Progress on the New York Declaration on Forests

Protecting and Restoring Forests:

A Story of Large Commitments yet Limited Progress

FIVE-YEAR ASSESSMENT REPORT

September 2019

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About the NYDF Progress Assessment:
This report was researched and authored by the New York Declaration on Forests Assessment Partners and coordinated by Climate Focus. It is a collaborative effort that relies on the contributions of countless individuals and organizations. The report and its accompanying technical annexes have undergone an extensive internal and external peer review process, with 700+ comments and input received from 50+ experts around the world.

The NYDF Assessment Partners include: CDP, Center for International Forestry Research (CIFOR), Chatham House, Clean Cooking Alliance, Climate Focus, Conservation International (CI), Environmental Defense Fund (EDF), Forest Foundation Philippines, Forest Trends, Global Canopy, Institute for Global Environmental Strategies (IGES), Instituto de Manejo e Certificação Florestal e Agrícola (Imaflora), the International Center for Tropical Agriculture (CIAT), International Union for Conservation of Nature (IUCN), National Wildlife Federation (NWF), Overseas Development Institute (ODI), Rainforest Alliance, Rights and Resources Initiative (RRI), Stockholm Environment Institute (SEI), The Nature Conservancy (TNC), The Sustainability Consortium (TSC), Woods Hole Research Center (WHRC), World Resources Institute (WRI), World Wildlife Fund (WWF-US), and the Zoological Society of London's (ZSL) Sustainability Policy Transparency Toolkit (SPOTT) initiative.

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Forewords

Five years after the launch of the New York Declaration on Forests, this Progress Assessment is a mixed report card. Its analysis of satellite data provides powerful insights into the complex loss and gain dynamics in the world's forests. In some places the world is suffering irreversible loss of primary forests while elsewhere new trees are enriching rural landscapes. What is clear is that we are well short of meeting the Declaration's 2020 targets and will need to dramatically escalate funding and action to achieve the 2030 targets. If we want to limit climate change, we must avoid irreversible losses of biodiversity, bring degraded land back into productivity, and respect the rights, livelihoods and cultures of forest peoples. The planet can't afford for us not to.

With case studies of deforestation and restoration in China, El Salvador, Indonesia, Malawi, the Congo Basin, and Brazil, this report takes a clear-eyed view of the challenges ahead in halting forest loss and recovering areas where forests have been lost or degraded.

The report's pilot study of the Mekong region offers a hopeful note and a promising methodology to monitor not just where forest cover is decreasing, but also where it is, encouragingly, on the rise. The assessment found that the Mekong region has seen a net increase of trees outside forests – on croplands, shrublands, and homesteads – even as dense forest cover continues to decline. This methodology could be useful in tracking tree cover loss and gain more widely. The public and private sectors should deepen their investments in these technologies to ensure we can more accurately "see" all the dynamics of tree cover change in all regions of the world.

It is vital to increase support for research and development of techniques to monitor tree cover gain and loss at varying scales, focusing on restoration. A maxim from the business world applies here: what gets measured gets managed. Country and corporate leaders, government agencies, the private sector, and decision makers in all sectors should keep this in mind as they read and utilize this report. Never has management of forests been more crucial as the world focuses on action to cope with a changing climate.

Dr. Andrew Steer

President and CEO, World Resources Institute

Forests can make a critical contribution to the Paris Agreement goal of keeping average global warming to well below 2 degrees Celsius, both through rapidly reducing greenhouse gas emissions from deforestation, and through removing carbon dioxide from the atmosphere via natural sinks and ecological restoration. Land-use change and forestry account for 13 percent of global carbon dioxide emissions, primarily from deforestation — which is only partially offset by afforestation and forest regrowth.

At the same time, the land (mostly unmanaged forest) is a sink for around a third of anthropogenic carbon dioxide emissions. Though this natural sink has increased as a natural response to rising carbon dioxide levels, nitrogen deposition, and some climate changes such as longer growing seasons, this crucial service is at risk from the duel compounding threats of further deforestation and future climate change. Forests cover only 68 percent of their pre-industrial area. The continued loss of primary forests, at ever-increasing rates, despite their incalculable value and irreplaceability is both shocking and tragic.

There are complex reasons for forest loss. As researchers, policy makers, practitioners, businesses, and consumers, we must strive to understand the role of all human actions in this relationship. Policies to end deforestation will not be successful until they recognize the interconnectedness and importance of sustainable development goals such as food security, health, biodiversity, and climate. To be most effective, policy instruments must rely on cross-sectoral thinking and approaches, pinpoint uneven power relations that result in injustice and inequalities, and incentivize both individual responsibility and collective action. Coordination between national planning, agriculture, environment, and natural resources agencies supports sound and sustainable policy making. We must also formally acknowledge and support those communities that are already playing a vital role in sustainably managing forests and have been doing so for hundreds of years.

Preserving remaining forests and biodiversity despite the rapidly growing demand for timber, agricultural commodities, and restoration requires a clear understanding of opportunities, challenges, benefits, and trade-offs of existing land uses and of planned mitigation and adaptation actions. Global and local datasets that analyze current and potential future land uses are necessary to inform policy making. There have been great leaps forward in remotely sensed and ground-based datasets, on forest cover, and forest biomass, with forest degradation and forest management being key areas for new progress. There is increasing integration of socioeconomic data, understanding of sociopolitical drivers, local knowledge, and increasing roles for communities in environmental monitoring, but there is also the need to better understand how environmental monitoring can affect communities such as increasing their role in nature conservation, or affecting their rights.

The New York Declaration on Forests Progress Assessment brings together current research and data on all aspects of deforestation and the conservation and restoration of forests to provide a comprehensive view on the state of global forests. New — and concerning — deforestation data are put into the context of efforts to address commodity- and mining-driven deforestation. The discussion on poverty-driven deforestation and forest governance highlights the vulnerability of many forest-adjacent populations, their needs, and the lack of rights and opportunities that often drive resource depletion.

This report is based on hundreds of papers and expert contributions but communicates the findings in language accessible for a broader public. It provides an evidence base for sound policy making on climate and forest goals. Five years after the signing of the NYDF, the findings of this Assessment should guide our collective stocktake of action and reorientation if we are to move forward to the next decade of real, effective, and transformative progress on forest and landscape preservation and restoration.

Dr. Jo House

Lead Author, Intergovernmental Panel on Climate Change
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Glossary

Adaptation: in the climate context, actions taken to prepare for and adjust to the changing climate, thereby reducing harm and taking advantage of new opportunities.[1]

Afforestation: the process of establishing new forests in naturally non-forest ecosystems such as natural grasslands or other areas that have not been forested for at least 50 years.[2]

Basic-needs activities: actions taken by poor communities to sustain subsistence (e.g. to procure food, shelter, and cooking fuel) as well as smallholder commercial activities (e.g. market faming, artisanal and small-scale mining, and charcoal production) which provide subsistence-level incomes for practitioners and their families.[3]

Carbon sequestration or carbon storage: the process by which carbon from the atmosphere is absorbed by living organisms (e.g. trees, soil microorganisms, and crops) and stored in biomass and soils. Land management choices can influence (reduce, maintain, or increase) the amount of carbon stored in land systems.[4]

Community forest management: a category of systems for the management of forest lands and resources in which indigenous peoples and local communities have equal or primary decision-making power. These systems may include commercial and non-commercial activities.[5]

Deforestation: the conversion of forest to other land use or the permanent reduction of the tree canopy cover below a defined minimum canopy cover threshold.[6]

Direct drivers of forest loss: human activities that directly reduce forest cover, including the expansion of agriculture, infrastructure development, and wood extraction.[7]

Ecosystem services: benefits for humans derived from the natural functioning of Earth's biological and physical processes; includes benefits that provision (e.g. water, food, fiber, and medicine), regulate (e.g. natural heating and cooling, pest and disease control, pollination), and support (e.g. nutrient cycling, soil formation, and photosynthesis) human existence.[8]

Forest: though definitions vary by government, organization, and intended use, generally an area of land of minimum 0.5 hectares with a tree cover density of 10–30 percent, where trees have potential to reach a minimum height of 2–5 meters at maturity in place.[9]

Forest cover change or **forest loss:** the removal or clearance of trees or woody biomass from forest areas which may temporarily reduce tree cover density without necessarily leading to permanent deforestation. Activities such as forestry and shifting agriculture may lead to a temporary loss of tree cover density which is then (fully or partially) reversed through regeneration.[10]

Forest degradation: the reduction of a forest's capacity to provide the full suite of forest ecosystem services, such as biodiversity, carbon, or hydrological services. Degradation can occur through the removal of trees or woody biomass (e.g. selective logging or infrastructure construction) or through the collection of non-timber forest products (e.g. fruits, nuts, or bushmeat).[11]

Forest governance: the mechanisms, processes, and institutions through which forest lands are allocated, controlled, utilized, and protected. Good forest governance implies, among other aspects, respect for the rule of law in forest activities, transparent resource management, participatory rights in decision-making, equitable and secure land tenure, the control of corruption, and local levels of use and management.[12]

Forest landscape restoration: the long-term process of regaining ecological functionality and enhancing human well-being across forests and related ecosystems that have lost their structure, function, biodiversity or have otherwise been damaged or degraded. As a land planning and management approach, forest landscape restoration integrates six guiding principles: 1. Focus on landscapes; 2. Engage stakeholders and support participatory governance; 3. Restore multiple functions for multiple benefits; 4. Maintain and enhance natural ecosystems within landscapes; 5. Tailor to the local context using a variety of approaches; and 6. Manage adaptively for long-term resilience.[13]

Forest-risk commodities: agricultural products whose production processes drive significant deforestation, such as palm oil, pulp, cattle, soy, cocoa, and coffee.[14]

Forest-smart mining: the process of extracting metals and minerals while minimizing or avoiding adverse effects on forests.[15]

Green finance: finance that is aligned with objectives for the conservation, protection, or sustainable use of forests. This includes finance provided with a clear and stated objective of climate mitigation in the forestry sector, REDD+, conservation, and sustainable forest and land use.[16]

Grey finance: finance that has no stated objective to positively impact the forest but has the potential to have an impact on forests. Whether this impact is positive or negative depends on the policy context, as well as the design and implementation of these activities.[17]

Gross forest loss: the magnitude of annual change, counting all tree cover or forest area cleared or reduced below a defined tree cover density threshold, over a defined period of time, without regard to any regeneration or reforestation of natural forest.[18]

Indirect drivers of forest loss: underlying factors that enable forest loss; may be economic (e.g. prices for agricultural productions or land), institutional (e.g. lacking land title or corruption), or technological (e.g. lack of knowledge or monitoring capacities), as well and social and cultural.[19]

Landscape approach or **jurisdictional approach:** a method to promote sustainable development across a legally defined territory that seeks to facilitate collaboration and consensus among governments, companies, civil society organizations, and other relevant stakeholders. These include programs and initiatives to facilitate REDD+ as well as sustainable commodity supply chains.[20]

Mitigation: in the climate change context, efforts to reduce or prevent emission of greenhouse gases (e.g. from land use, energy, or transportation) or to increase the capacity of carbon sinks (e.g. through soil carbon sequestration and reforestation), intended to reduce the amount and/or rate of global temperature increase.[21]

Natural forest: both primary and secondary forests that are naturally regenerated with primarily native species.[22]

Net forest loss: the change in forest area from one reporting period to another, calculated by subtracting the area of regenerated or reforested area from the area of gross forest loss over the period.[23]

Primary forests: natural, mature forests that have not been cleared and regrown in recent history (i.e. the past 30–50 years).[24] Consisting of native species, these forests are largely free from industrial-scale land uses and infrastructure, and ecological processes have not been significantly disturbed.[25]

Protected area downgrading, downsizing, and degazettement: reducing or removing the legal protections of protected areas like national parks and nature reserves, often to facilitate industrials and/or extractive activity or infrastructure development.[26]

REDD+: refers to the incentive mechanism defined under the UN Framework Convention on Climate Change to "Reduce Emissions from Deforestation and Forest Degradation in developing countries, plus conservation, sustainable management of forests, and enhancement forest carbon stocks" in developing countries.

Reforestation: the human-driven establishment of a forest on a land area that had been previously deforested.[27]

Restoration: the process of returning degraded land to full ecological or ecosystem functionality.[28]

Secondary forest: forests that have regenerated largely through natural processes after significant removal or disturbance of original forest vegetation (primary forest) by human or natural causes.[29]

Tree cover: As defined for data from Global Forest Watch in the Goal 1 assessment, all vegetation five meters or taller with a canopy cover greater than 25 percent.[30] Tree cover indicates the biophysical presence of trees but may not meet many definitions of "forest."

Tree cover gain: the increase in vegetation five meters or taller in an area which previously had no tree cover or tree cover below a defined density threshold; may include natural forest growth or tree plantation establishment.[31]

Tree cover loss: the removal or mortality of trees within a defined area; loss may be permanent or temporary.[32]

Verified emission reductions: any credit, unit or certificate, tradable or non-tradable, which represents a quantity (typically one ton) of CO_2-equivalent emissions reduced or sequestered, which has been generated according to agreed standards of measuring, reporting, and verification; includes emission reduction credits traded on voluntary and compliance markets, and payments for performance.[33]

Zero-deforestation commitment: a type of voluntary sustainability pledge or initiative adopted by a company to signal its intention to reduce or eliminate deforestation associated with commodities that it produces, processes, or trades.[34]

Five years after the New York Declaration on Forests

In September 2014, a broad coalition of governments, companies, civil society, and indigenous peoples' organizations endorsed the New York Declaration on Forests (NYDF). Driven by the shared understanding that halting deforestation is essential to keep temperature increases below 2 degrees Celsius above pre-industrial levels, the endorsers — who now number over 200 — adopted an ambitious declaration detailing ten goals. By committing to the ten goals of the declaration, endorsers have agreed to work toward halving tropical deforestation by 2020 and ending it by 2030. The NYDF also calls for the restoration of 150 million hectares of degraded landscapes and forestlands by 2020 and 350 million hectares by 2030.

Five years later, there is little evidence that these goals are on track, and achieving the 2020 NYDF targets is likely impossible (Figure 1). Tropical deforestation has continued at an unsustainable pace since 2014. Furthermore, while the political will to restore degraded land has increased, efforts to implement restoration promises have been slow to gain traction. So far, most restoration has taken place outside of natural forest. Forestlands continue to be converted to other commercial land uses, indicating that the short-term profits of forest conversion still trump the long-term benefits of forest conservation and restoration in many land-use decisions.

Despite what these trends may suggest, many private and public actors have taken action to address deforestation — but these often lack ambition and remain isolated. For example, companies are assessing their contributions to deforestation and governments are initiating conservation and restoration programs and projects. Overall, however, actions to address the direct and indirect drivers of deforestation and incentivize and fund restoration are inadequate to catalyze a systemic shift in behavior. Rather, they are often disconnected from the broader socioeconomic situation or are not designed to deal with multiple interconnected deforestation drivers.

Figure 1.

New York Declaration on Forests 2019 Progress Assessment: Key Messages

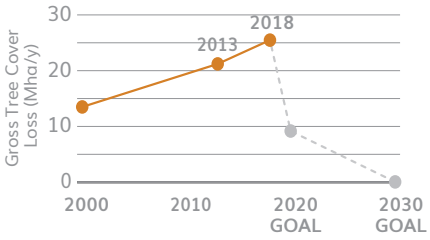
Deforestation and forest landscape restoration are closely connected, but they have largely been treated as separate conservation processes. We must preserve and restore natural forests, focusing on primary forests and developing countries.

On the current trajectory, our goals become more ambitious every year as timelines get shorter. The world is running out of time to save tropical forests.

NYDF Goal 1

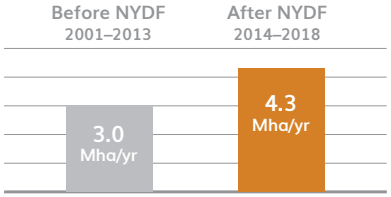
Globally, we have not made progress toward ending the loss of natural forests. Particularly concerning is the increasing rate of loss of irreplaceable primary forests.

The global rate of gross tree cover loss has increased by 43%—rather than decreased toward the goal.



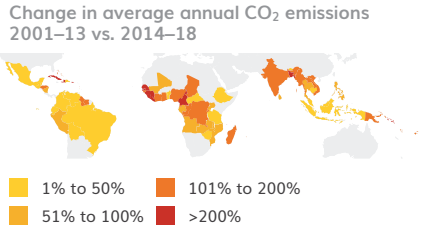
However, in 2017–18 national government and non-government actions contributed to a >30% reduction in the rate of deforestation in **Indonesia**.

Since the NYDF was endorsed, average annual humid tropical primary forest loss has accelerated by 44%.



Latin America continues to lose the most primary forests per year. **West Africa** recently experienced a sharp increase in the rate of loss.

Annual CO_2 emissions from tropical tree cover loss are equal to the total GHG emissions of the European Union.



DRC	138%
Thailand	73%
Brazil	27%
Indonesia	25%

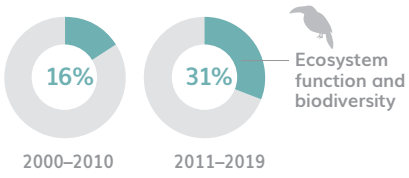
NYDF Goal 5

There is mixed progress on the implementation of forest landscape restoration. Restoring natural forests is vital for recovering ecosystem function and services. Data limitations make progress difficult to evaluate.

Large pledges indicate high political will, yet, since 2000 only 18% of the 2020 goal has been realized as increases in forest or tree cover.

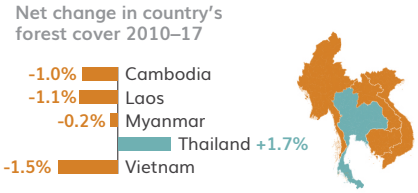
Forest landscape restoration aims to restore ecological integrity at the same time as improving human well-being through multifunctional landscapes.

Since 2011, the primary objectives for restoration have shifted more toward recovering ecosystem function and biodiversity.



Natural regeneration and ecological restoration of forests generate large benefits to ecosystem function and services. Agroforestry (outside forests) improves livelihoods and climate adaptation.

A pilot study of the Mekong region found that, despite restoration taking place, there is an overall net loss of natural forests.



Three times more restoration is happening outside forests compared to inside forests. Restoration of forests takes decades to centuries and cannot replace halting deforestation.

Serious corrective action is needed. Efforts to date have been inadequate to achieve systemic change.

The private sector is not on track to eliminate deforestation from agricultural production. Non-agricultural economic sectors continue to pose risks to forests.

Finance is needed. Grey finance for agriculture is 15 times more than green finance for forests. Forests receive 1.5 percent of the climate finance to all sectors.

Improvements in forest governance have been too slow to effectively protect forests. This includes land titling, transparency, adoption of policies, and strengthened law enforcement.

Tropical forests need to be effectively protected to meet climate targets

On average, an area of tree cover the size of the United Kingdom was lost every year between 2014 and 2018. While hotspots of increasing tree cover loss have emerged in Africa in the last five years, Latin America still loses the most tree cover every year. In June 2019 alone, deforestation rates in the Brazilian Amazon increased by 88 percent compared to the same month last year. The expansion of agricultural commodities continues to be the largest driver of deforestation. Over ninety percent of global deforestation linked to agricultural commodities and urbanization occurred in the tropics.

The accelerated loss of irreplaceable primary forests is particularly alarming given that they serve as invaluable carbon sinks. Detection of humid tropical primary forest loss increased by 44 percent relative to the baseline period of 2002–13, from 3.0 to 4.3 million hectares per year — an area twice size of El Salvador. On average, annual tropical tree cover loss between 2014 and 2018 emitted 4.7 gigatons of carbon dioxide per year — more than all of the European Union's (EU) 2017 greenhouse gases emissions. Nearly half of these emissions occurred within humid tropical primary forests.

More positively, primary forest loss in Indonesia slowed considerably in 2017 and 2018, by more than 30 percent compared to the average annual loss rate over the reference period of 2002–16. A confluence of factors, including actions taken by government, the private sector, and civil society organizations, as well as wetter weather conditions that reduced the incidence and extent of fires, resulted in a sharp reduction of forest loss in the last two years. However, with the country currently experiencing its worst fires since 2015, it is clear that these conservation efforts need to be intensified and that additional measures are needed to combat deforestation in Indonesia.

Restoration of forest ecosystems must be accelerated

Forest landscape restoration must complement efforts to halt deforestation by recovering some of the lost ecosystem functions and services of cleared forests. Among other benefits, adding trees to degraded forest landscapes can improve air and water quality and provision and reduce the risks of soil erosion and flooding. At a larger scale, restored forests can enhance biodiversity and absorb carbon from the atmosphere, though it will take a long time to replace the carbon stocks accumulated in mature natural forests over hundreds of years. Increasing tree cover in degraded non-forest landscapes like croplands and pastures through agroforestry systems can also yield ecosystem services that benefit local communities. Other approaches to increasing vegetation cover — such as afforestation and the large-scale production of feedstocks for bioenergy — require careful assessments of trade-offs and limitations. This is particularly relevant where they replace natural ecosystems with non-native monoculture plantations.

The political will to restore degraded landscapes is high, but translating forest landscape restoration commitments into action remains challenging. So far, only a fraction of the committed restoration goals has been realized as increases in forest or tree cover area. As of April 2019, there were 59 Bonn Challenge pledges from countries, jurisdictions, and companies totaling 170.6 million hectares of restoration commitments for 2020 and 2030 combined. However, evidence for restoration of forests amounts to only 18 percent of the 2020 forest landscape restoration goal (26.7 of 150 million hectares brought under restoration since 2000).

Constraints in the available data and resources to monitor restoration make it challenging to quantify progress on forest landscape restoration. A case study of the Mekong region using satellite data piloted an approach that has helped to understand important nuances in forest restoration dynamics. The results of the case study indicate that most tree cover

gain in the area since 2010 has taken place outside of forests (e.g. on croplands, shrublands, and other non-forest lands) rather than inside forests (gaining 4.7 million hectares outside of forests while losing a net of -0.3 million hectares inside forests). Trees outside forests provide important socioeconomic and livelihoods benefits, yet more measures need to be taken to protect and restore natural forest ecosystems to enhance their essential biodiversity and carbon sequestration functions.

Drivers of deforestation: Larger scale and more coordinated action is needed

Efforts to address the drivers of deforestation are making incremental progress. A number of governments have adopted strategies to conserve forests and reduce deforestation and forest degradation. Governments have also formulated Nationally Determined Contributions to the Paris Agreement that include land-based mitigation and adaptation actions, and have made some progress in strengthening forest governance. Many private companies have made commitments to eliminate deforestation embedded in their supply chains, and financial institutions have started to screen investments for negative forest impacts. Civil society supports supply-chain transparency while working with communities on the ground to implement projects and programs to halt deforestation and restore forests. However, current actions are not enough to meet NYDF targets because implementation is slow and action remains limited in geographical scope and not fully integrated throughout supply chains and across sectors.

Increases in the number of companies with commitments to reduce or eliminate deforestation from their supply chains have stalled in the last three years. Of the companies with existing commitments, only eight percent have a zero-deforestation commitment that covers all of their supply chains and operations. Companies have been slow to implement commitments due to lack of agreement on priority actions, limited understanding of where risks are, and hesitation to invest in sustainable activities where the financial returns are unclear. Furthermore, company reporting on actions taken and progress made toward achieving these commitments remains inadequate to assess the efficacy of supply chain-based zero-deforestation approaches.

There is evidence that sector-wide approaches lead to a reduction in deforestation. The Soy Moratorium in the Brazilian Amazon and the Peatland Moratorium in Indonesia have worked in their targeted regions, even though there is indication that the Soy Moratorium has led to some displacement of deforestation. Growing momentum around collaborative actions at the sub-national level in many producer countries points to a new path forward, but implementation of these jurisdictional approaches is still in the early stages and their impact on deforestation from agriculture is yet to be seen at scale. Nevertheless, efforts by both producer and consumer governments to facilitate the implementation of private-sector commitments remain limited and mostly in the form of high-level policies and pledges.

Global demand for mined materials and oil and gas is expected to significantly grow in the coming decades, increasing the risk of forest loss from extractive activities. Currently intact forest areas in the Amazon, the Congo Basin, and Southeast Asia are expected to incur increasing rates of deforestation and fragmentation due to planned infrastructure and new mining and oil and gas projects. Even more concerning is the trend in many countries of reversing the status of protected areas to open up new areas to development. At the same time, community-led movements against destructive mining operations are gaining international recognition and winning some legal victories, and high-level support for mainstreaming forest and biodiversity protection across economic sectors has grown. However, this progress has yet to be translated into real transformational changes in these sectors' approach to forests.

Poverty can also drive forest loss. A lack of livelihood alternatives and increased population pressures often trigger unsustainable forest use to meet basic needs. For example, shifting agriculture shapes over a quarter of all forested land in the Democratic Republic of the Congo and accounts for 70 percent of total tree cover loss in that country. While rotational agricultural systems allow secondary forests to regrow and soils to regain fertility, population increases put shifting agriculture systems under growing strain. Farmers face pressures to shorten shifting cultivation cycles, leading to declining productivity and eventual expansion of cropland through primary forest clearance. Similarly, in the absence of alternatives, the clearing of trees to produce charcoal and cash crops remains one of the few opportunities for the rural poor to earn cash, fueled by the demand from growing cities. Satellite data of the Congo Basin show that the rate of disturbance in primary forests and woodlands, which doubled between 2001 and 2014, correlates with the increase in population (including from migration) over that time.

Most programs addressing poverty and human development do not track forest impacts, making it difficult to determine how much support is specifically addressing forest loss. However, increased understanding of the link between poverty and resource degradation can help to improve the efficacy of interventions like the formalization of small-scale commercial activities and the adoption of clean cookstoves.

Improving implementation conditions is essential to achieving forest goals

Achieving international and national forest goals is not possible without dedicated and reliable financing from domestic, international, public, and private sources to address each of the above drivers of forest loss. This implies a need for new finance streams, but, even more importantly, a redirecting of mainstream finance toward activities that have positive conservation outcomes ('green' finance). Today, green finance comprises a fraction of the grey finance flowing into countries with high levels of deforestation; development finance for agriculture amounts to 15 times more than climate mitigation finance with a forestry objective. In addition, companies and governments continue to provide subsidies and support to activities that potentially harm forests. Even where there is interest, financial institutions and lenders largely lack the safeguards necessary to ensure that investments and finance are not supporting deforestation.

In addition to a shift in finance, more new finance is needed. The current amount of green finance for forests captured by this report is under USD 22 billion. Since our in-depth assessment of the NYDF finance goals in 2017, overall finance for forests has increased by a minor amount (9 percent). Support to address deforestation and protect forests in tropical countries comprise less than 1.5 percent — only USD 3.2 billion — of the USD 256 billion committed by multilateral institutions and developed country donors since 2010 to climate change mitigation. The renewables sector alone has received over 100 times more commitments of finance than forests.

Demand-side measures play an important role in addressing drivers of deforestation. International pledges such as the Amsterdam Declaration have been made to eliminate deforestation from commodity supply chains. However, only the timber sector has seen concrete actions and regulatory measures adopted (e.g. European Union Timber Regulation, the Lacey Act in the United States). A recent European Communication on "Stepping up EU Action against Deforestation and Forest Degradation" signals that the EU is considering a set of regulatory and non-regulatory measures that reduce the import of embedded deforestation into the Union and that strengthen international cooperation in support of forest conservation and restoration. The EU is also contemplating measures that re-direct finance to support more sustainable land-use practices.

Together with finance, good governance provides the foundation for policies to be developed, laws to be enforced, and the conditions for investment and implementation to improve. Improvements in forest governance, including land titling, transparency, adoption of policies, and strengthening of enforcement, remain too slow relative to the accelerating threats faced by forests. New and existing policies and tools, such as sectoral agreements and certification schemes, can be used to minimize the impact of commercial activities on forest. However, their effectiveness is subject to the conditions around their implementation. This includes strong governance, good policy design, and reconciling conflicting interests in regulating agencies. Trends in Brazil demonstrate the fragility of forest policies in light of changing political priorities. After a change of government in 2019, deforestation in Brazil has increased due to reversals of existing legal and institutional forest protection policies and frameworks.

Effective conservation of forest ecosystems includes recognizing the contribution of indigenous peoples and local communities to forest conservation. When communities have full land rights to govern forest territories, these forests and the carbon they store are better protected over time. Despite this, indigenous peoples and local communities are still struggling to achieve full recognition and protection of land rights. About half of the world's land is subject to long-standing customary claims by indigenous peoples and local communities who have used, owned, and occupied it for generations.

Looking to the future: The path to 2030

To achieve the goals of the NYDF and keep global warming below 2 degrees Celsius, it is essential to preserve natural, and in particular primary, forests, as well as to restore natural forests, with a particular focus on restoration and protection efforts in tropical countries. Restoring forests, however, cannot offset deforestation because lost habitat and ecosystem services may take decades to centuries to recover. It is therefore vital that restoration be used as additional measure, and not as an "alternative" to stopping forest loss.

