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From reference levels to results reporting:
REDD+ under the UNFCCC

From reference levels to results reporting: REDD+ under the UNFCCC

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Foreword

For well over a decade, developing countries have been encouraged to undertake activities in their forest sectors that are designed to reduce greenhouse gas emissions while also working to conserve, enhance and sustainably manage forest carbon stocks. These activities are known collectively as Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD+), which was established under the United Nations Framework Convention on Climate Change (UNFCCC).

More recently, these actions were confirmed by the landmark Paris Agreement on climate change, which entered into force in 2016, as a core element of a new global climate change regime. Under this regime, governments have agreed on policy approaches and positive incentives for activities that reduce greenhouse gas emissions and enhance carbon sinks in the forest sector of developing countries. FAO has supported countries in their REDD+ efforts, assisting them in the development of monitoring, reporting and verification (MRV) capabilities – crucial to the REDD+ process.

This publication provides a status report on progress and achievements related to the MRV of REDD+ activities, as well as an update on activities related to countries' submissions of their Forest Reference (Emission) Levels (FRELs/FRLs). The report also summarizes experiences with the technical assessment process, as of early 2017, and offers an overview of initial REDD+ results reporting and technical analyses of those reports.

It is fair to say that much progress has been made within the REDD+ framework over the past years, as countries have agreed to policy approaches and positive incentives for activities that reduce greenhouse gas emissions and enhance carbon sinks in developing countries. Within this framework, an increasing number of countries can now boast significant achievements along the REDD+ readiness path, with several moving towards implementation of these measures as part of international efforts to mitigate climate change.

Highlights of this report include measures that show a strong uptake of FREL/FRLs among tropical forest countries. FREL/FRLs which have already been submitted involve many of the countries with the largest forest areas, and cover vast amounts of emissions from their forest sectors. There is also progress in areas that are not as easy to quantify: for example, an unprecedented level of transparency has been achieved concerning countries' forest-sector data and information, thanks to data reporting in the context of REDD+.

It is hugely encouraging to see the progress that has been made to date in developing REDD+. This publication highlights how one of its key components – a robust MRV framework – is shaping up. Hopefully, it can become a useful input for countries' further work towards participation in REDD+ and greater transparency regarding their forests and climate change.



Eva Müller
Director,
Forestry Policy and Resources Division,
Food and Agriculture Organization of the United Nations

Facts on REDD+ reference levels and results reporting

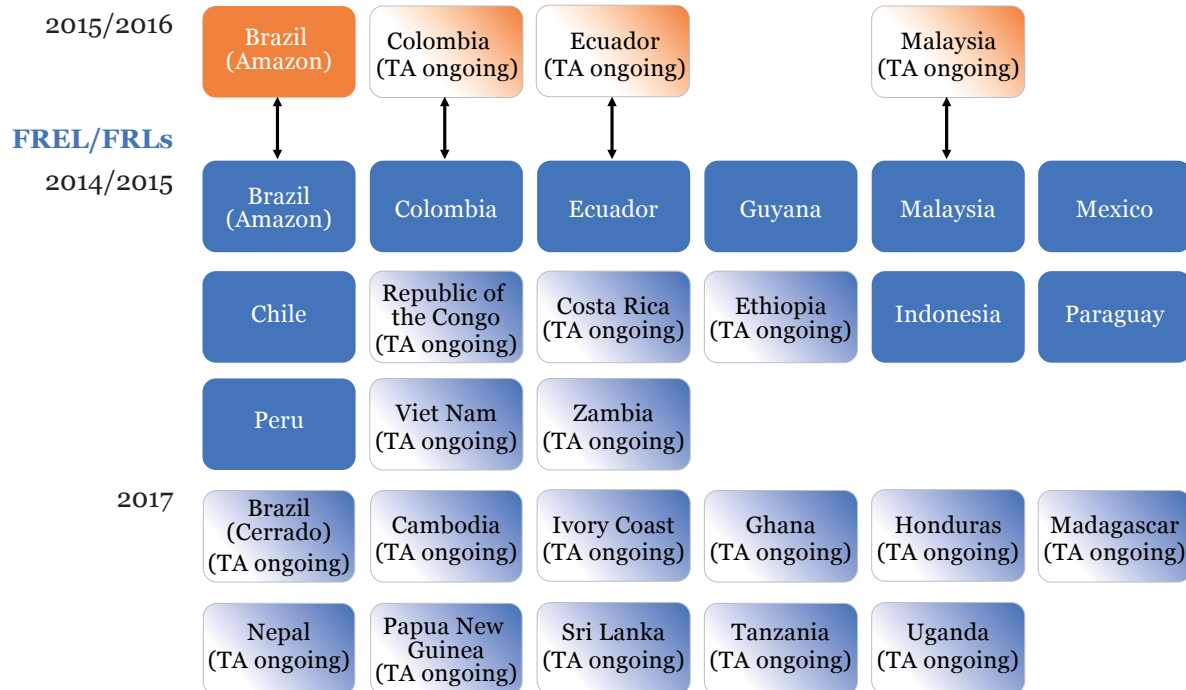
The landmark Paris Agreement on climate change has created a new context for international mitigation efforts while confirming the existing framework for Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD+). Within this framework, many countries are making progress in developing and submitting to the United Nations Framework Convention on Climate Change (UNFCCC) their Forest Reference (Emission) Levels (FREL/FRLs), participating in the technical assessment of FREL/FRL, reporting on REDD+ results through annexes to Biennial Update Reports (BUR), and undergoing the International Consultation and Analysis process. Nearly all countries pursuing REDD+ have also submitted Nationally Determined Contributions (NDCs) that include forest-sector actions.

The measurement, reporting and verification (MRV) of REDD+ activities is progressing and, as of early 2017, the following milestones had been achieved:

- As many as 25 countries have submitted a total of 26 FREL/FRLs¹ to the UNFCCC for technical assessment.
- The UNFCCC has published nine technical assessment reports of FREL/FRLs; a further 17 technical assessments are ongoing.
- Four countries have reported REDD+ results to the UNFCCC, totalling over 3 billion tCO_{2e} in reductions, mostly from Brazil. One technical analysis has been completed; the other three technical analyses are ongoing.

This publication aims to inform countries of developments related to the MRV of REDD+ activities. It provides an update on FREL/FRL submissions and REDD+ results reporting, a summary of experiences to date with the technical assessment process, and an overview of initial REDD+ results reports and their technical analyses.

REDD+ results



1 One country (Brazil) has submitted two FREL/FRLs for separate biomes.

Key messages

- The Paris Agreement on climate change creates a new context for mitigation as REDD+ matures from capacity development to producing results.
- Countries have made progress on the measurement, reporting and verification (MRV) of REDD+ activities, notably on the first two elements.
- In many countries, unprecedented transparency of countries' forest-sector data and information has resulted from the MRV of REDD+ as, for the first time, data at this level of detail have been reported internationally.
- A country's national forest monitoring system (NFMS) should provide data and information for the MRV of REDD+, the national greenhouse gas (GHG) inventory, and NDC progress reporting to enhance sustainability and consistency.
- Experience to date in improving the NFMS, and the development of FREL/FRLs, has demonstrated that such systems can provide needed evidence for policy-makers to make decisions that support the implementation of strategies for sustainable development, including for the NDCs.
- Continued experience with FREL/FRLs, REDD+ results reporting, and the associated technical assessment and analysis may provide useful lessons in drawing up the Paris Agreement's transparency framework.
- More clarity is needed concerning how REDD+ results can trigger results-based payments finance through their FREL/FRLs and REDD+ results annexes, as submitted to the UNFCCC.
- FAO will continue supporting capacity development at the country level for FREL/FRLs, REDD+ results reporting, and the development of NFMS that can underpin NDC progress reporting.
- Countries are encouraged to take a stepwise approach in improving MRV systems for REDD+ and building on lessons learned. FAO intends to help countries on this path and to foster an enabling environment to share knowledge and experiences among countries as part of its support for the phased approach of REDD+: from readiness to full implementation, including demonstration of results, and eventual results-based payments.

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Acronyms

AD	Activity data
AGB	Above-ground biomass
BGB	Below-ground biomass
BUR	Biennial Update Report
CO_{2e}	Carbon dioxide equivalent
COP	Conference of the Parties
DW	Deadwood
EF	Emission factor
ER-PD	Emission Reduction Programme Document
FCPF	Forest Carbon Partnership Facility
FREL	Forest Reference Emission Level
FRL	Forest Reference Level
GCF	Green Climate Fund
GHG	Greenhouse gas
HWP	Harvested wood products
ICA	International Consultation and Analysis
INC	Initial National Communication
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
L	Litter
LDCs	Least Developed Countries
LULUCF	Land Use, Land-Use Change and Forestry
MRV	Measurement, Reporting and Verification
NAMAs	Nationally Appropriate Mitigation Actions
NDC	Nationally Determined Contribution
NC	National Communication
NFI	National Forest Inventory
NFMS	National Forest Monitoring System
REDD+	Reducing Emissions from Deforestation and Forest Degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries
SIDS	Small Island Developing States
SOC	Soil organic carbon
TA	Technical Assessment/Technical Analysis
tCO_{2e}	Tonnes CO _{2e}
UNFCCC	United Nations Framework Convention on Climate Change

1. Introduction

The landmark Paris Agreement on climate change, which entered into force in 2016, confirms that actions to reduce GHG emissions and enhance carbon removals from forests are a core element of a new global climate regime. It also encourages all countries to take actions to implement and support “reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks” (REDD+). As part of international efforts to mitigate climate change, countries have agreed on policy approaches and positive incentives for activities that reduce GHG emissions and enhance carbon sinks in the forest sector in developing countries.

Many countries are already making progress in developing REDD+ National Strategies and/or Action Plans, developing and submitting REDD+ Forest Reference (Emission) Levels (FREL/FRLs) and participating in associated technical assessment processes. Several countries are also moving towards implementing REDD+ National Strategies and Action Plans, and a first set of countries has submitted REDD+ results to the United Nations Framework Convention on Climate Change (UNFCCC) for technical assessment.

