PROGRESS ON THE NEW YORK DECLARATION ON FORESTS

Goal 1 assessment

Striving to end natural forest loss

November 2020

Note: Footnotes and figure captions regarding the global tree cover loss data were revised in April 2021.

The New York Declaration on Forests (NYDF) is a voluntary and non-binding international declaration aimed at halting global deforestation by 2030 with more than 200 endorsers: national and sub-national governments, multi-national companies, groups representing Indigenous and local communities, and non-governmental organizations. Published annually, the NYDF Progress Assessment evaluates the global status of forests as well as overall efforts made toward achieving the NYDF goals.

This update presents progress as of 2020 toward achieving Goal 1:

Goal 1

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

Key messages

- According to all indicators, we are failing to halve forest loss and associated greenhouse gas emissions by 2020 and are not on track to stop them by 2030.
- Global deforestation – our most straightforward indicator for estimating permanent loss of natural forests as a result of land use conversion – is currently around 10 million hectares per year, according to multiple data sources. Deforestation needs to decrease by nearly 1 million hectares per year to achieve the 2030 target of ending deforestation.

- Humid tropical primary forest loss needs to decrease by 340,000 hectares each year to achieve the 2030 target of zero loss. For each year we do not reduce loss by sufficient amounts, we must make even larger reductions in following years to achieve our target.[a]
- The sustained reductions in forest loss needed to achieve the 2030 target would be unprecedented and are highly unlikely. All assessment indicators show either insufficient progress towards ending forest loss and associated greenhouse gas emissions by 2030 or that we are moving further from the targets. For example, not only are we not close to halving forest loss, but humid tropical primary forest loss is well above pre-NYDF levels, with an average of 41 percent more loss each year after the NYDF was signed than before.

Introduction

The overarching goal of the NYDF Goal 1, aims to halve loss of natural forests by 2020 and halt it by 2030. By specifying "natural forests," Goal 1 excludes monoculture tree plantations and other non-natural forest systems. However, Goal 1 does not state whether the aim is to reduce and then end *gross* loss of natural forests or *net* loss of natural forests. Ending gross loss of natural forests would mean that, from year to year, there would be no measurable clearing of natural forest area. Ending net loss of natural forests would mean that any measurable area of natural forest clearing would be offset by an equal or greater area of measurable natural forest regeneration/reforestation over the same time period. Due to this ambiguity in Goal 1, the annual progress assessment covers both interpretations.[1]

As reflected in NYDF Goal 7 and recognized by the Intergovernmental Panel on Climate Change (IPCC), reducing emissions from deforestation is essential to meeting the <2°C degree warming goal of the Paris Agreement on climate change.[2,3] Thus, Goal 1 also tracks progress in reducing gross carbon dioxide emissions from forest loss. Although specific targets for carbon dioxide emission reductions are not stated in Goal 1, they are assumed to be the same as those for natural forest loss (halve by 2020, eliminate by 2030).

Overview of goals and indicators

To address the dual interpretations of Goal 1 referring to gross or net natural forest loss, this assessment tracks both using several indicators (Table 1). All indicators come from two data sources: Global Forest Watch (GFW)[4] and the United Nations Food and Agriculture Organizations' Global Forest Resources Assessment 2020 (FRA 2020).[5,6] Neither data source is fully able to annually track gross or net natural forest change since 2000, but they are complementary and in combination provide a more complete assessment of progress on Goal 1. GFW compiles globally consistent and annually updated geospatial datasets

[a] All remote sensing-based statistics, such as this one for tropical primary forest loss, are for forests with tree cover density >30 percent. Hansen et al. (2013), upon which the remote sensing indicators are based, 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 30 percent. Global Forest Watch illustrates the Hansen et al. 2013 dataset, updated through 2019. Changes in the methodology in 2011 and 2015 and the inclusion of new satellite data in 2013 may result in higher estimates for tree cover loss in recent years compared to earlier years. Collectively, these changes may overestimate the detected increase in tree cover loss. For more about the methodology changes, see https://blog.globalforestwatch.org/data-and-research/a-fresh-look-at-forests-2011-2013 and https://www.globalforestwatch.org/blog/data-and-research/tree-cover-loss-satellite-data-trend-analysis.

developed by independent researchers (primarily satellite images as analyzed by Hansen et al. 2013,[7] updated through 2019) to map tree cover loss and derivative indicators every year every year. The FRA (published every five years) aggregates statistics reported by national governments to track changes in forest over five- or ten-year periods; the national statistics are a combination of national forest inventory data and, increasingly in FRA 2020, remote sensing data, harmonized using a standardized classification system.[6] Although data sources vary among countries, the data used in FRA 2020 are more up-to-date than in previous FRAs, indicating that countries are increasing their national forest monitoring capacity. Key differences between GFW and the FRA 2015 are outlined in the 2015 NYDF Progress Assessment;[8] many of those differences still apply.

Goal 1 specifies the halting of "natural forest" loss, but this requires defining and identifying natural forests. Different governments and organizations define natural forests differently and no single definition is appropriate for all kinds of forest globally.[9,10] Each NYDF indicator handles the goal's focus on natural forests differently (discussed below). Future assessments are expected to refine tracking of progress on Goal 1 (see "Data Developments" section).

Despite the limitations in the indicators, they are unanimous in demonstrating that we are not on track to achieve the 2020 or 2030 targets. Many of the indicators also demonstrate that we are further from stopping deforestation now than before the NYDF was signed. This is shown through comparisons of the average annual loss before the signing of the NYDF (the baseline period, 2001-13 for GFW and 2000-10 for FRA 2020) to after the signing of the NYDF (2014-19 for GFW and 2010-20 for FRA). Resulting comparisons are along the lines of "Average annual tree cover loss increased by X% from the baseline period," meaning that the average annual loss after the NYDF was signed was X% higher than the average annual loss before the NYDF was signed.

Table 1. Criteria and indicators to track Goal 1

Criteria	Indicator	Data source(s)	Trend
1. Rate of natural forest loss	1.1. Global net natural forest loss (ha/yr)	1.1. FAO FRA 2020	Decreasing, but not on target
	1.2. Global gross tree cover loss (ha/yr)	1.2. Global Forest Watch (Hansen et al. 2013)	Increasing, futher from target
	1.3. Global deforestation (ha/yr)	1.3. FAO FRA 2020 and Global Forest Watch (Curtis et al. 2018)	Mixed (depending on source), but not on target
	1.4. Humid tropical primary forest loss (ha/yr)	1.4. Global Forest Watch (Turubanova et al. 2018)	Increasing, further from target
2. Carbon dioxide emissions from forest loss	2.1. Gross emissions from global deforestation (million tonnes CO_2/yr)	2.1. Global Forest Watch (Zarin et al. 2016, Curtis et al. 2018)	Increasing, futher from target
	2.2. Gross emissions from humid tropical primary forest loss (million tonnes CO_2/yr)	2.2. Global Forest Watch (Zarin et al. 2016, Turubanova et al. 2018)	Increasing, further from target

Note: "Not on target" means that the indicator is getting closer to the 2020 and 2030 targets but will not achieve either based on projecting that indicator forward. "Further from target" means that the indicator has moved away from the 2020 and 2030 targets since the NYDF was signed. Global Forest Watch is a consortium of organizations that provides a free and publicly accessible website for monitoring changes in forests. FAO FRA 2020 is the United Nations Food and Agriculture Organizations' Global Forest Resources Assessment 2020.

