TECHNICAL NOTE ON METHODOLOGY FOR THE GLOBAL RESTORATION COMMITMENTS DATABASE

Note

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Contents

1 Rationale and purpose

This technical note describes the methodology behind the database on Global Restoration Commitments and, in the Appendix, an excerpt of the data per country. For the full results and analysis of global land restoration commitments see the accompanying policy brief (Sewell et al., 2020). Chapter 3 and the Appendix include some results to help explain the database and its potential use.

1.1   A database on global restoration commitments

The Global Restoration Commitments database provides information on the order of magnitude of restoration commitments in different countries, regions, and the world, as well as information on the type of restoration measures that countries plan to implement. The data is sourced from information that is publicly available through nationally submitted plans or voluntary target setting reports under the three Rio Conventions (UNFCCC, CBD and UNCCD) and under the Bonn Challenge and associated regional initiatives.

All the quantitative national commitments, publicly available as of August 2020, have been collected and categorized in the database, for 115 countries (Table 1.1. and Appendix) that have submitted restoration plans or commitments under at least one of the conventions or the Bonn Challenge. The database only includes commitments that are quantifiable in hectares with a clear reference year, or in a percentage that is translatable into hectares, such as increase in forest area. In general, the commitments are to be achieved between 2020 and 2030, and in a small number of cases by 2040. The database only includes country commitments that are planned, and does not track implementation or cover what area has already been restored, as far as that could be discerned from the national plans and reports. Qualitative commitments, or quantitative commitments formulated in tons of CO_2, rate of change, or number of watersheds, are not included.

The database was developed within the PBL Global Land Outlook project, which works at the request of the UNCCD Secretariat in support of the goals of the convention and of the Global Land Outlooks 1 and 2 in particular. The Appendix provides a selection of the results by listing the size of all commitments included by country (Table A.1).

Table 1.1: Number of countries per aggregated region with quantitative commitments in GRC database

Region	Number of countries
North America	2
Central - and South America	20
Middle East and North Africa	9
Sub-Saharan Africa	45
West and Central Europe	6
Russia and Central Asia	10
South Asia	7
China Region	2
Southeast Asia	10
Japan and Oceania	4
Total	**115**

1.2 Policy rationale for the database

There is increasing global attention and ambition for restoration of land and ecosystems.
There is an increasing attention for the possible role of ecosystem restoration, including improved land management, in realising global sustainability ambitions (Suding et al., 2015; Chazdon et al., 2017). These ambitions are expressed in the goals and targets of the UN Convention to Combat Desertification, the UN Convention on Biological Diversity, and the UN Framework Convention on Climate Change. Restoration ambitions are also included in the Sustainable Development Goals (SDGs), and in various other international and regional agreements and initiatives.

The increased attention for restoration follows a number of high-level reports that highlight the extent and impact of climate change, land degradation and biodiversity loss. This is exemplified by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Land Degradation and Restoration Assessment (2018), the Intergovernmental Panel on Climate Change (IPCC) Special Report on Climate Change and Land (2019), and the first edition of the Global Land Outlook by the United Nations Convention to Combat Desertification (UNCCD) (2017), as well as much-discussed journal articles on reforestation potential and the role of nature-based solutions in tackling climate change (Bastin et al., 2019; Griscom et al., 2017; Roe et al., 2019; Strassburg et al., 2019).

Furthermore, a number of initiatives have arisen to build knowledge networks and capacity development, such as the Global Partnership on Forest and Landscape Restoration (2003), the Bonn Challenge (2011) and New York Declaration on Forests (2014). Most recently, the United Nations (UN) has declared the years between 2021 and 2030 as the UN Decade on Ecosystem Restoration, jointly led by the Food and Agriculture Organization of the United Nations (FAO) and United Nations Environment Programme (UNEP), supported by collaborating agencies including the three Rio Conventions, other international conventions, and regional partners including the International Union for Conservation of Nature (IUCN).

Countries' commitments for restoration are found in national plans and target setting processes
Countries prepare and submit national plans, target setting reports, strategies and commitments under various conventions and initiatives that include restoration in their goals or targets or are wholly aimed at restoration (Pinto et al., 2014; Aguilar et al., 2015; Murcia et al., 2015). Parties to the UNFCCC, CBD and UNCCD submit national plans to the Conventions, which are followed by national reports to measure progress.

The UNCCD has a Land Degradation Neutrality[1] (LDN) ambition and parties are voluntarily setting their national LDN targets, and also appropriate measures describing how they intend to achieve those LDN targets by 2030. The LDN concept has been developed to encourage implementation of an optimal mix of measures designed to avoid, reduce, and/or reverse land degradation in order to achieve a state of no net loss of healthy and productive land. A capacity building drive, including technical guidance and specialised expertise supported by the UNCCD Secretariat and the Global Mechanism, has seen many countries participating in the LDN Target Setting Programme[2] develop and commit to such targets, related reports and the documents on country commitments on achieving LDN. As of August 2020, a total of 102 out of 124 participating countries have successfully set voluntary LDN targets and measures[3].

Under the national plans for the CBD (called the NBSAPs[4]) and the UNFCCC (called the NDCs[5]), there are specific components that refer to ecosystem restoration, improved land management or the prevention of degradation. Furthermore, other initiatives such as the Bonn Challenge and New York Declaration on Forests have also developed global ambitions and function by getting countries to make public commitments for restoration, contributing to reaching multiple restoration goals at once.

A database to collect and update national restoration commitments
There is no single database that is publicly available that collates all the information on national commitments on restoration and improved land management, and is kept up to date (see also 1.4). The GRC database provides an overview of the current commitments under the various conventions and initiatives. It is designed in such a way that it could be updated in the future to reflect new commitments by countries or to add information on commitments towards other agreements such as the Ramsar Convention and UN Forum on Forests (UNFF) Global Forest Goals. Restoration in this note covers both restoration and rehabilitation measures (Box 1.1.).

1.3   Purpose of the database

The primary purpose of the database is to inform PBL's work on global scenario analysis covering land-use change, land degradation and land restoration for the UNCCD's Global Land Outlook, second edition. Data outputs from the GRC database (on the order of magnitude, regional location and restoration category of commitments) allow for estimating how scenario projections on land degradation, or scenario assumptions on restoration policies, compare to the current level of ambition, and therefore informs on how relatively ambitious a scenario is vis-à-vis current plans. It also allows for a gap analysis, for instance for an ambition such as achieving Land Degradation Neutrality, comparing what part of projected future land degradation would be counterbalanced for by the current commitments. This purpose requires a database that covers quantitative restoration commitments, for a broad definition of restoration (Box 1.1) and all terrestrial ecosystems, from as many sources as possible, globally.

The database can also be used to inform policy makers on the extent of current global and country commitments and facilitate discussions on possible improvements to commitments. Other potential uses include monitoring (whereby progress on restoration can be compared

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[1] A state whereby the amount and quality of land resources, necessary to support ecosystem functions and services and enhance food security, remains stable or increases within specified temporal and spatial scales and ecosystems." (UNCCD, 2016)
[2] https://www.unccd.int/actions/ldn-target-setting-programme
[3] https://knowledge.unccd.int/home/country-information/countries-with-voluntary-ldn-targets
[4] National Biodiversity Strategies and Action Plans (NBSAPs)
[5] Nationally Determined Contributions (NDCs)

against the national commitments in the database), policy coherence discussions (i.e. on synergies between different convention commitments within countries), informing global restoration cost estimates (Verhoeven et al., forthcoming), identifying countries that require capacity building to improve the quality and measurability of commitments (with regard to size, geographies and priorities), and analysing best practices in reporting styles between countries and conventions.

