THREE BASINS THREAT REPORT:

Fossil Fuel, Mining, and Industrial Expansion Threats to Forests and Communities

OCTOBER 2023
EXECUTIVE SUMMARY

Earth Insight

PARTNERS:

AMAZON SACRED HEADWATERS ECUADOR · PERU

auriga

COICA COORDINATOR OF INDIGENOUS ORGANIZATIONS OF THE AMAZON BASIN

DYNAMIQUE DES GROUPES DES PEUPLES AUTOCHTONES

RAINFOREST FOUNDATION UK
SECURING LANDS, SUSTAINING LIVES

TABLE OF CONTENTS

Suggested Citation:
Three Basins Report: Fossil Fuel, Mining, and Industrial Expansion Threats to Forests and Communities, Earth Insight, 2023.

Cover Image: (**Top**) Deforestation and degradation of mountain side at the Indonesia Weda Industrial Park (IWIP) in Central Halmahera, North Maluku Province. Credit: Courtesy of Auriga via Flicker, (**Bottom Left**) A woman from the Waorani community speaks via megaphone during a protest against new oil projects in the Amazon in Ecuador, Quito. Credit: Juan Diego Montenegro/picture alliance via Getty Images, (**Bottom Right**) Oil well in the Democratic Republic of Congo on October 19, 2021. Credit: Alexis Huguet/AFP via Getty Images

EXECUTIVE SUMMARY

The vital forests and riverine ecosystems that span the Amazon, Congo, and Borneo-Mekong Southeast Asian basins are natural and cultural wonders that are critical for the maintenance of biodiversity and climate stability. Their preservation is essential for Indigenous and local communities who call them home and for the future of humanity. The first cut is the deepest, and the expansion of fossil fuel, mining, commercial logging or agriculture industries all initiate a cascade of deforestation and forest degradation that follow.

This report offers a stark look at the looming threats from the expansion of these industries by examining where oil and gas, mining, and other industrial concessions overlap with Undisturbed Tropical Moist Forests (often primary forests and key biodiversity areas and hereafter referred to as "intact tropical forests"). The report also indicates overlap with Indigenous Territories, customary lands, and other populated places. The findings underscore the **critical need for a moratorium on the expansion of industrial activities, in primary and priority forests** in these regions and globally in order to create space for financial solutions (like debt relief, subsidy redirection, payments for ecosystems services, and other financial system innovations) to be established to preserve these global treasures and meet development needs.

New mapping and analysis shows that:

- **Nearly 20% of intact tropical forests in the three basins are now in active and potential oil and gas concessions.**
- **Nearly 25% of intact tropical forests in the Amazon and Congo basins are now in active or potential mining concessions.**
- **In Indonesia nearly half of all nickel concessions, a major source for the EV industry, overlap with natural forests.**
- **Over 200 million people, including a significant proportion of Indigenous and local communities, or about 20% of the population in the three basin regions, live within oil and gas blocks.**

Without a halt to extractive activities – and adequate protection and enforcement, the remaining forests and the Indigenous and local communities that depend on them will continue to be severely impacted.

An analysis[1] of Landsat data from 1990-2019 found 218.7 million ha of tropical moist forest disappeared, with a further 106.5 million ha in a degraded state. **It estimated that at least 45.4% of recent degradation will likely lead to deforestation in less than ten years.** Global tropical primary forest loss in 2022[2] totaled 4.1 million hectares, the equivalent of 11 football fields of forest disappearing every minute.

In the Amazon Basin, some 26% of its area show signs of deforestation and high degradation; 20% have been irreversibly converted; and 6% are highly degraded.[3] It is also projected that at least 27% of intact rainforests in the Congo Basin present in 2020 face dire, existential threats by 2050, if the rate of deforestation and forest degradation continues.[4] South-east Asia has lost forest area larger than Germany – 376 000 km^2, or nearly one-sixth of its forests,[5] with mounting threats from fossil fuel, mining, agribusiness, forestry and other industrial expansion.

Without a rapid halt in deforestation and natural forest degradation, all three basins risk systemic ecosystem breakdown, and as climates warm, feedback loops get triggered, and entire canopies die off. Amazonia is already in the midst of a tipping point crisis, and in the Congo Basin a similar tipping point threshold near 25% deforestation and high degradation has also been modeled[6] where it may no longer support rainforest ecosystems and services if that threshold is passed.

Aerial view of the Amazon Rainforest showing massive swaths of deforestation. Image credit: Courtesy of ESA/Alexander Gerst via Flickr (CC BY-SA 4.0)

Industrial Expansion - A Driver of Violence Facing Indigenous Peoples and Local Communities

Forests and communities in all three basins face multiple threats from the expansion of fossil fuels, mining, logging, cattle and agribusiness. A holistic understanding of the cascade of deforestation and forest degradation needs to consider not only the proposed impact area of a project but all related changes, from infrastructure development and demographic pressures and migration, to forest fragmentation and biocultural erosion.

It is estimated that almost 60%[7] of Indigenous peoples' lands in 64 countries worldwide are either highly threatened (8.6 million km^2) or moderately threatened (14.1 million km^2) by industrial development expansion. Another study found that Indigenous peoples are involved in at least 34%[8] of all documented environmental conflicts worldwide, with more than three-fourths of these caused by mining (24.7%), fossil fuels (20.8%), the agriculture, forestry, fisheries, and livestock (AFFL) sector (17.5%), and dams (15.2%). However, the AFFL sector caused the most land dispossession, livelihood loss, and environmental degradation.

For the last five years, mining has posed the most danger to environmental defenders.[9] For Indigenous peoples, resisting industrial expansion projects can be tantamount to a death sentence. An analysis of 3081 environmental conflicts over development projects reported in the Environmental Justice Atlas database indicates that mining and land conflicts pose the highest risk for assassinations, physical violence, and criminalization.[10] The death toll more than doubles for Indigenous environmental defenders. As investments switch to transition minerals, until governments establish legal enforcement – and until supply chains are regulated, traceable and actually accountable – this trend could mean a far more perilous time for Indigenous groups standing for the survival of their homes and the ecosystems that humanity needs to preserve for our shared future.

A nun on August 2022 in Lima, Peru holds a photo of Herasmo Garcia Grau, a murdered Indigenous leader and Amazon defender. Image Credit: Fotoholica Press Agency via Alamy Live News

SUMMARY OF KEY FINDINGS

Fossil Fuel Expansion Threats to the Forests and Communities of the Three Basins:

By 2030 fossil fuel expansion is projected to produce 240% more coal, 57% more oil, and 71% more gas over the limits that keep global warming to the 1.5°C threshold.[11] Given the immense biocultural diversity in the forests and ecosystems of the three basins, they are the last places on Earth where oil and gas expansion should be happening. Yet massive threats are looming, as the map and metrics for each of the three regions demonstrate below.

