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Reduction in Emissions from Deforestation and Forest Degradation (REDD⁺)

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Reduction in Emissions from Deforestation and Forest Degradation (REDD⁺)

Many stakeholders are concerned with the status of global forests and the effects of deforestation and forest degradation, for several reasons. Forests store the greatest amount of terrestrial carbon on Earth and play a significant part in the global carbon cycle. When forests are disturbed through forest clearing, weather events (e.g., hurricanes, droughts), and wildfires, they release carbon dioxide (CO₂) into the atmosphere, which can exacerbate climate change. Land use change and forestry, which includes deforestation and forest degradation, accounted for approximately 13% of global carbon emissions from anthropogenic sources from 2007 to 2016. Forests also support biodiversity; provide ecosystem services, such as retaining soil and improving water quality; and sustain Indigenous cultures, among other things.

International policy initiatives to address global deforestation and forest degradation were originally referred to as *REDD* (Reductions in Emissions from Deforestation and Forest Degradation) and now are termed *REDD⁺*. *REDD⁺* policies attempt to create financial value for carbon stored in forests by using market approaches to compensate landowners for not clearing or degrading their forests. *REDD⁺* also promotes co-benefits of reducing deforestation, such as biodiversity conservation, sustainable management of forests, and conservation of existing forest carbon stocks. *REDD⁺* is prominently included in international climate change discussions and agreements, and many analysts consider it a low-cost policy mechanism to reduce carbon emissions. *REDD⁺* largely addresses tropical regions in developing countries, because these countries have the most forested area, experience high rates of deforestation compared with other countries, and often rely on international financial assistance to address deforestation.

The concept of *REDD⁺* was introduced in its basic form at the 11th Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change in 2005. It has evolved and grown into a broad policy initiative to address deforestation and forest degradation. In 2015, *REDD⁺* was incorporated into Article 5 of the Paris Agreement (an international treaty on climate change made at COP21). *REDD⁺* initiatives typically incentivize and compensate developing countries or subnational entities for reducing their emissions from deforestation and forest degradation through results-based payments. *REDD⁺* implementation in countries consists of several stages, including (1) achieving *REDD⁺* readiness; (2) formalizing an agreement for financing; (3) monitoring, reporting, and verifying results; and (4) receiving results-based payments. *REDD⁺* activities focus on conserving and sustainably managing forests to reduce carbon emissions.

Over 50 countries have national *REDD⁺* initiatives, mostly developing countries in or adjacent to the tropics. *REDD⁺* is also being implemented at the subnational level through provincial and district governments and at the local level through private landowners. As of 2020, there were over 400 ongoing *REDD⁺* projects globally, with Brazil and Colombia accounting for the largest amount of *REDD⁺* project land area (over 25 million hectares). A number of bilateral and multilateral funding mechanisms finance *REDD⁺* projects, including the Green Climate Fund.

International forest conservation efforts, including *REDD⁺*, are of interest to Congress because reducing CO₂ emissions from deforestation and forest degradation is a strategy debated in Congress to mitigate the effects of anthropogenic carbon emissions. Further, Congress has authorized and appropriated funding to conserve and restore forests through international programs administered by several agencies, such as the U.S. Agency for International Development (USAID), the U.S. Department of State, the U.S. Department of the Treasury, and the U.S. Forest Service. *REDD⁺* topics—including forest-related emissions reductions pledges, financing opportunities and needs, and deforestation concerns—are expected to be discussed at COP26 in November 2021.

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Introduction

Many stakeholders are concerned with the status of global forests and the effects of deforestation and forest degradation within them, for several reasons. Forests store the greatest amount of terrestrial carbon on Earth compared with other ecosystems,¹ and deforestation and forest degradation lead to greenhouse gas (GHG) emissions, which exacerbate climate change. Forests also support biodiversity; provide ecosystem services, such as influencing weather, retaining soil, and improving water quality; and sustain Indigenous cultures, among other things.²

Some international policy initiatives to address global deforestation and forest degradation are broadly referred to as *REDD⁺* (Reductions in Emissions from Deforestation and Forest Degradation). *REDD⁺* policies attempt to create financial value for carbon stored in forests by using market approaches to compensate landowners for not clearing or degrading their forests. The *plus* in *REDD⁺* signifies co-benefits of reducing deforestation, such as biodiversity conservation, enhanced forest monitoring, sustainable management of forests, and conservation of existing forest carbon stocks, among others.³ *REDD⁺* is prominently included and promoted in international climate change discussions and agreements, and many analysts consider it a low-cost policy mechanism to reduce carbon emissions.⁴ Currently, *REDD⁺* largely addresses tropical forests in developing countries, because these countries have the most forested area, experience high rates of deforestation compared with other countries, and often rely on international financial assistance to address deforestation.

International forest conservation efforts, including *REDD⁺*, are of interest to Congress for several reasons. Reducing carbon dioxide (CO₂) emissions from deforestation and forest degradation is one of the strategies debated in Congress to mitigate the effects of anthropogenic carbon emissions.⁵ At the international scale, developing countries often seek bilateral or multilateral assistance—including from the United States—to meet forest conservation and other emissions reduction targets. Congress has authorized and appropriated funding to conserve and restore forests through international programs administered by several agencies.⁶ Further, some in Congress have supported biodiversity conservation, which can also cover forest conservation.⁷

¹ Yude Pan et al., “A Large and Persistent Carbon Sink in the World’s Forests,” *Science*, vol. 333, no. 6045 (August 19, 2011), pp. 989-993, at <https://science.sciencemag.org/content/333/6045/988>. Hereinafter, Pan et al., “A Large and Persistent Carbon Sink in the World’s Forests.”

² Tropical forests, for example, are considered among the Earth’s most biologically diverse ecosystems; some scientists estimate that tropical rainforests hold nearly 50% of the Earth’s biological diversity

³ Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014: Synthesis Report*, Contributions of Working Groups I, II and III to the Fifth Assessment Report of the IPCC, Geneva, Switzerland, 2014, p. 126.

⁴ International Institute for Environment and Development, “REDD: Protecting Forests, Climate, and Livelihoods,” October 2021, at <https://www.iied.org/redd-protecting-climate-forests-livelihoods>.

⁵ For example, see U.S. Congress, House Committee on Foreign Affairs, Subcommittee on Western Hemisphere, Civilian Security and Trade, *Preserving the Amazon: A Shared Moral Imperative*, hearings, 116th Cong., 1st sess., September 10, 2019, H.Hrg. 116-60.

⁶ For example, the Tropical Forest Conservation Act of 1998 (22 U.S.C. §§2431 et seq.) authorized the United States to conduct debt-for-nature swaps with developing countries to conserve their tropical forests. In addition, Congress funds the Natural Climate Solutions program, administered by the U.S. Agency for International Development (USAID). This program aims to “protect, manage, and restore forests and other lands to combat climate change while improving livelihoods and resilience.” For more information, see CRS Report R46493, *U.S. Funding for International Conservation and Biodiversity*, by Pervaze A. Sheikh et al.; and CRS Report RL31286, *Debt-for-Nature Initiatives and the Tropical Forest Conservation Act (TFCA): Status and Implementation*, by Pervaze A. Sheikh.

⁷ See “U.S. Initiatives to Address *REDD⁺*” section.

Members and congressional staff also participate in international conferences featuring discussions on issues regarding forests, climate change, and biodiversity, including the 26th Conference of Parties (COP26) to the United Nations Framework Convention on Climate Change (UNFCCC) in November 2021 in Glasgow, United Kingdom.

To facilitate understanding of the principles underlying REDD⁺, this report begins with an overview of the forest carbon cycle and the contribution of deforestation to carbon emissions and an overview of deforestation (how it is measured, the factors that drive deforestation, and global and country-specific trends). The report then provides an overview of REDD⁺, including its history and implementation, and lists selected international and domestic initiatives that address REDD⁺. The report also discusses the potential role of REDD⁺ in discussions and negotiations in COP26.