The database is able to answer these questions:
- How many hectares are committed to restoration globally as of August 2020?
- How are the commitments distributed by region and restoration measures?
- What is the level of coherence regarding commitments across conventions and the Bonn Challenge? And, conversely, what is the overlap in commitments submitted under various conventions by a single country?

The database is not an exhaustive overview of all restoration commitments globally. Rather, for the purpose above, it aims to reflect most of the commitments in order to provide an order of magnitude in both scale of commitments, as well as type. See Chapter 2 for further detail on what commitments are and are not included in the GRC database.

Box 1.1: Restoration and rehabilitation definition for this technical note

Restoration encompasses the improvement of natural ecosystems as well as the rehabilitation of lands under human use
'Land and ecosystem restoration' covers the full or partial restoration of an ecosystem. An area that has scope for restoration can be fully restored to its natural state, or be rehabilitated to serve a specific land use. Areas do not have to be abandoned for them to have a certain restoration potential. Agricultural areas that are still in use but have suffered from erosion or other degradation processes may also have scope for restoration. There is, therefore, a clear link between restoration and land management. Improved land management, or sustainable land management, can reduce or avoid degradation processes and, over time, lead to ecosystem recovery. For instance, applying grazing management may help grasslands and their soils to recover from overgrazing and erosion.

Central to discussions on restoration and degradation, and the potential contribution of restoration to global sustainability ambitions, are changes to ecosystem functions. These functions include the ability to regulate water, nutrients and produce biomass and are themselves dependent on the biological diversity and condition of the ecosystem. Changes to ecosystem functions can be intentional; for instance, when a natural system is converted into an agricultural system, or changes unintentionally, and some functions can increase while others decrease (Van der Esch et al., 2017; IPBES, 2018). Restoration is about increasing ecosystem functions where possible, generally, without reducing other functions.

Restoration, therefore, covers efforts aimed at restoring ecosystems to their natural state and also rehabilitating and improving systems that are under human use and management. This technical note uses 'restoration' to encompass all these degrees of restoration.

2 Database methodology

This chapter covers the conventions or initiatives for which restoration commitments of all ecosystem types were made and were included in the database (2.1), the data sources used for each of the included commitments (2.2), the conditions for inclusion of commitments (2.3), the categorization of the data per country in the database (2.4), and a short discussion on uncertainties regarding data extraction, categorization, and calculation (2.5).

The method used for data collection and categorisation for the database builds upon existing work by Arts et al. (2017), Lewis et al. (2017), Wolff et al, (2018), Climate Focus and IUCN (2018), Gichuki et al. (2019), and other reports linking the various Rio Conventions (CBD and FERI, 2016; Global Mechanism of the UNCCD and CBD, 2019) and outlining restoration categories (Global Mechanism of the UNCCD, 2019). These existing estimates of restoration commitments range from 57 to 400 million ha, but they each have a different scope and lack a global overview of all the Rio Conventions, ecosystems and types of restoration, as necessary for global scenario work. They either focus on overarching goals rather than individual country commitments, utilize limited data sources (not all the conventions and other initiatives), or limit the scope to a single biome (tropics), group of countries, or restoration definition (e.g. Forest and Landscape Restoration). Gichuki et al. (2019) is the most recent report that attempts this, and looks at a small selection of countries across all conventions and commitments, but not at types of restoration measures.

2.1   Commitments included in the database

There are a number of global goals for restoration and rehabilitation (Table 2.1). These include goals under the three Rio Conventions, under the SDGs, under other UN agreements or UN-led ambitions such as the Ramsar Convention and UNFF Global Forest Goals, and under initiatives like the Bonn Challenge, New York Declaration on Forests and associated regional initiatives (e.g. AFR100, Initiative 20x20, ECCA30). Countries have, through national plans, reports and target setting programmes, set restoration commitments and published them through these conventions and initiatives, to show their contribution to global restoration goals.

The database includes national commitments reported by countries to the UN Convention on Biodiversity (CBD) and the UN Framework Convention on Climate Change (UNFCCC), voluntary national commitments in LDN Target Setting reports under the UNCCD and from the Bonn Challenge and associated regional initiatives, that are publicly available. Table 2.1 provides an overview of the global goals with underlying country commitments included in the database. Commitments contributing to the goals on restoration under the SDGs are in general included through the associated goals in other conventions or agreements.

There are other goals for restoration and rehabilitation linked to the Bonn Challenge, such as the Agadir Declaration commitment to restore 8 million ha of degraded and deforested land by 2030 in the Mediterranean region. It is endorsed by ten countries - Algeria, France, Iran, Israel, Lebanon, Morocco, Portugal, Spain, Tunisia, and Turkey – and strongly supported by

several international organizations (FAO, 2020). There is also the Regional Strategy and Action Plan for Forest and Landscape Restoration (FLR) in Asia-Pacific (2017), which resulted in a new aspirational goal of increasing forest cover by at least 20 million ha of all types of forests by 2020 (FAO & APFNet, 2018). However, individual country commitments contributing to these overarching goals could not be identified and are therefore not included within this database.

The GRC database, in its current form, is not an exhaustive overview of all restoration commitments, globally. There are regional or national plans that are not reported to the Rio Conventions or the Bonn Challenge, but those are not included (e.g. the EU's Green New Deal plans on reforestation) and the same goes for commitments that could exist under other conventions or ambitions (e.g. the Ramsar Convention or the UNFF Global Forest Goals). Still, the database is estimated to include the majority of commitments globally and thus provide a useful order of magnitude estimate.

Table 2.2: Overview of global agreements and initiatives that address restoration and improved land management, with underlying commitments included in the GRC database

Rio Conventions	
UNCCD - Land Degradation Neutrality	In 2015, at the 12th session of the Conference of Parties (COP.12) to the UNCCD, the Parties endorsed SDG Target 15.3, which includes the concept of land degradation neutrality (LDN), as a strong vehicle for driving the implementation of the Convention. Alongside this, all national Parties were invited to formulate national voluntary targets to achieve LDN. The UNCCD defines Land Degradation Neutrality (LDN) as 'a state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems' (Global Mechanism of the UNCCD and CBD, 2019). LDN is an integral part of SDG Target 15.3, which aims to 'combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world', by 2030. LDN encourages countries to adopt a broad range of measures to avoid or reduce land degradation through appropriate planning, regulation and sustainable land management practices, combined with localised action to reverse past degradation, through land restoration and rehabilitation, to achieve a state of no net loss of healthy and productive land. Through the Land Degradation Neutrality Target Setting Programme, the Global Mechanism (GM) and the secretariat of the UNCCD, in collaboration with multiple international partners, are supporting interested countries with their national LDN target-setting process, including setting national baselines, targets and associated measures to achieve LDN. LDN is part of the UNCCD Strategic Framework (2018–2030). Countries deliver National Action Programmes (NAPs), as well as regional and sub-regional plans.
CBD – Aichi Biodiversity Targets	Aichi Biodiversity Targets 5, 7, 11, 14, 15 (under the Strategic Plan for Biodiversity 2011–2020) are most relevant for restoration, They include halving the rate of loss of forests, ensuring at least 17% of terrestrial areas are conserved through effectively and equitably managed protected areas or comparable approaches, restoring at least 15 of degraded ecosystems, enhancing resilience and contribution of biodiversity to carbon stocks, sustainably managing productive areas to also conserve biodiversity, and conserving and restoring ecosystem services. New objectives are being formulated to succeed the Aichi Biodiversity

