

IMPACTS OF EXTRACTIVE INDUSTRY AND INFRASTRUCTURE ON FORESTS

GLOBAL AND SYNTHESIS REPORT



EXECUTIVE SUMMARY

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Assessment and Scoping of Extractive Industry and Infrastructure in Relation to Deforestation: Global and Synthesis Report

Executive Summary

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Executive Summary

This executive summary provides an overview of key findings from five reports exploring the significance of extractive industry and infrastructure as drivers of deforestation and rights violations in forest communities globally and in three regions: Mexico and Central America, the Brazilian and Western Amazon, and Indonesia. The study was commissioned by the Climate and Land Use Alliance (CLUA) and carried out by Clark University from mid-2016 to early 2018 together with the organizations PRISMA (El Salvador), CASA (Brazil) and Samdhana Institute (Indonesia).

Context

Indonesia, the Amazonia, and Mesoamerica constitute distinct contexts for forest loss and forest resurgence. Indonesia is undergoing rapid forest loss, especially concentrated in certain parts of the archipelago. The Brazilian Amazon has been characterized until 2012 by a slowdown in deforestation and relative success of forested protected areas, though these trends are now increasingly in reversal. Mesoamerica's forest geography is more complex, with patchy but significant forest resurgence and well-organized networks of community-based forest management organizations, but also significant areas of forest loss and degradation. The political economies and political ecologies of the three regions are also distinct. Indonesia and Brazil are characterized by national development strategies that emphasize large-scale resource extraction and agroindustry coupled with significant and advanced industrialization. Mesoamerican economies, while more varied, are less industrialized, less dependent on large-scale resource extraction, more reliant on migrant remittances, and more dependent on transnational forces and organizations. Focusing on these three distinct regions highlights the need for differentiated approaches, but also reveals common trends in drivers and responses.

Findings

Increasing investment in extractive industry and infrastructure (EII) is promoted as a pillar of economic development. However, EII investment has also been accompanied by corruption, poor governance, inequality, environmental damage and climate change effects. The complex challenges of managing EII for sustainable and equitable development are reflected in the growing concern that EII is a driver of deforestation and rights violations in communities who live in and near forests. This concern is serious because many of the world's remaining areas of extensive humid and semi-arid forest are sites of important mineral, oil, coal and natural gas reserves. These forest areas are also set to receive significant investment in infrastructure designed to support extractive industry and large-scale agriculture. This suggests that threats to forest cover from EII are likely to increase. This analysis explores these issues in Mexico and Central America, the Brazilian and Western Amazon, and Indonesia, and finds evidence that this concern is warranted.

Infrastructure and extractive industry often come bundled together. Efforts to promote investment in the two sectors and the synergies between them drive legal and institutional

reforms that change how forests are governed. These reforms have led to reductions in protected area status, weakened protection of Indigenous territories, and relaxation of environmental assessment procedures, among others. Violence against environmental defenders has increased.

In aggregate terms, infrastructure seems a more important driver of forest loss than mining or hydrocarbon extraction, but in practice the two sectors are better understood as existing in a relation of synergy. While the direct footprints of extractive industry operations on deforestation are relatively limited in space, there is evidence that the forest degradation effect stretches much further than the mine site. Access infrastructure, on the other hand, facilitates expansion of the agricultural frontier by large agro-industrial and smallholder colonists alike, as well as immigration of artisanal and small-scale miners. By opening roads and other means of access, energy transmission infrastructure and pipeline construction can have the same effect. Much new extractive industry investment, especially in more remote forest locations, requires access and energy infrastructure, and the prospect of resource extraction can make infrastructure investment more financially viable. In some sense, infrastructure is the “driver of drivers” of forest loss – it enables extractive industry, it drives expansion of the agro-industrial frontier, and it drives colonization.

If infrastructure has the greater footprint on forests, resource extraction has the larger adverse impact on bundles of rights¹ and (together with dams) has induced more mobilization and protest from local communities than have road, railway or waterway building projects. Beyond this distinction, the bundling of extractives and infrastructure has been associated with a general tendency towards conflict and constraints on civic space, and criminalization of community leaders and activists who are portrayed as “anti-development.”