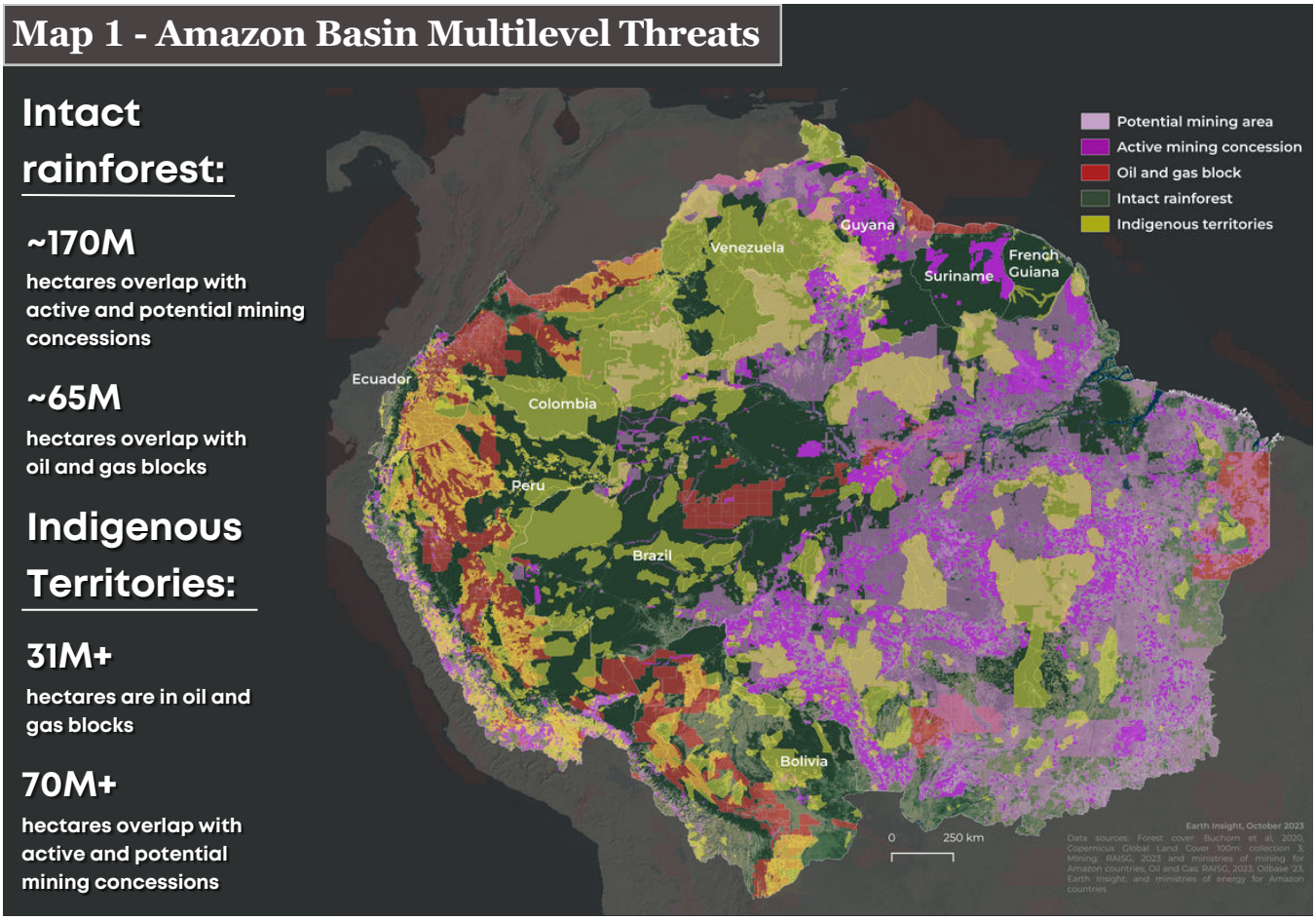
Mining

Mining is estimated to be the fourth[12] biggest driver of deforestation. Across all three basins, mining expansion represents a significant threat to both ecosystems and local communities, given the associated deforestation and forest degradation and toxic impacts to communities and freshwater critical for survival.

A pantropical investigation of 7,019 km^2 of tropical forests in mining areas in 2000 showed a 46.5% reduction by 2019.[13] **Most (80%) of the deforestation was concentrated in four countries: Indonesia, Brazil, Ghana, and Suriname.** Of the 26 countries analyzed, Indonesia accounted for 58.2% of direct forest loss by mining. Looking ahead, the race for critical minerals has the potential to significantly exacerbate this trend. So far, 20% of critical mine sites are located in biodiversity hotspots.[14] This latest resource rush could continue the historic pattern of North-South exploitation, biodiversity depletion, and impacts on Indigenous and local communities. Extensive mining-related expansion threats for metals and minerals are looming, which the maps and metrics for each of the three regions demonstrate on the following pages.

Aerial view of the Carajas Mining Complex, surrounded by Amazonia rainforest, municipality of Canaa dos Carajas, Para state, Brazil on May 17, 2023. Image credit: Mauro Pimentel/AFP via Getty Images

