

Chapter 2

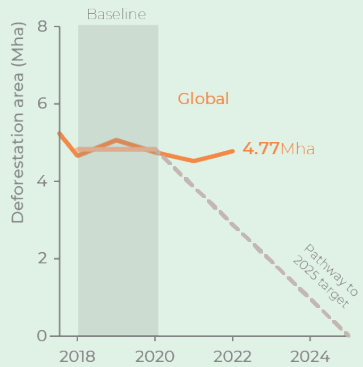
SUSTAINABLE PRODUCTION & DEVELOPMENT

Theme 2 Assessment

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IN 2022, THERE WAS A STAGGERING 4.77 MILLION HECTARES OF COMMODITY-DRIVEN DEFORESTATION



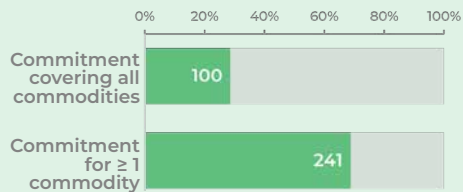
That's a **5.6%** increase in commodity-driven deforestation in 2022 compared to 2021.

With only two years left to meet the 2025 target date to eliminate commodity-driven deforestation, the world is not on track.

Leading agricultural companies are taking action on forest protection, but global impact remains limited

Only **29%**

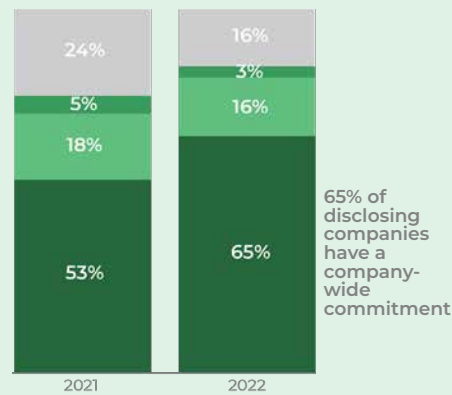
of companies in forest-risk commodity supply chains assessed by Forest 500 have a deforestation commitment in place for all commodities to which they are exposed.



Only 12% of companies disclosing to CDP claim to be close to eradicating deforestation from their supply chains.

Limited progress in mining and extractives sectors on addressing forest risks

In 2022, more mining and coal extractive companies reported through CDP that they had made a public commitment to reduce or avoid impacts on biodiversity than in 2021.



Few downstream companies conduct environmental due diligence for forest-risk commodities.

FORESTS GIVEN LOW PRIORITY BY GOVERNMENTS

Governments fail to recognize the long term loss of value that comes from deprioritizing forests compared to other economic and development objectives.

Limited progress on REDD+ in most participating countries



Investments into harmful forest activities dwarfs investments into protecting & restoring forests



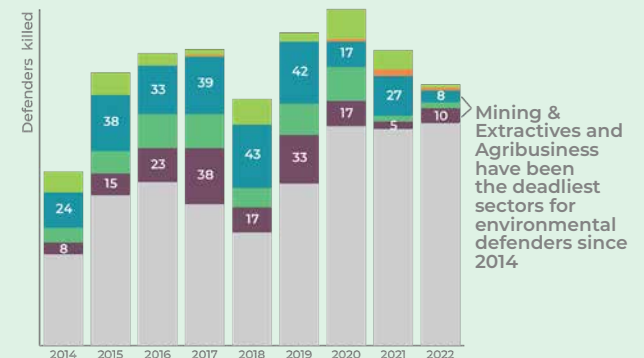
Some countries demonstrate strong political will to protect forests - but it may not be enough



Grassroots actors champion forest protection despite risks of violence

Grassroots movements - with Indigenous Peoples and local communities at the forefront - have led international and place-based resistance to unsustainable development.

But this has come at a significant cost.



At least 80 multistakeholder and multisector initiatives have been established

Collaborative jurisdictional and landscape approaches are still in their early stages, but more companies are engaging:

25 out of 100. The number of palm oil sector companies implementing jurisdictional or landscape approaches, per ZSL SPOTT

2x The increase from 2021 to 2022 in palm oil companies disclosing landscape engagement through CDP

62 The total number of midstream and downstream companies invested in jurisdictional or landscape approaches in 2022, per CDP

>90 The number of additional companies who plan to engage in jurisdictional or landscape approaches in the next two years

KEY MESSAGES

With only seven years left to achieve the 2030 forest goals, and two years left to achieve the private sector goal to eliminate deforestation from commodity supply chains by 2025, recent deforestation and degradation rates show that the world is off track. With insufficient progress, the world risks approaching irreversible tipping points in some areas like the Amazon.¹ Global action towards these goals can't wait any longer. Additionally, while tree cover loss from forestry is intended to be temporary, degradation indicators show that many forestry practices are unsustainable, particularly logging in primary and old-growth forests.

Governments

- Following the money, it becomes clear governments give forests low priority, failing to recognize the long-term loss of value. Most developing countries face enormous challenges initiating the bold reforms needed to reconcile their development pathways with forest goals. While the number of countries that have received payments for emission reductions under REDD+ has grown slowly, this incentive offered by donor countries is not commensurate with the challenge of reaching forest goals. However, strong political will has led to (some) alignment in a few geographies, notably in the European Union (EU).
- Governments have a range of regulatory and fiscal policy tools available to protect forests, several of which are employed widely or are increasing in implementation. However, policies can vary widely in their effectiveness, while others may have unintended consequences, underscoring the need for well-designed forest protection measures.
- Governments also have many policy measures at their disposal to simultaneously promote sustainable livelihoods while addressing deforestation and degradation, or promoting sustainable land use. Such policies have achieved mixed levels of success. Examples show that policy implementation can succeed with strong governance and several other enabling conditions in place.

Companies

- A small group of leading companies in agricultural commodity supply chains continue to prioritize eliminating deforestation and conversion of natural ecosystems. However, their overall impact remains limited, as they control only a small share of the global market, while the majority of companies are either behind on their forest commitments or have yet to make them.
- Corporate transparency related to forest risks remains very limited in the mining and extractives sectors. While companies reporting in 2022 showed small signs of improvement in adopting biodiversity-related commitments and policies, these policies' quality and effectiveness remains unclear due to a lack of specificity.

Grassroots sector

- Indigenous Peoples (IPs) and local communities (LCs) have made astounding headway in raising awareness at the international level of the critical role they play in safeguarding the world's forests and other natural ecosystems. Grassroots movements and resistance led by IPs, LCs, and other stakeholders have elevated conversations about the environmental and social impacts of large-scale development projects and the potential for alternative development pathways.
- Yet, evidence from ground level tells a story of woefully insufficient funding, legal recognition and respect for rights, and protection for environmental defenders.

Collaborative efforts

- Over the last decades, at least 80 multistakeholder and multisector initiatives have emerged with varying degrees of formalization.
- Many are still in their early stages, making it difficult to attribute any recent reductions in deforestation to improved collaboration.



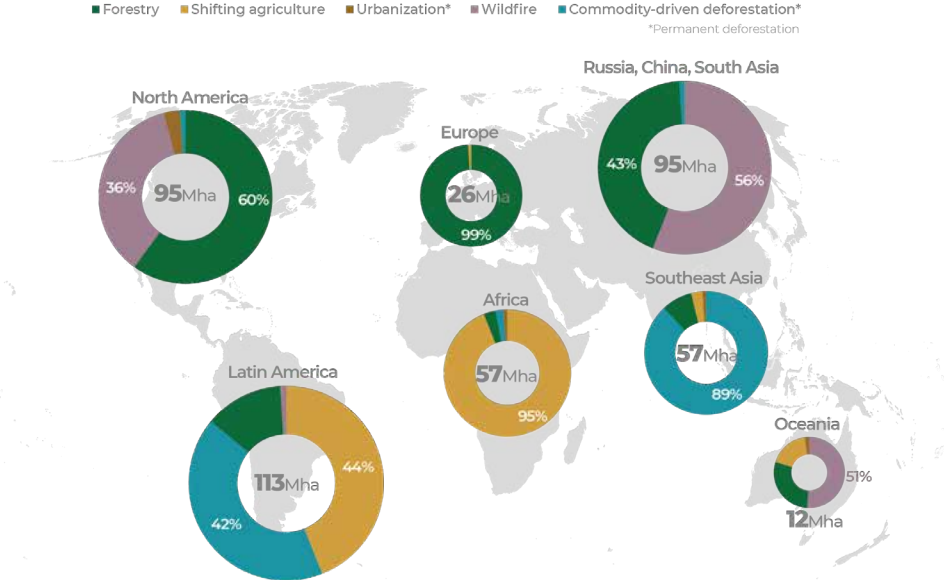
INTRODUCTION

Why look at sustainable production and development?

Sustainable production and development^a are essential for global forest goals. Forests and other natural ecosystems are being destroyed and degraded at rates far higher than they can be regenerated. Global market demand for soft commodities like food and timber, and for mined commodities like fossil fuels, metals, and minerals drives the expansion of forest risk activities like agriculture, extractive industries, forestry, and infrastructure.

Since 2000, the area of annual tree cover loss^b has grown. Tree cover loss peaked in 2016 and 2017 at almost 30 million hectares, and in subsequent years has remained relatively stable at around 24 million hectares annually.² The largest direct driver of tree cover loss is forestry,^c followed by shifting agriculture and commodity production—mostly for agriculture (Figure 2.1). In the tropics, forests and other natural ecosystems are often converted for commodity production, with soy, beef and palm oil as the dominant commodities or cleared for shifting agriculture. In boreal and temperate regions, trees are lost mainly due to forestry and wildfires. The loss to forestry, wildfires, and shifting agriculture is categorized as temporary since trees are typically replanted or can regenerate; however, tree regrowth is not itself an indicator of full ecosystem recovery, as original forest values, particularly in primary and old-growth forests, may be permanently lost.

Figure 2.1. Drivers of tree cover loss by region, in million hectares, 2001-2022



Source: World Resources Institute (WRI) (2023). [Indicators of Forest Extent: Forest Loss](#).

- **Agricultural commodity production is by far the largest driver of deforestation and ecosystem conversion globally**, particularly in the tropics. Forests and other ecosystems are converted by large-scale enterprises as well as smallholder farmers that produce commodities like soy, cocoa, and palm oil. International export demand for commodities is responsible for 20 to 25 percent of tropical deforestation associated with agricultural production, while the remainder is driven by domestic demand in developing countries.³

^a In the context of this report, sustainable development means that forests and other natural ecosystems are sufficiently valued for their contribution to human well-being and ecosystem services as countries also pursue economic growth and social inclusion (building on the UN definition that sustainable development “meets the needs of the present without compromising the ability of future generations to meet their own needs”). Similarly, sustainable production denotes production practices and approaches that maintain and regenerate forests’ and other natural ecosystems’ contributions and services for current and future generations.

^b Tree cover loss refers to a loss event that may or not be permanent. Non-permanent tree cover loss routinely occurs in the context of logging, fire, or swidden agriculture.

^c Forestry encompasses several activities, like low intensity logging, tree plantations, and clear cutting. It is defined by Curtis et al. (2018)—the source for data in Figure 2.1—as the “large-scale forestry operations occurring within managed forests and tree plantations with evidence of forest regrowth in subsequent years.”

- **Billions of people, particularly IPs and LCs, rely on forests and other natural ecosystems for their livelihoods.**⁴ These groups are also the most affected by the damage to natural ecosystems. Forest loss due to smallholders and LCs (e.g., shifting cultivation or fuelwood collection) is usually temporary, but can lead to degradation or permanent deforestation when demand exceeds the rate of regeneration.
- **Infrastructure development and extractive activities are the frontline activities that expose forests to other drivers of deforestation.** Some of the gravest forest risks to forests and natural ecosystems come from so-called “megaprojects,” which combine multiple types of transportation and energy infrastructure with sites for agricultural commodity production, natural resource extraction, and planned urbanization. Such projects are currently underway or planned in all major tropical forest regions, including the Amazon, the Congo Basin, Indonesian Borneo and Papua, and the Mekong Delta.⁵ Currently only responsible for a minor share of deforestation, risks from the extractives and mining sectors are expected to grow in the coming decades. Around 20 percent of intact forest landscapes (IFLs) in tropical areas overlap with extractive concessions.⁶ Further, 7.8 percent and 11.3 percent of tropical IFLs overlap with oil and gas concessions and mining concessions, respectively.⁷
- **Forestry drives forest degradation.**⁸ Intensive forestry practices like clear-cutting, short harvesting cycles, and the logging of primary or old-growth forests or other biodiversity-rich forests are major drivers of degradation.

Despite the large risks to forests, there is no question that these industries are essential for economic development. Certain infrastructure, for example, is essential to reduce poverty while providing economic opportunities (i.e., through job creation) and access to schools, hospitals, and other basic services. Extractive industries provide essential fuels, metals, and minerals that underpin the global economy, and certain minerals will increasingly be required for a low carbon economy. Yet, there are ways to mitigate risks to forests by creating more sustainable models of forest and resource use, which may even be economically beneficial than less sustainable models.

At their core, all policies to achieve forest goals fall into three pillars that broadly categorize the protection and sustainable use of forests (**Box 2.1**). Decision makers need to carefully balance competing goals and avoid the primacy of short-term benefits for a few over sustainable development for all.

BOX 2.1. PILLARS OF FOREST GOALS

1. Set aside and protect primary and old-growth forests. Even the best restoration will never replace these ecosystems and their unique and potentially irrecoverable value.
2. Mitigate forest risks when considering the development of forest areas and other ecosystems, in order of priority: avoid or minimize, and as a last resort, restore or offset forest loss and degradation.
3. Embrace better practices such as sustainable or “closer to nature” forest management, forest landscape restoration, integrated forestry systems such as agroforestry or reduced impact logging, while also pursuing strategies to promote sustainable livelihoods.

Synergies may exist between competing economic goals. Some sustainable production strategies are more economically viable than current models of land use. For example, investments into silvopastoral systems may require more upfront investment than typical pasture but are more profitable in the long run. Yet, many reforms needed to achieve forest goals will come with costs and foregone revenues. However, if the world wants to reach 2030 goals, solve the biodiversity crisis, and reach the 1.5°C goal of the Paris Agreement, business-as-usual cannot go on.

What has been pledged on sustainable production & development?