Countries use their national forest monitoring systems (NFMS) to measure REDD+ results, mostly including data from national forest inventories and satellite land-monitoring systems. Countries report on REDD+ results through FREL/FRL submissions and the REDD+ results annexes (the latter are contained in a dedicated annexes to Biennial Update Reports (BUR)). These undergo technical assessments and technical analyses. Reporting should maintain consistency with countries’ national GHG inventories.

The objective of this paper is to inform countries that are interested in REDD+ about developments around FREL/FRLs and REDD+ results reporting. To achieve this objective, this paper provides:

- an update on the context in international climate change mitigation policy for FREL/FRL submissions and REDD+ results reporting (Section 2);
- information on FREL/FRL submissions and a summary of experiences to date in the technical assessment process (Sections 3 and 4);
- examples of submitted REDD+ results and their technical analysis (Section 5).

This paper builds on three previous UN-REDD publications: *National Forest Monitoring Systems – Monitoring and Measurement, Reporting and Verification (M & MRV) in the context of REDD+ Activities*², *Emerging approaches to Forest Reference Emission Levels and/or Forest Reference Levels*³ for REDD+, and *Technical considerations for Forest Reference Emission Level and/or Forest Reference Level construction for REDD+ under the UNFCCC*⁴.

Since publication of these papers, more countries have developed and submitted FREL/FRLs, adding to the body of country experience. In addition, a first set of countries has begun reporting REDD+ results while a growing number of countries have gained experience with the technical assessment and analysis of FREL/FRLs and REDD+ results. Further, international climate change mitigation policy has evolved with the Paris Agreement providing a clear context for mitigation actions, including REDD+.

2 FAO. 2013. *National Forest Monitoring Systems: Monitoring and Measurement, Reporting and Verification (M & MRV) in the context of REDD+ Activities*. Rome. Available at: www.fao.org/3/a-bc395e.pdf.

3 FAO. 2014. *Emerging approaches to Forest Reference Emission Levels and/or Forest Reference Levels for REDD+*. Rome. Available at: https://unfccc.int/files/land_use_and_climate_change/redd_web_platform/application/pdf/redd_20141113_unredd_frel.pdf.

4 FAO. 2015. *Technical considerations for Forest Reference Emission Level and/or Forest Reference Level construction for REDD+ under the UNFCCC*. Rome. Available at: www.fao.org/3/a-i4847e.pdf

2. The evolving context for Forest Reference (Emission) Levels and REDD+ results reporting

A series of UNFCCC decisions provide guidance to developing countries that wish to measure, report and verify their REDD+ results (Sections 2.1, 2.2, 2.3). Also important is the evolving context of international climate change mitigation policy and finance of REDD+ results (Section 2.4).

2.1. UNFCCC guidance and procedures

Countries can voluntarily submit FREL/FRLs to the UNFCCC for technical assessment. Once the technical assessment is completed, countries can submit REDD+ results in an annex to their BURs for technical analysis (Figure 1). UNFCCC decisions suggest countries should follow these steps if seeking to obtain and receive results-based payments/finance⁵.

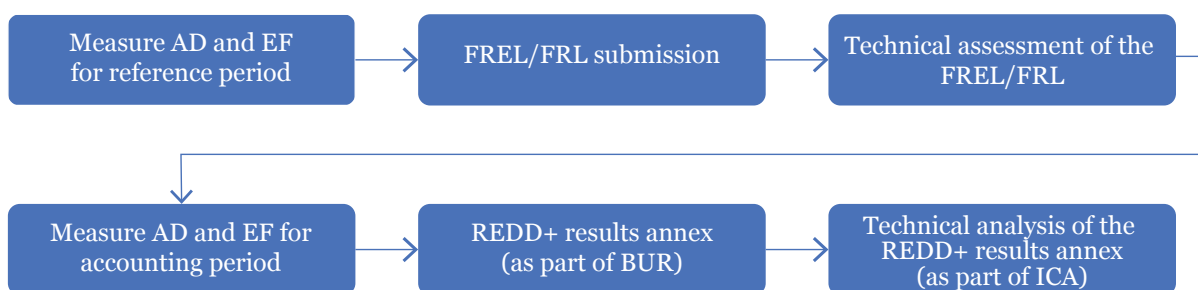


Figure 1: MRV for REDD+.

FREL/FRL submissions and REDD+ results annexes are a voluntary addition to developing countries' UNFCCC reporting requirements (Table 1) and part of the UNFCCC's MRV framework. For developing countries, except least developed countries (LDCs) and small island developing states (SIDS), the MRV framework⁶ requires the submission of National Communications (NCs) every four years and BURs every two

Table 1: UNFCCC submissions relevant to REDD+ results reporting.

Submission	Country requirement	Relevance to REDD+	Assessment
FREL/FRL submission	Developing countries may voluntarily submit at any time (assessments occur once a year)	FREL/FRLs are benchmarks for assessing countries' REDD+ performance	Subject to a technical assessment*
REDD+ results annex (technical annex to the BUR)	Developing countries may voluntarily submit at any time, as part of a BUR submission, following completion of the FREL/FRL technical assessment	Voluntary and in the context of results-based payments/finance for REDD+ results-based actions	Subject to a technical analysis as part of ICA, including on consistency with the FREL/FRL**
BURs	Developing countries to submit every two years (LDCs and SIDS at their discretion)	Updates information provided in the NC, including the GHG inventory (FREL/FRLs and REDD+ results should be consistent with the GHG inventory***)	Subject to ICA, which includes a technical analysis and facilitative sharing of views****

*Decision 13/CP.19, annex - **Decision 14/CP.19, paragraph 11 - *** Decision 12/CP.17, paragraph 8 and decision 14/CP.19, paragraph 9 - ****Decision 2/CP.17, annex IV, paragraph 4

⁵ Decision 9/CP.19, paragraph 3

⁶ UNFCCC. 2014. *Handbook on Measurement, Reporting and Verification for developing country parties*. Available at: http://unfccc.int/files/national_reports/annex_i_natcom/application/pdf/non-annex_i_mrv_handbook.pdf.

years. The latter undergo a process of International Consultation and Analysis (ICA). The BURs contain an update of a country's national GHG inventory, information on the implementation and results of mitigation actions, identification of needs and support received. Optionally, they can include a dedicated REDD+ results annex, while FREL/FRL submissions are provided separately from BURs. Developing countries may also undertake (and measure the results of) nationally appropriate mitigation actions (NAMAs).

2.2. Modalities for Forest Reference (Emission) Levels and the technical assessment

Countries have agreed on a set of important modalities for FREL/FRL submissions on a voluntary basis⁷ (Figure 2, Figure 3). FREL/FRL submissions are available on the UNFCCC REDD+ web platform.⁸

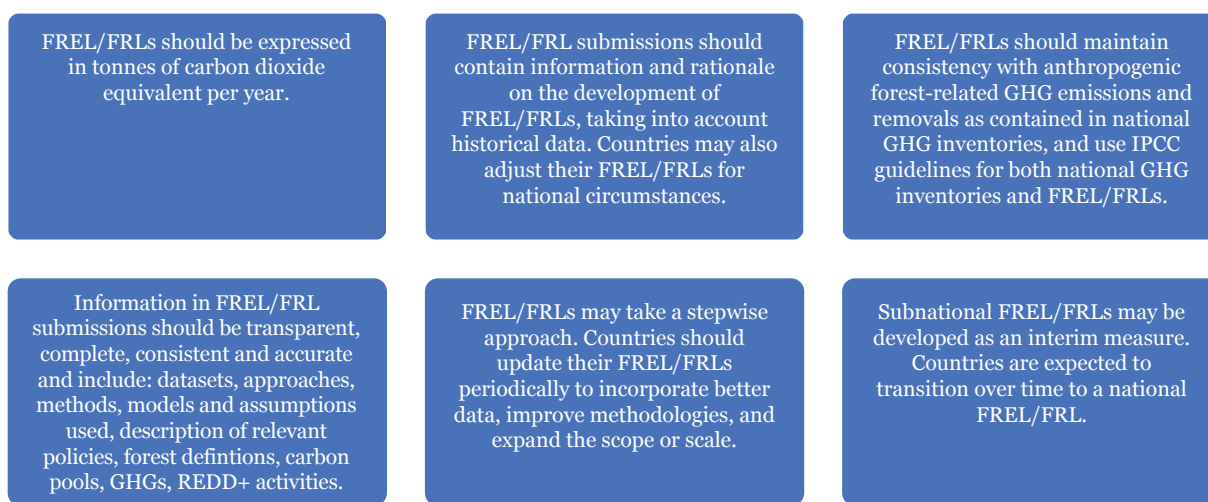


Figure 2: Summary of modalities for FREL/FRLs⁹.

