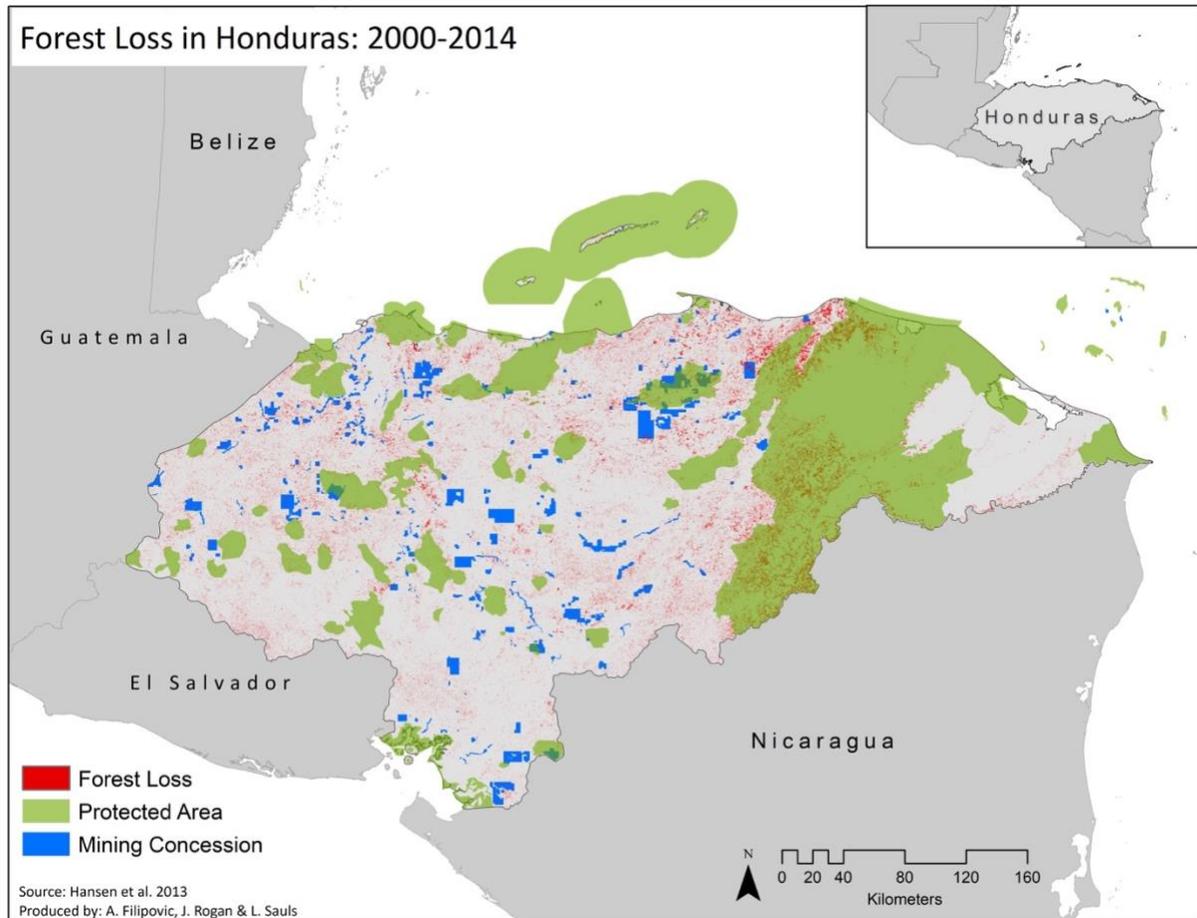


Figure 3. Mining concessions, protected areas, and forest loss in Honduras. Oil deposits off the northeastern coast of Honduras are not shown on this map. Although they do not impact forests directly, the mixed forest and marine livelihoods strategies of the Miskitu and Garifuna people could be impacted by changing offshore activity (30).

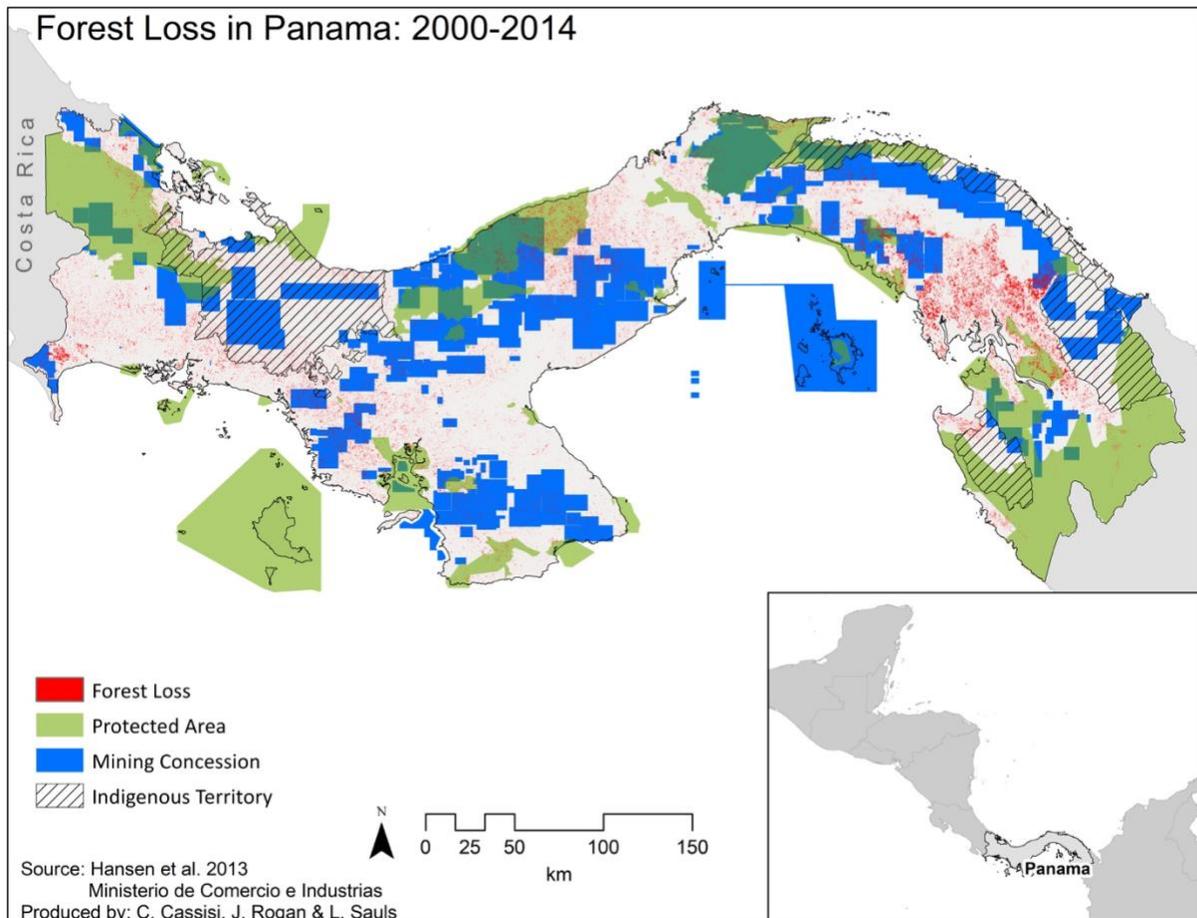


Figure 4. Mining concessions, protected areas, Indigenous territories (*comarcas*), and forest loss in Panama

While these maps suggest extraction has limited direct impact on forests and emissions, there are notable exceptions. In Panama, one copper mining project, Cobre Panama, will clear 5,500 hectares (ha) of tropical forest and increase deforestation due to accompanying infrastructure development such as road building; further, it will increase Panama’s greenhouse gas emissions by 8 percent (31). Cobre Panama is a huge project with capital expenditures projected to total \$6.3 billion for 2016-2018 – an amount that already exceeds the \$5.6 billion cost of the Panama Canal expansion (32–34).³ Cobre Panama includes a mine and processing plant, where mining and ore processing activities will take place; a tailings storage facility; a port site at Punta Rincón for concentrate filtration and ship loading and unloading; two coal-fired power plants providing energy to the mining complex; and supporting infrastructure (roads,

³ The “Cobre Panama” concession consists of four zones totaling 13,600 ha in an area covered by dense rainforest. In February 2018, First Quantum, the Canadian company developing the project, reported that capital development costs would reach \$6.3 billion by 2018 and that \$4.74 billion had already been spent during 2016-2017.

pipelines, transmission lines, camps for accommodation, emission, liquid and solid waste management) (35).