In parallel, direct and indirect drivers of deforestation from the production of food, fuel, and fiber must be reduced to remove undue pressures on land while also feeding growing populations. This requires more productive systems among smallholders and basic-needs populations, improved land management and practices across sectors, and, to a larger extent, a move to sustainable, plant-based diets among the wealthy, and a reduction in overall food waste and losses.

Policies motivated by other priorities, such as food security, public health, or rural development, should incorporate conservation into their program priorities. Public policies that combine a bundle of several goals tend to be stronger than those motivated by a single issue because they get more and broader financial support and buy-in. Examples of aligned goals include sustainable investments in agricultural productivity, land rights, public health, regional investments in infrastructure and institutions, market access, biodiversity, and ecosystem services. Furthermore, to be effective, policies must be implemented and enforced and progress needs to be measured and monitored to hold stakeholders to account.

Assessing progress toward the NYDF

Transparent monitoring of forest goals

The New York Declaration on Forests (NYDF) is a voluntary and non-binding international declaration calling for action to halt global forest loss. It was first endorsed at the United Nations Climate Summit in September 2014 and as of August 2019 the NYDF supporters have grown to include over 200 endorsers: 41 national governments, 21 subnational governments, 60 multinational companies, 22 groups representing indigenous communities, and 65 non-government organizations. These endorsers have committed to doing their part to achieve the NYDF's ten goals (**Box 1**) and follow its accompanying action agenda.

The NYDF commits its endorsers to ambitious targets to end natural forest loss by 2030, with a 50 percent reduction by 2020 as a milestone toward its achievement. In addition, the declaration reiterates the Bonn Challenge's goal of restoring 350 million hectares (Mha) of degraded and deforested lands by 2030,[35] supporting the private sector in eliminating deforestation from the supply chains of major agricultural commodities by 2020, and providing financial support to reduce emissions related to deforestation and forest degradation. According to the calculations backing the NYDF, achieving the goals could reduce global greenhouse gas (GHG) emissions by 4.5 to 8.8 gigatons (Gt) every year — equivalent to the United States' annual emissions.[36]

When it was first endorsed, the NYDF lacked any institutional backing and follow-up. To mitigate this oversight, in 2015 the NYDF Assessment Partners were formed as an independent civil-society initiative to monitor progress toward the NYDF's global goals. What started as a coalition of six organizations has grown into a strong and diverse group of 25 members, with an even higher number of external collaborators. In 2017, the NYDF Global Platform was launched to serve as secretariat of the NYDF, increase ambition, forge new partnerships, and accelerate progress on the NYDF goals.

Voluntary declarations such as the NYDF are based on the premise that strong overall targets will lead endorsers and partners to step forward and formulate concrete implementation actions and plans. The NYDF Progress Assessments monitor whether this is indeed happening and how effective actions are in achieving the NYDF goals. Because many of the goals include targets to be achieved by 2020, next year will serve as a logical, and necessary, point to review and revitalize the NYDF goals. The information that NYDF Assessment Partners collect and publish every year aims to support this process in the hope that the 2030 forests goals can be met through a coordinated and collaborative effort of governments, corporations, and civil society.

Assessment approach

The NYDF's goals include two with objectives to maintain and increase forest cover (**Goals 1 and 5**); three targeting specific drivers of deforestation — commodity agriculture (**Goal 2**), other economic sectors like mining and infrastructure development (**Goal 3**), and activities to meet basic needs (**Goal 4**); and a series of goals that seeks to build the conditions needed for forest protection and enhancement: setting an ambitious international forest agenda (**Goals 6 and 7**), ensuring adequate finance to implement forest emission

reduction strategies (**Goal 8**), rewarding successful emission reductions (**Goal 9**), and strengthening forest governance while empowering forest communities (**Goal 10**).

For the purposes of assessing the 2014 NYDF, we consider Goals 6 and 7 to have been met. The Sustainable Development Goals (SDGs) include forests, with targets consistent with the NYDF's aim to halt deforestation. Similarly, in 2015, the Paris Agreement included an article dedicated to land use and forests. These developments indicate there is the support and political will at the highest international levels to advance the NYDF. Operationalization and implementation of the SDGs and Paris Agreement are still underway and include limitations. Assessing the limitations of Nationally Determined Contributions (NDCs) and SDGs is important but goes beyond the scope of this report. It is possible that future reports may fill that analytical gap.

The NYDF Progress Assessment is an iterative and collective process. Partners and collaborators participate in working groups for individual goals or topics. These working groups develop and revise goal-specific assessment frameworks. They also coordinate data generation and analysis and discuss findings. Where possible, new research is commissioned to close essential data gaps. In addition, the assessment findings benefit from the peer review of dozens of experts from all over the world.

Finally, while the NYDF has a set of endorsers, the NYDF Progress Assessment does not focus on evaluating the individual or collective progress of NYDF endorsers. Instead it evaluates the global status of forests and overall efforts to meet the NYDF goals. Since its adoption, the NYDF has become a reference point for the status of forests in general, and tropical forests in particular. It has also come to represent a broadly accepted international framework of forest goals. As such, our progress assessment takes a global view and highlights specific regions or activities through case studies and examples.

Structure of the report

The 2019 report, *Protecting and Restoring Forests: A Story of Large Commitments yet Limited Progress*, features our most detailed assessment to date of progress toward the flagship goals to halt deforestation (**Goal 1**) and restore degraded landscapes and forestlands (**Goal 5**). Moreover, it presents findings from all ten goals to identify the dynamics that help and hinder the achievement of the NYDF, providing a comprehensive picture of the state of global forests. **The full technical summaries of the assessments of each goal, which inform the findings of this report, are available on the Assessment Partners' website (www.forestdeclaration.org).**

Essential forest terms and concepts are defined in **Chapter 2**. The remainder of the report presents the synthesized findings from our 2019 NYDF Progress Assessment: **Chapter 3** provides an update on the biophysical aspects of the NYDF — deforestation and restoration. **Chapter 4** describes our assessment of the direct drivers of deforestation and efforts to address them. **Chapter 5** delves into the indirect conditions underlying the NYDF — finance and governance, followed by a conclusion.

This report also features six case studies (Brazil, China, the Democratic Republic of the Congo and the Congo Basin, El Salvador, Indonesia, and Malawi) that analyze the socioeconomic and political factors that may have contributed to positive or negative deforestation and restoration trends.

Box 1. The ten goals of the NYDF

Goal 1
At least halve the rate of loss of natural forests globally by 2020 and strive to end natural forest loss by 2030.

Goal 2
Support and help meet the private-sector goal of eliminating deforestation from the production of agricultural commodities such as palm oil, soy, paper, and beef products by no later than 2020, recognizing that many companies have even more ambitious targets.

Goal 3
Significantly reduce deforestation derived from other economic sectors by 2020.

Goal 4
Support alternatives to deforestation driven by basic needs (such as subsistence farming and reliance on woodfuel for energy) in ways that alleviate poverty and promote sustainable and equitable development.

Goal 5
Restore 150 million hectares of degraded landscapes and forestlands by 2020 and significantly increase the rate of global restoration thereafter, which would restore at least an additional 200 million hectares by 2030.

Goal 6
Include ambitious, quantitative forest conservation and restoration targets for 2030 in the post-2015 global development framework, as part of new international sustainable development goals.

Goal 7
Agree in 2015 to reduce emissions from deforestation and forest degradation as part of a post-2020 global climate agreement, in accordance with internationally agreed rules and consistent with the goal of not exceeding 2 degrees Celsius warming.

Goal 8
Provide support for the development and implementation of strategies to reduce forest emissions.

Goal 9
Reward countries and jurisdictions that, by taking action, reduce forest emissions – particularly through public policies to scale-up payments for verified emission reductions and private-sector sourcing of commodities.

Goal 10
Strengthen forest governance, transparency, and the rule of law, while also empowering communities and recognizing the rights of indigenous peoples, especially those pertaining to their lands and resources.

Understanding forests: Terms and concepts

Types of forest cover change

Deforestation generally refers to the longer term — often permanent — conversion of **forest** to other land use, such as agriculture, roads, or settlements. Human action or natural events can remove trees from a landscape and not all forest clearing necessarily leads to deforestation. **Forest loss** associated with forestry, fires, and shifting agriculture is often temporary and forests regenerate after disturbance. This means that **forest cover change** can but does not have to lead to deforestation. Regardless of the type of forest loss and subsequent land use change, **ecosystem services** are always negatively impacted and may take decades to centuries to recover. **Primary forests** can be cleared and in a short amount of time be converted into short-rotation timber plantations. While fast-growing trees can be established within 10 or 20 years, the loss of biodiversity, a significant part of the **carbon storage** and the hydrological functions of the land may be lost for good. The same plot of land that was deforested could also be abandoned and followed by natural regeneration which, over a much longer time period (20–200 years[37]), may help to restore most of the original forest's ecological structure and function.

When accounting for deforestation, it is also important to differentiate between **gross** and **net deforestation** (or **forest loss**). Gross deforestation refers to the total amount of forests lost, while net deforestation describes the total amount of forest loss minus the amount of forest gain. Net deforestation counts forests regrown or restored against the deforestation that took place over the monitoring period. In the context of forests, is important to emphasize gross numbers because regrowth often has lower ecological functionality and cannot compensate for avoiding deforestation in the first place. Because primary forests cannot be restored within a human timeframe, the net loss of primary forests is the same as gross loss of primary forests.

Forests can also suffer damage from **forest degradation**. Forest degradation is the loss of canopy cover that is insufficient to be classified as deforestation (e.g. selective logging), and results in losses of biodiversity and other ecosystem services as well as significant greenhouse gas emissions.[38] Annual emissions from tropical forest degradation have recently been estimated to account for approximately a quarter of forest-related emissions (2.1 Gt CO_2e/yr).[39] Across Africa, Latin America, and Asia they contribute 70, 81, and 46 percent of all carbon losses, respectively.[40] Degradation can take place gradually over years, at finer scales, and through the chance of recovery, biomass gains can partially or wholly offset biomass losses.[41] Studies of deforestation rarely include land degradation and most studies on degradation focus on regional scales.

In contrast to forest loss, a gain in forest cover can be achieved through **restoration**. Restoration has various interpretations due to the different types of degradation that it seeks to remedy, the actions involved, and the different objectives of the land managers promoting restoration. In 2000, a group of experts established the term **forest landscape restoration** (FLR) to incorporate multiple objectives in landscape mosaics that include regaining ecological integrity and enhancing human well-being.[42] In contrast to site-based ecological restoration, where the focus is to recover forests back to their reference condition or the practice of **reforestation** or **afforestation** to create productive forests, the FLR approach encompasses a range of activities

that balance environmental and socioeconomic needs. While the process and intent of FLR is well-defined, there is no universal set of defined FLR activities.[43]

Box 2 summarizes the definitions of forest-related terms as used in this report. A full list of key terms (in **bold** on first appearance in the text) can be found in the **Glossary**.

Box 2. Forest terms used to assess progress on the NYDF

Afforestation: the process of establishing new forests in naturally non-forest ecosystems such as natural grasslands, or areas that have not been forested for at least 50 years.[44]

Deforestation: the conversion of forest to other land use or the permanent reduction of the tree canopy cover below a defined minimum canopy cover threshold.[45]

Forest: though definitions vary by government, organization, and intended use, generally an area of land of minimum 0.5 hectares with a tree cover density of 10–30 percent, where trees have potential to reach a minimum height of 2–5 meters at maturity in place.[46]

Forest degradation: the reduction of a forest's capacity to provide the full suite of forest ecosystem services, such as biodiversity, carbon, or hydrological services.[47]

Forest landscape restoration: the long-term process of regaining ecological functionality and enhancing human well-being across forests and related ecosystems that have lost their structure, function, biodiversity or have otherwise been damaged or degraded.[48]

Gross forest loss: the magnitude of annual change, counting all tree cover or forest area cleared or reduced below a defined tree cover density threshold, over a defined period of time, without regard to any regeneration or reforestation of natural forest[49]

Natural forest: both primary and secondary forests that are naturally regenerated with primarily native species.[50]

Net forest loss: the change in forest area from one reporting period to another, calculated by subtracting the area of regenerated or reforested area from the area of gross forest loss over the period.[51]

Primary forest: natural, mature forests that have not been cleared and regrown in recent history (i.e. the past 30–50 years).[52] Consisting of native species, these forests are largely free from industrial-scale land uses and infrastructure, and ecological processes have not been significantly disturbed.[53]

Reforestation: the human-driven establishment of a forest on a land area that had been previously deforested.[54]

Secondary forest: forests that have regenerated largely through natural processes after significant removal or disturbance of original forest vegetation (primary forest) by human or natural causes.[55]

Tree cover: all vegetation five meters or taller with a default canopy density threshold of 25 percent.[56] Tree cover indicates the biophysical presence of trees but may not meet many definitions of "forest."

Tree cover gain: the increase in vegetation five meters or taller in an area which previously had no tree cover or tree cover below a defined density threshold; may include natural forest growth or tree plantation establishment.[57]

Tree cover loss: the removal or mortality of trees within a defined area; loss may be permanent or temporary.[58]

Halting deforestation and restoring natural forests

There is a need for goal congruence between avoiding deforestation and restoration

Halting deforestation is the NYDF's overarching goal. It is imperative to reduce carbon dioxide emissions, preserve the biodiversity of tropical forests, and prevent deforestation-driven changes to water availability and climate variability that could have strong local implications for agriculture and food security.[59] However, avoiding deforestation is not enough to meet the Paris Agreement's temperature goals. All pathways of the Intergovernmental Panel on Climate Change (IPCC) that would limit global warming to 1.5 to 2 degrees Celsius depend on the removal of 100 to 1000 gigatons of carbon dioxide over the 21st century.[60] Restoration of forests is the only tested, large-scale CO_2-removing ("negative emissions") technology and is an important complement to efforts to protect forests and reduce fossil fuel emissions. Furthermore, ecological restoration of landscapes has multiple benefits, including climate change adaptation and mitigation, biodiversity, soil fertility, micro-climate, and improved hydrology.[61]

In fact, climate and forest policies require the preservation of natural and, in particular, primary forests, *as well as* the restoration of **natural forests** with a focus on restoration and protection efforts in developing countries.[62] Restoring forests does not offset deforestation, particularly of primary forests, because it takes decades to centuries to recover lost ecosystem function and services. As the recent IPCC Special Report on Land stresses, direct response options to mitigate climate change include the conservation of high-carbon ecosystems such as peatlands, wetlands, rangelands, mangroves, and forests. Restoration of forests also provides multiple ecosystem functions but takes more time to deliver results. This means that restoration is additional to avoiding deforestation and necessary to rebuild forest ecosystems (e.g. natural regeneration), strengthen landscapes' climate resilience (e.g. agroforestry systems), or to provide timber to substitute for high-emissions building and construction materials (e.g. plantations). Avoiding deforestation and reducing the demand for land (e.g. through reducing food waste and meat consumption) have many co-benefits and can be applied without increasing the competition for land.[63] However, if we fail to quickly and effectively reduce carbon emissions, increasingly problematic, larger-scale landscape efforts, including afforestation and bioenergy with carbon capture and storage, may be necessary to meet the Paris Agreement's temperature goals. Large-scale plantations at the level of removing several gigatons carbon dioxide (CO_2) per year from the atmosphere would also greatly increase the competition for land.[64]

While deforestation and forest landscape restoration are closely connected, they have largely been treated as separate processes. On international policy agendas, for instance, they are typically addressed and monitored using different approaches. **REDD+** focuses on combatting forest loss,[a] while the Bonn Challenge and related programs (e.g. Initiative 20x20 and the African Forest Landscape Initiative) seek to encourage restoration. The consequence is often a lack of coherence in planning and implementing REDD+ and restoration activities. Overcoming siloed efforts to protect and restore forests requires the coordination of

a. REDD+ stands for "reduced emissions from deforestation, forest degradation, the role of conservation, sustainable forest management and enhancement of forest carbon stocks in developing countries". As such it includes efforts to enhance forest carbon stocks and could also — depending on the choice of carbon pools and reference scenario of a country — include forest restoration.

government agencies as well as donor countries. Preserving primary forests, sustainably managing production forests, and restoring forests on degraded landscapes are essential building blocks of a comprehensive forest strategy. Only with an integrated and coordinated forest strategy can primary forests be effectively protected and overall forest coverage be sustained and increased.

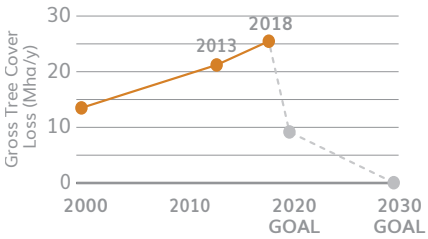
This chapter summarizes the findings of our progress assessment toward the NYDF goals on forest cover (**Figure 2**) — halting deforestation (**Goal 1**) and restoring degraded landscapes and forestlands (**Goal 5**). We focus on quantifying progress toward these goals to the extent possible, while recognizing the limitations of current approaches.

Figure 2.

Key Messages: Halting deforestation and accelerating restoration

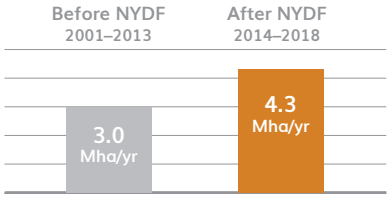
NYDF Goal 1 — Globally, we have not made progress toward ending the loss of natural forests. Particularly concerning is the increasing rate of loss of irreplaceable primary forests.

The global rate of gross tree cover loss has increased by 43%—rather than decreased toward the goal.



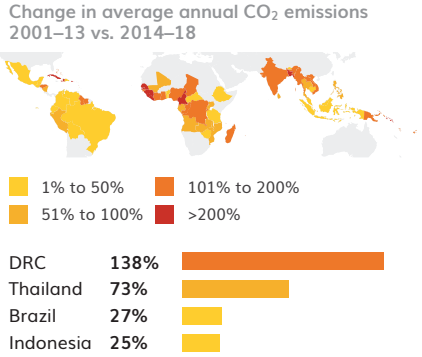
However, in 2017–18 national government and non-government actions contributed to a >30% reduction in the rate of deforestation in **Indonesia**.

Since the NYDF was endorsed, average annual humid tropical primary forest loss has accelerated by 44%.



Latin America continues to lose the most primary forests per year. **West Africa** recently experienced a sharp increase in the rate of loss.

Annual CO_2 emissions from tropical tree cover loss are equal to the total GHG emissions of the European Union.

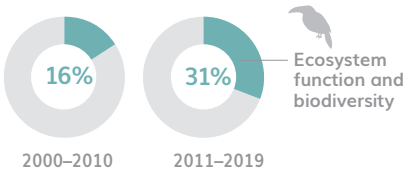


NYDF Goal 5 — There is mixed progress on the implementation of forest landscape restoration. Restoring natural forests is vital for recovering ecosystem function and services. Data limitations make progress difficult to evaluate.

Large pledges indicate high political will, yet, since 2000 only 18% of the 2020 goal has been realized as increases in forest or tree cover.

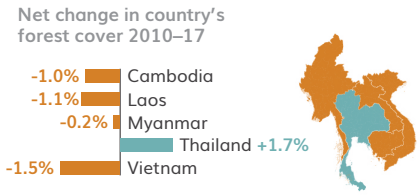
Forest landscape restoration aims to restore ecological integrity at the same time as improving human well-being through multifunctional landscapes.

Since 2011, the primary objectives for restoration have shifted more toward recovering ecosystem function and biodiversity.



Natural regeneration and ecological restoration of forests generate large benefits to ecosystem function and services. Agroforestry (outside forests) improves livelihoods and climate adaptation.

A pilot study of the Mekong region found that, despite restoration taking place, there is an overall net loss of natural forests.



Three times more restoration is happening outside forests compared to inside forests. Restoration of forests takes decades to centuries and cannot replace halting deforestation.

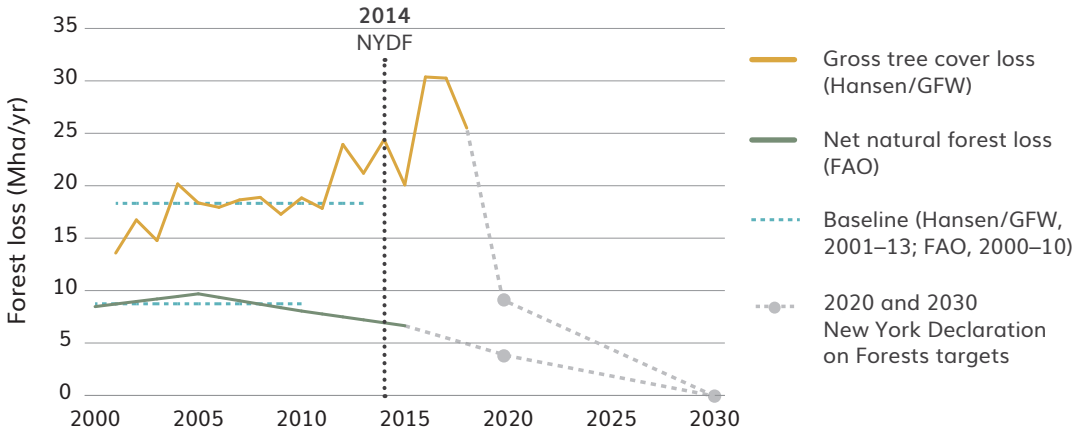
GOAL 1

Halting the loss of natural forests

At least halve the rate of loss of natural forests globally by 2020 and strive to end natural forest loss by 2030.

Instead of slowing down, tropical deforestation has continued at an unsustainable pace since the adoption of the NYDF. Since 2014, the world has lost an area of tree cover the size of the United Kingdom every year. Particularly concerning is the loss of tropical primary forests, where average loss was 44 percent higher since 2014 (4.3 million hectares per year) than during the baseline period of 2002–13 (3.0 million hectares per year).[b] While hotspots of rapidly increasing tree cover loss have shifted to Africa over the last five years, Latin America still loses the most tree cover every year. These trends mean that achieving Goal 1 grows further from reality with each passing year, and corrective action is needed to reverse trends and get on course.

Figure 3. Gross and net forest loss relative to 2020 and 2030 targets, in million hectares



Note: For the Hansen/Global Forest Watch (GFW) estimates, tree cover loss was calculated using a >25 percent tree cover density threshold. Improvements to the methodology for detecting tree cover loss starting in 2011 may result in higher estimates of loss in 2011–18 compared to 2001–10. For the Food and Agriculture Organization (FAO), the line represents a crown cover threshold of 10 percent. Hansen/GFW data is reported every year, while FAO data is reported every five years.

Source: Hansen, M. C., Potapov, P. V., Moore, R., Hancher, M., Turubanova, S. A., Tyukavina, A. et al. (2013). Tree Cover Loss (Hansen/UMD/Google/USGS/NASA). Global Forest Watch database. http://data.globalforestwatch.org/datasets/; Food and Agriculture Organization of the United Nations. (2016). Global forest resources assessment 2015. Rome: FAO. http://www.fao.org/forest-resources-assessment/past-assessments/fra-2015/en/

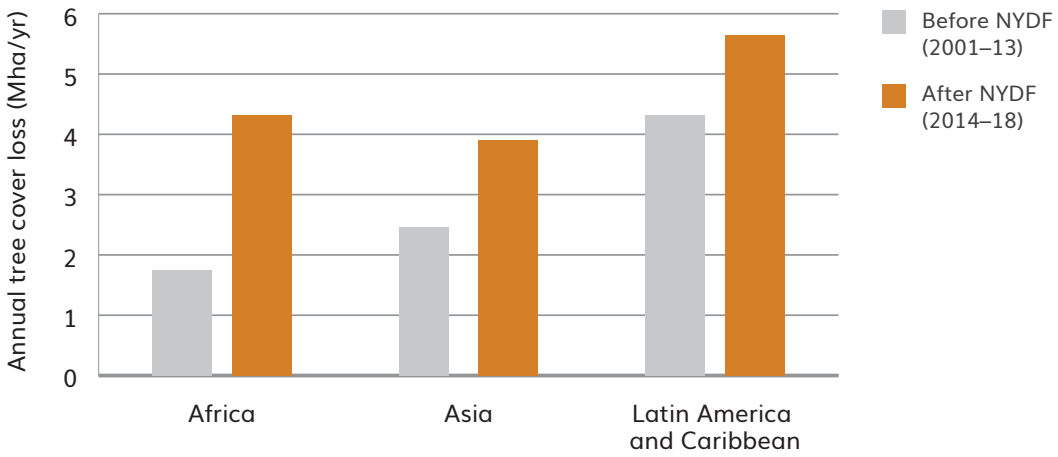
b. All statistics are for forests with tree cover density >25 percent. The Hansen et al. (2013) dataset uses satellite imagery at a 30-meter pixel resolution and measures areas with tree cover as a proxy for forest area, defined as all vegetation 5 meters or taller with a default canopy cover threshold of 25 percent. Global Forest Watch illustrates the Hansen et al. 2013 dataset, with updated data through 2018. A change in the methodology and the inclusion of new satellite data in 2011 and 2013, respectively, may result in higher estimates for tree cover loss in 2011–18 compared to 2001–10. This may impact the magnitude of the detected in tree cover loss. For more about the methodology change see Potapov et al., 2015 at https://blog.globalforestwatch.org/data-and-research/a-fresh-look-at-forests-2011-2013

Tropical tree cover loss at all-time high since the NYDF

Since the NYDF was endorsed in 2014, the global average rate of gross **tree cover loss** (the yellow line in **Figure 3**) remains notably higher than in the baseline period of 2001–13, increasing from an average loss of 18.3 to 26.1 million hectares per year (Mha/yr).

Tropical forests are at the forefront of recent global deforestation, accounting for 91 percent of deforestation due to expansion of agricultural commodities and urbanization between 2001 and 2015.[c; 65] These forests are highly biodiverse and represent some of the richest carbon stocks in the world. In the past five years, the most significant changes in the rate of tree cover loss have occurred in tropical regions of Africa (+146 percent), followed by tropical Asia (+59 percent), and tropical Latin America and the Caribbean (+31 percent) (**Figure 4**).[d]

Figure 4. Average annual tropical tree cover loss by region, in million hectares



Note: Comparison of tropical tree cover loss by region before (2001–13) and after (2014–18) the signing of the New York Declaration on Forests (NYDF). Tree cover loss calculated using a >25 percent tree cover density threshold. Improvements to the methodology for detecting tree cover loss starting in 2011 may result in higher estimates of loss in 2011–18 compared to 2001–10.

Source: World Resources Institute analysis based on 2018 data from Global Forest Watch.

If we consider net natural forest change (when regrowth of natural forests is counted as offsetting clearing) instead of gross tree cover loss, the picture looks a bit brighter. Annual net forest loss is decreasing after peaking at 9.7 million hectares in 2005 (the green line in **Figure 3**).[66] However, forest regrowth is not a direct replacement for the loss of natural forests. Since it takes decades or centuries until restored forests show the same ecosystem functions as cleared natural forests, restoration cannot offset deforestation.

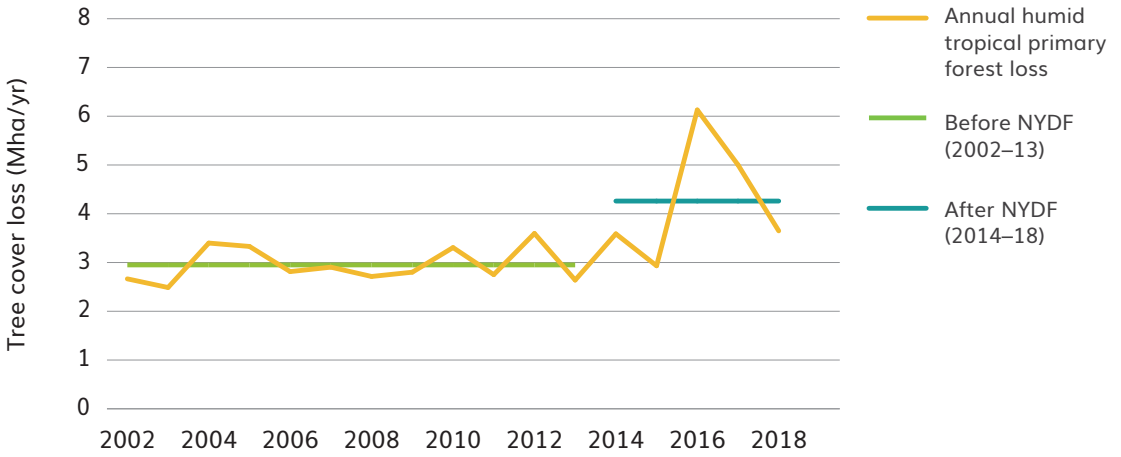
c. These values are calculated from Curtis et al. 2018, using the NYDF assignment of tropical and non-tropical countries. The percent of deforestation that occurred in the tropics increases to 94 percent if the shifting agriculture driver is included.

d. Much of the increase in tree cover loss detected in Central Africa, specifically, may be linked to the improvement of the tree cover loss methodology to include Landsat 8, which is better at detecting small-scale tree cover loss dynamics like those prevalent in Central Africa.