The Forest Carbon Cycle⁸

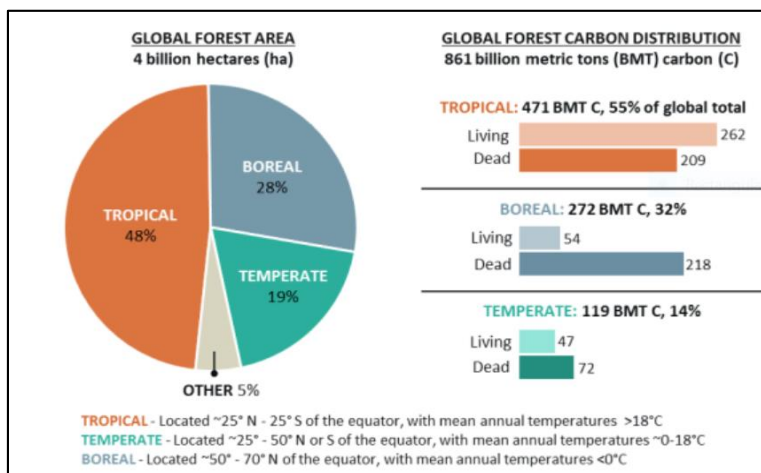
Anthropogenic emissions of greenhouse gases (GHG) into the atmosphere are the dominant contributor to the observed warming trend in global temperatures.⁹ Carbon emissions into the atmosphere are derived, in part, from forests undergoing anthropogenic and natural changes. Forest ecosystems uptake, store, cycle, and release carbon. The forest carbon cycle starts with the accumulation of atmospheric carbon in living plants—primarily trees—as they grow. As trees or parts of trees die, the carbon cycles into dead wood, litter, and soils. Carbon may remain in these *pools* for varying amounts of time—from months to millennia—before either returning directly to the atmosphere through natural processes (e.g., decomposition, combustion, respiration) or leaving the forest ecosystem through other means (e.g., timber harvests).¹⁰ Over time, forest ecosystems accumulate significant amounts of carbon and store a substantial amount of global terrestrial carbon (see **Figure 1**).

⁸ For a more comprehensive discussion of the forest carbon cycle, see CRS Report R46312, *Forest Carbon Primer*, by Katie Hoover and Anne A. Riddle.

⁹ Other greenhouse gases include methane (CH₄), nitrous oxide (N₂O), and several fluorinated gases. D. J. Wuebbles et al., “Executive Summary,” in *Climate Science Special Report: Fourth National Climate Assessment (NCA), Volume II*, U.S. Global Change Research Program, 2018.

¹⁰ Klaus Lorenz and Rattan Lal, *Carbon Sequestration in Forest Ecosystems* (New York: Springer, 2010).

Figure I. Global Forest Area and Carbon Distribution
(by major forest biome)



Source: Data from Table S3 in the online supporting material for Yude Pan et al., “A Large and Persistent Carbon Sink in the World’s Forests,” *Science*, vol. 333, no. 6045 (August 19, 2011), pp. 989-993, at <https://science.sciencemag.org/content/333/6045/988>.

Notes: Figures may not add due to rounding. Forest biomes also are defined by precipitation and vegetation type. “Living” includes carbon in living biomass; “dead” includes carbon in deadwood, litter, and soil. BMT C = billion metric tons of carbon.

The amount of carbon stored in a forest relative to the amount of carbon the forest releases into the atmosphere is constantly changing with tree growth, death, and decomposition. If the total amount of carbon released into the atmosphere by a given forest over a given period is greater than the amount of carbon sequestered in that forest, the forest is a *net source* of carbon emissions. If the forest sequesters more carbon than it releases into the atmosphere over a given period, the forest is a *net sink* of carbon. These forest carbon dynamics are driven in large part by *disturbances* (i.e., events that cause tree mortality).¹¹ Disturbances, including timber harvesting, forest clearing, weather events (e.g., hurricanes, droughts), insect and disease infestations, and wildfires, can change forests. Definitions of some terms related to forests in the context of REDD⁺ include the following:

- A *forest* is land spanning more than 0.5 hectares (ha) with trees higher than 5 meters and a canopy cover of more than 10% or with trees able to reach these thresholds. It does not include land that is predominantly under agricultural or urban land use.¹²
- *Deforestation* occurs when a disturbance causes a forest to convert to permanent or long-term non-forest cover, such as agricultural land, grassland, or development (e.g., urbanization). Deforestation occurs through deliberate human

¹¹ *Disturbance* is defined as “any relatively discrete event in time that disrupts ecosystems, community, or population structure and changes resources, substrate availability, or the physical environment.” Steward T. A. Pickett and P. S. White, *The Ecology of Natural Disturbance and Patch Dynamics* (Orlando: Academic Press, 1985). As a relatively prolonged event, drought may not fit the specific ecological definition of a disturbance but is included as one in this report.

¹² Food and Agriculture Organization of the United Nations (FAO), *Global Forest Resources Assessment 2020: Terms and Definitions*, 2018, at <https://www.fao.org/3/I8661EN/i8661en.pdf>. This definition of *forest* is widely used internationally, including by the U.S. federal government for forest inventory and analysis purposes. However, other sources may use other definitions or may not cite a formal definition. A hectare is about 2.47 acres.

intervention (e.g., clearing forests to plant grasslands) and, in some cases, without human intervention (e.g., natural disasters, such as fires or hurricanes). The term deforestation is not typically used to refer to areas where trees have been harvested and are expected to be replanted or to regenerate naturally.¹³

- *Forest degradation* occurs when disturbances cause a long-term decline in forest condition—such as loss of canopy cover—without deforestation.¹⁴
- *Tree cover loss* refers to decreases in forest canopy cover from anthropogenic or natural causes. In contrast to deforestation, tree cover loss may or may not persist over the long term. For example, a timber harvest where trees were replanted on the same land would result in tree cover loss but not deforestation.¹⁵

Forest Change and Deforestation

Scientists aim to quantify global forest change to inform efforts to monitor deforestation, forest degradation, and changes in carbon fluxes. Comprehensive, global data on forest change, in particular deforestation, is lacking. This is due in part to challenges related to the global scope, technological capabilities, and inconsistent definitions of relevant concepts, such as what constitutes deforestation. Further, even though satellite technology is capable of detecting many aspects of forest cover, satellites cannot differentiate between permanent and temporary tree cover loss. This must be done by on-the-ground verification.

Deforestation, in part, led to a net decline of global forest area of approximately 178 million ha from 1990 to 2020.¹⁶ This figure contains significant regional variation (e.g., gains of forest area in some regions). Forest degradation is difficult to assess and is generally not reported in global statistics.¹⁷ The *rate* of deforestation varies over this 30-year span and has declined in recent years. Global deforestation between 2015 and 2020 was estimated at 10 million ha per year, less than the 16 million ha per year calculated in the 1990s.¹⁸ Forests that are not cleared also face issues that affect their health. For example, scientists estimate that more than 100 million ha of forests globally are adversely affected by forest fires, pests, diseases, invasive species, drought, and weather events.¹⁹

Researchers, stakeholders, and governments measure carbon flux using varied scopes, methodologies, and definitions, leading to varying results. Some estimates of carbon flux combine forestry with other land use activities, such as agriculture, which may mask the specific

¹³ Food and Agriculture Organization of the United Nations, *Global Forest Resource Assessment 2020: Terms and Definitions*, 2020, at <https://www.fao.org/3/I8661EN/i8661en.pdf>.

¹⁴ Ian Thompson et al., “An Operational Framework for Defining and Monitoring Forest Degradation,” *Ecology and Society*, vol. 18, no. 2 (2013), p. 20.

¹⁵ World Resources Institute (WRI) Global Forest Watch, “Country Profiles,” accessed September 21, 2021, at <https://www.globalforestwatch.org/dashboards/global>. For additional discussion of the difference between tree cover loss and deforestation, see Nancy Harris et al., “When a Tree Falls, Is It Deforestation?” *WRI Global Forest Watch* blog, September 13, 2018, at <https://www.globalforestwatch.org/blog/data-and-research/when-a-tree-falls-is-it-deforestation/>.