Map 1 - Amazon Basin Multilevel Threats



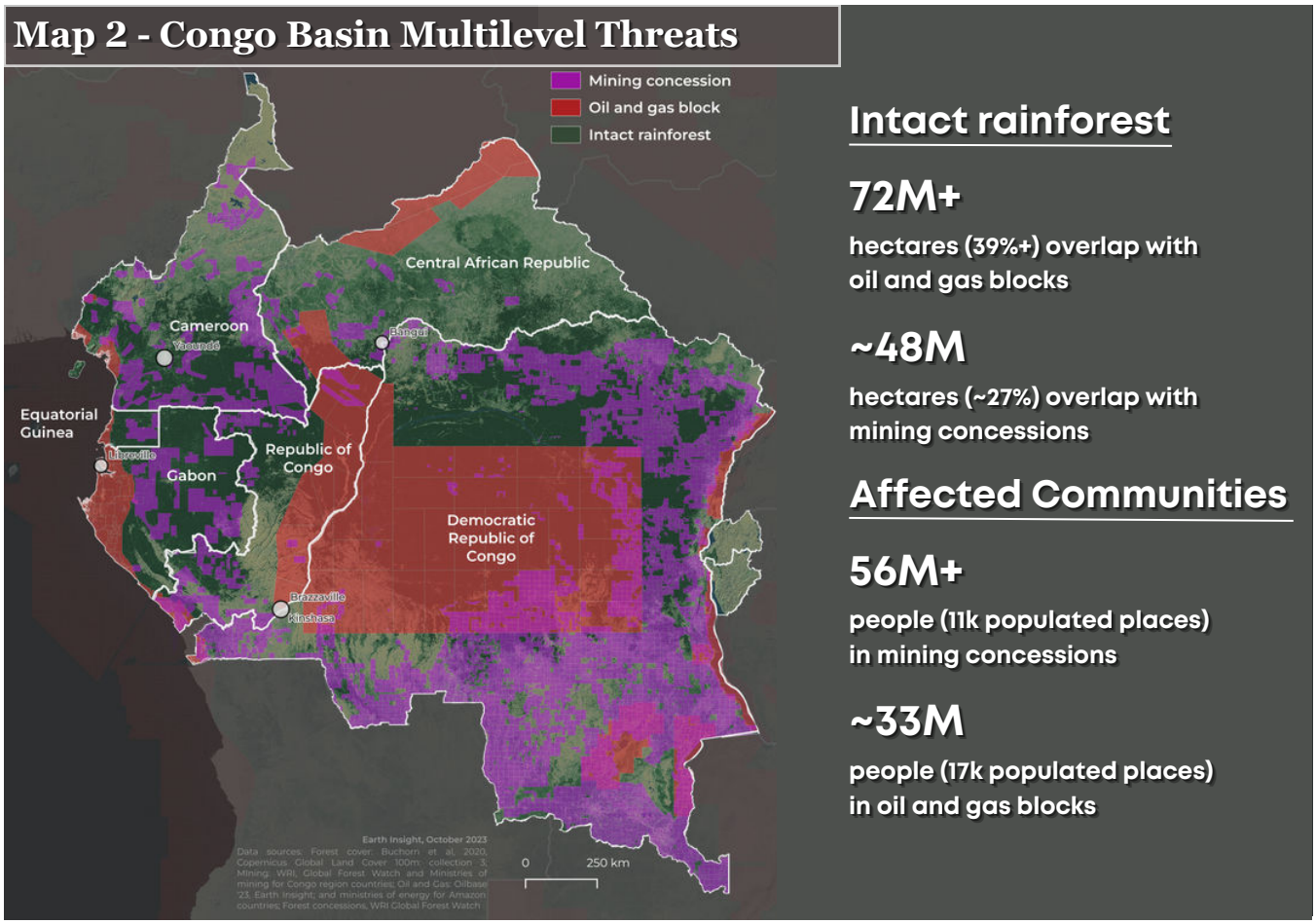
Oil and Gas Expansion Threats In the Amazon Basin:

- An estimated 65 million hectares, or nearly 13% of undisturbed Tropical Moist Forests (an area nearly twice the size of Poland) overlap with oil and gas production and exploration blocks.
- Over 500 distinct Indigenous nationalities call the Amazon Basin home, and more than 31 million hectares of Indigenous Territories are now in oil and gas production and exploration blocks.
- More than 13,000 populated places - including villages, towns, etc. — representing nearly 14 million people, or more than 23% of populated places in Amazonia — now live in oil and gas production and exploration blocks.

Mining Expansion Threats In the Amazon Basin:

- Nearly 170 million hectares, or more than 33% of undisturbed Tropical Moist Forests, overlap with active (~71m ha) and potential (~99m ha) mining concessions.[15]
- More than 70 million hectares of Indigenous Territories overlap with active (~10m ha) and potential (~60m ha) mining concessions. [16]
- In an extreme threat scenario, more than 16,000 populated places (villages, communities, towns, etc.) and 27 million people are located in active and inactive mining concessions.[17]

Map 2 - Congo Basin Multilevel Threats

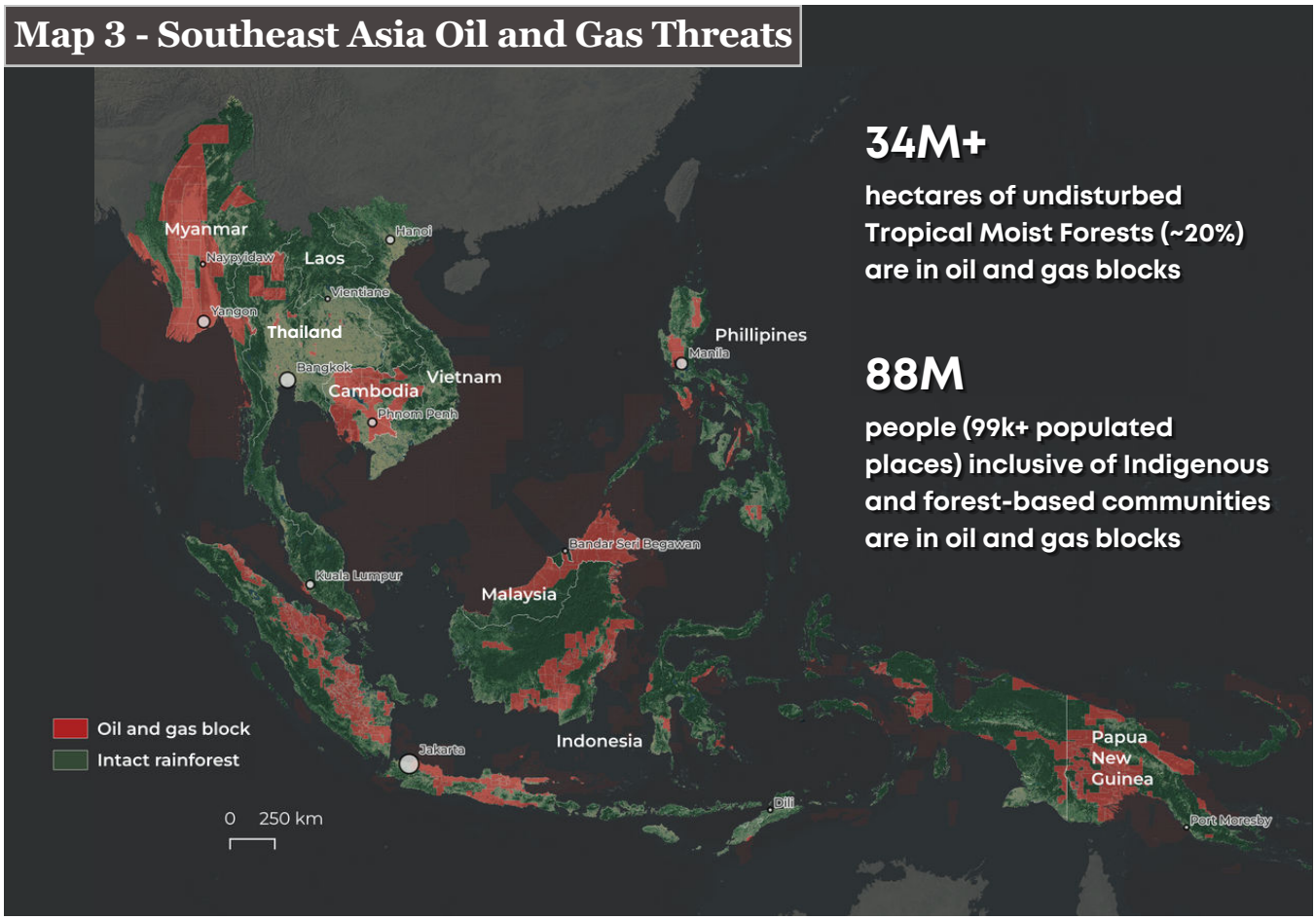


Oil and Gas Expansion Threats In the Congo Basin:

- Over 72 million hectares, or more than 39% of the intact Tropical Moist Forests, now overlap with oil and gas production and exploration blocks.
- Over 150 distinct ethnic groups call the Congo Basin home, and nearly 33 million people in more than 17,000 populated places — or more than 20% of populated places (villages, communities, towns, etc.) in the Congo Basin — now live in oil and gas production and exploration blocks.