	Targets for the post-2020 Global Biodiversity Framework. Countries submit their plans to achieve targets via National Biodiversity Strategic Action Plans (NBSAPs).
UNFCCC – Paris Agreement	The Paris Agreement (2015), focused on undertaking ambitious efforts to combat climate change and adapt to its effects, has 2 goals relevant to restoration: • Article 4 (AFOLU and NDCs): Reporting on mitigation activities including agriculture, forestry and other land use (AFOLU). • Article 5 (carbon sinks and REDD+): 'Parties should take action to conserve and enhance, as appropriate, sinks and reservoirs of greenhouse gases'. Including REDD+: 'reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks'. The REDD+ mechanism contributes directly to achieving SDGs 13 and 15, which address climate change, reducing deforestation and sustainable use of ecosystems. • Article 7.1 (climate adaptation): 'enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with the view to contributing to sustainable development and ensuring adequate adaptation response in the context of the temperature goal' (UNFCCC, 2015).
Bonn Challenge and associated regional initiatives	
The Bonn Challenge (global)	The Bonn Challenge is a voluntary, non-binding, global initiative launched to advance the restoration movement and in recognition of the importance of forest landscape restoration for meeting national priorities and international commitments (Dave et al., 2017). Launched in 2011, it is the largest action-oriented platform for forest and landscape restoration and has been recognised as a key driver in mobilising restoration ambition and actions across diverse ecosystems and landscapes (IUCN, 2017). It is intended as an implementation vehicle for domestic restoration priorities while simultaneously contributing to the achievement of many existing international commitments, including the SDGs, CBD Aichi Target 15, the UNFCCC REDD+ goal, and the UNCCD land degradation neutrality goal. The goal is to restore 150 million hectares of the world's deforested and degraded lands by 2020, and 350 million hectares by 2030.
ECCA30 (regional)	ECCA30 seeks to bring 30 million hectares of degraded and deforested land in Europe, the Caucasus and Central Asia (ECCA) into restoration, by 2030. ECCA30 is the most recent regional contribution to the Bonn Challenge, though it builds on the earlier Astana Resolution. It is a regional initiative to secure additional regional commitments and accelerate the implementation of the Bonn Challenge, Land Degradation Neutrality and land and forest-based targets towards achieving the objectives of the Paris Agreement. It will facilitate access to technical and financial support, and reinforce regional cooperation and capacity exchange on forest landscape restoration (FLR). Further, it will help countries receive international and regional recognition for their restoration ambitions connected to their domestic priorities and projects (Bonn Challenge, 2020).
Initiative 20x20 (regional)	The Initiative 20x20 is a country-led effort in Latin America and the Caribbean to bring 20 million hectares of deforested and degraded land into restoration, by 2020. Launched at UNFCCC COP 20 in Lima, it supports the Bonn Challenge and NYDF. 17 countries and 3 regional programs have committed to begin restoring more that 50 million ha of degraded land. It is supported by 40 technical institutions and a coalition of impact investors and private funds (Initiative 20x20, 2020).
AFR100 (regional)	The African Forest Landscape Restoration Initiative (AFR100) is a country-led effort to bring 100 million hectares of degraded and deforested land in Africa into restoration, by 2030. It aims to accelerate restoration to enhance food security, increase climate change resilience and mitigation, and combat rural poverty; and restore deforested and degraded land. AFR100 contributes to the Bonn Challenge, the African Resilient Landscapes Initiative (ARLI), the African Union Agenda 2063, the Sustainable Development Goals and other targets (AFR100, 2020).

2.2 Sources used per commitment

For each of the commitments included (UNCCD, CBD, UNFCCC, Bonn Challenge and associated regional initiatives) specific sources were drawn on for the specific commitments per country. These sources and why they were used are summarized below. Table 2.2 provides the online location of the data sources.

UNCCD
- Data on Land Degradation Neutrality (LDN) restoration commitments were extracted from the publicly available (Table 2.2) summary of LDN targets, in the original language, or translated to English.
- The underlying LDN Target Setting Final Reports and the LDN Country Commitments contained in the High-Level Notes were checked for clarification and confirmation of accuracy, where necessary.
- National Action Plans (NAPs) were not used, as the LDN summaries and underlying reports/commitments were more recently published and provide sufficient information from national level sources to give an order of magnitude of commitments. The submitted national LDN reports were regarded as the official voluntary commitments.

CBD
- Data on commitments was extracted from the latest NBSAPs via the search tool for national (Aichi) targets, as well as the search tool for NBSAPs and national reports, to check for clarification and confirmation of accuracy where necessary. Whenever an NBSAP was unavailable, the latest national report was checked for additional information. National targets on biodiversity referenced in countries' communications to the CBD are not always captured in national NBSAPs.
- Where a there is a commitment for both 2020 and 2030, only the 2030 commitment was included.
- Commitments regarding fisheries (Aichi Target 6) were not included, as the database covers terrestrial ecosystem restoration commitments. This also applies to Aichi Target 9 on invasive alien species, though this could be included in future expansion of the database as there are links to ecosystem restoration.
- For the same reason, any commitments related to oceans were also excluded. The exception being any commitments in which a percentage increase in marine and coastal protected areas were included and categorised in the land use category "coastal", thereby covering Aichi Target 11 which partly relates to both coastal and marine areas.

UNFCCC
- Data on commitments was extracted from the most recent NDC Country reports in the NDC Registry Database.
- Where commitments distinguished between unconditional and conditional commitments (i.e. depending on investment and international support), both were extracted, but only the highest commitment (conditional) was recorded in hectares.
- Both mitigation and adaptation commitments are included in the database
- The database does not include commitments on carbon emissions reductions. Many NDCs missed this data, due to data availability for emissions estimates in the agriculture, forestry and other land use (AFOLU) sector.

Bonn Challenge and associated regional initiatives
- Data was extracted from the Bonn Challenge website for both 2020 and 2030 commitments. Only the largest commitment was used to calculated total number of hectares per country for the Bonn Challenge total. Data was also extracted from the AFR100, Initiative 20x20 and ECCA2030 websites. The InfoFLR database was not used, as identical data could be found on the aforementioned websites.

Table 2.2: Online location of data sources

Name of source	Link
UNCCD - LDN Target Reports	https://knowledge.unccd.int/home/country-information/countries-with-voluntary-ldn-targets
CBD – NBSAPs & National Targets	https://www.cbd.int/nbsap/targets/default.shtml and https://www.cbd.int/nbsap/about/latest/
UNFCCC – NDCs	https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx
Bonn Challenge	https://www.bonnchallenge.org/commitments
AFR100	https://afr100.org/content/countries
Initiative 20x20	https://initiative20x20.org/regions-countries
ECCA30	https://www.iucn.org/news/forests/201807/caucasus-and-central-asia-demonstrate-impressive-political-will-restoration-and-bonn-challenge

2.3 Conditions for inclusion of commitments in the GRC database

Given the need to develop a new database (section 1.3), this section describes the requirements for inclusion of country commitments into the Global Restoration Commitments (GRC) database:

- Commitments are from plans and reports that are publicly available and published by a country through a convention, the Bonn Challenge, or associated regional initiative (see section 2.2). If a country plan references more national commitments in other national reports, e.g. national forestry plan, if this is not specifically and quantitatively included in the national plans and reports as described above, then this commitment is not further researched and included;

- The commitments refer to restoration or rehabilitation measures (see categories in section 2.4);

- Commitments are quantitatively formulated, measurable, expressed in hectares or other area-based metrics[6], e.g. *by 2030, improve forest cover through the restoration of 8 million hectares of degraded forest landscapes through afforestation, reforestation and the establishment of new plantations;*

- Or, can be translated into hectares if also including a reference year. This is only carried out for commitments that reference an increase in forest area, e.g. *increase forest cover by 20% by 2030 as compared to 2015.* These commitments can be translated into hectares using FAO 2015 forest area data as a baseline reference;

- Protected area commitments with reference to hectares were included, while those referring to percentage change with reference to a baseline year were not, due to

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[6] Commitments in non-hectare units are copied directly into the database and translated into hectares in the hectares column. See section 2.4. Restoration commitments included in sub-national areas are included, mindful of overlap with overarching national commitments.

time constraints of the researchers, but can be added at a later date (for instance using the World Database on Protected Areas (WDPA)).