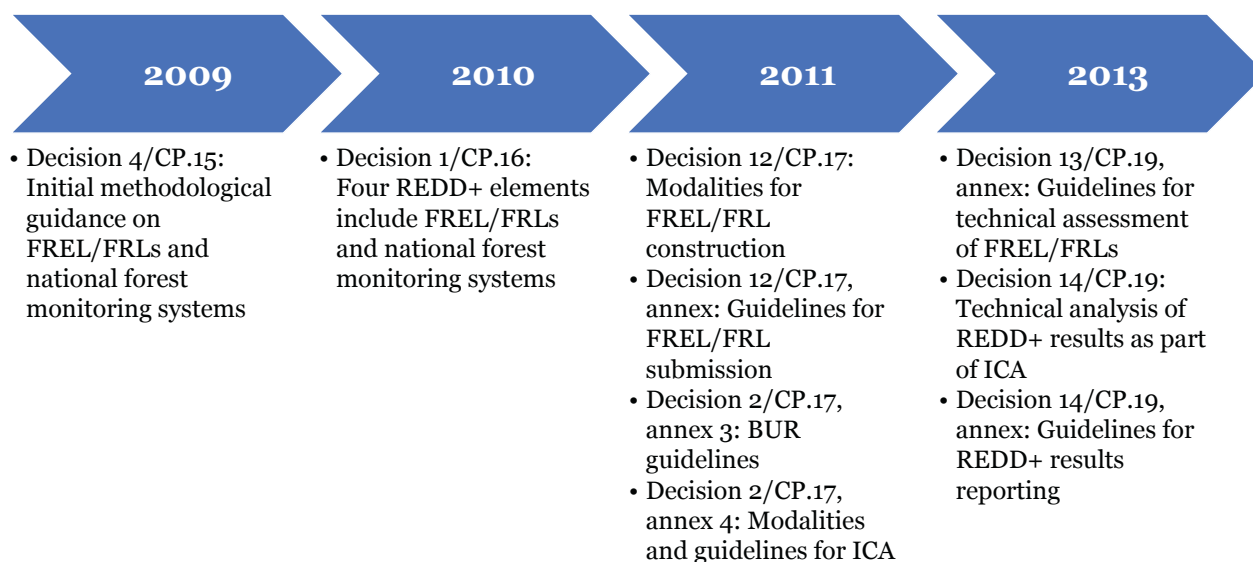


Figure 3: Chronological overview of UNFCCC decisions on issues related to REDD+ measurement, reporting and verification.

⁷ Decision 12/CP.17, annex

⁸ Available at: <http://redd.unfccc.int/>

⁹ Decision 12/CP.17

Guidelines and procedures for the technical assessment on proposed FREL/FRLs are provided in UNFCCC decisions¹⁰. Accordingly, the technical assessment addresses the data, methodologies and procedures for the construction of the FREL/FRLs following a set of modalities (Figure 4).

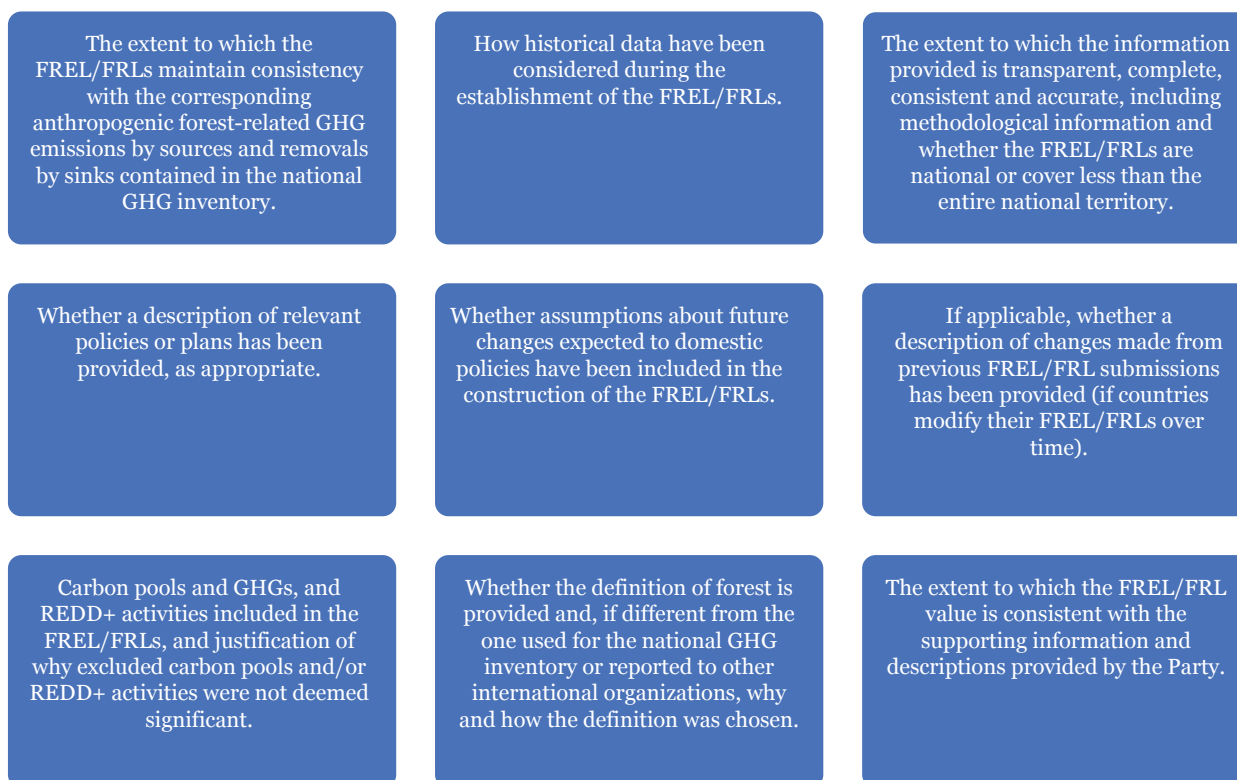


Figure 4: Key issues addressed in the technical assessment of FREL/FRLs¹¹.

2.3. Modalities for REDD+ results reporting and the technical analysis

Once its FREL/FRL has been technically assessed, a developing country can report on REDD+ results through a technical annex¹² to the BURs.

The REDD+ results annex should include the following:¹³

- summary information from the technical assessment report containing each assessed FREL/FRL: i) the assessed FREL/FRL expressed in tCO₂e/year, (ii) the REDD+ activities included in the FREL/FRL, (iii) the territorial forest area covered, (iv) the date of the FREL/FRL submission and date of the technical assessment report, and (v) the reference period (in years) of the assessed FREL/FRL;
- results in tCO₂e/year during the accounting period, consistent with the assessed FREL/FRL;
- demonstration that the methodologies used to produce the results are consistent with those used to establish the FREL/FRL;
- a description of the NFMS and the institutional roles and responsibilities for measuring, reporting and verifying the results;
- necessary information that allows for the reconstruction of the results;
- a description of how the elements in UNFCCC decision 4/CP.15, paragraph 1(c) and (d), have been taken into account, including use of the most recent Intergovernmental Panel on Climate Change (IPCC) guidance and guidelines, as adopted or encouraged by the Conference of the Parties (COP) as a basis for estimation¹⁴; establishment of NFMS that (i) uses a combination of remote sensing and ground-based

¹⁰ Decision 13/CP.19, annex

¹¹ Decision 13/CP.19, annex

¹² Decision 14/CP.19, paragraph 7

¹³ Decision 14/CP.19, annex

¹⁴ Decision 4/CP.15, paragraph 1(c)

inventory approaches; (ii) provides estimates that are transparent, consistent and accurate, and that reduce uncertainties; and (iii) is transparent and available for review¹⁵.

The BUR will be subject to International Consultation and Analysis (ICA)¹⁶. It consists of two steps: a technical analysis and a facilitative sharing of views. ICA is conducted by a technical team of experts under the auspices of the Subsidiary Body for Implementation and aims to increase the transparency of developing countries' mitigation actions and the effects of these.

The REDD+ results annex, if included in a technical annex to the BUR, is subject to technical analysis as part of the BUR's ICA¹⁷. To analyse the REDD+ results annex, the technical team of experts includes two experts in land use, land-use change and forestry (LULUCF), in addition to the experts already engaged in the BUR's technical analysis¹⁸. The REDD+ results annex is not covered by the ICA's facilitative sharing of views.

For countries that report REDD+ results, two separate reports are produced under the ICA process: the summary report on the technical analysis of the BUR, and the technical report on the technical analysis of the REDD+ results. Both reports are made publicly available on the UNFCCC website¹⁹.

The technical analysis of the REDD+ results annex covers the following elements²⁰: i) consistency between reported results and the assessed FREL/FRL in methodologies, definitions, scope and scale, and any other submitted information; and ii) completeness and transparency of information submitted in accordance with the list of information required, as well as its accuracy.

"The technical report on the REDD+ results annex, prepared by the LULUCF experts, will contain²¹: (a) the technical annex (i.e. REDD+ results reporting); (b) analysis of the technical annex; (c) areas for technical improvement identified; and (d) comments and/or responses by the relevant party, possibly including areas for further improvement and capacity-building needs."

2.4. Recent developments in international climate change mitigation policy

The Paris Agreement marks an important milestone for international climate change efforts. At the same time, more clarity is emerging on how the Green Climate Fund will provide results-based payments/finance for REDD+ and on the role of REDD+ results reporting. There are also additional modalities emerging with regard to finance for REDD+ results (and baselines against which payments are made), most notably under the Forest Carbon Partnership Facility's (FCPF) Carbon Fund and bilateral arrangements between donor governments and developing countries.

The Paris Agreement and REDD+

The Paris Agreement confirms the importance of REDD+ actions and recognizes the Warsaw Framework for REDD+²². It encourages countries to support REDD+, including through results-based payments/finance for REDD+ results and requires that all countries put forward Nationally Determined Contributions (NDCs). In the case of countries with significant forests or forest-related emissions, their intended NDCs (i.e. INDCs, submitted before agreement ratification) have mostly included mitigation in the forest sector and/or, in the case of developing countries, REDD+ actions²³.