Indicator 1.1. Global net natural forest loss. The release of the FRA 2020 allows global net natural forest loss to be updated for the first time since the 2015 NYDF progress assessment,

although it reports over 5- or 10-year intervals, precluding the identification of trends over shorter time periods. This indicator explicitly distinguishes natural forests from planted forests. The FRA 2020 defines natural forests as "Forest predominantly composed of trees established through natural regeneration," and is based on land use instead of land cover.[11] Thus, it does not distinguish stocked from unstocked forests. Being an indicator of net natural forest change, this indicator equates gains and losses of forests regardless of whether the forests are primary or secondary.

Indicator 1.2 Global gross tree cover loss. As a proxy for gross natural forest loss, we use global tree cover loss data available through GFW (Hansen et al. 2013, updated through 2019). The global tree cover loss data include all forms of tree cover that is above 5 meters in height and with greater than 30 percent canopy density, and so does not distinguish natural forests from planted forests or tree crops. This dataset is based on land cover (the presence of sufficiently tall trees of any kind) instead of land use (how the trees are being used). Distinguishing natural forests from planted or heavily managed forests using remote sensing data is not always straightforward or possible, partially because they exist on a continuum.

Indicator 1.3 Global deforestation. Tree cover can be temporarily reduced (e.g. from fires or forestry) or permanently removed (e.g. conversion to cropland, pasture, or settlements). Defining and distinguishing temporary from permanent tree cover loss is complex, both because the potential return of cleared land to tree cover can take many years, and because the permanence of land use change occurs along a continuum. At one end are drivers of tree cover loss that signify permanent conversion to another land use, such as large-scale farming and expansion of urban or rural settlements. At the other end are drivers of temporary tree cover loss that signify eventual regrowth of forests, such as wildfires and wood harvesting. However, between those two extremes are situations where the land is neither permanent forest nor permanent farmland (e.g. shifting cultivation); the land must be monitored following tree cover loss to determine if forest is returning or not. This is most commonly the case for small-scale subsistence farming where farms are rotated, and forests are left to regrow between farming periods.

Indicators 1.1 and **1.2** do not differentiate tree cover loss by its permanence or the use of the land after loss. This year, we report estimates of deforestation using two sources of data. First, the FRA 2020 is the first FRA to report deforestation (forest area lost and not offset by regrowth) alongside net natural forest area change (Indicator 1.1) as in previous reports. As with net natural forest area change, this is a compilation of statistics using a variety of methods reported by national governments, harmonized using standardized FAO definitions. This data source also does not separate conversion from natural to planted forests.

Second, we filter global tree cover loss (Indicator 1.2) to only those areas where land use change is assumed to occur, as identified by a global tree cover loss driver map (Curtis et al. 2018, updated to 2019).[12] This map assigns a dominant driver to a 10-kilometer grid cell and interpretation of the map further classifies every loss pixel within that grid cell to the dominant driver: commodity-driven deforestation, urbanization, shifting agriculture, wildfires, and forestry. The first two drivers are strongly associated with land use conversion from forests to agriculture or settlements, while the third driver may or may not result in permanent land use conversion. The fourth and fifth drivers (wildfires and forestry) often result in the temporary loss of tree cover, followed by regrowth, and are not further used for estimating deforestation, although fires can also be used to clear forest. When we present ranges for deforestation estimates, the lower bound includes tree cover loss only from the commodity-driven deforestation and urbanization classes, and the upper bound includes tree cover loss from the commodity-driven deforestation, urbanization, and shifting agriculture classes.

Indicator 1.4 Humid tropical primary forest loss. As another window into loss of natural forests (as opposed to natural and planted forests), we track loss of humid tropical primary forest. Because primary forests cannot be regained within the NYDF's timeframe (i.e. loss of primary forests' ecosystem services cannot be offset by forest regrowth by 2030), net loss of primary forests is the same as gross loss of primary forests. Reporting loss of primary forests provides a minimum estimate for how much high value natural forest is lost each year and in what regions; secondary forests, which also provide valuable ecosystem services, are also being lost but are not included in this indicator. Filtering global tree cover loss (Indicator 1.2) to humid tropical primary forest extent in 2001[13] allows targeted monitoring of loss occurring within natural forests only from 2002 onwards, and specifically monitoring of those most important for carbon storage and biodiversity. Primary forest loss data are available only for the humid tropics (see GFW[14] for map of extent). The FRA 2020 includes global and regional primary forest loss data, but the data are incomplete and apparent trends should be treated with caution.[5]

Indicator 2.1 Gross emissions from global deforestation. Previous Goal 1 assessments had one indicator for emissions: gross emissions from tropical tree cover loss. This year we are broadening this criterion to include two indicators, both based on GFW analyses. Both are based on forest change indicators from Criterion 1. As in previous assessments, the emissions indicators were created by multiplying the loss area from the relevant Criterion 1 indicator by an estimate of the aboveground carbon content of that area using a map of pre-disturbance biomass (year 2000) produced at 30-meter resolution by the Woodwell Climate Research Center[15] (available on GFW[16]; emissions method described in Zarin et al.[17]). "Gross emissions" means that the indicator includes only the loss of carbon from woody biomass without including any regrowth or gain in carbon due to forest growth or regrowth. The first emissions indicator we are reporting this year is carbon emissions from global deforestation (based on Indicator 1.3). This represents global emissions from tree cover loss that is likely to be permanent.