Figures 2-4 do not distinguish between concessions that are active and those that are exploratory, and while the former are the only ones that may have direct impacts on forest loss, exploration activities can attract other forms of investment, speculation and in-migration that may affect forest peoples and land use. Cases of concession overlap with Indigenous and communal lands, which often have community forests of more limited extent, are common, and it is often not until exploration begins in earnest that communities discover that their lands are subject to external claims. In the case of the iconic Marlin Mine in Sipakapa municipality, Guatemala, no clear consultation took place, and it was not until the government granted exploration licenses that the communities became aware of the activity. In Honduras, the law requires that the Institute of Geology and Mines publish the coordinates of all concessioned sites, but they do so in small advertisements in the newspaper, and most communities (and even professionals) lack the knowledge required to know to look for this information and to match coordinates with community locations (36). In such cases, Indigenous peoples and other affected communities have little chance to respond much less consent to projects.

Extractives-related infrastructure development, especially of roads and pipelines, may have an important influence on forest quality and overlap with forested areas and communally claimed lands. For example, the development of hydrocarbon reserves in the western Petén in Guatemala required the construction of roads, pipelines, processing facilities, worker camps, etc., in areas technically classified as protected (37). Local leaders directly attribute the historic and ongoing loss in forest cover in this zone to the government granting permission for an oil access road in the national park, leading to rapid and uncontrolled settlement.⁴ Carr (38, 39) suggests that 66 percent of the population growth in Petén from the 1960s to 1990s came from in-migration, primarily of cattle ranchers and small farmers, following road construction – and the population ballooned from tens of thousands to over 600,000 over this period. A proposed pipeline to connect natural gas from Mexico to Guatemala, and potentially through to Honduras and a Salvadoran port, would cross areas of Guatemala already concessioned for mining and with traditional lands in the western portion of the country, and would accompany an inter-modal transportation project (40–42).

2. Energy and Infrastructure: Capacity and Connectivity

An important indicator of the growing potential for infrastructure and energy expansion comes from national and regional commitments to public-private partnerships (PPPs) and integration plans. The Alliance for the Prosperity (APP) of the Northern Triangle, launched in 2014, exemplifies this trend as it aims to attract significant investment to El Salvador, Guatemala, and Honduras to achieve economic development through infrastructure and integration. The Alliance's plan has attracted large-scale financial pledges, including \$750 million from the Inter-American Development Bank. The three governments hope to leverage another \$1.75 billion in

⁴ L. Sauls interview with ACOFOP leader, Santa Elena, Guatemala (7 June 2017).

private funds (43). The United States also announced up to \$1 billion in funding for the area, although it had not met its goal as of 2016, and the Trump administration's budgeting priorities could shift this number (44).

The Alliance's plan lays out the construction of eight "logistics corridors" to better connect ports and major cities in the region and to Mexico and Colombia. Natural gas pipeline extension is also emphasized in the connectivity plan, and a planned pipeline to transport U.S. gas southward would pass through areas of Mexico and Guatemala that are strongholds for Indigenous groups and community forestry, including Chiapas and Quetzaltenango (45). New power plant development in Panama and El Salvador, in particular, may explore liquid natural gas (LNG) as an option, although the region does not currently produce this resource and would rely on imports through new infrastructure development, including ports and pipelines (46).

In addition to these regional energy and infrastructure integration efforts in the Northern Triangle, efforts to connect Panama and Colombia to the south may also pose a threat to forests (41). In Panama, the proposed electric grid integration through the Darién Peninsula that would have required construction in some of the most intact forests in Central America was publicly rejected by the Minister of the Environment in 2015. However, the preferred solution with a marine entry point near Mamitupu would cross two Indigenous territories (Wargandi and Guna Yala) and trigger additional deforestation of 9,553 ha over 25 years (47, 48).

Proposed intermodal transport routes would cross areas with overlapping concessions and community claims and increase access to these areas. Plans to connect Mexico and Guatemala, as laid out in the APP, would do so. Costa Rica's proposed "dry canal" will also promote connectivity between ports on its different coasts, but involves the expansion and improvement of roads through forested areas on the Caribbean coast and the protected dry forests of Guanacaste (49). Finally, while few believe that the proposed interoceanic canal in Nicaragua will proceed, the regulatory changes that enabled the long-term land concessions along the route have already led to a number of demonstrations in protest of the 'eminent domain' style clause in the canal's enabling legislation (50).

Energy generation projects also have the potential to impact existing forest areas as well as lands titled to and claimed by Indigenous and traditional communities. Each of the governments in Central America has promoted hydroelectric energy over the past decade, with several projects moving ahead even under tense conditions. These projects have already caused strife in almost all of the countries, even relatively more stable Costa Rica and Panama, especially where the projects impact lands held by Indigenous groups. In Panama, the Chan-75 and Barro Blanco projects, which directly interfere with forested Indigenous areas and vulnerable watersheds went ahead, and while the Agua Zarca project in Honduras is currently on hold, even its proposal has caused deadly conflict (51).

In making significant commitments to carbon neutrality and climate change mitigation, Costa Rica has opted to expand hydroelectric capacity. The Reventazón dam is the largest hydroelectric project in Central America as of its initiation in 2016 – and it is the second largest infrastructure project in the region after the Panama Canal (52, 53). The proposed – and

contested – Diquis hydroelectric project would rival Reventazón in size and allow Costa Rica to export additional electricity to its neighbors. It would flood over 7,300 hectares, including Indigenous lands and sacred sites as well as internationally recognized wetland and mangrove ecosystems (54). Guatemala has also pushed to bring new hydroelectric capacity online – at one point proposing a mega-project “hydraulic ring” of connected generation infrastructure across the heavily Indigenous departments of Huehuetenango, Quiché, Alta Verapaz, and Baja Verapaz, despite stiff opposition from civil society and Indigenous Peoples (55, 56).

The Patuca III dam project in Honduras provides an important example of how hydropower projects and Indigenous and protected lands coincide, as shown in Figure 5. As in many other cases, a lack of consultation led to conflict and even to the criminalization of community leaders resisting the project (57). This contested watershed has also been reported as the site of artisanal small-scale mining (ASM) and illicit activity related to narco-trafficking (58). These sites of multiple, conflicting, and overlapping claims in the context of limited government capacity can contribute to a sense of lawlessness and higher rates of deforestation with impunity, especially in protected areas (59). And as Chayes (60) discusses, in the case of Patuca III, one of the principle underlying drivers of this deforestation is a high level of endemic corruption, through which a small, land-rich elite continues to exert outsized influence on state policy and priorities.