15 Decision 4/CP.15, paragraph 1(d)

16 Decision 2/CP.17, annex IV

17 Decision 14/CP.19, paragraph 11

18 Decision 14/CP.19, paragraph 10

19 Available at: http://unfccc.int/national_reports/non-annex_i_natcom/reporting_on_climate_change/items/8722.php

20 Decision 14/CP.19, paragraph 11

21 Decision 14/CP.19, paragraph 14

22 The Warsaw Framework for REDD+ refers to the body of COP decisions on REDD+.

23 Forests were mentioned by 103 countries for mitigation and by 78 countries for adaptation in their INDCs.

The Paris Agreement also establishes a transparency framework. While the details are still to be negotiated, the agreement states that countries are to “regularly provide the following information:

- a national inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases, prepared using good practice methodologies proposed by the Intergovernmental Panel on Climate Change and agreed upon by the Conference of the Parties serving as the meeting of the Parties to this Agreement;
- information necessary to track progress made in implementing and achieving its nationally determined contribution under Article 4.”²⁴

The Green Climate Fund

It is expected that results-based payments/finance for results-based actions will come from a variety of sources – public and private, bilateral and multilateral^{25,26}. As well, UNFCCC decisions include references to market-based approaches for REDD+²⁷. Notably, the Green Climate Fund, as the official financial entity of the UNFCCC, plays an important role in REDD+ results-based payments/finance.²⁸ While the Green Climate Fund will apply the guidance encapsulated in the Warsaw Framework for REDD+ and related UNFCCC decisions^{29,30}, discussion continues on how it will operationalize results-based payments for REDD+.

FREL/FRL experience following guidance beyond that of the UNFCCC

An increasing number of countries are accessing results-based payments/finance for REDD+ results. The specific modalities for measuring results and accessing payments for those results may vary, depending on the financing instrument and those funding them.

Twenty-five countries have submitted FREL/FRLs to the UNFCCC, and 20 countries (including some of the same) have varying levels of experience in developing reference levels (or baselines) following methodological guidance beyond that of the UNFCCC – usually with the objective of accessing results-based payments/finance for REDD+ results (Table 2). These include both subnational and national reference levels for REDD+ results-based payments that: are nationally defined (Brazil); are agreed on between donors and recipient countries (Guyana, Colombia); or follow the guidance of the FCPF Carbon Fund Methodological Framework. In many cases, the reference levels developed for such results-based payments/finance are not the same as those submitted to the UNFCCC.

24 Paris Agreement, article 13, paragraph 7

25 Decision 9/CP.19, paragraph 1

26 The variety of other sources may be understood to potentially include a broad range of initiatives: e.g. KfW’s REDD+ Early Movers programme, the voluntary carbon markets and the Verified Carbon Standard, the FCPF Carbon Fund and the BioCarbon Fund, as well as other bilateral initiatives, such as those entered into between Norway and several forest-rich developing countries.

27 Decision 14/CP.19, paragraph 15

28 UNDP. 2016. *Towards a common understanding of REDD+ under the UNFCCC*. UN-REDD Programme.

29 Decision 14/CP.19

30 GCF B.80/80

Table 2: Timeline for countries collecting FREL/FRL experience in the context of bilateral agreements and the FCPF Carbon Fund.

2008	Brazil creates the Amazon Fund, including a methodology for its baseline
2009	Guyana and Norway joint concept note sets forth conditions for results-based payments, including an agreed baseline
2013	Carbon Fund pipeline: Costa Rica**
2014	Carbon Fund pipeline: Chile**, Republic of the Congo**, Ghana*, Mexico**, Nepal, Republic of the Congo*, Viet Nam*
2015	Carbon Fund pipeline: Guatemala, Indonesia, Peru Colombia, Germany, Norway and the United Kingdom of Great Britain and Northern Ireland joint concept note sets forth conditions for results-based payments, including an agreed baseline
2016	Carbon Fund pipeline: Côte d'Ivoire, Dominican Republic, Fiji, Lao People's Democratic Republic, Madagascar, Mozambique, Nicaragua

*Have submitted Emission Reduction-Program Documents (ER-PDs) to the FCPF Carbon Fund.

**The ER-PD has been selected into the Carbon Fund portfolio.

3. Technical assessment of Forest Reference (Emission) Levels

FREL/FRLs undergo technical assessments with agreed and defined objectives that include assessing the degree to which the FREL/FRL submission both follows UNFCCC guidelines and supports the capacity of developing countries to improve FREL/FRLs through technical exchange. The UNFCCC has stated that: “A stepwise approach to a national FREL/FRL may be useful, enabling Parties to improve the FREL/FRL by incorporating better data, improved methodologies and, where appropriate, additional pools”.³¹

By early 2017, nine countries had completed the technical assessment process, including a published technical assessment report. As part of this process, they provided a modified FREL/FRL submission. About half did not change the overall FREL/FRL emission estimate, but provided more information (e.g. Brazil³², Colombia, Guyana, Indonesia). Others modified the FREL/FRL emission estimate (e.g. Ecuador, Malaysia, Mexico). A further four countries were completing the technical assessment process from 2016 while an additional 11 FREL/FRL submissions were expected to undergo technical assessment in 2017.

In addition to commenting on specific technical issues (Section 4), the technical assessment report includes an overall conclusion on transparency, completeness and adherence to the guidelines contained in UNFCCC decision 12/CP.17. Of the nine FREL/FRLs that have been assessed, most were deemed transparent, complete and generally in accordance with the guidance. One was “partly transparent and partly complete”, and another was “mostly in accordance with the guidelines”.

It is not the objective of the technical assessment process to provide a summary judgment of the FREL/FRL submissions³³. The process chiefly presents an opportunity for developing countries to discuss their data and to get help in identifying areas for technical improvement. In this, the process is different from verification audits such as those for participation in carbon markets and reviews in the context of the FCPF Carbon Fund, which lead to recommendations for “acceptance”, “approval” or “endorsement” of reference levels or baselines.

Technical assessment reports list areas for improvement on specific technical issues. These may correspond to areas for improvement that countries had already identified in their FREL/FRL submissions, plus any additional areas for improvement identified by the assessment team. Sometimes assessment reports also discuss the consequences of countries’ methodological choices. For example, if only certain REDD+ activities are chosen, or if certain carbon pools or GHGs are excluded from estimation, the technical assessment may note whether this could lead to over- or under-estimations of net emissions and emission reductions.

Assessment teams suggest areas for improvement based on the UNFCCC guidance for FREL/FRLs and IPCC guidance and guidelines. Consistency in the assessment approach among the technical assessment teams is an important principle for any review process facilitated by the UNFCCC. For this reason, precedence from earlier reports plays a role in technical assessments.

In analysing the information used to develop FREL/FRLs, assessment teams often compare data with other sources of information, such as FAO’s Global Forest Resources Assessment (FRA), IPCC default values and

³¹ Decision 12/CP.17, paragraph 10

³² Brazil’s FREL values were updated, resulting in a <0.1 percent change which here is not considered as a modification of the FREL value in the initial submission.

³³ Decision 13/CP.19

other global products. Although such comparisons do not imply quality judgments of sources, cross-checking against other national and international datasets is a common practice of evaluation and can be useful in improving FREL/FRLs.

Technical assessment reports have referred to the need to reduce the displacement of emissions and to avoid the conversion of natural forests (Section 5.4). These issues are related to the Cancun safeguards³⁴. Reports have mentioned both displacement between REDD+ activities when only including one activity and geographical displacement when submitting a subnational FREL/FRL. One assessment report mentioned the requirement to ensure that REDD+ actions are not used for the conversion of natural forest.

³⁴ Decision 1/CP.16, appendix I

4. Update on Forest Reference (Emission) Level Submissions

By early 2017, 25 countries had submitted FREL/FRLs (Figure 5), and one of these countries had already produced two FREL/FRL submissions. These 26 submissions represent a wide range of circumstances – various geographic regions, low to high income, dry forests to humid tropical forests, and various stages of forest transition, from high deforestation countries to those now gaining forest cover.

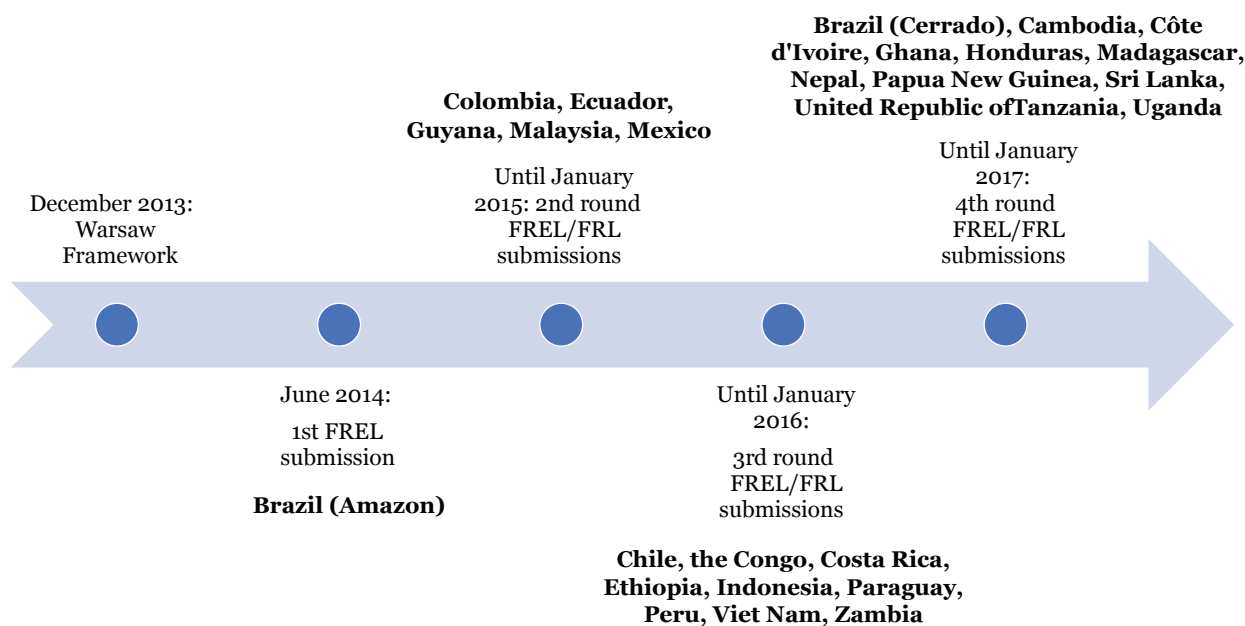


Figure 5: Timeline of FREL/FRL submissions to the UNFCCC.