Indicator 2.2 Gross emissions from humid tropical primary forest loss. The second emissions indicator we are reporting is emissions from humid tropical primary forests (based on Indicator 1.4), some of the most carbon-rich, irreplaceable forests. As with Indicator 2.1, this indicator does not account for any increase in carbon due to forest growth or regrowth. It also does not account for emissions from peatlands, which are a significant carbon store in the tropics.[18]

Findings

Criterion 1: Rate of forest loss

Indicator 1.1: Global net natural forest loss (ha)

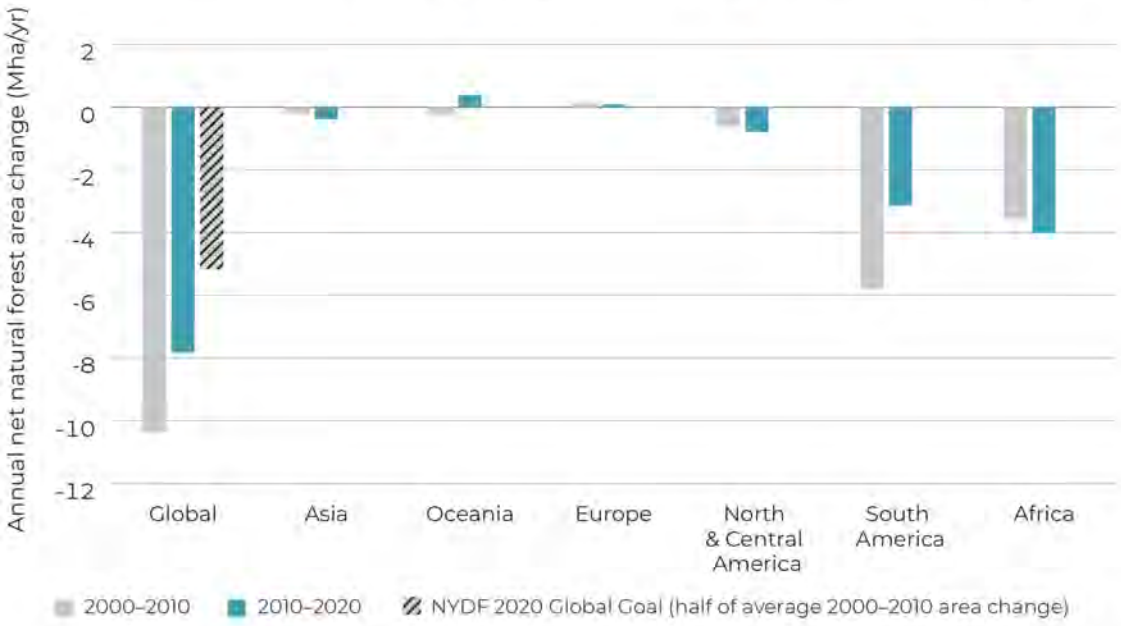
Global net natural forest loss has decreased slightly since 2000, but is not on track to achieve the 2020 or 2030 targets for Goal 1

FRA 2020 reported net forest area change in 10-year increments since 1990. For the period of interest for the NYDF progress assessment, deforestation exceeded forest expansion during the two most recent intervals (2000-10 and 2010-20), resulting in a reported global net natural forest loss of 10.4 million hectares per year (Mha/yr) between 2000 and 2010 and 7.8 Mha/yr between 2010 and 2020 (Figure 1). Although the average rate of net forest loss declined by 2.6 Mha/yr between the two time intervals, the 2020 target of 5.2 Mha/yr (half of

the 2000-2010 baseline of 10.4 Mha/yr) is highly unlikely to be achieved. The average rate of net forest area loss between 2020 and 2025 needs to drop to about 3.9 Mha/yr (as reported in the anticipated 2025 FRA) to be on target for eliminating net loss of forest by 2030.

The FRA 2020 also reports net forest change by region and subregion. The two regions that dominated global net forest loss for 2000-10 and 2010-20 were South America and Africa. Oceania switched from losing natural forest to gaining natural forest during the two time periods, while Europe continued to gain natural forest and South America's loss of natural forest decreased. As with global gross tree cover loss (Indicator 1.2), this indicator shows Africa emerging as a major frontier in net forest loss.

Figure 1. Net natural forest area change by region and decade, in million hectares per year



Note: The Food and Agriculture Organization (FAO) defines natural forest as "Forest predominantly composed of trees established through natural regeneration." It defines forest as "Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use." Mha/yr = million hectares per year. The 2020 target is shown only for global net forest change because NYDF Goal 1 does not specify the geographic distribution of halving forest loss.

Source: Food and Agriculture Organization: FAO Global Forest Resources Assessment 2020. Rome: FAO.

Indicator 1.2: Global gross tree cover loss

We are failing to halve global tree cover loss by 2020 and moving further from stopping global tree cover loss by 2030

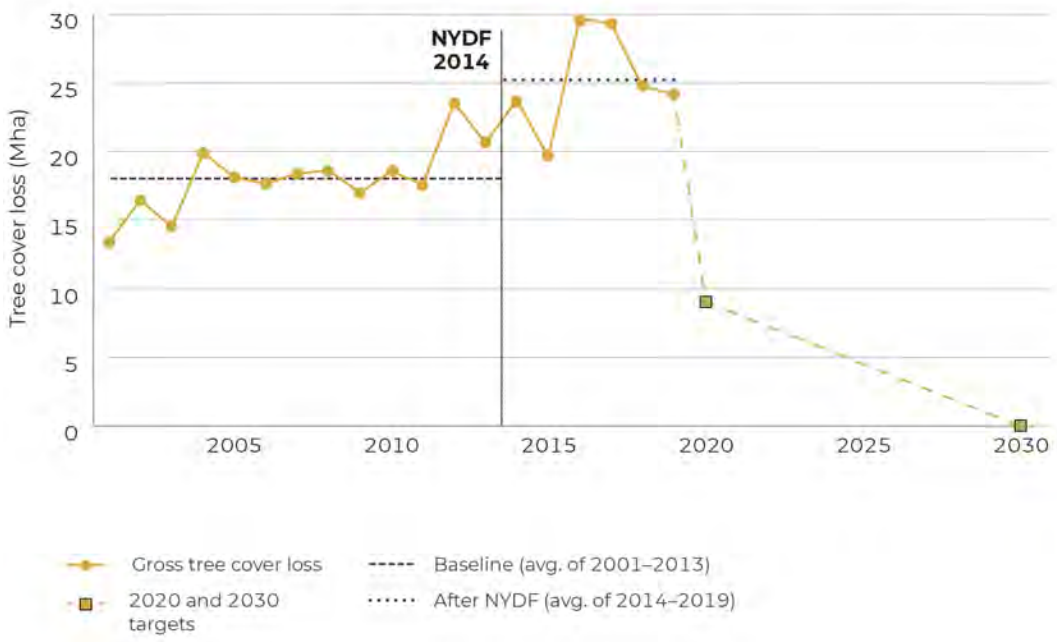
Global gross tree cover loss in 2019 was 24.2 million hectares.[b] Tree cover loss in 2020 would need to decrease by 15 million hectares (63 percent) compared to loss in 2019 to achieve the

[b] All remote sensing-based statistics are for forests with tree cover density >30 percent. Hansen et al. (2013), upon which the remote sensing indicators are based, 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 30 percent. Global Forest Watch illustrates the Hansen et al. 2013 dataset, updated through 2019. Changes in the methodology in 2011 and 2015 and the inclusion of new satellite data in 2013 may result in higher estimates for tree cover loss in recent years compared to earlier years. Collectively, these changes may overestimate the detected increase in tree cover loss. For more about the methodology changes, see https://blog.globalforestwatch.org/data-and-research/a-fresh-look-at-forests-2011-2013 and https://www.globalforestwatch.org/blog/data-and-research/tree-cover-loss-satellite-data-trend-analysis.