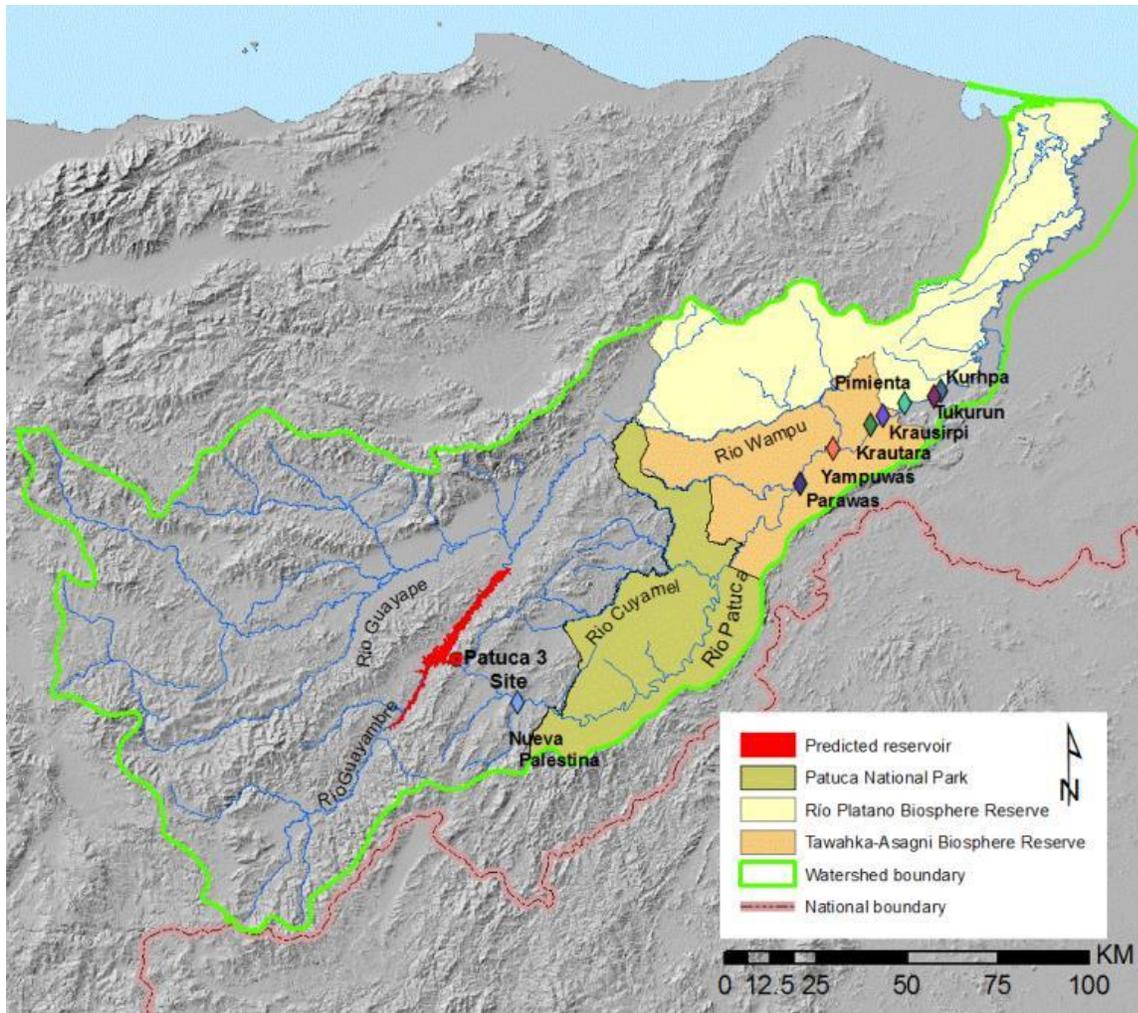


Figure 5. The placement of the Patuca III dam project and adjacent protected and Indigenous lands. Source: The Nature Conservancy (61).

C. Key drivers of extractive industry and infrastructure

While the primary drivers of deforestation vary across countries in the region, in each of them increasing privatization and decentralization of resource governance along with increased focus on infrastructure development and integration have had impacts on forests and communities. These trends influence individual and community behavior and open up new spaces for both planned and unplanned ‘development’. Below, we discuss proximate and underlying drivers of extractive industry, transport infrastructure, and hydroelectric power expansion, which in many cases are related to these macro-policy changes. These drivers include macroeconomic

policies; national and regional policies (especially for integration); new sources of finance seeking investment opportunities; corruption and special interests; infrastructure for informal and sometimes illicit economies; and synergies between infrastructure, energy and agro-industry.

1. Macroeconomic policies for resource-based FDI

Global commodity prices are a clear underlying driver of increased investment in minerals, hydrocarbons and infrastructure to foster agricultural investment. However, just as important are the policy positions assumed by governments in response to these global contexts. While the governments of the region have taken different stances vis-à-vis mining, their engagement in international and regional economic development initiatives and treaties reveals a commitment to both primary and industrial export expansion. The Central American Free Trade Agreement (CAFTA-DR), MIDP, and the APP all indicate a preference for the kinds of interconnectivity that would enable outward-oriented economic growth and liberalization. For example, commentators and activists have alleged the Government of Honduras is engaging in a ‘race to the bottom’ with its “Honduras is Open for Business” motto and associated reforms (2, 3). This push signals a pro-foreign investment and export-oriented approach to economic growth indicative of a wider trend in the region, where Guatemala, Nicaragua, and Panama have all promoted new legislation to bolster FDI (2, 3).

2. National and regional policies for integration

The former Plan Pueblo-Panama – now MIDP – outlined the key goals in infrastructure expansion (particularly in regard to roads, ports, multi-modal transport systems, and energy) that have been tracked and have become observed trends. While local communities often welcome new road connections or improvements and energy access options because of the opportunities they bring, these systems can have negative impacts on forests and traditional communities (8). The plans for regional integration put forth in the APP between Guatemala, Honduras, and El Salvador also tracks closely with the infrastructure proposals in the MIDP and its predecessor plans (62). An additional driver in this case is the regional geopolitical relationship with the United States and Mexico, as the APP was announced after a spike in the northward migration of youth in 2014. While its stated aim is to bolster economic growth through integration, many have commented that the Alliance’s focus on PPPs and continuation of existing policies is more likely to continue concentrating wealth in elite hands and dispossessing already marginalized groups – with little impact on migration rates (44, 63). Enabling legislation to promote PPPs have been a signature of integration efforts in the region since 2010, with explicit laws passed to promote them in El Salvador (Decree 379-2013), Guatemala (Decree 16-2010 and Governmental Agreement No. 360-2011), and Honduras (Decree 143-2010) (64).

The Mexico-Guatemala border in Petén is one area where these regional integration plans have pushed for this type of infrastructure- and energy-based connectivity (65). Currently, the area between Belize, Guatemala, and the Calakmul National Park in Quintana Roo, Mexico, has a dense network of paved roads and shows extensive tree cover loss, emanating both from

larger, planned infrastructure development and as a result of more localized demands. While deforestation seems to stop at the Guatemalan border, the pressure to build the roads into Guatemala is mounting and if – or when – they are built, extensive deforestation in that area of Petén is to be expected in both the protected areas and the community concessions. Increasing oil production from new fields – especially within the Maya Biosphere Reserve and on the southwestern edge of Petén – could hasten the extension of infrastructure (66).