Loss in tropical primary forests is particularly concerning

The inability for restored forests to show the same ecosystem function as natural forests is particularly true for primary — or undisturbed — forests that store large amounts of carbon and provide a complex set of ecosystem services.[67] Looking at tree cover loss in primary forests provides a minimum estimate for how much irreplaceable forest is lost each year and in what regions. After the launch of the NYDF in 2014, instead of being reduced, primary forest loss spiked: the average annual rate of humid tropical primary forest loss increased by 44 percent relative to a baseline period of 2002–13, from 3.0 to 4.3 million hectares per year — an area twice the size of El Salvador (**Figure 5**).[e]

Figure 5. Average annual loss in humid tropical primary forests, in million hectares



Note: Comparison of tree cover loss in humid tropical primary forests before (2002-13) and after (2014-18) the endorsement of the New York Declaration on Forests (NYDF). Tree cover loss calculated using a >25% tree cover density threshold. Improvements to the methodology for detecting tree cover loss starting in 2011 may result in higher estimates of loss in 2011–18 compared to 2001–10.

Source: For tree cover loss, Hansen, M. C., Potapov, P. V., Moore, R., Hancher, M., Turubanova, S. A., Tyukavina, A. et al. (2013). Tree Cover Loss (Hansen/UMD/Google/USGS/NASA). Global Forest Watch database. http://data.globalforestwatch.org/datasets/; For primary forest loss, Turubanova, S., Potapov, P. V., Tyukavina, A., & Hansen, M. C. (2018). Ongoing primary forest loss in Brazil, Democratic Republic of the Congo, and Indonesia. Environmental Research Letters, 13(7), 074028.

The largest relative increase in the rate of primary forest loss was concentrated in Africa (+146 percent, 0.45 Mha/yr increase) compared to Latin America (+35 percent, 0.61 Mha/yr increase) and Asia (+30 percent, 0.26 Mha/yr increase). Six of the ten tropical countries (Cameroon, Ghana, Equatorial Guinea, Liberia, Nigeria, and Sierra Leone) with the highest percent increase in primary forest loss over the baseline period of 2002–13 were in West Africa, highlighting the mounting pressures on primary and natural West African forests.[f]

Despite significant investments into REDD+ readiness, average loss of primary forest in the Democratic Republic of the Congo more than doubled in the last five years (see **Congo Basin**

e. A change in the methodology and the inclusion of new satellite data in 2011 and 2013, respectively, may result in higher estimates for tree cover loss in 2011–18 compared to 2001–10. This may impact the magnitude of the detected increase in tree cover loss. For more about the methodology change see Potapov et al., 2015 at https://blog.globalforestwatch.org/data-and-research/a-fresh-look-at-forests-2011-2013.

f. Among countries with an average of more than 1000 ha/yr forest lost between 2001 and 2013.

case study on **page 63**). Other countries that lost significant areas of primary forests in the past five years include Madagascar in Africa; Brazil, Bolivia, Colombia, and Peru in Latin America; and Indonesia, Malaysia, Cambodia, and Papua New Guinea in Southeast Asia and Oceania.[g; 68]

In Indonesia, there is some good news. While average primary forest loss since 2014 remains above the historical average (2002–13), loss in 2018 dropped to its lowest rate since 2003, continuing a decline that started in 2017. A combination of political action (a ban on the conversion of peatlands), favorable weather conditions (more rain), and supply-chain interventions show that it is rarely one factor or set of actions that can slow and eventually halt deforestation (see **Indonesia case study** on **page 53)**.

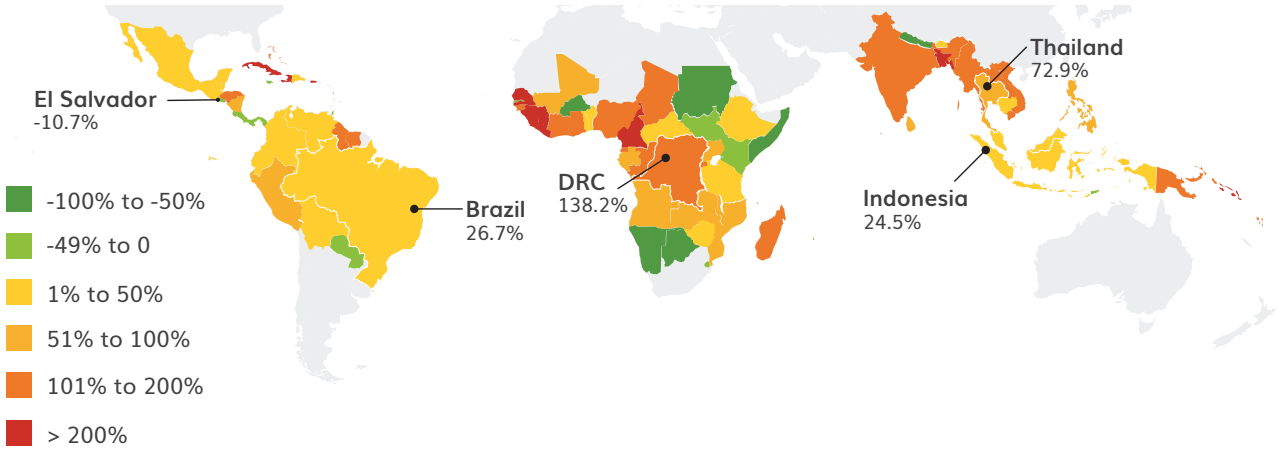
Carbon emissions from tropical tree cover loss are equal to GHG emissions of the EU

In 2018, gross annual carbon dioxide emissions from tropical tree cover loss (4.2 Gt CO_2) were significantly lower than the peak observed in 2016 (6.1 Gt CO_2).[h] However, average emissions are still 57 percent higher since the NYDF was endorsed, increasing from an average of 3.0 to 4.7 gigatons of CO_2 per year. Average annual emissions from tropical tree cover loss since 2014 are now more than the entire European Union's greenhouse gas emissions across all sectors (e.g. energy, cars, and industry).[69] Almost half of these emissions (43 percent, or 2.1 Gt CO_2/yr) occurred within primary forests, and the highest relative increases in primary forest emissions were concentrated in West and Southeast Africa (**Figure 6**).

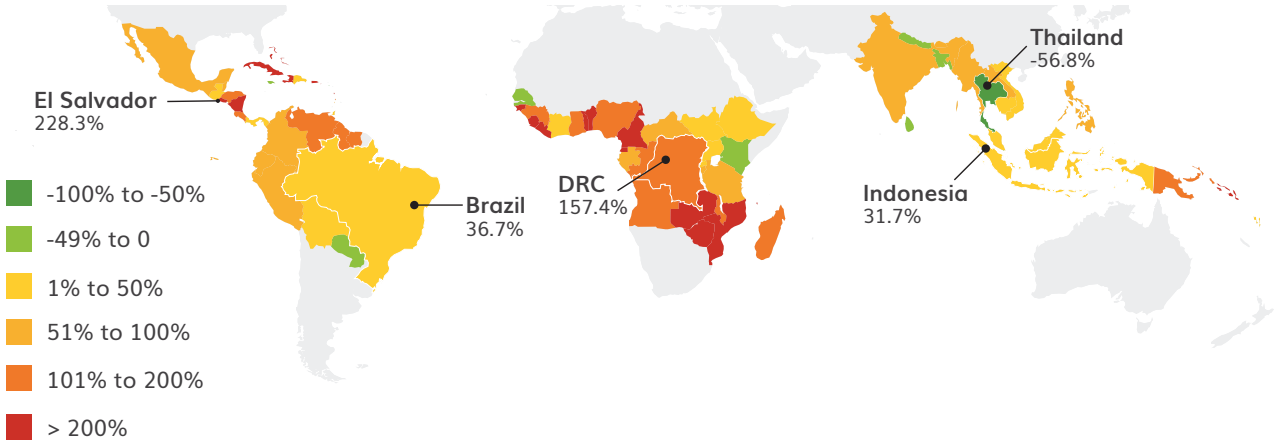
g. Much of the increase in tree cover loss detected in Central Africa, specifically, may be linked to the improvement of the tree cover loss methodology to include Landsat 8, which is better at detecting small-scale tree cover loss dynamics like those prevalent in Central Africa.
h. World Resources Institute analysis of 2018 data from Global Forest Watch.

Figure 6. Change in average annual CO_2 emissions from gross tree cover loss in tropical countries between 2002–13 and 2014–18, in percent

(a) In all forested area



(b) In humid tropical primary forest only



Note: Comparison of average annual gross CO_2 emissions from aboveground biomass loss by country before (2002–13) and after (2014–18) the signing of the New York Declaration on Forests (NYDF). Forest is defined as areas with >25 percent tree cover density in 2000. Negative values represent decreases in emissions.

Source: World Resources Institute analysis based on 2018 data from Global Forest Watch.

GOAL 5

Restoring degraded landscapes and forestlands

Restore 150 million hectares of degraded landscapes and forestlands by 2020 and significantly increase the rate of global restoration thereafter, which would restore at least an additional 200 million hectares by 2030.

Progress on the implementation of forest landscape restoration has been mixed. Pledges under the Bonn Challenge totaling 170.6 million hectares indicate significant political will to restore landscapes. However, only a small amount of restoration has been reported, and data limitations make progress difficult to quantify. Our systematic global literature review found that only 18 percent of the 2020 goal (26.7 Mha of forests) are documented to have undergone restoration since 2000. An in-depth analysis of the Mekong region using satellite data reveals that most restoration in the area since 2010 has taken place outside of forests; tree cover is increasing on croplands, shrublands, and other non-forest land uses at a higher rate (75 percent) than inside forests (25 percent). Furthermore, deforestation in the Mekong region has continued at a higher pace than forest restoration, amounting to an overall net loss of natural forests (-0.3 Mha). These results indicate that greater efforts are needed to protect and restore natural forests and the important forest ecosystem functions they supply (e.g. biodiversity and carbon sequestration).

The type of forest landscape restoration has implications for the climate

NYDF Goal 5 endorses and builds on the Bonn Challenge, a global initiative launched in 2011 with the goal of bringing 150 million hectares of the world's deforested and degraded land into restoration by 2020 and an additional 200 million hectares by 2030. Our assessment of Goal 5 focuses on restoration that falls under the concept of forest landscape restoration (FLR) adopted by the Bonn Challenge. FLR aims to restore ecological integrity at the same time as improving human well-being through multifunctional landscapes.[70] While the process and intent of FLR is well-defined, there continues to be various interpretations of what is included in FLR.[71] For the purposes of this assessment, we focus our reporting on FLR activities that yield an increase in tree or forest cover, such as establishing natural or semi-natural forests through regeneration or reforestation, as well as improving existing landscapes with trees, such as plantations and agroforestry systems.[i]

As of August 2019, there were 59 Bonn Challenge pledges from countries, jurisdictions, and companies totaling 170.6 million hectares of restoration commitments for 2020 and 2030 combined.[72] Additionally, an analysis of FLR in countries' Nationally Determined Contributions under the Paris Agreement found that 49 NDCs (30 percent) have quantitative restoration-aligned targets for **mitigation** and/or **adaptation**.[73] There are approximately 56.7 million hectares of FLR-aligned activities (i.e. planted forests and woodlots, silviculture, assisted regeneration, watershed mangrove restoration, agroforestry, and improved fallow) under NDCs' unconditional or conditional targets. On March 1, 2019, the United Nations declared a Decade on Ecosystem Restoration, starting in 2020, to scale up the restoration

i. For the purposes of this report, we may refer to "forest landscape restoration" as "forest restoration" or "restoration."

of degraded and destroyed ecosystems as a proven measure to fight the climate crisis and enhance food security, water supply, and biodiversity.

Restoration plans for two thirds of the total pledged area under the Bonn Challenge indicate that about half (45 percent) of commitments will be met by planting monoculture tree plantations, one third (34 percent) of the area will be allowed to naturally regenerate, with agroforestry accounting for the remainder (21 percent).[74] While increasing the area of tree plantations may support local economies and should not be downplayed,[75] this will not provide the same benefits for the climate as regenerating or restoring natural forests. On average, natural forests store 40 times more carbon than plantations and 6 times more than agroforestry.[76]

Despite high ambition, implementation is limited

Findings from a systematic literature review indicate that the political will expressed by commitments has yet to be fully translated into FLR action.[j] Based on the review's findings, the goal of restoring 150 million hectares of forest landscapes by 2020 will not be met. Since 2000, only 26.7 million hectares of forest landscapes have undergone restoration (20.5 Mha reforestation, 6.2 Mha afforestation) (**Figure 7**)[k]. Even more concerning, after the launch of the Bonn Challenge and the NYDF, the rate of restoration of forests has decreased from approximately two million hectares per year between 2000–10, to less than one million hectares per year after 2011.

In addition to the literature review, the results of a pilot study[l] for the Mekong region also show that more progress is needed to recover forests. While there has been a significant amount of forest gain in the countries of the Mekong, with the exception of Thailand, the rate of deforestation has outpaced the rate of reforestation between 2010–17. Our study found that approximately 5.5 million hectares of tree cover has been restored "inside forests", but the region yielded an overall net loss of -0.3 million hectares when factoring in deforestation rates over the same time period (see **page 36**). This means that valuable natural and primary forests were lost, and restoration rates are not reaching levels to keep the overall forest area stable.

Latin America and China lead in total areas under FLR

Since 2000, forest landscape restoration was predominantly reported in forest biomes in the tropics (40 percent) and temperate regions (18 percent).[77] A portion of forest increase also occurred in grasslands as afforestation (30 percent or 6.2 Mha) (see **Figure 7**) rather than reforestation of previously forested land. Afforestation may increase some ecosystem services; however, it may also pose risks to resource use and biodiversity, in particular where it replaces natural grassland and other non-forest ecosystems with non-native monocultures (see **China case study** on **page 34**).[78]

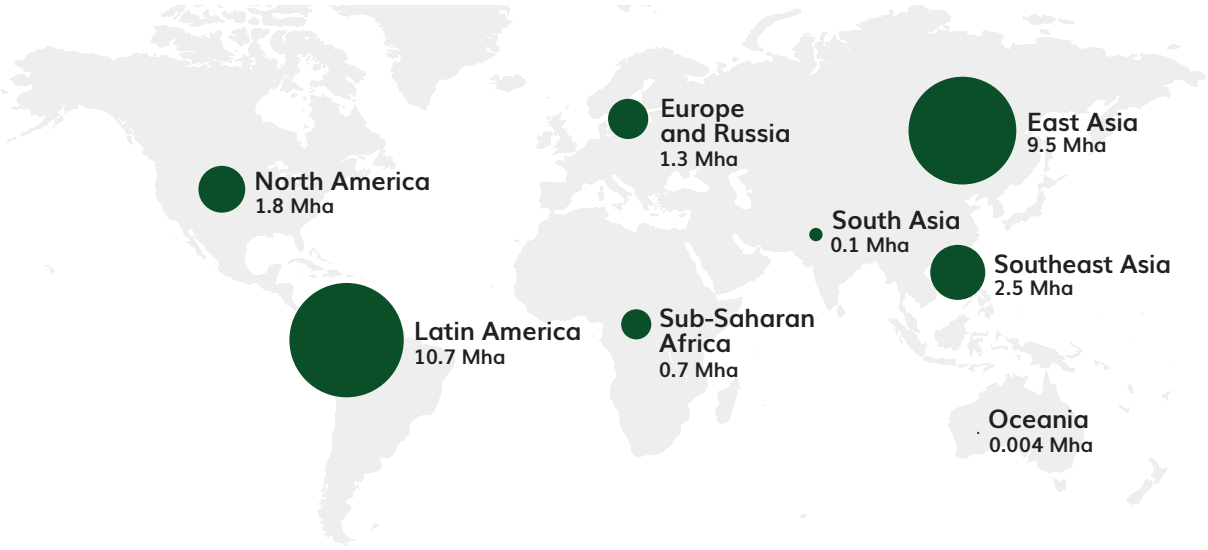
j. This systematic literature review was conducted by researchers at the University of Virginia as an independent study commissioned by the NYDF Assessment Partners. A peer-reviewed paper is forthcoming.

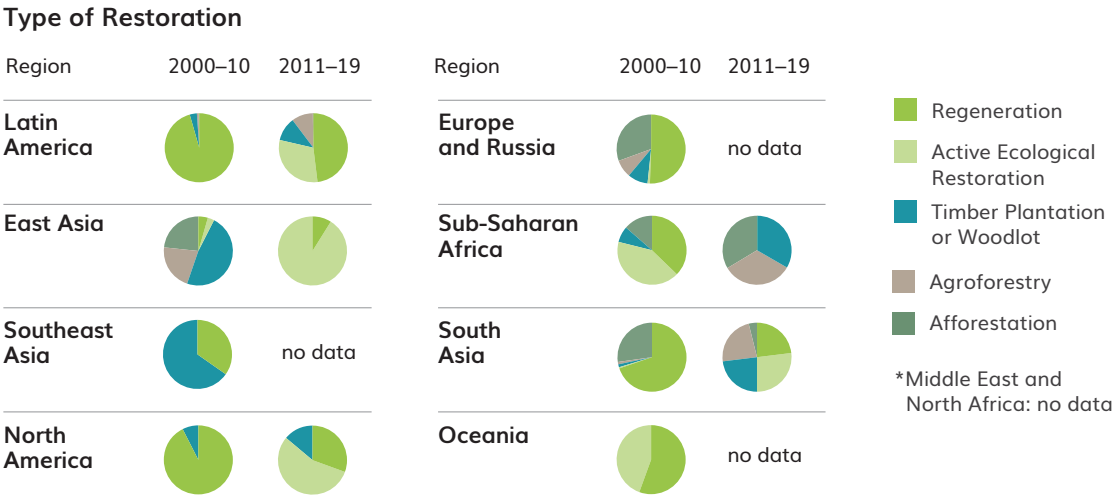
k. These results diverge from the 2019 Bonn Challenge Barometer report finding of 43.7 million hectares under FLR since 2011 because the literature review only included the Barometer countries with more information on timelines and restoration activities (6 out of 19 countries) and excluded activities that did not increase forest cover (e.g. silviculture of existing forests, conservation of existing forests, rangeland improvements, and agricultural soil restoration or good practices).

l. The pilot study on monitoring restoration in the Mekong region was conducted by researchers at World Resources Institute in collaboration with JD 4Consulting as an independent study commissioned by the NYDF Assessment Partners.

Regionally, Latin America and East Asia represent the majority of areas under forest landscape restoration. Between 2000–10, 9.7 million hectares were under restoration in Latin America, primarily as regeneration in Brazil (97 percent). In East Asia (China and Mongolia), 9.5 million hectares were under restoration, with approximately half (47 percent) occurring as afforestation with timber species. Southeast Asia and the EU also had significant restoration between 2000–10 (2.5 Mha and 1.3 Mha respectively), primarily as new timber plantations (66 percent) and regeneration (33 percent) in Vietnam, and regeneration in Eastern Europe and Russia (75 percent). From 2000–10, the main motives for forest landscape restoration were risk mitigation (e.g. soil erosion, flooding) (13 percent), commercial interests and local employment (12 percent each), then enhancing soil fertility, **carbon sequestration**, and ecosystem function (8 percent each) (**Figure 8**).

Figure 7. Increase in forest area through forest restoration (reforestation and afforestation activities) from 2000–19 in million hectares, and by region, time period, and type of restoration





Note: Regional numbers are exclusive; however, the area per type of restoration is not exclusive and may overlap as some projects report multiple types of restoration. The total amount of restoration reported from 2000–10 was 23.6 million hectares (Mha), and from 2011–19 was 3.1 Mha.

Source: Systematic literature review by University of Virginia researchers of global forest landscape restoration implementation (reforestation and afforestation activities) since 2000, evaluating over 3,500 peer-reviewed studies, grey literature and databases published since 2010. Academic journal publication forthcoming.

CASE STUDY

China: Ambitious restoration through afforestation and reforestation

For four decades, China has been at the forefront of global afforestation and reforestation (A/R) efforts to restore degraded landscapes and increase vegetation cover. With several mega-forest-restoration programs that are considered the most ambitious such programs ever undertaken,[79] China has sought to address environmental degradation, including extensive desertification, flooding, soil erosion, dust storms, and, more recently, the loss of biodiversity and greenhouse gas emissions. Though China has not made a restoration commitment under the Bonn Challenge, it has accounted for an outsized share of documented tree cover gain over the last two decades. Between 2000–17, China alone accounted for 25 percent of the global net increase in canopy area with only a 7 percent share of total global vegetated area.[80]

Lessons learned lead to huge gains

The longest running A/R project in China is the Three Norths Shelterbelt Development Program — also known as the "Great Green Wall." Since 1978, the program has afforested 26.5 million hectares. However, the program suffered from a number of design flaws. Tree survival in the project area was low — according to some authors as low as 15 percent[81] — and until 2000, desertification continued to increase.[82] In 1998, the Conversion of Cropland to Forest Program (CCFP) or "Grain-to-Green Program" was launched to convert cropland and shrubland on mountainous terrain susceptible to erosion back into forested landscapes, and to increase vegetation cover by afforesting barren lands. Farmers' participation in the program is voluntary and incentivized through the provision of seedlings, grain subsidies, and annual cash stipends based on the extent of the afforested or reforested area. Payment of subsidies is conditional to 75 percent survival rate of the planted trees, which are annually inspected by the county forestry officers.[83] Farmers receive the payments directly in their bank accounts, which promotes the modernization of household finances and use of digital banking technologies.[84] Furthermore, participating households are provided with forest land-use rights certificates, thus making tenure reform a crucial element of the A/R program, and encouraging famers' participation and compliance.[85]

In the first 15 years of its implementation, the Chinese government reported that the CCFP forested 28.2 million hectares[m] of cropland and wasteland — an area larger than Ecuador.[86] By 2014, it had become one of the largest rural development programs in the country, with more than USD 50 billion in government investment.[87] Tree survival rates were 60 to 70 percent.[88] The program has had considerable success in achieving its two primary goals: soil retention and flood mitigation.[89] It is the largest "payment for ecosystem services" program on A/R in the world, involving 32 million rural households across 25 provinces, providing both direct compensation to households and village-level development assistance.[90]

Local trade-offs inspire change in practice

However, because most of the planted forests are monocultures or simple mixed forests, their impacts on local ecosystem function vary across regions, with localized trade-offs such as reduced water yield or biodiversity.[91] For example, in arid northern areas, afforestation reduced soil moisture and led to a depletion of water resources, mainly due to planted trees that were not suited local ecological conditions.[92] Reforestation with monocultures has led to a loss of biodiversity, but in mixed forests, it has resulted in moderately improved biodiversity, although much lower when compared to biodiversity in native forests.[93] In response, project managers have begun planting more native shrubs and trees.[94] In some regions, they have also begun developing new plantations that mimic natural forest structure to increase the resilience of the established ecosystem.[95]

True test of success is yet to come

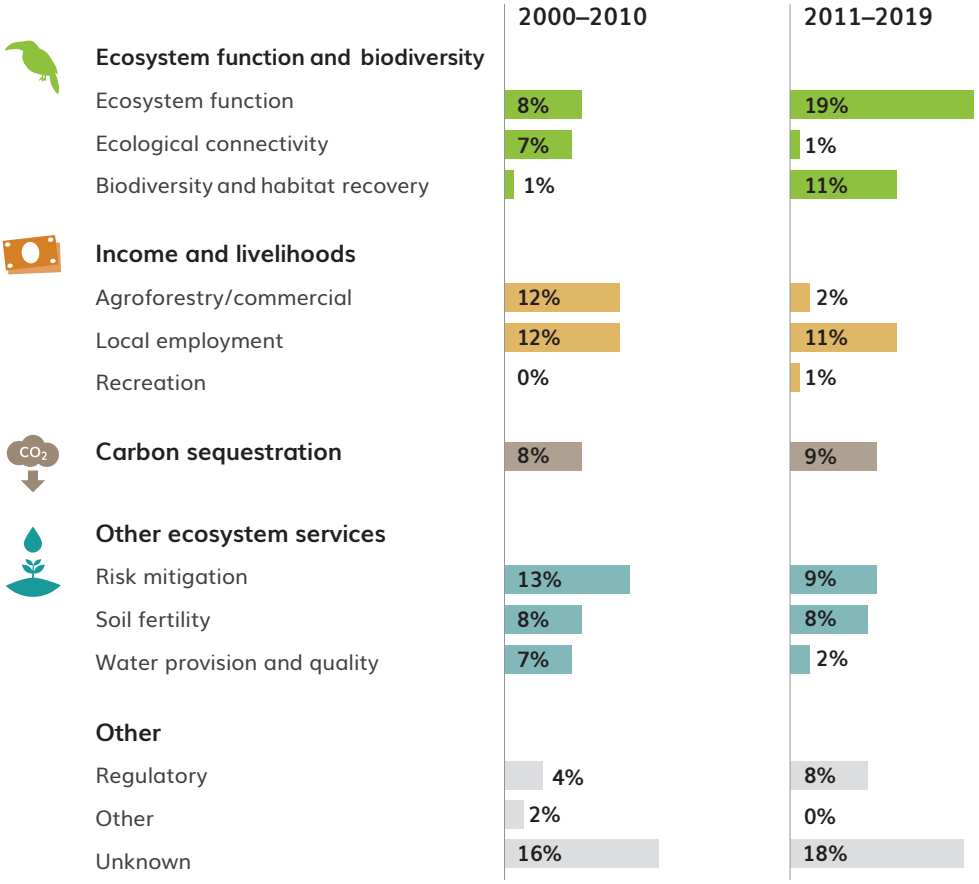
Overall, China's A/R programs led to a substantial increase in forest cover and associated carbon stocks, reduced risk of soil erosion, and increased household incomes. But these impacts vary across regions with localized trade-offs in ecosystem functionality. Furthermore, it is unclear whether income from tree products will be sufficient to keep trees in place after the subsidies expire. As China's rural economies have transformed in the past 20 years and the off-farm opportunities have increased, the hope is that farmers will not revert to old land-use practices, and that China will sustain the recovered forests.

m. Differing numbers of forested area have been reported by the government and scientific literature. Results from the systematic literature review that compiled data from peer reviewed and grey literature put the figure at 9.5 million hectares for the same time period.

Biodiversity and carbon sequestration increasingly motivate restoration

Since 2011 (the start of the Bonn Challenge), most restoration has been reported in North America (USA) (1.4 Mha), Latin America (0.75 Mha), and Sub-Saharan Africa (0.7 Mha). South Asia and East Asia (China) had fewer data and more modest gains (0.011 Mha and 0.001 Mha respectively) (see **Figure 7**). The primary motives, or objectives, for restoration after 2011 were recovering ecosystem function (19 percent), biodiversity and local employment (11 percent each), and carbon sequestration and risk mitigation (9 percent each) (see **Figure 8**). Even though the rate of restoration did not increase after 2010, international commitments to restore ecosystems, biodiversity, and carbon sequestration seem to have had a positive effect on promoting the types of restoration that realize those goals (e.g. reforestation through natural regeneration, ecological restoration, and agroforestry).

Figure 8. Primary objectives for forest landscape restoration (reforestation and afforestation activities), in percent of total area



Note: Area totals are not exclusive and may overlap as some projects report multiple motivations for restoration. Figure represents normalized area numbers in percent.

Source: Systematic literature review by University of Virginia researchers of global forest landscape restoration implementation (reforestation and afforestation activities) since 2000, evaluating over 3500 peer-reviewed studies, grey literature and databases published since 2010. Academic journal publication forthcoming.

Currently, our literature review is the only systematic global assessment of forest landscape restoration (through reforestation and afforestation) progress to date. However, it comes with some caveats: Because of the time lag between implementing restoration activities and being able to observe reportable results, it is likely that many interventions since

2010 are not yet reflected in the literature. In addition, academic and grey literature may be biased in their selection of geography and scale, leading to a higher representation of large restoration projects over small-scale restoration. The review therefore provides a conservative estimate of progress. At the same time, the reviewed studies do not provide continuous data and therefore do not address the issue of permanence, meaning it is unclear whether the identified restoration efforts are sustained over time.

Mekong: Restoration is happening but there is an overall net loss of natural forests

To monitor progress on Goal 5 systematically in the future, we developed an approach that combines earth observation data resources that are currently considered the best available for monitoring biophysical progress on restoration (**Box 3**). This approach was applied in a pilot-scale analysis for the five countries of the Mekong region — Cambodia, Lao People's Democratic Republic (Lao PDR), Myanmar, Thailand, and Vietnam — evaluating progress on Goal 5 for the period from 2010–17. The study specifically identifies progress on two types of forest landscape restoration: increase in **"trees inside the forest"** (i.e. dense and clustered trees, >10 percent tree canopy cover**)** using GLAD data and increase in "**trees outside the forest"** (i.e. sparse tree cover on non-forest lands such as cropland and settlements) using Collect Earth data (see **Box 3**).