NYDF Goal 1 2020 target of reducing loss to 9 Mha/yr.[c] Furthermore, global tree cover loss would need to decline from its 2019 level by about 2.2 Mha (9.1 percent) each year between 2020 and 2030 to achieve NYDF's Goal 1 for 2030 (Figure 2).

However, at no point in the last 20 years has there been a sustained decrease in global tree cover loss. (The spike in tree cover loss in 2016 and 2017 was due to extensive fires in Brazil and elsewhere and the subsequent decline from that in 2018 and 2019 reflects a return to "normal" fire years.) In fact, global annual gross tree cover loss continues to be higher since the NYDF was signed in 2014 than before it was signed (the pre-NYDF baseline of 2001-13). Since the signing of the NYDF in 2014, global average annual gross tree cover loss during 2014-19 has been 40 percent higher than during the baseline period, increasing from an average of 18 to 25 Mha/yr, or an area of tree cover loss roughly the size of the United Kingdom. This shows that annual global tree cover loss has generally moved further from the target, which makes achieving either the 15 Mha one-year decrease in loss needed to achieve the 2020 target and the sustained decreases of 2.2 Mha needed to achieve the 2030 target very unlikely. Each year that global tree cover loss continues to increase or stay constant amplifies the annual reductions in loss needed to achieve the 2030 target.

Figure 2. Global tree cover loss relative to 2020 and 2030 targets, in million hectares



Note: Tree cover loss was calculated using a >30 percent tree cover density threshold. Improvements in the detection of tree cover loss due to the incorporation of new satellite data and methodology changes in 2011, 2013, and 2015 may result in higher estimates of loss in recent years compared to earlier years. Mha = million hectares.

Source: Global Forest Watch analysis of data from Hansen et al. 2013

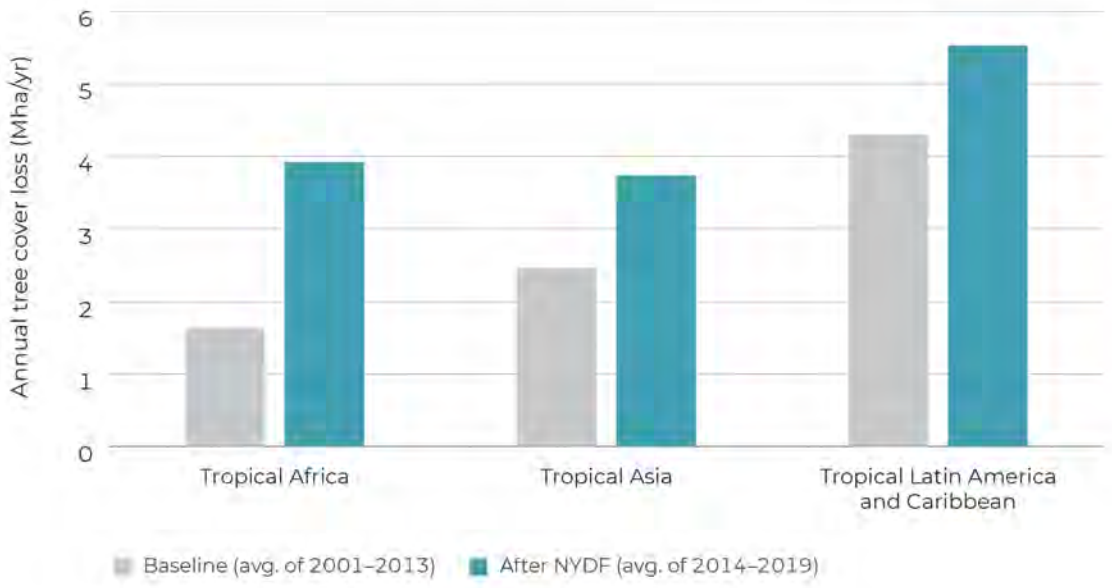
Gross tree cover loss has increased in all regions

Gross tree cover loss has increased both in tropical and non-tropical forests since the NYDF was signed. Outside the tropics, average annual tree cover loss has increased by 25 percent (2.4 Mha/yr) after the NYDF was signed compared to before. The relative and absolute

[c] The average annual tree cover loss during the baseline period (2001-2013) was 18 million hectares per year, so the 2020 target for this indicator is half of that, or 9 million hectares per year.

increase in tree cover loss since the NYDF was signed has been greater inside the tropics than outside the tropics (57 percent or 4.8 Mha higher annual average loss compared to the baseline). In tropical forests, increases in annual tree cover loss have been largest in tropical Africa in both relative (percent) and absolute (area) terms (140 percent or 2.3 Mha higher annual average loss in 2014-19 than in 2001-13), with smaller increases in tropical Latin America and the Caribbean (+29 percent, 1.2 Mha/yr increase) and tropical Asia (+52 percent, 1.3 Mha/yr increase) (Figure 3). Since 2017, annual tree cover loss in tropical Africa has consistently been higher than in tropical Asia, suggesting a global shift in the frontiers of tree cover loss.

Figure 3. Average annual tropical tree cover loss by region, in million hectares per year



Note: Tree cover loss was calculated using a >30 percent tree cover density threshold. Improvements in the detection of tree cover loss due to the incorporation of new satellite data and methodology changes in 2011, 2013, and 2015 may result in higher estimates of loss in recent years compared to earlier years. Mha = million hectares.

Source: Global Forest Watch analysis of data from Hansen et al. 2013

Indicator 1.3: Global deforestation (ha)