To develop FREL/FRLs, countries must make methodological choices on issues such as: scale; scope; definitions; data selection and analysis; methods, approaches and tiers; FREL/FRL; construction approaches; and reference periods³⁵. This section summarizes some of the choices made and how the technical assessment teams responded.

4.1. Forest definition

Countries should provide the forest definition used for the construction of the FREL/FRL and explain whether it differs from that used in the national GHG inventory or in reporting to other international organizations (e.g. FAO's Global Forest Resource Assessment) (Figure 6). If applicable, an explanation should be provided of why a different definition is used and how this affects the estimates. The forest definition must be consistent between the FREL/FRL and REDD+ results reporting to ensure that changes detected in forest-area assessments over time reflect real changes³⁶. Additional guidance documents are available to support the national setting of definitions of forest and other wooded land^{37,38}.

35 FAO. 2015. *Technical considerations for Forest Reference Emission Level and/or Forest Reference Level construction for REDD+ under the UNFCCC*. Rome. (Available at: <http://www.fao.org/3/a-i4847e.pdf>)

36 FAO. 2015. *Technical considerations for Forest Reference Emission Level and/or Forest Reference Level construction for REDD+ under the UNFCCC*. UN-REDD Programme, Italy. (Available at: <http://www.fao.org/3/a-i4847e.pdf>)

37 FAO. 2006. *Choosing a forest definition for the Clean Development Mechanism*. Forest and Climate Change. Working Paper 4. Rome. (Available at: <http://www.fao.org/forestry/11280-03f2112412b94f8ca5f9797c7558e9bc.pdf>)

38 FAO. 2013. *National forest monitoring systems: monitoring and measurement, reporting and verification (M & MRV) in the context of REDD+ Activities*. Rome. (Available at: <http://www.fao.org/3/a-bc395e.pdf>)

Threshold parameters³⁹ used in national forest definitions may have an impact on the assessment of forest area and forest-area change. For instance, threshold parameters for forest land⁴⁰ include: minimum canopy cover⁴¹ (expressed in percentage); minimum tree height (expressed in metres); and minimum area (expressed in hectares). The choice of thresholds is often based on forest ecology, but may also be influenced by the type and quality of historical data available to construct FREL/FRLs⁴². Consistency in the thresholds chosen for national reporting (e.g. national forest inventories) and reporting at the international level (e.g. FAO's Global Forest Resources Assessments, UNFCCC reports) can make data more comparable.

Several countries have based their choice of forest definition on: the existing national definition (e.g. Malaysia, Viet Nam, Zambia); definitions used in previous reporting to the UNFCCC, such as that used in the Clean Development Mechanism (e.g. Costa Rica); or definitions used in national GHG inventories. Countries have provided various reasons for selecting the thresholds used in their forest definitions. The Congo has aligned its forest definition with other Congo Basin countries. Chile and Paraguay apply different canopy-cover thresholds, according to different climatological conditions. Ethiopia's choice of forest definition attempts to capture the natural state of the forest while excluding severely degraded areas. Beyond such forest-cover criteria, some countries also include a reference to land use in defining forest, for example including temporary destocked land as forest or excluding estate crops like oil palm from definitions (see Box 3).

No. of FREL/FRLs

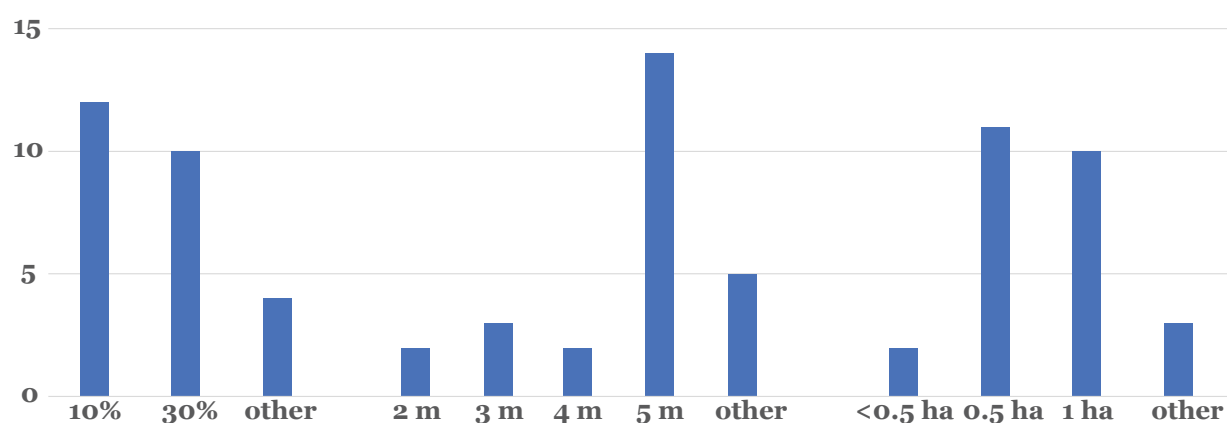


Figure 6: Threshold values for countries' forest definitions in FREL/FRLs.

When countries include areas with temporary forest-cover loss within the area deforested (often referred to as “gross deforestation”) the technical assessment has sometimes suggested applying a *land-use based forest definition rather than a land-cover based definition*, which is what the land category descriptions refer to in IPCC guidance (see Box 3). In several cases, the technical assessments also noted that a land-cover based assessment of deforestation may overestimate emission reductions associated with reducing deforestation.

39 Binary (young stands, temporarily unstocked areas, non-forest land uses, agroforestry) and thresholds (minimum area, minimum height, crown cover, temporary, stripwidth) parameters are used to define forest.

40 This IPCC category includes all land with woody vegetation consistent with thresholds used to define Forest Land in the national greenhouse gas inventory. It also includes systems with a vegetation structure that currently falls below, but in situ could potentially reach, the threshold values used by a country to define the Forest Land category.

41 The IPCC guidelines defines canopy cover as the percentage of the ground covered by a vertical projection of the outermost perimeter of the natural spread of the foliage of plants not to exceed 100 percent.

42 FAO. 2015. *Technical considerations for Forest Reference Emission Level and/or Forest reference Level construction for REDD+ under the UNFCCC*. Rome. (Available at: <http://www.fao.org/3/a-i4847e.pdf>.)

4.2. Scale

Developing countries wishing to participate in REDD+ are asked to develop, in accordance with their national circumstances, a national FREL/FRL or, if appropriate and as an interim measure, subnational FREL/FRLs. Most countries have developed national FREL/FRLs (Figure 7). The subnational FREL/FRLs follow administrative boundaries such as provinces, districts or certain biomes such as tropical rainforests.

In cases where countries have submitted subnational FREL/FRLs that cover regions of highest forest cover or highest level of emissions, the technical assessment reports have commented positively on these choices. Similar positive comments have been made when a country has revealed plans to transition over time to national FREL/FRLs. For most subnational submissions, the technical assessments implied an expectation that the country would provide information on potential *displacement of emissions*. Some technical assessment reports have also suggested, as an area for improvement, the *expansion of coverage*, or the monitoring of additional forested lands.

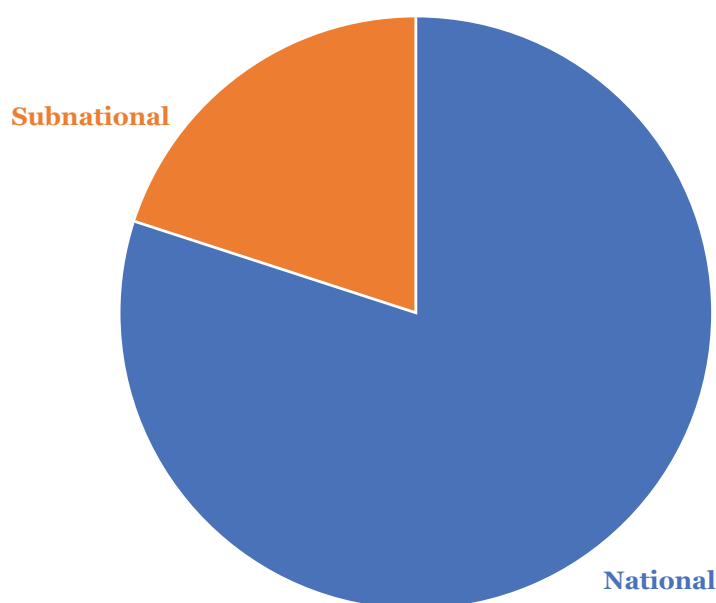


Figure 7: Scale chosen for countries' first FREL/FRL submissions.

4.3. Scope

Countries are required to indicate the REDD+ activities, carbon pools and GHGs included within the scope of their FREL/FRLs⁴³ (Table 3). Where possible, FREL/FRLs should not exclude significant REDD+ activities or carbon pools, and omissions must be justified. Countries may take a stepwise approach to developing FREL/FRLs and improve them over time by incorporating better data, improved methodologies and additional pools.

⁴³ Decision 12/CP.17 paragraph 10; decision 12/CP.17, annex, paragraph (c); decision 13/CP.19, annex, paragraph 2(f)

Table 3: REDD+ activities, carbon pools and GHGs for setting the scope of REDD+.

REDD+ activities	Carbon pools	Greenhouse gases
Reducing emissions from deforestation	Above-ground biomass	Carbon dioxide (CO ₂)
Reducing emissions from forest degradation	Below-ground biomass	Methane (CH ₄)
Conservation of forest carbon stocks	Deadwood	Nitrous oxide (N ₂ O)
Sustainable management of forests	Litter	
Enhancement of forest carbon stocks	Soil-organic carbon	

Scope of REDD+ activities

REDD+ activities (deforestation, forest degradation, etc.) are not firmly defined in UNFCCC decisions. Countries instead define these according to the IPCC guidelines and according to their national circumstances.