Restoration of "trees inside the forest" include such activities as natural regeneration, ecological restoration, and seedling plantings. While there has been a significant amount of gross forest gain in the region (5.5 Mha), the rate of deforestation has out-paced the rate of restoration over the time period in all countries except Thailand (**Table 1**). Overall, there was a net loss of -0.33 million hectares across the region, with Vietnam experiencing the greatest net loss at -0.34 million hectares, or -1.5 percent of their baseline forest cover. Lao PDR and Cambodia also experienced significant net losses at -1.0 percent and -1.1 percent of their baseline forest cover, respectively. Myanmar had a significant amount of forest gain at 1.6 million hectares, though their loss slightly outpaced their gain at -0.2 percent. Vietnam and Lao PDR both have the highest percentages of rotational (plantation) forests that undergo interannual cycles of gain and loss. These rotational forests are sometimes considered restoration when they are replacing land that would otherwise be degraded or barren. Further analysis would be required to identify areas where rotational forests meet these criteria.

When looking at the geographic variability of forest change within each country, provinces with stronger deforestation trends are concentrated in northern Vietnam, northern Cambodia, Lao PDR, and central Myanmar, with only a few provinces in Thailand (**Figure 9**). The provinces with stronger trends toward restoration are clustered in eastern Thailand, southern Vietnam and Cambodia, and southern Myanmar. This information can be used to target the provinces where additional investment in restoration activities is needed to increase forest cover and protect existing forests from loss.

Box 3. Methods and data for monitoring restoration

Restoration is much more difficult to quantify than deforestation. While deforestation is a land cover change that is rapid and highly visible from space, restoration is a more gradual process requiring monitoring over longer time horizons that can span years or decades.[96] In addition, forests are highly dynamic ecosystems that are subject to a multitude of influences, both natural and man-made. Logging, agricultural expansion, fires, and pest outbreaks are just a few of the many causes of tree cover loss, while natural regeneration, reforestation, and agroforestry systems are among the restorative measures that lead to tree cover gain. Teasing out areas under restoration from such a highly dynamic system requires careful evaluation.

At present there are no globally-consistent, transparent datasets available to measure progress on forest landscape restoration (FLR) on a systematic basis.[97] Ongoing efforts to quantify restoration in the context of international commitments rely mostly on self-reported information by governments.[98] However, not all countries report, and if they do, they may follow different definitions and methods that may not be fully consistent and comparable.[99] The Secretariat to the Convention on Biological Diversity (CBD) reports progress toward the Aichi Targets primarily through national reporting. The Bonn Challenge Barometer currently brings together data from countries and other stakeholders for a subset of pledgers (19 countries).[100]

While global tree cover loss has been consistently quantified using satellite data for some time now, methods to quantify FLR progress using satellite data have not had the same level of research or investment. Two earth observation data resources that are currently considered the best available for monitoring biophysical progress on restoration are detailed below. Each tool is best suited to monitor a certain aspect of restoration.

Collect Earth: used to measure increases in "trees outside the forest" in our analysis, i.e. sparse tree cover on non-forest land such as croplands, grasslands, and settlements. Our assessment of trees outside forests involved counting individual trees in over 14,000 sample plots in the Mekong region across varying types of land uses between 2010 and 2018. As a tool, Collect Earth is suited for this type of data collection because it relies on very high-resolution imagery and human interpretation, which can distinguish subtleties in tree cover and land use that are often undetected using algorithm-based remote-sensing techniques. These "trees outside the forest" are often overlooked by other assessments, as demonstrated by the recent study that "discovered" 500 million hectares of "forest" in drylands that had never been counted before.[101]

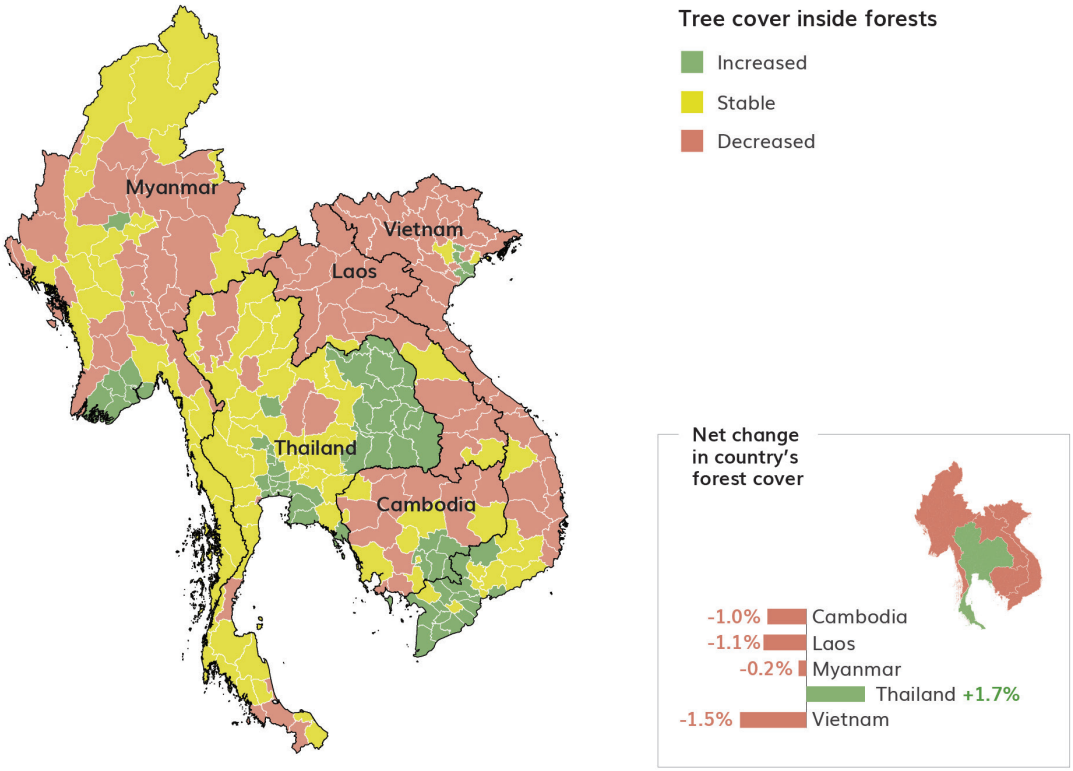
University of Maryland GLAD dataset on tree canopy cover and height dynamics: used to identify progress on tree cover gain "inside the forest" in our analysis. We defined restoration as an increase in tree canopy cover of greater than 20 percent and any increase in tree canopy height of greater than 5 meters using a pixel-by-pixel comparison of data for the baseline (2009–11) and most recent (2015–17) periods. The significance of this dataset is that it provides a comprehensive picture of forest cover change for the region — both the increase and decrease. Therefore, it is possible to calculate the net impact of both forest restoration and degradation on total forest cover as well as identify patterns in tree cover change. Identifying these patterns enables one to distinguish "long-term" gains and losses associated with restoration and deforestation from "rotational" gains and losses associated with working forests such as tree crops and plantations.

Note: There are limitations associated with each dataset in monitoring FLR which are detailed in the technical annex of Goal 5.

Table 1. Forest cover dynamics by country in the Mekong region for trees inside the forest for the period 2010–17, categorized by type of change (long-term gain/loss, rotational or stable) and as a percent of the countries' total forest cover

Region	Gross long-term forest gain (Mha)	Gross long-term forest loss (Mha)	Net long-term forest change (gain-loss) (Mha)	Net long-term change of country's forest cover	Share of country's forest cover that is rotational	Share of country's forest area that is stable
Cambodia	0.48	-0.59	-0.10	-1.0%	8%	81%
Lao PDR	0.66	-0.90	-0.24	-1.1%	10%	83%
Myanmar	1.63	-1.73	-0.10	-0.2%	6%	88%
Thailand	1.71	-1.25	0.46	+1.7%	7%	82%
Vietnam	1.04	-1.38	-0.34	-1.5%	12%	78%
Mekong region	5.51	-5.85	-0.33	-0.2%	8%	84%

Figure 9. Summary of change in tree cover for trees inside the forest, by subnational jurisdiction for the period 2010–17



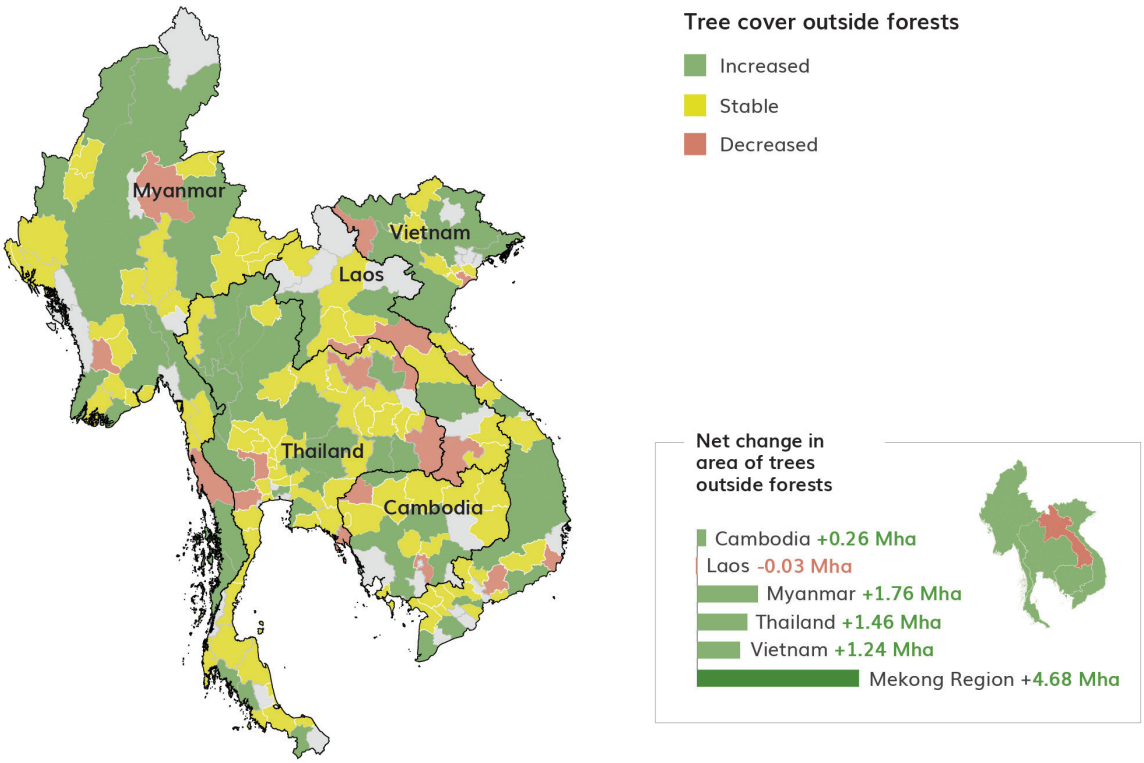
Note: These results are based on an index that combines data on gross area of forest gain, net change, and stable forest to identify areas of restoration as well as protection of existing natural forest.

Source: World Resources Institute interpretation of University of Maryland GLAD forest cover dynamics data for Mekong region, 2019.

Table 2. Gross land area by country in the Mekong region with gain or loss of trees outside forests for the period 2010–18, in million hectares

Region	Gain	Loss	Net Change
Cambodia	0.84	-0.58	0.26
Lao PDR	0.5	-0.53	-0.03
Myanmar	3.73	-1.97	1.76
Thailand	6.25	-4.8	1.45
Vietnam	2.89	-1.66	1.24
Mekong region	14.21	-9.54	4.68

Figure 10. Summary of change in tree cover for trees outside the forest, by subnational jurisdiction for the period 2010–18



Note: These results are based on the number of sample plots with gain or loss in tree cover outside of forests. The map categorizes the provinces according to net change.

Source: Data collected via Collect Earth mapathon by JD 4Consulting and interpreted by World Resources Institute, 2019.

In addition to forests, trees are often planted on non-forest lands in agroforestry systems or homestead plantings to provide valuable services to people, such as to increase soil productivity on croplands, curb erosion on hillsides near villages, provide a source of food or woodfuel to a household, or to provide shade and fodder for livestock. The analysis of "trees outside the forest" in the Mekong region focused on identifying trends in tree cover on land uses other than forests, such as croplands, grasslands, shrublands, settlements, and wetlands. While trees outside of forests are a critical part of forest landscape restoration in people-centric landscapes, improvements to biodiversity and ecological function are relatively fewer when compared to restoring forests.

The results of the analysis show that in each country, increases in tree cover on bushlands/shrublands were the highest, followed by grasslands and croplands, with less prevalence in barren land (except in Thailand), settlements, and wetlands. In terms of the gross area, all countries except Lao PDR had a net gain in tree cover outside of forests, with Myanmar experiencing the highest net gain (**Figure 10**). In total, non-forest lands saw a gross increase 14.2 million hectares and a net increase of 4.7 million hectares in tree cover across the Mekong (**Table 2**). Provinces with increased tree cover outside the forest are widespread, with Myanmar, Thailand, and Vietnam having the largest number of provinces with increases in trees outside forests.

While this assessment has focused on quantifying restoration progress in the Mekong region, there are a number of ongoing initiatives to monitor and quantify restoration progress in other parts of the world. For example, in Malawi, monitoring of trees outside the forest, specifically on croplands, has demonstrated the widespread application of a practice known as farmer-managed natural regeneration, where farmers are managing trees on their land to increase productivity of cropland and reduce dependence on mineral fertilizer (see **Malawi case study** on **page 60**).

Political momentum points toward further restoration efforts

Since 2017, the Bonn Challenge Barometer has worked with government officials, implementing agencies, and multidisciplinary experts in various countries to identify the conditions that enable FLR, identify appropriate progress indicators, and develop reporting structures with quality control measures. These are particularly important given concerns around secure land rights and the sustainability of investments. Despite different national contexts, common success factors for FLR include: 1. Coherent policies and institutional support for FLR; 2. Technical planning and prioritization methods that incorporated a multidisciplinary approach and involved multi-sectoral agencies and land use stakeholders to account for various objectives; and 3. Directing significant financial flows to restoration activities.[102] However, intersectoral coordination in planning and implementation still require strengthening in order to have a greater return on investment and increase the efficiency and impact of FLR actions. Improved cross-sectoral coordination is needed, for example, between the agricultural and environmental sectors on planning and budgeting for FLR actions that fall under diverse sectoral portfolios.

According to the Barometer, Brazil reported large areas of regeneration, established through improved land governance that allowed coordination and implementation of restoration efforts across public and private sectors (see **Brazil case study** on **page 74**).[103] Rwanda has incorporated forest restoration into its sustainable development agenda, and critical to its success thus far is the strong policy framework that encompasses the multitude of FLR-aligned policies enacted in 2018. Similarly, El Salvador set an example with its National Ecosystem and Landscape Restoration Program which includes an operational action plan and includes a monitoring system with an FLR activity database (see **El Salvador case study** on **page 41**).

CASE STUDY

El Salvador: A small country with big strides forward

A restoration pioneer, driven by need

El Salvador has been a strong proponent of ecosystem restoration, taking a lead at regional and international levels to stimulate action and implement commitments on restoration. In 2012, El Salvador joined the Bonn Challenge with an ambitious commitment of restoring one million hectares, half of the country's total area.[104] Since then, the country has been a leader in Initiative 20x20, Latin America's Bonn Challenge implementation framework.[105] El Salvador also spearheaded the adoption of the UN Decade of Ecosystem Restoration 2021–30, in March 2019.[106]

Through landscape restoration, El Salvador aims to adapt to and reduce the impacts of climate change while harnessing restoration's mitigation potential.[107] The country is particularly vulnerable to climate change's effects due to a history of deforestation and land degradation. Almost 90 percent of the national territory has been severely degraded: 42 percent of landslide-prone areas, 67 percent of riparian forests, and 64 percent of major water recharge areas lack vegetation, and only 6,000 hectares of primary forests remain.[108] Restoration has therefore become a necessity for El Salvador, and supportive policies, appropriate technical planning, and the establishment of a national restoration monitoring system have facilitated some first restoration successes.[109]

Multi-scalar and multi-stakeholder process set foundation for success

El Salvador's restoration planning process was participatory from the beginning, resulting in an integration of restoration goals at multiple levels of governance, from local development plans to national strategies. Developing El Salvador's restoration strategy started with a process facilitated by the International Union for Conservation of Nature (IUCN), which identified restoration opportunity areas totaling over 1,250,000 hectares.[110] Thereafter, local restoration and sustainable development plans were collectively developed with the participation of local communities, the private sector, NGOs, small farmers, local governments, and indigenous peoples. A National Monitoring Plan was defined to measure and track the process and impact of restoration interventions, to be carried out by an interdisciplinary team of national government agencies and international organizations backed by a network of local environmental observers.[111] All of these efforts are coordinated under the Program for Ecosystem and Landscape Restoration (PREP by its Spanish acronym), which prioritizes restoration methods and facilitates crucial alliances for implementing and monitoring actions.[112]

Government alignment promotes progress

With political leadership from national government officials and the backing of local communities, supported by expertise and leadership of international civil society organizations, the national restoration strategy has been largely integrated across national and local laws and institutions.[113] Both the National Environmental Policy and the National Climate Change Strategy prioritize landscape protection and restoration. Inter-ministerial and multi-stakeholder consultative bodies, such as the Environmental and Vulnerability Cabinet and the National Council for Environmental Sustainability and Vulnerability (CONASAV), support dialogue and align efforts across ministries, civil society, and other actors.[114] The country has also made progress in aligning restoration with other policy objectives, such as the 2017 ban on metallic mining in 2017, which had accounted for five percent of deforestation between 2000–14.[115]

Progress toward the goal, with social benefits

As of December 2018, El Salvador was about one tenth of the way toward its Bonn Challenge goal, with 122,000 hectares brought under restoration since 2014. Over a quarter of this area — 33,000 hectares — has targeted biodiversity priority areas to contribute to biological connectivity and ecological integrity of the landscape.[116] These restored hectares are estimated to sequester 3.6 million tons of carbon dioxide equivalent over their lifetime. Beyond the climate mitigation benefits, farmers are seeing multiple co-benefits from agroforestry practices, including increased firewood and fodder availability, as well as soil improvements from increased nitrogen, improved water retention, and decreased erosion.[117]

Addressing drivers of deforestation

Drivers of forest loss and deforestation

The loss and degradation of tropical forests is caused by a variety of direct and indirect factors. **Direct drivers of forest loss** are human activities that directly reduce forest cover. Direct drivers include the expansion of agriculture, infrastructure development, and wood extraction. In addition, new urbanization and mining are important drivers in selected regions. **Indirect drivers of forest loss** are underlying factors that indirectly enable deforestation and degradation. Indirect drivers can be divided into economic (e.g. prices for agricultural productions or land), institutional (e.g. lacking land title or corruption), and technological (e.g. lack of knowledge or monitoring capacities) factors.

In addition to human-induced deforestation from conversion of forest land to another land use such as cropland or pasture, drivers of forest loss can arise from natural disturbances such as drought or pests. The effects of such subtler drivers may occur over longer periods of time and may be exacerbated through climate change. These interact with human-induced drivers in a negative feedback loop, further accelerating deforestation and/or preventing natural regeneration.

The five main direct drivers of forest loss are commodity-driven deforestation (27 percent), shifting agriculture (24 percent), forestry (26 percent), wildfires (23 percent), and urbanization (<1 percent).[118] Agricultural expansion and — to a much lesser extent — urbanization are the most important drivers of permanent deforestation. The most significant drivers and causes of forest degradation are selective logging (including illegal logging), uncontrolled fires, livestock grazing, woodfuel collection, and charcoal production.[119]

Commercial agriculture of **forest-risk commodities**, in particular the production of cattle, soy, palm oil, and timber, is the largest driver of deforestation. Cattle and soy remain the major causes of forest loss in Latin America, while palm oil drives most deforestation in Southeast Asia (see **Goal 2**). Mining and infrastructure drive comparatively little forest loss, but by opening the forests, act as an enabler of settlements, woodfuel collection, and agriculture (see **Goal 3**). Most forest loss in sub-Saharan Africa is driven by subsistence and small-scale commercial farmers clearing forests manually to feed themselves and those in nearby towns and cities; however, infrastructure and expansion of logging concessions are underlying drivers of the migration leading to the expansion of small-scale agriculture (see **Goal 4**).[120]

A coordinated effort is necessary to address root causes of deforestation

An increasing number of countries, subnational jurisdictions, and corporations have committed to protect forests nationally and internationally. For example, companies have pledged to address deforestation in their supply chains and adopt sustainable business practices. With growing awareness of the relevance of climate risks, financial institutions are demanding more transparency and seeking to avoid high-risk investments. Governments, meanwhile, are working to support and introduce policies that provide alternatives to activities that drive deforestation.

Current supply-chain interventions in the form of company commitments, certification schemes, and sectoral initiatives generally focus on a single commodity supply chain. To have an aggregate impact on forests, more companies across commodities need to assume ambitious commitments, certification schemes need to be scaled, and sectoral initiatives need to be replicated in other threatened ecosystems. Standing in isolation, current company commitments are not enough to reduce global deforestation from agricultural production. Furthermore, to be successful, company interventions need to be better supported by public policies and government actions both in producer and in consumer countries. To meet global food demand without losing more forests, a systematic change in how food is produced — including coordinated and integrated strategies to improve productivity[121] — and consumed — including an elimination of embedded deforestation from traded commodities, a shift in diets away from meat and a reduction of food waste and losses — is needed.[122] Efforts to increase productivity and spare land must be implemented alongside efforts to protect forests. However, governance challenges (e.g. weak institutions, insecure land titles, and poor regulatory frameworks; see **Goal 10**) as well as a lack of finance make it challenging to offer farmers the support they need to improve agricultural practices. Additionally, financial institutions must address the risk of embedded deforestation in their portfolios and provide additional funds to support sustainable supply chains (see **Goal 8**).

Supply-chain actors have turned to **landscape** or **jurisdictional approaches**, including more comprehensive approaches to a geographic region, which have the potential to reinforce supply-chain strategies with systems-level strategies.[123] However, many of these initiatives are too nascent to fully realize this potential. In an ideal scenario, governments accelerate progress by providing institutional frameworks and high-level policies, making finance available, and facilitating effective land planning, decision-making, and regulation. Similarly, financial institutions can provide funds, safeguards, or both to their lending to incentivize best practices that reduce impacts on forests. There are still few jurisdictional approaches

Figure 11.

Key messages: Addressing drivers of deforestation

NYDF Goals 2, 3, & 4

Governments, supply-chain companies, and financial institutions have taken steps to address forest loss. However, the sum of these efforts has not been enough to reduce the rate of forest loss globally.

Deforestation will not be eliminated from the production of agricultural commodities by 2020.

Zero of the 350 most influential companies with forest-relevant operations are on track to achieve their supply-chain commitments by 2020.

Mining, extraction, and infrastructure pose clear risks to forests.

27% of global forest area overlaps with the 50 km buffer zones of forest mines

Protected areas are being opened up to infrastructure and mining development. Changes to Brazil's mining code could open up 9.8 Mha of protected area to mining development by 2025.

Poverty and a lack of livelihood alternatives underlie deforestation driven by basic needs.

Wood harvesting (primarily for woodfuel) and small-scale crop production (primarily for swidden agriculture) are the two most common basic-needs activities which may have a negative impact on forests.

in place and, so far, the majority are not in the top producing regions of forest-risk commodities.[124] The Tropical Forest Alliance (TFA 2020) has counted about 95 initiatives with a jurisdictional scope, though only 20 of those are in top commodity-producing regions.[125] Nonetheless, they provide platforms for companies, governments, civil society, and communities to coordinate their efforts to take landscape level actions that target results and metrics at broader spatial scales. Larger programs can also incentivize change at greater scales by involving all relevant stakeholders and covering diverse landscapes.[126] Through their "commodity-first" approach, TFA 2020 has started working with companies and partners on accelerating jurisdictional approaches in forest-risk regions.[127]

This chapter presents findings from our evaluation of efforts to tackle deforestation caused by direct drivers (**Figure 11**) — commercial agriculture (**Goal 2**), other economic sectors (**Goal 3**), and basic needs (**Goal 4**). We assess the progress that the data allows, complementing this with case studies to provide context.

GOAL 2

Efforts to address deforestation in agricultural supply chains

Support and help meet the private-sector goal of eliminating deforestation from the production of agricultural commodities such as palm oil, soy, paper, and beef products by no later than 2020, recognizing that many companies have even more ambitious targets.

Deforestation will not be eliminated from the production of agricultural commodities by 2020. None of the world's most influential companies with forest-relevant operations is on track to meet their supply-chain commitments by this date.[128] Furthermore, only a handful of companies (8 percent) have zero-deforestation commitments that cover all their supply chains and operations. Due to a lack of reporting and overall transparency, it remains unclear how effective current commitments are at reducing forest loss. In relative terms, the most advanced and successful interventions to address deforestation have been sector-wide efforts, such as a soy moratorium in the Brazilian Amazon; a suite of public and private efforts to protect peatlands in Indonesia; and demand-side timber regulations. Well-designed jurisdictional approaches hold promise, but they are still in their infancy and data on their impacts are limited.

Commercial agriculture continues to be the main driver of deforestation

Almost 18 soccer fields of forests per minute were cleared between 2001–15 to make room for commercial agriculture. Southeast Asia and South America are the hotspots of deforestation from commodity production and were responsible for 61 percent and 64 percent of forest loss, respectively, in that time period.[129] Cattle, palm oil, soy, and timber are the most dominant causes of commodity-driven deforestation. While palm oil is the main driver of deforestation in Malaysia and Indonesia, soy and cattle grazing have caused most of the deforestation in South America. A significant part of deforestation from these commodities is embedded in their exports to Asia and Europe, with demand continuously growing in large markets like China and India.[130]

In terms of recent growth, both tropical Asia and tropical Africa have shown rapid increases in deforestation since 2014 compared to average loss between 2001–13 (see **Goal 1**). In Southeast Asia, between half and three-quarters of tree cover loss is permanent forest conversion for commodity production, including agricultural and mineral resources.[n; 131] So far, deforestation for commodity production is a small fraction of tree cover loss in Africa — only one to three percent of the total deforestation within high forest-cover countries in the Congo Basin.[132]

n. Deforestation in places like Indonesia has decreased in recent years, but levels of forest loss remain substantial.

Few new companies are making commitments; existing commitments lack ambition

Since the NYDF was endorsed in 2014, the number of companies that have committed to eliminating or reducing deforestation in their supply chains has almost doubled.[o] However, these companies, and the agriculture sector as a whole, are not on track to meet 2020 targets.[133] Most companies have yet to set verifiable targets to structure progress toward zero-deforestation goals and continue to decline to release information on implementation that would allow outside observers to assess progress.

In the past two years, the number of new companies making commitments has plateaued (**Figure 12**). One possible reason for this is that commitments made in the context of the Consumer Goods Forum, the TFA 2020, and the NYDF are time bound and linked to 2020.[p; 134] As such, companies may be reluctant to assume commitments that are unlikely to be met in the closing timeframe. Most companies that made pledges have commitments that cover only part of their supply chains and thus will not eliminate deforestation from the company's operations. Just under eight percent of almost 400 companies assessed have an ambitious **zero-deforestation commitment** that covers all the supply chains and sourcing regions where they have operations.[q] Ambitious, time-bound and measurable zero-deforestation commitments that cover all commodities, operations, suppliers, and sourcing regions of a company are more likely to lead to a reduction in deforestation from commodity supply chains.[135]

For the company commitments to effectively contribute to forest conservation goals, new and updated commitments from existing and new actors are essential.[136] Those that are largely missing and need to be included in supply-chain efforts are smallholders, small and medium enterprises in forest countries, the financial sector, and public and private actors in emerging economies. Smallholder and small companies need support through government and private action to transition to sustainable practices. Financial institutions can be motivated to eliminate deforestation from their investment portfolios through shareholder and civil society pressure, and actors in emerging economies can be targeted through a combination of outreach and cooperation.

New guidance may support the effective implementation of commitments

Companies have made some progress in implementing their commitments. However, so far it is unclear how effective they are because very few companies report on their actions in a meaningful and transparent way.[r] Only companies that are required to report on their compliance under certification schemes are reliably providing information.[s] This results in an

o. Based on data from Forest Trend's Supply Change Initiative. These include cattle products, soy, palm oil, and timber and timber products.