3. New financial flows and actors

New sources of investment (i.e., outside of traditional donors and development banks) paired with the extractivist development logic of most Central American governments, are poised to enable the expansion of EII. Through the early 2000s, the now-struggling Brazilian National Development Bank (BNDES) and firms like the discredited infrastructure powerhouse Odebrecht provided an influx new financial flows into developing countries, including across Central America. A new focus on South-South development and PPPs underpinned extensive road- and dam-building projects throughout the region. The support of Brazilian funding for EII at the beginning of this century and its subsequent disappearance has opened space for other new actors to fill the gaps (67, 68).

Most studies of Chinese investment to Latin American have focused on South America; however, both Costa Rica and Panama have re-oriented their geopolitical allegiances away from the Republic of Taiwan in recent years, and China has pledged new grant and loan packages in the same timeframe (69). In Costa Rica, Chinese financing is enabling the construction of an enhanced highway to support expanded port capacity along the country's Caribbean coast. The Chinese government has provided \$395 million of the nearly \$500 million project budget, and a Chinese infrastructure and engineering firm is in charge of implementation (70). In Panama, Chinese companies are playing a key role in the development of lands along the Panama Canal, and the government has expressed interest in leveraging Chinese investment to fund a Central American railway connector (71). Although Nicaragua maintains its ties with Taiwan, the proposed canal project would be backed primarily by a Chinese investor, perhaps reflecting China's desire to enable and control alternate transoceanic routes.

The Chinese focus on Latin America in general – and Central American connectivity in particular – reflects the priorities of China's Belt and Road Initiative, including to secure influence over key global transportation routes and to provide a counterpoint to historic U.S. dominance in the region. In 2018, the Community of Latin American and Caribbean States (CELAC) signed an agreement with China to expand engagement between them, with infrastructure as the signature issue (72). The pivot toward PPPs as the key mechanism for implementing infrastructure projects in national legislation further facilitates the entry of new investors and sources of finance, with Chinese firms playing an increasing role at the expense of traditionally strong European firms (73).

4. Corruption and special interests

Corruption is also an underlying driver of deforestation. Processes of land speculation and grabbing often rest on complex political-financial transactions that privilege national elites and international corporations, even where laws requiring consultation and environmental impact assessments exist (20). While its impact was perhaps most destabilizing in Brazil, the *Lavo Jato*, or “Carwash”, scandal also hit Guatemala and Panama, where government officials awarded the Brazilian firm Odebrecht major infrastructure and hydroelectric contracts for road-building – in conjunction with receiving millions of dollars in bribes (74, 75). The fallout of this investigation, together with the Panama Papers scandal, has exposed the regularity of such corruption, and the difficulty of prosecuting individuals for infrastructure-related corruption (76).

Mining has also been a key sector for bribery and corruption in Central America, as demonstrated in cases such as Petaquilla Gold (Panama) and Tahoe Resources (Guatemala) (77). Canadian companies have been particularly influential in encouraging mining reforms, such as in Honduras, that allow them to operate with higher levels of impunity, including in regard to consultation and community rights (*ibid.*). Road-building related to integration, mining, agro-industrial expansion, and interests in enhancing large-scale tourism provides opportunities for corruption, militarization, and a continuing concentration of economic and political power; these pressures on land use and control have led to dispossession and clear environmental impacts (20, 78).

5. Infrastructure for informal and illicit economies

Informal road building also plays an important role in driving deforestation and often with more direct negative impacts on existing communities. As work by McSweeney et al. (58) suggests, the introduction of drug trafficking and illicit cattle grazing can open up forest areas for other types of land uses, with long-term consequences. First, forests are cut for clandestine roads and landing strips (and occasionally illegal timber). Second, drug trafficking intensifies preexisting pressures on forests by infusing resident ranchers, oil-palm growers, land speculators, and timber traffickers with unprecedented amounts of cash and weapons, thus allowing them to greatly expand their activities – typically at the expense of the (Indigenous) smallholders who are often key forest defenders. Third, the vast profits from moving drugs create powerful incentives for drug-trafficking organizations themselves to convert forest to agriculture (usually pasture or oil-palm plantation) as a way to hide or launder illicit profits. In most cases, the purchase and conversion of forests within protected areas and Indigenous territories is illegal, but traffickers have enough political influence to ensure their impunity and, where necessary, to falsify land titles. The result is permanent conversion of forests to agriculture. Here, a top-down approach to development coupled with insufficient oversight and enforcement at the ground level combine to drive deforestation through official and extra-legal mechanisms (79).

6. Synergies between infrastructure, energy, and agroindustry

As signatories to the Paris Agreement, Central American countries are all producing national mitigation strategies. At the same time, the expansion of the electric grid and energy access is a key priority for the region's countries, according to the MIDP. This dual attention to climate change mitigation and electricity generation has renewed interest in dams and hydropower in particular. Wind and geothermal energy have also received increasing attention, such as new windfarms in southern Mexico, which may compete for land with small-scale agriculturalists (16). Given the clear demand for electricity generation *and* distribution in a region where millions of people still lack access to reliable energy as well as the re-focus on 'sustainable' energy sources, hydropower has gained renewed interest, despite many negative reports of its historical impact (13, 14). Even with significant reporting on the environmental and social impacts of these projects, IFIs and national governments continue to pursue the expansion of hydroelectric capacity.

Oil palm production (for industrial, consumer, and biofuels) is also expanding significantly in the region. Large-scale investment in oil palm in the region has not led to expansion into forested areas in Central America to the degree it did in Ecuador or Peru (80, 81), but has driven deforestation by taking over land previously owned by peasants, many of whom have then gone on to occupy lands in forested areas (11). For example, the Aguán River Valley in Honduras was in previous decades a focus for land re-distribution programs, but has recently become a key oil palm investment zone. Although a 1974 law prohibited the sale of lands distributed under the agrarian reform, requiring that they be reverted to the state for re-distribution to landless peasants, the Agricultural Modernization Law of 1992 privatized and individualized peasant cooperatives, leading to a dramatic sell-off of peasant lands in the Aguán Valley. As accessible and fertile lands for commodity agriculture have become re-concentrated, the migration of now-landless farmers has become an important proximate driver of deforestation (82). Some of this oil palm is destined for "agro-energy" production, reflecting further synergies beyond agroindustry, energy transition imperatives, and pressure on forests – which, with the added pressures of the narco-economy and corruption, challenge the capacity of forest peoples to protect their lands (83).

D. Impacts of extraction and infrastructure

This section summarizes the environmental and social impacts from the expansion of extractive industries and infrastructure in the region, beginning with trends in forest loss. Based on a review of the literature, interviews with a range of informed observers, extensive document and media reviews, and a workshop with academic, NGO, and community-based leaders from the region, we suggest that the following areas may be especially important for considering the extraction-infrastructure-deforestation complex. This finding specifically takes into account the

important connection between Indigenous and community forest users' rights and forest protection outcomes:

- Guatemala: Petén (especially along the borders with Mexico and Belize), far western Highlands (San Marcos, Quetzaltenango) for mining/protected area overlap and infrastructure expansion
- Honduras: the Muskitia (Gracias a Dios, Olancho), especially Sico-Paulaya watershed for infrastructure expansion and community lands, the Northern Triangle border area
- Nicaragua: Northern and Southern Caribbean Coast Autonomous Regions (RACCN and RACCS) for infrastructure expansion and mining
- Panama: Chiriquí region for planned infrastructure development, Comarca Ngäbe-Buglé (adjacent to dam areas), Darién peninsula for electricity integration infrastructure.