Global deforestation is not on track to achieve 2020 or 2030 targets

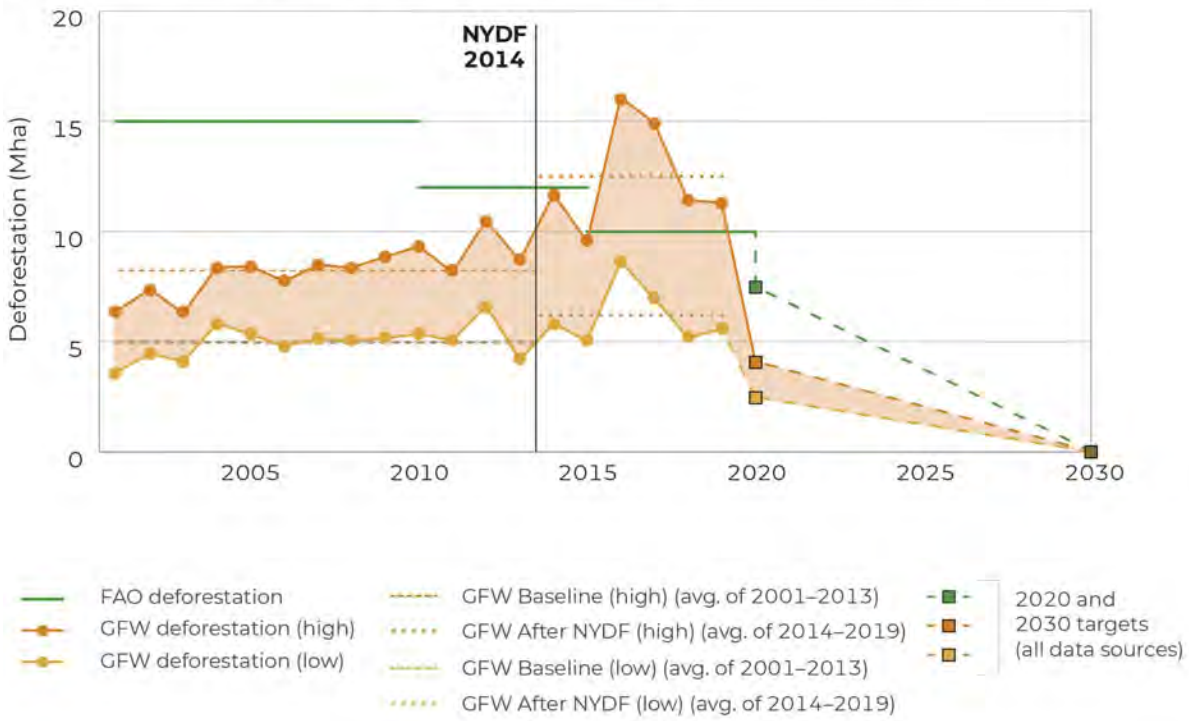
This indicator measures global gross deforestation in two ways: the aggregated national statistics from FRA 2020 and the global-scale remote sensing-based estimate from GFW. Despite these two methods showing different trends in global deforestation, both strongly indicate that deforestation is not on track to achieve the 2020 or 2030 targets.

For the first time, the 2020 FRA includes gross deforestation from all causes, in either five- or ten-year increments. According to FRA, gross deforestation has declined since 2000, from an average of 15 Mha/yr between 2000 and 2010, to an average of 12 Mha/yr between 2010 and 2015 and then to an average of 10 Mha/yr between 2015 and 2020 (Figure 4). Though the decrease is promising, it has not been sufficient to meet the goal of halving deforestation by 2020 relative to a 2000-2010 baseline (7.5 Mha/yr). To achieve the 2030 target of zero deforestation, deforestation would have to decrease by 1 Mha each year between 2020 and 2030.

Deforestation can also be approximated by reporting global tree cover loss in areas that are permanently converted from forest to a new land use using a map of the drivers of tree cover loss.[12] Using this measure, global deforestation was between 5.6 Mha and 11 Mha in 2019, or between 55 and 64 percent above the 2020 target (2.5 – 4.1 Mha/yr) for halving deforestation relative to the pre-NYDF baseline.[d] Moreover, to achieve zero gross deforestation by 2030, deforestation would have to decrease between 0.51 and 1.0 Mha every year from its 2019 level until 2030 (see Figure 4).

In contrast to FRA results that report 5- or 10-year averages, this annual GFW metric indicates that deforestation has *increased* relative to the baseline period, showing that we are moving further from achieving the 2020 and 2030 targets. Average annual deforestation has been between 25 and 52 percent (6.2 to 13 Mha/yr) higher following the signing of the NYDF than during the baseline period. Each year that global deforestation continues to increase or stay constant amplifies the annual reductions in loss needed to achieve the 2030 target.

Figure 4. Global deforestation using FAO FRA 2020 and Global Forest Watch annual deforestation data 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 >30 percent tree cover density threshold. Improvements in the detection of tree cover loss due to the incorporation of new satellite data and methodology changes in 2011, 2013, and 2015 may result in higher estimates of loss in recent years compared to earlier years. The "low estimate" for GFW deforestation includes tree cover loss from commodity-driven deforestation and urbanization driver classes of Curtis et al. 2018, updated through 2019. The "high estimate" for GFW deforestation includes tree cover loss from those two categories and shifting cultivation. The Food and Agriculture Organization (FAO) data represent a crown cover threshold of 10 percent. Mha = million hectares.

Sources: GFW deforestation: Global Forest Watch analysis of data from Hansen et al. 2013, filtered by updated Curtis et al. 2018. FAO deforestation: FAO Global Forest Resources Assessment 2020. Rome: FAO.

The differing trends in deforestation reported by FRA 2020 and GFW are likely due to the different methods used in each approach (aggregating national statistics collected from national forest inventories and remote sensing versus applying a single algorithm to satellite

[d] When ranges of deforestation are provided, the first number defines deforestation as tree cover loss area due to commodity-driven deforestation and urbanization, while the second number defines deforestation as tree cover loss from those two drivers plus shifting agriculture. Driver classes refer to the 2019 update of Curtis et al. 2018. Both statistics are provided because of ambiguity in the extent to which shifting agriculture contributes to deforestation.

imagery for the entire globe, respectively). However, these two methods have converged on approximately 10 Mha/yr of deforestation between 2015 and 2019, suggesting this as a consensus level of deforestation against which to compare progress towards the 2030 target. One reason the two methods may be converging is that more countries are now using satellite-based monitoring to some degree in their national forest monitoring, meaning that the FRA 2020 is more methodologically similar to GFW than previous FRAs were.

Tropical deforestation has increased since the NYDF was signed

According to the FRA 2020, tropical deforestation comprised 87 percent of global deforestation between 2000 and 2015 and comprised 91 percent between 2015 and 2020. GFW-based deforestation estimates indicate a similar proportion of deforestation in the tropics between 2001 and 2019 (92-94 percent), and that the share of global deforestation occurring in the tropics has increased from 90-93 percent before the signing of NYDF to 94-96 percent after. Tropical deforestation increased from between 4.5 and 7.6 Mha/yr during the baseline period to between 5.9 and 12 Mha/yr, or an increase of between 31 and 57 percent. Whether shifting cultivation is included in deforestation affects which continent's tropical forests had the greatest increase in deforestation compared to the baseline. Including shifting cultivation, Africa had the greatest increase by relative (percent) and absolute (area) terms (143 percent, 2.3 Mha/yr). Excluding shifting cultivation, Asia had the largest increase in deforestation in terms of absolute area compared to the baseline (35 percent increase, 0.69 Mha/yr).