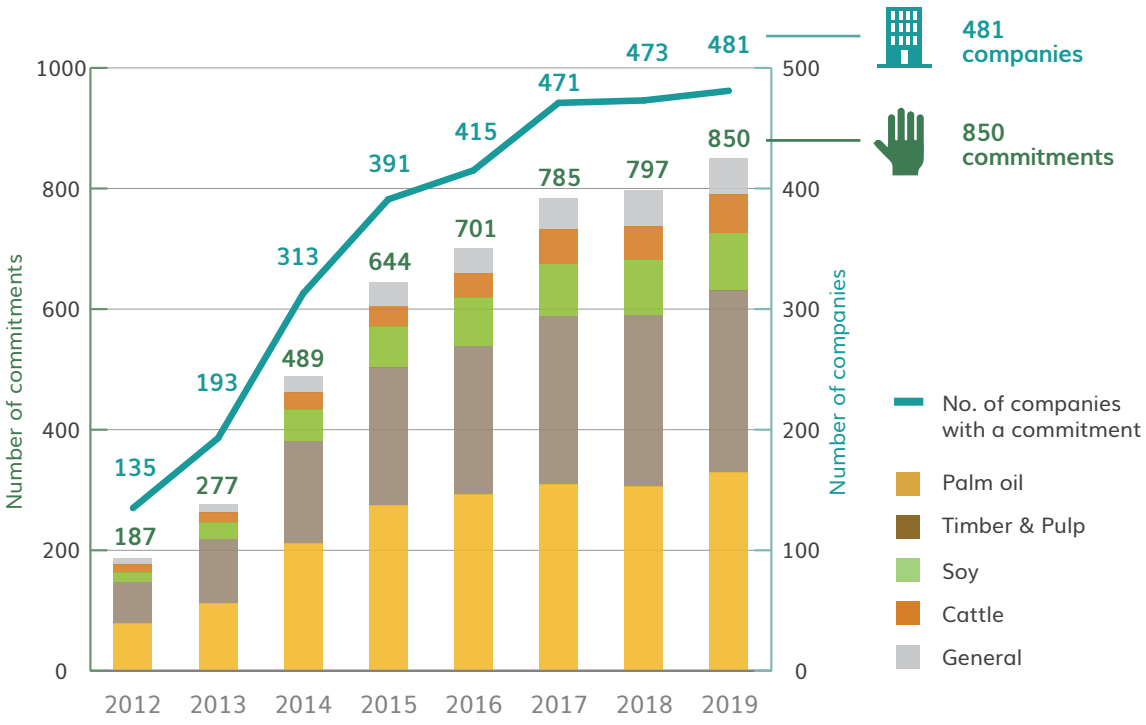
p. The Consumer Goods Forum (CGF) is a CEO-led organization that brings consumer goods retailers and manufacturers together globally to collaborate, alongside other key stakeholders, to secure consumer trust and drive positive change, including greater efficiency. In 2010, the CGF pledged to mobilize resources to help achieve zero-net deforestation by 2020. The Tropical Forest Alliance 2020 is a global public-private partnership in which partners take voluntary actions, individually and in combination, to reduce the tropical deforestation associated with the sourcing of commodities such as palm oil, soy, beef, and paper and pulp.

q. Based on data from The Soft Commodity Risk Platform (SCRIPT), a freely-available system to help financial institutions understand and mitigate the risks associated with financing companies in soft commodity supply chains. SCRIPT aggregates data from Forest 500, CDP, and SPOTT to assess companies' deforestation risks and progress made by companies in removing deforestation and associated impact from their commodity supply chains.

r. Only about a quarter of more than 1000 companies CDP has invited every year to disclose how they address their exposure to deforestation risks does so, and since the NYDF's endorsement, there has been little change in the number of companies reporting to CDP.

s. Of 1,165 companies tracked by SCRIPT, the majority (86 percent) of companies report at least annually or more frequently against their commitments for palm oil but far fewer companies report for soy (14 percent), cattle (7 percent), and timber (26 percent). The comparatively better reporting in palm oil is largely because of existing reporting requirements under the Roundtable for Sustainable Palm Oil (RSPO) certification.

Figure 12. Forest-related commitments in different commodity supply chains



Source: Compiled by Climate Focus based on data provided by Forest Trend's Supply Change Initiative.

incomplete understanding of the status of company-specific and aggregate implementation progress. Another challenge is that the information reported is often not standardized and comparable indicating a need for guidance to inform the design, implementation and monitoring of these commitments.[137]

Moreover, there remain significant data gaps around companies' exposure to deforestation risks in their supply chains. Many companies find it difficult to trace products to their point of origin and determine whether they are linked to deforestation. The level of fragmentation in the sourcing determines the complexity of supplier engagement and actions needed to ensure a supply is deforestation-free. Most companies only engage with their direct suppliers to ensure compliance with their sourcing requirements. This leaves millions of smallholders — who form a significant production base in the palm oil sector in Indonesia and the cocoa sector in West Africa — lacking the adequate technical and financial capacity to meet deforestation-free supply-chain goals.[138]

To address these challenges, civil society organizations collaborated to develop the Accountability Framework — a common set of norms and guidelines for companies and others working to address deforestation, ecosystem conversion, and human rights violations.[139] In addition, several forest monitoring and supply-chain traceability tools have been developed that can support companies' implementation and monitoring efforts (**Box 4**). While these tools can help standardize implementation and reporting, better legislation and policies from both producing and importing countries and by financial institutions are also needed (see **page 51**).

Box 4. Examples of civil society tools to enable accountability

The **Accountability Framework initiative** is a set of norms and guidelines that clarifies good practice for setting, implementing, monitoring, verifying, and reporting on supply-chain commitments.

Global Forest Watch (GFW) Pro is an online application tool for companies and financial institutions designed to support them in managing deforestation risks in their portfolio. Using GFW Pro, they can plot the location of farms, production facilities, or municipalities to track environmental risks such as tree cover loss and fires occurring in these areas, and to monitor progress over time.

The **Proforest Soy Toolkit** provides a guide for companies and decision makers on existing and emerging solutions available at each of the key stages of the soy supply chain for decoupling soy production and trading from deforestation.

The **Supply Chain Solutions Center** — facilitated by the Environmental Defense Fund — provides a pool of resources and best practices around sustainable supply-chain management to support companies in developing and implementing their sustainability plans

Trase is an open-access online platform that connects different data sources to map commodities from sub national places of production via the trading companies to the countries of import, showing the links between consumer countries, trading companies and deforestation risks in sub-national regions of production for soy from Brazil, Paraguay and Argentina, cattle from Brazil and Paraguay, Indonesian palm oil and Colombian coffee.

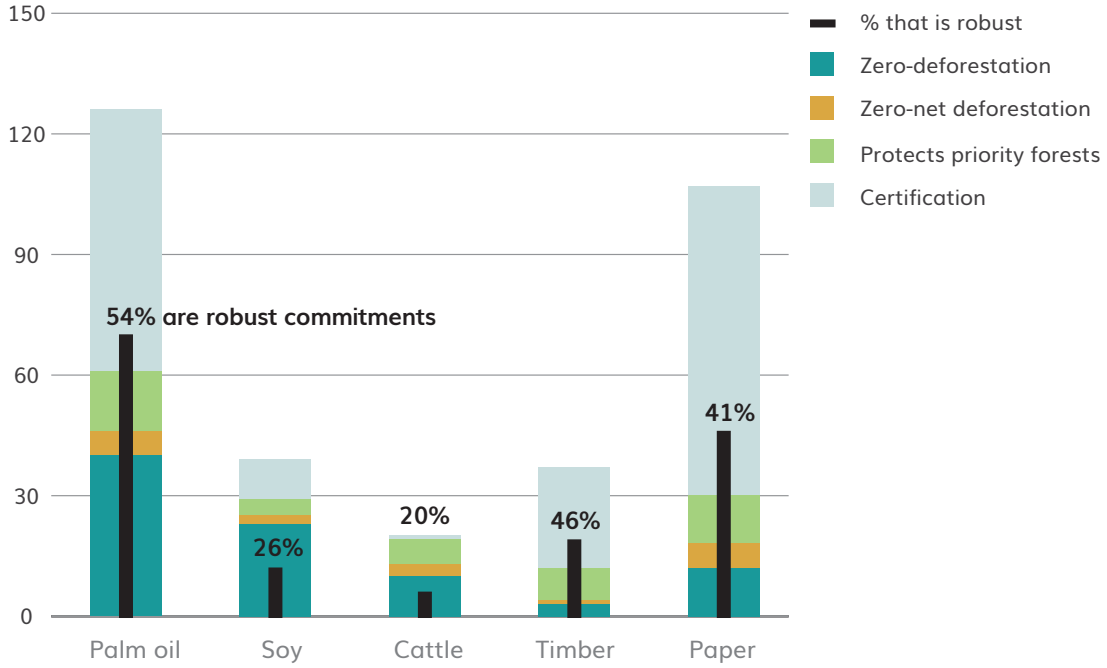
Certification may help to focus company commitments

Companies rely on a mix of internal company policies and sectoral standards to implement their commitments. The particular set of strategies depends on the national and supply-chain contexts. Some commodity supply chains, such as beef and soy in Brazil, involve large agribusinesses, whereas others, such as palm oil in Indonesia, significantly involve smallholders.[140] The various forms and complexity of these supply chains make it difficult to define generally applicable strategies that address deforestation.

In the case of palm oil in Indonesia and Malaysia, many companies have made individual zero-deforestation pledges and commitments to procure certified palm oil. In these regions, there is also growing collaboration among the private sector, civil society, and government at the jurisdictional level (e.g. a province or state), such as the Roundtable for Sustainable Palm Oil (RSPO) jurisdictional certification in the Seruyan district in Central Kalimantan in Indonesia. In 2018, over a third of major palm oil companies exposed to risk of deforestation in their supply chains had a zero-deforestation commitment (**Figure 13**).[141] Compared to other commodities, palm oil companies tend to have stronger commitments, meaning they are more likely to be linked to certification, cover all of their suppliers, and include verifiable actions and time-bound targets close to 2020. However, the voluntary nature of certification schemes, their slow uptake, and their small market coverage — only 19 percent of global palm oil is RSPO-certified — constrain their impacts in protecting forests.[142]

In the soy sector in Latin America, the Amazon Soy Moratorium — which effectively banned sourcing from deforested areas — remains one of the most effective supply-chain interventions to date. Even though there is indication that the Moratorium has led to some displacement of deforestation to the Cerrado region, it has achieved its goal of curbing deforestation driven by soy in the Brazilian Amazon. Deforestation from soy production fell from 30 percent in 2004 to almost 1 percent in 2013.[143]

Figure 13. Company commitments by commodity and content, and share of company commitments that are robust, in percent



Note: Total number of companies with a commitment for each commodity: Palm oil (126), Soy (39), Cattle (20), Timber (36), and Paper (107). Commitments are defined as "robust" if they apply to all regions, all operations, all suppliers, have a current deadline or at least 2025 or earlier, and specify milestones.

Source: Compiled by Climate Focus based on 2019 data provided by Global Canopy's Forest 500 Project.

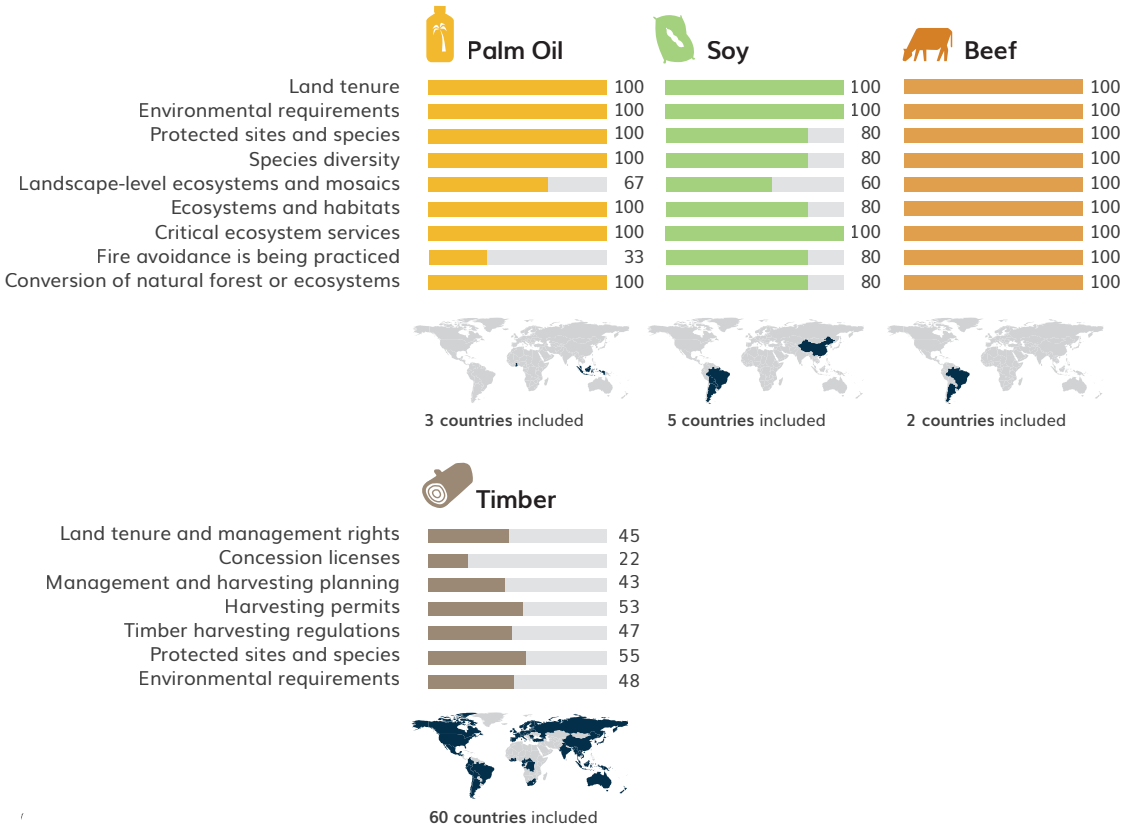
An agreement to curb the loss of vegetation in the neighboring Cerrado biome in Brazil could prevent an estimated average loss of 0.14 million hectares of native vegetation per year.[144] However, this idea has been resisted by several large companies in the soy sector.[145] In 2017, Brazilian NGOs released the Cerrado Manifesto, a call for "immediate action in defense of the Cerrado by companies that purchase soy and meat from within the biome, as well as by investors active in these sectors."[146] While 70 global consumer goods companies endorsed a statement of support for the Cerrado Manifesto's objectives, no collective agreement has yet been reached within the Cerrado Working Group to define the mechanism by which legal deforestation and the conversion of native vegetation would be reduced. At the moment, up to 11 million hectares of the Cerrado are at risk of legal conversion.[147]

Sectoral supply-chain measures in the cattle sector in Latin America have had little impact so far on deforestation. Zero-Deforestation Cattle Agreements in Brazil committed meatpacking companies to block sales from properties with deforestation.[148] Since their adoption, they have been effective in changing companies' purchasing behavior and sourcing criteria, but their success in avoiding deforestation was limited. Some suppliers decreased deforestation on their properties, but deforestation on others increased.[149] Furthermore, the original intent of the cattle agreements was to include both direct and indirect suppliers yet, until recently, technical limitations only allowed for verification of direct suppliers.[150] In 2017, the industry began addressing indirect suppliers through the Indirect Suppliers Working Group.[151]

Lack of prosecution of illegal deforestation amplifies risks of forest loss

While legal deforestation and forest conversion continues, the risk of laws being broken in the production of agricultural commodities also remains high (**Figure 14**). A critical factor in many countries is a lack of cross-sectoral coordination among entities whose decisions impact deforestation.[152] In Brazil, weak enforcement has encouraged noncompliance with forest laws, such as cattle ranchers illegally clearing forests for grazing.[153] The rapid undermining of institutions enforcing forest laws and monitoring deforestation under the current government administration further encourages illegal land conversion.[154] Similarly, in Argentina, forests are often cleared for cattle production without necessary authorizations and permits.[155] In the main palm oil producing regions in Indonesia and Malaysia, the risk that laws are not respected by palm oil companies also remains high.[156] A Greenpeace analysis of 11 civil court cases in Indonesia from 2012–18, revealed that plantation companies failed to pay approximately USD 1.3 billion in fines and penalties associated with illegally clearing land with fire and logging.[157] Similarly, several corruption cases in Indonesia that involve bribes in exchange for the issuance of plantation permits have been reported. In 2014, it was reported that a third of regents (district heads) across the country were under investigation for corruption.[158] Three quarters of the world's top 60 timber-producing countries also show risks of bribery, violating forest management requirements, and improperly acquiring permits for timber trading and transport.

Figure 14. Legality risks in forest and agricultural commodity supply chains as of 2017



Source: Climate Focus analysis based on 2017 data on country-level legality risk assessments from Nature Economy and People Connected (NEPCon)'s Sourcing Hub.

Stepping up demand-side action is essential

The timber sector shows that demand-side regulatory measures by importing countries can be very effective. The Lacey Act in the United States and the Timber Regulation in the European Union put the onus on importers to prove the legality of the timber that enters the US and the EU respectively. The EU Timber Regulation accomplishes this by being linked to the Forest Law Enforcement, Governance and Trade Action Plan and, as such, serves as a form of systematic support for **forest governance** (see **Goal 10**).

Governments of major consumer countries are also making pledges and developing strategies to eliminate imported deforestation from other, non-timber commodity supply chains. The signatories of the Amsterdam Declaration, a non-legally binding commitment signed by several European countries in 2015, support the implementation of private-sector commitments under the NYDF and includes a partnership that aims to promote learning and policy coordination with supply-chain initiatives in producer countries. Additionally, in November 2018, the government of France adopted a "National Strategy to Combat Imported Deforestation." It aims to end deforestation caused by importing "unsustainable forest and agricultural products" by 2030 by encouraging every actor in the supply chain to change their practices to reduce deforestation.[159]

Developments in emerging consumer countries like China are encouraging but have not yet resulted in substantial outcomes. For example, in 2019, COFCO International — the overseas trading arm of the China National Cereals, Oils and Foodstuffs Corporation (COFCO), China's largest state-owned commodity processor and trader — became a member of the Roundtable on Responsible Soy. They also joined the Soft Commodities Forum of the World Business Council for Sustainable Development, with a focus on tackling deforestation from soy production in the Cerrado.[160] Similarly, the leading Chinese forest products enterprises jointly declared they would establish a global green supply-chain initiative with the aim of ensuring forest sustainability both in China and abroad.[161]

While these efforts are marking a first step in the right direction, advocates have called for firm regulatory measures similar to those adopted with the EU Timber Regulation and the US Lacey Act to ensure the action plan succeeds.[162] In the United States, California passed the "California Deforestation-Free Procurement Act" that requires all companies contracting with the State government in the provision of tropical deforestation-risk commodities like cattle, palm oil, soy, paper/pulp, rubber, and timber to demonstrate deforestation-free supply chains.[163]

In July 2019, the European Union released a Communication on "Stepping up EU Action against Deforestation and Forest Degradation."[164] It recommends an assessment of regulatory measures to "ensure a level playing field and a common understanding of deforestation-free supply chains, in order to increase supply-chain transparency and minimize the risk of deforestation and degradation associated with commodity imports in the EU." The Communication also sets out a framework with five priorities that include reducing the EU's consumption footprint on land and encouraging the consumption of products from deforestation-free supply chains in the EU. It also endorses partnerships between producer and consumer countries, businesses, and civil society to deliver on these commitments. To achieve these priorities, the Communication proposes concrete actions, including a multi-stakeholder dialogue with member states on deforestation, stronger standards and certification to promote deforestation-free commodities, and developing and implementing incentive mechanisms for smallholder farmers.

Financial institutions are not yet using their influence to protect forests

Based on an assessment of 150 financial institutions at risk of contributing to deforestation through investing directly in or lending to companies engaged in forest risk commodity supply chains,[t] the overall proportion of financial institutions that have adopted policies to discourage deforestation remain low. Across commodities, an average of 20 percent of financial institutions have policies in place to protect priority forest areas. Even fewer have traceability requirements that would ensure a clear understanding of the activities that their finance is going to. Some financial institutions require companies active in palm oil to demonstrate certification from the Roundtable for Sustainable Palm Oil. There is no matching requirement for other commodities. Only over half of the financial institutions who have set commodity-specific policies have developed processes to identify and address non-compliant companies in their portfolios.

Transformation requires individual commitments and collaborative approaches

Commitments are more effective in achieving conservation and sustainability outcomes at the sectoral level, when they are complemented and supported by public sector action (see **Indonesia case study** on **page 53**).[165] Governments in producer and consumer countries must step up efforts to improve forest governance and enforcement of existing laws and regulations (see **Goal 10**), including increasing transparency and addressing deforestation through trade regulations. Similarly, civil society organizations have an important role to play in driving action in agricultural supply chains, as they can enable and create pressure for corporate and government action. Non-governmental organizations can influence private acts by creating public pressure or by providing technical assistance and consultation on the various actions needed to improve supply-chain transparency and governance.

Jurisdictional approaches allow for integrated management of landscapes, including areas of commodity production at the forest frontier. These approaches can be civil society-, government- , or private-sector led, and the focus is on helping tropical forest regions adopt sustainable production methods across larger landscapes. TFA 2020 has counted about 95 jurisdictional initiatives,[166] and the Earth Innovation Institute identified 38 jurisdictions in 12 tropical forest countries, which have signed formal commitments to either slow down deforestation and/or to promote reforestation.[167] However, increased efforts need to devise strategies covering areas with high levels of commodity production. In most jurisdictions there is also a need for improvement of robust, transparent, and feasible monitoring and reporting as well as technical and financial support. While jurisdictional approaches hold potential, so far data on impact are lacking.

t. Forest 500 identifies and ranks the 150 financial institutions that have the power to incentivize a market-wide shift toward sustainable supply chains due to their financial links to 350 companies that play a major role in forest-risk commodity supply chains.

CASE STUDY

Indonesia: A sign of hope for reducing deforestation?

Actions to reduce forest loss contend with diverse drivers

Since 2002, Indonesia has lost more than nine million hectares of its primary forests — an area the size of Portugal — to palm oil plantations, forest fires, small-scale agriculture, timber plantations, infrastructure, and mining. Palm oil plantations caused the largest portion of forest loss between 2001–16, driving 23 percent of deforestation, while fires were responsible for converting large forest areas to grass and shrublands (causing 20 percent of nationwide deforestation).[168] The year 2015 was particularly dry, leading to an unusually high number of forest fires.[169] The impact of forest fires masked a reduction of deforestation driven by other causes in the years 2014–16 (**Figure 15**).

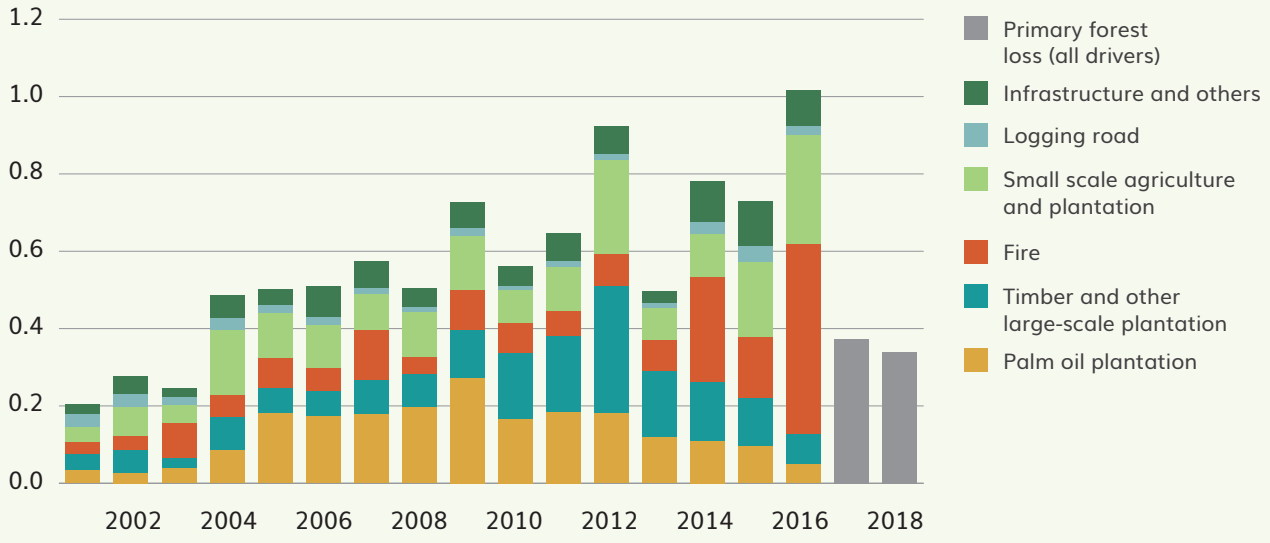
A confluence of factors, including actions taken by government, the private sector, and civil society organizations, and favorable weather conditions, resulted in a recent sharp reduction of deforestation. In 2017 and 2018, the rate of primary forest loss dropped by more than 30 percent compared to the average annual loss rate over the reference period of 2002–16 (see **Figure 15**). Regionally, the islands of Kalimantan and Sumatra experienced the largest dip in primary forest loss, with deforestation falling by 68 percent and 51 percent, respectively, from 2016 to 2017.[170] Rewarding recent successes, Indonesia is expecting a first payment from the Government of Norway under the 2010 Co-operation Agreement on REDD+.[171]

The price of crude palm oil has been steadily dropping over the past eight years, which could play a role in slowing palm oil expansion.[172] Wet weather conditions also contribute; increased rainfall in 2017 and 2018 led to a naturally reduced risk of forest fires.[173] Between 2005–17, the area of peatlands burned fell by more than 98 percent.[174]

Government policies urge increased forest protection

However, conservation efforts by the government and private sector in the palm oil and timber industries also contributed to the reduction in forest fires and land conversion.[175] In 2011, the government issued a national moratorium on new concessions on

Figure 15. Annual primary forest loss area by disturbance 2001–16, in million hectares



Source: For 2001–16, Austin, K. G., Schwantes, A., Gu, Y., & Kasibhatla, P. S. (2019). What causes deforestation in Indonesia? Environmental Research Letters, 14(2), 024007; For 2017 and 2018 data, Hansen, M. C., Potapov, P. V., Moore, R., Hancher, M., Turubanova, S. A., Tyukavina, A. et al. (2013). Tree Cover Loss (Hansen/UMD/Google/USGS/NASA). Global Forest Watch database.

primary forests and peatlands for palm oil and timber plantations and logging activity , protecting about 55 percent of Indonesia's peatlands.[176] Since then, the moratorium has been extended several times, and in August 2019 it was made permanent.[177] In 2016, as a first step toward a full moratorium, the government issued a moratorium on the conversion of peatlands.[178] The Ministry of Environment formulated supporting technical guidelines applicable to all private and public actors for peat management and ecosystem recovery.[179] The government has also taken preventative measures against the use of fire in land management, strengthened law enforcement, and supported awareness campaigns.[180] The new Peatland Restoration Agency rewetted 200,000 hectares of peat in 2017 and put a further 460,000 hectares of peatlands under restoration in 2018.[181] The government also established a land-swap program in 2017, which allows companies to exchange concessions in protected peat areas for other government-provided areas.[182]

Community forest management has also helped to protect forests. In 2014, the government adopted an ambitious target to allocate some 12.7 million hectares of forest land to marginalized communities under the Social Forestry Initiative, of which 2.7 million hectares have been assigned.[183] The program puts forest management back in the hands of local communities.[184]

Clear signs of reduced deforestation

Many palm oil companies have also adopted corporate zero-deforestation commitments, covering 86 percent of Indonesia's palm oil exports.[185] This led to 22 percent of Indonesian palm oil and 11 percent of palm oil plantations being certified by the Roundtable for Sustainable Palm Oil (RSPO).[186] A comparison of areas certified under RSPO and those not certified showed that certification reduced deforestation by 33 percent.[187] Stronger import regulations by the European Union (EU) have also boosted action by both the government and private sector to address deforestation in timber and palm oil supply chains.[188] Since 2016, Indonesia only exports verified legal timber and timber products to the EU.[189] Market pressure from the EU, improved forest governance, and law enforcement have likely made it harder for producers to expand production by clearing forests.[190]

A cautiously optimistic future

While there is clear evidence showing a sharp decline in forest loss in Indonesia over the past two years, linking this reduction to a specific set of factors is difficult. Various measures taken over several years — including the country's international commitments to reduce emissions, the bilateral agreement with Norway, and the government's reactions to the fires of 2015, as well as private sector-led sustainability and zero-deforestation initiatives — all contributed to bring forest loss under control. However, challenges remain as some of the newer programs still battle implementation problems (e.g. the land-swap program and the Social Forestry Initiative).[191] Furthermore, violence and criminalization continue against indigenous peoples and local communities (see **Box 10** on **page 79**). A new wave of fires in July and August 2019 is putting the recent policies to the test.[192] For Indonesia to maintain this downward trend in forest loss, the government, the private sector, and civil society organizations need to strengthen these positive measures and build on them to end deforestation in the country.

GOAL 3

Reducing deforestation derived from other economic sectors

Significantly reduce deforestation derived from other economic sectors by 2020.