- Commitments that refer to an increase in hectares from a reference year, and not just total amount in 2030 without reference to a clear starting date. This is done to avoid overlaps with commitments that may already be completed.

2.4   Data categorization per country

Once it is clear that a commitment should be included in the database, the exact text is copied into the database for categorization. Where a sentence included more than one commitment, these were placed into separate cells. Qualitative commitments that referred to restoration were not included. In addition, where the report was not available in English, the original text was copied and the translation (via google translate) was attached to the cell with the original text, via comments.

This section clarifies the rules on how the extracted data was categorized. The database is in Microsoft Excel format, with each country assigned a row and a column for the data entries per country. The headings represent each column in the database. Table A.3 in the Appendix provides an example of a complete entry for a country.

Commitment type
This column has the data source e.g. LDN or NBSAP.

Country
This column has the country name and region based on the 10 regions described below.

Region/IMAGE regions
The database includes a categorization of countries into 10 regions that are used in the Global Land Outlook scenario analysis (Figure 2.1). Other geographic groupings can be made based on the country column.

Commitment/Target
Commitment text copied directly into the database. Translated where necessary and translation pasted into comment connected to cell with original text.

Quantitative? (Y or N)
For some countries qualitative commitments were included for future reference. This column has a Y for yes or N for No, depending if the restoration commitment is quantitative or not.

Unit
The unit in which a commitment is expressed (see Table 2.3).

Figure 2.1

The 10 regions used in this report to aggregate countries' commitments'

- North America
- Central and South America
- Sub-Saharan Africa
- Middle East and Northern Africa
- Western and Central Europe
- Russian region and Central Asia
- South Asia
- Southeast Asia
- Japan, Korea and Oceania
- China region
- Polar
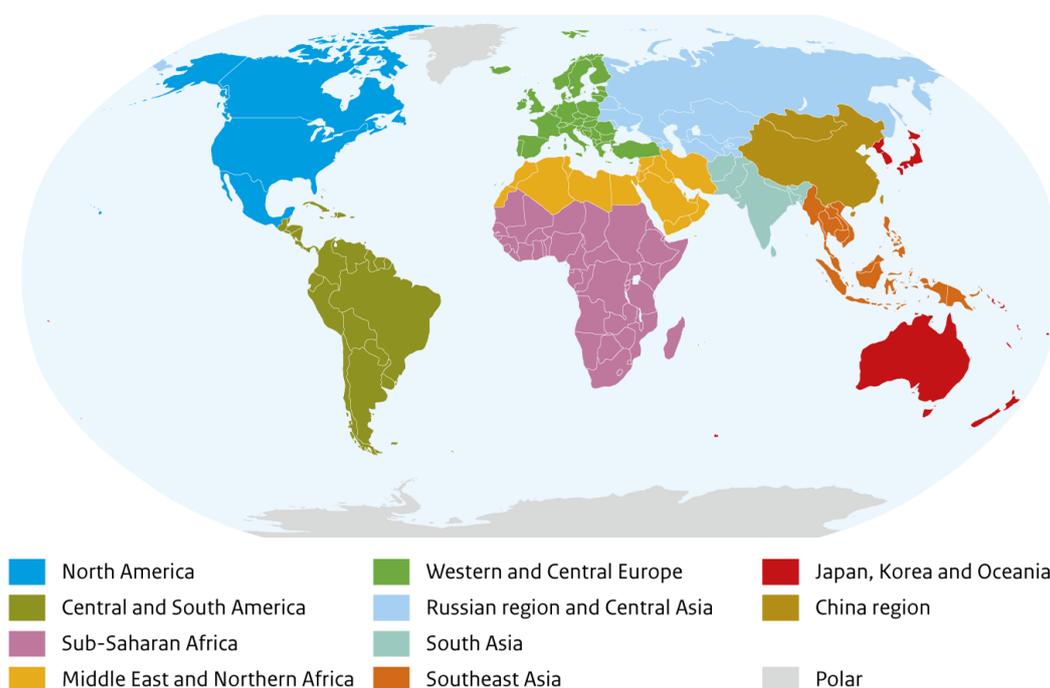
Source: PBL

Table 2.3 Overview of units in which commitments are expressed in the database

Unit	Unit in full	Comment
Ha	Hectares	
%	Percentage or percentage change	Where commitment in % change is expressed with a reference year, and can be converted into hectares using FAO data, change unit to Ha.
t/ha	metric tonnes per hectare	
tCO2	metric tonnes CO2	
GgCO2	gigagrams CO2	
tCO2-eq	metric tonnes CO2 equivalent	
Other		Where commitment is expressed in a unit not included above, such as '3 watersheds' or '4 communities'
Multiple		Combination of units e.g. Ha and t/ha

Amount of hectares referring to increase of total number of hectares

Some commitments, particularly in the NBSAPs and referring to an increase in protected areas, do not make a clear distinction between the total area under restoration and protection in 2030 (in general, though 2020 for the NBSAPs), and the actual area of land which is still to be restored. In calculating the total number of hectares to be restored, only the increase in hectares will be used, as far as that could be discerned from the national plans and reports. E.g.:

- **Increase**: *To achieve LDN by the year 2030, Guinea-Bissau needs to increase forest cover by about 4.5%, i.e. to reforest about 40,000 ha of land* **(40,000 ha);**
- **Total**: *By 2021, the accumulated restoration area has been increased to 300,000 hectares, with an emphasis on fragile ecosystems and river basins that contribute to multipurpose, irrigation and hydro-generation projects* **(unclear increase).**

Restoration category and subcategories

The database uses the main and sub-categories for LDN targets as the point of departure, used to identify the main restoration themes in country reports in the LDN Target Setting Program Technical Review[7] (Global Mechanism of the UNCCD, 2019a and 2019b)). This list was then expanded with additional categories and sub-categories to avoid overlaps and double counting when incorporating the other commitments (e.g. improve forest management). Any commitments that were general in nature fall into the "other/general/unspecified" category, e.g. *100,000 ha will be rehabilitated in Western province, Enga, Morobe, New Ireland, Milne Bay, East and West Sepik and Madang*).

In addition, many commitments combined different restoration categories into one commitment that was not possible to separate. These fall under the various "multiple" categories, e.g. *Restoration of natural habitats (forests and mangroves: 45,000 ha; lakes, streams, etc. (2025) Environmental amenities and ecosystem services associated with the restoration of 55,000 ha of forests and mangroves (2030)*. Table 2.4 shows the full categorization used. Instruments were added as an additional category to check reference to non-biophysical measures that may also aid restoration. Table A.2 in the Appendix shows the total restoration categories in hectares for the commitments at a regional and global level.