Indicator 1.4: Humid tropical primary forest annual loss (ha)

We are failing to halve tropical primary forest loss by 2020 and moving further from achieving our 2030 goal of stopping tropical primary forest loss

Humid tropical primary forest loss in 2019 was 3.8 Mha. Tropical primary forest loss in 2020 would need to decrease by 2.3 Mha (61 percent) compared to loss in 2019 to achieve the NYDF Goal 1 2020 target of 1.5 Mha/yr of loss (half of 2001-13 baseline). Furthermore, tropical primary forest loss needs to decline by 0.34 Mha (9.1 percent) each year between 2020 and 2030 to achieve NYDF's Goal 1 for 2030.

The prospects for attaining the repeated annual decreases in tropical primary forest loss needed to achieve the 2030 target are poor based on historical precedent. Since the beginning of the annual primary forest loss record in 2001, the only adjacent years with substantial decreases in primary forest loss were 2017 and 2018, following the loss of large amounts of primary forest loss due to fires in Brazil and elsewhere. In fact, primary forest loss has increased by 41 percent on average since the baseline period, from 3.0 to 4.2 million hectares per year, or approximately the size of the Netherlands.[e,f] A sustained decrease in primary forest loss to achieve the 2030 target would be unprecedented.

[e] All remote sensing-based statistics are for forests with tree cover density >30 percent. Hansen et al. (2013), upon which the remote sensing indicators are based, 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 30 percent. Global Forest Watch illustrates the Hansen et al. 2013 dataset, updated through 2019. Changes in the methodology in 2011 and 2015 and the inclusion of new satellite data in 2013 may result in higher estimates for tree cover loss in recent years compared to earlier years. Collectively, these changes may overestimate the detected increase in tree cover loss. For more about the methodology changes, see https://blog.globalforestwatch.org/data-and-research/a-fresh-look-at-forests-2011-2013 and https://www.globalforestwatch.org/blog/data-and-research/tree-cover-loss-satellite-data-trend-analysis.

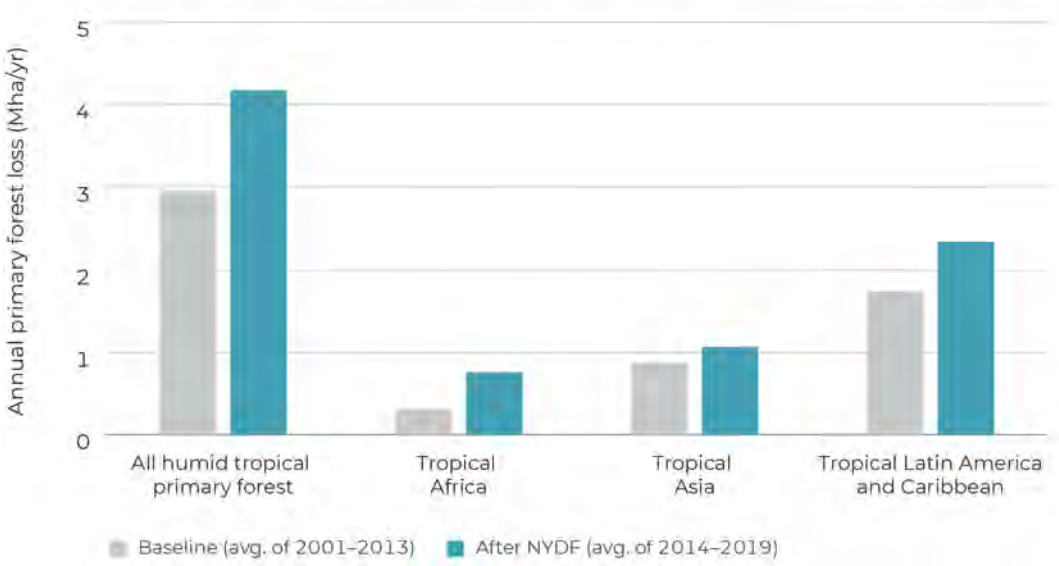
[f] The primary forest extent of Turubanova et al. 2018 represents extent in 2001, so loss of primary forests is reported from 2002 onwards. Hence, the baseline period for primary forest loss is 2002 through 2013, instead of 2001 through 2013, as for tree cover loss.

Tropical Africa is a frontier of primary forest loss but more than half occurs in Latin America

Although the greatest percent increase in tropical primary forest loss compared to the baseline period was in Africa (+144 percent, 0.45 Mha/yr increase), the greatest area increase was in Latin America (+34 percent, 0.60 Mha/yr increase), while Asia had the lowest increase in terms of both percentage and area (+23 percent, 0.20 Mha/yr increase) (Figure 5). This reflects how Africa is an emerging regional front in primary forest loss but does not have the extent of primary forest that Latin America does. In fact, well more than half of tropical primary forest loss occurs in Latin America each year. Annual primary forest loss in tropical Africa remained smaller than in other tropical regions between 2014 and 2019 (0.76 Mha/yr in Africa, 1.07 Mha/yr in Asia, and 2.34 Mha/yr in Latin America).

The analysis of global primary forest loss by decade in FRA 2020 shows a decrease from 3.5 Mha/yr between 2000 and 2010 to 1.3 Mha/yr between 2010 and 2020. However, the FRA 2020 notes that primary forest data are very incomplete (137 countries reported data, covering 57 percent of global forest area) and trend analysis should be treated with caution.

Figure 5. Average annual humid tropical primary forest loss by region, in million hectares per year



Note: Comparison of tree cover loss in humid tropical primary forests before (2002-2013) and after (2014-2019) the signing of the New York Declaration on Forests (NYDF). Mha/yr = million hectares per year. Improvements in the detection of tree cover loss due to the incorporation of new satellite data and methodology changes in 2011, 2013, and 2015 may result in higher estimates of loss in recent years compared to earlier years.

Sources: GFW deforestation: Global Forest Watch analysis of Hansen et al. 2013 and Turubanova et al. 2018

Criterion 2: Carbon dioxide emissions from forest loss

Indicator 2.1: Global gross emissions from deforestation (Mt CO_2)