Trends

Some common drivers help explain EII’s expansion into forests across Amazonia, Indonesia, and Mexico and Central America, including:

- A policy emphasis on national and regional infrastructure integration, including macro-regional integration of energy systems and increased national energy generation capacity. In each region, increased energy access and use together with higher quality infrastructure are considered key to economic development. This means responses to EII’s impacts on forests need to promote “smarter” rather than “no” infrastructural investment and less carbonized, rather than less intensive, national energy strategies.
- Stable political settlements in which government and economic elites (who sometimes overlap) have a shared political commitment to these projects of integration and resource extraction across different elected regimes
- The weakening of regulations protecting forested lands, Indigenous and community territories, and restrictions on the rights and freedoms of environmental activists and organizations

- The use of illegality to access forest lands for large- and small-scale EII investment – through corruption or organized violence
- An increased presence of companies who are not International Council on Mining and Metals (ICMM) members or publicly traded in OECD countries, reflecting changes in patterns of investment and the rise of resource nationalism in some countries. To the extent that such investment is less subject to safeguards, this may increase environmental and social risk.
- Synergies between extractive industry and infrastructure investment in which each makes the other more financially viable, so the two types of investment become drivers of each other.

Infrastructure and its land cover impacts

Large-scale, expanded, inter-regional, and rural-urban infrastructure investment is at the core of development plans for each region. Planned infrastructure is designed to have synergistic relationships with increased carbon-based energy use, expansion of the agricultural frontier, and facilitation of new mining and hydrocarbon frontiers. Recurrent features of these plans are large-scale roads, interconnected electricity generation and transmission systems, and port improvement. In Indonesia, there is a particular commitment to thermal power plants and rail, in the Amazon to improved hidrovías (waterways), and in Mesoamerica to telecommunications.

Infrastructure is essential for development, but a large body of evidence shows that it has also been a historical driver of forest loss, especially by facilitating smallholder colonization and the expansion of the large-scale agricultural frontier. The fact that one of the primary lobbies for infrastructure investment in the Brazilian Amazon has been the agro-industrial lobby is testament to this synergy. In this sense, the greenhouse gas emissions deriving from large-scale agriculture are also a consequence of infrastructure investment. Similarly, emissions from extractive industry are also a consequence of the infrastructure investment that made the extraction possible.

Small-scale infrastructure – legal, illegal, and/or unplanned – also emerges as a cause of deforestation. The opening of tracks and roads by small-scale miners, loggers, ranch owners, and local authorities has been an initial catalyst to forest loss and degradation in all three regions, though it typically passes under the radar of planners and civil society monitoring efforts and research.

Given that accessibility and distance appear to be at least as effective in protecting forests as the designation of protected area status, there is good reason to be concerned about the expansion of infrastructure that increases access to remote areas through the combination of large-scale routes and smaller, sometimes illegal, feeder roads. This infrastructure also increases the financial viability of extractive industry investment in these remote forest areas. In fact, evidence shows that infrastructure is, directly and indirectly, the primary driver of tropical deforestation today.ⁱⁱ

Approaches for Reducing EII Impacts

Approaches for addressing the direct and indirect impacts of EII on forests and forest communities share several similarities across the regions studied. The most successful strategies recognize the following:

- The importance of grassroots capacity in strategies that combine resistance and negotiation as an effective mode of regulation, either in blocking projects or, more often, in renegotiating their design
- The importance of non-sectoral government agencies in gaining traction over large-scale investment, especially anti-corruption agencies, public ministries, and the offices of public prosecutors and human rights defenders
- The significance of legal action and litigation as a component of strategies to defend forests and forest users. As a result of litigation, Supreme and Constitutional courts have taken decisions that protect forest and native land cover, defend rights to consultation, and suspend national policies seeking to promote EII without adequate planning or consultation. Legal action has also involved collaboration between parliamentarians and civil society in drafting legislative proposals.
- The important role played by the development of spatially explicit analyses of investments and their effects, with innovative use of Geographic Information Systems and cartography. Though resources invested and the number of organizations involved in such efforts is limited, their visibility and effects are outsized, and there is growing traction to the idea that data on all natural resource based activities should be consolidated into single, publicly accessible data bases.
- The importance of understanding the regulation of extractives, infrastructure, oil palm, protected areas, and territories as a whole, and not issue by issue, or sector by sector. The same, or at least overlapping, interests participate across these sectors, and owners lobby for similar rule changes regarding land and forest governance, often without input from Indigenous territories and communities.