Commitments can be divided into two overarching categories, broadly covering 1) restoration and protection, and 2) management and rehabilitation. 'Restoration and protection' category includes measures that aim to bring ecosystems back to a natural state or measures that aim at conservation and the prevention of degradation. 'Management and rehabilitation' category includes measures that aim to rehabilitate areas that are under human use but are degraded, or to rehabilitate degraded areas for human use, or to improve the management of used areas to at least partially restore natural condition and functions (e.g. restore soils in agricultural areas) while maintaining the area for human use.

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[7] LDN TSP: Technical Review of the LDN TSP Country Reports Data Analysis (2019)

Table 2.4: Database categorization of restoration measures

Group	Restoration measures	Overarching type
Restore/improve forest land	Reduce/halt deforestation and conversion of forest to other land cover types (includes conserving forest land)	Restoration & Protection
	Restore forest land	Restoration & Protection
	Increase land productivity in forest areas	Management & Rehabilitation
	Improve forest management e.g. fire management	Management & Rehabilitation
Increase forest land	Increase forest land (net gain) e.g. plantations	Restoration & Protection
Restore/improve cropland	Increase land productivity in agricultural areas	Management & Rehabilitation
	Rehabilitate bare or degraded land for crop production	Management & Rehabilitation
	Improve water use for irrigation	Management & Rehabilitation
	Halt/reduce conversion of cropland to other land cover types	Restoration & Protection
	Sustainable Land Management	Management & Rehabilitation
Restore/improve grassland and savannah	Restore and improve pastures	Management & Rehabilitation
	Improve land productivity in grassland/savannah	Management & Rehabilitation
	Restore rangeland (e.g. by controlling livestock and wildfires)	Management & Rehabilitation
	Halt/reduce conversion of grassland to other land cover types	Restoration & Protection
Restore/improve wetlands (including peatlands and mangroves)	Halt/reduce wetland conversion to other land uses (includes conserving wetlands)	Restoration & Protection
	Restore/preserve wetlands and reduce degradation of wetlands	Restoration & Protection
Increase soil fertility and carbon stock	Rehabilitate bare land and/or restore degraded land	Management & Rehabilitation
	Increase carbon stock and reduce soil/land degradation	Management & Rehabilitation
	Maintain current level of SOC	Management & Rehabilitation
	Reduce soil erosion	Management & Rehabilitation
	Reduce sand encroachment	Management & Rehabilitation
	Improve watershed/landscape management	Management & Rehabilitation
Manage artificial area and mining	Restore degraded mining areas	Restoration & Protection
	Halt illegal mining and/or reduce mining area	Restoration & Protection
	Improve land productivity in artificial areas	Management & Rehabilitation
	Halt/reduce/regulate expansion of urban/artificial area	Restoration & Protection
Restore /improve protected areas	Restore protected areas	Restoration & Protection
	Improve management of protected areas	Restoration & Protection

Increase protected areas	Increase protected areas	Restoration & Protection
Improve coastal management	Reduce coastal erosion	Restoration & Protection
	Reduce saline water intrusion in coastal zone	Management & Rehabilitation
Other/General/Unspecified	Avoid/Prevent/ halt degradation (of degraded lands)	Restoration & Protection
	Restore vegetation cover (unspecified land use)	Restoration & Protection
	Achieve LDN	Management & Rehabilitation
	Improve land productivity (unspecified land use)	Management & Rehabilitation
	Other/General/Unspecified	Management & Rehabilitation
Instrument	General instrument (e.g. policies, economic incentives)	Restoration & Protection
Restore/improve multiple land use	Forest and grassland	Management & Rehabilitation
	Cropland and grassland	Management & Rehabilitation
	Forest and wetlands	Restoration & Protection
	Forest, cropland and grassland	Management & Rehabilitation
	Protected area and forest	Restoration & Protection
	Other	Management & Rehabilitation
	All land uses	Management & Rehabilitation
Reduce/halt conversion of multiple land uses	As above	Restoration & Protection
Restore/improve multiple functions	Productivity and carbon stock	Management & Rehabilitation
	Other	Management & Rehabilitation
	Multiple functions	Management & Rehabilitation
Restore/improve multiple functions in multiple land uses	Improve productivity and SOC stock in croplands and grasslands	Management & Rehabilitation
	Other	Management & Rehabilitation

Land use category

Restoration measures were linked to a land use category to enable linking to scenario analysis (Table 2.5). Desert and mountain ecosystem were initially included, since they are referred to in the Aichi Targets, but eventually not included due to little to no reference to them in the quantitative commitments.

Table 2.5 Land use categories used in the database

Land use categories	Includes
Forest	Forest plantation
Grassland	Savannah, Rangeland, Pasture, Silvopasture
Wetlands	Mangroves, Peatlands
Cropland	Agricultural land, agroforestry
Coastal	
Protected areas	Conservation areas
Degraded/bare land	
Artificial/urban areas	Mining
Other/not specified	
Multiple	
Freshwater systems	Watersheds
Natural ecosystems	

Primary function/goal

This column presents what goal the restoration is intended for, if so mentioned in national plans (Table 2.6). LDN reports often specify between carbon sequestration, water retention, soil fertility, land productivity and biodiversity, NBSAPs also refer to enhancing ecosystem services and resilience to climate change. NDCs also refer to improving governance, incomes, reducing conflict and the exodus of youth, but not enough to warrant an own category. These fall into "other". Only if a primary function became clear from the commitments, or was clearly mentioned, was it categorised as such.

Table 2.6 Overview of the goal categories of restoration commitments

Primary function categories
Carbon
Water
Soil fertility
Productivity
Biodiversity
Other
Multiple
Resilience to climate change
Enhance ecosystem services

Total amount of ha

The total amount of hectares is calculated per individual subcategory, for all commitments included per country. If there is a forest area commitment expressed in percentage change from a reference year, this has been translated into hectares using 2050 FAO data for a 2015 reference year.

Reference year

This column is for when a reference year is mentioned, e.g. g*ain in land productivity and SOC stocks in about 8,333 km² of cropland in reclaimed desert lands at different location (cultivated areas) by 2030 as compared to 2015.*

Deadline year
The year by which the commitment is to be completed. If no year is mentioned in the commitment, it is left blank and assumed to be 2030, or 2020 for the NBSAPs.

Link to other plans
There are many discussions at present on synergies between the Rio Conventions, the nexus role of land and nature-based solutions, and the upcoming restoration decade. Reports can be quickly scanned using key words to check for reference to other Rio Conventions and national plans and initiatives. This information is scored (Table 2.7) but is currently incomplete for current commitments. This information is therefore not used, but can be included in database expansions.

Table 2.7 Scoring used in the database of links to other plans mentioned in national plans

Link to other plans	Explanation
No	Not mentioned at all
Mentioned	Mentioned in name e.g. this country has ratified this convention
Efforts to align	Report mentions effort to align or find synergies between different reports, plans and commitments.
Clear alignment	Report mentions clear alignment with other reports, plans, commitments and targets. For example, "these targets contribute to the NDC and Bonn challenge targets, which are x and x"

Source link
The exact online location of the data for each commitment, in URL form.

2.5   Uncertainties

Given the broad scope of the database and time constraints, there are uncertainties to take into account regarding data extraction, categorization, and calculation of hectares. For the first two elements, random checks were carried out in terms of the process of data extraction and categorization, with a colleague, to verify the data.