¹⁶ Maria Janowiak et al., *Considering Forest and Grassland Carbon in Land Management*, U.S. Department of Agriculture, U.S. Forest Service, GTR-WO-95, June 2017; and Food and Agriculture Organization of the United Nations (FAO), *Global Forest Resources Assessment 2020*, 2020, p. 10, at <http://www.fao.org/3/ca8642en/CA8642EN.pdf>. (Hereinafter, FAO, *Global Forest Resources Assessment 2020*.)

¹⁷ FAO, *Global Forest Resources Assessment 2020*, p. 96.

¹⁸ FAO, *Global Forest Resources Assessment 2020*, p. 13.

¹⁹ FAO, *Global Forest Resources Assessment 2020*, p. xvi.

contributions of the forestry sector.²⁰ Some studies might report only net fluxes and not gross fluxes, and others might only include CO₂ emissions versus all GHGs and make assumptions to differentiate anthropogenic and non-anthropogenic fluxes.²¹

According to estimates by the Intergovernmental Panel on Climate Change (IPCC) from 2007 to 2016, net global anthropogenic emissions from agriculture, forestry, and land use (often referred to as AFOLU) for this period were 5.2 (+/- 2.6) gigaton (Gt) of carbon dioxide equivalent per year (CO₂e/yr) or approximately 13% of net global CO₂ emissions.²² This was driven by land cover change, including deforestation and afforestation/reforestation, wood harvesting, and other land uses (e.g., peatland burning). Net emissions noted above include estimated gross emissions of about 20 GtCO₂e/yr and gross removals of about -14 GtCO₂e/yr, largely from forest growth.²³ IPCC further noted in its report that the “largest potential for reducing AFOLU emissions are through reduced deforestation and forest degradation (0.4-5.8 GtCO₂-eq/yr).²⁴”

Forest Coverage and Deforestation Trends

Forests cover approximately 31% of the global land area, with approximately half of all forests located in five countries: Brazil, Canada, China, Russian Federation, and the United States.²⁵ (See **Table 1.**) Scientists measure changes in forest coverage by estimating tree cover loss, which includes deforestation and other activities that might not be permanent (e.g., selective logging in plantations). There are many challenges for measuring forest change over time, and estimates of deforestation rates for certain countries may vary among reports.²⁶ This section of the report relies on data provided by the Agriculture Organization of the United Nations (FAO) for percent global forest coverage and the World Resources Institute’s Global Forest Watch Program (GFWP) for changes in tree cover loss and estimated deforestation. GFWP estimated deforestation by reviewing satellite data of tree cover loss and categorizing the loss based on drivers of deforestation (e.g., clearings, conversion to agricultural fields and pasture, urban expansion, and others).²⁷ **Table 1** shows these estimates including total tree cover loss, by country, between 2001 and 2020. (Note that these figures do not include tree cover gain.)

Countries with higher levels of potentially permanent forest loss (e.g., Brazil, the Democratic Republic of the Congo [DRC], and Indonesia) are experiencing commodity-driven deforestation,

²⁰ Nancy Harris et al., “Global Maps of the Twenty-First Century Forest Carbon Fluxes,” *Nature Climate Change*, vol. 11, (2021), pp. 234-240.

²¹ Nancy Harris et al., “Global Maps of the Twenty-First Century Forest Carbon Fluxes.”

²² IPCC, Chapter 2, “Land-Climate Interactions,” and Table 2.2, “Net Anthropogenic Emissions Due to Agriculture, Forestry, and Other Land Use (AFOLU) and non-AFOLU (Average for 2007-2018), in *Climate Change and Land: An IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems*, 2019, p. 123. Hereafter, IPCC, Chapter 2, “Land-Climate Interactions.” Carbon dioxide equivalent is a measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.

²³ IPCC, Chapter 2, “Land-Climate Interactions.”

²⁴ IPCC, Chapter 2, “Land-Climate Interactions.”

²⁵ FAO, *Global Forest Resources Assessment 2020*; World Resources Institute (WRI) Global Forest Watch, Country Profiles, accessed September 21, 2021, at <https://www.globalforestwatch.org/dashboards/global>.

²⁶ Scientists note that rates of forest loss can be measured by satellites, but the causes and permanence of forest loss that help define deforestation must be assessed by on-the-ground information. See H. Manjari Jayathilake et al., “Drivers of Deforestation and Degradation for 28 Tropical Conservation Landscapes,” *Ambio*, vol. 50 (2021), pp. 215-228.

²⁷ WRI, “Global Forest Review – Data and Methods,” at <https://research.wri.org/gfr/data-methods#forestchange1>.

shifting agriculture, and urbanization, according to GFWP.²⁸ In contrast, countries with lower levels of potentially permanent forest loss (e.g., Russia, Canada, and Australia) are losing forest coverage as a result of forestry activities or wildfires—both drivers with the potential for forest regeneration.²⁹ In the United States, tree cover loss is largely due to forestry activities (e.g., plantation forestry) and wildfire—representing approximately 69% and 23% of the total nationwide tree cover loss, respectively.³⁰

Table I. Selected Tree Cover Data for the Top 10 Forested Countries
(not including tree cover gain)^a

Country	Percent Global Forest Coverage in 2020	Forest Area in 2020 (Mha)	Tree Cover Loss 2001-2020 (Mha) ^b	Estimated Percent of Tree Cover Loss Likely to Be Permanent ^c	Drivers of Tree Cover Loss
Russia	20%	815	69.5	0%	Wildfire, forestry
Brazil	12%	497	59.8	71%	Commodity-driven deforestation, shifting agriculture
Canada	9%	347	44.1	0%	Forestry, wildfire
United States	8%	310	42.2	8%	Forestry, wildfires, urbanization
China	5%	220	10.3	2%	Forestry
Australia	3%	134	8.5	1%	Wildfire, forestry
Democratic Republic of the Congo (DRC)	3%	126	15.9	34%	Shifting agriculture
Indonesia	2%	92	27.7	94%	Commodity-driven deforestation
Peru	2%	72	3.4	not available	Shifting agriculture, commodity-driven deforestation
India	2%	72	1.93	not available	Forestry

Sources: FAO, *Global Forest Resources Assessment 2020*. Global Forest Watch, Country Profiles, accessed September 21, 2021, at <https://www.globalforestwatch.org/dashboards/global>; World Resources Institute (WRI), “Global Forest Review – Top 10 Lists,” at <https://research.wri.org/gfr/top-ten-lists>; WRI, “Global Forest Review – Data and Methods,” at <https://research.wri.org/gfr/data-methods#forestchange>.

²⁸ WRI, “Global Forest Review – Top 10 Lists,” at <https://research.wri.org/gfr/top-ten-lists>.

²⁹ WRI, “Global Forest Review – Top 10 Lists,” at <https://research.wri.org/gfr/top-ten-lists>.

³⁰ See Global Forest Watch dashboard for the United States at <https://www.globalforestwatch.org/dashboards/country/USA>. Plantation forestry is an intensively managed planted forest that at maturity is composed of one or two species, has one age class, and has regular tree spacing. Once trees are harvested, the soil is reformed, and new trees are planted.

Notes: Global Forest Watch partners with the Global Land Analysis and Discovery (GLAD) laboratory at the University of Maryland to provide annual, updated global-scale forest loss data derived from satellite imagery. The data are not self-reported by countries.

- According to Global Forest Watch, because of variation in methodology and date of content, tree cover loss and gain data cannot be compared accurately, and variables such as net tree cover gain or loss cannot be calculated.
- Tree cover loss data are from regions that contains over 30% tree coverage.
- Global Forest Watch estimates percent of permanent tree cover loss as loss of tree cover associated with commodity-driven deforestation, shifting agriculture, forestry activities, wildfire, and urbanization.