Non-agricultural economic sectors — such as mining, oil and gas extraction, and infrastructure development — pose significant risks to forests. As global demand for mined and extracted products continues to grow, many forest countries continue to rely on the short-term benefits of large-scale infrastructure development at the expense of forest protection. Currently planned projects threaten intact forest areas in the Amazon, the Congo Basin, and Southeast Asia. In addition, the trend of changing the status of protected areas to facilitate new infrastructure development is concerning. At the same time, community-led movements against mining operations are gaining international recognition and winning some legal victories, while high-level support for mainstreaming forest and biodiversity protection across economic sectors has grown. However, this progress on awareness has yet to be translated into real transformation in these sectors' approach to forests.

Mining, extraction, and infrastructure pose clear risks for forests

While the direct "forest footprint" of mining and oil and gas extraction is often quite small, the risk of deforestation and degradation greatly increases where concessions for mining, oil and gas, and other non-agricultural commodity extraction are allocated. As extraction sites are explored and developed, access roads and other complementary infrastructure are built. These, in turn, may drive migration and subsequent forest-clearing for agriculture or settlements, or forest degradation due to the collection of woodfuel or non-timber forest products to cover basic needs (see **Goal 4**).[193] At the same time, new roads and highway projects can make other deforesting activities, such as low-value, high-volume sand and gravel mining, more feasible and economically viable.[194] In this way, infrastructure acts as a "driver of drivers," with its impacts extending far beyond its footprint.

Furthermore, as the world becomes more urbanized and industrialized, the demand for products from mining and extraction activities continues to increase. Consumption of goods that rely on mineral- and metals-intensive technology show no signs of slowing.[195] On the contrary, demand for mined minerals is expected to grow as economies transition to renewable energy to reduce greenhouse gas emissions from energy generation.[196] A global shift to low-carbon technologies is estimated to require exponential amounts of minerals such as lithium, graphite, and nickel. This is because clean energy technologies, such as solar, wind, and battery storage, are more mineral-intensive than fossil fuel infrastructure. While recycling can cover some of this rising demand, most of it is expected to be met through increased mining capacity in mineral-rich developing and middle-income countries.[197] At the same time, until an energy transition is achieved, demand for fossil fuels is expected to grow and place forests at risk through new site development and expansion.[198] Growth in worldwide energy demand has increased sharply since 2015, with 70 percent of new energy demand met by fossil fuels.[199]

Sustainable and "forest-smart" mining is largely absent

The mining sector has made strides in recent years to design and implement approaches for responsible resource extraction, including specific consideration for forests and habitats. Five years ago, no sustainability certifications were available for the mining sector. Now, certification from the Aluminum Stewardship Initiative has been available since December 2017, and two new schemes — the Initiative for Responsible Mining's Standard for Responsible Mining, and the Responsible Steel Standard — are about to be launched.[200] Other initiatives provide information and guidance or seek to promote reporting on actions. However, uptake of responsible extraction practices is lagging, and there are concerns about their cohesion and effectiveness.[201] Recognizing these risks, the World Bank has developed a **forest-smart mining** initiative to better identify, understand, and mitigate the associated risks and impacts of extractive industries on forests. Since its inception, the initiative has conducted the most comprehensive research into the forest impacts of the mining sectors and did not find any examples of mining operations that were fully "forest-smart."[202]

Infrastructure booms stand to redraw global maps while fragmenting forests

The scale of planned road, railway, and energy infrastructure construction to strengthen regional and global connectedness is unprecedented. Economic development "mega-projects" planned across the Amazon and Indonesia, for example, are expected to fragment and degrade hundreds of thousands of hectares of intact forest.[203] Projects under China's Belt and Road Initiative span vast corridors across Eurasia and Africa and are expected to pass through important biodiversity hotspots, with negative impacts almost certain.[204] While China has policies in place to reduce the environmental — specifically forest and biodiversity — impacts of new construction, their effectiveness often depends on the capacity and enforcement of host country governments, which may be limited.[205]

Concern for forests lags among project finance lenders and investors

Coordinated efforts by financial institutions, the public sector, and civil society to reduce deforestation from mining, oil and gas, and other extractive sectors are still in their infancy. Though a number of financial institutions, led by the International Finance Corporation, have adopted lending standards that aim to reduce environmental impacts from extractive industries, these standards are often ineffectively applied.[206] However, growing awareness of the forest and climate impacts of these sectors may inspire an increased response from non-company actors.[207] For example, in May 2019, the World Bank launched the Climate-Smart Mining Facility, a multidonor trust fund whose mandate in part includes reducing mining-related deforestation through forest-smart mining. With a total investment goal of USD 50 million over five years, the Facility will work to help countries limit the negative environmental and social impacts of new and expanded mining operations. At the same time, this amount is a drop in a bucket compared to the actual costs of cleaning up mining sites and preventing future damage.

Though investors in extractive projects have largely declined to prioritize forest impacts in their investment decisions, recent investor actions regarding tailings dam[u] safety demonstrate the power of the financial sector to inform sector practices. The past five years have seen an increase in tailings dam collapses around the world.[208] A 2019 tailings dam rupture in Brazil, for example, resulted in over 200 deaths and the destruction of at least 269 hectares of native Atlantic Forest.[209] After the dam collapse, institutional investors demanded that hundreds of mining companies fully disclose safety details on their facilities.[210] The power to demand disclosure and transparency could be harnessed to increase the adoption and application of forest-specific safeguards to "green" the currently "grey" investments on mining and extraction (see **Goal 8** for **green and grey finance**).

u. Tailings dams are one of the most common structures for storing mining waste.

Extractive growth dominates, but community-led protests are pushing back

Traditional economic development models have been geared toward economic expansion, with few built-in incentives for forest protection or restoration.[211] Because of high opportunity costs for forest conservation, as well as a political inertia against change, many governments in high forest-cover countries struggle to reorient development models toward forest-friendly approaches.

As some tropical forest countries seek to implement economic development plans based on infrastructure expansion and extractive activities, they often resort to changing the status of protected areas to facilitate new construction. Such actions — known as **protected area downgrading, downsizing, and degazettement** (PADDD) — can sometimes be implemented in an effort to improve the effectiveness of the protected areas that remain.[212] However, in others, the reclassifications fail to incorporate local opinion and accurately assess the expected ecological impacts of the resulting projects.[213] A significant proportion of PADDD in Brazil has been implemented to facilitate the construction of new energy infrastructure such as hydropower.[214] Recently, the current government administration announced its intention to subject over 60 protected areas to PADDD expressly to facilitate further infrastructure construction.[215]

This trend of backtracking environmental advances is fueled in part by competing economic interests. Despite risks to forests, governments regularly transfer rights to utilize and extract natural resources through concessions to private companies to encourage further economic growth.[216] Continued investment in forest-risk activities can be explained in part by the pull of pre-determined development pathways. These pathways may come in the form of regional energy and infrastructure integration commitments; economic growth policies built around natural resource use and export; and reforms to policy, laws, and regulations to spur investment in previously protected areas.[217] In addition, corruption can be a major driver of political resistance to change.[218]

Though many dominant approaches to economic growth are at odds with conservation efforts, development models can be designed to avoid or minimize forest impacts.[219] Community-led protests against extractive growth models and infrastructure development, which often promote alternatives as well, have achieved increased awareness on the international stage through alliances with international organizations.[220] Often relying on a discourse of rights for indigenous peoples and local communities, these efforts have recently achieved legal victories in some countries while facing opposition and further threats in many others.

Indigenous communities in Ecuador have recently won major court cases against the government and extractive companies, building on a long tradition of legal advocacy for community rights to protect their environment. In October 2018, the Cofán community of Sinnagoe won their lawsuit to cancel mining concessions in their territory because community consultations were never conducted.[221] In May 2019, a lawsuit contesting the flawed consultation process when the Government of Ecuador put the Waorani indigenous community's territory in the southern Amazon up for sale in an oil auction led to the same outcome.[222] These victories reinforce the importance of free, prior, and informed consent and communities' right to self-determination (see **Goal 10**). However, around the world access to these legal processes remains unequal.

GOAL 4

Alternatives to deforestation driven by basic needs

> *Support alternatives to deforestation driven by basic needs (such as subsistence farming and reliance on fuel wood for energy) in ways that alleviate poverty and promote sustainable and equitable development.*

Individuals and communities in poorer developing countries often depend on forests for subsistence needs. Under certain socioeconomic conditions, these activities can become unsustainable, leading to deforestation and forest degradation. Triggers include a lack of livelihood alternatives — linked to a lack of clear land and resource rights and regulatory barriers to local economic opportunities — and increased population pressures. Most poverty and sustainable development interventions do not track forest impacts, making it difficult to determine how much support is specifically addressing forest loss. However, increased understanding of the local contexts of basic-needs activities can help to assess the efficacy of interventions like the formalization of small-scale mining and charcoal production and clean cookstoves.

Where basic needs cannot be met, forest ecosystems may suffer

As of 2019, nearly 20 percent of the world's population depends on forests and forest products to provide some or all of their livelihoods.[223] Forests also serve as places of spiritual and cultural importance for many populations. Livelihood activities in and near forests may include gathering materials to sustain subsistence, such as food and cooking fuel, as well as smallholder income-generating activities, such as market farming, artisanal and small-scale mining, and charcoal production. Forest loss from smallholder commercial activities is often related to rising demand from urban populations.[224] Such commercial operators often live near the poverty line and have no economic alternatives. Forest loss linked to poverty is often associated with a lack of available livelihood alternatives.[225] A survey of communities in Ghana found that 27 percent of people blamed a lack of livelihood alternatives for their need to engage in activities that are harmful to forests — including wood harvest, charcoal production, and hunting.[226] **Box 5** summarizes the most prevalent types of **basic-needs activities** associated with forest loss.[227]

Poverty needs to be addressed alongside conservation

Where basic needs drive deforestation and forest degradation, mitigating measures need to address poverty as a root cause of negative environmental outcomes. Examples of such measures for woodfuel collection and wood harvest include the development and scaling up of clean cooking solutions, the establishment of energy plantations specifically for woodfuel, and the implementation of **community forest management**. For subsistence and shifting agriculture, sustainable intensification interventions can encourage land-sparing. Other interventions may include securing land tenure for indigenous peoples and local communities and formalizing informal production and value chains. While support for these interventions

may also include finance and improvements in forest governance, these topics are covered in other sections of the report (see **Goal 8** and **Goal 10**, respectively).

In the last decade, great advances have been made in the efficiency and accessibility of clean cookstoves. More efficient cookstoves can reduce the use of woodfuels by 30 to 60 percent, resulting in decreased pressure on forest resources.[229] Furthermore, alternative fuels are becoming more economical with innovative financing schemes and government-backed programs.[230] Recent research from India demonstrates that transitioning to clean fuels, such as biogas, can promote forest regrowth.[231] New business models are also emerging to improve access and usage of clean cooking products, including pay-as-you-go models which allow the customer to purchase just as much fuel as they need without paying premiums for smaller sales units.[232] Likewise, some national governments have adopted policies — such as reduced taxes and tariffs — that support the growth of the clean cooking business.

However, there are still limitations to our assessment of the impact of clean cookstoves on deforestation and degradation reduction. Progress related to cookstoves remains concentrated in East Africa, with over 50 percent of tracked investment going to companies headquartered in the region.[233] Furthermore, while the number of cookstoves and fuels distributed in developing countries nearly doubled between 2015 and 2016, this does not necessarily reflect use. One study found that due to maintenance and practicality issues, the use of clean cook stoves in Malawi actually fell to 50 percent in 2017.[234] The government of Malawi recognized this challenge in cookstove utility when it adopted its National Charcoal Strategy that same year (see **Malawi case study** on **page 60**).

Box 5. Basic-needs activities driving forest loss

Swidden or "shifting" agriculture: Traditional practices that clear forest land for short-term cultivation before moving on and allowing forests to regenerate. The effect of swidden agriculture on forests depends on how much time fallow areas are given for regeneration and what type of clearing techniques are used.

Subsistence agriculture: Permanent crop production on land that is cleared only once. Subsistence level agriculture may lead to additional forest clearance through cropland expansion driven by population growth.

Wood harvest / woodfuel collection: Activities associated with the non-mechanized extraction of woody biomass from forests, especially for cooking or heating. Wood harvest for firewood or for charcoal production is primarily a driver of forest degradation rather than deforestation. Wood harvest can be part of the cultivation-fallow cycle for swidden agriculture.

Collection of non-timber forest products: The gathering, for household or commercial use, of forest products other than wood or timber (e.g. medicinal plants, bush meat, nuts, and fruits). Collection of these products may lead to forest degradation through the direct removal of biomass (e.g. plants) or through the disruption of natural regeneration processes (e.g. removing fruits before seeds can be dispersed).

Artisanal and small-scale mining: The unlicensed extraction of mineral resources. This type of mining may be conducted by individuals to provide some or all of their basic incomes or may be mechanized and organized under small businesses and contracts with larger companies.

Note: Livestock raising for household consumption and smallholder production and illegal crop cultivation by smallholders are also included in our Goal 4 analysis, though there is limited data of these activities' forest impacts.[228]

CASE STUDY

Malawi: Improving livelihoods through restoration

A growing population influences restoration priorities

Nearly 80 percent of Malawi's land area (8 Mha) is deforested or degraded.[235] Since 2000, the country has lost almost 11 percent of its tree cover mainly due to small-scale agriculture and wood collection and charcoal for household consumption.[236] Recognizing the disastrous impact of further forest loss on landscapes and livelihoods, in 2016, the Government of Malawi committed to restoring 4.5 million hectares of forests by 2030 under the Bonn Challenge.

More than 90 percent of the population depends on agriculture as a source of livelihood.[237] And nearly every household (97 percent) relies on firewood or charcoal as the primary source of cooking and heating fuel.[238] A rapidly growing population continues to put further pressure on the remaining forests. It is therefore not surprising that stakeholder consultations prioritized agricultural technologies, soil and water conservation, forest management, community forests and woodlots, and river and stream-bank tree planting as restoration activities (**Table 3**).[239]

Various approaches can support restoration

The Government seeks to achieve its restoration goals through a range of measures. To reduce the demand for charcoal and firewood with the goal of alleviating pressure on forests, and recognizing that the uptake and adoption of clean cookstoves has so far been limited throughout the country, the government has adopted a National Charcoal Strategy to promote alternative cooking fuels, the adoption of efficient cookstoves, and sustainable woodfuel harvesting and charcoal production.[240] The government plans to sponsor restoration interventions through the expansion of cash-for-work programs and incentivized grants or loans to smallholders while also adjusting or removing perverse incentives from subsidies and establishing a national restoration fund. It also supports farmer-managed natural regeneration, which restores soil organic matter, improves crop yields, and increases the supply of wood, fodder, fruit, and other products.

Trees on farms provide steady benefits

A new analysis[v] of two districts (Dowa and Mchinji) in Malawi shows that on-farm tree cover is quite widespread, indicating the utility of these trees for farm health. The maps in **Figure 16** show the percent of on-farm tree cover in 2009 (top) and 2017 (center), and the change in density between the two dates (bottom). The map of change shows that, overall, there was widespread stability in tree density, with a slightly a higher incidence of increase than decrease in the two districts collectively. Barriers to action include the perception that it takes a long time for farmers to realize the benefits of restoration and concerns that trees on the farm could reduce crop yield by taking up space otherwise dedicated to agricultural production.[241]

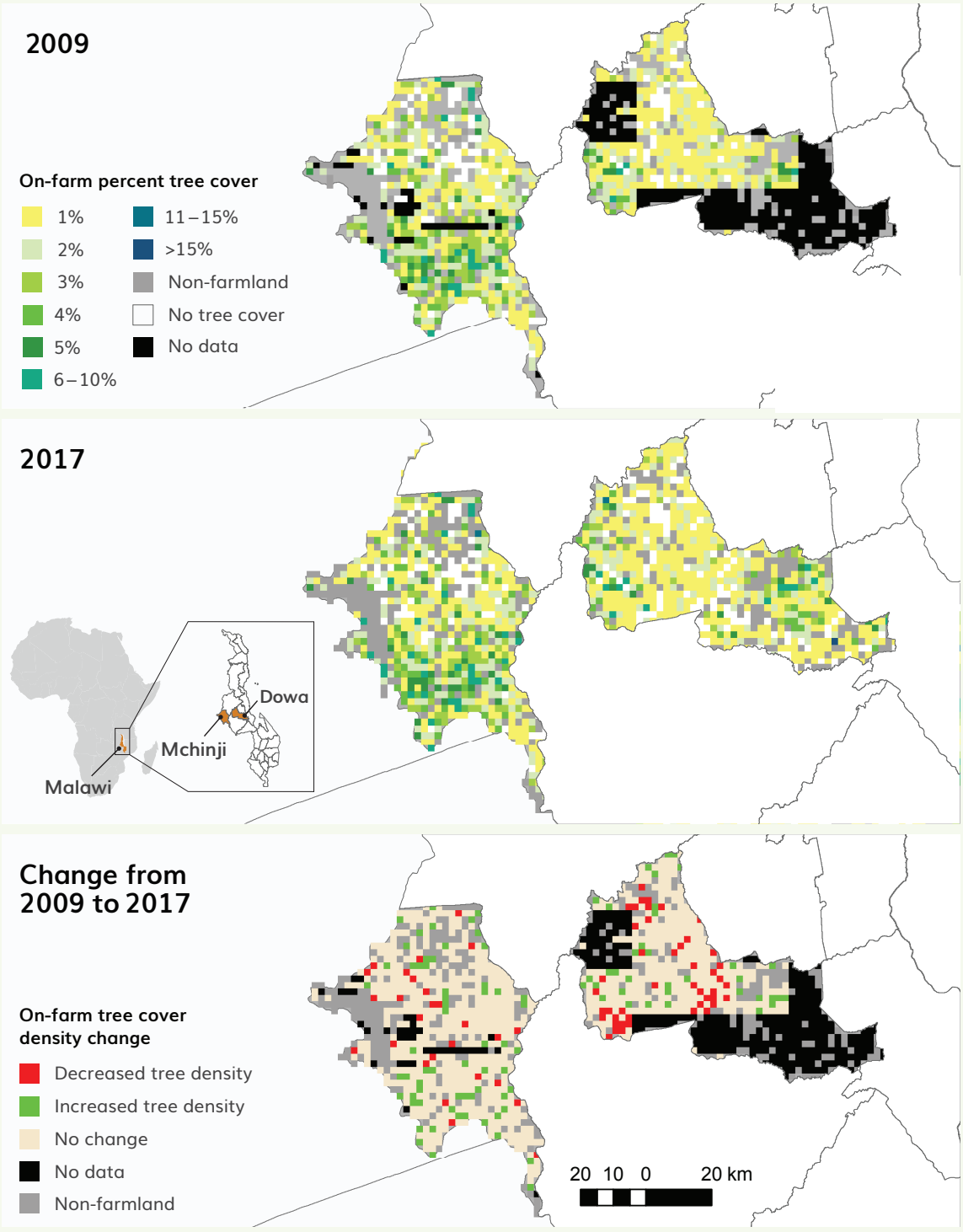
v. Analysis conducted by the United States Geological Survey analysis; see the full case study in the NYDF Goal 5 technical annex at www.forestdeclaration.org/goals/goal-5

Table 3. Priority restoration interventions

Priority restoration interventions	Opportunity area (ha)	Percent of the country
Agricultural technologies (conservation agriculture, farmer-managed natural regeneration, agroforestry)	3,730,790	39%
Forest management	3,401,279	36%
Soil and water conservation	1,043,768	11%
Community forests and woodlots	753,471	8%
River and stream-bank restoration	36,478	0.5%

Source: Republic of Malawi, The Ministry of Natural Resources, Energy and Mining. (2017). Forest Landscape Restoration Opportunities Assessment for Malawi, June 2017.

Figure 16. Comparison of on-farm tree cover in the Mchinji and Dowa districts of Malawi, in 2009 (top) and 2017 (middle), in percent, and direction of change between the two periods (bottom)



Note: These maps of on-farm percent tree cover were prepared manually from visual analysis of high resolution imagery from the years 2009 and 2017. The method used area frame samples spaced at 2-kilometer intervals on a regular grid. Percent tree cover was quantitatively measured using a 100-dot calibration grid within each area frame. Only area frames falling on cropland were analyzed for tree cover.

Source: U.S. Geological Survey (USGS) and U.S. Agency for International Development (USAID).

Vulnerable populations often operate in informal sectors

Work in unregulated, largely illegal sectors can place people outside of the security of public policies and limit investment into the sector. The informality of the charcoal sector in the Congo Basin, and high demand from urban areas, has led to a massive and inefficient production system with perverse economic incentives encouraging unsustainable wood harvest near cities (see **Congo Basin case study** on **page 63**).[242] Explicitly illegal operations, such as illicit crop production or illegal mining, similarly operate outside of policy frameworks meant to ensure sustainable forest use.[243] Deforestation rates as a result of illegal gold mining recently rose to a new record in the Peruvian Amazon. During 2017 and 2018, more than 18,440 hectares were cleared, the highest since 1985.[244]

The formalization of informal charcoal production and artisanal mining can reduce forest pressures from basic-needs activities.[245] Formalization can include the licensing and regulation of production and trade of forest products, in order to encourage the adoption of certain practices and technologies, while capturing tax revenue for the state.[246] It may also aim to clarify land tenure, which alongside forest monitoring and effective enforcement, can lead to reduced forest loss.[247] When forest communities have secure rights over their land, they are more likely to conserve and sustainably utilize that land,[248] resulting in higher carbon stocks,[249] better forest and biodiversity conservation,[250] and improved social and economic outcomes.[251]

Formalization has had demonstrated successes in improving producer and forest outcomes. In the charcoal sector, sustainable production has been shown to be possible when supportive policies are in place (e.g. protected harvest areas, intensive grazing, and fire management).[252] Factors like secure tenure, formalized production management, and strategic harvesting plans were found to reduce degradation in Tanzania, where charcoal and woodfuel constitute up to 90 percent of energy supply.[253]

However, formalization also carries risks. It can transform informal producers, who merely operate outside of mainstream economic pathways, into illegal operators, subjecting them to fines, displacement, or imprisonment.[254] In Guyana, attempts to formalize small-scale mining have been undermined by narrow interventions that target tenure security without providing additional state support and technical capacity building.[255] Furthermore, while formalization would provide security for miners operating at a basic-needs level, governments often restrict formalized mining to limit deforestation and other environmental degradation, thus removing mining as a livelihood activity.[256] Consequently, formalization has been shown to be most effective at improving safety, livelihood, and forest outcomes when initiatives include supplementary interventions like developing supportive legal frameworks; improving miner access to geological data, capital, and equipment; providing capacity building; and enabling stakeholder dialogue.[257]

Finally, activities such as community forest management can provide communities with new income and subsistence opportunities. In Guatemala's Maya Biosphere Reserve (MBR), this approach has proven to be effective at decreasing forest loss while maintaining livelihoods.[258] Communities manage concessions and are required to achieve and maintain Forest Stewardship Council certification within three years of being granted use rights, the costs of which are covered by donor support. In 2017, a sector of the MBR encompassing nine community forestry and two industrial forestry concessions experienced a net forest gain of a total of 1,088 hectares.[259] These concessions have created nearly 7,000 jobs, generated timber sales of nearly USD 50 million, and kept deforestation rates near zero.[260]

CASE STUDY

Congo Basin: Early warning signs point to major forest risk

Alarming deforestation trends in the Congo Basin

Between 2001–18, the Congo Basin lost over 22 million hectares of tree cover,[261] with disturbance rates reaching unprecedented heights in the last three years (**Figure 17**).[262] Since 2014, three countries — Democratic Republic of Congo (DRC), the Republic of Congo, and Cameroon — have lost 7.6 million hectares of tree cover, an area bigger than Panama.

Behind this forest loss lies a complex set of interdependent drivers related to human activities. Forces of socioeconomic change — such as population growth and rising global demand for commodities — are poised to realign economic relations in Congo Basin countries, putting the world's second largest tropical rainforest at risk. Weak governance indirectly exacerbates deforestation risks in the Congo Basin.[263] Especially in the DRC, the government remains absent in remote areas, often failing to address declining agricultural productivity, unemployment, and high fertility rates. The country also has a long history of conflict, severe poverty, and food insecurity, and one of the fastest-growing populations in the world (3.2 percent annually).[264] The absence of government engagement creates a vacuum in which people must fend for themselves, leading to unsustainable land use practices.

Historically, shifting agriculture and selective logging accounted for most of the forest degradation, but new threats from infrastructure and commodity agriculture could open the area to massive forest loss.

Shifting agriculture is a primary cause of tree cover loss in the Congo Basin

Between 2000–14, small-scale agriculture together with clearing for charcoal production drove 84 percent of tree cover loss in the Congo Basin (93 percent in DRC).[265] Shifting agriculture shapes over a quarter of all forested land in the Democratic Republic of Congo and accounts for 70 percent of total tree cover loss, with an average clearance cycle of 18 years.[266] For hundreds of years, subsistence farmers have manually cleared forests for cropland in a rotational fallow system. Traditionally, as productivity declines, farmers clear the next parcel, allowing secondary forests to regrow and soils to regain fertility. Thus, in this system, tree cover loss can be temporary.

Population increases put shifting agriculture systems under growing strain. Farmers face pressures to shorten shifting cultivation cycles, leading to declining overall productivity and eventual expansion of cropland through primary forest clearance. Similarly, in the absence of alternatives, the clearing of trees to produce charcoal and cash crops remains one of the few opportunities for the rural poor to earn cash, fueled by the demand from growing cities. Satellite data show that the rate of disturbance in primary forests and woodlands correlates with population growth and has doubled from 2001–14.[267]

Selective logging has outsized effects on emissions from forests

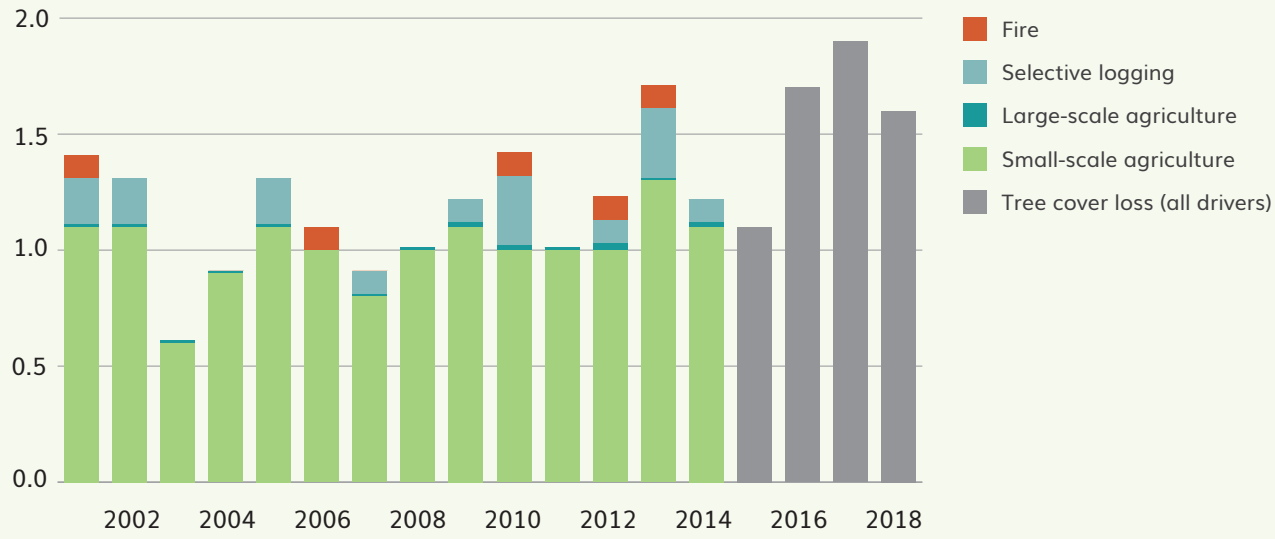
Selective logging is responsible for 10 percent of tree cover loss in the Congo Basin.[268] Its contribution may be even larger because logging roads often clear the way to undisturbed forest, and logging takes place in forests with higher carbon density than small-scale agriculture.[269] This impact is particularly evident in Gabon, Republic of Congo, and Cameroon, accounting for 62, 46, and 22 percent of tree cover loss, respectively.[270] The Chinese export market, the largest buyer of timber from the region, drives the selective logging industry,[271] with exports doubling between 2001–15.[272] Data also indicate a marked increase in small-scale artisanal logging.[273]

Infrastructure and agricultural expansion exacerbate forest threats

Infrastructure developments contribute to this trend by opening access for shifting agriculture into undisturbed areas.[274] The Congo Basin has seen a massive expansion of road networks since 2003 — the length of roads doubled within logging concessions and expanded by 40 percent in other areas.[275] Although other direct drivers such as mining, fire, or construction have relatively minor impact (0.04, 3.8, and 1.5 percent, respectively),[276] they facilitate encroachment of small-scale agriculture.