Mining Expansion Threats In the Congo Basin:

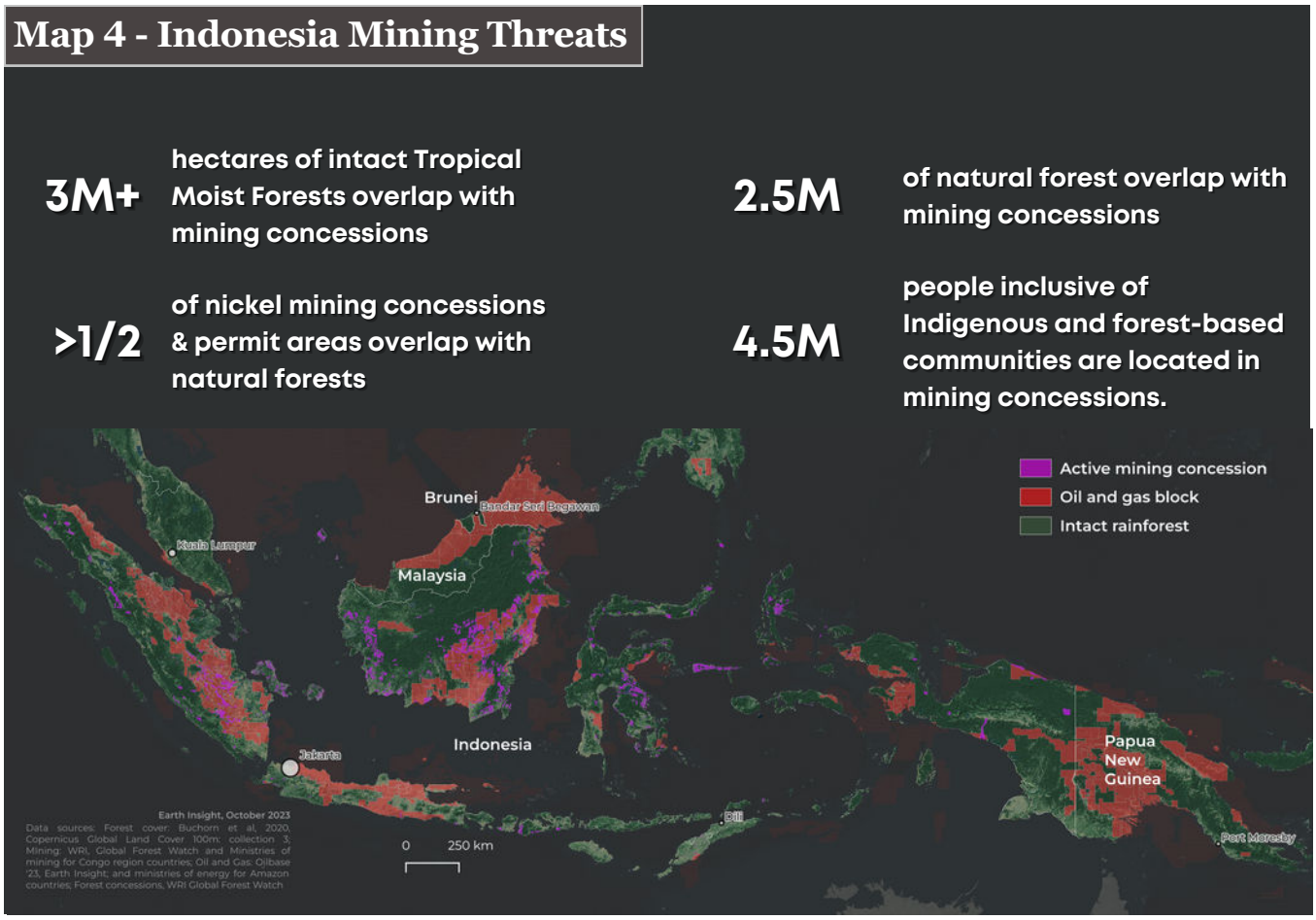
- Nearly 48 million hectares, or nearly 27% of undisturbed Tropical Moist Forests, overlap with mining concessions.
- More than 11,000 populated places (villages, communities, towns, etc.) and 56 million people (inclusive of Indigenous and forest-based people) are located in mining concessions.



In Southeast Asia:

- More than 34.8 million hectares are in oil and gas production and exploration blocks.
- In Indonesia, 88 million people (inclusive of a high degree of Indigenous and forest-based people) in more than 99,000 populated places (villages, communities, towns, etc.) now live in oil and gas blocks.

Petroleum spill mixed with other chemical substances on sea and sand surface in Samet Island, Thailand. Image credit: Arun Roisri via Getty Images



In Indonesia:

- More than 3 million hectares of intact Tropical Moist Forests overlap with mining concessions.
- More than 450,000 hectares of nickel mining concessions and permit areas for the energy transition, or more than half of concessions, overlap with natural forests.
- Nickel deposits span more than 3 million hectares in Indonesia, and 2.5 million hectares of deposits overlap with natural forests – representing a massive risk of deforestation if nickel mining permits expand.
- More than 3,000 populated places (villages, communities, towns, etc.) and 4.5 million people (inclusive of Indigenous and forest-based peoples) are located in mining concessions.