Data extraction
While every effort was made to be consistent in data extraction, it may be that there are some inconsistencies and inaccuracies. Firstly, this may be due to the large variation in reporting styles and how the various data sources structure and display their commitments. For example, NBSAPs vary greatly between countries in format, style and length, and lack a clear summary of commitments that are otherwise unevenly distributed throughout the reports, making them difficult to locate. Efforts were made to include as many relevant commitments as possible but it may mean that some commitments were missed due to human error. In addition, it may be that commitments were missed due to translation errors.

Secondly, given the breadth of the concept of ecosystem restoration definition, some topics which have a more indirect link with restoration were not included in the database, such as invasive alien species and pollution. These could be included as a potential expansion of the database.

Categorisation
A random sample of commitments in the database was checked by two colleagues, to verify that categorising commitment data was consistently carried out. Again, given the breadth of the restoration definition, the difference in format and detail between reported commitments,

and the limited number of categories, it may be that there are some inconsistencies remaining.

The restoration measure categorization used by the UNCCD for LDN targets was used as the starting point but proved limited when applied to other sources (see Section 2.4). The final categorisation has therefore been expanded from the initial LDN categorization with minimal overlap between sub-categories. For example, some NBSAP restoration related commitments did not directly relate to LDN categories, so a new category was formed for "increase protected areas" (referring to measures preventing land degradation).

There are mixed commitments which relate simultaneously to several land use or restoration measure categories. So, while the commitments can be quantitative, they do not necessarily provide quantitative information that can be linked to a specific land use category and restoration measure. An example of this is "*Protection, enhancement and management of 4,400 hectares of designated land for biodiversity benefit*". This was solved through adding multiple mixed categories but remains a factor of uncertainty. This did not affect the number of hectares per country.

Commitments under the Bonn Challenge and affiliations were difficult to categorise to a specific measure. The information on the Bonn Challenge website mentions only the total commitment to Forest Landscape Restoration (FLR), even though multiple categories fall underneath this including agriculture, agroforestry systems and improved fallow systems, amongst others (Bonn Challenge, 2020). This information was previously available on the Bonn Challenge website, as utilised in Arts et al., (2017), but is no longer available. Countries show the breakdown of their commitments under the Bonn Challenge Barometer – however this is only available for 5 countries, though application is ongoing for 12 countries. Therefore, Bonn Challenge and associated regional initiative commitments are placed under 'restore/improve forests', until such categorisation is available.

Calculations
Not all quantitative commitments can be translated into hectares. A number of quantitative commitments are expressed in metric tons of CO_2, or refer to a rate of change, or number of watersheds. For example, "*To undertake, by 2017, restoration projects (tree planting in degraded villages; clearing of bush-encroachment and invasive weeds) in 6 identified and prioritised areas*". Those quantitative commitments that are specific but were difficult to calculate into hectares were included and highlighted as such for later reference.

Not all quantitative commitments refer to new areas that will be restored. Some commitments, particularly in the NBSAPs and referring to an increase in protected areas, do not make a clear distinction between the total area under restoration and protection in 2030 (with reference to a reference year or current area already under restoration), and the actual increase in land area which is still to be restored. For example, "*The country will reach 1,000,000 hectares in the process of restoration in susceptible areas defined by the National Ecological Restoration Plan for the Rehabilitation and Recovery of Disturbed Areas.*" In calculating the total number of hectares to be restored in the future, only the increase in hectares will be used in order to avoid counting what may already be restored. As a result, some large commitments may not be included in in the final calculations.

3 Coherence between different commitments

While it is clear that there are synergies and benefits between the objectives of the different Rio Conventions and the SDGs (WWF, 2017; Global Mechanism of the UNCCD and CBD, 2019; Seddon et al., 2019), alignment between restoration commitments is lacking. A study by CBD & FERI (2016) shows that there is no consistency or cross-referencing between the ecosystem-based quantitative contributions under the UNFCCC and the national targets under Aichi Biodiversity Targets 5 and 15. Where alignment is found between conventions, it is due to effective coordination and management between various sectors or ministries, or within the same ministry (Gichuki et al., 2019). This highlights that the complexity of implementing restoration at scale is also very much a challenge of government coordination, and potentially also donor coordination (Mansourian, 2017; Chazdon et al., 2017). This section focuses on estimating coherence and overlap between quantitative restoration commitments in the GRC database.

3.1 Using the database to estimate coherence and overlap between commitments

The database allows calculation of total restoration commitments, per country, region, or globally. However, many countries often report different commitments under each of the three different conventions and the Bonn Challenge. The question is to what extent these commitments overlap when a country reports multiple, mutually inconsistent commitments.

To address this issue a number of methods were used. Overlap and coherence can be analysed in two steps, with the second step being a choice of three methods.

Step 1: The first step is to limit overlap within the Bonn Challenge and its associated regional initiatives.

For the Bonn Challenge and associated regional initiatives, there is assumed to be a very high level of overlap, though some countries feature in the regional initiatives but not the Bonn Challenge. In order to reduce overlap, the highest single country commitment is taken. For example, if a country has 1 million ha committed under the Bonn Challenge, and 1.2 million ha committed under AFR100, then the AFR100 commitment is used. Using this approach, the total of current commitments under the Bonn Challenge and related initiatives comes to around 210 million ha for 65 countries.

Step 2: Use one of three methods to calculate the total commitments based on different assumptions of overlap (Table 3.1).

Method 1 (High estimate): Assumes no overlap between commitments by a country. All country commitments are added up. This results in the highest estimate of commitments per country. This estimate is very likely to be too high as discussions with experts point to a general high degree of overlap of commitments within countries.

Method 2 (Middle estimate): This method takes the highest commitment per subcategory of measures, per country. The reasoning is that countries may make multiple mutually

inconsistent commitments on a restoration measure that can be expected to have a high overlap (e.g. restore forest land) but that a different measure (e.g. increase land productivity in agricultural areas) will be an additional commitment. For example, if a country has two commitments for the same sub-category (restore forest land), the assumption is that the highest commitment in this sub-category includes the smaller commitment as well; and do this for all categories.

Method 3 (Low estimate): This method takes the highest single commitment per country, per data source (LDN, NBSAP, NDC or 'Highest Bonn Commitment' as in Step 1). For example, if a country has 500,000 ha for LDN and 1,000,000 ha for NDC, then the 1,000,000 ha is assumed the total commitment in hectares for that country, and the LDN commitment and potential other smaller commitments are assumed to be included within that 1,000,000 ha.

Table 3.1: Total estimates range

Name	Description	Assumption	Example	Total (ha)
High estimate	All targets added and combined per country	Assumes no overlap: each target is additional to the others	*E.g. NDC + LDN + highest Bonn + NBSAP*	1,002,118,074
Middle estimate	Only the highest target (between sources) per restoration measure category, per country	Assumes some overlap: that other sources with a smaller target for the same restoration measure are included within the highest estimate of another source	*e.g. restore forest land NDC 300,000 > restore forest land LDN 200,000*	946,844,114
Low estimate	Only the single highest commitment between all sources, per country, regardless of measure	Assumes high overlap: all other smaller commitments for other sources are included	*e.g. sum of targets under LDN > sum of targets under NDC or NBSAP or Highest Bonn*	765,472,331

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Appendix

Table A.1: Partial overview of Global Restoration Commitments database output per country, source and range of total commitments, in hectares. Shows only a selection of available columns and information.