Over the last decade, governments and companies have made numerous global commitments and statements indicating their intent to protect and restore forests. Most (193) national governments signed on to the 2030 Agenda for Sustainable Development, which includes the goal of sustainably managing and protecting forests. Another almost-universal pledge is the Glasgow Leaders’ Declaration on Forests and Land Use, endorsed by 145 national governments during COP26 in 2021. Many global companies have joined forces with the Consumer Goods Forum, among other pledges, to promote sustainable commodity production (**Table 2.1**). Many governments and companies have also made individual pledges.

How do we assess progress?

This chapter assesses the following indicators of progress toward sustainable production and development:

- Global trends in commodity-driven deforestation and forest degradation from forest-risk supply chains like mining and agriculture.
- **Governments** and whether they i) align macroeconomic development with forest goals, ii) implement policies that promote sustainable commodity production, and iii) implement policies that promote sustainable livelihoods and forest goals in tandem.
- **Companies'** progress towards i) eliminating deforestation and ecosystem conversion from forest-risk agricultural commodity supply chains and ii) mitigating the forest and land use impacts of extractive industries.
- **Grassroots actors** and their advocacy for forest protection and alternative development pathways, along with barriers to progress.
- **Collaborative efforts'** progress on advancing jurisdictional- and landscape-scale forest initiatives.

This chapter builds on previous Assessment reports and is complemented by available data updates and additional literature review. Data and analysis from CDP, ⁴Global Canopy's Forest 500, Supply Change, and Zoological Society of London's Sustainability Policy Transparency Toolkit (ZSL's SPOTT) are integral to assessing company progress in agriculture and the extractive industries.

Table 2.1. Examples of pledges and initiatives related to sustainable production and forests^a

Pledge or Initiative	Endorsers	Progress reporting	Final target
Glasgow Leaders' Declaration on Forests and Land Use	145 countries	Not yet developed.	Halt and reverse forest loss and land degradation by 2030.
2030 Agenda for Sustainable Development	193 countries	The 2023 report found "modest" progress overall for forests.	Goal 12 (Responsible consumption and production) and Goal 15 (Life on land) apply. Target 15.2 sets the target of, by 2020, promoting the implementation of sustainable management of all types of forests, halting deforestation, restoring degraded forests and substantially increasing afforestation and reforestation globally.
United Nations Strategic Plan for Forests 2017–2030	Almost universal	Countries have voluntarily reported progress in 2019, mostly listing relevant policies.	Six goals to reduce deforestation and degradation, increasing forest restoration, and fostering global collaboration with specific key targets.
Consumer Goods Forum's Forest Positive Coalition	21 of the world's largest manufacturers and retailers ⁹	Members are annually reporting progress toward KPIs.	Transforming production landscapes, in areas equivalent to our collective production base footprint, to forest positive by 2030.

⁴CDP expanded its disclosure framework in 2019 to include new sector-specific questions on forests for metals, mining, and coal companies. The resulting disclosures in 2019, 2020, and 2021 provide the first insight of their kind into corporate action on reducing the forest and biodiversity impacts in these sectors in line with expectations of their business partners, financiers and other stakeholders.

⁹Other pledges include the recent [Belem Declaration](#); [SOS Cerrado](#); [Retailers' Commitment on Nature](#); several pledges related to soy in the [UK](#), [France](#), and [Denmark](#); and a pledge related to [salmon](#) by a Norwegian company.

This report aims to assess progress globally. However, due to data and literature availability, this chapter includes relatively more information on i) tropical forests rather than temperate or boreal forests, ii) developing countries rather than developed countries, iii) multinational companies rather than small- and medium-sized companies, and iv) supply-side measures rather than demand-side measures. In addition, efforts to reduce the consumption of forest-risk commodities and products are not addressed in this chapter, despite their importance for achieving sustainable development in line with forest goals. Notably, this year's assessment aims to include more information on developed country progress where data is available. As always, future assessments will aim for a more comprehensive analysis.

Many of the topics covered in this chapter closely relate to **Chapter 4** on forest rights & governance,¹⁰ which assesses progress towards effective legal frameworks, efforts to reduce imported deforestation and degradation and illegal deforestation, protecting the rights of IPs and LCs, and supporting participatory forest decision making. While there is some overlap, this chapter covers topics that are most relevant to the deforestation- and degradation-risk economic sectors and development activities under discussion (rather than issues of legality and forest governance, which has a broader scope).

FINDINGS

2.1 Is the world on track to address forest risks from commodity production?

With only seven years left to achieve the 2030 forest goals, and two years left for companies to meet the 2025 target date to eliminate deforestation from commodity supply chains, recent deforestation rates show that the world is off track. While tree cover loss from forestry is temporary, evidence suggests that current activities are unsustainable. Meeting both these 2030 and 2025 goals are fundamental to keeping global warming below 1.5°C and preventing the world from passing irreversible climate tipping points.

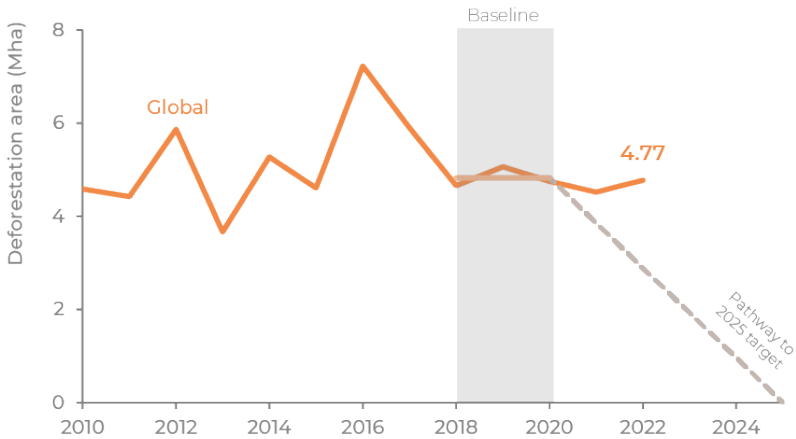
Commodity- and agriculture-driven deforestation not on track

It is important to track progress towards ending commodity-driven deforestation in light of both global forest goals (which aim to stop deforestation and land degradation by 2030) and the private sector goal to eliminate deforestation and ecosystem conversion within supply chains or by 2025 (as recommended by the Accountability Framework initiative (AFI)).^f In 2022, 4.77 million hectares of forests were destroyed permanently to make room for commodity production, mostly agriculture (Figure 2.2).

HOW DO WE ASSESS PROGRESS?

We assess recent trends in deforestation (i.e., permanent tree cover loss) from commodity production, by comparing deforestation in 2022 to a baseline for the period of 2018-20. Drivers of temporary tree cover loss include shifting cultivation and forestry. Since this tree cover loss may be reversible, the Forest Declaration Assessment cannot define a pathway to 2030. Instead, we assess general trends, complemented by indicators of degradation and deforestation in key biodiversity areas. In addition, we present the latest information on forest risks from mining and extractives sectors. Comprehensive information on forest landscape restoration related to commodity production is unavailable, hence we do not assess it (see **Chapter 1** on overarching forest goals for more on the limitations of restoration data).

Figure 2.2. Commodity-driven deforestation, in million hectares, and the pathway toward the 2025 goal



Note: Commodity driven deforestation is defined as permanent tree cover loss due to the production of agriculture, mining, and energy infrastructure.

Source: GFW, Hansen et al. 2013, and Curtis et al. 2018, and Climate Focus projection of the pathway from 2021 to 2025 based on a target of zero gross deforestation from commodity production by 2025

^fAFI- a coalition of organizations committed to promoting ethical production and trade to safeguard forests, ecosystems, and human rights—has adopted a [consensus recommendation](#) that companies set a target date for eliminating deforestation and ecosystem conversion from their supply chains no later than 2025. The AFI created the Accountability Framework, which offers guidelines to eliminate deforestation, ecosystem conversion, and human rights violations in commodity supply chains.

This is an increase of 5.6 percent compared to 2021 and only a slight decrease compared to 2018-20,⁹ the baseline against which this report measures progress. The world is off track to eliminate commodity-driven deforestation by 2025 or by 2030.¹⁰

Agriculture also leads to permanent loss of vegetation in other ecosystems. While comprehensive data is not yet available to assess whether the world is on track to eliminate ecosystem conversion by 2025 or 2030, regional data show that the scale of conversion is substantial. For example, from 1985 to 2017, pasture expanded by 46 percent in Brazil—mainly in the Amazon and Pantanal biomes. Agriculture in Brazil expanded by 172 percent from 1985 to 2017 and predominantly replaced old pastures in the Atlantic Forest or converted savanna and grasslands in the Cerrado biomes.¹¹

While this chapter focuses on legal commodity production, it's also worth noting the immense challenge that illegal deforestation presents to the world's forests. For instance, a 2014 estimate suggests that half of all tropical deforestation between 2000 and 2012 was the result of illegal clearing for commercial agriculture.¹² Additionally, a more recent 2021 study found that nearly all of the deforestation that occurred in the Legal Amazon and a portion of the Cerrado biome had not been backed by ecosystem clearing permits and was therefore illegal (see **Chapter 4** for more on issues surrounding illegality).¹³

Forestry's contribution to forest degradation

The largest driver of tree cover loss is forestry,¹⁴ which led to temporary tree cover loss of 6.7 million hectares in 2022. This loss can be permanent or lead to degradation where harvesting exceeds regrowth or negatively affects its structure, species composition, function, productivity, or overall ecosystem conditions. Degradation is a more relevant indicator than deforestation in most forestry contexts, given that the industry often intends for the logged area to regenerate tree cover. It encompasses practices such as clearcutting in primary forests or threatened species habitat.¹⁵

For example, in the EU, only 14 percent of forest habitats assessed for the EU Habitats Directive have good conservation status overall, while over 90 percent of boreal forest habitats were found to have an unfavorable conservation status.¹⁶ This poor status is largely attributed to forestry interventions, climate change, and eutrophication.¹⁷

Another recent assessment in Europe found that one third of the forest area was in decline, in particular in north Scandinavia, the Carpathians and the Balkans, the northern Apennines, and in forests throughout the Iberian Peninsula.¹⁸ The authors call for further restoration, improvements in management, and an extended period of recovery to approach natural conditions.

In Canada, industrial logging in primary and old-growth forests is common, and industrial logging is still planned or occurring in areas where boreal caribou populations already have insufficient habitat to survive long term.¹⁹ In Eastern Canada, a recent study found that intensive forest management has substantially reduced old forests and led to degradation, driving widespread avian habitat and population declines.²⁰

When shifting agriculture becomes unsustainable

After forestry, shifting agriculture is the next largest driver of tree cover loss, resulting in 5.87 million hectares of tree cover loss in 2022.²¹ Shifting agriculture refers to the small- to medium-scale conversion of forests and shrublands for agriculture, which is later abandoned and ultimately followed by forest regrowth.²² This is a slight decrease (-1.7%) compared to 2021.

As with forestry, much of the tree cover loss associated with shifting agriculture is likely temporary. Farmers rotate their plots periodically, clearing trees as they go and allowing trees to regrow on old plots. Shifting cultivation can be sustainable over large areas and long periods of time.

However, increased demand for agricultural commodities and restrictions in forest areas or access can drive unsustainable and expanded shifting cultivation. In the Congo Basin, for example, scientists observed an expansion

⁹ Under the Forest Declaration Assessment methodology, the average rate of commodity-driven deforestation from 2018-20 is set as a "baseline" against which to compare future years.

¹⁰ It is important to note that this linear trajectory does not consider the cut-off dates that companies, certification standards, and some regulations (e.g., the Amazon Soy Moratorium and forthcoming EU legislation) set in order to communicate and enforce which land must not have been used for cultivation.

of the area under shifting cultivation from 2000 to 2014, correlating with human population growth.²³ Worryingly, scientists also detected increasing encroachment into primary forests.²⁴

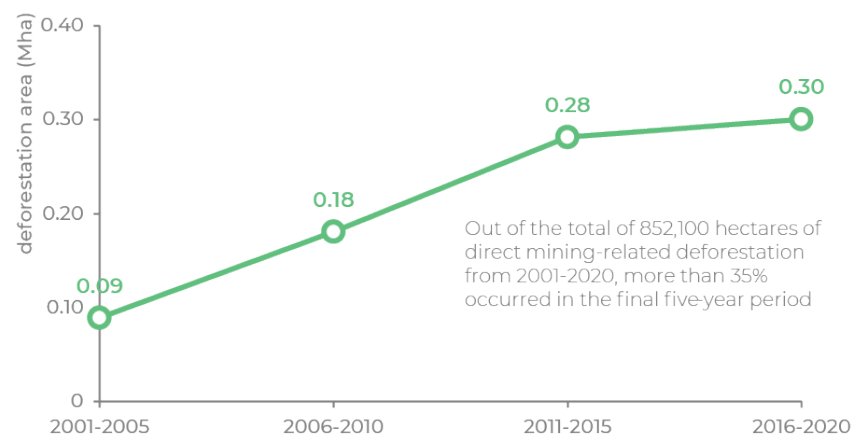
Mining's extensive forest footprint

Mining is a driver of permanent tree cover loss and has increased in tropical rainforests in recent years (**Figure 2.3**).²⁵ While the mining sector may provide important socioeconomic benefits to many regions, it also brings environmental and social burdens like deforestation, pollution, and community displacement.²⁶

At a global scale, direct deforestation from extractive industries is minor, estimated to account for between 1.3 and 3.3 percent of deforestation in tropical forests.²⁷ However, mining-related direct deforestation is concentrated in certain biomes and countries.²⁸ For example, tropical rainforests contain only 29 percent of all mining sites but suffer 62 percent of mining-related direct deforestation. Almost 84 percent of all mining-related direct deforestation in the past 20 years took place in only 10 countries.²⁹

Extractive industries' indirect impacts on forests and other natural ecosystems are estimated to be much larger than their direct impacts.³⁰ For example, the number of deforestation incidents is strongly correlated with proximity to mining sites, even after controlling for other deforestation drivers.³¹ Up to a third of the world's forests may be affected by indirect and cumulative impacts—deforestation and degradation—of mine sites.³²

Figure 2.3. Mining-related direct deforestation in tropical rainforests by 5-year period, in million hectares (Mha)



Note: Mining-related direct deforestation does not include small-scale and artisanal mining.
Source: Adapted from WWF (2023). *Extracted Forests*; and Giljum et al. (2022).