EII and its land cover impacts

To date, the direct land cover impacts of extractive industry have been limited. As one example, the Indonesian regions Sumatra, Kalimantan, Sulawesi, Moluccas, and Papua lost approximately 14.7 million hectares (Mha) of forests between 2000 and 2010. While 43 percent of this forest loss occurred in forestry, logging, fiber, oil palm and other non-mining related natural resource concessions, only 2 percent occurred in mining concessions.ⁱⁱⁱ Analyses of Mexico and Central America and the Amazon suggest a similar pattern, though there is evidence of more extensive impacts of extractive industry on forest degradation beyond the sites of mines and oil and gas wells. But there are four caveats to this general observation.

First, digging deeper into the Indonesian data reveals that the percentage of concession area undergoing forest loss within coal mining concessions is comparable with the percentage of forest lost within concessions for oil palm, wood fiber, and tree plantations. The rates of forest loss within concessions are also far higher when different types of concession overlap. These results suggest that the rapid increase in coal mining concessions in Indonesia should be a cause for concern because when these overlap with other concessions, a probable effect will be to accelerate forest loss.^{iv}

Second, localized land cover and biodiversity impacts of mining in particular types of environments can be substantial. In the case of large-scale mining, the iron-coking coal complex in Brazil stands out as a clear example, as does coal mining in forest environments in Kalimantan, Indonesia. The local impacts of artisanal and small-scale gold mining (ASGM) on forests are also significant and growing rapidly in many parts of Indonesia and the Amazon.^v In the areas in which it operates, this mining clears all forest and renders soils sterile post-mining, placing alluvial forest as well as riverine biodiversity at particular risk.

Third, the forest loss effects of extraction are not limited to the concession area. Resource extraction can require the construction of access infrastructure to open mines and ship out resources (this is much more serious for mining than for oil and gas, for which there are also offshore-onshore options). This access infrastructure can expose far larger areas to forest loss due to the in-migration that it facilitates.^{vi} In this regard, iron ore and coal are especially significant commodities, as their low unit value and volume requires the building of large railways, roads or waterways to extract and transport minerals for export. This is especially significant for Brazil (iron ore) and Indonesia (coal).

Finally, infrastructure and resource extraction can lead to the degradation of forests in areas that extend well beyond the areas of more localized forest clearance. Recognizing and assessing such degradation is important as recent work has begun to suggest the considerable significance of forest degradation for emissions.^{vii} Degradation can result from the effects of small paths and access roads running through forests, increased forest use by communities springing up around roads and sites of extraction, and unplanned and unsustainable timber and fuelwood extraction, including to support mining activities, especially ASGM.

While impacts of extractive industry on forest loss and emissions have been modest to date, future impacts may be more significant:

- In Indonesia, strategic coal deposits are located deep within forest areas, particularly in Kalimantan. The direct and indirect impacts of these concessions on future emissions are threefold. First, the development of these concessions (which sometimes depends on infrastructure investment) would open up these forests to additional pressures from in-migration. Second, developing the deposits requires forest clearance. And third, the extraction and burning of the coal releases more greenhouse gases. The Government of Indonesia's commitment to important increases in thermal electricity generation makes it likely that such coal extraction will expand significantly.

- In the Amazon, there is a clear risk that pressures to extract oil and minerals will lead to further downsizing, degazetting, and/or downgrading of protected areas and Indigenous territories, and this is already occurring in some areas.^{viii} Even without degazetting, there will be serious overlaps and conflicts with conservation areas and Indigenous territories. A second concern is that future development of mineral concessions combined with access infrastructure (waterways, rail) in the state of Amazonas, Brazil, might help “pull” development into areas of primary rainforest.
- In Mesoamerica, large-scale mining in Panama threatens substantial increase in emissions from forest loss, while the combined effect of hydrocarbon development and infrastructure places increased pressure on the community managed forest concessions of the Petén in Guatemala.

Rights impacts of EII

The granting of extractive industry and infrastructure concessions overlaps with land and resource rights held by Indigenous and traditional communities across all three regions. The granting of EII concessions does not automatically compromise or violate these tenure rights, but it accentuates risks to those rights. Concessions can also introduce powerful actors who have frequently used a combination of payments, incentives and intimidation to encourage forest residents and users to transfer rights to EII interests.^{ix} Legislative efforts to weaken Indigenous territorial land rights (for instance, in Brazil at present) reflect efforts to facilitate rights transfer or displacement from communities to extractive industry. Indigenous and other rural movements across all three regions have expressed concern for territorial rights and tenure security in relation to EII investment.