Country	LDN	NBSAP	NDC	Bonn Challenge	Low estimate	Middle estimate	High estimate
Afghanistan	-	-	5,582,050	-	5,582,050	5,582,050	5,582,050
Algeria	4,975,000	5,000,000	1,245,000	-	5,000,000	10,745,000	11,220,000
Argentina	1,340,000	-	-	1,000,000	1,340,000	2,140,000	2,340,000
Armenia	73,500	-	-	500,000	500,000	536,000	573,500
Australia	-	60,100,000	-	-	60,100,000	60,100,000	60,100,000
Azerbaijan	-	-	-	270,000	270,000	270,000	270,000
Bangladesh	510,000	-	-	750,000	750,000	1,260,000	1,260,000
Belarus	560,000	-	430,000	-	560,000	980,000	990,000
Benin	5,485,760	-	10,452,000	500,000	10,452,000	16,287,760	16,437,760
Bhutan	6,300	-	-	-	6,300	6,300	6,300
Bolivia	2,700,000	-	51,504,000	-	51,504,000	53,304,000	54,204,000
Brazil	-	-	32,000,000	22,000,000	32,000,000	42,000,000	54,000,000
Burkina Faso	8,600,000	-	5,351,750	5,000,000	8,600,000	17,026,750	18,951,750
Burundi	738,000	-	120,000	2,000,000	2,000,000	2,694,600	2,858,000
Cambodia	3,055,700	-	1,134,200	-	3,055,700	3,484,200	4,189,900
Cameroon	12,000,000	-	-	12,060,000	12,060,000	24,060,000	24,060,000

Country	LDN	NBSAP	NDC	Bonn Challenge	Low estimate	Middle estimate	High estimate
Cape Verde	53,300	-	20,000	-	53,300	73,300	73,300
Central African Republic	1,227,415	-	-	3,500,000	3,500,000	4,727,415	4,727,415
Chad	-	-	-	5,000,000	5,000,000	5,000,000	5,000,000
Chile	564,800	-	200,000	500,000	564,800	1,046,800	1,264,800
China	106,100,000	-	-	-	106,100,000	106,100,000	106,100,000
Colombia	145,200	600,000	2,500,000	1,000,000	2,500,000	4,242,000	4,245,200
Costa Rica	-	1,002,150	307,600	1,000,000	1,002,150	1,309,750	2,309,750
Cote D'Ivoire	5,807,200	1,500,000	-	5,000,000	5,807,200	12,307,200	12,307,200
Democratic Republic of Congo	31,738,400	-	3,000,000	8,000,000	31,738,400	31,738,400	42,738,400
Djibouti	-	-	2,000	-	2,000	2,000	2,000
Dominican Republic	237,900	-	-	310,000	310,000	516,000	547,900
Ecuador	-	500,000	-	500,000	500,000	500,000	1,000,000
Egypt	4,882,350	-	-	-	4,882,350	4,882,350	4,882,350
El Salvador	-	-	1,000,000	1,000,000	1,000,000	2,000,000	2,000,000
Eritrea	4,819,900	-	2,706,000	-	4,819,900	7,239,900	7,525,900
Eswatini	628,390	-	-	500,000	628,390	1,128,390	1,128,390
Ethiopia	52,731,930	7,501,000	-	15,000,000	52,731,930	74,805,200	75,232,930
Gabon	1,989,585	-	-	-	1,989,585	1,989,585	1,989,585
Gambia	158,700	-	-	450,000	450,000	608,700	608,700
Georgia	9,236	-	869,000	10,000	869,000	870,000	888,236
Ghana	7,413,963	-	663,000	2,000,000	7,413,963	9,277,907	10,076,963
Grenada	1,983	-	-	-	1,983	1,983	1,983

Country	LDN	NBSAP	NDC	Bonn Challenge	Low estimate	Middle estimate	High estimate
Guatemala	-	-	-	1,240,000	1,240,000	1,240,000	1,240,000
Guinea	849,700	-	100,000	2,000,000	2,000,000	2,849,700	2,949,700
Guinea-Bissau	66,000	-	-	-	66,000	66,000	66,000
Guyana	2,580,200	-	2,000,000	-	2,580,200	4,580,200	4,580,200
Haiti	-	-	208,000	-	208,000	208,000	208,000
Honduras	-	-	-	1,000,000	1,000,000	1,000,000	1,000,000
Hungary	-	5,000	-	-	5,000	5,000	5,000
India	-	-	37,433,270	21,000,000	37,433,270	53,433,270	58,433,270
Indonesia	-	-	12,000,000	-	12,000,000	12,000,000	12,000,000
Iran (Islamic Republic of)	-	2,000,000	-	-	2,000,000	2,000,000	2,000,000
Iraq	340,000	100,000	-	-	340,000	340,000	440,000
Italy	2,425,000	-	-	-	2,425,000	2,425,000	2,425,000
Jordan	16,000	-	-	-	16,000	16,000	16,000
Kazakhstan	571,429	-	-	1,800,000	1,800,000	2,371,429	2,371,429
Kenya	-	-	-	5,100,000	5,100,000	5,100,000	5,100,000
Kyrgyzstan	120,000	30,000	-	323,200	323,200	463,200	473,200
Lebanon	91,000	-	-	-	91,000	91,000	91,000
Lesotho	796,925	-	-	-	796,925	796,925	796,925
Liberia	774,076	-	-	1,000,000	1,000,000	1,774,076	1,774,076
Madagascar	600,000	-	385,000	4,000,000	4,000,000	4,985,000	4,985,000
Malawi	5,433,010	-	20,000	4,500,000	5,433,010	9,099,260	9,953,010
Mali	3,950,000	-	817,000	-	3,950,000	4,767,000	4,767,000

Country	LDN	NBSAP	NDC	Bonn Challenge	Low estimate	Middle estimate	High estimate
Mauritania	-	-	100,000	-	100,000	100,000	100,000
Mauritius	34,024	20,400	-	-	34,024	49,894	54,424
Mexico	-	-	-	8,500,000	8,500,000	8,500,000	8,500,000
Moldova, Republic of	1,030,000	5,500	-	-	1,030,000	1,030,500	1,035,500
Mongolia	1,825,370	-	1,429,040	600,000	1,825,370	3,254,410	3,854,410
Morocco	-	4,500,000	4,208,600	-	4,500,000	6,840,000	8,708,600
Mozambique	-	-	-	1,000,000	1,000,000	1,000,000	1,000,000
Myanmar	-	130,000	-	-	130,000	130,000	130,000
Namibia	13,817,010	-	15,420,000	-	15,420,000	29,187,010	29,237,010
Nepal	2,628	25,000	2,098,000	-	2,098,000	2,125,628	2,125,628
New Zealand	-	500,000	-	-	500,000	500,000	500,000
Nicaragua	1,938,938	2,500	-	2,800,000	2,800,000	4,738,938	4,741,438
Niger	4,792,675	-	3,574,833	3,200,000	4,792,675	10,467,508	11,567,508
Nigeria	14,149,300	-	-	4,000,000	14,149,300	18,149,300	18,149,300
Niue	-	2,550	-	-	2,550	2,550	2,550
State of Palestine	-	-	4,270	-	4,270	4,270	4,270
Pakistan	-	67,000	3,153,280	700,000	3,153,280	3,860,280	3,920,280
Panama	1,292,420	-	1,000,000	1,000,000	1,292,420	2,292,420	3,292,420
Papua New Guinea	4,400,000	-	-	-	4,400,000	4,400,000	4,400,000
Peru	29,238,196	-	-	3,200,000	29,238,196	32,438,196	32,438,196
Philippines	6,250,000	1,000,000	-	-	6,250,000	7,250,000	7,250,000
Republic of Congo	104,421	-	100,000	2,000,000	2,000,000	2,204,421	2,204,421

