



Forest landscape restoration in NDCs

Methodological framework for the analysis and database

The sample and scope

The analysis constitutes an in depth review of all submitted (I)NDCs from 165 countries as of February 7, 2018. While it includes an overview of all forest references, there is an analytical emphasis on forest landscape restoration (FLR) activities.

The resulting database *only* presents FLR and land-based ambition and action with negative emissions potential, disaggregated in qualitative and quantitative data, for both target and non-target information in NDCs. This information is presented in total and disaggregated manner across: type of information or *climate ambition* (target or non-target), scope of mitigation targets, conditionality, approaches, and specific FLR activity. Quantitative information from activities or targets for *reducing* emissions in the land sector are not considered in this analysis.

Methodological considerations, coding and interpretation of NDCs

Number coding: The table uses '1' and '0' values to indicate when certain criteria does apply to an NDC ('1') or if that criteria does not apply ('0'). This basic coding is utilised across the table categories, including: existence of a target, the scope, nature, and approach for forest targets, existence of a non-target and approach for forest non-targets, and to identify which FLR activity types are included in an NDC.

Target information: NDC's references for mitigation and adaptation commitments were evaluated for qualitative and quantitative targets from a FLR-perspective and considering nature-based negative emissions activities. When available, the textual narrative describing FLR and nature-based negative emissions targets was entered in the table under the corresponding mitigation or adaptation *target* column.



CLIMATE FOCUS

Non-target Information: most NDCs contain information on countries' existing efforts, additional actions, and/or current policies that are presented as separate from their official NDC mitigation or adaptation *target(s)*. When this occurs, the analysis captures the FLR activity qualitative or quantitative description as ***non-target*** information, meaning it does not represent an official NDC *target*. As with target information, non-target information is also entered under either mitigation or adaptation to provide further context and relevant information on countries' on-going or planned efforts besides those under the official target. Also, if the non-target information did not fall within the reference period¹ considered for the purposes of this analysis NDC period, it was excluded from quantitative tallies.

Scope: Under mitigation targets, each NDC forest and FLR target has been evaluated according to how it is to be accounted for and reported. In this sense, NDCs targets are categorised as either:

- ❖ *“Economy-wide / multisector”* when LULUCF or AFOLU is considered for greenhouse gases accounting purposes as part of either economy-wide (across all sectors) or multi-sector (multiple sectors identified but may not be economy-wide).
- ❖ *“Excludes land / forest”* for greenhouse gases accounting purposes under the NDC target, when either mentioning explicitly the exclusion of the sector or not mentioning the sector from those multi-sector targets.
- ❖ *“Sectoral”* when countries have specific sectoral targets in LULUCF that fall under FLR and/or nature-based negative emissions (e.g. enhanced forest carbon stocks).

Nature of targets: this indicator describes the *conditionality* of FLR targets, and has been determined by the explicit mention of unconditionality and/or conditionality to which *target* achievement is contingent. When not explicit, the nature is interpreted by examining the NDCs' language and context which could suggest an implicit conditionality for achieving mitigation and/or adaptation targets, and also considering the practical implications for NDC revision, implementation, and reporting.

Approach: All FLR targets and non-targets are categorised as either under a mitigation or an adaptation approach. This was assessed according to whether the FLR reference is explicitly framed as mitigation or adaptation, and if the information is not explicit, then NDC language and context has been examined and interpreted accordingly, independently from the units used.

¹ Time period (No. 9 under 'Coding and Interpreting Criteria for NDC target and no-targets).



Time frame: For the purpose of this analysis, all NDCs have been evaluated within the same implementation period: 01 January 2021 to 31 December 2030. This time period is considered as appropriate given the timeframe of the first five-year accounting period (2021-2025) and given that the majority of NDCs utilise 2021-2030 as their implementation timeframe.²

Units: for the purposes of this analysis, all quantitative FLR targets and non-targets expressed in NDCs are recorded in the table as either hectares and/or tons of CO₂eq, based on how quantitative values have been originally expressed in NDCs. Those targets expressed in hectares have not been converted to CO₂eq and vice versa, and conversions have not been applied unless a specific conversion factor is detailed in a country’s NDC. When quantifiable target or non-target values have been expressed in other metrics, a set of assumptions and/or complementary sources of information have been used on a case-by-case basis to estimate or convert such values to the metrics considered in this analysis. Specific assumptions, when used, are included accordingly in the target or non-target narrative columns so to inform a comprehensive and comparable reading of countries’ NDCs.

FLR activities: Following both the textual narrative for target and non-target information in NDCs, forest targets/non-targets that are relevant for achieving negative emissions have been coded under the FLR activities’ typology. For further references, such typology has been reconciled with applicable REDD+ typology for context purposes (see below).

FLR Typology	Corresponding REDD + Typology
Planted Forests and Woodlots	Reduced Degradation
	Enhanced Carbon Sequestration
Natural Regeneration	Reduced Degradation
	Enhanced Carbon Sequestration
Mangrove Restoration	Reduced Degradation
	Enhanced Carbon Sequestration
Watershed Protection and Erosion Control	Reduced Degradation
	Enhanced Carbon Sequestration
Silviculture	Sustainable Forest Management
Agroforestry	Sustainable Forest Management
Improved Fallow	Sustainable Forest Management

² When periods for targets or non-targets are different from this, specific assumptions may be applied accordingly, as detailed under ‘Assumptions and Methods’.