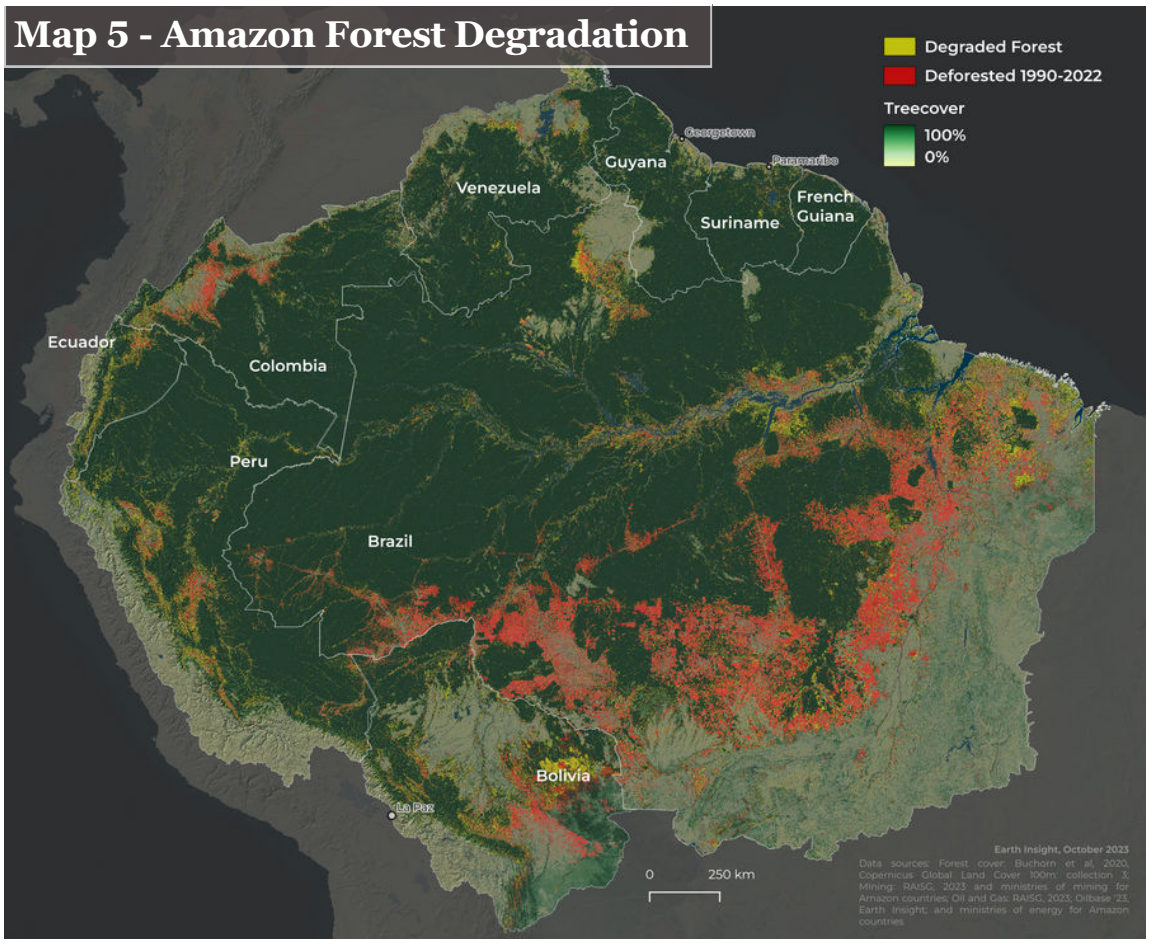
The PT Sungai Raya Nickel Alloy Indonesia (SRNAI) smelter is located in Landipo Village, Moramo District, South Konawe Regency, Southeast Sulawesi Province. This smelter is a National Strategic Project (PSN). Image crdit: Courtsey of Yudi Nofiandi via Auriga

Agribusiness and Logging

It is estimated that commercial agriculture was responsible for 60%[18] of the 77 million hectares of tropical forests lost between 2013-2019. On average, **half of the global annual tropical deforestation from agriculture and forestry sectors is concentrated in two countries: Brazil (33%) and Indonesia (14–19%).** Globally, beef, soybeans, and palm oil production were responsible for about 60% of the tropical deforestation in this century. This proportion rises to 75% once wood and paper are included.[19] While a comprehensive analysis for all three basins will be available in future analyses, the illustrative examples below show the scale of the threat from logging concessions that overlap with primary and priority forests:

Border between PT Tunas Sawaerma Palm Oil Concessions and forest. Image credit: Courtesy of Auriga via Flickr

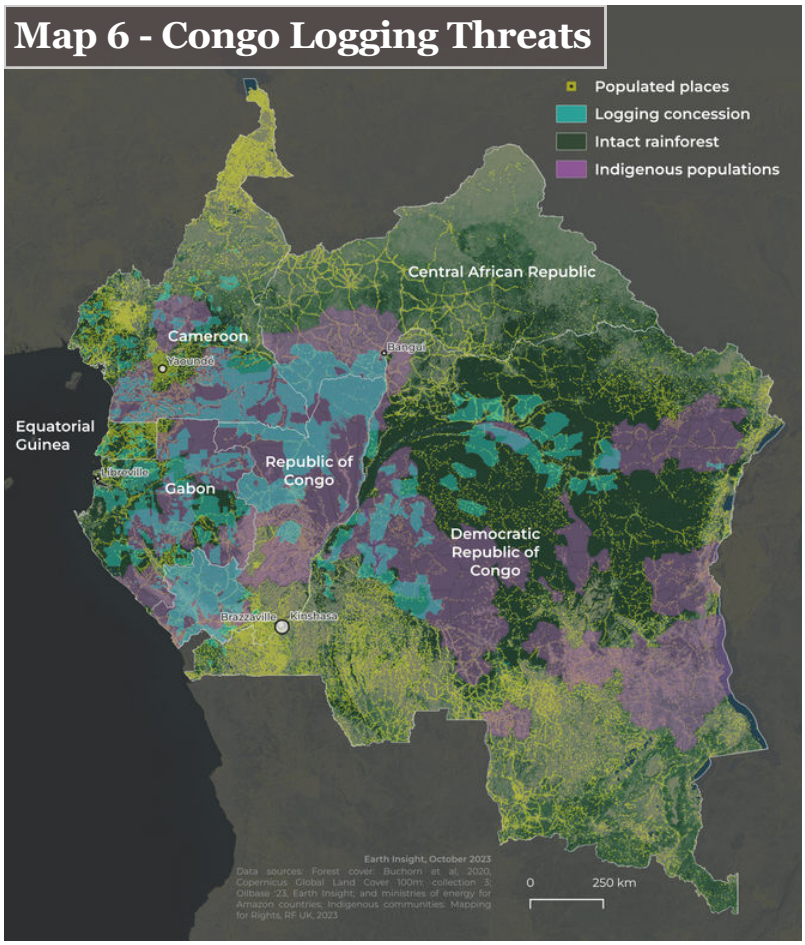
Logging transportation in Mouyondzi, Congo-Brazzaville. Image credit:Boussou Gaston via Wikimedia Commons (CC BY-SA 4.0)



In the Amazon Basin:

- According to a recent study based on accessibility projections by the Amazon Network of Georeferenced Socio-Environmental Information (RAISG), in just five years, the Amazon may lose up to 23.7 million hectares of forest, an area almost as large as the entire United Kingdom[20] — driven primarily by the expansion of agribusiness and livestock - unless different trajectories are chosen

"We, Indigenous peoples have cared for the Amazon for millennia so today we raise our cry for help and urgently call for 80% protection by 2025. This means stopping deforestation, forest degradation and pollution of the water that sustains all forms of life. It also means legal security of Indigenous territories as a condition for the safeguarding of territorial rights for Indigenous peoples in the Amazon and in the whole of the three basins and beyond." - Fany Kuiru Castro, General Coordinator, COICA