In these regions and cases, factors such as narco-trafficking and the expansion of the agricultural frontier may be important drivers of deforestation; however, these trends are often intimately linked to EII across scales. From oil access road construction facilitating land invasions to ASM as a by-product of the narco-economy, EII expansion has clear links to the deforestation of these remote margins of Central American countries (59).

According to the Global Forest Watch tool, the mean annual rate of tree cover loss in Central America since 2000 was 0.61 percent, with a total loss over the years 2000 to 2016 of 9.8 percent (Table 2). A meta-review of studies on deforestation by Armenteras et al. (84) suggests that between 1980 and 2010, Costa Rica had a slightly positive mean forest cover gain annually, but all other countries included in this study have experienced annual deforestation. Sesnie et al. (59) suggest that up to 30 percent of the more recent deforestation is related to narco-trafficking through the region, much of which is linked to speculative and illegal land investments. PRISMA (85) also notes various cases in which the narco-economy and organized crime are related to forest loss and pressures on territory (while also noting strategies of territorial defense in these contexts).

Table 2. Deforestation by country from 2001 to 2016 and annually during that time period, for Central America (86).

| Country | Percent Tree Cover Lost (2001-16, relative to 2000) | Mean Percent Tree Cover Loss Per Year, 2001-2016 |
|-----------------|---|--|
| Belize | 10.8 | 0.68 |
| Costa Rica | 5.1 | 0.32 |
| Guatemala | 16.1 | 1.01 |
| Honduras | 10.6 | 0.67 |
| Mexico | 5.8 | 0.36 |
| Nicaragua | 14.3 | 0.89 |
| Panama | 5.6 | 0.35 |
| <i>Regional</i> | <i>9.8</i> | <i>0.61</i> |

In general, the impacts of EII on forest loss in Central America are not well-researched, although infrastructure expansion has gained more attention than extraction. The vast majority of academic literature on hardrock mining in Central America focuses on Guatemala, and specifically on the impacts of and resistance to the Marlin Mine in San Marcos. Transnational mining companies seem to have undertaken the greatest amount of activity in Guatemala, and the mineral reserves of interest – primarily gold – are amongst the most accessible; however, other countries in the region have experienced similar natural resource development trends since the late 1990s (87, 88). Although the themes emerging from the literature on Guatemala and the Marlin Mine likely reflect trends in neighboring countries as well, the lack of focus on sites in Honduras, Nicaragua, and Panama in particular suggests an opportunity for broader evidence collection. Very recent additions to the academic literature, such as an overview of violence and conflict around mining in Honduras, are expanding research into mining in the region, but evidence is still sparse (4, 36). That said, if some of the trends in Guatemala hold true in these other countries, significant human rights and environmental protection work will remain to be done (89, 90).

While extraction does impact the rights and livelihoods of Indigenous and other forest-dependent communities, it appears that neither metallic nor non-metallic mining have a high level of direct impact on deforestation (Table 3). Across these three countries, approximately 0.96 percent of forest loss occurs in concessions with mines in the exploitation phase. However, mining and hydrocarbon extraction does not happen in isolation, especially where the subsoil resources are in remote areas; rather, extraction-related infrastructure development, other infrastructure and human activities can influence forest cover change (91). Indeed, the figures in Table 3 should be understood only as correlations, and not causal relations. This is well illustrated by the data on El Salvador where the deforestation within metallic mining concessions is difficult to explain as being due to mining given that there has been no significant mining activity within concessions.⁵

Table 3. Summary of loss of forest (ha) within different types of active mining concessions in select countries in Central America over the years 2001-14, based on data from Hansen et al. (92).

| Forest Loss | <i>El Salvador</i> | <i>Guatemala</i> | <i>Honduras</i> | <i>Sub-region</i> |
|-------------------------------------|--------------------|------------------|-----------------|-------------------|
| Metallic: Exploitation | 3,643 | 4,148 | 1,290 | 9,081 |
| Non-metallic: Exploitation | N/A | 4,692 | 2,139 | 6,832 |
| Total Forest Loss | 62,738 | 1,014,611 | 588,299 | 1,665,648 |
| Percent Loss from Metallic | 5.81 | 0.41 | 0.22 | 0.55 |
| Percent Loss from Non-Metallic | 0.00 | 0.46 | 0.36 | 0.41 |
| Percent Loss from All Mining | 5.81 | 0.87 | 0.58 | 0.96 |

⁵ The 3643 ha figure for El Salvador may also be reflecting forest loss within non-metallic mining areas (where there has been quarrying etc.) insofar as concession data combines concessions for both metallic and non-metallic mining.

However, the broader environmental impacts from mining extend well beyond the footprint of mine sites, and sites are often under-regulated. Insufficient legal requirements for mine closure and low levels of oversight and enforcement have proved a consistent problem in Panama, for example, as mine projects have closed without proper environmental remediation (93). In 2010, Panama’s environmental regulator assessed the Petaquilla Gold company, which operated the Molejón gold mine, \$1.9 million for deforesting 80 percent of the forest within the concession and found evidence that the levels of heavy metals in tailings ponds exceeded legal limits (24, 93). The sudden closure of the Molejón mine also left local communities with millions of dollars in unpaid wages and debt they could not repay. The localized environmental and social impacts of a mine, even if not extensive as a percent of total deforestation, can be intense.

In terms of infrastructure, road expansion has long correlated directly to forest clearing. Landsat images from April 1986 and 1990 indicated that over 90 percent of new forest clearings were within 3 km of a road or river in Petén, Guatemala (94). Laguna del Tigre National Park in Petén showcases the road building–forest clearing nexus (37): in the period 1986–93, forest clearing rates were quite low but increased significantly from 1995-97, out from the road entering the park from the south to access the Xan Perenco oil field inside the park (Figure 6).