¹"Direct" deforestation refers to permanent forest clearing within a mine site, or to expand mine sites. "Indirect" impacts may include deforestation or forest degradation that is associated with but not directly caused by mine site activities; for example, forest clearing for shifting agriculture facilitated by mine site access roads. "Cumulative" impacts refer to additive disturbances or changes caused by multiple mine sites in proximity with each other; for example, the fragmentation of habitat caused by one mine site may be insignificant on its own, but may contribute to significant disruptions in combination with other mine sites.

²Indonesia, Brazil, Russia, Canada, the United States, Australia, Peru, Ghana, Myanmar, and Suriname.

2.2 Have governments advanced their efforts to achieve forest goals?

2.2.1 Aligning macroeconomic priorities with forest goals

Following the money, it becomes clear governments give forests low priority. Most developing countries face enormous challenges initiating the bold reforms needed to reconcile their development pathways with forest goals. While the number of countries that have received payments for emission reductions under REDD+ has grown slowly, this incentive offered by donor countries is not commensurate with the challenge of reaching forest goals. However, strong political will has led to (some) alignment in a few geographies, notably in the EU.

There is limited systematic information available on how policy makers integrate forest goals into strategic decision making; whether fine print renders such strategies ineffective; if risks are assessed and mitigated; how potential tradeoffs are weighed; and where investments contribute to or are paired with commensurate investments for sustainable development goals.

Low priority of forest goals

Despite the surge in commitments and ambitious forest goals, the low priority of forest goals is evident on a global scale. This is best illustrated by the sheer scale of investments into economic sectors that drive deforestation compared to sustainable investments aligned with forest goals.

^kAs of December 2022.

HOW DO WE ASSESS PROGRESS?

ALIGNMENT WITH FOREST GOALS: While ambitious forest goals are almost universally adopted, in practice, pledges are rarely more than words on a piece of paper. We assess examples of investment priorities and results achieved for REDD+, and highlight recent examples of integration. We also consider the role (and limitations) of political will, taking the examples of Brazil, the EU, and Indonesia.

REGULATORY AND FISCAL POLICIES: A range of policy tools can help governments regulate land use, mitigate forest risks, and facilitate forest restoration. To this extent, we assess the following:

- Regulatory measures that manage, guide, or limit the development of forests and other lands (e.g., protected area regulations)
- Fiscal policy measures that incentivize activities that protect and restore forests, and disincentivize activities that threaten forests (e.g., agricultural subsidy reforms)

POLICIES FOR SUSTAINABLE LIVELIHOODS: To effectively address poverty and deforestation in forest-reliant populations, governments need to implement enabling conditions and targeted incentives which avoid any contrary effects. We assess policies being implemented by governments that help to mitigate forest risks while supporting sustainable livelihoods.

The Belt and Road Initiative (BRI), for example, has mobilized trillions of dollars for investments in infrastructure, energy, industrial capacity, and telecommunications that will cut across forests and other fragile and biodiverse landscapes around the world. The initiative, which is promoted by the Chinese government, currently spans 148 countries.^{k33} Independent analyses have identified major direct and indirect environmental risks from the BRI—particularly for Southeast Asia and tropical Africa.³⁴

In contrast to the trillions of dollars for the BRI alone, global public investments in forest goals amount to roughly USD 1.3 billion per year (see **Chapter 3** on finance for forests). Further, shifting economic priorities against the backdrop of post-pandemic economic recovery efforts present risks to forests in some countries (see the **Philippines case study**).

Even governments that have adopted “green growth” agendas for economic development struggle to make investments that are aligned with environmental or forest goals. For example:

- **Cambodia** and the **Lao People’s Democratic Republic** (Lao PDR) have targeted “green growth” while opening their economies to multinational enterprises and large-scale extractive, energy, and infrastructure projects without reconciling land use tradeoffs or ensuring participatory decision making.³⁵
- **Ecuador** has struggled to balance its commitment to the rights of nature (i.e., the legal right for nature—generally—to “exist, flourish, and evolve”³⁶) established in its 2008 Constitution against its economic reliance on oil revenue. Oil’s contribution to Ecuador’s GDP dropped from 18 percent in 2008 to just 6 percent in 2021.³⁷ The state oil company responded in 2022 by announcing a goal of doubling output in five years, in spite of significant and frequent forest degradation from oil infrastructure development, oil spills, and poor management of toxic wastes.³⁸ In August 2023, the people of Ecuador resoundingly rejected oil drilling in Block 43 of Yasuní National Park (see **Box 2.5**).³⁹
- A 2021 analysis of COVID-19 stimulus spending found that countries targeting “green” investments largely missed the mark on nature.⁴⁰ In the same study, a sample of ten **European** countries’ stimulus plans—totaling EUR 500 billion—was reviewed for predicted impacts in climate and nature. Over half of nature-relevant spending was expected to be harmful for nature.¹

Some, but limited progress for REDD+

For developing countries, progress on REDD+ is one indicator of governments’ integration of forest goals into macroeconomic and development planning. Forty-five governments, mostly in tropical countries, have taken steps to develop REDD+ strategies^m as part of the Forest Carbon Partnership Facility’s (FCPF) REDD+ program.⁴¹ Twenty-eight countries have

completed the “readiness” process, meaning they have assessed the drivers of deforestation and forest degradation, created new institutions for coordination and collaboration, built forest monitoring capacities, and installed systems for environmental and social safeguards. Additionally, REDD+ efforts have been instrumental in driving forest policy changes such as formalizing IPs’ and LCs’ land rights, reforming forest laws and regulations, and creating new participatory mechanisms.⁴²

Though many countries have developed national REDD+ readiness strategies—incentivized by potential finance—results are lagging. Only six countries (Ghana, Mozambique, Costa Rica, Côte d’Ivoire, Indonesia, and Lao PDR) have delivered verified REDD+ emissions reductions under the FCPF program.⁴³ The vast majority of REDD+ countries have not yet produced real, verifiable emissions reductions or are no longer pursuing REDD+ under the FCPF program. The slow progress of REDD+ also reflects the enormous challenge it presents to developing countries. Meaningfully reducing deforestation and protecting and restoring forests requires significant upfront investments—that are often lacking from donors who instead focus on “readiness” support for countries and on financing results—and bold sectoral reforms that often come with major tradeoffs for other economic development priorities. REDD+ also requires a high level of political will and legislative consensus that few countries have achieved (see **Chapter 3** on finance for forests).

There are several REDD+ programs in operation (e.g., FCPF, UN-REDD, REDD+ for Early Movers) and participating countries are often plagued by similar challenges across programs. These can include burdensome and fragmented donor requirements that can overwhelm governments with already limited capacities. ⁿ Pay-for-performance systems for large-scale REDD+ programs range from USD 5-10 per metric ton of carbon dioxide⁴⁴—not enough to compensate for the true price of forest carbon and project implementation costs (see **Chapter 3**). Therefore, while REDD+ may signify

¹Nature-relevant spending includes potential impacts on forests, e.g., through subsidies or waved fees for forest-risk agriculture, waivers of forest conservation mandates, or other environmental deregulation.

^m Forest strategies refer to national plans set out under REDD+ to achieve emissions reductions. Under the FCPF’s Carbon Fund, for instance, these include Emission Reduction Program Documents (ER-PDs) and Emission Reduction Program Idea Notes (ER-PINs).

ⁿAs one example as summarized in a literature review by Morita & Matsumoto (2023), the GCF’s pilot program for REDD+ results-based payments placed a significant burden on countries’ abilities to access results-based finance because it required them to demonstrate compliance with its interim safeguards in REDD+ results-based finance.

some alignment of countries' macroeconomic strategies with forest goals, it has yet to deliver sufficient on-the-ground progress on its stated goals.

Examples of political will and its limitations

Political will has driven important changes in recent years. Its effects are well illustrated by the deforestation trajectory of Brazil, the country with the largest intact rainforest in the world. Under President Bolsonaro (2019-22), the Brazilian government openly encouraged agricultural production and mining in the Amazon,⁴⁵ which likely contributed to the stark rise in deforestation.⁴⁶ In 2023, the new government of President Lula da Silva brought back a rhetoric of conservation, and deforestation fell 34 percent in the first semester, following a similar downward trend of his first time as president (2003-10).⁴⁷ After this initial success, the Lula government is facing stark political realities. Getting support for environmental reforms from the pro-agribusiness Congress is proving to be difficult, as was demonstrated when Congress voted in June 2023 to strip some of the authority of the Ministry of Environment and Climate Change and the Ministry of Indigenous Peoples.⁴⁸

Similar observations about political will can be made in Indonesia. The government has championed substantial reductions in deforestation while at the same time promoting vast infrastructure developments in forest areas. The Senate has also passed a law that might threaten environmental protection (see **Chapter 4**).

Another example where ambitious goals were translated into practice is the European Regulation on deforestation-free products (EUDR) (see **Chapter 4**). The regulation stems from the strong political will of EU institutions and a critical number of member states. Under this regulation, companies must ensure that major forest-risk commodities placed on the European market or exported to international markets are free from deforestation; for wood related products, also free from forest degradation as defined in the law; and legal, i.e. produced in compliance with the producing country's national laws and with international laws regarding human rights and free, prior, and informed consent (FPIC), and more. Several practical questions remain for the EUDR's implementation.

While the EUDR is highly relevant for regulating demand for forest-risk commodities produced in tropical forest countries, it also marks a significant milestone toward addressing the issue of forestry-driven degradation in boreal and temperate forests. Under the EUDR, companies must, for the first

time, prove that timber products are “degradation-free.” However, the narrow definition of “degradation” under the regulation demonstrates how political realities can force compromise, even when there is significant political will to drive change (**Box 2.2**).

Even under the current narrow definition, the EUDR could lead to a reduction in large-scale clear-cutting and conversion of primary forests that is still common in northern forests, including in Northern Europe and Canada. This marks important progress toward fostering greater accountability for degradation from forestry in developed countries.

BOX 2.2. DEGRADATION UNDER THE EUDR: THE POWER AND LIMITATIONS OF POLITICAL WILL

The European Union's (EU) newly adopted Regulation on deforestation-free products (EUDR) applies to all products being placed on the EU market—no matter their origin. The regulation aims to stop products being linked to deforestation, or, for forest products also to forest degradation as defined in the legislation. It therefore can also make strides toward addressing a key issue in northern forests, both within the EU and in other boreal and temperate regions: widespread degradation mainly caused by forestry.

However, under the EUDR, “degradation” is narrowly defined as the conversion of primary or naturally regenerating forests to planted forests or plantations.⁴⁹ Notably, the definition excludes disturbances from unsustainable timber harvesting, the effects of fragmentation or other degradation. It also excludes clear-cutting, where it is followed by natural regeneration rather than planting. A broader degradation definition failed to get agreement from Northern European governments, where it would have required a massive overhaul of forest industry practices.⁵⁰

Forestry practices vary widely between EU member states, as do perspectives on what constitutes “sustainable” forest management. For example, in Northern European countries like Sweden and Finland, forests are mostly harvested by large-scale clear cutting, including in old-growth forests, followed by either planting or natural regeneration. Environmentalists in Sweden stress that this practice has negative consequences on biodiversity, carbon storage, and the resilience of forests, highlighting the alarming situation of forest ecosystem health in the country. The Swedish Forest Vision,⁵¹ an initiative by scientists and civil society organizations, calls for an immediate logging moratorium in all forests with identified conservation value. The EU's forest strategy for 2030 also recommends that clear-cutting should only be used in duly justified cases, noting its detrimental effects on biodiversity and carbon.

Meanwhile—and perhaps as an interim measure—the EU Commission separately published guidelines on “closer-to-nature” forest management that may be voluntarily applied by forest authorities or local practitioners in the EU and guidelines on defining, mapping, and strictly protecting all primary and old-growth forests.⁵² Confirming its commitment to the cause, the EU also makes various funding sources available to support the adoption of improved practices, such as the Common Agricultural Policy.

2.2.2 Adopting policies to protect and restore forests

Governments have a range of regulatory and fiscal policy tools to protect forests, several of which are employed widely or are increasing in implementation. However, policies can vary widely in their effectiveness, while others may have unintended consequences, underscoring the need for well-designed forest protection measures.

A core category of policies is those that regulate, limit, prohibit, or more sustainably plan the development of forests and other lands (i.e., “regulatory” forest policies, see examples in **Table 2.2**). Another group of policy options provide economic incentives and disincentives that motivate—but do not mandate—subnational governments or private sector actors to take actions to protect and restore forests (i.e., “fiscal” forest policies, see examples in **Table 2.3**).^o

Because implementation of a given policy tool does not guarantee that it is effective, it is important to stress that most policy measures have significant caveats (e.g., poor enforcement, spillover effects, mixed evidence on efficacy). The assessment of government policy implementation is broadly split into two parts:

1. **The extent of implementation of a given policy measure.** Are governments often choosing this tool to advance forest goals? Does data exist that shows an increase in uptake of the policy measure over time?
2. **A policy measure’s efficacy and/or quality of implementation.** Is there mixed evidence for a policy’s efficacy in protecting and restoring forests? To what degree do loopholes, spillover effects, or poor enforcement render policies ineffective? What enabling conditions must exist that improve the efficacy of these policies?

While this section predominantly focuses on the first category of assessment, it also highlights some key findings and caveats on policies’ efficacy (see **Chapter 4** for more on governance issues that impede policy implementation). Ultimately, policies won’t be effective without strong,

consistent implementation and enforcement (see **Argentina case study** for an example of how weak governance can impact policies’ efficacies).

Comprehensive global data for both of these assessment categories is often lacking. Still, based on available data, it is clear that several policy options are widely implemented (e.g., protected areas, environmental and social impact assessments or ESIA) or have increased in prevalence in recent years (e.g., environmental fiscal transfers or EFTs). Other policies are projected to have significant impacts on forests (e.g., agricultural subsidy reforms), but real-world data that connects them to forest outcomes is unavailable (**Box 2.3**). Mixed evidence on some policy options—like moratoria—highlights the importance of designing and implementing policies carefully and with consideration to potential spillover effects and proper enforcement.