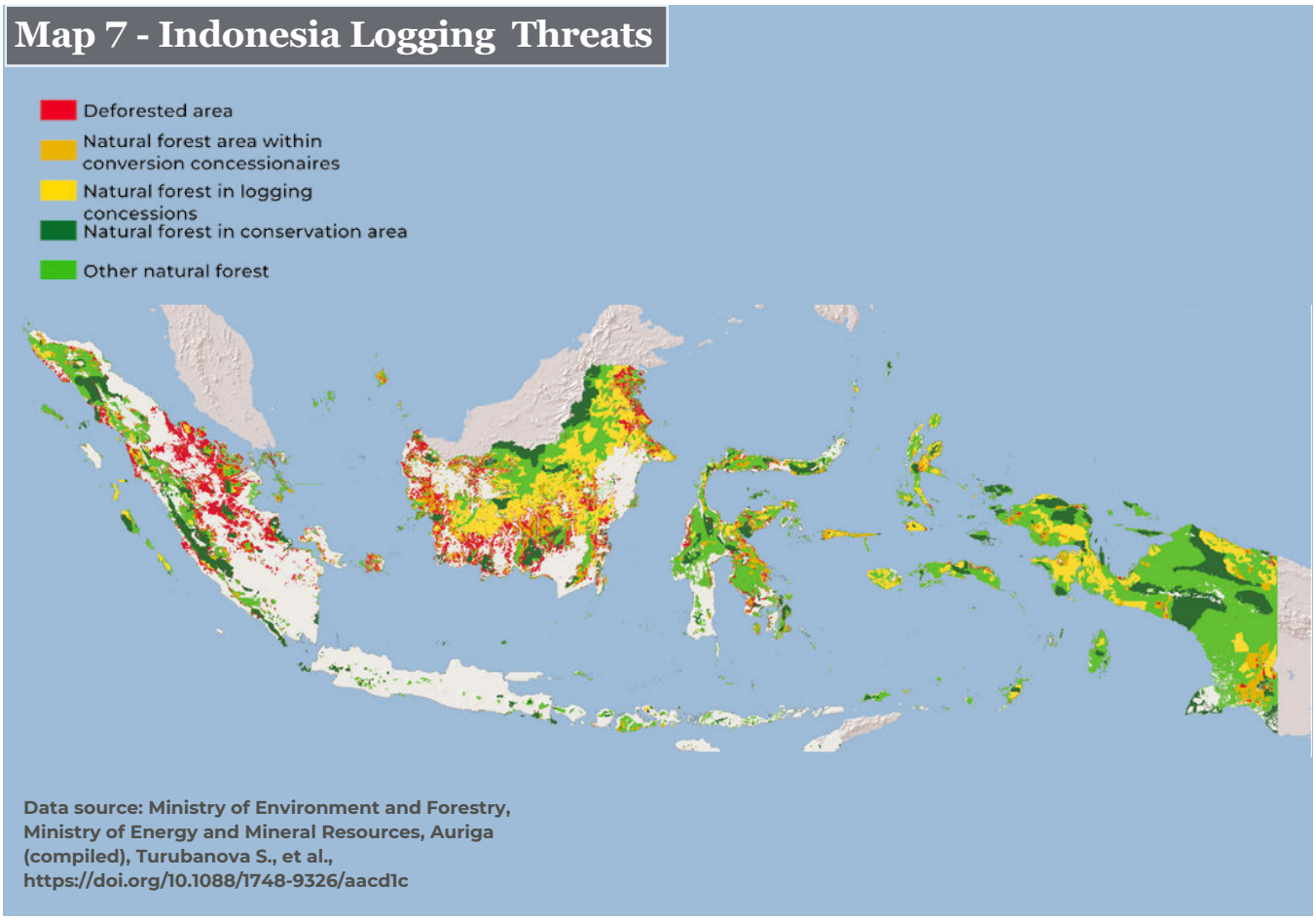


In the Congo Basin:

- As the largest buyer of wood from all six Congo Basin countries, China's growing demand will continue to threaten the region's forests.[21]
- More than 54 million hectares of logging concessions span Congo basin intact tropical moist and other forests. According to Rainforest Foundation UK, tens of millions of hectares of forest are at risk, if the DRC's industrial logging moratorium is lifted.[22]

"Indigenous and forest-based people in the Congo basin have stewarded the forests of this region for millennia. Fossil fuel, mining, and other extractive industry expansion represents an existential threat to the rich cultures and future of Indigenous pygmy and other rare and threatened peoples. World leaders face a turning point and can leave a lasting legacy of forest protection for generations to come if they act before it's too late."
- Patrick Saidi Hemedi, Coordinator of the Dynamique des Groupes des Peuples Autochtones (DGPA)

Map 7 - Indonesia Logging Threats



In Indonesia:

The future threat scenario represented below shows the massive scale of natural forests under concessions in Indonesia.[23] According to analysis by Auriga Nusantara, of the 83.8 million hectares of natural forest in Indonesia at present:

- Only 16.2 million hectares (19.4%) are legally protected and in conservation areas.
- Nearly 23 million hectares of the forest are granted for extractive concessions including 7.3 million hectares (8.7%) for forest conversion concessions (timber plantations, oil palm and mining) and 15.6 million hectares (18.6%) for logging concessions that are degrading the forest.
- Accordingly, a substantial portion of natural forests (44.7 million hectares or 53.4%), is vulnerable to potentially be granted for extractive concessions by the government.

"Indonesia is ground zero for nickel mining for the energy transition. Our forests and communities have been hit hard from waves of global demands from palm oil to pulp and paper and it is time for our government and international companies, particularly electric automakers, to ensure that our remaining natural forests and the communities that call them home are protected."
- Timer Manurung, Executive Director, Auriga Nusantara

Protecting Forests, Advancing Indigenous and Community Rights, and Averting Tipping Points:

Put simply, primary and intact forests must be preserved now before it is too late and the life-sustaining forest ecosystems of the three basins pass irreversible tipping points and further exacerbate the climate crisis.

The multitude of cascading industrial pressures and future threats explored in this report reinforce the need for **new, bold policies and financial mechanisms that are critical for global climate stability and to safeguard the forests of the three basins and the Indigenous and local communities who call them home**. In a statement issued by a wide range of Indigenous, regional, and frontline organizations, heads of state from the three basins are being called upon to commit to the following:

- Scale up rights based on legal protection, demarcation and recognition of forest communities' lands and territories, as a prerequisite to more effective forest protection.

- Uphold communities' right to fully and effectively participate in decision-making on any developments planned in these areas; respecting Indigenous peoples' right to free, prior and informed consent, as well as securing the protection of those living in voluntary isolation.

- Empower and protect Indigenous peoples and other frontline environmental and human rights defenders by enhancing access to justice and providing strong legal protection for them.

- Halt and reverse loss and degradation of all natural ecosystems from large-scale agriculture, mining, extractives and other industries, such as through a global moratorium on industrial activities in primary forests as well as priority forests and through provision of legal protections for remaining natural forests, including in concession areas.

- Accelerate true, low-carbon development in tropical forest countries through a just energy transition, protecting natural forests and the rights and food sovereignty of local communities and Indigenous peoples.

- Adopt time-bound and measurable goals towards these objectives, for transparency and accountability.