Most countries include deforestation in their FREL/FRLs, but many lack data on forest degradation and many choose not to include enhancement of forest carbon stocks (afforestation or reforestation) (Figure 8). To date, all participating countries, except one, have included deforestation. For those that have chosen deforestation, many have limited this to gross forest-cover loss (e.g. Brazil, Colombia, Ecuador, Zambia), not capturing (all) regrowth that occurred after land clearing (see Box 3). In nearly all cases, countries state that the REDD+ activities chosen represent the most significant emissions.

Unlike REDD+ activities, the land-use subcategories in national GHG inventories are well defined in the IPCC guidelines, and some countries relate these to each other, (e.g. matching “deforestation” to “forest land converted to uses other than forest land”). The definitions of REDD+ activities are a matter of national choice and therefore are not taken in a uniform manner across countries. In Chile, for example, net removals from forest land that remains forest land are labelled as “enhancement of forest carbon stocks” for most of the country; and as “conservation” if net removals are within areas subject to official processes of conservation. These definitions make sense in the national context; UNFCCC decisions, however, would not exclude different interpretations (e.g. summarizing all such net removals under just one REDD+ activity).

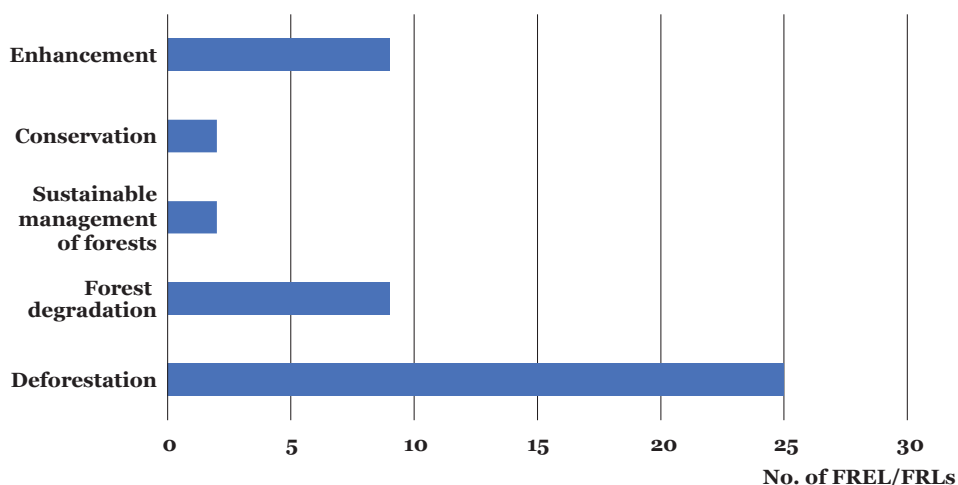


Figure 8: REDD+ activities chosen by countries in their first FREL/FRL submission.

Technical assessment reports address several issues related to the scope of REDD+ activities:

- Countries which include multiple REDD+ activities in their submission – especially deforestation and forest degradation – may be asked to ensure that the same emission is not captured under both activities and, as such, reported twice. For example, the assessment team requested clarification from Guyana on *potential double counting* of the activity data for deforestation and forest degradation in Guyana’s MRV system.
- In several cases when countries defined deforestation as gross forest-cover loss (e.g. Brazil and Colombia), the assessment team recommended *inclusion of regrowth* to avoid overestimating emissions from deforestation by counting temporary unstocking as deforestation without subtracting subsequent removals from regrowth.
- The assessment teams encourage the *inclusion of significant REDD+ activities* in future FREL/FRL submissions. In some cases, they have encouraged a country to include degradation in future submissions, using proxies or starting with analyses of degradation at subnational scales as an interim step towards estimating degradation at the national level.

Scope of carbon pools

Generally, above-ground biomass (AGB) and below-ground biomass (BGB) represent larger sources of emissions than the other carbon pools (with the exception of organic soils), and most countries include these carbon pools in their submitted FREL/FRLs (Figure 9). Many countries do not include litter (L), deadwood (DW), or soil organic carbon (SOC) due to data gaps or deficiencies. Omission of these carbon pools in the case of deforestation and forest degradation may be considered conservative in most cases, and litter is likely not significant for most tropical forest countries. SOC may be significant, but few countries have sufficient reliable data to include this carbon pool⁴⁴.

No. of FREL/FRLs

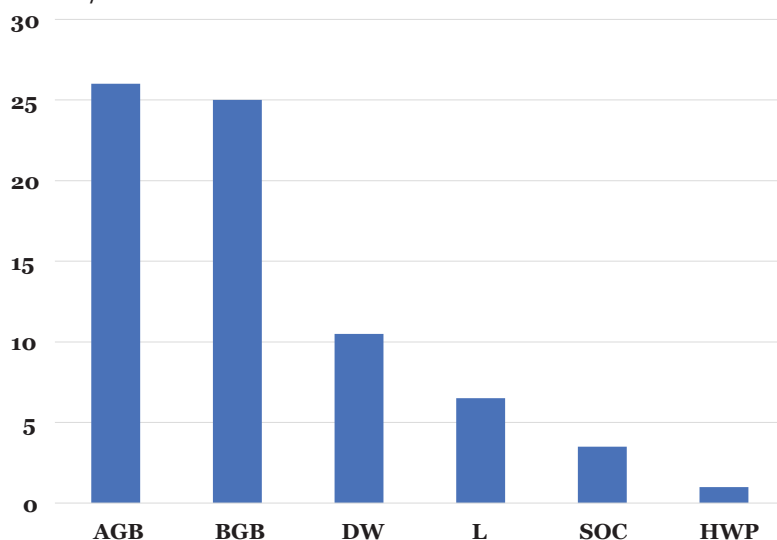


Figure 9: Scope of carbon pools chosen by countries for their FREL/FRL submissions.

In discussing countries’ *choice of carbon pools*, the assessment teams often consider the initial inclusion of only above-ground biomass and below-ground biomass to be part of a stepwise approach. In many instances, the technical assessment reports identify adequate justification of exclusion as an area for improvement and/or the collection of more information for future inclusion of the omitted carbon pools, particularly if these are thought to be significant.

⁴⁴ Unlike L and DW, which under tier 1 can be assumed to fully oxidize at the time of deforestation, emissions in SOC should be calculated considering SOC content in the replacing landuse and long-term dynamics after conversion.

Scope of GHGs

Emissions of N₂O and CH₄ can be a significant component of GHG fluxes from forests in the case of fire and where large areas of organic soils are drained. However, most countries have not included non-CO₂ GHG emissions due to lack of data (Figure 10). Few countries have included N₂O and CH₄ from fire, while others have provided information to demonstrate that such emissions are likely not significant. Generally, only countries with a monitoring system for forest fires have reported associated N₂O and CH₄ emissions.

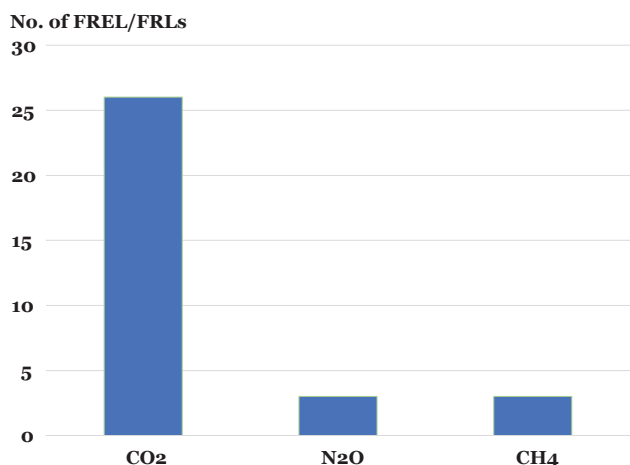


Figure 10: Scope of GHGs chosen by countries for their FREL/FRL submissions.

Similarly to the exclusion of carbon pools, in most cases the assessment teams indicated that countries' decisions to *limit the scope of the GHGs to CO₂* in their FREL/FRLs was “adequately justified” if a country provided information to show it was not significant or part of a stepwise approach. In some instances, the assessment team suggested the *treatment of non-CO₂ GHGs* as an area for future improvement, particularly if a country has included them in its national GHG inventory.

4.4. Data selection and analysis

Quantifying historical emissions for FREL/FRLs makes it necessary to draw on a variety of data sources. Most important are activity data and emission factors for deforestation and forest degradation since these are the most frequently included REDD+ activities and the most significant sources of forest-related emissions in many countries (Figure 11).

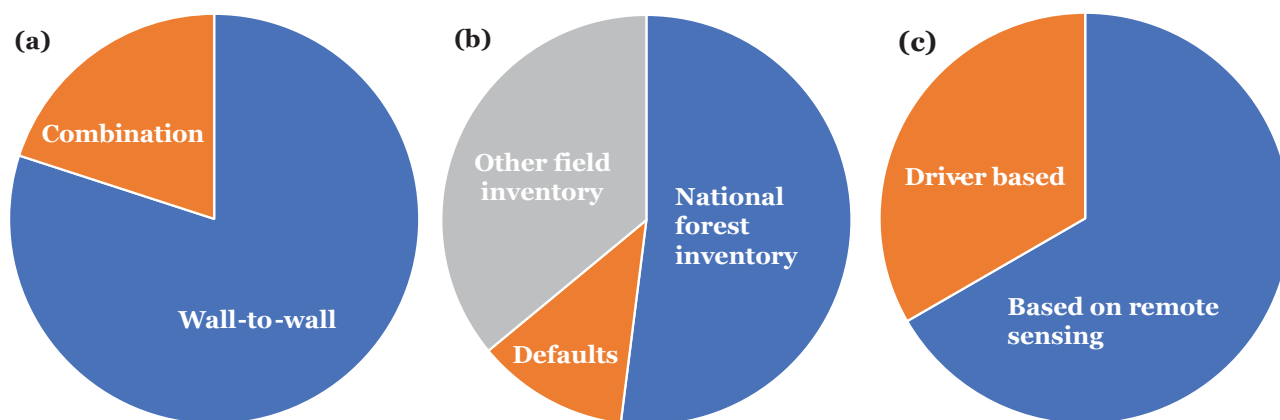


Figure 11: Main data sources used by countries for their FREL/FRL submissions: a) deforestation activity data, b) deforestation emission factors, c) forest degradation.