Examples of regulatory and land use planning tools

- Environmental and social impact assessments (**ESIAs**) are required in most countries before development projects (e.g., for agriculture, mining, or infrastructure) are approved.⁵³ ESIA may be conducted with bias toward their outcome or intentionally manipulated, and they often lack the “teeth” to actually stop harmful development. In most cases, they also suffer from poor coordination between multiple site-level assessments. For example, in Liberia, Guinea, and Brazil, there is evidence of overlapping concessions with varying levels of ESIA implementation and uncoordinated development in areas with high road density and forest fragmentation.⁵⁴
- **Moratoria and protected areas (PAs)**—which are two distinct policy measures that both regulate and limit the use of land—continue to be among the most common legal and policy instruments used by governments to address deforestation. For instance, nearly 17 percent of global land is conserved.⁵⁵ PAs are one of the most studied policies for forest protection, and are shown to be one of the most effective tools for reducing deforestation, per a 2023 meta-analysis,⁵⁶ though with marked differences between continents, notably Africa.⁵⁷ Even when regulatory tools are widely implemented, many come with important caveats on efficacy and unintended spillover effects (see **Table 2.2**). For example, recent studies suggest that Indonesia’s 2011 moratorium on peatland

^o None of these policies present a ‘silver bullet’ for forest protection and restoration, and the list presented below is far from an exhaustive account of available policy measures.

concessions may have spurred unintended deforestation spillovers into surrounding forests,⁵⁸ or reduced deforestation to only a minor degree (0.65 percent compared to non-moratorium areas⁵⁹).

Assessing progress on other regulatory tools is limited by a lack of data. For instance, the most recent global review of legislation to assess environmental impacts is from 2018.⁶⁰ Global and regional analyses on other specific land use planning tools like buffer zones or scenario analyses (and their specific consideration of forests) are not available.

Increased attention on trade regulations

Trade or import regulations that promote deforestation-free supply chains have gained some momentum in recent years. The 2023 implementation of the EUDR is a major milestone. The EUDR is more comprehensive than similar legislative efforts in the UK (i.e., the 2021 Environment Act, which includes a requirement to end deforestation associated with agricultural commodity imports) and the United States (i.e., the 2021 FOREST Act, which has not passed). Though the EUDR is far from perfect (see **Box 2.2** and **Chapter 4**), it represents an unprecedented step towards sustainable supply chains globally. Still, similar developments will be necessary in other regions—especially in China, India, the United States, and Japan (see **Japan case study**), which account for 24 percent, 9 percent, 7 percent, and 5 percent of global imported deforestation, respectively⁶¹—to shift the global trend towards sustainable production.

Increased implementation of some fiscal policy tools

Policymakers also have an array of fiscal tools at their disposal that attempt to incentivize forest protection and restoration or disincentivize negative impacts to forests (**Table 2.3**).

The overall impacts of fiscal policies are immense. Recent analysis suggests that the world is spending at least USD 1.8 trillion per year (equivalent to 2 percent of global gross domestic product) on subsidies that are driving the destruction of ecosystems and species extinction.⁶² Given this scale of financial support that impacts forests, it is crucial that governments carefully design fiscal policies that help prevent deforestation, minimize the costs of forest restoration, and improve sustainable forest management practices. Challenges persist in measuring global progress

Governments employ fiscal tools to ‘nudge’ public and private actors for environmental causes, including to influence forests. Additionally, there is

some strong quantitative evidence on the progress of governments implementing fiscal policy measures for forests, like in the case of ecological fiscal transfers (EFTs):

- **Use of EFTs by governments has accelerated:** The implementation of EFTs has accelerated in recent years, growing from USD 0.35 billion per year in 2007 to USD 23 billion per year in 2020, per a 2021 global review.⁶³ That’s approximately 20 times as much as total official development assistance for forestry. Still, EFTs still account for a tiny minority of global intergovernmental fiscal transfers (which totaled about USD 4.9 trillion in 2020).⁶⁴
- **EFTs are often tied to forest outcomes or protected areas:** The same global review overviewed 23 ETF schemes, 17 of which were tied to the maintenance or implementation of protected areas, and four were tied to specific forest outcomes (e.g., to forest fire control, areas of moderately or highly dense forests, or reductions in deforestation).
- **EFTs can provide significant fiscal incentives for subnational governments:** India’s EFTs have channeled billions of dollars to states based on their forest coverage. This annual funding, averaging about USD 7.4 billion between 2015-16 and 2018-19, surpasses the country’s approximately USD 1 billion in annual funding from REDD+.⁶⁵ It also exceeds the USD 5 billion forest cover grant from India’s 13th Finance Commission, which had conditions and was designated for forest-related expenses.

Table 2.2. Examples of regulatory and/or land use planning measures

Regulatory tools can regulate or limit the use and development of forests and other lands. Land use planning tools can guide development projects to reduce their impacts on forests.

Policy tool	Details
<p>Moratoria</p> <p>Governments prohibit the conversion of forests for commodity production within areas at risk of deforestation and forest degradation.</p>	<p>Moratoria are often cited as one policy tool that significantly contributed to Indonesia's reduction in commodity-driven deforestation. The country implemented a moratorium on new forest and peatland concessions in 2011.⁶⁷ In 2019, the president made permanent the moratorium on clearing primary forests and peatlands.⁶⁸ Notably, the moratorium excludes 18 percent of primary forests, 10 percent of peatlands, and areas that were covered by permits in 2011, such as for palm oil.⁶⁹ The moratorium also lacked consequences for violations.⁷⁰ Additionally, some studies find significant spillover effects into areas not covered under the 2011 moratorium,⁷¹ which suggests that moratoria must be carefully designed and implemented to reduce adverse effects. In 2016, Indonesia issued an additional moratorium on peatland drainage, which was much more successful due to stronger enforcement and a series of implementing regulations that followed.⁷²</p> <p>In Lao PDR, support from the Prime Minister was a key factor in the partial success of a timber export suspension (i.e., moratorium) in 2016.⁷³ Exports of illegally traded timber dropped significantly after the moratorium was declared, but legislative loopholes left conditions for large-scale logging to continue.⁷⁴</p> <p>Western Australia has an upcoming 2024 moratorium on native forest logging.⁷⁵</p> <p>The U.S. state of Massachusetts has a temporary moratorium on new logging contracts on state lands until at least December 2023.⁷⁶</p>
<p>Protected areas (PAs)</p> <p>Legal designations aimed at conserving land and forests from human encroachment, ranging from areas with strictly no human activity allowed, to multiple-use areas where limited, sustainable resource use is permitted.</p>	<p>PAs are one of the most studied policies for forest protection, and are shown to be one of the most effective tools for reducing deforestation, per a 2023 meta-analysis.⁷⁷ PAs are consistently associated with lower deforestation, and strict PAs often produce more effective forest outcomes than mixed-use PAs.⁷⁸ For example, PAs in the Amazon were associated with 21 percent less deforestation between 2008-20.⁷⁹ Enforcement of laws that help protect forests—like the monitoring of protected areas—consistently reduces deforestation.⁸⁰</p> <p>However, some individual studies show PAs as not achieving reduced deforestation,⁸¹ or not being different from adjacent areas where no PA exists.⁸² PAs can face similar concerns to moratoria, like the potential for spillover (though evidence has also been found for positive spillovers on surrounding areas)⁸³ and concerns for harms to local communities.⁸⁴</p> <p>Though the recent growth in global implementation of PAs is notable, many PA systems are “residual” in nature, meaning that they were established in landscapes that are already poorly suited for producing commodities (and are therefore least threatened).⁸⁵</p>
<p>Environmental and social impact assessments (ESIAs)</p> <p>Land assessment tools that systematically consider the environmental and social impacts of a development.</p>	<p>There are many types of land use planning tools, including ESIAs, which are used to scope the potential impacts of development and land use projects. Here, we focus on ESIAs.</p> <p>ESIAs are required in most countries before development projects will be approved.⁸⁶ Yet the scope, timing, and implementation of these assessments are often poorly matched to the aim of forest protection, and not aligned with the mitigation hierarchy.⁸⁷ ESIAs are often not required to consider the indirect or cumulative impacts of an extractive or infrastructure project, and often occur only after the exploration phase has been completed, making them less likely to influence whether approval is actually granted.⁸⁸</p> <p>Additionally, ESIAs do not necessarily prevent development projects even if the outcome of the assessment is negative. For example, European Union regulations permit projects to proceed despite negative environmental and social outcomes if there are no alternative solutions.⁸⁹</p> <p>Also, bias and manipulation is inherent to ESIAs (and other tools that require input from a diverse group of stakeholders), which can complicate their outcomes.⁹⁰</p> <p>The requirement for ESIAs often does not prioritize forest loss, nor consider all the impacts a project can have. For example, in Malaysia, ESIAs for infrastructure projects only expect developers to consider potential local impacts within a limited spatial scale, without requiring assessment of any potential indirect risks.⁹¹</p>

Table 2.3. Examples of fiscal policy measures

Economic incentives and disincentives that aim to motivate—but not mandate—subnational governments and/or private sector actors to take actions to protect and restore forests.

Policy tool	Details
<p>Repurposing harmful subsidies</p> <p>Governments transfer billions of dollars of support each year to an array of economic sectors. Many of these subsidies directly and indirectly harm forests—something especially true of agricultural subsidies. Reforming harmful subsidies is a potentially high-impact policy tool.</p>	<p>Projections on the possible forest benefits of repurposing agricultural subsidies,⁹² but there is a data gap on how agricultural subsidy reform impacts forests in aggregate.</p> <p>As just one example of subsidies' negative impacts, to promote productive land use, Brazil taxed forested land more heavily than agricultural land, which provided a perverse incentive to clear trees from landowner's properties.⁹³</p> <p>However, there is no singular, unequivocal link between changes in agricultural systems and tropical deforestation, and definitive links cannot yet be made between specific agricultural support policies and levels of deforestation and forest degradation.⁹⁴</p> <p>In the agriculture sector, for example, implementing direct payments to farmers instead of market price supports or other coupled forms of support can help reduce distortions (and excess production) and improve conservation outcomes, especially when implemented alongside other reforms.</p> <p>Other harmful subsidies may include subsidies for biomass energy. For example, the United Kingdom provides subsidies to biomass energy, which is categorized as clean energy based on forest carbon accounting practices.⁹⁵ However, biomass harvesting has been linked with negative impacts on forests and the climate.^{96,97} Subsidies for biomass energy may be redirected to truly renewable energy sources such as wind and solar.</p>
<p>Ecological fiscal transfers (EFTs)</p> <p>EFTs transfer inter-governmental public funds based on ecological indicators, which can include criteria related to forests or protected areas. EFTs compensate subnational governments for the costs of conserving ecosystems and, in principle, can incentivize greater conservation and/or restoration of forests and other ecosystems.</p>	<p>While EFTs still account for a tiny minority of global intergovernmental fiscal transfers, if just 2 percent of intergovernmental transfers were "greened," the resulting finance would equal USD 100 billion per year.⁹⁸</p> <p>EFT schemes are not specific to forests, but are often tied to sustainable forest outcomes.</p> <p>Brazil has multiple subnational EFT schemes, mostly tied to protected area management.⁹⁹</p> <p>India's 2015 EFT "compensates states for 'fiscal disability' of forgone tax revenue due to forest cover, and also to recognize forests' 'huge' ecological benefits."¹⁰⁰</p>
<p>Other "green" incentives (e.g., subsidies) or disincentives (e.g., environmental commodity taxes)</p> <p>There are many other fiscal policy tools that attempt to sway the choices of subnational governments and private sector actors towards those that protect and restore forests.</p>	<p>Fiscal incentives to motivate sustainable forest use and management can take many forms. However, both the quantity and diversity of such fiscal policies make it difficult to list them exhaustively or assess them holistically.</p> <p>Still, key examples of other "green" fiscal tools include subsidies for forest restoration, Indigenous-led land stewardship, and export tariffs to benefit forests.</p> <p>For example, Chile¹⁰¹ has implemented subsidies for afforestation and reforestation. These results emphasize that strong, well-enforced safeguards for natural ecosystems can improve climate and biodiversity benefits of afforestation incentives, while reducing their costs.</p> <p>The EU LIFE program includes, for example, support to: (i) restore natural or semi-natural forest habitats and species in their structure, composition and functioning; (ii) improve forest resilience to fires, droughts, diseases, and climate change, and prevent/reduce the impact of natural disasters; (iii) protect the EU's primary and old-growth forests; (iv) create ecological corridors and other green infrastructure; and (v) test/demonstrate new management approaches, including closer-to-nature forestry practices.¹⁰²</p>

BOX 2.3. CHALLENGES IN ASSESSING FISCAL POLICY TOOLS

Comprehensively assessing progress on implementation of many fiscal policy tools—rather than evaluating these policies individually—is challenging. First, there is limited aggregate analyses on the global or regional implementation of many forest-based fiscal policy tools. Second, in several tropical countries with vast remaining primary tropical forests (e.g. the Democratic Republic of the Congo), the informal economy dominates, making it very challenging to measure the impact of any new formal fiscal policy. In addition to this information gap, the broad policy landscape makes it challenging to compare policies across country contexts.

The case of agriculture subsidy reform serves as an example of the challenges of assessing fiscal policy implementation. Agricultural subsidies are projected to significantly harm forests. Estimates suggest that agricultural price supports are responsible for the loss of 2.2 million hectares of forest cover per year—equal to approximately 14 percent of total annual deforestation.¹⁰² However, there are data gaps on the extent of agricultural subsidy reform. Despite the general consensus that repurposing agricultural subsidies could greatly benefit forests and other ecosystems, there is a data gap on the global or regional implementation of agricultural subsidy reforms. At the global level, existing research mainly concentrates on defining, identifying, and measuring harmful agricultural subsidies under the broad framework of “environmentally harmful” subsidies rather than those specifically tied to forest outcomes.¹⁰³ Specific literature on the linkages between land degradation and agricultural support is less well-developed, as the complex interactions between policies, ecology, and outcomes are better suited for local-level analysis.¹⁰⁴

Fiscal policy success hinges on proper design and implementation, strong political cooperation and enforcement, and many other enabling conditions. The lack of these enabling conditions limits the efficacy of fiscal tools. For example, an important barrier that complicates fiscal policy implementation is the prevalence of corrupt practices, both in the private sector and in governments (see **Chapter 4** on forest rights & governance). This reality should not discourage governments from utilizing a range of policy tools to address forest risks; instead, governments should work to carefully design and implement policies so that they are effective at protecting forests.

2.2.3 Achieving forest goals while promoting sustainable livelihoods

Governments have many policy levers at their disposal to promote sustainable livelihoods while addressing deforestation and degradation or promoting sustainable land use. Such policies have achieved mixed levels of success. Our examples show that implementation of these policy measures can succeed with strong governance and several other enabling conditions in place.