SOLUTIONS

Regional and global awareness and momentum is building; and bold action is critical. A range of solutions and frameworks are referenced below that embody the need for both measured and accelerated action:

- The Belem Declaration, if sufficient and timely action is taken, can help avert the tipping point crisis that the Amazon basin is facing.

- A moratorium on all industrial activity in primary and priority forests until 2050 in order to safeguard critical ecosystems and allow time and space to develop appropriate financial system innovations, including adequate funding and payments for ecosystem services, debt relief, redirecting subsidies away from extractive industries, and to develop the legal mechanisms that support primary forest preservation and Indigenous co-management and restoration.

- Expansion of global Indigenous land tenure, access and resource rights, direct funding for co-management, and the requirement of Free, Prior, and Informed Consent (FPIC)

- Global financial architecture reforms that scale up financial resources towards climate action and the Sustainable Development Goals as uplifted by the Bridgetown Initiative

- The Amazonia for Life: 80% by 2025 Declaration from Amazonizan Indigenous federations

- New debt for Climate and Biodiversity commitments from International Financial Institutions, such as the IMF, large debt-holding nations like China, and other debt holders in the private sector

- New frameworks for action including the 10-Point Plan for Financing Biodiversity

- Increased country-level commitments to the principles of the Beyond Oil and Gas Alliance and widespread commitments to the Fossil Fuel Non-Proliferation Treaty

- Unlocking the vast potential in renewables and scaling up direct support to forest communities and other frontline forest defenders.

END NOTES

1 Vancutsem, C. et al. (2021, March). Long-term (1990–2019) monitoring of forest cover changes in the humid tropics. Science Advances. Accessed September 2023 at: https://www.cifor.org/publications/pdf_files/articles/ANasi2101.pdf

2 Weisse, M. et al. (2023). Tropical Primary Forest Loss Worsened in 2022, Despite International Commitments to End Deforestation. World Resources Institute. Accessed Sept 2023 athttps://research.wri.org/gfr/latest-analysis-deforestation-trends

3 Quintanilla, M. et al. (2022). The Amazon Against the Clock: A Regional Assessment on Where and How to protect 80% by 2025. Amazonia80x2025. Accessed Sept 2023 at: https://amazonia80x2025.earth/

4 Duhesme, C. et al. (2022, July). Forests of the Congo Basin - State of the Forest 2021. Observatory of Central African Forests (OFAC)., Accessed October 2023 at https://www.observatoire-comifac.net/publications/edf?lang=en

5 Estoque, R.C. et al. (2019). The future of Southeast Asia's forests. Nature Communications 10, 1829. Accessed October 2023 at https://www.nature.com/articles/s41467-019-09646-4

6 Ewane, E.B. (2022). How much deforestation in the Congo Basin can cause the hydrological cycle to degrade to a tipping point?
Academia Letters. Article 5040. Accessed Oct 2023 at https://doi.org/10.20935/AL5040
‘

7 Kennedy, C. et al. (2023, August 18). Indigenous Peoples' lands are threatened by industrial development; conversion risk assessment reveals the need to support Indigenous stewardship. One Earth 6, 1032–1049. Elsevier Inc. Accessed October 2023 at https://www.cell.com/one-earth/pdf/S2590-3322(23)00340-8.pdf

8 Schiedel, A. et al. (2023, June). Global impacts of extractive and industrial development projects on Indigenous Peoples' lifeways, lands, and rights.
Science Advances 7, Vol 9, Issue 23. Accessed October 2023 at https://www.science.org/doi/10.1126/sciadv.ade9557

9. Global Witness. (2022, September). Decade of Defiance. Global Witness. Accessed October 2023 at https://www.globalwitness.org/en/campaigns/environmental-activists/decade-defiance/

10 Schiedel, A. et al. (2020, July). Environmental conflicts and defenders: A global overview. Global Environmental Change. Vol. 63. Accessed October 2023 at https://doi.org/10.1016/j.gloenvcha.2020.102104

11 SEI, IISD, ODI, E3G, and UNEP. (2021).The Production Gap Report 2021. Accessed October 2023 at http://productiongap.org/2021report

12 Hruschka, F. et al. (2022, June 30). Developing Forest-Smart Artisanal and Small-Scale Mining (ASM) Standards (English). World Bank Group. Accessed October 2023 at http://documents.worldbank.org/curated/en/099235104252220988/P1722450cd79500c30bca0078f7496c1e66

13 Giljum, S. et al. (2022, September). A pantropical assessment of deforestation caused by industrial mining. Proceedings of the National Academy of Sciences of the United States of America. 119 (38) e2118273119. Accessed October 2023 https://doi.org/10.1073/pnas.2118273119

14 Critical Minerals: A Critical Threat for Biodiversity? (2023, July 10). Responsible Investor. Accessed October 2023 at https://www.responsible-investor.com/critical-minerals-a-critical-threat-for-biodiversity/

15 Note this figure includes 99 million hectares of formerly established and now “inactive” concessions that still represent a potential expansion threat.

16 Note this figure includes 60 million hectares of formerly established and now “inactive” concessions that still represent a potential expansion threat.

17 Note this figure includes approximately 5,000 populated places now in “inactive” concessions that still represent a potential expansion threat.

18 Dummett, C., Blundell, A. (2021, May). Illicit Harvest, Complicit Goods: The State of Illegal Deforestation for Agriculture. (Forest Policy Trade and Finance Initiative Report) Forest Trends. Accessed October 2023 at https://www.forest-trends.org/wp-content/uploads/2021/05/Illicit-Harvest-Complicit-Goods_Annex.pdf

19 Bausano, G., Masiero, M. et al. (2023). Food, biofuels or cosmetics? Land-use, deforestation and CO2 emissions embodied in the palm oil consumption of four European countries: a biophysical accounting approach. Agric Econ 11, 35. Accessed October 2023 https://doi.org/10.1186/s40100-023-00268-5

20 Deforestation in the Amazon: Past, Present, and Future: Sept 2022, Synthesis in English provided by InfoAmazonia that can be accessed at: https://infoamazonia.org/en/2023/03/21/deforestation-in-the-amazon-past-present-and-future/ and the original research accessed at: https://infoamazonia.org/wp-content/uploads/2023/03/DEFORESTACION-AMAZONIA-2025_21032023.pdf

21 Ren, P., Zhang, J. (2021, May). Advancing Sustainability in China's Engagement in the Congo Basin: An Assessment of China's Role and Potential Collaboration Opportunities in Forest-Related Trade and Development Cooperation. Congo Basin Forest Partnership.) Accessed October 2023 https://pfbc-cbfp.org/news-partner/China-CongoBasin.html

22 Rainforest Foundation UK. (November 2018). At Loggerheads:The Moratorium, Geographical Programming and Community Mapping in DRC. (Briefing). Accessed October 2023 at https://www.rainforestfoundationuk.org/wp-content/uploads/2021/10/media.ashx_loggerheads-in-drc-2018.pdf

23. Data source: Ministry of Environment and Forestry, Ministry of Energy and Mineral Resources, Auriga (compiled), Turubanova S., et al., https://doi.org/10.1088/1748-9326/aacd1c (Estoque et al. 2019).