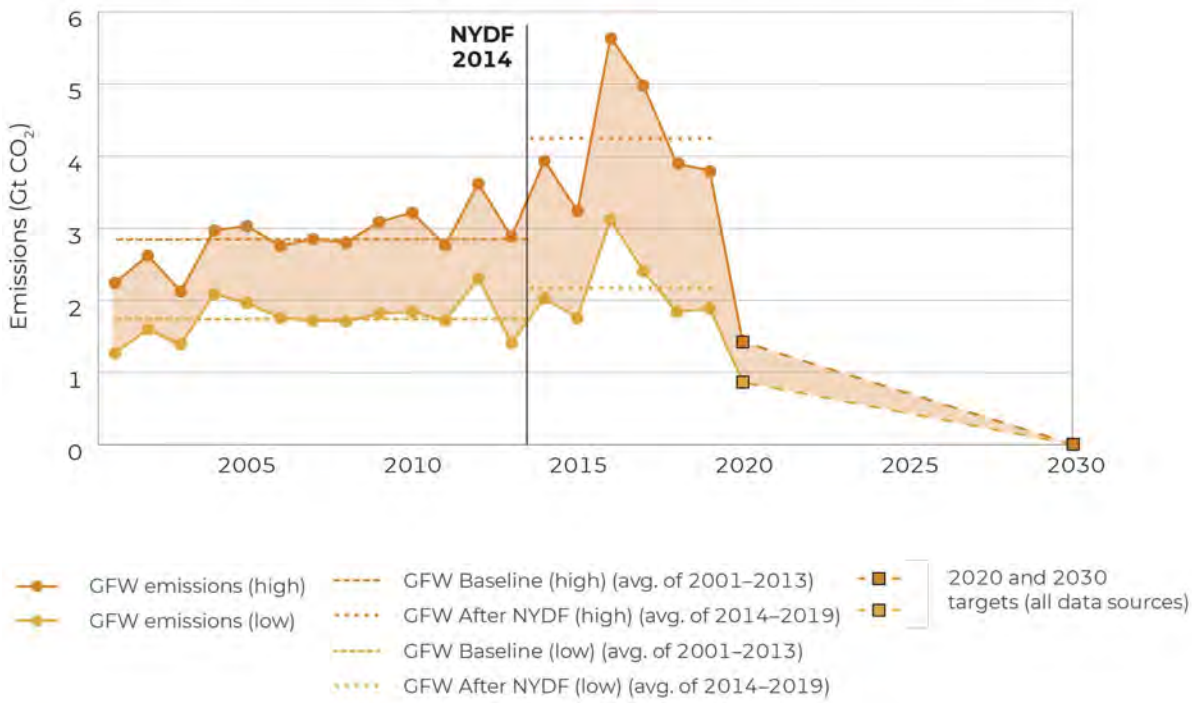
Global gross greenhouse gas emissions from deforestation are not on track to achieve NYDF targets

Reducing deforestation is a crucial part of achieving global climate change mitigation commitments.[3] However, this assessment shows that greenhouse gas (GHG) emissions from global deforestation (as defined in the tree cover loss-based part of Indicator 1.3) are not on

track to achieve either the 2020 or 2030 targets of NYDF Goal 1.[g] In 2019, gross emissions from deforestation (between 1.9 and 3.8 gigatons CO_2 (Gt CO_2)) were between 1.0 and 2.4 Gt CO_2 (54-63 percent) above the 2020 target (Figure 6).[h] Achieving zero emissions associated with the target of zero deforestation in 2030 requires reducing annual emissions by between 0.17 and 0.35 Gt CO_2 each year between 2020 and 2030.

However, emissions from deforestation have risen over the last several years, in tandem with deforestation. Average emissions since the signing of the NYDF are between 25 and 49 percent higher than the baseline period, increasing between 0.43 and 1.4 Gt CO_2/yr from the baseline period to after the NYDF was signed. This shows that emissions from tree cover loss are moving away from the 2030 emissions target.

Figure 6. Global gross emissions from deforestation, in billion metric tonnes CO_2



Note: For the Hansen/Global Forest Watch (GFW) estimates, tree cover loss was calculated using a >30 percent tree cover density threshold. Improvements in the detection of tree cover loss due to the incorporation of new satellite data and methodology changes in 2011, 2013, and 2015 may result in higher estimates of emissions in recent years compared to earlier years. The "low estimate" for GFW emissions includes tree cover loss from commodity-driven deforestation and urbanization driver classes of Curtis et al. 2018, updated through 2019. The "high estimate" for GFW emissions includes tree cover loss from those two categories and shifting cultivation. Gt CO_2 = billion metric tonnes CO_2

Source: GFW analysis of Zarin et al. 2016, with Curtis et al. 2018 drivers updated through 2019

[g] FRA 2020 does not provide an estimate of emissions from deforestation. It simply reports that carbon stocks in forests have decreased from 663 gigatonnes of carbon in 2000 to 662 gigatonnes of carbon in 2020 globally, with stocks further broken down by region. Decreases in carbon stock are termed emissions specifically.

[h] When ranges of emissions from deforestation are provided, the first number defines deforestation as tree cover loss area due to commodity-driven deforestation and urbanization while the second number defines deforestation as tree cover loss from those two drivers plus shifting agriculture. Driver classes refer to the 2019 update of Curtis et al. 2018. Both statistics are provided because of ambiguity on the extent to which shifting agriculture contributes to deforestation. Changes in the methodology in 2011 and 2015 and the inclusion of new satellite data in 2013 may result in higher estimates for tree cover loss in recent years compared to earlier years. Collectively, these changes may overestimate the detected increase in tree cover loss. For more about the methodology changes, see https://blog.globalforestwatch.org/data-and-research/a-fresh-look-at-forests-2011-2013 and https://www.globalforestwatch.org/blog/data-and-research/tree-cover-loss-satellite-data-trend-analysis.

Indicator 2.2: Humid tropical primary forest emissions (Mt CO_2)

GHG emissions from humid tropical primary forest loss are not on track to achieve NYDF targets

As with global gross emissions from deforestation (Indicator 2.1), emissions from humid tropical primary forest loss are not on track to achieve the 2020 or 2030 Goal 1 targets. In 2019, gross emissions from primary forest loss (1.8 Gt CO_2) were 1.1 Gt CO_2 (62 percent) above the 2020 target of 0.70 Gt CO_2. Achieving zero emissions associated with the target of zero tropical primary forest loss in 2030 requires reducing annual emissions by 0.17 Gt CO_2 (9.1 percent reduction) each year between 2020 and 2030.

Annual emissions resulting from the loss of humid tropical primary forests have been 45 percent higher since the NYDF was signed than before, increasing from an average of 1.4 to 2.0 Gt CO_2 per year. Moreover, in 2019, as in recent years, almost half (45 percent) of emissions from tropical forests occurred from loss of primary forests. As with primary forest loss, Africa has had the largest percent increase in emissions (+144 percent, 0.22 Gt CO_2/yr) following the signing of the NYDF, with smaller percent increases in Latin America (+36 percent, 0.29 Gt CO_2/yr) and Asia (+28 percent, 0.12 Gt CO_2/yr) (Figure 7).