Drivers of Deforestation

Efforts to reduce deforestation focus, in part, on reducing drivers of deforestation. Reducing drivers of deforestation, in turn, can increase the effectiveness and permanence of REDD⁺ activities. Scientists and policymakers have identified several drivers of deforestation that vary by region, forest type, local economies, and global trade, among other factors. The largest driver of global deforestation is agricultural expansion, which includes commercial agriculture, shifting small-scale agriculture, and ranching.³¹ Other drivers include legal and illegal logging; extractive industries (e.g., mining); wildfire; and urbanization, including the expansion of roads and infrastructure such as hydroelectric dams.³² Associating the appropriate drivers of deforestation with forested regions is a key step in implementing REDD⁺, according to scientists. Complex indirect and direct deforestation drivers affect large forested regions in the tropics, such as the Amazon Rainforest, the Congo Basin, and forests in Indonesia. These forested areas are often the focus of REDD⁺ initiatives and contain *hotspots* of deforestation.³³ **Table 2** provides a summary of these forest characteristics and their deforestation drivers.

Table 2. Deforestation Data in Selected Regions

Region	Area Deforested (year)	Primary Drivers of Deforestation
Legal Brazilian Amazon ^a	1,090,000 ha (2020)	Cattle ranching, small-scale agriculture, conversion of pastureland to soybean production, and fires in drought-prone forests
Congo Basin ^b	775,000 ha ^c (2019)	Small-scale agriculture, commercial agricultural expansion, logging, and fuelwood and charcoal extraction
Indonesia	115,500 ha (2020)	Small-scale farming, expansion of crops such as pulpwood and palm oil plantations, logging, and fires

Sources: Data from the Brazilian Instituto Nacional de Pesquisas Espaciais, accessed October 6, 2021, at <http://terrabrasilis.dpi.inpe.br/en/home-page/>; Johannes Reiche et al., “Forest Disturbance Alerts for the Congo Basin Using Sentinel-1,” *Environmental Research Letters*, vol. 16, no. 2 (2021) (hereinafter, Reiche et al., “Forest Disturbance Alerts”); Francis Seymour and Nancy Harris, “Reducing Tropical Deforestation,” *Science*, vol. 365, no. 6455 (2019), pp. 756-757; World Wildlife Fund, “Chapter 3: Drivers of Deforestation,” in *Deforestation*

³¹ Francis Seymour and Nancy Harris, “Reducing Tropical Deforestation,” *Science*, vol. 365, no. 6455 (2019), pp. 756-757.

³² World Wildlife Fund, “Chapter 3: Drivers of Deforestation,” in *Deforestation Fronts: Drivers and Responses in a Changing World*, January 13, 2021, at <https://www.worldwildlife.org/publications/deforestation-fronts-drivers-and-responses-in-a-changing-world-full-report>; WRI Global Forest Watch, “Global Summary,” accessed October 7, 2021, at <https://www.globalforestwatch.org/dashboards/global>.

³³ Susan Minnemeyere et al., *New Deforestation Hot Spots in the World’s Largest Tropical Forests*, WRI, February 7, 2017, at <https://www.wri.org/insights/new-deforestation-hot-spots-worlds-largest-tropical-forests>.

Fronts: Drivers and Responses in a Changing World, January 13, 2021, at <https://www.worldwildlife.org/publications/deforestation-fronts-drivers-and-responses-in-a-changing-world-full-report>.

Notes: Details about how deforestation rates are calculated are available from each of the sources listed above. ha = hectares.

- a. The Legal Brazilian Amazon is a defined area under Brazilian law comprising nine states that contain the Amazon forest.
- b. The Congo Basin includes area in Cameroon, the Central African Republic, the Republic of Congo, the Democratic Republic of Congo, Equatorial Guinea, and Gabon.
- c. This value of 775,000 ha represents the area of forest disturbance, which the authors define as, “the complete or partial removal of tree cover within a 10m² pixel.” See Reiche et al., “Forest Disturbance Alerts.”

What Is REDD⁺?

History of REDD⁺

REDD evolved over a series of international negotiations, conferences, agreements, and treaties. The concept of REDD was introduced by the Coalition of Rainforest Nations in a submission to the 11th Conference of the Parties (COP 11) in 2005.³⁴ This initial concept document outlined an approach for the UNFCCC to support the use of international financing from industrialized countries to reduce carbon emissions from tropical deforestation.³⁵ In 2007, the Bali Decision on Deforestation acknowledged that deforestation and forest degradation contribute to GHG emissions and stated an “urgent need” to further reduce GHG emissions from deforestation.³⁶ The decision promoted various efforts, including demonstration projects, to reduce GHG emissions from deforestation and forest degradation, and it encouraged financial and technical support for those efforts from the parties to the convention and others.³⁷

REDD became REDD⁺ in 2008, when the UNFCCC expanded the activities associated with REDD to include participation of Indigenous people; inclusion of co-benefits of reducing deforestation, such as biodiversity conservation; enhanced forest monitoring; and the conservation of existing forest carbon stocks.³⁸ The Cancun Agreements, adopted in 2010, further evolved REDD⁺ to broadly address drivers of deforestation; land tenure; forest governance; gender issues; and the participation of relevant stakeholders, including Indigenous peoples and local communities (these are known as the *Cancun Safeguards*).³⁹ The Cancun Agreements also provided a list of activities to be undertaken for REDD⁺ that included the following:

³⁴ United Nations Framework Convention on Climate Change (UNFCCC), *Reducing Emissions from Deforestation in Developing Countries: Approaches to Stimulate Action*, Conference of the Parties, 11th Session, Submission from Parties, November 11, 2005.

³⁵ Since 1992, the UNFCCC has been the primary multilateral vehicle for international cooperation to address climate change. UNFCCC, agreed on May 9, 1992, entered into force March 21, 1994, 1771 U.N.T.S. 107; United Nations, Treaty Series, vol. 1771, p. 107; and U.S. depositary notifications C.N.148.1993.

³⁶ UNFCCC, Decision 2/CP.13—“Reducing Emissions from Deforestation in Developing Countries: Approaches to Stimulate Action,” reported in UNFCCC, *Report of the Conference of the Parties on Its Thirteenth Session Held in Bali from 3rd to 15th December 2007*, March 14, 2008, p. 8.

³⁷ *Ibid.*

³⁸ UNFCCC, Decision 4/CP.15, reported in *Report of the Subsidiary Body for Scientific and Technological Advice on Its Twenty-Ninth Session, Held in Poznan from 1 to 10 December 2008*, Subsidiary Body for Scientific and Technological Advice, February 17, 2009, p. 8.

³⁹ The Cancun Agreements have seven safeguards for REDD⁺, including that REDD⁺ actions (1) are consistent with national forest programs and international conventions and agreements; (2) are governed by transparent and effective

- Reducing emissions from deforestation
- Reducing emissions from forest degradation
- Conservation of forest carbon stocks
- Enhancement of forest carbon stocks
- Sustainable management of forests⁴⁰

In addition, the Cancun Agreements requested that parties develop a national strategy to implement the activities discussed above, calculate a national forest emission reference level, develop a forest monitoring system, and implement a system to address safeguards for REDD+.

In 2013, the Warsaw Framework for REDD+ was created from earlier decisions on REDD+ adopted by COP. The Warsaw Framework is considered the “REDD+ implementation guide.”⁴¹ In 2015, REDD+ was incorporated into Article 5 of the Paris Agreement (PA);⁴² a framework for a global carbon market to financially support REDD+ was included under Article 6 of the PA in the same year.⁴³

Implementation of REDD+

REDD+ aims to reduce emissions from deforestation and forest degradation by providing funding and incentives to landowners (public or private) for not deforesting their land. Over 50 countries have national REDD+ initiatives, mostly developing countries in or adjacent to the tropics. In addition, provincial and district governments implement REDD+ at the subnational level, and private landowners implement it at the local level.⁴⁴ REDD+ initiatives typically incentivize and compensate developing countries or subnational entities for reducing their emissions from deforestation and forest degradation through results-based payments.⁴⁵ REDD+ is implemented in countries in several stages, including (1) achieving REDD+ readiness; (2) formalizing an agreement for financing; (3) monitoring, reporting, and verifying results; and (4) receiving results-based payments.

structures; (3) respect the knowledge and rights of Indigenous peoples and local communities and take into account relevant international obligations; (4) allow for the full participation of relevant stakeholders; (5) are consistent with the conservation of natural forests, biodiversity, and ecosystem services; (6) address the risk of reversals of REDD+; and (7) reduce displacement of emissions.