Several policy measures are available to simultaneously mitigate forest risks and support sustainable livelihoods (**Table 2.4**). Many of these policies have been consistently associated with reductions in deforestation, like community forestry and payment for ecosystems services (PES).¹⁰⁵ Examples of countries with direct support policies have also shown positive forest and livelihood outcomes. However, the example of artisanal and small-scale mining (ASM) illustrates that efforts to regulate or formalize informal livelihood activities without explicitly providing safeguards for forests and other ecosystems can exacerbate, rather than reduce, harmful environmental impacts.

Overall, while there is significant analysis on the efficacy of these policies—often on project or program levels—there are limited comprehensive, aggregate studies on the extent to which countries implement them across the world.

Table 2.4. Examples of policy tools that address forest risks while promoting sustainable livelihoods

Governments have several policy levers at their disposal to promote sustainable livelihoods while addressing deforestation, which have achieved mixed levels of success.

Policy tool	Details
<p>Payment for ecosystem services (PES)</p> <p>Countries employ PES schemes that compensate individuals or communities for managing their land in ways that provide key ecosystem services, like carbon sequestration or biodiversity conservation.</p>	<p>PES schemes are consistently associated with less deforestation at a regression-level and a study-level, per a 2023 meta-analysis.¹⁰⁷ Evidence from REDD+ projects demonstrates that PES schemes offer a direct and flexible model for incentivizing forest protection while providing additional income for local communities.¹⁰⁸</p> <p>PES schemes have several enabling conditions that can prompt their success, like sufficient stakeholder engagement (built on trust and local ownership), stable, reliable payments, and transparent implementation.¹⁰⁹</p> <p>Ecuador's Socio Bosque program is often lauded as a major success story in the PES arena.</p>
<p>Community forestry</p> <p>Most countries have schemes in place for collaborative or community forestry, which refers to forest management activities implemented by local people as part of their livelihood strategies.</p>	<p>Community forest management is consistently associated with less deforestation on a regression-level (though not always at an individual study level).¹¹⁰ It can reduce deforestation through better forest governance, but it can also increase deforestation by incentivizing the expansion of cultivated lands and pasture.¹¹¹</p> <p>Community forestry programs have yielded results in both poverty alleviation and forest protection where they were able to involve local communities and carefully assess community needs and capacities, and to assure secure tenure and rights.¹¹²</p> <p>Community forestry programs are highly context-dependent (e.g., different user groups, governance mechanisms, and social, economic, and environmental contexts), meaning that the success of community forestry programs should not be generalized or necessarily extrapolated.</p> <p>In Mexico, a 2023 study of community forestry management found that the associated reductions in deforestation were “economically significant” and “could far outweigh the costs of adopting the management plans” for involved communities.¹¹³</p>
<p>Small and medium forest enterprises (SMFEs) support</p> <p>SMFEs make up 80-90 percent of forestry enterprises and over 50 percent of the entire forestry sector in many countries. Creating policies to support SMFEs has been recognized as a way to leverage associated poverty alleviation and improvements in livelihoods, but environmental impacts are less clearly understood.</p>	<p>Globally, 20 million people are employed by SMFEs, which generate USD 130 billion a year of gross value added.¹¹⁴ However, a clear consensus on the forest impacts of SMFEs has not been established. While global meta analyses are not available, regional assessments show mixed results.¹¹⁵</p> <p>Evidence in support of the impact of SMFEs on livelihoods is clearer, though large-scale international assessments are not available. A study in Pakistan found a strong positive correlation between SMFEs and improvements in rural community livelihood, including income and assets owned.¹¹⁶ A study in Nepal found similar results.¹¹⁷ More globally, impacts vary.</p> <p>A global analysis of the uptake of SMFE support policy among REDD+ participating countries in 2016 found there had been little progress in implementing policy to support SMFEs.¹¹⁸ Since then a general absence of research/discussion appears to suggest that few concerted efforts have been made to establish this tool.</p> <p>Guatemala has committed to investing one percent of its budget in financing sustainable land-use, with funds being distributed to programs that support forest producers with and without legal ownership of their land. Agreements with private banks also provides a means of financing the expansion of SMFEs.¹¹⁹</p> <p>In Mozambique, public institutions have been mandated to promote the development of forest-linked SMEs through fiscal and non-fiscal incentives. This involves providing access to loans through programs such as FINAGRO (partnership of USAID and Mozambique government) direct lending at favorable interest rates.¹²⁰</p>
<p>Direct support</p> <p>Many countries provide direct support to rural populations that can</p>	<p>Where direct support programs are effective at improving livelihoods, their impact on forests remains unclear.</p> <p>The effectiveness of these programs is often limited by insufficient funding or limited capacities of relevant government institutions. For example, smallholder cattle ranchers in the Brazilian Amazon lack access to technical assistance and often rely on extensive farming and pasturing. The main limitation is the lack of qualified extension officers; basic services, such as health and education, are also in short supply.¹²¹</p>

Policy tool

Details

have positive impacts on forests as co-benefits.

In the cocoa sector in **West Africa**—a smallholder sector tied to commodity markets and characterized by poor land management and widespread poverty—there is evidence that government support has led to increased productivity in cocoa production. There is a risk, however, that increased productivity may subsequently incentivize farm expansion and additional deforestation.¹²²

Similarly, in **Indonesia**, the role of extension service providers promoting better agricultural practices among smallholder palm oil farmers is limited by lack of capacity.¹²³

Regulating artisanal and small-scale mining (ASM)

Regulating ASM directly often falls short in reducing deforestation while enhancing livelihoods.¹²⁴ Improved forest governance and protected area policies that target areas where ASM is practiced have typically had more success in reducing deforestation but unclear impacts on local livelihoods.

Governments commonly seek to “formalize” ASM to reduce miners’ vulnerability, but interventions to formalize, paradoxically, can increase deforestation due to perverse incentives and mechanization, particularly when not combined with tenure security and training.¹²⁵ For example, **Peru’s** formalization efforts from 2001 to 2014 led to more mining and 40,000 hectares of forest loss.¹²⁶

International regulations often overlook forest-related concerns in ASM.¹²⁷ Yet, there is a growing push in policy and industry-led initiatives to integrate environmental aspects, focusing on business integrity and human rights. Critics warn that mandatory due diligence regulations may lead to ASM being excluded from responsible supply chains, as players may exit this high-risk sector due to elevated costs and reputational risks.

Multilateral organizations are developing innovative approaches that explicitly address forest impacts. The World Bank’s “Bolt-on Forest-Smart ASM Standard” enables ASM enterprises, regulators, and buyers to adopt “forest-smart” practices with support from various stakeholders.¹²⁸ The Global Environmental Facility’s GOLD+ program, targeting reduced mercury use in ASM, considers a jurisdictional approach, encompassing sectors like forestry, water, health, and the environment.¹²⁹

2.3 Have companies advanced their efforts to achieve forest goals?

2.3.1 Eliminating deforestation and conversion from agricultural and forestry commodity supply chains

Only a small group of leading agricultural commodity and forestry companies prioritize eliminating deforestation and conversion from their supply chains, though their efforts prove that such an outcome is possible. Their overall impact remains limited, however, because they control only a small share of the global market. The majority of companies are either behind on progress toward their forest commitments or have yet to adopt them.

Civil society organizations supported by public and private donors have laid the groundwork for private sector action. They have developed extensive guidance (e.g., the Accountability Framework and numerous certification standards) for companies to design and implement policies in their supply chains to address deforestation, conversion of natural ecosystems, and human rights abuses. Civil society organizations have gathered data on forests, deforestation hotspots, commodity trade, and deforestation risks in supply chains and made it available through platforms like Global Forest Watch, trase.earth, and Mighty Earth's Cocoa Accountability Map—among others—for companies to use and act upon.

HOW DO WE ASSESS PROGRESS?

Producers, traders, processors, manufacturers, and retailers of commodities can implement a range of measures to eliminate deforestation, forest degradation, and the conversion and degradation of other ecosystems from their supply chains. These measures include production and supply chain management systems and processes such as risk and impact assessments, traceability, supplier management and support, and monitoring and verification of compliance, along with strong grievance and noncompliance processes. This section focuses on addressing forest risks from legal activities, though illegal activities also play a major role in harming forests. See **Chapter 4** on forest rights & governance for more on illegal deforestation.

We assess company progress on two types of policies:

COMPANY POLICIES IN THE AGRICULTURE AND FORESTRY SECTORS: We look at the adoption of supply chain management commitments including time-bound targets, and implementation mechanisms such as for risk assessment, traceability, managing and supporting suppliers, and monitoring and verification of compliance.

COMPANY POLICIES IN THE MINING AND EXTRACTIVES SECTOR: We review how companies address the indirect influence of opening up forests to other drivers of deforestation, such as by applying the mitigation hierarchy.^P Policies are typically framed in the context of biodiversity protection.

Despite this engagement and effort by civil society over the last decade, most companies operating in agricultural and forestry commodity supply chains do not disclose their risks or progress in addressing those risks. Among those that disclose, many companies have yet to adopt robust and comprehensive commitments. While there are a handful of leading companies, their overall impact on reducing negative forest impacts is limited because they control only a small share of the global market for these commodities. Overall, corporate actors' progress is slow.

A minority (29%) of companies in forest-risk commodity supply chains assessed by Forest 500 have a deforestation commitment in place for all commodities to which they are exposed (**Figure 2.4**).¹²⁹ While this is progress, it's not fast enough. Since 2014, the percentage of companies that have a deforestation commitment for all of the commodities to which they are

^PThe "mitigation hierarchy" is a decision framework which allows for the systematic consideration of negative environmental impacts (direct, indirect, and cumulative) from a development project, and for the identification of appropriate mitigation options. Its application is considered a "best practice" approach in the mining, extractives, and infrastructure sectors. Four key steps are called for, in order of priority: Avoid impacts from the outset, through e.g. improved spatial or temporal planning; Minimize impacts that cannot be completely avoided; Restore or rehabilitate ecosystems and habitats impacted by the project, either concurrently or post-project closure; and Offset any residual impacts through interventions outside the project area. As a second priority, it calls for remedial measures, restoring or offsetting negative impacts. Effective application of this framework requires strong prioritization of avoidance and mitigation. Source: Forest Trends, <https://www.forest-trends.org/bbop/bbop-key-concepts/mitigation-hierarchy/>

exposed increased by 19 percent—demonstrating progress, albeit too slow. Progress by producers of major forest-risk commodities differed significantly. The majority of companies producing palm oil and timber have a deforestation commitment in place, continuing to show stronger ambition than those producing soy (less than half of which have a deforestation commitment). Beef producers lag even further behind, with just 30 percent of assessed companies having a deforestation commitment in place. Based on data from ZSL’s SPOTT, only 12 percent (10 out of 79) of companies in the palm oil sector have a commitment to no conversion that aligns with the Accountability Framework’s criteria for natural ecosystems.

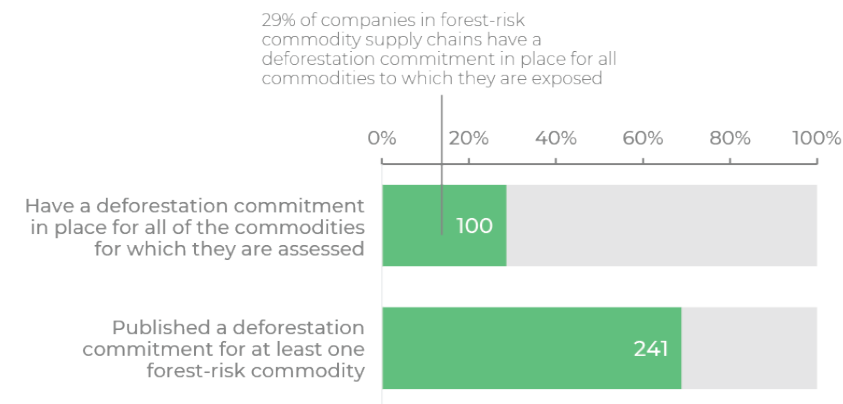
Overall, only 12 percent of companies disclosing to CDP claim to be close to eradicating deforestation from their supply chains.¹³⁰ Among the mainly large- and medium-sized companies disclosing through CDP, just half (49%) of them had a system to control, monitor, or verify compliance with their zero deforestation supply chain policies or commitments. Only a third (35%) report over 90 percent of their commodity volumes to be in compliance with their no-deforestation or no-conversion policies or commitments (**Figure 2.5**).

There are various means by which companies can implement their no-deforestation and conversion commitments. Companies can combine different approaches depending on the specific commodities and geographies where they operate. These may include the implementation of robust supplier management, traceability and monitoring systems, use of certification (i.e., participation in and compliance with voluntary sustainability certification programs, like the Roundtable on Sustainable Palm Oil or the Rainforest Alliance standard for other commodities), direct supplier engagement and participation in jurisdictional initiatives. The Accountability Framework provides guidance necessary for companies to achieve their zero-deforestation, zero-conversion and respect for human rights in their agricultural and forestry supply chains and is designed to be used in tandem with other initiatives and approaches.

Limited progress on supply chain traceability

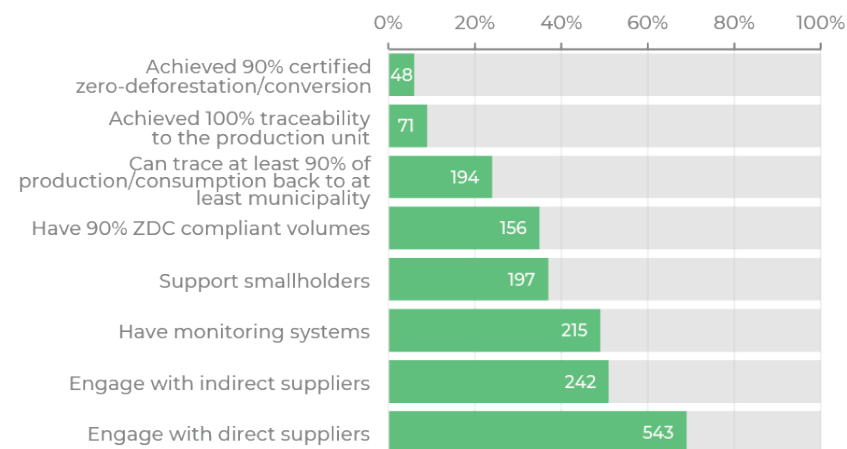
Just 9 percent (71 out of 810) companies disclosing through CDP report that they trace 100 percent of at least one of their sourced raw products back to the unit of origin (e.g., plantation, farm, and cattle ranch). According to Supply Change, of the 125 largest companies (those with global operations accounting for over USD 4 trillion in global sales), only 38 report the percentage of their volumes traceable to the source or primary production unit for at least one sourced commodity.¹³¹

Figure 2.4. Deforestation commitments among Forest 500 companies



Source: Forest 500 2023 Report

Figure 2.5. Implementation of no-deforestation commitments by agricultural supply chain companies disclosing through CDP



Source: CDP disclosure data from 2022

Full traceability is particularly important given recent regulatory developments like the EUDR, which introduced strict traceability requirements for companies who want to sell and import their products through the EU market. Companies that do not have a system in place to track and monitor the origin of their disclosed commodities cited reasons for this, per CDP disclosures. These reasons include that such systems are not an immediate business priority; that companies are in the process of implementing traceability systems within the next two years, but do not currently do so; and that there is insufficient data on their operations to do so.¹³²

According to CDP, improved traceability is most common in the palm oil sector. At least 46 percent of companies assessed indicate that they can trace almost half (43%) of their palm oil volumes to the processing level.¹³³ Unless companies can trace their commodities to at least subnational producer regions or the location of origin where they can monitor deforestation and conversion through satellite technologies, determining the risk of deforestation associated with these commodities remains a challenge.