Country	LDN	NBSAP	NDC	Bonn Challenge	Low estimate	Middle estimate	High estimate
Republic of Korea	-	100	-	-	100	100	100
Rwanda	461,115	-	260,100	2,000,000	2,000,000	2,721,215	2,721,215
Saint Lucia	4,605	-	-	-	4,605	4,605	4,605
Sao Tome and Principe	32,000	-	-	-	32,000	32,000	32,000
Senegal	5,145,699	-	-	2,000,000	5,145,699	5,264,703	7,145,699
Serbia	1,000,844	-	-	-	1,000,844	1,000,844	1,000,844
Seychelles	10,005	-	-	-	10,005	10,005	10,005
Sierra Leone	2,307,000	-	-	-	2,307,000	2,307,000	2,307,000
Singapore	-	46,000	-	-	46,000	46,000	46,000
Somalia	-	500,500	-	-	500,500	500,500	500,500
South Africa	16,193,874	-	-	3,600,000	16,193,874	17,546,772	19,793,874
South Sudan	5,209,560	-	-	-	5,209,560	5,209,560	5,209,560
Sri Lanka	-	-	-	200,000	200,000	200,000	200,000
Sudan	12,336,842	-	33,033,000	14,600,000	33,033,000	59,963,242	59,969,842
Sweden	-	1,714,000	-	-	1,714,000	1,714,000	1,714,000
Tajikistan	-	-	-	70,000	70,000	70,000	70,000
Tanzania	24,190,826	-	-	5,200,000	24,190,826	24,190,826	29,390,826
Thailand	-	-	4,036,600	-	4,036,600	4,036,600	4,036,600
Timor Leste	745,682	-	-	-	745,682	745,682	745,682
Togo	377,997	-	-	1,400,000	1,400,000	1,777,997	1,777,997
Tunisia	-	2,000,000	-	-	2,000,000	2,000,000	2,000,000
Turkey	8,541,551	-	-	-	8,541,551	8,541,551	8,541,551

Country	LDN	NBSAP	NDC	Bonn Challenge	Low estimate	Middle estimate	High estimate
Uganda	2,133,920	211,250	5,943,800	2,500,000	5,943,800	8,455,050	10,788,970
Ukraine	-	2,500	-	-	2,500	2,500	2,500
United Kingdom of Great Britain and Northern Ireland	-	211,240	-	170,000	211,240	381,000	381,240
United States of America	-	-	-	15,000,000	15,000,000	15,000,000	15,000,000
Uruguay	-	-	5,264,836	2,500,000	5,264,836	7,764,836	7,764,836
Uzbekistan	-	-	-	1,000,000	1,000,000	1,000,000	1,000,000
Venezuela	362,361	-	2,184	-	362,361	364,545	364,545
Viet Nam	4,785,000	-	380,000	-	4,785,000	5,165,000	5,165,000
Zambia	2,831,750	-	-	-	2,831,750	2,831,750	2,831,750
Zimbabwe	9,016,307	-	-	2,000,000	9,016,307	9,016,307	11,016,307
TOTAL	451,729,771	89,276,690	252,058,413	209,053,200	765,472,331	946,844,114	1,002,118,074

Table A.2: Overview of Global Restoration Commitments database output for total hectares per region and per restoration measure

Region	Restore/ improve forest land	Increase soil fertility and carbon stock	Increase forest land	Restore/improve cropland	Restore/improve grassland and savannah	Increase protected areas	Restore/improve multiple functions	Restore/improve protected areas	Restore/improve multiple land use	Other/general/ unspecified	Restore/improve wetlands, peatlands, mangroves	Manage artificial area and mining	Restore/improve multiple functions in multiple land uses	Instrument	Improve coastal management
JKO	500,000	100,100	-	-	-	60,002,550	-	-	-	-	-	-	-	-	-
SEA	1,047,174	1,000,000	5,725,800	13,020,000	-	6,350,000	-	3,000,000	-	6,734,509	380,000	-	-	-	-
CHN	1,429,040	104,000,000	3,529,040	-	-	-	-	-	-	-	396,330	-	-	-	-
SAS	22,959,550	270,050	37,684,560	3,507	5,350,050	-	-	-	-	70,000	9,811	-	-	-	120,000
RCA	4,018,200	1,432,500	185,000	591,429	16,000	780,000	-	-	100,500	30,000	430,000	10,000	-	-	-
EUR	3,245,001	900,000	2,186,594	3,300,000	855,000	1,368,400	-	-	-	2,206,600	-	5,800	-	-	-
SSA	162,047,337	47,029,082	63,417,823	73,171,983	49,736,637	2,463,000	10,262,096	2,697,000	17,994,334	8,646,223	926,778	531,738	463,000	2,820	277
MEN	1,764,000	10,245,050	3,118,470	4,481,600	3,052,000	1,000,000	1,257,500	-	-	2,000,000	-	-	-	-	-
CSA	59,278,941	2,244,791	4,143,457	4,526,680	25,737,686	4,612,336	29,000,000	24,211,900	6,000,000	1,576,482	60,000	-	-	300,000	-
NAM	23,500,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	279,789,242	167,221,573	119,990,744	99,095,199	84,747,373	76,576,286	40,519,596	29,908,900	24,094,834	21,263,813	2,202,919	547,538	463,000	302,820	120,277

Regions:
JKO: Japan, Korea and Oceania
SEA: Southeast Asia
CHN: China Region
SAS: South Asia
RCA: Russia and Central Asia
EUR: West and Central Europe
SSA: Sub-Saharan Africa
MEN: Middle East and North Africa
CSA: Central - and South America
NAM: North America

Table A.3: Example of a country commitment filled into the Global Restoration Commitments database for reference

Commitment category	Region	Country	Commitment/ Target	Quantitative?	Unit	Amount of hectares referring to increase or total	Restoration Category	Sub category	Land use category	Primary Function	Amount (ha)	Reference year	By when	Link to other plans?	Which plans	Source
LDN	Sub-Saharan Africa	Mali	Increase the forest area by 10 per cent between 2015 and 2030, that is about 200,000 ha, through reforestation and afforestation	Y	Ha	increase	*Increase forests*	*Increase forest land (net gain) e.g. plantations*	Forest		**200,000**	2015	2030			https://knowledge.unccd.int/home/country-information/countries-having-set-voluntary-ldn-targets/mali

ABBREVIATIONS & GLOSSARY

AFOLU	Agriculture, forestry and other land use
AFR100	African Forest landscape Restoration initiative
CBD	United Nations Convention on Biological Diversity
ECCA30	Restoration initiative for Europe, the Caucasus and Central Asia
FAO	Food and Agriculture Organization of the United Nations
GRC database	Global Restoration Commitments database
Initiative 20x20	Restoration initiative for Latin America and the Caribbean
LDN	Land Degradation Neutrality
MEAs	Multilateral Environmental Agreements
NBSAPs	National Biodiversity Strategies and Action Plans under the CBD
NDCs	Nationally Determined Contributions under the UNFCCC
Rio Conventions	The UNFCCC, CBD and UNCCD conventions, agreed at the Earth Summit held in Rio de Janeiro in 1992.
SDGs	Sustainable Development Goals: a collection of 17 interlinked goals for 2030, building on the Millennium Development Goals and agreed on in 2015 by the UN General Assembly.
UNCCD	United Nations Convention to Combat Desertification
UNEP	United Nations Environment Programme
UNFCCC	United Nation Framework Convention on Climate Change
UNFF	United Nations Forum on Forests