⁴⁰ UNFCCC, Decision 1/CP.6, UNFCCC Secretariat, *Key Decisions Relevant for Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD+)*, February 2016. Hereinafter, Decision 1/CP.6.

⁴¹ UNFCCC, Decision 9-15/CP.19, “Decisions Adopted by the Conference of the Parties,” reported in UNFCCC, *Report of the Conference of the Parties on its Nineteenth Session, Held in Warsaw from 11 to 23 November 2013*, January 31, 2014, pp. 24-43.

⁴² Conference of the Parties to the UNFCCC, “Adoption of the Paris Agreement,” in UNFCCC, “Addendum, Part Two: Action Taken by the Conference of the Parties at Its Twenty-First Session,” in *Report of the Conference of the Parties on Its Twenty-First Session, Held in Paris from 30 November to 13 December 2015*, FCCC/CP/2015/10/Add.1. Decision 1/CP.21. 2016. Hereinafter, the Paris Agreement. Under Article 5, parties are encouraged to implement activities to reduce emissions from deforestation and forest degradation based on already agreed upon guidance and decisions. The agreement also discusses a REDD+ approach and results-based payments for implementing activities.

⁴³ Article 6 of the Paris Agreement.

⁴⁴ Amy E. Duchelle et al., *Forest Based Climate Mitigation: Lessons from REDD+ Implementation*, WRI, Issue Brief, October 2019, pp. 1-31. Hereinafter, Amy E. Duchelle et al., *Forest Based Climate Mitigation*.

⁴⁵ Results-based payments are funding provided upon completion of actions or pre-agreed terms by one or more beneficiaries. For REDD+, results typically are associated with reductions in greenhouse gas emissions from forests.

To achieve REDD⁺ readiness, nations must be prepared to receive results-based payments for conserving forests.⁴⁶ This is accomplished by initially establishing a forest reference emission level or forest reference level that serves as a baseline for measuring and assessing the performance of REDD⁺ activities. The reference level also sets the basis for measuring the effectiveness of REDD⁺.⁴⁷ Reference levels are reported as emitted tons of CO₂e/yr from deforestation and forest degradation for a reference period.⁴⁸ REDD⁺ readiness also may involve implementing national policies, measures, and strategies, as well as conducting demonstration projects.

After achieving REDD⁺ readiness, the country, subnational entity, or locality may enter a legally binding commitment (*agreement*) with a funder to finance REDD⁺ activities. An agreement typically contains provisions and terms for implementing REDD⁺ activities and for providing payments upon the completion of these activities. An agreement also may contain conditions for adhering to REDD⁺ safeguards, such as taking actions that are consistent with national forest plans and international agreements, among other conditions.⁴⁹

REDD⁺ activities typically are implemented after agreements are made, although in some cases agreements may cover existing activities. (See **Table 3** for examples of projects.) After implementation, results are monitored, reported, and verified (MRV) before payments are given. MRV programs can have several components. Domestic agencies may monitor deforestation, reforestation, and forest degradation with satellite imagery and analyze the results. For example, the NASA Carbon Monitoring System aims to provide MRV data to address forest changes in the United States.⁵⁰ Forest data also help scientists estimate the effects of REDD⁺ activities through indicators such as how many tons of CO₂e are reduced annually. In addition, MRV protocols can include measuring the effectiveness of REDD⁺ activities and verifying the distribution of payments and nonmonetary benefits to stakeholders.⁵¹ As of September 2020, 13 countries had reported results from national-level REDD⁺ activities, most of which aim to reduce emissions from deforestation.⁵² These country-level programs reported to the UNFCCC emissions reductions from REDD⁺ totaling 9.03 billion tons of CO₂e; approximately 90% of this amount was reported from Brazil.⁵³

Results-based payments are made to countries (or landowners depending on the scale) who have successfully implemented REDD⁺ programs. The payments aim to overcome the opportunity costs of other land uses that drive deforestation, such as ranching and crop production. Payments

⁴⁶ Under the Warsaw Framework, readiness involves four factors: (1) develop a national REDD⁺ strategy; (2) establish a national reference emission level or forest emission level; (3) create a national forest monitoring system; and (4) provide a system to assess and report how REDD⁺ safeguards are being addressed.

⁴⁷ As of September 2020, 50 countries had submitted reference levels to the UNFCCC, representing areas that experienced approximately 75% of global deforestation. FAO, *From Reference Levels to Results Reporting: REDD+ Under the United Nations Framework Convention on Climate Change*, Forestry Working Paper no. 19, 2020. Hereinafter, FAO, *From Reference Levels to Results Reporting*.

⁴⁸ UNFCC, “REDD⁺ Platform: Forest Reference Emission Levels,” fact sheet, at <https://redd.unfccc.int/fact-sheets/forest-reference-emission-levels.html>.

⁴⁹ International Union for Conservation of Nature (IUCN), *REDD Plus and Benefit Sharing*, December 2009, at https://www.iucn.org/downloads/benefit_sharing_english.pdf. Hereinafter, IUCN, *REDD plus and Benefit Sharing*.

⁵⁰ This system is in its prototype phase. For more information, see National Aeronautics and Space Administration (NASA), “NASA Carbon Monitoring System,” at <https://carbon.nasa.gov/>.

⁵¹ EuroREDD Facility, “Measuring, Monitoring, Reporting, and Verification,” at <https://www.euredd.efi.int/measuring>.

⁵² FAO, *From Reference Levels to Results Reporting*.

⁵³ FAO, *From Reference Levels to Results Reporting*.

might come from a variety of public, private, bilateral, and multilateral sources. Funds from national-level REDD+ programs generally are to be reinvested for activities in line with the country's nationally determined contributions (NDCs) as established under Article 4 of the Paris Agreement, national REDD+ strategies, or low-carbon development activities.⁵⁴

Table 3. Examples of REDD+ Activities at the Local and National Scales

Scale	Examples
Local (implemented by landowners and communities)	Preservation of forests Sustainable management of forests (e.g., excluding cattle, removing invasive species) Forest restoration/afforestation Monitoring of local forests Reduction of damage to forests from extractive activities
National and subnational	Laws and regulations that lead to the conservation and protection of forests Monitoring and enforcement of conservation-related laws and regulations National strategy for implementing REDD+/national program for payments for REDD+ Regulation of carbon markets, if applicable Establishment and enforcement of land tenure Monitoring and measuring of change in forest cover

Sources: CRS and Arturo Balderas Torres and Margaret Skutsch, "Splitting the Difference: A Proposal for Benefit Sharing in Reduced Emissions from Deforestation and Forest Degradation (REDD+)," *Forests*, vol. 3, no. 1 (December 2012), pp. 137-154.

Note: This list is not comprehensive. REDD+ = Reductions in Emissions from Deforestation and Forest Degradation. *Afforestation* is the act or process of establishing a forest on land not previously forested.

There are a variety of financing approaches used to implement REDD+ activities: direct, nested, or project-based.

- **Direct Approach:** Financing may go directly to a jurisdiction (country or state) for implementing REDD+; in this case, the government would receive all of the benefits from REDD+ activities and distribute them to stakeholders via a benefit-sharing mechanism. As noted above, funds from national-level REDD+ programs generally are to be reinvested for activities in line with the country's NDCs, national REDD+ strategies, or low-carbon development activities.⁵⁵
- **Nested Approach:** Under a nested REDD+ approach, participation and terms (e.g., rules and parameters for projects) are set at the jurisdictional level and benefits are provided to individual projects.⁵⁶ For example, a country may establish an overarching program for REDD+ to provide guidelines and parameters for individual projects to be funded directly.
- **Project-Based Approach:** This approach involves providing benefits directly to projects that are not subject to a jurisdictional framework. Nonprofit or for-profit developers often use the project-based REDD+ approach and sell credits directly to buyers.⁵⁷ Voluntary transactions of this type stimulate investments from those

⁵⁴ FAO, *From Reference Levels to Results Reporting*, p. 40.

⁵⁵ FAO, *From Reference Levels to Results Reporting*, p. 40.

⁵⁶ Amy E. Duchelle et al., *Forest Based Climate Mitigation*. Although Article 6 of the Paris Agreement formalized a framework for a global carbon market, this framework has not been widely used to finance REDD+.