The FLR typology³ entails:

- ❖ *Planted forests and woodlots*: Planting of trees on formerly forested land. Native species or exotics and for various purposes, fuelwood, timber, building, poles, fruit production, etc.
- ❖ *Silviculture*: Enhancement of existing forests and woodlands of diminished quality and stocking, e.g., by reducing fire and grazing and by liberation thinning, enrichment planting, etc.
- ❖ *Assisted regeneration*: Natural regeneration of formerly forested land. Often the site is highly degraded and no longer able to fulfil its past function – e.g. agriculture. If the site is heavily degraded and no longer has seed sources, some planting will probably be required.
- ❖ *Watershed protection and erosion control*: Establishment and enhancement of forests on very steep sloping land, along water courses, in areas that naturally flood and around critical water bodies.
- ❖ *Mangrove restoration*: Establishment or enhancement of mangroves along coastal areas and in estuaries.
- ❖ *Agroforestry*: Establishment and management of trees on active agricultural land (under shifting agriculture), either through planting or regeneration, to improve crop productivity, provide dry season fodder, increase soil fertility, enhance water retention, etc.
- ❖ *Improved fallow*: Establishment and management of trees on fallow agricultural land to improve productivity, e.g. through fire control, extending the fallow period, etc., with the knowledge and intention that eventually this land will revert back to active agriculture.
- ❖ *Other*: this activity category is selected when a country indicates general restoration of forests or includes forests in a list of areas for restoration but fails to specify the type of FLR activity planned.

Multiple ecosystems: for FLR targets and non-targets that include multiple ecosystems under one restoration target (e.g. restore grasslands, forests, and wetlands), the target/non-target has been categorised under “other” where the target (ha/tons) is inclusive of all ecosystem types mentioned in the NDC target. (e.g. see Niger)

³ IUCN and WRI (2014). A guide to the Restoration Opportunities Assessment Methodology (ROAM): Assessing forest landscape restoration opportunities at the national or sub-national level. Working Paper (Road-test edition). Gland, Switzerland: IUCN. 125pp.



Other Terms and their FLR activity categorisation:

- ❖ *Arboriculture* is considered a tree plantation activity;
- ❖ *Rehabilitation* of forests is considered 'other' restoration due to lack of activity specification; and
- ❖ *Restoration of forests* is considered 'other' restoration due to lack of activity specification.

Combined conditionality: when targets that have both unconditional and conditional activity allotments it has been assumed that the conditional target number is inclusive of the unconditional target number – unless there is explicit language differentiating the two (e.g. with terms including “additional”).

Assumptions and methods for standardising values/units

The assumptions and methods described in this section were applied across the FLR and NDC Database where necessary to harmonise NDC timeframes and the multiple ways targets are described by different countries. For the countries where these assumptions and methods are applied, they are indicated in the Database with **red text** that follows the textual information taken from NDCs and reflected in **black text**.

The assumptions and methods include the following:

Timeframe: for comparability and aggregation purposes, a standardised implementation time period has been applied universally across all NDCs for target and non-target values. All quantitative target and non-target info has been presented in the table as cumulative hectares or tons of CO₂eq over the period 2021-2030 (10 years). In the case of different timeframes used for describing the implementation of a target / non-target, the following assumptions have been used:

- If an NDC target is reported as to be achieved *by 2030* and does not include a reference to a baseline year, it has been assumed that the implementation is occurring over the 2021-2030 implementation period.
- When targets are expressed as annual hectares and/or tons CO₂eq, and/or do not specify a time period, they have been assumed to begin on 2021 and continue through 2030. This information has then been presented as the total hectares and/or tons CO₂eq extrapolated over 10 years.



- All NDC and non-target quantitative targets that are expressed in the NDC textual narrative for a temporal period that includes years before or after 2021-2030 have been converted to a flat annual average and then expressed as the cumulative target that would occur during 2021-2030.

Applied example: Madagascar has a 45,000 ha restoration target for 2020-2030, but because this falls outside of the temporal zone by one year we divide 45,000 by 11 years to produce an annual figure which is then multiplied across the implementation period to produce the 10-year cumulative target during the NDC period of 40,909 ha.

Tons of carbon: when the mitigation potential is given in tons of carbon, it is converted to CO₂e by multiplying by 3.67 (or 44/12)⁴

Forest cover goals: NDCs that express targets via increases in percent forest cover have been converted to hectares and have been coded under the *planted forest and woodlots* FLR activity. The conversion has considered the percent forest cover goal and the current forest cover and land area (excluding water bodies) to calculate the expected increase in forest area. As for *current forest cover*, the conversion has utilised the latest reported World Bank forest and land area (excl. water) data. All forest cover targets have been converted, if necessary, to only include forest increases that would occur during 2021-2030 based on converting the target into a flat annual average and extrapolating the average across up to 10 years (or to fit the annual average based on the target date in the NDC. If a forest cover goal is expressed as percent and then followed by a goal or potential expressed as tCO₂e then no hectare-based target is extrapolated as is described above.

Forest cover and conversion data sources:

2017 Land area: <https://data.worldbank.org/indicator/AG.LND.TOTL.K2>

2015 Forest area: <https://data.worldbank.org/indicator/AG.LND.FRST.K2>

All forest cover targets are assumed to A/R (planted forest activity) unless specified otherwise in NDC language (e.g. through 'regeneration').

⁴ Source: [EPA](#)



Range-based targets: when annual targets are presented as a range (e.g. 20,000-80,000 ha per year) the upper threshold has been used as the recorded target for quantification purposes and has been multiplied by 10 years to determine cumulative emissions for the 2021-2030 time-period (unless another time period is specified). In cases where a range-based estimate is presented in combination with an estimated cumulative figure, the estimated cumulative figure has taken precedence and has been used to determine the target over the 2021-2030 time-period.