METHODOLOGY

Data Disclaimer:
The geospatial analyses in this report are an attempt to capture processes of change using the most recently available, most accurate and precise data and methods available. As such, the results of these analyses may change between reports as data and/or methods are updated. Modeled datasets and the resulting analyses, such as gridded population data and population estimates, carry a degree of uncertainty.

Earth Insight takes a precautionary approach to estimating the potential area under oil, gas, and mining threats. Oil, gas and mining data used in the analyses in this report include active production blocks and concessions, as well areas under multiple stages of exploration and permitting. This approach provides the most expansive view of areas under threat of oil, gas, and mining.

Oil, Gas and Mining Threats to Tropical Forests in the Amazon

The extent of the Amazon region was defined by RAISG based on a consultative process that combines hydrographic, ecoregional and other biogeographic factors. Note that based on this definition the region may be different from the one used in the national context of individual countries. The extent of oil and gas blocks was compiled based on the RAISG oil and gas database and was updated by Earth Insight based on recent official publications by the Ministries of Natural Resources or Energy of Brazil, Bolivia, Peru, Ecuador, Colombia, Venezuela, Guyana and Suriname. The extent of mining concessions was compiled based on the RAISG mining database which was updated by Earth Insight based on recent official publications by the Ministries of Natural Resources or Mines of Brazil, Bolivia, Peru, Colombia. The forest cover used in this analysis consisted of the 2022 EC JRC Undisturbed and Degraded Tropical Moist Forest product (TMF), while the global ESA Tree Cover fraction was used for visualization purposes. The TMF is thought to be the most accurate representation of tropical forest cover that is currently available.

Oil, Gas, Mining and Logging Threats to Tropical Forests in the Congo

The Congo Basin countries were defined as the six nations that encompass the Congo Forest ecoregions: Democratic Republic of Congo, Republic of Congo, Central African Republic, Gabon, Cameroon and Equatorial Guinea. Note that the domain differs from the hydrographic basin which is smaller than the country domain. The oil and gas blocks, mining concessions and logging concessions were identified based on recent publications by the governments of the DRC, RoC, CAR, Gabon, Cameroon, and Equatorial Guinea.

Oil, Gas and Mining Threats to Tropical Forests in Southeast Asia

Southeast Asia was defined as the following twelve countries: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Papua New Guinea, Philippines, Singapore, Thailand, Timor, and Vietnam. Note that the domain differs from the hydrographic basins that cover the Mekong and Borneo basins, which are smaller than the country domain. The oil and gas blocks were identified based on recent publications by the governments of Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Papua New Guinea, Philippines, Thailand, and Vietnam. The extent of mining concessions in Indonesia was compiled based on a database provided by Auriga.
Oil, Gas and Mining Threats to Indigenous Territories
The extent of Indigenous territories was derived from the RAISG database. This layer was intersected with the Earth Insight oil and gas block and mining concession datasets in order to identify areas of overlap.

Oil, Gas, and Mining Overlap with Human Settlements

This map illustrates the overlap between the oil and gas blocks and mining concessions, the large number of settlements throughout the Congo Basin region and their concentration along rivers and access roads. The populated places layer was derived from a global product maintained by the US National Geospatial-Intelligence Agency. Population numbers were derived from the global WorldPop Constrained 2020 UN adjusted gridded (100m) population product.

DATA SOURCES

Oil and gas blocks: Amazon: RAISG oil and gas block database (2023), Bolivian Ministry of Hydrocarbons and Energy, Brazilian National Agency of Petroleum and Natural Gas and Biofeuls, Colombian National Hydrocarbon Agency, Ecuadorian Ministry of Energy and Non-Renewable Resources, Guyanese Ministry of Natural Resources, PerúPetro, Staatsolie, Venezuela's Ministry of Energy and Petroleum. Congo: Ministry of Mines, Industry and Technological Development of Cameroon, Ministry of Energy, Mines, Geology and Water Resources of the Central African Republic, Ministry of Hydrocarbons of the Democratic Republic of Congo, Ministry of Mines and Hydrocarbons of Equatorial Guinea, Ministry of Hydrocarbons of the Republic of Congo, the Ministry of Oil, Gas and Hydrocarbons of Gabon. Southeast Asia: Cambodian National Petroleum Authority, Indonesian Ministry of Energy and Mineral Resources, Department of Energy of the Philippines, PetroVietnam Exploration and Production Company (PVEP), Thai Ministry of Energy, Petronas (Malaysia), Ministry of Energy of Myanmar, Papua New Guinea Department of Petroleum and Energy.

Mining concessions: Amazon: RAISG mining concession database (2023), Bolivian Ministry of Mining and Metallurgy, Brazilian Ministry of Mines and Energy, Colombian National Hydrocarbon Agency, Ecuadorian Ministry of Energy and Non-Renewable Resources, Guyana Geology and Mines Commission, Peruvian Ministry of Energy and Mines, Suriname's Natural Resource and Environmental Assessment, Venezuelan Ministry of Energy and Mines. Congo: Ministry of Forestry and Wildlife of Cameroon, Ministry of Mines and Geology of the Central African Republic, Cadastre Minier (CAMI) of the Democratic Republic of Congo, Ministry of Mines and Hydrocarbons of Equatorial Guinea, Ministry of Mines and Geology of Gabon, Ministry of Mines and Geology of the Republic of Congo. Indonesia: AURIGA (2023).

Logging: Ministry of Water, Forests, Hunting and Fishing of the Central African Republic, Ministry of Economy, Forestry, Water, Finishing and Aquaculture of Gabon, Ministry of Forestry and Wildlife of Cameroon, Ministry of Agriculture and Forests of Equatorial Guinea, Ministry of Forest Economy of the Republic of Congo, Ministry of Environment, Nature Conservation and Tourism.

Indigenous Territories.
Presence of Indigenous Peoples: The presence of indigenous peoples in the Congo Region is based on extensive field data collection by Rainforest Foundation UK, Dynamique des Groupes des Peuples Autochtones (DGPA) and other partners.

Tree Cover Fraction: The Global Tree Cover Fraction was derived from the PROBA-V satellite observations and ancillary datasets.

Tropical Moist Forests: The European Commission's Joint Research Centre developed this new dataset on forest cover change in tropical moist forests (TMF) using 40 years of Landsat time series. The analysis and maps in this report use the Undisturbed and Degraded Tropical Moist Forest product.

Populated places: The populated places database was derived from the Geographic Names Server maintained by the US National Geospatial-Intelligence Agency.

Population data: High resolution population estimates were derived from WorldPop Constrained individual countries 2020 UN adjusted gridded (100m) population product.

Country outlines: The geoBoundaries Global Database of Political Administrative Boundaries Database built by William and Mary geoLab provides national boundaries.