All countries that included deforestation in their FREL/FRLs have assessed *activity data for deforestation* using remote sensing data. There are two common approaches for collecting activity data: a mapping approach, and a sample-based approach. Some countries (Ethiopia, Paraguay, the Congo, Zambia) have used a combination of wall-to-wall maps and sampled point data where the sample points provided ancillary data using higher-resolution imagery and/or visual interpretation. This was used to correct for classification errors. In some cases, sample data have been collected and used for an accuracy assessment of the map classes without correcting the map estimates for errors (e.g. Guyana).

Emission factors for deforestation are usually derived from field inventory data. In most cases, such field inventory data are interpolated to deliver estimates of emission factors for locations where deforestation was detected. Several countries used field measurements from their national forest inventory (NFIs) (e.g. Ecuador, Ethiopia, Mexico, the Congo, Viet Nam, Zambia). In most cases, the NFI sample data were post-stratified into strata with homogeneous carbon content, such as forest types or ecozones. Countries without NFIs used interim field measurements (Colombia) or information from scientific literature (Brazil).

For measuring *activity data for forest degradation*, countries used either observation of canopy-cover changes from remote sensing or statistics on drivers (such as logging statistics) as proxy data. Guyana, Malaysia and the Congo used such information on commercial timber extraction. Chile, Indonesia and Viet Nam focused on changes in canopy-cover density, combining earth observation and field measurements. Unlike deforestation, there is no consensus among sector experts and scientists on the best practice for assessing forest degradation (see Box 1).

Box 1 Current approaches to forest land remaining as forest land

The measurement of emissions and removals in forest land remaining as forest land is challenging, and is associated with REDD+ activities related to forest degradation and sustainable management of forests. For example, in many countries logging (both conventional logging and reduced impact logging), fuelwood collection and fire should be considered as well as conservation, on occasion.

To quantify logging emissions consistent with IPCC guidance for forest land remaining as forest land, there are two basic approaches. Firstly, logging statistics can be used to quantify wood extraction and assumptions can be made on typically occurring collateral logging damage. Different kinds of logging damage factors can be used to distinguish conventional logging from reduced impact logging. Secondly, logging emissions can be quantified based on the observation of different carbon stock densities from remote sensing. There are limitations to both these approaches.

Concerning the use of remote sensing for activity data, deforestation detection can be quite straightforward (with the actual algorithms and data available); however, there is no single method to detect forest degradation using satellite imagery, even with high spatial resolution data.

Methodological choices depend on the type of degradation, available data, capacities and resources. Direct detection of degradation and related area changes focuses on forest-canopy damage. Features that are enhanced and extracted from satellite imagery are forest-canopy gaps, small clearings and structural forest changes resulting from disturbances. Indirect approaches focus on the spatial distribution and evolution of human infrastructure, which are used as proxies for newly degraded areas. With either of these, carbon-stock changes in standing forests are hard to detect and forest degradation can go unnoticed. Even if carbon-stock changes can be detected, separating transient carbon stock reductions from long-term forest changes is very difficult. Similarly, with currently available technologies, it is very hard to distinguish conventional logging from reduced impact logging, although this switch is of particular relevance in many countries' policy frameworks for REDD+.

Using logging statistics to estimate emissions from logging is not straightforward. Emissions during actual logging are (to some extent) offset by post-logging regrowth. To accurately estimate emissions from logging, the areas considered must be larger than the area being logged. Moreover, post-logging regrowth occurs over long timeframes. Any estimates need to factor in not only losses during the logging event itself, but also regrowth during post-logging recovery. Such an approach would reflect “net committed losses” that potentially occur only years after the logging event. The extent to which a forest is expected to regrow after logging is not easily estimated and the IPCC does not provide conclusive guidance for arriving at estimates for net logging losses¹.

Although logging is the most addressed topic in degradation activity, it is important to note that some countries have managed the issue of forest remaining as forest land with other activities as enhancement and conservation in their submissions (Section 4.3).

¹ The issue is irrelevant in the context of national GHG inventories because these relate to annual emissions. GHG inventories are conducted on an annual basis, and large losses from logging in individual years or sub-areas will be balanced by appropriately chosen regrowth factors that are to be applied over large areas and over the long timeframes of subsequent inventory years.

For *emission factors on forest degradation*, Guyana used field measurements of damage factors for logging gaps and wood transport (in combination with harvested volumes and length of skid trails). The Congo used damage factors from literature, applying a lower damage factor to timber volume harvested from certified concessions through reduced impact logging and a higher damage factor to conventionally harvested timber. Chile used two NFI cycles comparing the number of trees and basal area over time.

The technical assessments identified several recurring issues in the FREL/FRL submissions. For countries that did not apply the principle of *comparing images rather than maps* (e.g. Ecuador), the assessment teams identified this as an area for improvement. The use of an *NFI for improved ground data* and better statistical sampling of biomass was also indicated as an area for improvement by technical assessments. For some countries, when a REDD+ activity was only partially included (e.g. only forest degradation from timber extraction but not from other drivers), the technical assessment identified the need for the *estimation of emissions from other drivers of forest change* in addition to those included in the FREL/FRL submissions.

4.5. Uncertainty analysis

Several countries included uncertainty estimates in their submissions⁴⁵. Many countries have included information on the estimated error of activity data and emission factors in their FREL/FRL submissions and some countries have provided overall estimates of uncertainty on emission estimates (Figure 12). Dealing with uncertainties in estimating emissions can be a complex exercise, and errors can potentially be large (see Box 2). The methodologies used to estimate uncertainty do not always result in uncertainty estimates that are directly comparable. Also, sources of included uncertainties tend to be different; for example, many countries included only sampling errors for emission factors and not errors in allometric equations or errors in the below-ground biomass approximation using root-shoot default ratios. In fact, efforts to improve the uncertainty estimates by including more sources of errors may lead to increases in the uncertainty estimate.

Including (quantitative) uncertainty estimates was an area for improvement identified by many of the technical assessments, which noted that uncertainty estimates would enhance the transparency of FREL/FRLs. In many cases, *only partially complete uncertainty estimates* were identified. For example, when countries provide overall map accuracy, the assessment team in some instances indicated that the accuracy of land-use changes was more important than an accuracy assessment of the land-use classification.

⁴⁵ Decision 4/CP.15, paragraph 1(d)(ii) asks that Parties provide estimates that are transparent, consistent, accurate (as far as possible), and that reduce uncertainties, taking into account national capabilities and capacities.

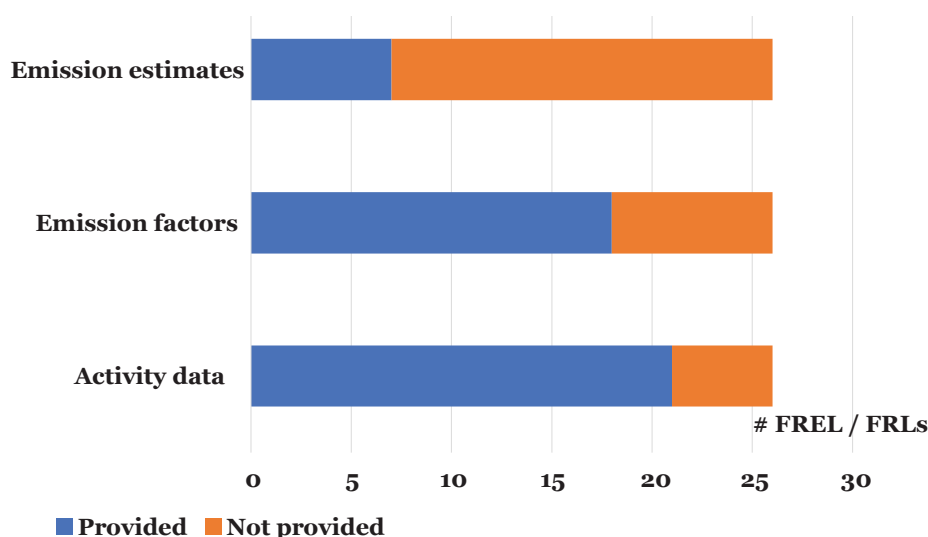


Figure 12: Uncertainty analysis of part of FREL/FRL submissions.

Box 2 Dealing with uncertainties

The issue of uncertainties is receiving increased attention in the context of REDD+ results reporting, as countries move closer to receiving results-based payments/finance. This triggers such questions as: How accurate are reported emission reductions from REDD+ activities? What are the largest sources of error? What are the implications of large uncertainties? What can be done to improve estimates?

The IPCC guidelines say that uncertainty analysis is an essential component of a complete GHG inventory. Such an analysis includes the identification and quantification of sources of error to prioritize future data collection and to support stepwise improvement.

Uncertainties related to emissions and removals from the LULUCF sector can be relatively large compared with uncertainties in other sectors. This is especially true in the first cycles of an inventory, when monitoring technologies and capabilities might be lacking. Large uncertainties can make it difficult to assess performance in implementing REDD+ activities, because in certain cases uncertainties may be greater than the emission reductions themselves (Figure 13).