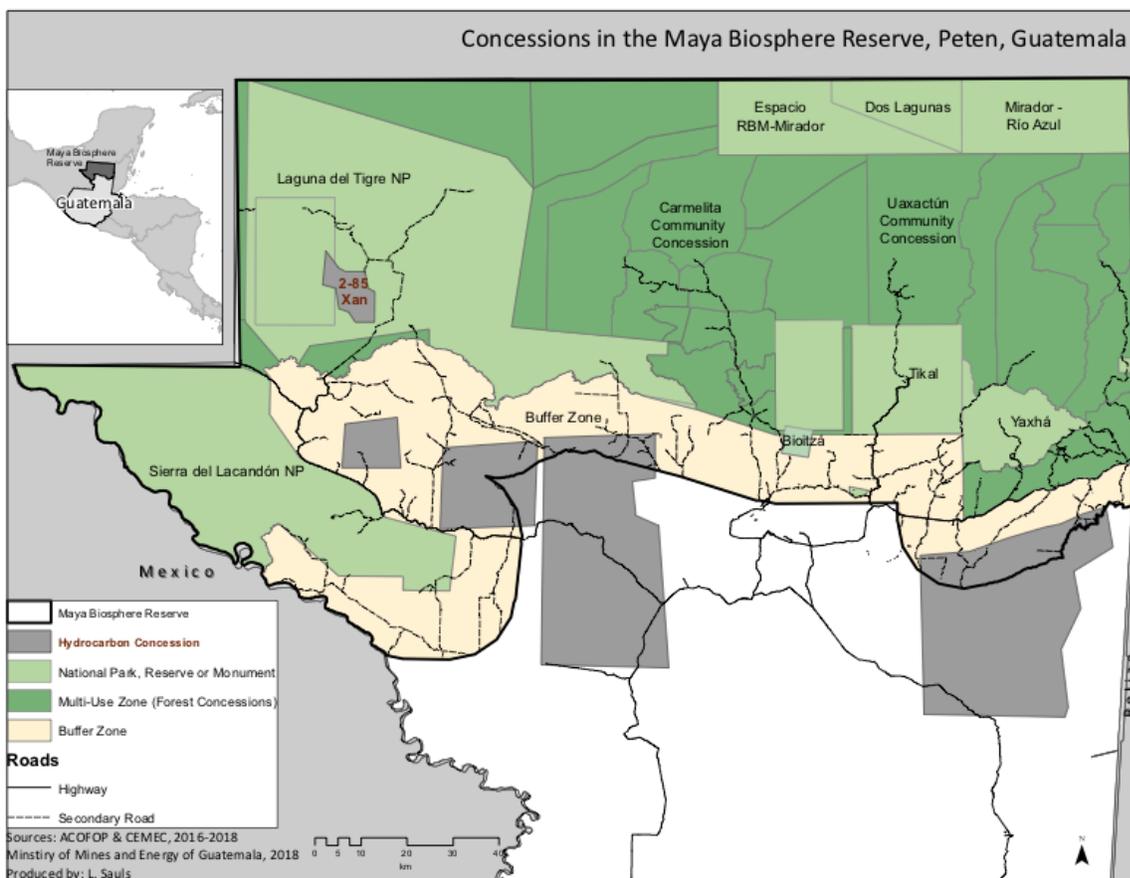


Figure 6. Petroleum concessions and the major roads network in the Maya Biosphere Reserve, Petén, Guatemala. The Xan oilfield is highlighted because of its connection to road-building and in-migration.

The data from Petén related to road expansion also suggests that it is not only large-scale, nationally planned roads, but also smaller-scale municipal and at times informal road building that are influencing forest cover change, especially along the border with Mexico (8). According to Amor and Christensen (95), the increased road building supported by regional integration projects “will generate the deforestation of approximately 22,964 hectares during the first decade” – equal to nearly 2.3 percent of total deforestation in Guatemala for the 15-year period cited in Table 2. This type of infrastructure expansion can also have significant impacts on biodiversity, especially of megafauna and key predators such as the jaguar (96).

Large increases in small-scale and regionally integrating road building in the Honduran Mosquitia and in the RACCN and RACCS of Nicaragua also suggest this coastal zone may have high potential for forest loss (Table 4). While road expansion (and accompanying electrification and connectivity) may open up new economic opportunities for people in these more remote regions, this infrastructure may impact traditional livelihood structures and support immigration into previously forested regions. The clear impacts on the Nicaraguan Mosquitia of cattle expansion and associated investments in rural electrification (for dairy storage) and roads to access markets is a case in point.⁶

Table 4. Road network expansion in the RACCN by municipality, 2005 and 2015. Source: Ministerio de Transporte e Infraestructura de Nicaragua (97).

| Municipality | Km of roads in 2005 | Km of roads in 2015 | Percent Increase |
|----------------|---------------------|---------------------|------------------|
| Bonanza | 43 | 85 | 98 |
| Mulukukú | 75 | 214 | 185 |
| Prinzapolka | 27 | 46 | 70 |
| Puerto Cabezas | 293 | 426 | 45 |
| Rosita | 127 | 192 | 51 |
| Siuna | 157 | 260 | 66 |
| Waslala | 101 | 252 | 150 |
| Waspam | 253 | 446 | 76 |
| Total | 1076 | 1921 | 79 |

Hydroelectric dam expansion has also impacted forest resources, but more explicitly has had negative effects on community land rights. As mentioned above, the Patuca dam complex has posed particular challenges (98).⁷ The United Nations’ Special Rapporteur on the Rights of Indigenous Peoples reports from her November 2015 trip to Honduras that the construction of the Patuca III dam and its reservoir has affected non-Indigenous populations leading to the illegal settlement of Indigenous Tawahka lands (99). She also mentioned as a cause for

⁶ H. Rosa, interview with regional forest and Indigenous rights expert, Skype (8 Nov. 2018).

⁷ The Patuca Complex includes the controversial Patuca III dam, under construction since 2013, and the planned Patuca IIa and IIb dams. The Industrial and Commercial Bank of China (ICBC) is the primary project investor and Sinohydro the main contracted builder.

concern the expected impacts of the network of dams on the water levels of the rivers used by the Tawahka and Miskitu communities, especially for their livelihoods and because of the flooding of their ancestral forests. She reported that she was informed that no appropriate consultations with these Indigenous peoples had been held and that there had been no proper studies to assess the impact of the dams on these groups' territorial rights (*ibid*).

These trends in the lack of consultation and the knock-on effects of large-scale hydropower development – including deforestation and rights violations – are also apparent in Panama and Guatemala in particular (55, 100). Indeed, in July 2013, then-UN Special Rapporteur James Amaya singled out the Barro Blanco dam in Panama as a case in which Indigenous people's rights were not being honored (101). He found that the Barro Blanco project was symbolic of the way in which Indigenous people were treated in Panama in mining and hydroelectric investments (102). Nevertheless, the project went ahead and began operations in April 2017.

E. Regulators of EII expansion

Natural resource and land governance take place across scales – local, national, international – and include governmental, non-governmental and private actors (103). For extraction and infrastructure in Central America, national governments, international financial institutions (IFIs), and private corporations have historically played a significant role in laying the groundwork for the incentivization and regulation of extraction and infrastructure. While the political and policy contexts in Central America vary by country, this configuration of actors has been important in setting the agenda for development. At the same time, non-governmental organizations (NGOs) and community mobilizations have affected of policy development and implementation, particularly since the late 1990s, and continue to play important advocacy and watchdog roles.

National policy contexts for extractive industry vary across the region. While mining has historically been significant in places like Guatemala, several governments in the region have taken recent steps to slow or halt the authorization of mining concessions, in part because of a lack of adequate mechanisms for governance and rights protection. Costa Rica banned open-pit metals mining by presidential decree in 2002, although it was briefly repealed between 2008 and 2010 to enable the development of a gold mine in Las Crucitas by the Canadian company Infinito Gold. By late 2010, the legislature responded to serious concerns by the environmental movement and unanimously passed a new ban, making Costa Rica the first country in the world to ban open-pit mining (104).

El Salvador's national legislation has gone even further. After a moratorium lasting for nearly ten years, in March 2017, El Salvador passed a full ban on metals mining – the first in the world. In 2008, President Antonio Saca of the conservative ARENA party issued a moratorium on new mining permits, which was continued by subsequent presidents from the opposing FMLN party (25). Proponents of the moratorium argued that the country lacked the capacity to adequately oversee, monitor, and enforce mining laws and that mining would threaten freshwater in the already highly water stressed country (26). The transition from moratorium to a full ban was set

against the backdrop of an investment dispute at the World Bank Group's International Centre for the Settlement of Investment Disputes (ICSID) in which the Oceana Gold/Pacific Rim company claimed that the Salvadoran government should pay \$250 million in damages (26, 105). While the case proceeded in ICSID, a coalition of environmental, ecumenical, human rights, and government advocates also pushed for legislation that would permanently ban mining in the country, which passed with a strong, multi-party majority in March 2017 (106). This said, the law has not yet been regulated and early statements ahead of forthcoming presidential elections suggest that it may still be subject to some rollback as well as contention related to practitioners and proponents of ASGM (107).