Though currently driving only one percent of forest loss in the Congo Basin,[277] large-scale agriculture is expected to drive a rapid increase in tree cover loss in the future. Farmers currently produce mainly for domestic markets, but a shift toward export-oriented production is underway, and a high share of land is allocated to foreign investors.[278] Several governments have adopted policies to increase commodity exports, further increasing the threat to forests.[279]

Figure 17. Annual forest loss area by disturbance driver in the Congo Basin, in million hectares



Note: Countries assessed include Cameroon, Central African Republic, Democratic Republic of the Congo, Equatorial Guinea, Gabon, and Republic of Congo. Specific drivers are not yet assessed for 2015–18.

Source: For 2001–14, Tyukavina, A., Hansen, M. C., Potapov, P., Parker, D., Okpa, C., Stehman, S. V., et al. (2018). Congo Basin forest loss dominated by increasing smallholder clearing. Science Advances, 4(11), eaat2993; For 2015–18 data, Hansen, M. C., Potapov, P. V., Moore, R., Hancher, M., Turubanova, S. A., Tyukavina, A. et al. (2013). Tree Cover Loss (Hansen/UMD/Google/USGS/NASA). Global Forest Watch database.

Multiple threats position the world's second largest tropical forest for drastic change

Even without evidence clarifying the underlying dynamics of canopy loss, fallow periods, and the recovery of secondary forests, it is clear Congo Basin forests are disappearing faster than they can recover. These forests face increasing threats from small-scale, shifting agriculture aiming to meet local needs and those of nearby cities.[280] Additionally, the use of fire by farmers to clear shrublands are putting these forests at increasing risk. These fires may rapidly grow out of control and the Congo Basin governments' lack the capacity — both technically and financially — to fight them.[281] With the pressures of incipient industrial agriculture, mining, and infrastructure, forest loss is on a path to become even greater without urgent intervention and sustainable use.

Preparing the grounds for forest action: Finance and governance

Ending deforestation depends on fundamentally realigning incentives

Successfully ending deforestation depends on reorienting the larger systemic levers that guide and determine economic development. These levers include the economic incentives driven by patterns of consumption and investment, and the political incentives and policy signals determined by government regulation. Changing trodden economic pathways requires appropriate disincentives, sanctions, and safeguards. Realigning global financial flows to consider forests is essential to build a "deforestation-free economy", as is strengthening institutions and designing policies to serve the human need for sustainable, accessible, and functioning forest ecosystems.

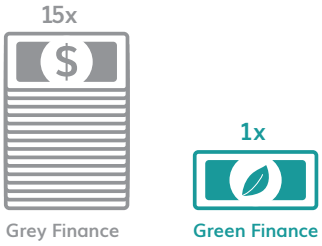
Achieving international and national forest goals is not possible without dedicated and reliable financing from domestic, international, public, and private sources. There is a need for new finance, but equally or even more necessary is shifting existing funds from traditional to sustainable investments. Financing a transition toward healthy and productive landscapes requires a shifting of baseline **"grey" financing** to **"green" financing**, paired with direct support for measures that address direct and indirect drivers of forest loss. This includes support for the sustainable production of agricultural commodities, in particular products that are associated with healthy and sustainable diets; strong safeguards around necessary infrastructure and mining investments; and support for programs that address the

Figure 18.

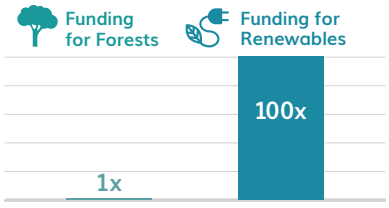
Key messages: Finance and governanace

NYDF Goals 8, 9, & 10

Successfully ending deforestation will depend on reorienting the larger systemic levers that guide and determine economic development.



Mainstream finance still has to shift away from business-as-usual investments that lack strong safeguards for forest protection. Grey development finance for agriculture in tropical deforestation countries dwarfs climate mitigation finance with a forestry objective.



More new finance is needed. Green finance for forests amounts to just under USD 22 billion since 2010. The renewables sector has received over 100 times more finance commitments in the same period.

Indigenous communities manage at least **22%** of the total carbon stored in tropical forests.

Improvements in forest govenance have been too slow to effectively protect forests. This includes land titling, transparency, adoption of policies, and strengthened law enforcement.

underlying drivers of forest loss, most notably, poor governance and a lack of alternative development options.

Though many forest countries have started on the path toward improved forest governance — strengthening transparency and participation policies and pledging to recognize community land tenure — progress is materializing too slowly to prevent incursions into some of the remaining intact forest landscapes on Earth. In general, forests are still considered a niche issue, to be dealt with on the sidelines of the economic and political system, rather than as a defining issue to guide every economic and political decision-maker.

This chapter presents findings from our evaluation of progress toward improving the conditions that enable forest protection and restoration (**Figure 18**) — the provision of finance for forests (**Goals 8 and 9**) and the strengthening of forest governance (**Goal 10**), including transparency, the rule of law, and the empowerment and rights of indigenous peoples and local communities (IPLCs).

GOALS 8 AND 9

Mobilizing finance for forests

Provide support for the development and implementation of strategies to reduce forest emissions.

Reward countries and jurisdictions that, by taking action, reduce forest emissions — particularly through public policies to scale-up payments for verified emission reductions and private-sector sourcing of commodities.

Finance has yet to shift from baseline, business-as-usual investments in forest-risk activities to investments with clear conservation goals — or at least those which apply strong safeguards for forest protection. Green finance for forests from donors flowing into countries with high levels of deforestation amounts to just seven percent of the grey finance for agriculture from the same sources. Companies and governments continue to provide subsidies and support to activities that potentially harm forests, and financial institutions and lenders lack the safeguards to ensure that investments and finance are sustainable. In addition to redirecting finance, more new finance is needed to protect and enhance forests. Green finance for forests captured by this report is under USD 22 billion, and there has been a minor increase (9 percent) since our in-depth assessment of the NYDF finance goals in 2017. Comparatively, since 2010, the renewables sector alone has received over 100 times more commitments of finance than forests.

Green finance for forests is 1.5 percent of climate mitigation finance from donors

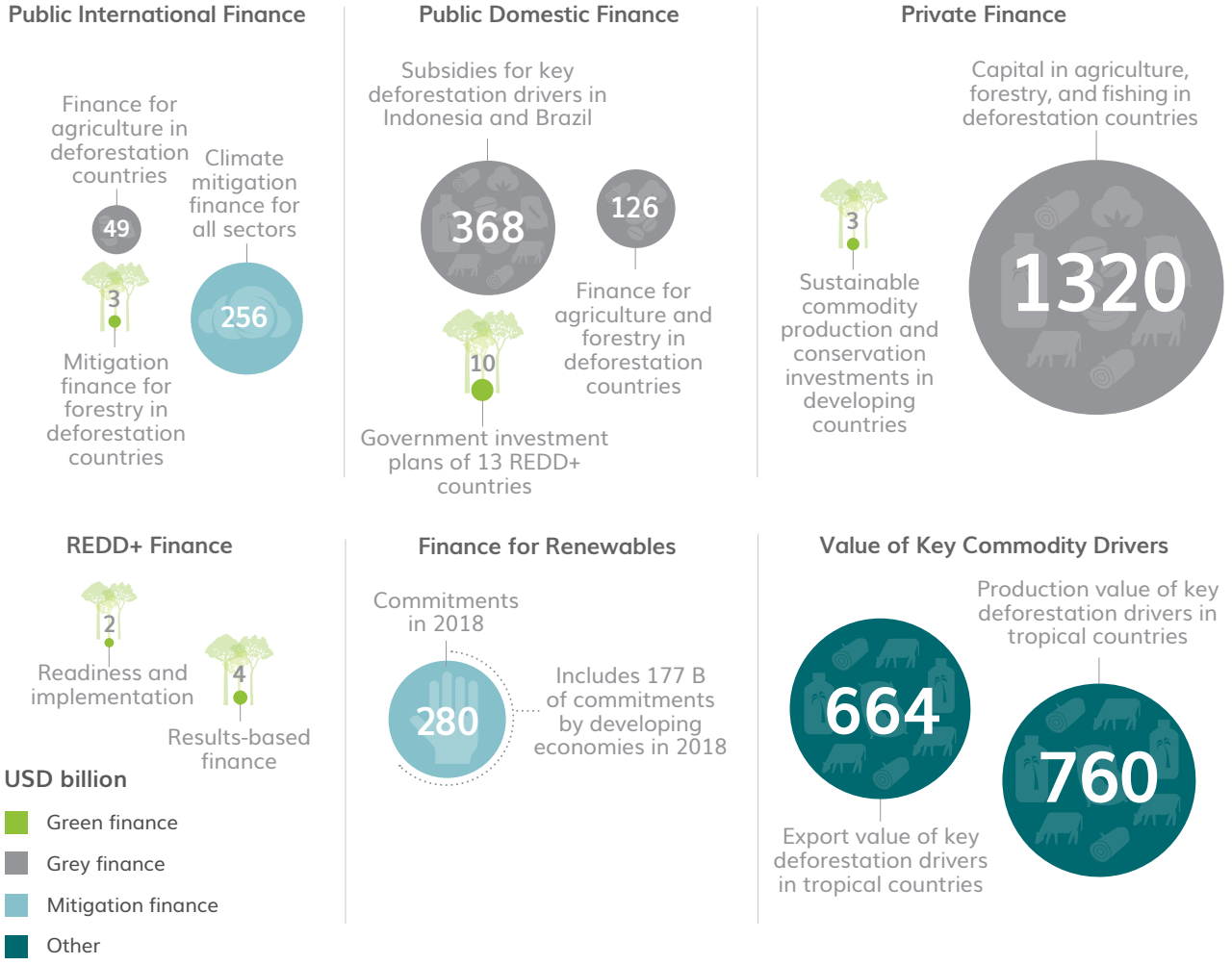
Finance specifically earmarked for protecting and enhancing forests (green finance) is far outweighed by financial flows to sectors with unclear or negative impacts on forests (grey finance) (**Box 6**). Demand continues to promote extractive growth models that tear forests down through infrastructure development and concessions for private-sector resource extraction on forest landscapes. This is intensified by financial institutions and lenders that continue to direct finance flows to support unsustainable and forest-risk activities and governments that have not yet brought forests to the forefront of policymaking and enforcement. In tropical countries with high deforestation, over 15 times more public finance from international donors goes to the agriculture sector than climate-mitigation finance with a forest objective.[w; 282]

Green finance commitments for the development and implementation of strategies to reduce forest emissions remain far below the level needed to halt deforestation and support the enhancement of forest landscapes. While estimates of the exact amount of finance range widely (**Box 7**), it is clear that current commitments are not enough and tens of billions of US dollars more are required to advance and scale efforts. Forests also stand at a disadvantage to other sectors when it comes to climate finance. Current finance does not match the mitigation potential of protecting and restoring forests. Support for forests in

w. For the purposes of this assessment of finance for forests, we consider "deforestation countries" to be developing countries with high deforestation (>30,000 hectare gross forest loss in the period 2010–15).

tropical deforestation countries amounts to only USD 3.2 billion of the USD 256 billion (1.5 percent) committed by multilateral institutions and developed country donors since 2010 to climate change mitigation.[283] In total, just under USD 22 billion in green finance for forests has been committed since 2010 from public and private sector sources (**Figure 19**). The renewables sector received over 14 times more commitments (USD 280 billion) in 2018 alone.[284] While a major source of finance for forests has been from international donors, over half of the commitments in the renewables sector comes from (177 billion in 2018) from developing economies (e.g. China and India).

Figure 19. Estimates of green and grey finance flows captured by this report (since 2010)



Note: Estimates of grey finance and non-forest climate mitigation finance are included for illustrative purposes to demonstrate the opportunity for shifting existing finance toward forest conservation outcomes and the need to increase finance for forests to be in line with their potential to contribute to climate change mitigation. Some estimates of finance are for a smaller time period than 2010–present, based on available data. Other amounts are based on annual estimates multiplied by 8 to provide a comparable number to cumulative finance since 2010.

Figure 19 source:

PUBLIC INTERNATIONAL FINANCE

- Climate mitigation finance for all sectors and mitigation finance for forestry in deforestation countries: Climate Focus compilation based on climate mitigation-related development finance commitments (cumulative 2010-17) – Climate Change: OECD DAC External Development Finance Statistics - OECD. (n.d.). http://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/climate-change.htm.
- Finance for agriculture in deforestation countries: Climate Focus compilation based on development finance commitments (cumulative 2010-16) – Creditor Reporting System (CRS). (n.d.). https://stats.oecd.org/Index.aspx?DataSetCode=CRS1.

PUBLIC DOMESTIC FINANCE

- Government investment plans of 13 REDD+ countries: Climate Focus analysis of Forest Carbon Partnership Facility (FCPF) Emission Reduction Program Documents (the 13 countries are those that budgeted for government expenditures). Investment plans cover different timeframes – Countries | Forest Carbon Partnership Facility. (n.d.). https://www.forestcarbonpartnership.org/countries.
- Subsidies for key deforestation drivers in Indonesia and Brazil: Climate Focus estimation based on McFarland, W., Whitley, S., & Kissinger, G. (2015). Subsidies to key commodities driving forest loss. [Working paper]. London, United Kingdom: Overseas Development Institute. Annual estimate multiplied by 8.
- Finance for agriculture and forestry in deforestation countries: Climate Focus compilation of FAOSTAT data on government expenditure for the agriculture and forestry sectors (cumulative 2010-17) – FAOSTAT. (n.d.). http://www.fao.org/faostat/en/#data/CISP

PRIVATE FINANCE

- Sustainable commodity production and conservation investments in developing countries: Climate Focus compilation based on Hamrick, K. (2016). State of private investment in conservation 2016. A landscape assessment of an emerging market. Washington, DC: Ecosystem Marketplace. Cumulative since 2004, however financing prior to 2009 only makes up a minor share. This estimate includes capital commitments in Africa, Asia, and Latin America.
- Capital in agriculture, forestry, and fishing in deforestation countries: Climate Focus compilation based on FAOSTAT data for gross fixed capital formation in agriculture, forestry and fishing (cumulative 2010-18) – FAOSTAT. (n.d.). http://www.fao.org/faostat/en/#data/CISP. Capital are a proxy for investment in activities in the sectors.

REDD+ FINANCE

- Readiness and implementation: Climate Focus compilation of REDD+ readiness and implementation finance commitments (cumulative since 2010) – Climate Funds Update. (n.d.). https://climatefundsupdate.org/.
- Results-based finance: Climate Focus compilation of commitments based on personal communications with donors and the BioCarbon Fund (cumulative since 2010). Commitments to the FCPF Carbon Fund were retrieved from publicly available documentation – Countries | Forest Carbon Partnership Facility. (n.d.). https://www.forestcarbonpartnership.org/countries.

FINANCE FOR RENEWABLES

- Frankfurt School-UNEP Centre/BNEF. (2018). Global Trends in Renewable Energy Investment Report 2018. https://www.greengrowthknowledge.org/resource/global-trends-renewable-energy-investment-report-2018.

VALUE OF KEY DRIVER COMMODITIES

- Climate Focus estimation based on Tropical Forest Alliance 2020. (2017). The role of the financial sector in deforestation-free supply chains. Geneva, Switzerland: World Economic Forum. Annual estimate for 2015 multiplied by 8.

Box 6. Understanding green and grey finance

For the purposes of our assessment we use definitions – as explained below – of green finance and grey finance that focus finance with a clear or potential impact on forests.

Green finance: finance that is aligned with objectives for the conservation, protection, or sustainable use of forests – or what we refer to as forest and climate goals. This includes finance provided with a clear and stated objective of climate mitigation in the forestry sector, REDD+, conservation, and sustainable forest and land use. Specifically, we cover finance for (1) the development of national forest and REDD+ strategies or action plans, policies and measures, and capacity building; (2) support for the implementation of national policies and measures and national strategies or action plans that could involve investments, capacity building, technology development, and transfer; and (3) results-based actions that are fully measured, reported, and verified.

Grey finance: finance that has no stated objective to positively impact the forest but has a potential impact on forests. The impact - whether positive or negative – depends on the context, as well as the design and implementation of these activities.

Box 7. The financial effort needed to protect forests is unclear

Implementing and scaling up action to halt deforestation and advance forest landscape restoration comes at a cost. The exact amount of finance needed differs based on national and local context as well as the measures taken.

The cost of transitioning to a deforestation-free economy may vary according to the setting, timing, and blend of finance instruments. Support is needed for training, policy support, and the building of institutional structures and infrastructure. Finance for capacity-building activities in the forest sector to carry out REDD+ projects in high-risk areas are estimated to range from USD 2 to 3 billion, while costs for implementation and improvements in the enabling environment depend on the stringency and range from USD 0.4 billion per year, for a 10 percent reduction in global deforestation by 2030, to USD 233 billion for a complete agricultural sector transformation to deforestation-free commodity production globally by 2020. The opportunity costs, for example from foregoing unsustainable land use activities, are a common, albeit imperfect, proxy for assessing the financial needs linked to reduced deforestation and can range between USD 5 to 60 billion.[285] Estimates of opportunity costs do not take into account the political, rather than economic, interests of land use decision-makers, which may lead them to make choices that are not in line with the best economic outcomes, or may put them in conflict with other stakeholders.

Costs for forest landscape restoration (FLR) depend on the degree of degradation, specific social, political, and biophysical characteristics and circumstances. Global cost-per-hectare estimates for FLR range from USD 2,390 to USD 3,450.[286] Based on this, an estimated USD 359–518 billion is needed to meet the 2020 target of the Bonn Challenge (150 million hectares) and USD 837–1,208 billion to achieve the NYDF (350 million hectares).[287] These costs can be borne by a range of financial actors depending on the risk of the restoration investment. Highly degraded landscapes with a low possibility of economic return will have to rely on grant funding from non-governmental organizations or private-sector corporate social responsibility interventions, while low risk, high-return landscapes should attract investment from more traditional investors like development finance institutions and commercial banks.[288] However, it should be noted that estimates of the total cost of FLR activities remains limited by the lack of detailed reporting on observed costs in the literature. Furthermore, an under-estimation of financial flows already supporting FLR is quite likely given that at this moment informal and in-kind contributions made to support FLR implementation are not being factored into the financial flows estimates across the suite of pledgers applying the Bonn Challenge Barometer (see **Goal 5**).[289]

In the period between 2010–17, developed countries and multilateral institutions committed USD 5.1 billion in forest sector finance for climate mitigation-related development — the majority (62 percent) to countries with high levels of deforestation.[x; 290] Another USD 1.3 billion has been pledged for regional or unspecified support to the forestry sector. Furthermore, the majority of the financial commitments concentrated on a few countries, including major deforestation hotspots.

In addition to the aforementioned climate mitigation-related development finance, just over USD 1.8 billion in REDD+ finance has been committed by multilateral sources for the development, capacity building, and implementation of strategies that reduce emissions

x. Developing countries with high deforestation >30,000 hectare gross forest loss in the period 2010–15, as identified in our 2017 NYDF Progress Assessment report, *Finance for Forests*.

from deforestation since 2010.[y; 291] Half of this amount (54 percent) has been disbursed. However, assessing progress on overall REDD+ commitments and disbursements remains difficult due to the limited transparency and accessibility of information around donor finance and the lack of a systemized approach to tracking finance flows among countries.

Green finance commitments from the public sector are also increasingly being used to unlock commitments from other sources of finance. The Green Climate Fund (GCF), for example, has approved several projects for reducing deforestation. These include a USD 84 million co-financed grant with the Government of Ecuador to develop Ecuador's REDD+ Action Plan and a USD 70 million co-financing commitment to leverage private investment in sustainable landscapes in Madagascar, as well as projects in Peru, Mexico and Guatemala, Uganda, and Gambia. Similarly, a number of the countries participating in the Forest Carbon Partnership Facility (FCPF) often cite public domestic contributions as a complementary source. Mexico, for example, has allocated nearly USD 8 billion in government funding, and Costa Rica nearly USD 1 billion.[292] These contributions also support a variety of activities, including sustainable land use planning, costs of monitoring, reporting, and verification, forest policy and land tenure reforms, and interventions to address deforestation driven by basic needs.

Payments for verified results are slow to materialize

Nearly USD 4.7 billion of results-based finance for verified carbon emissions reductions has been committed by bilateral or multilateral sources since 2010 (**Figure 20**).[293] In the past year, however, almost no new results-based finance commitments have been made. As of April 2019, payments of about one third (35 percent) of these commitments have been disbursed or announced — mostly by Norway to Brazil.

While deploying finance has generally been slow in over the past five years, in February 2019 the first payment from the GCF for deforestation-related emissions reductions was confirmed. USD 96.5 million will be paid to Brazil for results achieved in the Amazon biome in 2014 and 2015, compared to a 1996–2010 baseline.[294] Under the GCF agreement, Brazil pledged to use the funds to strengthen REDD+ strategy implementation and develop a domestic payment for the environmental services program. While some argue that the payments send a signal that protecting forests pays off,[295] paying for historic reduction in deforestation amid an erosion of government commitment toward forest protection and sharply increasing deforestation in the Brazilian Amazon has drawn criticism from civil society.[296] In reaction to the lack of will by the new Brazilian government to continue policies to stop deforestation, Norway and Germany put payments to support Brazil for efforts related to slowing deforestation on hold in August 2019.[297]

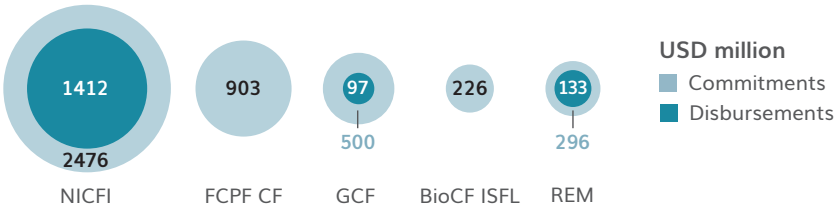
Norway also announced that an initial results-based payment would be made to Indonesia for their reductions in carbons emissions from deforestation in 2017.[298] Norway, who pledged up to USD 1 billion to Indonesia in 2010, has spent about 13 percent of the total pledge so far in support of the Indonesian government's efforts to address deforestation.

However, while many countries demonstrate interest in participating in results-based payment mechanisms, reaching the final stage of acceptance is cumbersome and exceedingly challenging. One barrier is a lack of finance to support countries in moving from a readiness phase toward implementation (**Box 8**); other barriers are the institutional and political demands that come with committing to a results-based payment program for

y. In December 2015, Germany, Norway, and the United Kingdom announced a REDD+ financing pledge of USD 5 billion for the period 2015–20. A part of this amount is captured here as REDD+ finance for readiness and implementation, while the remainder of what has been committed to date is accounted for in the results-based finance section (see **Figure 20**).

Figure 20. Progress in results-based REDD+ finance

Commitments and disbursements by program (since 2010)



Agreements for multilateral and bilateral initatives

Multilateral initiatives

- Proposals selected into the FCPF Carbon Fund pipeline
- Programs provisionally selected into the FCPF Carbon Fund portfolio
- Programs selected into the BioCarbon Fund Initiative for Sustainable Forest Landscapes
- FCPF ERPA signed

Bilateral initiatives

- German, Norwegian and/or UK agreements in the REDD Early Mover Program
- Amazon Fund agreement with Norway/Germany
- Other Norwegian bilateral agreements

* *Note:* Colombia falls into both categories: Programs provisionally selected into the FCPF Carbon Fund portfolio, and Programs selected into the BioCarbon Fund Initiative for Sustainable Forest Landscapes.

Source: Climate Focus compilation of commitments based on personal communications with donors and the BioCarbon Fund. Commitments to the FCPF Carbon Fund were retrieved from publicly available documentation – Countries | Forest Carbon Partnership Facility. (n.d.). https://www.forestcarbonpartnership.org/countries.

REDD+, which often fail to account for national circumstances. Just three countries — the Democratic Republic of the Congo, Mozambique, and Ghana — have signed Emission Reductions Payment Agreements (ERPAs) under the FCPF Carbon Fund. This number is anticipated to increase over the next couple of years. As of May 2019, nineteen countries were in the FCPF pipeline.

Recognizing the need for collaboration, important stakeholders are pooling resources and efforts to drive greater ambition and impact. Similar to the co-financing taking place through mechanisms such as the GCF and FCPF, large multidonor financing facilities are a way to leverage finance from different sources. The World Bank's Climate-Smart Mining Facility (see **Goal 3**), for example, was established in May 2019 with funds from the German government and two major multinational mining companies, Rio Tinto and Anglo American.

Box 8. Essential finance for REDD+ implementation is lacking

The implementation of REDD+ activities (Phase 2) is an important step for countries working to translate their plans to reduce deforestation and enhance forests into action. REDD+ donors are galvanizing finance for recipient countries in the readiness stage (Phase 1), as they prepare and build the capacity to enable successful program activities, and to ensure that funding is available to provide payments for results related to emission reductions (Phase 3). Yet, finance for Phase 2 is notably lagging behind the other phases.[299] At the same time, the implementation phase provides an obvious opportunity for private-sector engagement compared to the other phases, given the returns on investment through forest-friendly production as well as the generation of carbon credits.

Furthermore, involving the private sector in REDD+ efforts has the potential to catalyze a wider scale of REDD+ activities due to their influence on landscapes through agriculture, forestry, mining, and other production.[300]

Responding to this financing gap and the expressed need of countries hoping to move beyond the readiness phase, multilateral and bilateral funders have dedicated a portion of their REDD+ grants and low-interest loans to implementation.[301] Implementation pledges have come primarily from the Global Environment Facility, the Green Climate Fund, and the Forest Investment Program.[302] However, for the most part, these approaches are limited and insufficiently coordinated.

The re-emergence of the forest carbon markets

Through the trade of **verified emission reductions** (VERs), carbon credits, or offsets generated in the forestry sector, carbon markets provide platforms for economic actors to purchase credits to meet both voluntary and compliance targets for climate change mitigation.[303] The Paris Agreement could provide a stimulus for carbon trades once the rules for "internationally transferred mitigation outcomes" have been agreed. Until then, most carbon market trades come from voluntary markets. While the generation, trade, and use of offsets is controversial from a climate policy point of view, the generation of VERs allows projects and programs in the forest sector to access finance. Here we summarize recent trends in the forest carbon markets because they channel finance to forest conservation and restoration. However, we do not judge the overall merits and drawbacks of offsets or of the projects and programs through which they are generated.

To date, average annual volumes of all (forest and non-forest) carbon credits traded globally (excluding Australia) — roughly 6 megatons of CO_2-equivalent (CO_2e) in the compliance market[z] and 22 megatons of CO_2e in the voluntary market[aa] — represent only a small fraction of global annual emissions from deforestation (2,270 $MtCO_2e$), demonstrating that demand is still relatively low and a carbon market cannot compensate for avoiding deforestation in the first place.[304] Still emission reductions from forest projects are among the most demanded type of voluntary carbon credits (28 percent).[305] There are also signs of higher demand in the future as more companies announce ambitious emission reduction targets. In 2017, Eni started to compensate parts of its own emissions through carbon offset with a focus on forest, land-use management and preservation credits and targets zero net carbon emissions by 2030. Similarly, Shell announced that it would invest USD 300 million in natural ecosystems to contribute to their three-year target to reduce its Net Carbon Footprint by two to three percent. Furthermore, the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) under the UN International Civil Aviation Organization could accept forest credits and stimulate investments into REDD+.[306]

z. Average for 2010–16, and excluding volumes traded in the Australian market which only started in 2015.
aa. Average for 2010–16. Note that annual volumes vary widely across the different markets.

GOAL 10

Improvements in forest governance

> *Strengthen forest governance, transparency, and the rule of law, while also empowering communities and recognizing the rights of indigenous peoples, especially those pertaining to their lands and resources.*

Good governance provides the foundation for policies to be developed, laws to be enforced, and investment and implementation to move forward. Since the endorsement of the NYDF, improvements in forest governance — including land titling, transparency, adoption of policies, and strengthening of enforcement — have been too slow to effectively protect forests. A large share of tropical deforestation is likely to be illegal, while corruption, weak enforcement, insecure tenure, and conflicting laws and regulations all hinder effective implementation of even the most promising policies. While there have been small steps forward (e.g. in recognizing the rights of indigenous peoples and local communities), there must be a sustained commitment to support governance to effect transformational change.

Poor forest governance correlates with high deforestation and enables illegal activity

Adopting and implementing strong environmental policies, clarifying ownership rights, and strengthening the rule of law have been proven to remove pressure on forests and help protect forest ecosystems.[307] In addition, the overall strength of national and local institutions has an important — although indirect — influence on forest governance. Instances of limited forest governance most often occur in poorer countries, where institutions and the rule of law tend to be weaker overall. Countries with weak forest laws and policies, insufficient enforcement, and high levels of corruption experience higher rates of deforestation than countries with stronger legal frameworks and institutions.[308]

Though an overwhelming majority of countries have environmental policies and laws, protections for the environment, or the right to a healthy environment embedded in their constitution,[309] compliance with environmental regulation is often lax. Major challenges that lead to the failure to implement or enforce laws include the perception that environmental laws will hinder development, a lack of funding for environmental agencies, corruption, and a lack of participation of civil society.[310] Consequently, almost half (49 percent) of tropical deforestation around the world continues to be illegal.[311] Efforts to protect forests often fall victim to competing priorities between government offices.[312] The offices with environmental interests lack the legal powers or political influence needed to transform the policy agendas trumped by production and resource extraction goals. Additionally, recent developments in Brazil demonstrate the fragility of even strong laws and policies to protect forests and their susceptibility to be changed when they do not have high-level support (see **Brazil case study** on **page 75**).