⁵⁷ Beatrice Granziera, Kelley Hamrick, and Maggie Comstock, *Eligibility Requirements for REDD Standards and*

in the private sector that are seeking carbon credits to offset their emissions. The voluntary market for REDD+ has increased significantly in recent years, going from 104.3 million tons (mt) CO₂e in 2019 to 188.2 mtCO₂e in 2020 to 239.3 mtCO₂e through August 2021. By the end of 2021, the market is expected to double the 2020 value.⁵⁸

REDD+ Initiatives

Reporting REDD+ initiatives globally is challenging, due to projects occurring at various jurisdictional levels and a lack of homogenized data. There is no comprehensive source of REDD+ project data at all jurisdictional and private levels. However, the International Database on REDD+ Projects and Programs (ID-RECCO), created in 2015, aims to capture descriptions and data on as many REDD+ projects and data as possible.⁵⁹ The database is considered indicative and not comprehensive since it reflects reported projects that are described in English. Other databases, such as the UNFCCC REDD+ Web Platform, make available information about the results of completed REDD+ projects at the national level, including tons of carbon dioxide equivalent associated with each project, information on entities providing funding, and associated documentation.⁶⁰ Others have compiled similar data.⁶¹

According to ID-RECCO, as of 2020, there were a total of 624 REDD+ projects, including 416 ongoing projects, 206 inactive projects, and 2 planned projects. **Table 4** lists the 10 countries with the greatest area devoted to REDD+, ranked by number of hectares associated with REDD+ projects. Of the 416 ongoing REDD+ projects catalogued by the database, 108 are occurring in these countries (approximately 25%).⁶²

Table 4. Ongoing REDD+ Projects in Selected Countries
(as of 2020)

Country	Number of Projects	Cumulative Area of Projects (ha)
Brazil	27	14,190,032
Colombia	28	10,897,008
Indonesia	18	5,936,444
Myanmar	1	3,888,200
Kenya	8	2,646,810
Peru	13	2,073,021

Financing, Nature Conservancy and Conservation International, May 21, 2021.

⁵⁸ Stephen Donofrio et al., *Markets in Motion: State of the Voluntary Carbon Markets 2021*, Ecosystem Marketplace: Forest Trends Initiative, September 21, 2021.

⁵⁹ Gabriela Simonet and Coline Seyller, *ID-RECCO, A New Collaborative Work Tool to Improve Knowledge on REDD+ Projects: Sources, Methodology, and Data*, Chaire Economie du Climat, Working Paper no. 2015-08, September 2015, at <http://www.chaireeconomieduclimat.org/wp-content/uploads/2015/09/15-09-Cahier-R-2015-08-Simonet-Seyller.pdf>.

⁶⁰ The Lima REDD+ Information Hub was created in response to Decision 9/CP.19 at COP19, directing the establishment of “an information hub on the web platform on the UNFCCC website as a means to publish information on the results of activities.” See UNFCCC, “Lima REDD+ Information Hub,” at <https://redd.unfccc.int/info-hub.html>.

⁶¹ See, for example, the Center for International Forestry Research, “Global Database of REDD+ and Other Forest Carbon Projects,” 2017, at <https://www2.cifor.org/gcs/redd-map/>.

⁶² Stibniati S. Atmadja, *Summary Analysis of REDD+ Projects, 2018-2020, v. 4.1*, 2021, available from the International Database on REDD+ Projects and Programs at <https://www.reddprojectsdatabase.org/>.

Country	Number of Projects	Cumulative Area of Projects (ha)
Zambia	4	1,272,803
Cameroon	1	1,247,391
Madagascar	4	1,017,439
Cambodia	4	894,115
Total	108	44,063,263

Source: Stibniati S. Atmadja, *Summary Analysis of REDD⁺ Projects, 2018-2020*, v. 4.1, 2021, available from the International Database on REDD+ Projects and Programs at <https://www.reddprojectsdatabase.org/>.

Note: The 10 countries with the greatest area devoted to REDD⁺ projects are in this table. ha = hectares; REDD⁺ = Reductions in Emissions from Deforestation and Forest Degradation.

Multilateral REDD⁺ Initiatives

International funding to address deforestation through REDD⁺ programming comes from initiatives such as the United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation (UN-REDD), the Forest Carbon Partnership Facility, and the World Bank's Forest Investment Program. International funding is also provided through bilateral foreign assistance, international environmental funds, and public-private partnerships. **Table 5** discusses selected multilateral efforts. Most multilateral efforts to implement REDD⁺ focus on tropical and subtropical developing countries. Some of these efforts focus on landuse policies broadly, with an emphasis on REDD⁺; such efforts include programs that address governance, sustainability, and agriculture in conjunction with REDD⁺. Other programs focus on REDD⁺ readiness.⁶³

Table 5. Selected Multilateral Initiatives That Support REDD⁺

Initiative	Description
United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation (UN-REDD)	UN-REDD helps developing countries build the capacity to implement a national-level REDD ⁺ program (i.e., <i>REDD⁺ readiness</i>). UN-REDD has assisted 32 countries to finalize national REDD ⁺ strategies and supported over 45 countries in developing national forest monitoring systems. As of 2020, several countries were on the brink of meeting all four objectives of REDD ⁺ readiness under the program: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Indonesia, and Paraguay. The European Union and Denmark, Japan, Luxemburg, Norway, Spain, and Switzerland fund UN-REDD. Donors have provided a cumulative \$333.7 million to UN-REDD since its inception in 2008, with 85.6% of the funds contributed by Norway.
Forest Carbon Partnership Facility (FCPF)	The FCPF is a partnership of governments, businesses, civil society, and Indigenous peoples' organizations that aims to implement REDD ⁺ . FCPF implements REDD ⁺ through the Readiness Fund, which focuses on helping countries become REDD ready, and the Carbon Fund, which provides results-based payments to REDD ⁺ -ready countries. The FCPF has 47 country participants and 17 donors, which have provided approximately \$1.3 billion in contributions and commitments since its inception in 2008. The United States is a donor to both funds.

⁶³ UN-REDD Programme, 2020: *12th Consolidated Annual Progress Report of the U.N.-REDD Programme Fund*, 2020, p. 5, at <https://2020ar.unredd.net/wp-content/uploads/2021/07/UN-REDD-2020-Annual-Report.pdf>.

Initiative	Description
Forest Investment Program (FIP)	The FIP provides grants and concessional loans through multilateral development banks for countries to address drivers of deforestation and implement REDD ⁺ . The program is administered by the World Bank and has allocated approximately \$603 million to 51 projects, largely in Latin America and Africa.
BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL)	ISFL, initiated in 2013, is a multilateral fund, supported by donor governments and managed by the World Bank. ISFL aims to reduce greenhouse-gas emissions from the land sector and includes efforts to implement REDD ⁺ , sustainable agriculture, and land use planning policies and practices. Donors include Germany, the United Kingdom, Switzerland, Norway, and the United States. Capital in the fund is approximately \$355.0 million as of 2020.
Green Climate Fund (GCF)	The GCF is an international fund derived from the United Nations Framework Convention on Climate Change. The GCF, operational in 2014, aims to assist lower-income countries in their efforts to address climate change through administering grants and other concessional financing for mitigation and adaptation projects, programs, policies, and activities related to addressing climate change. Contributions from donor countries and private sources capitalize the GCF; donor countries such as the United States, Japan, Germany, the United Kingdom, France, and others provide approximately 66% of the fund's capital, and private sources provide approximately 34%. The GCF has approved 190 projects in 127 developing countries and has committed approximately \$10.0 billion in financing. A portion of the fund addresses forest and land use issues, including REDD ⁺ .
Central African Forest Initiative (CAFI)	CAFI focuses on helping six partner countries in Africa (Cameroon, the Central African Republic, the Democratic Republic of the Congo [DRC], Equatorial Guinea, Gabon, and the Republic of the Congo) implement the Paris Agreement, reduce poverty, develop sustainably, and implement biodiversity activities. CAFI has approximately \$500 million committed for 30 programs, a large majority located in the DRC. Donors include the European Union, France, Germany, Netherlands, Norway, and South Korea.