Increased investment in EII also raises human rights concerns, especially in the context of trends observed in many tropical forest regions: the curtailment of civic space, the reduction of civil liberties, the criminalization and murder of activists, and the persecution of organizations supporting them. Four land and environment defenders are murdered every week globally, and Brazil, Colombia, Peru, Nicaragua, and Guatemala are among the most dangerous countries in this regard.^x

The implications of ASGM for rights are also complex. While this activity is associated with increased livelihood opportunities, its potential links to organized crime, money laundering, land speculation, and the progressive un-governability by the state of wider forest areas are also significant. Some of these warning signs can be observed in regions such as Madre de Dios (Peru), parts of the Atlantic Coast of Mesoamerica, Serra Pelada (Brazil), Bolívar (Venezuela) and parts of Indonesia.

Recommendations

Addressing the indirect and direct impacts of extractive industry and large-scale infrastructure on forests and forest communities requires engagement with the elite politics linked to these investments and related economic activities, both legal and illicit. It also involves action in

remote geographical locations where the rule of law and civic oversight are weak, increasing the potential for human rights abuses and repression. This suggests that confronting the interests behind resource extraction and infrastructure head-on is not a wise approach. Civil society and some public sector actors, however, have developed strategies that have proven effective (see Box 2 above). These strategies operate at different levels (from local to national and international), have been pursued by organizations in different sectors (community based, NGO, government and even private commercial), and are targeted at different points along the value chain (resource extraction, distribution, financing and consumption). These strategies have often been combined in innovative ways.

In addition to these proven options, there are two areas in which there is need to do more strategic thinking and capacity development:

- **The development of viable economic and energy strategies that can provide alternatives to the ideas about “development” that are used to give legitimacy to large-scale investments.** Alternatives need to show how to combine the protection of forest cover and community rights with the provision of dignified livelihoods and systems of energy generation and distribution that can broaden energy access and increase energy provision. In this sense, proposals for viable large-scale decarbonization of energy systems and livelihood generation are integral to the success of strategies of forest protection.
- **Analysis of the growing diversification of investment in EII and its implications for forests, climate and community rights.** New investment is coming not only from China, India, Southeast Asian countries and elsewhere, but also from national elites and sources of finance capital that are interested in investing in public-private partnerships for infrastructure projects. Civil society, public bodies and the research community need enhanced capabilities to understand and monitor these new financial flows, to guarantee the implementation of social and environmental safeguards, and to hold these sources of investment accountable.

In short, there are good reasons to be concerned about the impacts of EII on deforestation and community rights. In many cases, these reasons have less to do with what has gone before and much more to do with what might be coming in terms of future investment. Researchers who explored these issues in the early 2000s produced reports that have turned out to be prophetic. For whatever reason, a decade ago many pushed the issue of EII and forests to one side, perhaps because they felt the evidence seemed too limited or the issues too sensitive. The question is whether this time around, with more data at hand and clearer evidence on future planned investments, the same will happen again.

Notes

ⁱ A bundle of rights may include the rights to use a resource, to manage it, to transfer (assign or reassign) management and use rights, and the right to own. https://land-links.org/wp-content/uploads/2016/09/USAID_Land_Tenure_Property_Rights_and_NRM_Report.pdf (1).

ⁱⁱ Laurance WF, Goosem M, Laurance SGW (2009) Impacts of roads and linear clearings on tropical forests. *Trends in Ecology & Evolution* 24(12):659–669.

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^{iv} Johnson K (2017) Characterizing the Impacts of Coal Mining on Forest Loss and Protected Areas in Sumatra, Indonesia (2000-2014). MSc (Clark University, Worcester, MA).

^v Asner GP, Llactayo W, Tupayachi R, Luna ER (2013) Elevated rates of gold mining in the Amazon revealed through high-resolution monitoring. *PNAS* 110(46):18454–18459.

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^{vi} Sonter LJ, et al. (2017) Mining drives extensive deforestation in the Brazilian Amazon. *Nature Communications* 8(1). doi:10.1038/s41467-017-00557-w.

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^{vii} Tyukavina A, et al. (2015) Above ground carbon loss in natural and managed tropical forests from 2000 to 2012. *Environmental Research Letters* 10(7):074002.

^{viii} These changes are defined as: reducing the spatial extent of protected areas (downsizing), eliminating their protected status entirely (degazettement), and allowing more human activity within protected areas (downgrading) (2, 3).

^{ix} Global Witness (2016) *On Dangerous Ground* (Global Witness, London) Available at: <https://www.globalwitness.org/en/campaigns/environmental-activists/dangerous-ground/> [Accessed March 12, 2018].

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