Mixed progress on voluntary certification

The main certification schemes with zero-deforestation requirements are the Roundtable on Sustainable Palm Oil (RSPO); the Round Table on Responsible Soy (RTRS) and Proterra for soy; and the Rainforest Alliance (RA) for cocoa, coffee, and other commodities.

There is significant uptake of certification schemes within some commodities. Certification use is highest among companies reporting on palm oil (72%) and coffee (36%).¹³⁴ Similarly, while 68 percent of companies report using certification (e.g., Forest Stewardship Council) for timber, this generally refers to timber plantation certified “sustainable” but not necessarily “deforestation-free” (**Box 2.4**). While certification can be an effective assurance mechanism to implement deforestation-free policies and commitments to ensure sourced materials come from sustainable sources, their uptake alone does not provide the full picture.

In addition to zero-deforestation requirements, companies need to source segregated or identity-preserved materials certified under these schemes to provide zero-deforestation assurance. However, only 3 percent of companies reporting on palm oil report that at least 90 percent of their volumes can be identified as originating from identity-preserved or segregated supply chains. While RSPO has certified 14.7 million metric tons (19% of the entire

global palm oil sector), it has been unable to penetrate key markets such as China and India.¹³⁵ Meanwhile, no companies report this level of certification for soy, cattle products, natural rubber, cocoa, or coffee.

A 2023 meta-analysis found that commodity certification was among the policies and institutions associated with reduced deforestation.¹³⁶ The analysis found that certification schemes were linked with less deforestation in most—but not all—regions. A 2021 review of studies on voluntary certifications found that such schemes prompted farmers to increase tree cover or afforded them higher incomes when coupled with incentives like improved market access.¹³⁷ For example, while households with RSPO-certified farms have generally seen improved income, evidence for conservation outcomes, like reduced deforestation and reduced fire occurrence, compared to non-certified plantations was mixed.¹³⁸

Additionally, the private sector is increasingly acknowledging the importance of addressing deforestation due to both legal and reputational risks. For instance, Australian beef companies with international operations, for example, are cautious about being associated with deforestation and some are reevaluating their beef production methods (see **Australia case study**).

BOX 2.4. COMPANY EFFORTS ON SOURCING LINKED TO DEFORESTATION AND DEGRADATION

Many companies in the forest product supply chain rely on commitments centered on third-party certification systems. These systems, however, vary widely in the actual level of protection they provide to forests and Indigenous rights. Systems like the Sustainable Forestry Initiative, for example, don't prohibit degradation and offer minimal protections against biodiversity, climate, and human rights impacts.

However, investors have begun recognizing the risks associated with sourcing tied to forest degradation and pursuing measures to mitigate these risks in their portfolios. In 2020, 67 percent of shareholders for the multinational consumer goods company Procter & Gamble (P&G) voted in favor of a resolution asking the company to assess and report on how it can “increase the scale, pace and rigor of its efforts to eliminate deforestation and the degradation of intact forests in its supply chains.”¹³⁹ In 2022, 65 percent of shareholders for multinational home improvement retailer The Home Depot voted in favor of a similar resolution.¹⁴⁰

Investors have also begun integrating forest degradation standards into their policies. In its March 2023 Guidance on Environmental Management Disclosures, for example, State Street Global Advisors, which has USD 3.5 trillion in assets under management and is the fourth-largest asset manager in the world, highlights that companies should “manage [...] deforestation and land degradation risk in their supply chains and enhance disclosure on these efforts.”¹⁴¹

Progress on supplier engagement varies across supply chains and regions

Palm oil supply chains are doing comparatively well on supplier engagement compared to other forest-risk commodities, demonstrated by the sector in Indonesia (**Box 2.5**). Based on data from ZSL's SPOTT, about 56 percent of 93 assessed palm oil producers and processors report they have or support a program to support independent smallholders in the supply chain.

Engagement with indirect suppliers is challenging, especially in sectors that are dominated by many smallholders and intermediaries, such as the cocoa and palm oil sectors. In the cocoa sector, for example, companies focus support mostly on large, direct-supplying farms while many smallholders remain unsupported. However, there is increasing multistakeholder collaboration at the landscape and jurisdictional level in producer countries to address underlying drivers of deforestation including by supporting farmers (**Section 2.5.1**).

2.3.2 Mitigating impact from extractive industries

Corporate transparency on forest risks remains very limited in the mining and extractives sectors. Companies reporting in 2022 saw small signs of improvement in adopting commitments and policies to reduce or avoid biodiversity loss. However, the quality and effectiveness of these policies remains unclear due to a lack of specificity in their design. Downstream companies also still fail to address their environmental impacts related to mining and extractives.

Lack of ambition and specificity in company commitments

From 2021 to 2022, there was an increase in mining and coal extractive companies reporting through CDP that made a public commitment to reduce or avoid impacts on biodiversity (Figure 2.6), which can largely be attributed to a change in the sample of companies reporting.⁹

BOX 2.5. THE ROLE OF ZERO-DEFORESTATION COMMITMENTS IN INDONESIA'S PALM OIL SECTOR¹⁴²

Indonesia, the world's top palm oil producer, generated 46 million metric tons of crude palm oil in 2021, accounting for 59 percent of global exports.¹⁴³ Historically, palm oil production drove significant deforestation. Palm oil production was responsible for over 3 million hectares of forest loss over the past 20 years.¹⁴⁴ However, Indonesian palm oil producers have recently adopted more sustainable practices. Trase Insights¹⁴⁵ research demonstrates this shift, showcasing the positive impacts on forests.

Indonesia's palm oil sector has witnessed widespread adoption of zero-deforestation commitments (ZDCs), with over 85 percent of palm oil exports linked to companies having formal ZDCs. Initially, these commitments did not yield significant deforestation reductions, showing similar risk levels to the sector overall after adoption. However, this trend shifted in subsequent years as companies improved compliance and transparency. This time lag may be because many of the major producing companies certified their existing plantation base first, and then as the expansion continued, certified their new plantings.

Trase Insights reveals notable differences between ZDC-adopting supply chains and others in Indonesia. Exporters with ZDCs source palm oil from lower-deforestation supply chains, with each metric ton of palm oil exported by traders with ZDCs having just 70 percent of the deforestation risk of one exported by other traders. Together, these results provide evidence of a differentiated market in which supply chains governed by ZDCs have a markedly lower rate of deforestation.

While there is still much progress to be made, commodity-driven deforestation from palm oil has decreased in Indonesia. From 2018-20, deforestation for palm oil dropped to 18 percent of its 2008-12 peak, even as palm oil production expanded. Importantly, government-led action played a major role, here: in 2018, the Government of Indonesia instituted a palm oil moratorium (based on President Regulation No. 18), which helped stem deforestation from palm oil production. Challenges to maintaining this decrease include rising palm oil prices and the emergence of less transparent, unsustainable companies. However, Trase Insights reports that recent palm oil price increases did not drive a surge in deforestation, offering hope. This may be because as prices fell, many of the larger plantation companies began to replant their older plantations with improved planting materials. Yet, 2.4 million hectares of intact forest remain in Indonesian palm oil concessions, representing both a conservation opportunity and a significant continued risk.

⁹A total of 38 companies reported in 2021, and 37 companies reported in 2022; 9 new companies responded in 2022, while 10 that did so in 2021 failed to do so in 2022.

However, the overall lack of specificity and ambition in existing commitments among reporting companies undermines confidence in their quality and effectiveness. For example, less than a third (both in 2021 and 2022) of these companies pledged to adopt the mitigation hierarchy approach. Further, very few companies aim for a net positive impact on biodiversity (5 percent in 2021 and 8 percent in 2022).

Biodiversity policies on the rise, but remain vague

Policy adoption can be considered a more impactful action than making a commitment, since policies guide behavior. In response to investor demand, most mining companies have now adopted some form of corporate social responsibility approach or environmental, social, and governance (ESG) principles that guide their activities.¹⁴⁶ While biodiversity commitments and policies are relatively common in these principles, an explicit focus on forests is rare.

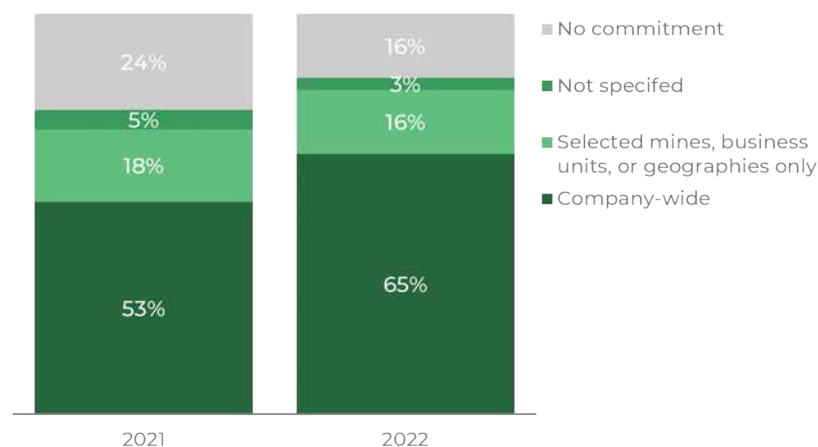
Nearly all companies that reported through CDP in 2022 have a biodiversity policy (89%), though fewer have an actual commitment to avoid or reduce impacts on biodiversity (73%). The share of companies whose biodiversity policy is publicly available was higher in 2022 (81%) than in 2021 (68%), but consistent transparency is still lacking, making it hard to track progress on this indicator.

In 2022, the proportion of biodiversity policies from reporting companies containing best practice elements generally increased compared to 2021. For example, the share of policies recognizing the overall importance of natural habitats increased from 42 to 51 percent, while those containing commitments to transparency went from 26 to 38 percent. On the other hand, fewer policies set time bound targets: 21 percent in 2021 dropped to 19 percent (Figure 2.7). Overall, well below half of the policies contain the kind of explicit commitments or references to best practices that characterize well-designed, effective policies to reduce negative forest and biodiversity impacts.

Performance improvements slowing down

Despite the significant work that remains even for companies that have traditionally been leaders on responsible mining, progress on performance has slowed in recent years. The Responsible Mining Foundation has tracked mining company progress in responsible mining since 2018. They evaluate four key indicators: ESG integration, transparency, rights-based harm prevention, and international action.¹⁴⁷

Figure 2.6. Scope of public biodiversity commitments among mining and coal extractive companies reporting through CDP in 2021 and 2022



Source: CDP analysis of self-reported and disclosed mining company data in 2021 and 2022

Note: A total of 38 companies reported in 2021, and 37 companies reported in 2022; 9 new companies responded in 2022, while 10 that did so in 2021 failed to do so in 2022.

The assessed companies, accounting for 25 to 30 percent of global mining, have shown slow improvement. On average, they improved by 17 percent from 2018-20 and 11 percent from 2020-22. Notably, top-tier companies only saw a 4 percent average improvement from 2020-22.

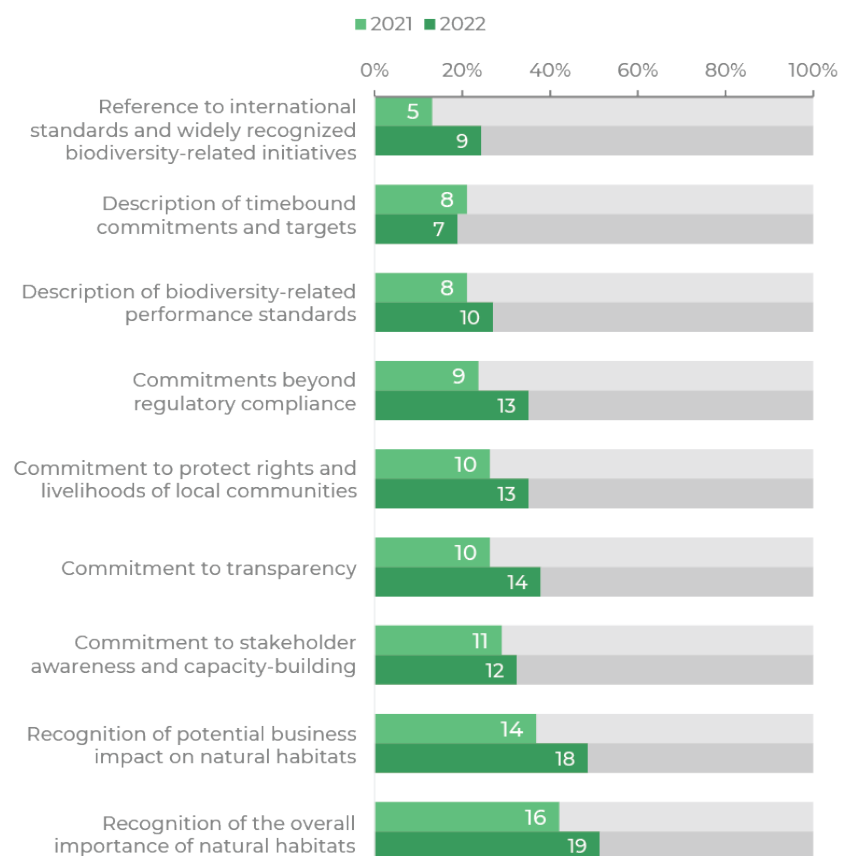
Another group, the Mining Association of Canada, assesses environmental stewardship through its Toward Sustainable Mining (TSM) framework.¹⁴⁸ The latest data from December 2022 reveals that 79 percent of companies achieved Level A or higher in “conservation planning and implementation,” with approximately 50 percent reaching the highest AAA rating. This indicates a slight decrease in overall performance compared to 2021—the same share (79%) of companies had reached the A level or higher, but a higher percentage had reached the AAA level (around 65%). However, overall performance has improved since 2013 when only 50 percent reached Level A or above, and around 30 percent attained the AAA grade.