Sources:

- a. UN-REDD Programme, *2020: 12th Consolidated Progress Report of the UN-REDD Programme Fund*, 2020, at <https://2020ar.unredd.net/wp-content/uploads/2021/07/UN-REDD-2020-Annual-Report.pdf>.
- b. FCPF, "About the FCPF," at <https://www.forestcarbonpartnership.org/about>.
- c. FIP, "Achieving a Triple Win," fact sheet, Climate Investment Funds, 2017, at https://www.climateinvestmentfunds.org/sites/cif_enc/files/fip_factsheet_0.pdf.
- d. ISFL, "Who We Are," at <https://www.biocarbonfund-isfl.org/who-we-are>.
- e. GCF, *GCF at a Glance: Project Portfolio*, October 7, 2021, <https://www.greenclimate.fund/sites/default/files/document/gcf-project-portfolio-eng.pdf>.
- f. CAFI, "Accelerating Reforms in Central Africa," at <https://www.cafi.org/>.

Note: REDD⁺ = Reductions in Emissions from Deforestation and Forest Degradation.

Bilateral Assistance

Several countries, including the United States and Norway, provide bilateral assistance to implement REDD⁺ at the national level. For example, Norway's International Climate and Forest Initiative aims to reduce the destruction of tropical forests and conserve biodiversity, while promoting sustainable development and alleviating poverty.⁶⁴ The program was initiated in 2008 and aims to provide approximately \$350.0 million annually to fund REDD⁺ activities. The

⁶⁴ Norway's International Climate and Forest Initiative (NICFI), "How Do We Work?," at <https://www.nicfi.no/how-do-we-work/>.

program entered into partnerships with Brazil and Indonesia to pay for reducing deforestation; however, both partnerships have been terminated. Norway continues to work with Colombia, Peru, the Democratic Republic of Congo, and other countries on REDD⁺.⁶⁵

Public Private Partnerships

Several public-private partnerships also address REDD⁺. For example, the Lowering Emissions by Accelerating Forest Finance (LEAF) Coalition is an initiative that combines efforts from Norway, the United Kingdom, and the United States with companies such as Amazon, Airbnb, Bayer, Nestlé, Salesforce, and Unilever, among others.⁶⁶ LEAF aims to support emissions reductions in a REDD⁺ framework in tropical and subtropical forested countries. LEAF plans to secure \$1.0 billion to implement REDD⁺ at the jurisdictional and sub-jurisdictional levels. In its initial call for proposals, LEAF deemed countries as well as subnational governing entities (e.g., states) eligible for purchase agreements with participating donors.

U.S. Initiatives to Address REDD⁺

The United States addresses international aspects of REDD⁺ directly through the Natural Climate Solutions Program (NCSP), under the U.S. Agency for International Development (USAID), and indirectly through other federal agencies. (See **Table 6**.) NCSP, formerly called the Sustainable Landscapes Program, aims to help partner nations protect, manage, and restore forests and other landscapes. It focuses on assisting countries with globally important forests that are threatened and where the degradation of ecosystems impairs development and stimulates excess carbon emissions.⁶⁷ NCSP also aims to help partner countries build systems to conduct forest inventories and monitor, report, and verify carbon emissions; build programs for forest management; and improve forest livelihoods for local communities.⁶⁸

USAID's biodiversity activities also address forested landscapes. Biodiversity activities have two goals: (1) conserve biodiversity in target areas and (2) integrate biodiversity as a component of human development.⁶⁹ Biodiversity activities that address REDD⁺ activities include the Central Africa Regional Program for the Environment (CARPE) and conservation in the Amazon, among others. CARPE was established in 1995 as a long-term, multifaceted program to “promote sustainable forest management, biodiversity conservation, and climate change mitigation in the [Central Africa] region through sustainable natural resource management, and strengthened conservation policy development and implementation.” The Amazon program is intended to help Brazil manage protected areas, encourage the private sector to improve sustainable livelihoods for Amazonian communities, and provide science and technology to improve conservation practices, among other activities.⁷⁰

⁶⁵ NICFI, “Partner Countries,” at <https://www.nicfi.no/partner-countries/>.

⁶⁶ Lowering Emissions by Accelerating Forest Finance (LEAF) Coalition, “LEAF Coalition,” at <https://leafcoalition.org/>.

⁶⁷ USAID, “National Climate Solutions,” at <https://www.usaid.gov/climate/natural-solutions>. Hereafter USAID, “National Climate Solutions.”

⁶⁸ USAID, “National Climate Solutions.”

⁶⁹ USAID, *USAID Biodiversity Policy*, March 2014, p. 10. In addition to these two goals, the policy sets six objectives for programs.

⁷⁰ USAID, “Bilateral Biodiversity Conservation,” July 12, 2021, at <https://www.usaid.gov/brazil/our-work/environmental-partnerships>.

The United States bilaterally addresses deforestation and forest-related issues through free trade agreements and other bilateral agreements with certain countries. For example, the U.S.-Peru Trade Promotion Agreement contains provisions to enhance forest management in Peru and reduce illegal logging.⁷¹

Table 6. Selected U.S. Programs That Address International Deforestation

Federal Agency	Description
U.S. Agency for International Development (USAID)	
National Climate Solutions Program	The National Climate Solutions Program aims to reduce greenhouse-gas emissions from deforestation and forest degradation. USAID and the U.S. Department of State draw funds for bilateral and regional programming from larger accounts in their budgets to support this program.
Biodiversity Programs	Biodiversity conservation activities conducted by USAID aim to help developing countries maintain biodiversity and habitats, as well as the environmental services they provide. USAID funds projects and activities in approximately 60 countries throughout the world and emphasizes sustainable development and community-based conservation. Biodiversity conservation activities are broadly authorized by Section 119 of the Foreign Assistance Act of 1961 (22 U.S.C. §2151q).
U.S. Department of State	
International Conservation Programs	Funding for international conservation programs covers international treaties, programs, and conventions that address conservation and, in some cases, forest issues. These treaties include the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Intergovernmental Platform for Biodiversity and Ecosystem Services, U.N. Forum on Forests, International Tropical Timber Organization, and Food and Agriculture Organization's National Forest Program Facility, among others.
U.S. Department of the Treasury	
Tropical Forest Conservation Act (TFCA; 22 U.S.C. §§2431 et seq.)	The TFCA authorized debt-for-nature transactions, where developing country debt is exchanged for local funds to conserve tropical forests and coral reefs.
Global Environmental Facility (GEF)	The GEF is a multilateral environmental trust fund that supports projects with global environmental benefits related to six areas: biodiversity, climate change, international waters, the ozone layer, land degradation, and persistent organic pollutants. Allocation of funding across these six areas varies annually.
U.S. Forest Service (FS)	
International Programs	The FS International Programs office promotes sustainable forest management and biodiversity conservation internationally. The office has three main units: Technical Cooperation, Policy, and Disaster Assistance Response. Specific activities include managing protected areas, protecting migratory species, engaging in landscape-level forest planning, providing fire management training, curbing invasive species, preventing illegal logging, promoting forest certification, reducing the impacts of forest use, and developing non-timber forest products.

⁷¹ Peru Trade Promotion Agreement, 18.3.4 Annex on Forest Sector Governance, entered into force February 1, 2009, at <https://ustr.gov/trade-agreements/free-trade-agreements/peru-tpa>.

Source: CRS Report R46493, *U.S. Funding for International Conservation and Biodiversity*, by Pervaze A. Sheikh et al.

Notes: Funding and activities for forests may constitute a small part of the objectives for the GEF and international conservation programs under USAID. For more information on TFCA, see CRS Report RL31286, *Debt-for-Nature Initiatives and the Tropical Forest Conservation Act (TFCA): Status and Implementation*, by Pervaze A. Sheikh.