CASE STUDY

Brazil: A history of success, but a future of uncertainty

Between 2001–18, Brazil lost almost 55 million hectares of tree cover at a rate of 5.7 soccer fields per minute.[313] More than 84 percent of this loss occurred in the biomes of Amazon (33 Mha of tree cover loss — an area bigger than Norway), while the Cerrado, at half the size of the Amazon, lost 13 million hectares.[314] In the Atlantic Forest, a biome where only 12 percent of the original forest remains, over 5 million hectares were lost over the same period. [315]

Rolling back of enforcement and protection puts past achievements in the Amazon at risk

The Brazilian Amazon has long been hailed as a success story in global forest conservation efforts. In 2012, Brazil recorded its lowest deforestation rate in the last 20 years. But tree cover loss in the Amazon began to rise again in 2016 when it reached 3.7 million hectares. While the rate of loss has fallen in the past two years, it is still higher than it had been since 2005 (**Figure 21**). For the Amazon, deforestation rates continued to rise in the first part of 2019 with an alarming 88 percent increase in June compared to same month the previous year.[316] The recent increase in deforestation is directly and indirectly encouraged by the current Brazilian federal government. The new administration began weakening environmental regulations, enforcement, and institutions immediately after the transition in power in January 2019.

A confluence of several factors can explain this surge in loss. A 2012 amendment to the Brazilian Forest Code reduced the area of legal reserves required on rural private properties, putting more than 15 million hectares of forest in the Amazon at risk.[317] The amendment, which was upheld by the Supreme Court last year, also pardoned illegal deforestation that happened before 2008.[318] Political instability since 2013 has led to a softening of environmental licensing requirements, suspension of demarcation of indigenous lands, and a reduction of the size of protected areas.[319] The increase in deforestation rates also coincides with heavy budgetary cuts in the Ministry of Environment, reducing funding for enforcement agencies, climate-related programs, and environmental services for forest-dwelling communities. The new government administration has further loosened environmental controls and enforcement. In its first months, the new administration dissolved climate and forest departments,[ab; 320] transferred the Brazilian Forest Services (previously housed under Ministry of Environment) to the Ministry of Agriculture,[321] and forcibly sought to transfer demarcation of indigenous lands to the Ministry of Agriculture. The President has also engaged in a dispute with the head of Brazil's National Space Research Institute (INPE), Ricardo Galvão, over INPE deforestation data, resulting in Galvão's dismissal.[322]

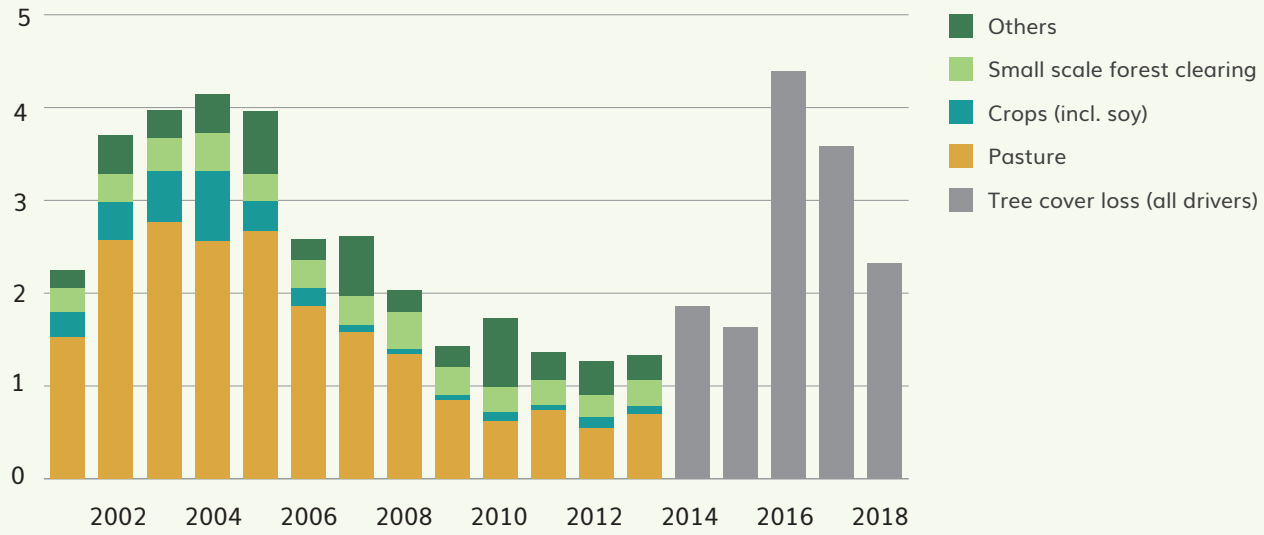
Slow progress in forging an agreement to support the ecosystems of the Cerrado

In the Cerrado, agriculture expansion through cattle and soy production has led to a substantial decline in native vegetation, with about 11 percent of the vegetation area lost since 2000.[323] With less legal protection than the Amazon, the Cerrado is subject to Forest Code provisions that allow deforestation in 65 percent of private rural areas and conservation units, protecting only 8 percent of the biome.[324] The opening of the Chinese market drastically increased demand for soybean and beef from Brazil. Between 2013 and 2017, China purchased 42 percent of Brazil's soybeans which accounted for loss of 223,000 hectares of forest — an area two times the size of New York City — mostly in the Cerrado.[325]

In 2017, 70 global consumer goods companies endorsed a Cerrado Manifesto that calls for immediate action in defence of the Cerrado.[326] However, companies have so far resisted converting the manifesto into an agreement on how to halt deforestation in the Cerrado. In July 2019, Cargill, one of the biggest traders of soy in Brazil, announced that it will not support a soy moratorium in the savanna biome of Cerrado, but pledged USD 30 million to limit forest loss in the Cerrado.[327]

ab. The Climate Change and Forest Secretary and its Department of Forests and Deforestation Prevention were part of the Ministry of Environment and recently ceased operations. Also, the number of fines for May 2019 reduced 35% in comparison to May 2018. See Borges, A., & S. Paulo, O. E. (2019, May 22). Desmatamento avança na Amazônia, que perde 19 hectares de florestas/hora. Estadao. https://sustentabilidade.estadao.com.br/noticias/geral-desmatamento-avanca-na-amazonia-que-perde-19-hectares-de-florestashora,70002838401. See also B. Brito et al.

Figure 21. Annual forest loss area by disturbance driver in the Brazilian Legal Amazon, in million hectares



Source: For 2001–13, Tyukavina, A., Hansen, M. C., Potapov, P. V., Stehman, S. V., Smith-Rodriguez, K., Okpa, C., & Aguilar, R. (2017). Types and rates of forest disturbance in Brazilian Legal Amazon, 2000–2013. Science Advances, 3(4), e1601047; For 2014-18 data, Hansen, M. C., Potapov, P. V., Moore, R., Hancher, M., Turubanova, S. A., Tyukavina, A. et al. (2013). Tree Cover Loss (Hansen/UMD/Google/USGS/NASA). Global Forest Watch database.

A successful restoration program helps to recover parts of the Atlantic Forest

Efforts aimed at restoration of deforested areas and degraded pastures across Brazil can help to recover some ecological functionality over time and promote conservation.[328] The revised Forest Code in Brazil, although substantially reducing the obligation to restore forests, still requires the restoration of 21 million hectares of native forests on private lands.[329] Brazil has also established a national policy and a specific plan for native vegetation recovery that proposes a stepwise implementation, concentrating restoration efforts in the Amazon and the Atlantic Forest.[330]

The Atlantic Forest Restoration Pact 2009 is a successful large-scale restoration initiative, with potential for replication to other regions and biomes. The Pact relies on effective engagement with local stakeholders, transparent monitoring through remote sensing and field data made available online, and a bottom-up approach that integrates multiple layers of governance.[331] Preliminary estimates suggest that almost 300,000 hectares of restored forests have been established, and a total of roughly 1.4 million hectares are estimated to be recovered by 2020.[332]

Outlook for Brazil

Under the Paris Agreement, Brazil pledged to reduce its greenhouse gas emissions by 37 percent by 2025, with an indicative (i.e. conditional) reduction of 43 percent by 2030.[333] Brazil's NDC also commits to restore 15 million hectares of degraded pasturelands and reforest 12 million hectares for multiple uses by 2030.[334] However, deforestation in Brazil has continued to see an uptick over the past five years, with average tree cover loss since 2014 exceeding the prior 12 years by 28 percent.[335] While the Cerrado has also seen higher deforestation rates, the Amazon's relapse particularly stands out, with deforestation climbing steadily since 2016 and reaching a record high in June 2019. Urgent action must be taken to confront recent deforestation trends and avoid a reversal of the Brazilian success story. Without an immediate course correction, the Amazon may reach a tipping point beyond which it cannot recover.[336]

Transparency, participation, and access to justice are essential to good governance

Governments and companies play an integral role in ensuring transparency and access to forest-related information, which is fundamental to creating the necessary conditions to protect and enhance forests. Transparency is instrumental to good governance in that it enables accountable, inclusive, legitimate, and democratic practices.[337] This inclusivity further depends on mechanisms to allow public participation in decision-making processes around forests. Finally, access to justice empowers citizens to challenge decisions and actions after the fact, through judicial and administrative mechanisms. True access also depends on having the means and support to maneuver through these systems.

Information such as deforestation rates, forest tenure, and concessions in forest areas allows stakeholders to participate in and influence decision-making and monitoring by providing a check on the government and other actors.[338] However, to make a difference, information must not only be available and accessible. Stakeholders also have to know how to find and have the means to obtain and use it. This often poses a challenge, as in practice the laws governing access to information frequently fall short of ensuring that most citizens can acquire it.[339]

At the same time, while most countries require public consultations for forest development projects, the processes are often technical and not designed to ensure public understanding.[340] Women are often excluded from consultative processes while facing higher barriers to information such as illiteracy, lack of time and mobility, and societal disapproval or cultural inappropriateness.[341] Despite evidence that a more balanced involvement of genders improves conservation outcomes while leading to more equitable economic gains, progress in bringing women to the table remains limited.[342] Though a number of countries have policies that aim to improve female participation in policymaking and have established designated agencies on gender issues, few countries require or guarantee a gender balance throughout policy development and implementation.[ac]

Similarly, access to judicial and administrative remedies is often too costly and court systems are slow to provide effective legal protection.[343] Grievance or conflict-resolution mechanisms can provide an alternative pathway to justice outside formal systems, but even these remain costly and out of reach for the most vulnerable populations.[344] Despite these challenges, overall access to justice in the environmental sector has improved in the past decades, especially due to an overall broadening of the criteria for standing (e.g. the requirement for sufficient interest in a case to bring it to court).[345] Some countries, such as Bolivia and Colombia, even give standing to nature or natural ecosystems. As of 2017, 130 countries allow citizens to bring suits based on their country's environmental legislation. The Philippines was recognized by the UN as having some of the most inclusive standing rules.[346]

Communities protect forests but lack fully secure tenure and rights

It has been shown that when indigenous peoples have full land rights to govern forest territories, these forests and the carbon they store are better protected over time.[347] About half of the world's land is subject to long-standing customary claims by indigenous peoples and local communities who have used, owned, and occupied it for generations (**Figure 22**).[348] The International Land and Forest Tenure Facility was launched in 2014 to address the gap in land recognition. As the first international, multi-stakeholder financial mechanism focused exclusively on securing community land rights, the initiative aims to invest USD 10 million per year in the effort, enough to secure title to an estimated

ac. The countries assessed were Brazil, Cameroon, the Democratic Republic of the Congo, Ghana, Indonesia, Lao People's Democratic Republic, Malaysia, Papua New Guinea, and the Republic of Congo.

42 to 91 million hectares.[349] However, to date, recognition of the rights of indigenous peoples and other local communities to their lands and resources remains limited, and a significant share of community lands remains unrecognized.

Indigenous communities manage at least 22 percent (293,000 Mt) of the total carbon stored in forests across 52 tropical and subtropical countries.[350] In its 2019 Special Report on Climate Change and Land, the Intergovernmental Panel on Climate Change (IPCC) affirmed the critical role of indigenous and local knowledge in preserving and managing these carbon-rich landscapes for both climate mitigation and adaptation.[351] Relevant knowledge systems for protecting the forest include not just ecological functionality but also customary governance systems, which guide the use and distribution of forest resources. Indigenous organizations have long advocated for recognition of IPLCs' contribution to sustainable land and forest management (**Box 9**).

Box 9. Examples of indigenous peoples' organizations contributing to forest protection

Coordinadora de las Organizaciones Indígenas de la Cuenca Amazónica (COICA) is an indigenous organization coordinating regional efforts in the Amazon basin to promote and protect indigenous peoples' territories, ways of life, and social, spiritual, and cultural values. Among other work, they support the participation of marginalized forest communities in REDD+ negotiations in the region and have provided technical advice on national REDD+ strategy development in Colombia, Ecuador, and Peru.

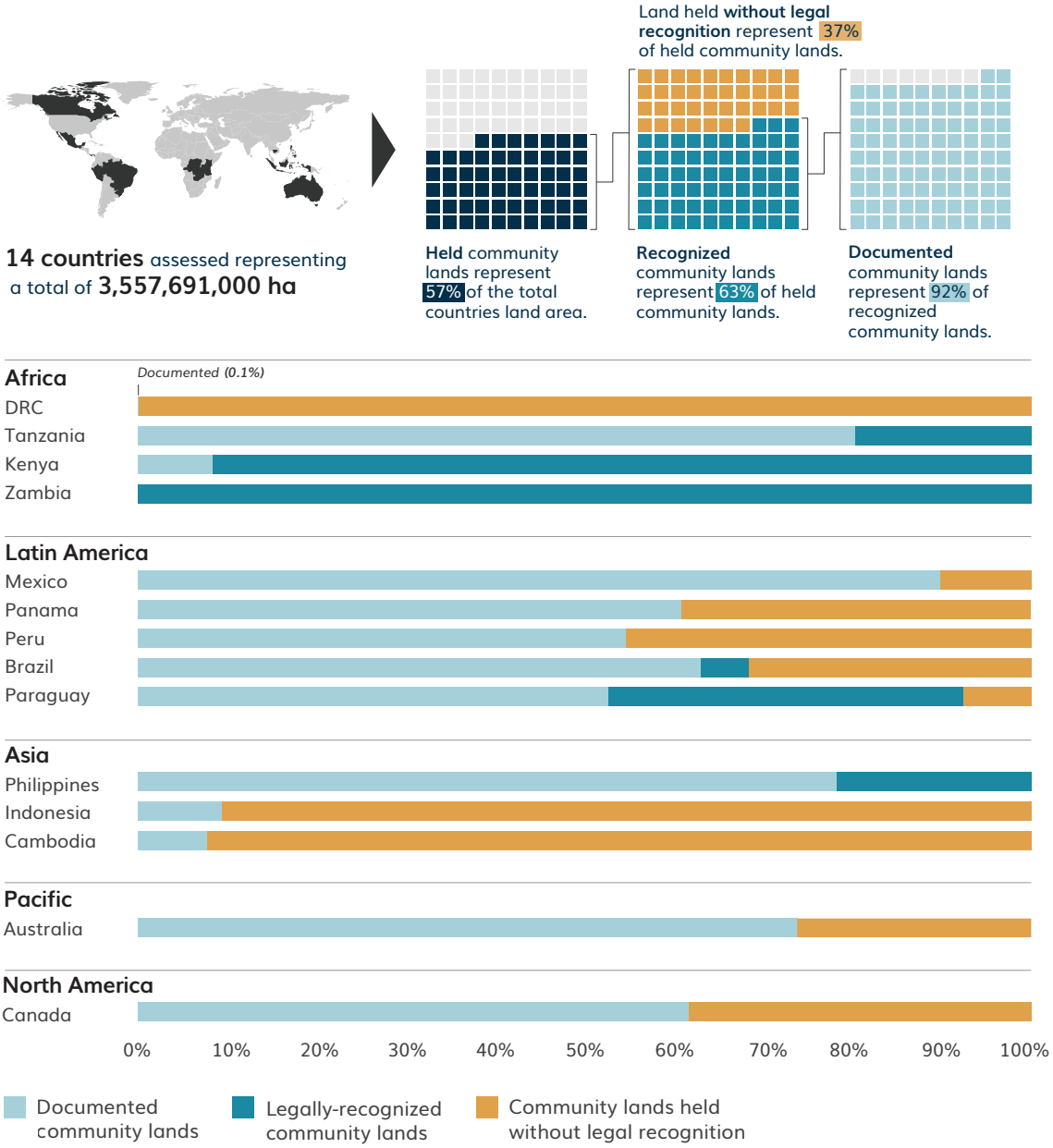
Aliansi Masyarakat Adat Nusantara (AMAN) is a coalition of 2,366 indigenous communities across Indonesia, representing 17 million individual members. AMAN has been actively involved in international REDD+ and Paris Agreement (COP 21) negotiations. At the national level, AMAN coordinates inter-ministerial efforts to advocate for indigenous communities' rights. In 2013, they won a Constitutional Court case that granted indigenous and forest communities the right to manage customary land, prohibiting the sale of these lands to private businesses.

Tebtebba, or the Indigenous Peoples' International Centre for Policy Research and Education, promotes the dissemincaiton of indigenous worldviews and perspectives through research, collaboration, and advocacy. Based in the Philippines, their research centers on traditional knowledge systems and customary governance for ecosystem management. They develop indigenous- and gender-sensitive tools and indicators for monitoring, measuring, reporting, and verifying how safeguards are addressed in climate change initiatives such as REDD+. They also have been supporting the effective implementation of the Convention on Biological Diversity) in the Philippines.

Indigenous Peoples of Africa Co-ordinating Committee (IPACC) is a network of 150 indigenous peoples' organizations in 20 African countries. Its work seeks to promote indigenous peoples´ human rights, equality, and right to participate in environmental conservation and climate justice. IPACC promotes the inclusion of indigenous knowledge systems in National Adaptation Plans for climate change and supports the development of an African approach to climate adaptation, drawing together science, indigenous knowledge, and decision-making.

Asian Indigenous Women's Network (AIWN) is a network of indigenous women's organizations and indigenous peoples' organizations with women committees in Asia. They advocate for indigenous women's issues in the United Nations and other multilateral bodies and provide capacity building for indigenous women on issues such as gender and land rights, climate change, and REDD+. AIWN also supports its members through skills and leadership training.

Figure 22. Status of community lands across 14 countries, and as percentage of national land



Note: Held Community Land is community land that is currently occupied and/or used by communities, including Indigenous Peoples. It is held and managed in a collective manner by communities, regardless of recognition under national statutory law. In this figure, community land refers only to currently held land and not to historically held land which communities may still claim but is not occupied or used. Legally Recognized Community Land is held community land that is recognized as such under national law. Documented Community Land is held community land for which a formal land title, certificate, or other official document has been issued by the government to the community. Not-Recognized Community Land is community land that is held only under customary tenure arrangements but not recognized as such under national law or documented.

Source: NYDF Assessment Partners and LandMark. (2019). Held, Legally Recognized, Documented, and Not-Recognized Community Land: Findings from 14 Countries. New York Declaration on Forests Progress Assessment Briefing Series: Goal 10: A Closer Look. Coordinated by Climate Focus with support from the International Climate Initiative (IKI).

At least one third of the land (containing 72,000 Mt carbon) managed by indigenous communities is located in areas where indigenous and community tenure rights have not been recognized. In addition, indigenous peoples increasingly face harassment and criminalization related to land use conflicts, including increased incidences of illegal surveillance, arbitrary arrests, travel bans to prevent free movement, threats, dispossession, and killings in 2018.[352] A frequent source of conflict is large agribusinesses and corporations, in countries like the Democratic Republic of the Congo, Brazil, and Indonesia, seeking to seize community land for productive or extractive use (**Box 10**).[353]

Box 10. Indonesia's land rights defenders fight criminalization and violence

In 2015, on the island of Sumatra, a rights activist and farmer named Indra Pelani was brutally beaten and killed. The alleged offenders were security guards at a nearby forestry plantation owned by Asia Pulp and Paper.[354] The conflict was emblematic of the all-too-common violence against and criminalization of indigenous peoples and local communities (IPLCs) in Indonesia, largely due to the overlap of commercial agribusiness and forestry concessions with customarily claimed lands. One report found evidence of 1,769 land related conflicts from 2015–2018, leading to 940 arrests of land rights defenders, 546 people tortured, 51 shot, and 41 killed.[355] Currently, 437 ongoing land conflicts involve 250,000 people across 4 million hectares of contested land.[356]

The non-recognition of IPLC customary land rights underlies many of these conflicts, with the government unilaterally awarding commercial concessions without community input.[357] Concessions cover over 30 percent of Indonesia's land area, while IPLCs lay claim to at least 40 million hectares (20 percent). of forests and land. Concessions also account for more than two fifths of nationwide deforestation from 2001–2016.[358] When IPLCs resist the destruction of their forests and landscapes, they are often criminalized. A landmark series of hearings by Indonesia's Human Rights Commission revealed the criminalization of IPLCs as palm oil companies and other agribusinesses sought to convert their forests to monoculture crops.[359] The Commission recommended the recognition of community land rights as the long-term solution to criminalization and protecting forests.[360]

A landmark 2014 decision by Indonesia's Supreme Court on Customary Forests provided the legal support to recognize community land rights. However, even as the Jokowi administration has promised to scale up customary forest rights recognition, entrenched commercial and bureaucratic interests have stalled efforts.[361] As yet, only 0.03 million hectares have been recognized. Meanwhile, organizations like Aliansi Masyarakat Adat Nusantara (see **Box 9**) and other civil society organizations are working to mitigate criminalization through interim measures such as an Anti-Criminalisation fund, even as they continue the larger fight for secure rights.

Such conflicts could, at least in part, be prevented through the consistent application of new principles to respect community land rights. One example of principles currently under development is The Gold Standard, spearheaded by the Indigenous Peoples Major Group for Sustainable Development, Rights and Resources Initiative, and the Global Landscapes Forum. It will seek to guide future actions and investments in conservation, restoration, climate action, management, and development in rural landscapes. The principles are grounded in international law, go beyond the usual "do no harm" minimum standards, and are designed to create a race to the top by including best practice standards.

Another positive advancement is The Escazú Agreement, which was signed in 2018 by 15 countries in Latin America and the Caribbean and includes a commitment to protect the security of human rights defenders working on environmental matters.[362] Nevertheless, given the significance of the risk posed to forest defenders in these regions, comprehensive

national measures urgently need to be implemented to give effect to this commitment. The threat remains as large as ever; at least 164 forest and land defenders were killed in 2018, according to Global Witness.[363]

Empowerment strengthens forest defenders

A change of overall societal and governmental attitudes toward underrepresented and often marginalized communities is a pre-requisite to enacting real, swift, and durable improvements in legal recognition, empowerment, and self-determination. The empowerment of rural communities has only slightly increased in recent years and livelihoods are under increasing stress.[364]

When forest communities build their own producer organizations, however, they can achieve previously unknown empowerment over their land and resources through strength-in-numbers.[365] An analysis of 947 forest and farm organizations supported by the Forest and Farm Facility found that organizations with multiple tiers — often organized at the local, regional, and national levels — were efficient at leveraging the relative strengths of each level. Forest and farm producer organizations have also proven to be effective political mobilizers by providing an avenue for advocacy, resulting in policy changes that benefit the producers themselves. A similar effect of strength-in-numbers was observed specifically for women in producer organizations, who often find new outlets for public participation.

To enhance community engagement in global climate governance processes, the Local Communities and Indigenous Peoples' Platform (LCIPP) was launched at the 24th Conference of the Parties to the United Nations Framework Convention on Climate Change in December 2018. The purpose of the LCIPP is strengthen the knowledge, technologies, practices and efforts of IPLCs around climate change mitigation and adaptation, and to facilitate an exchange of information and best practices.[366]

Concluding remarks

In 2014, governments, companies, indigenous groups, and civil society actors came together in a unified voice to declare that protecting and restoring forests must be a primary concern for every government, for every corporation, for every consumer, and for every community. Five years later, the NYDF's 2020 targets to halve deforestation and restore 150 million hectares of forest landscapes seem like a hazy vision in a dream long faded. Given the rate of forest loss since the NYDF's adoption, the 2030 target of halting deforestation becomes also more challenging by the day. Yet, the fight for forests is one that cannot be lost. And so, the battle continues.

Each of the ten NYDF goals remains relevant. However, what has become clear is that setting ambitious targets is not enough. The efforts by corporations to clean up their supply chains and adopt investment safeguards, as well as efforts by governments to support forest goals through finance and technical assistance, have been insufficient to overcome the countervailing winds of expanding and extractive development models. Short-term profit expectations continue to prevail over long-term benefit valuation. While this is an intrinsic problem of a lack of economic incentives to protect forests, the recent surge of populist governments further undermines efforts to valuate natural systems.

The good news is that forests — their vulnerability and need for protection — have moved up the political agenda, not least because of the call for action that followed the release of the Special Report on Land of the IPCC in August 2019. What this report has made clear is that protecting forests is no longer a niche problem of a few conservationists, but an essential strategy to meet the Paris climate goals and protect biodiversity as well as food security and livelihoods.

Protecting forests will require an integrated and comprehensive forest strategy that involves the coordination of governments — including both producing and importing countries — as well as companies, civil society, and indigenous peoples' organizations. This strategy must explicitly align efforts to preserve primary forests, sustainably manage production forests, and restore natural forests in degraded landscapes.

To achieve these outcomes, governments should increase efforts to improve forest governance by strengthening institutions that oversee law enforcement, land use planning, and empowering IPLCs, among others. Governments should also phase out countervailing fiscal and other incentives and replace them with smart subsidies that support ecological restoration, while creating additional incentives for forest and ecosystem conservation. Consumer countries can make a difference by further strengthening demand-side measures, working toward eliminating deforestation from imports and facilitating a shift toward healthier and more sustainable diets. At the same time, financial support for the protection of tropical forests needs to be ramped up to enable tropical countries to finance the measures that can help to conserve their forests.

Companies need to strengthen their supply-chain commitments and move toward their realization, including through technical assistance and smallholder support. In the context of jurisdictional approaches, they can work with governments to increase agricultural productivity, restore natural forests, and ensure the protection of forests. Collaboration between corporations and governments will also needed to reach out and involve 'missing actors' such as smallholders and traders on the one hand, and companies from emerging

economies on the other. It is also time for financial institutions to become serious about de-risking their investment portfolios and adopt mandatory safeguards that ensure deforestation-free investments. Also essential is the growing emphasis on building 'green' finance portfolios and supporting projects and programs with a conservation or restoration target.

Civil society organizations, including nongovernmental organizations, think tanks, and research organizations, can support the further release of data and continue their push for transparency. They are also important partners in the implementation of corporate commitments, jurisdictional programs, and government programs. In many countries, civil society serves as an important supportive link between IPLCs and governments and can help to channel finance to, lobby on behalf of, and provide technical support to local communities. IPLCs hold essential knowledge on how to sustainable manage and govern forests that should be integrated into strategies to protect forests. By recognizing their potential and contribution to forest protection, governments, companies, and civil society can empower IPLCs and highlight their contribution to achieving conservation and climate goals.

The case of Indonesia shows that an integrated and comprehensive effort to protect forests works. While weather and commodity prices may play a role in abating forest conversion, the government's Peatland Moratorium, corporate efforts to certify palm oil plantations, and civil society's progress on increasing transparency around deforestation, among others, have been essential components of Indonesia's success in reducing deforestation. But past successes are always at the risk of reversal in the absence of strong and sustained institutional support, as the case of Brazil shows. Recent data also show that urgent action is needed in the countries of the Congo Basin and West Africa to stop a trend of growing deforestation rates.

When it comes to restoration, increased support for the restoration of natural forests is needed. The cases of Malawi and El Salvador show that financial and technical assistance are essential to convert ambitious restoration plans into action in forests and on farms. Design elements like the choice of trees, consideration to local conditions, incentive packages provided to farmers, and integration of restoration interventions with forest conservation policies are essential for successful restoration programs. The case of China demonstrates how large-scale afforestation programs can develop over time to become more diverse and ecologically suited to the surrounding landscape.

It is evident that a fundamental realignment of our systems for valuation is needed — a restructuring of the economy to value forests for the benefits that they provide over the long-term rather than for the superficial and short-term gain that comes with clearing them. In the next five years of the NYDF, the global community will face an unprecedented challenge of our own making. Let us meet it with the verve and energy of 2014 and 2015, when the world came together in New York and Paris to declare forests a priority. However, let us learn from the past five years to replicate what works and leave aside the things that do not matter. The future depends on forests, and forests depend on us.

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