Voluntary sustainability standards are increasingly adopted but are not all strong on forests

Voluntary sustainability standards for extractive industries are becoming increasingly important, as evidenced by increased uptake by actors in the

mining sector and increasing consumer demand for sustainable products.¹⁴⁹ Voluntary standards have gained prominence as a means to guide companies in adopting best practices and providing assurance to consumers. Standards provide frameworks for monitoring, reporting, and independently auditing mining operations to assess their compliance.¹⁵⁰ Some standards cover a broad range of minerals and levels of supply chain, and others focus on specific commodities or supply chain segments.

Figure 2.7. Scope of biodiversity policies mining and coal extractive companies reporting through CDP in 2021 and 2022



Source: CDP analysis of self-reported and disclosed mining company data in 2021 and 2022.

Note: A total of 38 companies reported in 2021, and 37 companies reported in 2022; 9 new companies responded in 2022, while 10 that did so in 2021 failed to do so in 2022.

BOX 2.6. FOREST REQUIREMENTS IN MINING SECTOR VOLUNTARY SUSTAINABILITY STANDARDS

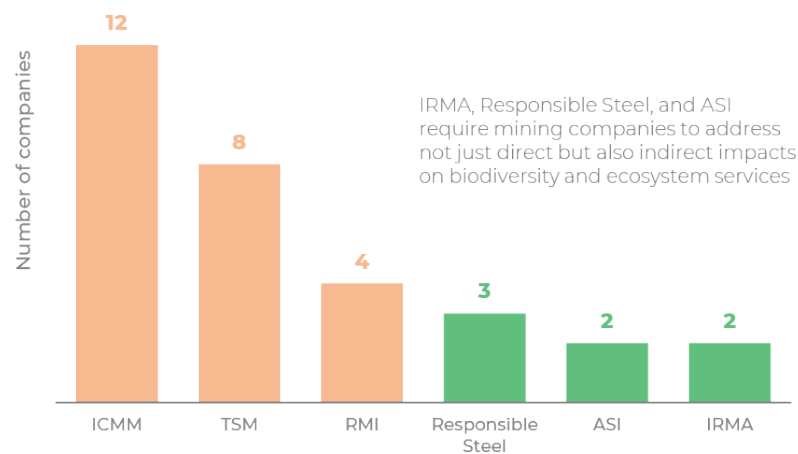
Sustainability schemes targeting the mining sector have been developed with varying relevance for forest and biodiversity protection (see **Theme 2 Annex**). At the level of mine site operations and processing, the International Council on Mining and Metals (ICMM)'s Mining Principles was the first international industry framework to address environmental and social impacts.¹⁵¹ The ICMM and the Toward Sustainable Mining (TSM) framework both require biodiversity and environmental impact assessments, with risks and impacts to be managed through application of the mitigation hierarchy. IRMA's Standard for Responsible Mining is the only standard for mine site level that requires assessment and management of "direct, indirect, and cumulative impacts."

The ResponsibleSteel Standard extends the IRMA Standard's principles up the supply chain throughout the steel sector, requiring mine sites to assess and manage biodiversity risks according to the mitigation hierarchy. ResponsibleSteel will conduct a full review of its international standard beginning in 2024. Also covering activities in the processing stage of supply chains is the Responsible Minerals Initiative (RMI). Through its Responsible Minerals Assurance Process (RMAP), the RMI manages nine standards covering a variety of commodities. Of these nine standards, two include forest-specific criteria such as the requirement for processors to not use, operate, or encroach on protected areas such as forests or wildlife preserves/management areas.

The International Finance Corporation (IFC)'s Performance Standards are one of the most common reference points for the sector and cover the entire lifecycle of an investment. IFC Performance Standard 6 states that projects should consider direct and indirect project-related impacts on biodiversity and ecosystem services. Similarly, the Responsible Jewelry Council's (RJC) Code of Practices calls for impact assessments to cover the direct, indirect, and cumulative impacts on biodiversity and ecosystem services. The Aluminum Stewardship Initiative's (ASI) version 3 of its Performance Standard, released in 2022, requires companies to assess the biodiversity and ecosystem services impacts of their operations within their area of influence, which includes indirect project impacts that affect communities' livelihoods.

The proliferation of standards in recent years has led to demand for clarity and alignment. Launched in 2019, the Mining, Minerals, and Metals (M3) Standards Partnership¹⁵² is a collaboration between standards organizations that includes ResponsibleSteel (the leader of M3), IRMA, RJC, and TSM. Rather than forming a new standard, M3 created the Integrated Assessment Protocol (IAP) Tool which is designed to allow mine sites to be assessed against multiple site-level standards in a single audit, supporting alignment across standards and facilitating demonstration of conformity with multiple standards with greater efficiency and reduced costs. ResponsibleSteel notes that as part of their collaboration efforts, IRMA, RJC, and TSM have engaged in dialogues on how to align their standards more closely.¹⁵³ It remains to be seen how, and to what extent, the inclusion of forests will be strengthened as part of this effort.

Figure 2.8. Participation in voluntary sustainability schemes by top 20 international mining companies



Source: Adapted from Franken, G., & Schütte, P. (2022).

Out of the 20 largest global mining companies, fourteen have embraced voluntary sustainability standards (**Figure 2.8**), with some adopting more than one standard.¹⁵⁴ The International Council on Mining and Metals (ICMM) leads with twelve member companies, covering 30 percent of global mining production.¹⁵⁵ The Mining Association of Canada’s TSM framework follows with eight members, succeeded by the Responsible Minerals Initiative (RMI) with four members, the ResponsibleSteel Standard with three, and the Aluminum Stewardship Initiative (ASI) Performance Standard with two. However, 6 of the top 20 firms remain outside any sustainability scheme.

Few mining standards include strong mandates for mine site operators to assess and mitigate their indirect and cumulative biodiversity impacts alongside direct effects (**Box 2.6**). The Initiative for Responsible Mining Assurance (IRMA)’s Standard for Responsible Mining is the only standard for mine site level that requires assessment and management of “direct, indirect, and cumulative impacts.”

Only 2 of the top 20 companies have adopted IRMA’s standard, meaning that its best-practice approach to addressing biodiversity and ecosystem impacts is not widely adopted by mining’s power brokers. However, by other measures, the standard’s reach is growing rapidly: there has been a six-fold

increase in mine sites participating in IRMA processes over the last three years. As of September 2023, 33 mine sites (spanning 23 companies) were in the self-assessment stage of IRMA adoption,¹⁵⁶ up from 30 sites in September 2022 and only 6 in September 2020. Additionally, 15 sites from 10 companies had begun or completed the independent, third-party assessment by September 2023.¹⁵⁷

The TSM framework is unique among voluntary sector standards in that it targets national industry bodies for adoption, rather than individual mining companies. To date, the TSM framework has been adopted by 13 countries’ national mining associations, covering 29 percent of global mineral and metal production value.¹⁵⁸ Guatemala, Mexico, and Panama adopted the TSM standard since the 2022 Forest Declaration Assessment.

The global transition to sustainable energy has thrust mining companies extracting critical materials like cobalt, nickel, lithium, and platinum into the spotlight. The ICMM standard is the most widely adopted among the top companies by market share in these energy transition commodities.

However, approximately half of the leading firms in these sectors have not joined any sustainability scheme, highlighting room for further engagement and improvement in promoting sustainable mining practices.

Downstream companies weak on addressing environmental impacts

Downstream companies with links to the extractive commodity sector—those who do not produce but instead procure extractive commodities—are making commitments to reduce their environmental impacts, but few are backing these up with concrete actions aligned with the mitigation hierarchy.

The Extractive Commodity Trading Report 2023¹⁵⁹ from the Responsible Mining Foundation and the World Resources Forum assessed commitments, due diligence, and public disclosure among 25 of the world’s largest companies that trade extractive commodities primarily sourced from third-party suppliers—most assessed companies were international oil companies

or energy traders. The report found that most companies express a commitment to addressing environmental impacts, but few formalize it with a mitigation-hierarchy approach.

Efforts to fulfill these commitments are generally weak. Over 70 percent of companies assessed in the Extractive Commodity Trading Report 2023 have set environmental expectations for their suppliers, but only a few formalize them in documents or require environmental management systems. Few have formal systems to assess supplier compliance with environmental matters, with just one disclosing actions for supplier non-compliance.¹⁶⁰ Only three assessed companies (Glencore, Eni Trade & Biofuels, and TotalEnergies Trading & Shipping) have relatively strong environmental due diligence performance. Minimum transparency on sourcing remains limited, with only one company (MRI Trading) publicly disclosing all of the countries from which it sources.

Without due diligence, environmental commitments are unlikely to improve environmental performance on the ground. Producing companies are unlikely to change their practices if they are not held accountable by sourcing companies—see **Box 2.7** for an example). As of now, there is little indication that downstream companies in the extractives sector are making efforts to review or improve their due diligence systems.

BOX 2.7. CHALLENGES IN MINING GOVERNANCE: THE CASE OF NICKEL MINING IN INDONESIA

The global transition to renewable energy has spurred increased mining activities in regions rich in critical minerals, driven by the growing demand for essential resources used in electric batteries and renewable technology components. As the supplier of 37 percent of the world's nickel in 2021, Indonesia is a pivotal player in this transition. Its share of nickel production is projected to soar to around 60 percent by 2025.¹⁶¹

Indonesia has actively sought foreign investment to strengthen its domestic nickel sector.¹⁶² For example, in August 2022, Tesla, the world's second-largest electric car manufacturer, signed a monumental USD 5 billion deal to secure nickel for its batteries from Indonesian suppliers.¹⁶³ In January 2023, German chemical giant BASF announced a planned USD 2.6 billion investment in an Indonesian facility to process nickel for use in electric vehicle batteries.¹⁶⁴ BASF's rationale for this investment decision partly hinges on the project site's commitment to "the highest standards of responsible and ethical practices, in line with the highest national and international standards."¹⁶⁵ This includes adoption of the IRMA standard, which mandates comprehensive social and environmental impact assessments and requires free, prior, and informed consent from affected Indigenous Peoples.

Despite claims of compliance with international mining standards, concerns have arisen regarding the impact of Indonesian nickel mining activities on local communities and on the environment, including evidence of large-scale deforestation.¹⁶⁶ These concerns stem largely from Indonesia's weak mining governance and policy frameworks that often prioritize the interests of large-scale mining companies over environmental protection and human rights. For example, Indonesia's granting of mining concessions does not require consultations with local people, as they are not considered the owners of the land under Indonesian law.¹⁶⁷ In response to a damning investigative report on conflicts of interest in granting mining licenses, the Indonesian Ministry of Energy and Mineral Resources took swift action by revoking permits for numerous nickel companies associated with deforestation.¹⁶⁸ Enhanced transparency and disclosure mechanisms could improve mining governance and mitigate some of the challenges associated with Indonesian nickel mining.

¹ Companies assessed include bp trading & shipping, CCI, Chevron Supply and Trading, CITIC Metal, ConocoPhillips, Eni Trade & Biofuels, ExxonMobil, Gerald Group, Glencore, Gunvor, LITASCO, Mercuria, Minmetals International, Mitsubishi Corporation, Mitsui, MRI Trading, Noble Resources, Phibro, RGL Group, Shell International Trading and Shipping, TotalEnergies Trading & Shipping, Trafigura, UNIPPEC, Vitol, and Wogen.

2.4 Have grassroots actors advanced their efforts to achieve forest goals?

2.4.1 Engagement of civil society, Indigenous Peoples and local communities, and other citizen-led groups in grassroots movements

IPs and LCs have made astounding headway in raising awareness at the international level of the critical role they play in safeguarding the world's forests and other natural ecosystems. Grassroots movements and resistance led by IPs, LCs, and other stakeholders have elevated conversations about the environmental and social impacts of large-scale development projects and the potential for alternative development pathways. Yet, evidence from ground level tells a story of woefully insufficient funding, legal recognition and respect for rights, and protection for environmental defenders.

Indigenous Peoples claiming space on the international stage

IPs' and LCs' voices are critical to shaping global narratives advocating for forests to be foregrounded in climate action, biodiversity protection, and sustainable development agendas. IPs and LCs have long been at the forefront of national and subnational forest stewardship efforts, and are now elevating this leadership in international contexts. Over the last 15 years, Indigenous leaders from all over the world have united their forest communities through transnational alliances to amplify IPs' and LCs' messages.¹⁶⁹

HOW DO WE ASSESS PROGRESS?

This section considers the extent and impact of grassroots activity that is positively contributing to the achievement of global forest goals, as well as the opposition that these actors face, using case studies and available aggregate data on grassroots efforts, where available. Civil society organizations, non-profit institutions, and IPs' and LCs' organizations, as well as ad hoc or informal coalitions of smallholder farmers, women's networks, and mutual aid groups,¹⁷⁰ can all contribute to grassroots activities, defined as taking place outside of dominant power and decision-making structures. These grassroots actors can unite in common cause against threats to their livelihoods or the environment.¹⁷¹ Grassroots actors use a variety of methods—such as organizing public protests, initiating legal challenges, and rallying international support—to influence how, where, or if development projects are undertaken and to exert IPs' and LCs' rights to self-determination.

The success of these efforts has been evident in recent climate and forest events—for example, through the launch of the IPLC Tenure Pledge at COP26. International alliances have allowed grassroots actors to overcome or circumvent authoritarian or oppressive domestic contexts—at least to an extent—even as space for civil society and activism closes in many countries.¹⁷² Grassroots efforts influence public opinion and inform land use decision making and policy.¹⁷³

Bottom-up mobilizations' limited but profound moments of success

An analysis of 2,743 cases found that bottom-up mobilizations (including formal petitions, street protests, and public campaigns) for more sustainable and socially-just uses of the environment occur worldwide across all income groups.¹⁷⁴ In 11 percent of cases, mobilizations contributed to halting environmentally destructive and socially conflictive projects, and defending the environment and livelihoods.¹⁷⁵ Another study of 649 cases of resistance movements found that place-based resistance movements are succeeding in curbing both fossil-fuel and low-carbon energy projects, and over a quarter of projects encountering social resistance were canceled, suspended, or delayed.¹⁷⁶ Ecuador has recently seen significant shifts due to mass resistance to the expansion of extractive concessions (**Box 2.8**).