REDD+ and COP26

COP26 likely will include discussions of REDD+, forest conservation, carbon sequestration potential, and other land use activities. The discussion of REDD+ at COP26 may focus on (1) the use of REDD+ activities to meet targets included in the Nationally Determined Contributions (NDCs) for certain countries, (2) funding commitments to support REDD+ activities, and (3) the role of commodity-specific deforestation policies to support REDD+, among other topics.⁷²

Nationally Determined Contributions and Forests

Parties at COP26 may discuss the role of REDD+ in meeting targets stated in their own and other countries' NDCs. NDCs are countries' pledged contributions of lower GHG emissions to meet the goals of the PA. Article 5 of the PA acknowledged the role of REDD+ in mitigation strategies, which led to the inclusion of REDD+ activities in NDCs. NDCs are countries' pledged contributions of lower GHG emissions to meet the goals of the PA.⁷³ Article 5 of the PA acknowledged the role of REDD+ in mitigation strategies, which led to the inclusion of REDD+ activities in NDCs. Most Parties to the PA (79%), in their NDCs, include mitigation measures to address carbon emissions in the landuse sector.⁷⁴ A majority of NDCs reviewed refer to aspects of REDD+, including afforestation, reforestation, and revegetation; sustainable forest management; land restoration; and forest conservation. Specifically, 29% of the NDCs refer to reduced deforestation and forest degradation. The *NDC Synthesis Report* also notes that, "many developing country Parties referred to reducing deforestation as a priority with high mitigation potential, including through efforts to implement REDD+ activities."⁷⁵

Some policymakers note that countries are interested in increasing their forest-related commitments in updated NDCs submitted prior to COP26.⁷⁶ Many NDCs that reference or recognize forestry's role in lowering carbon emissions do not include specific targets for reducing deforestation. For example, a 2020 survey found that of the 130 initial NDCs that mentioned forestry, 50 contained quantitative forest landscape restoration targets for GHG mitigation or climate adaptation.⁷⁷ Some policymakers anticipate that updated NDCs for COP26 may include

⁷² Additional REDD+ topics may include the rights of Indigenous peoples and local communities, gender equity, climate adaptation, and biodiversity, among others. These topics are beyond the scope of this report.

⁷³ For more information, see CRS Report R46945, *Greenhouse Gas Emission Reduction Pledges by Selected Countries: Nationally Determined Contributions and Net-Zero Legislation*, by Kezee Procita.

⁷⁴ UNFCCC, *Nationally Determined Contributions Under the Paris Agreement: Synthesis Report by the Secretariat*, October 25, 2021, at https://unfccc.int/sites/default/files/resource/cma2021_08rev01_adv.pdf. (Hereinafter, UNFCCC, *NDC Synthesis Report*.) As of the publication of this report, not all countries had submitted updated or new NDCs.

⁷⁵ UNFCCC, *NDC Synthesis Report*.

⁷⁶ Each party to the Paris Agreement was required to submit an intended NDC, which became the party's first NDC upon ratification. Every five years, parties are required to submit NDCs that reflect a progressive set of emission reduction targets. The next round of NDCs was due in 2020, but many countries are in the process of submitting new NDCs in late 2021, leading up to COP26, which was postponed as a result of the global Coronavirus Disease 2019 pandemic.

⁷⁷ IUCN, *Outlook for Boosting Ambition in 2020 Nationally Determined Contributions Through Forest Landscape Restoration Targets*, policy brief, 2020, at <https://www.iucn.org/sites/dev/files/content/documents/>

specific goals and conditions for implementing REDD+ activities. For example, Indonesia stated in its updated NDC that it aims to restore 2 million ha of peatlands and 12 million ha of degraded land by 2030.⁷⁸

Funding to Implement REDD+

Developing countries may seek financial commitments at COP26 to implement REDD+ to meet their NDC targets and support carbon markets. Several countries, including Cameroon, the Central African Republic, the Republic of Congo, Equatorial Guinea, and Indonesia, have submitted NDCs with REDD+ targets that are conditional upon the receipt of foreign aid.⁷⁹ Donor countries, however, may question the success of REDD+ to date and may consider introducing reforms for REDD+ implementation at COP26. Some analysts suggest there is a need to conduct an independent cost-benefit analysis of the effectiveness of REDD+ funds,⁸⁰ whereas others contend REDD+ initiatives should improve accessibility of finances to a range of stakeholders and increase the role of civil society in implementation.⁸¹

Deforestation and Commodities

Several policymakers have suggested commodity-specific deforestation policies to support REDD+.⁸² This concept could emerge in discussions at COP26. For example, reports suggest the United Kingdom might propose an initiative at COP26 to address deforestation by asking producers of commodities such as soybeans, cocoa, coffee, and palm oil to commit to reduce or stop clearing forested land for commodity production. The proposed initiative also may ask for new funding commitments from parties to lower deforestation and forest degradation.⁸³

The initiative that the United Kingdom may propose at COP26 would be an extension of the Forest, Agriculture, Commodity, and Trade (FACT) Dialogue. FACT, with the support of 25 countries,⁸⁴ aims to lower deforestation by implementing the sustainable trade of commodities; increase the involvement of smallholders, local communities, and Indigenous peoples in agricultural commodity supply chains; increase transparency and traceability of commodities to inform policy; and increase research and development in the trade of commodities to improve ecosystems' sustainability.⁸⁵

outlook_for_boosting_ambition_in_2020_ndcs_through_flr_targets_-_policy_brief_-_final_0.pdf.

⁷⁸ Republic of Indonesia, "Updated Nationally Determined Contribution," July 21, 2021, available from UNFCCC Interim NDC Registry at <https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx>.

⁷⁹ UNFCCC, *NDC Synthesis Report*.

⁸⁰ Peter Yeung, "As COP26 Looms and Tropical Deforestation Soars, the REDD+ Debate Soars On," *Mongabay*, April 15, 2021, at <https://news.mongabay.com/2021/04/as-cop26-looms-and-tropical-deforestation-soars-redd-debate-roars-on/>.

⁸¹ Molly Millar, *Forest Voices: The Path Forward for Strengthening Forest Governance*, Chatham House, October 14, 2021.

⁸² For example, see Darren McKenzie, "Why Financial Institutions Hold the Power to Stopping Deforestation," *Global Canopy, Insight* (blog), October 15, 2021, at <https://globalcanopy.org/insights/insight/why-financial-institutions-hold-the-power-to-stopping-deforestation/>.

⁸³ Patrick Greenfield and Fiona Harvey, "U.K. to Push Plan to 'Halt and Reverse Global Deforestation by 2030' at COP26," *Guardian*, October 15, 2021, at <https://www.theguardian.com/environment/2021/oct/15/uk-to-push-plan-to-halt-and-reverse-global-deforestation-by-2030-at-cop26-aoe>.

⁸⁴ The United States is not a signatory.

⁸⁵ United Kingdom Cabinet Office, *Joint Statement on Principles for Collaboration Under the Forest, Agriculture, Commodity, and Trade (FACT) Dialogue*, July 27, 2021, at <https://www.gov.uk/government/news/joint-statement-on-principles-for-collaboration-under-the-forest-agriculture-and-commodity-trade-fact-dialogue>.

Some in Congress support tying the trade in commodities to illegal deforestation through pending bills in the 117th Congress. For example, H.R. 5508 and S. 2950 would prohibit the import into the United States of commodities derived from illegally deforested land and would require foreign countries without adequate means to address deforestation to develop and implement an action plan to address illegal deforestation before commodities could be exported to the United States.

Addressing drivers of deforestation and forest degradation are broader than REDD+ activities and may include a suite of approaches applied at different jurisdictional levels. At the national level, countries may increase the area of protected lands that contain forests; improve enforcement of laws aimed at reducing or preventing deforestation; and reduce incentives for activities that promote drivers of deforestation, such as agricultural expansion. At the private level, corporations may commit to practices that lower deforestation and remove goods derived from recently deforested lands from commodity supply chains. At all levels, forest conservation may be tied to the ecosystem services that forests provide; forest restoration may be stimulated by a need to improve water quality in a watershed, to buffer the impacts of storm surges during hurricanes, and to support snowpack in areas with seasonal drought. Parties at COP26 might take a broader look at forests in their role as nature-based infrastructure to justify policies to conserve forests for reasons beyond their role in the carbon cycle.

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