Data developments

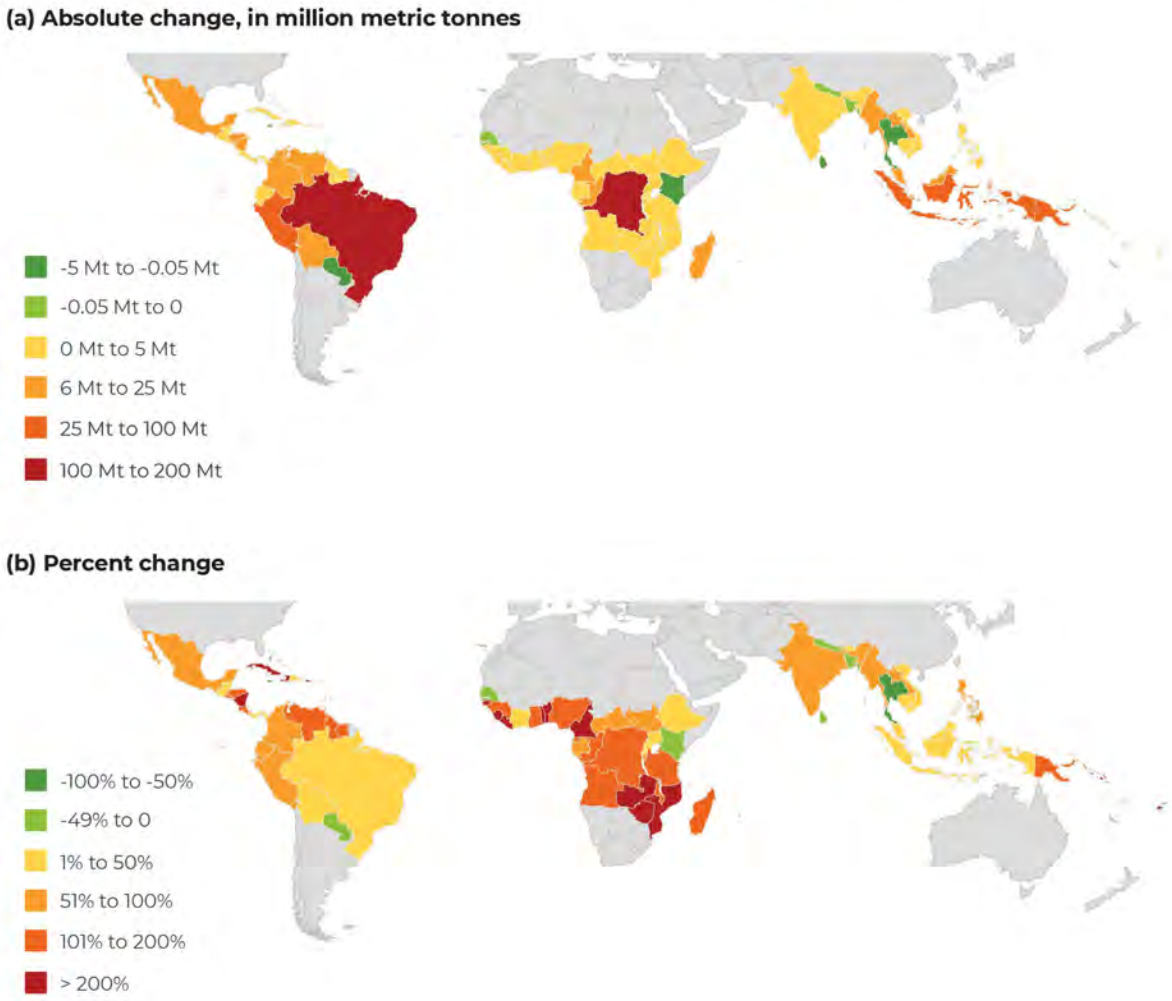
Several new data developments are underway that have enabled or will enable continued refinement of Goal 1 indicators::

Increased global access to and use of the latest remote sensing data, products and tools. During the last decade, FAO has invested heavily in supporting countries to access the latest remote sensing data and products, as well as easy-to-use software tools that facilitate their use for national forest monitoring and other reporting purposes. The newly developed digital FRA reporting platform allows all countries to access the latest freely available relevant remote sensing data and products. FAO's Open Foris Initiative provides a set of free and open source software tools and a cloud computing environment that greatly facilitates access and use of earth observation data for environmental monitoring. Coupled with tailored capacity development events, these actions are likely to further increase the developing countries' capacity to use Earth observation data within the coming years, increasing data quality and timeliness.

Drivers of tree cover loss. The global map of drivers of tree cover loss (Curtis et al. 2018) has been updated to include tree cover loss through 2019. The updated version is available on GFW.[6] A higher resolution driver model with additional driver classes is now being developed by WRI and The Sustainability Consortium. This will affect the deforestation and emissions from deforestation indicators once scaled globally.

Reprocessing of the tree cover loss data. The University of Maryland will reprocess the Landsat time series from 2001 onwards to apply a consistent method over the entire time series. This new method will also record repeated loss in a given location. Current tree cover loss data record only the first instance of loss to occur between 2001 and 2019 in a given location. This is expected to significantly alter and improve our understanding of tree cover change dynamics, such as helping to identify shifting agriculture and forestry cycles. It will also potentially change our evaluation of the progress towards NYDF Goal 1 (e.g., changing baseline tree cover loss and deforestation statistics) and affect almost all indicators.

Figure 7. Absolute change and percent change in average annual CO_2 emissions from primary forest loss in tropical countries before (2002–2013) and after (2014–2019) the signing of the NYDF



Note: Comparison of emissions from tree cover loss in humid tropical primary forests before (2002-2013) and after (2014-2019) the signing of the New Rok Declaration on Forests (NYDF). Tree cover loss calculated using a >30% tree cover density threshold. For the Hansen/Global Forest Watch (GFW) estimates, tree cover loss was calculated using a >30 percent tree cover density threshold. Improvements in the detection of tree cover loss due to the incorporation of new satellite data and methodology changes in 2011, 2013, and 2015 may result in higher estimates of loss in recent years compared to earlier years. Mt = million metric tonnes CO2.

Source: GFW analysis of Zarin et al. 2016 and Turubanova et al. 2018

Tracking net forest area change. While GFW and the University of Maryland currently report only gross tree cover loss on an annual basis, upcoming data on global gross tree cover gain will allow for the annual monitoring of regrowth and re-establishment of the tree canopy, and for an annually updated estimate of net forest area change. Annual tree cover loss and gain for the lower Mekong Delta from 2001 to 2017 have been published by the University of Maryland.[19] This would provide an additional data source for the net forest change indicator.

Tracking gross and net forest-related GHG fluxes. Indicator 2.1 does not account for carbon removals by forests from forest growth or expansion, which could be useful for tracking Goal 5 restoration targets. Various monitoring approaches are under development to estimate gross and net carbon dioxide fluxes from forests.[15] These estimates will provide a more comprehensive picture of the role forests play in the global carbon cycle and the extent to which progress is being made in reducing emissions and increasing removals from forests.

Endnotes

[1] Refer to NYDF Goal 1 2015 Progress Assessment, Box 1, for more information on the differences between gross and net forest loss. https://forestdeclaration.org/images/uploads/resource/2015Goal1.pdf
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