Community-led conservation and alternative development pathways shifting the status quo

Conventional models of protected areas have faced criticism for perpetuating “fortress conservation,” which excludes communities from lands that they have traditionally occupied and on which they rely. However,

new models for community-led conservation can counteract the trend toward exclusion, empowering communities and fostering self-determination while safeguarding forests.

For example, for decades, IPs in Canada have been leading the way in establishing Indigenous Protected and Conserved Areas that both protect forests for future generations and promote Indigenous governance.¹⁷⁷ The federal government of Canada has committed more than USD 1.2 billion toward Indigenous-led protection since 2018.¹⁷⁸ Guardians programs also provide new models of Indigenous-led stewardship, supporting and empowering Indigenous “eyes and ears” on the ground in their traditional territories. In December 2022, Canada announced the creation of a First Nations National Guardians Network.¹⁷⁹

Voices from Global South, particularly Indigenous communities, have been redefining development paradigms. Concepts like *buen vivir* (“living well”) from Latin America and similar ideas in other regions emphasize an alternative to the exploitative and destructive nature of modern capitalism.¹⁸⁰ These alternative approaches prioritize harmony with nature, community, and sustainability, aiming to dismantle the idea of universal progress driven by technology and economic growth. Recently, increasing efforts are underway to expand traditional measures of economic well-being (like GDP) to encompass a broader range of indicators for social and ecological wealth.¹⁸¹

Rising scrutiny of donors driving (slow) localization of funding

In recent years, donor countries and philanthropic organizations have increasingly recognized the importance of IPs and LCs in biodiversity conservation and climate change efforts.¹⁸² This represents a significant shift from earlier conservation programs that often excluded IPs and LCs from decision-making processes. A landmark 2021 report from Rainforest Foundation Norway, noting that less than 1 percent of global climate financing reached IPs and LCs, led to increased awareness and a USD 1.7 billion pledge (the IPLC Forest Tenure Pledge) by bilateral donors and foundations.¹⁸³ However, Indigenous leaders have raised concerns that this pledge will be fulfilled through existing funding channels, which do not generally meet IPs’ and LCs’ needs.¹⁸⁴ The first progress report issued by signatories to the pledge revealed that only 7 percent of distributed funding was directly reaching IP and LC organizations.¹⁸⁵

BOX 2.8. GRASSROOTS RESISTANCE TO EXTRACTIVES EXPANSION IN ECUADOR

The Waorani people and other Indigenous groups in Ecuador have long opposed using their traditional forest lands for extractive industries. In 2022 and 2023, they made significant strides in challenging Ecuador’s reliance on oil production. While potential alternative revenue sources are emerging, the timing of scaling them up to avoid an economic crisis is uncertain.

President Guillermo Lasso issued Decree 95 in July 2021, aiming to double national oil production and attract private investment to address pandemic-induced economic challenges. This decree opened parts of the Ecuadorian Amazon to new mining concessions and relaxed environmental controls. Despite Ecuador’s progressive constitution, governmental actions often contradicted its principles.¹⁸⁶

President Lasso’s decrees and the subsequent awarding of new concessions sparked protests and lawsuits.¹⁸⁷ In February 2022, Ecuador’s Constitutional Court ruled that Indigenous Peoples (IPs) have the right to consent to extractive projects on their lands, slowing oil concession permits.¹⁸⁸ Further unrest erupted in June 2022, and in September 2022, the government agreed to a temporary moratorium on new concessions and projects in Indigenous territories and protected areas, lasting at least 12 months or until free, prior, and informed consultation for IPs and comprehensive environmental legislation is enacted.¹⁸⁹ Lawsuits and protests also led to the repeal of Decree 95 and the reform of Decree 151.

Indigenous protests likely contributed to President Lasso’s declining popularity; the protests caused significant economic losses, and caused gasoline shortages and soaring prices.¹⁹⁰ Ecuador’s oil industry faced challenges, including declining production, coinciding with economic difficulties. New presidential elections were scheduled, and in August 2023, national and local referendums were held, with a majority rejecting oil drilling in Block 43—a major contributor to Ecuador’s oil production.¹⁹¹ Supporters of the oil ban argue that ecotourism and debt-for-nature swaps could mitigate the economic impact of shutting down oil production in Yasuni National Park, where Block 43 is located.

Recently established global, regional, and national IP- and LC-focused funding initiatives are welcome advancements, along with an increased representation of these communities in their leadership. For example, CLARIFI (the Community Land Rights and Conservation Finance Initiative, by the Rights and Resources Initiative and Campaign for Nature) recently appointed an Indigenous woman as its head.¹⁹² CLARIFI is a flexible global funding mechanism aiming to contribute to the goal of raising USD 10 billion by 2030 to support IPs and LCs. In May 2023, Indonesia’s three largest Indigenous and civil society organizations launched the Nusantara Fund, a direct community funding mechanism aiming to attract USD 20 million in donor commitments.¹⁹³ Another Indigenous and civil society consortium launched the Indigenous Peoples of Asia Solidarity Fund, or IPAS Fund,

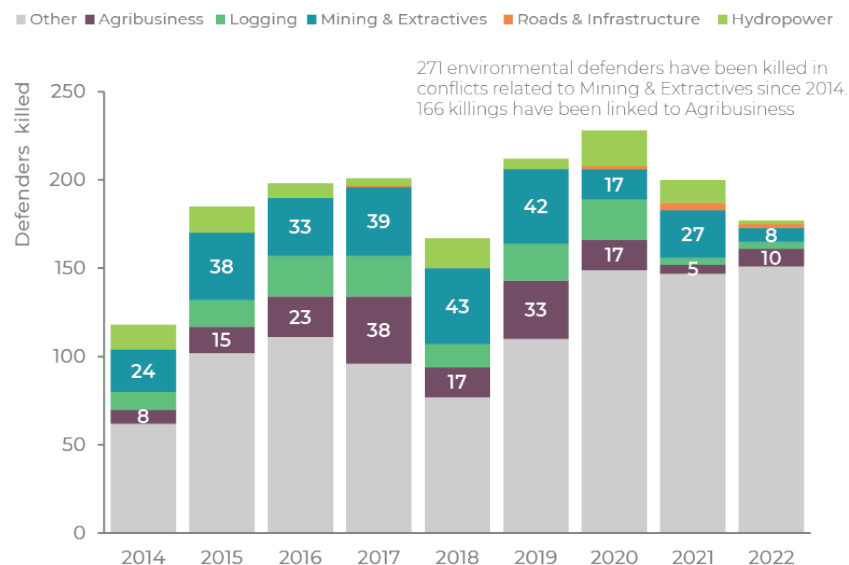
which aims to function as an endowment for long-term IP- and LC-directed funding.¹⁹⁴ An increase in initiatives focusing on and led by IPs and LCs reflects a recognition that Indigenous, Afro-descendant, and LC rights-holders must be empowered in decision-making spaces in order to simultaneously advance climate, forest, justice, and development goals.

Environmental defenders increasingly targeted

Recent grassroots successes have come at a rising cost to the environmental defenders involved in them.¹⁹⁵ Environmental defenders face high rates of criminalization, physical violence, and assassinations.¹⁹⁶ IPs and LCs are among the most likely groups to mobilize for environmental protection, and face even higher rates of criminalization, violence, and assassinations than other groups.¹⁹⁷ In a systematic mapping of resistance movements, violence was most common over projects related to hydropower, biomass, pipelines, and coal extraction.¹⁹⁸

At least 177 land and environmental defenders were killed in 2022, according to Global Witness, and the agribusiness and mining and extractives sectors are ranked as the deadliest for defenders (**Figure 2.9**). Most of these killings go unpunished; and some are facilitated by the State through systematic and deliberate suppression of IPs and LCs and grassroots environmentalists, justifying their actions through legal mechanisms such as penal laws and anti-terrorist legislations.¹⁹⁹

Figure 2.9. Killings of environmental defenders per industry driver



Source: Global Witness [In Numbers database](#) and 2023 report [Standing Firm](#).

2.5 Have collaborative efforts advanced to achieve forest goals?

2.5.1 Public, private, and civil society collaboration at the jurisdictional and landscape scale

At least 80 multistakeholder and multisector initiatives have emerged with varying degrees of formalization in recent years. Many are still in their early stages, making it difficult to attribute any recent reductions in deforestation to improved collaboration.

Establishment and effectiveness of multistakeholder and multisector landscape and jurisdictional initiatives

In recent decades, numerous multistakeholder and multisector initiatives, including public-private partnerships, civil society collaborations, commodity certifications, place-based sourcing agreements, REDD+ programs, and other sustainability efforts, have emerged at international, national, and subnational levels. A 2021 study identified 80 initiatives for improving sustainable resource use in forest landscapes, of which 25 had clearly specified stakeholders' roles and formalized their collaboration.²⁰⁰ Formalized examples of successful landscape or jurisdictional partnerships exist mainly in Latin America and in Southeast Asia.²⁰¹

Many of these initiatives are still in early stages, making it challenging to attribute recent deforestation reductions solely to improved collaboration. A 2018 study of 38 initiatives found progress in land use planning and multistakeholder governance, but limited advancements in sustainable agriculture support and financing, especially from the private sector.²⁰² Indonesia, for example, has made initial progress in developing jurisdictional approaches and gaining private sector support,²⁰³ but their impact on deforestation, fire prevention, or reforestation remains unclear.

Corporate engagement in jurisdictional initiatives

Corporate actors can also engage in jurisdictional initiatives as part of their efforts to reduce their impacts on forests. Involvement in these approaches is growing. As of November 2022, ZSL SPOTT reported that 25 out of 100 palm

HOW DO WE ASSESS PROGRESS?

Stopping deforestation requires the engagement and collaboration of all sectors and stakeholders that enable deforestation or are affected by efforts to prevent it. This collaboration is a fundamental component of landscape and jurisdictional approaches, which facilitate strategic alignment between initiatives, sectors, and market incentives within jurisdictions. We assess the status of jurisdictional and landscape initiatives, looking at progress and challenges as well as the share of companies reporting engagement in such collaborative initiatives.

oil sector companies implement landscape or jurisdictional approaches. A 2023 review found the number of palm oil companies disclosing engagement with landscape initiatives to CDP doubled in 2022 compared to 2021.²⁰⁴ In total, 62 midstream and downstream companies have invested in 37 landscape and jurisdictional initiatives palm oil-producing areas.²⁰⁵

Data from CDP's 2022 forests questionnaire identifies leaders and laggards in landscape-level action. In 2022, nearly 20 percent of respondents (191 companies) reported being engaged in landscape and jurisdictional approaches. More than 90 additional companies plan to engage within the next two years.²⁰⁶

Challenges and opportunities for expanding jurisdictional approaches

Most jurisdictional initiatives are less than five years old and face several implementation challenges. These include insufficient funding and monitoring capacities. Other common challenges include inconsistent land use data quality and availability; limited local government capacities; gaps in environmental law enforcement; slow progress on social issues; and misalignment of policies at national and subnational levels. Challenges persist in formalizing the inclusion of local land users, particularly IPs and LCs, and in creating equitable market access for these groups.²⁰⁷ Despite the ambition of many jurisdictional initiatives to create equitable collaboration spaces, many of them end up reproducing traditional power structures and struggle to empower marginalized voices.²⁰⁸

Acknowledging these early challenges can, however, help to spur investment in solutions to enable the implementation of successful jurisdictional initiatives over the long term. Strengthening respect for human rights, building accountability within jurisdictional initiatives, and securing increased financing can help improve their impacts going forward.²⁰⁹

Successful multistakeholder collaboration to address supply-chain deforestation

Public-private partnerships that deliver both environmental and socioeconomic benefits have potential for transformative change in commodity production and land use. Interventions tailored to local contexts and delivered at the landscape or jurisdictional scale, built through integrative, multipurpose, and inclusive collaboration, can allow national and subnational governments, producers, investors, civil society organizations, and the private sector to build shared trust and accelerate positive outcomes.²¹⁰

One of the most successful examples of multistakeholder collaboration to end supply-chain deforestation is the Amazon Soy Moratorium, in which almost all soy traders in the region collectively decided to halt purchases linked to Amazon deforestation (**Box 2.9**).

BOX 2.9. THE AMAZON SOY MORATORIUM

In 2006, the Brazilian Association of Vegetable Oil Industries (ABIOVE) and the National Association of Grain Exporters (ANEC) announced a policy that would become one of the most successful market-based conservation initiatives in the world: the Amazon Soy Moratorium. The Moratorium established that grain traders, representing 90 percent of soy trade in the region,²¹¹ would not purchase soy grown on recently deforested land in the Amazon region. Initially agreed for a period of two years, the Moratorium was later renewed annually until 2016, when it was renewed indefinitely. The original agreement prohibited purchase of soy produced on lands cleared after 24 July 2006. This date was later pushed to 22 July 2008, the amnesty for deforestation cut-off date established in the new Brazilian Forest Code of 2012.²¹²

The Moratorium is led by the Soy Working Group, a multistakeholder forum. It was endorsed by the government in 2008 with the National Institute for Space Research (INPE) supporting monitoring efforts. Banco do Brasil, Brazil's largest public bank and major funder of the Brazilian agricultural sector, is also part of the initiative.²¹³

The process of systematic discussions and annual renewals of the Moratorium led to gradual improvements of its monitoring and transparency system.²¹⁴ As a result, the agreement achieved a high level of maturity and obtained impressive results. Compliance reached remarkably high levels: non-compliant area corresponded to only 2 percent of total soy grown in the Amazon Biome in the 2019-20 crop year. Only a residual fraction of 0.11 million hectares were associated with deforestation after 2008.²¹⁵ On net, the Moratorium avoided an estimated 0.9 percent of global deforestation from 2011-16.²¹⁶ Despite the localized success of the Moratorium, up to half of the avoided deforestation "leaked" to other areas, mostly within Brazil, such as the Cerrado biome.²¹⁷ The Cerrado is not yet included in a moratorium.²¹⁸

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