Legal cases and calls for legislative reform led to effective moratoria for discrete periods in Honduras and in Guatemala. The Honduran Supreme Court struck down portions of its 1999 Mining Law, preventing new concessions; however, a reformulated Mining Law passed in 2013 allows for new concessions to go forward again (108). In Guatemala, a moratorium measure initiated in 2008 (in response to litigation led by an NGO) has generally affected only the granting of new concessions, while mining in previously licensed concessions has continued (109, 110). In Panama, debate over a proposed ban on minerals mining led to an effective moratorium in 2014. The government has not issued any new permits since that time, in response to citizen mobilization and problems with existing minerals legislation; however, several already-licensed large projects are in the works and could potentially impact forested areas (111, 112).

Governments calling for or implementing moratoria explain the need to 'pause' new concessions for several reasons: to enhance environmental protection; to adequately implement consultation and community outreach mechanisms; to ensure compliance with constitutional or international treaty laws; and to enhance alignment between agencies and policies. The historic lack of coordination between various ministries throughout the region has been cited as a potential problem for governance insofar as it has limited the ability of Ministries of Environment to regulate the negative impacts of decisions by Ministries of Mining and Energy (or Commerce). The invocation of 'national' or 'strategic' interest by governments undermines environmental regulation meant to guard against some of the worst impacts of mining and infrastructure development. The Barro Blanco hydroelectric project in Panama, the Reventazón hydroelectric project in Costa Rica, the large-scale project to connect hydroelectric capacity in Guatemala, and the Nicaragua canal's enabling legislation have all been facilitated by invocations of national interest as a means of overpowering dissenting voices and subverting due process (55, 113, 114).

Whereas Guatemala, El Salvador, and Panama have paused or put a stop to new concessions to address some of the most apparent negative impacts of extraction, Honduras and Nicaragua have passed legislation that is highly favorable to the extractive sectors, with Honduras clearly seeking investment in mining. Nicaragua's opening to Chinese capital around both extraction and infrastructure expansion may presage new governance challenges and limitations on popular resistance to these projects – regardless of the progress of their signature project (115). In all of these countries, weak and unclear mechanisms for reporting negative impacts and violations of environmental and human rights laws continue to hinder effective regulation of

extractive industries, and lead to negative consequences for individual and community health and well-being (116).

One legal innovation that has arisen in many countries around extractive industries is the requirement that companies pay into funds as part of corporate social responsibility (CSR) for local community development (117). In large-scale infrastructure projects, in which the government usually has a significant and direct role, commitments to resettlement or compensation for land loss have traditionally been part of the strategy to address negative impacts. These commitments have also been promoted by IFIs, partly in response to the pressures they have experienced from international protest, in particular for human rights violations. CSR and PPPs have both gained significant attention within IFIs and are now part of guarantee or loan packages to support expansion of infrastructure (118).

While several of the countries in the region are members of international voluntary and regulatory frameworks related to deforestation and extraction, participation is neither universal nor consistent. Guatemala and Honduras are members of the Extractive Industries Transparency Initiative (EITI), which promotes disclosure of revenue and statistics related to mineral and hydrocarbons by member states. Panama, which has significant mineral production, is not a member. Further, neither Guatemala nor Honduras have been in consistent good standing under the EITI, due to late submission of reports (110).

Additionally, the International Labor Organization (ILO) Convention 169 concerning Indigenous and Tribal Peoples and the United Nations Declaration on the Rights of Indigenous People (UNDRIP) continue to play important roles in shaping resistance to and reform of the laws governing extractive industries and infrastructure. That said, spotty implementation of ILO 169 in particular continues to underpin conflict over large-scale projects in the region, including uncertainty around the constitutionality of mineral concessions. Legal advocacy at national, regional, and international levels has also played an important role, with the Inter-American Court of Human Rights (IACHR) handing down important decisions about land rights with clear implications for communities potentially impacted by extractive industries (119). Cases from the region regarding rights violations related to mining and infrastructure continue to come before the IACHR, and the Court often rules against the states – although with severely limited ability to enforce any sanctions (120, 121).

F. Responses to negative impacts on forests and communities

Most civil society and public response to the impacts of resource extraction and infrastructure have focused on questions of human, Indigenous, land and territorial rights, such as the failure to undertake adequate free, prior and informed consent (FPIC) and the measures required to address these failures. Other responses have addressed adverse implications for water access and environmental degradation. Conversely, far fewer groups have addressed the impacts on

forest loss or degradation. While the loss of land, including forests, has been more clearly articulated in relation to some hydroelectric and large-scale infrastructure projects, once again forest loss is not a primary concern, but rather access to land or territory.

Overall, governments in Central America have not acknowledged clear linkages between deforestation and extraction and infrastructure expansion, although some have linked these activities with human rights violations and negative impacts on local communities, including environmental degradation. The landscape of national institutional mechanisms for overseeing and responding to the negative impacts of extraction and infrastructure is changing throughout Central America, but these mechanisms often remain opaque to those communities that are affected and seek some sort of recourse. Only the government of Panama, in its Reducing Emissions from Deforestation and Forest Degradation (REDD+) strategy, has made specific reference to the impact of expanding extraction and infrastructure on deforestation; however, actions to mitigate the negative effects of these activities are not made explicit. Many governments in the region have passed recent laws to reform the mining and hydrocarbon sectors, as discussed above, but these emerging frameworks have been criticized as assigning undue autonomy and socio-environmental responsibility to concessionaire corporations and undermining government oversight. Further, regulatory enforcement is variable across the region and within countries, even where laws to protect communities and the environment from damage from extractives and infrastructure do exist, as through the recognition of ILO 169 in constitutions through ratification of the Convention (122).

A major trend in this region has been the institution of a Human Rights Ombudsperson, Prosecutor, or Commission to investigate and recommend measures to address allegations of violations related to extraction and large-scale infrastructure development. In Guatemala, this body pays particular attention to the extractive industries and has in certain cases advocated for the closure of mining activities because of perceived negative impacts (123). On the other hand, in Honduras, this body has not made extractive industry conflicts an explicit focus of its work and has been slow to act on infrastructure cases. While the creation of offices or commissions has generally helped to highlight rights violations and to bring conflicts over development priorities to light in the region, they have limited capacity or legal authority to mediate solutions or to hold other parts of the government accountable.

Some of the most visible responses to the negative impacts of extraction and infrastructure expansion have come from Indigenous and community-based mobilizations, often with the support of urban-based non-governmental groups, religious organizations, and/or coalitions. For example, in Guatemala, Honduras, and Costa Rica, Indigenous communities have pushed for more accountable mechanisms for consultation and consent under ILO 169. In response to this push for consultation, and in some cases to judicial orders, most governments in the region have put forth some form of legislation or regulation around prior consultation (although consent is rarely mentioned). Both Costa Rica and Panama adopted government-wide requirements for consultation in 2016: Presidential Decree 042-MP established a new mechanism for consultation in Costa Rica, and Article 10 of Law 81 in Panama requires that government entities oversee FPIC processes for any measures or projects that would affect collective rights

(124, 125).⁸ In May 2017, Guatemala's Constitutional Court ordered the administration to advance legislation on consultation within one year; by March 2018, the government had put forth a proposed law and started consultations on it (126, 127). Honduras is also responding to pressure from the UN Special Rapporteur on the Rights of Indigenous Peoples as it advances a law on consultation, which is still under debate and has been in process since 2016 (128). While Nicaragua's Law 445, which established the autonomous regions on its Caribbean Coast, included language related to the rights to consultation, implementation has been limited and civil society and territorial authorities continue to call for greater respect for FPIC rights.

Where the government has not ensured adequate processes for free, prior, and informed consent (FPIC), the organization of *autoconsultas* (autonomous, community-organized consultation mechanisms) has allowed communities to declare their refusal to accept certain projects. Many of these *autoconsultas* have been invoked in sub-national jurisdictions, especially in Guatemala, where the Municipal Code has governed the voting process – although the Guatemalan Constitutional Court has not always considered the results binding (129). The process of *autoconsulta* has spread throughout the Western Highlands since the first Guatemalan case in 2005, becoming part of the strategy for gaining support to stop mining in the region more broadly. In many cases, these strategies focus on local challenges presented by mining, especially related to the importance of maintaining clean and adequate water sources, and target sub-national rather than national political spheres in their campaigns. There have also been strategy-sharing exchanges between those involved in Guatemala's *autoconsultas* and groups elsewhere in Latin America.

In their speeches, leaders of anti-mining and/or pro-consultation movements declare the importance of protecting natural resources and forests in particular to preserve community livelihoods. In Honduras, the Civil Council of Popular and Indigenous Organizations of Honduras (Consejo cívico de organizaciones populares e indígenas de Honduras, COPINH), led before her murder by the Goldman Environmental Prize-winning Berta Caceres, put up strong resistance to the construction of the Agua Zarca dam project and garnered international attention for their cause. In June 2017, the final international financial backers of the dam project withdrew their support, effectively halting work on the mega-project (51). In Panama, strong direct action paired with advocacy by the Coordinator for the Defense of Natural Resources and the Rights of Ngäbe Buglé People in Panama, as well as other comarca-based groups, led to concrete advances in stopping mining on Indigenous lands. The passage of Law 11 of 2012, in response to strong organizing by the Ngäbe Buglé against the Cerro Colorado gold mining project, cancelled existing concessions and prohibited new concessions for metal and non-metal mining in the Comarca, its annexed areas, and adjacent Ngäbe-Buglé communities – with the explicit intent of protecting water resources and the environment (130). In Guatemala, the creation of La Puya as an intentional community composed of Indigenous and non-Indigenous members from nearby towns to physically block a gold mining project provides another example where local water and livelihoods drove the formation of a successful coalition, which, when paired with the legal efforts of an environmental NGO, led to the

⁸ As of April 2018, Panama had national regulations regarding consultation in place, but had not signed ILO 169. Indigenous groups in the country have made joining this convention a key priority for advocacy.

complete cancellation of the project (131, 132). While forests are not the primary issue around which communities organize, the importance of secure access to natural resources for livelihoods – and the accompanying fear of the degradation of resources as a result of mega-projects and extraction – is a central cause of mobilization.⁹

Religious, social justice and research organizations have played important roles in supporting these coalitions and building networks around resistance to extraction. In 2014, the regional Catholic Church took a clear position in support of every local movement struggling against extractive industries and megaprojects (133). Religious groups, and especially the Catholic Church, have played a significant role in garnering support for the El Salvador mining ban, as well as the Cerro Colorado mine in Panama. Other regional efforts to address the negative impacts of mining and large-scale infrastructure include the Central American Movement against Minerals Mining (M4) and the Observatory of Mining Conflicts in Latin America (OCMAL); these are not active in all countries, but do coordinate regionally on topics related to the negative impacts of mining and how to respond to those impacts.

Some groups have also worked against the criminalization of “environmental defenders”, which is one way in which the priorities of groups focused on mining have overlapped with those focused on territory and forests, such as the Mesoamerican Alliance of Peoples and Forests (AMPB for its Spanish acronym). Global Witness (134, 135) has found that Honduras and Nicaragua are amongst the most dangerous places for environmental and Indigenous activists globally on a per capita basis, and that both this type of transparency and reporting work raises awareness of the links between EII, forests, and forest peoples’ rights. Oxfam, the International Union for the Conservation of Nature (IUCN), and research centers like Fundación PRISMA and the Research Center on Investment and Business (CEICOM), produce reports on the socio-economic and environmental impacts of extractivism that can influence policy debates. The legislative/litigation strategy has also been important for confronting mining in the region, with groups such as the Legal, Social and Environmental Action Center (CALAS) of Guatemala playing a key role in confronting laws that do not adequately address FPIC and human rights concerns.

For international philanthropy organizations, the focus has been on Indigenous and local communities’ territorial rights. This is an effective way to reduce impact of extractive industries on forests as the communities are often co-located with significant forest resources and have a record of environmental protection. However, there does not appear to be any consistent or region-wide program to respond to the impacts of extraction and infrastructure expansion on forests.

⁹ L. Sauls, interview with the head of a Guatemalan forest peoples’ group, Tegucigalpa, Honduras (2 March 2017).

G. Conclusions

While mining and hydrocarbon extraction may have limited direct impacts on deforestation in Central America, the downstream and broader indirect effects of these types of projects appear to be more important in driving new frontiers of deforestation. Further, the increased focus on road-building and hydroelectric expansion could directly impact forests, particularly through the erosion of forest peoples' rights. The remaining forested areas in Central America, mostly along the Caribbean/Atlantic coast of the isthmus and in highland areas, significantly overlap with Indigenous and traditional communities, many of which practice lower impact forest-based livelihood strategies. It is into these often frontier areas, such as the Petén and Western Highlands zones in Guatemala, Muskitia in Honduras and Nicaragua, and Chiriquí and Darién Peninsula areas of Panama, that new extractive investments, roads, electricity generation projects, and migrations are occurring.

More research is clearly needed regarding patterns of deforestation, emissions from deforestation in this region, and the linkages and interactions between different drivers. Because of overlapping and often complementary drivers, directly attributing deforestation to a single cause is difficult. That said, Central America is clearly witnessing new types of extractivism and new challenges in the governance of its natural resources. The push for regional integration, both physically and through markets and investment strategies, aligns with persistent political settlements that continue to see forested areas as zones for the accumulation of concentrated wealth through the dispossession of less powerful interests (136). Further, the addition of imperatives for 'green' energy generation and the introduction of new actors – both licit and illicit, have shifted incentives for investment in ways that may further imperil Indigenous and traditional communities' rights. Thus, while mining and hydrocarbon extraction may not directly drive significant levels of deforestation across Central America, the displacement and conflict that surrounds them could influence the future of forest cover in the region, aided and abetted by infrastructure development, in particular local road building.

Some of the efforts already underway to support community and Indigenous land rights and economic development may directly support forest cover retention, such as work in the Petén around community concessions (137). The rise of national mining moratoria also suggests a growing awareness of the challenges of capturing the benefits from extraction without incurring serious social, political, and ecological costs. At the same time, the pivot on the part of some countries back towards extractivism as the primary mode of development suggests that forests in Central America are still at risk. More significantly, the rapid growth of road connectivity will certainly impact forest cover in years to come, and a lack of both consultation around roads and recognition of their impacts could play an important role in conflict and deforestation in frontier and border zones.

Better legal frameworks for FPIC along with implementation of more consistent stakeholder engagement prior to the granting of concessions, the recognition of the multiple claims on spaces of production, and better planning for potential displacement are all parts of improving the context for development in Central America. All of these require the strengthening of both

government and community capacity as well as a commitment to transparency by international donors and corporations. Further commitment, especially by more powerful actors with access to capital, to understanding the implications of different types of investment and development visions for conflict, deforestation, and economic growth could alter some of the trends described above.

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