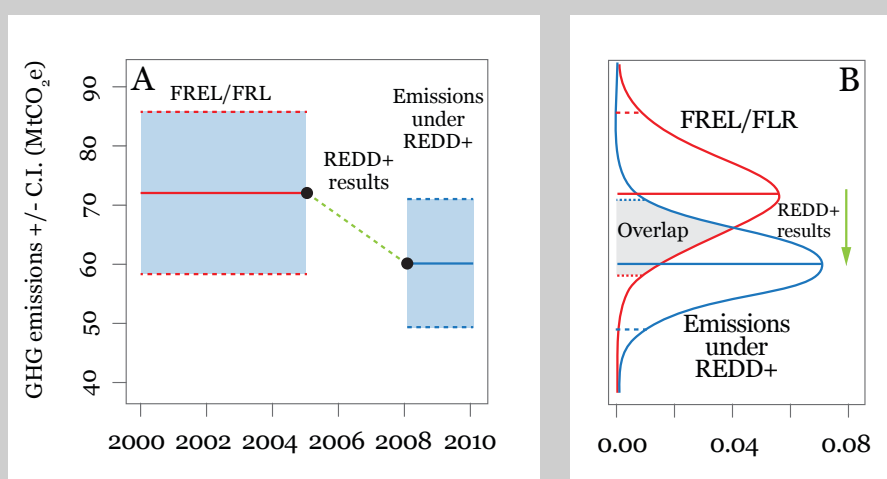


Figure 13: Hypothetical case where a country presents high uncertainties in the reference period for the FREL/FRL (red line, 2000–2005), and for REDD+ results reporting (2008–2010). If the FREL/FRL was set at 72 MtCO₂e/year, the REDD+ results during the accounting period of 2008–2010 would be 72–60 = 12 MtCO₂e/year. Uncertainties amount to ±14 and ±12 MtCO₂e/year, respectively. Since the error bars overlap, confidence is low that the emission reductions are significantly different from zero.

UNFCCC decisions state that the technical assessment of FREL/FRLs should assess the extent to which the information provided is accurate¹; similarly, the technical analysis of results also includes an analysis of the extent to which data and information are accurate². UNFCCC decisions also say that countries should use the most recent IPCC guidelines, which state that inventories consistent with good practice are “those which contain neither over- nor under-estimates so far as can be judged, and in which uncertainties are reduced as far as practicable”³.

The UNFCCC does not specify the implications of potentially large errors in estimating emission reductions from REDD+ activities on results-based payments/finance. Existing sources of finance that pay for REDD+ results often rely on accounting approaches for managing large uncertainties. Notably, these include discounting (i.e. lowering the quantity of) emission reductions using the conservativeness principle, such as in the Kyoto Protocol’s Clean Development Mechanism and the FCPF Carbon Fund. The principle of conservativeness encourages the use of reliable minimum estimates, for example, by only considering emission reductions where uncertainties do not overlap between the reference (or baseline) and estimates during the accounting period; by applying a “conservativeness factor” that discounts the results-based on the level of uncertainty; or by allowing the exclusion of carbon pools, REDD+ activities, or GHGs where their omission underestimates results.

The continuous improvement of estimation approaches should include an uncertainty analysis as its point of departure to prioritize future data collection efforts. To date, most FREL/FRL submissions and REDD+ results annexes do not quantify overall uncertainties in estimations.

1 Decision 13/CP.19, annex, paragraph 2(c)

2 Decision 14/CP.19

3 IPCC 2006 Guidelines for National GHG Inventories, Chapter 1 (Introduction to the 2006 Guidelines), Section 1.2.

4.6. Construction approaches and adjustments

The majority of countries choose a simple historical average as the construction approach for their FREL/FRLs (Figure 14). Few countries submitted linear projections of historical change data or made adjustments to their FREL/FRLs (one country used an adjustment for one REDD+ activity but used a simple historical average for others). Colombia proposed an upwards adjustment of historical average emissions by 10 percent with a justification that a successful peace process would bring new economic activity to the Amazon region. Guyana’s FREL used what it called a “*combined approach*” which calculates a midway point between the national historical rate of forest-related emissions and a global rate of tropical country forest-related emissions (from scientific literature). The Congo proposed an adjustment based on government development plans for envisioned macro-agricultural concessions that are expected to be given out. Viet Nam proposed an adjustment based on historical removals, with the justification that a 5 million hectare afforestation government programme had come to an end.

The assessment teams generally do not provide feedback on the construction approaches used to develop FREL/FRLs as this is not included in the agreed scope of the assessment. Among those countries that made an adjustment, two have gone through the technical assessment process, and the subsequent assessment report suggested that the countries should provide *robust information on the relationship between national circumstances and the quantified adjustment* to the FREL/FRL. For example, concerning Colombia’s post-conflict adjustment, the technical assessment report stated that there was “some evidence of positive correlation between increased GDP growth and increased deforestation rate”. But it also noted that Colombia’s deforestation trend had remained constant from 2000–2012 – despite a 65 percent increase in national GDP – and suggested that a future FREL/FRL submission should review the need and magnitude of an adjustment based on “the rate at which conditions change following cessation of conflict”. Further, the assessment suggested that this should be again reviewed as part of the technical assessment process. It also stated that the application of the adjustment for the current FREL would only apply if a peace agreement was

reached. Concerning Guyana’s combined approach adjustment, the assessment team stated “there should be more clarity as to how the average deforestation emissions of developing countries as a whole are related to Guyana’s future emissions” and that, in future FREL/FRL submissions, “a clearer link should be made to national circumstances”.

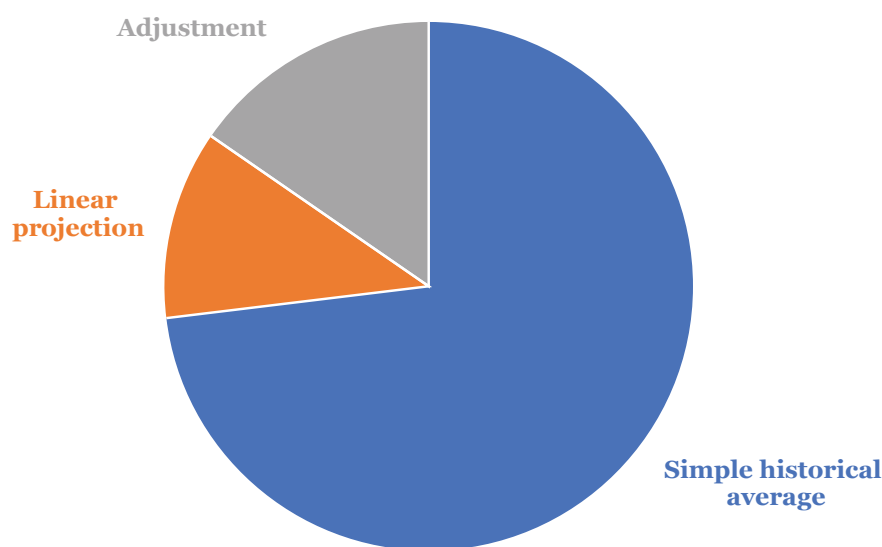


Figure 14: FREL/FRL construction approaches chosen by countries in their first submissions.

4.7. Reference periods

The length of the reference period varies widely: from eight to 22 years (Figure 15). In some instances, countries also specify accounting periods for REDD+ results. Different reasons underlie the choice of the reference period for FREL/FRLs. Some countries, especially those participating in the FCPF Carbon Fund, follow existing guidance from its Methodological Framework⁴⁶ to be consistent with their subnational FREL/FRLs (e.g. the Congo)⁴⁷. Brazil and Ecuador have chosen an end-point for the reference period that coincides with the point when they consider REDD+ implementation to have started in their countries; for example, Ecuador’s reference period ends in 2008 since that year corresponds with a constitutional change marking the starting point for implementation of a new forest policy.

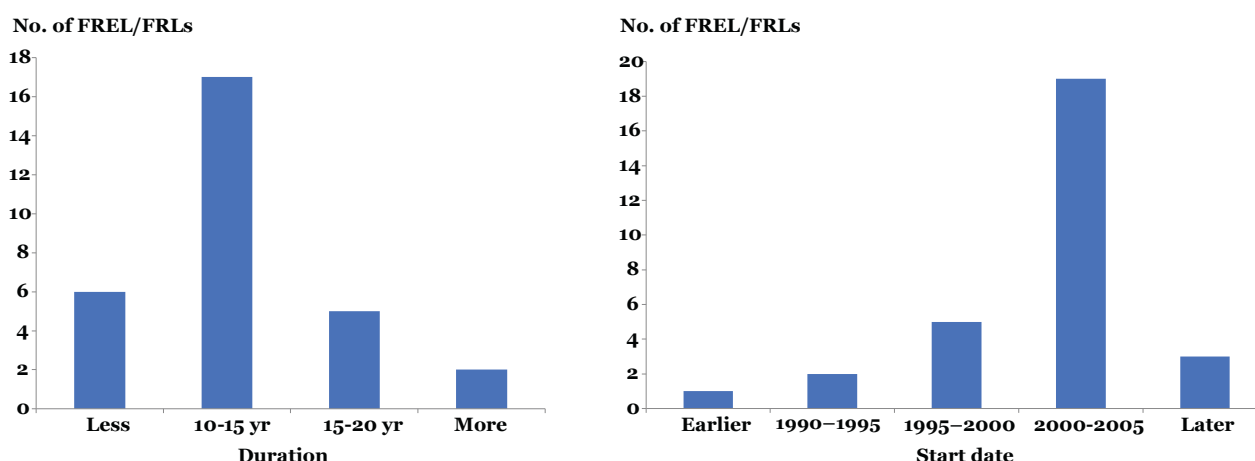


Figure 15: Duration (left) and start date (right) of reference periods chosen by countries for their FREL/FRL submissions.

⁴⁶ FCPF. 2013. *Carbon Fund methodological framework*. Forest Carbon Partnership Facility, World Bank. Washington, DC. (Available at: <https://www.forestcarbonpartnership.org/carbon-fund-methodological-framework>.)

⁴⁷ Different from UNFCCC guidance on REDD+, the FCPF methodological framework includes several indicators with specific guidance on the setting of the reference period that leave little flexibility.

Countries have also chosen reference periods based on data availability. For this reason, the reference period may differ between REDD+ activities; for example, Chile has a longer time series available for deforestation than for degradation.

As with other accounting issues, the applicable UNFCCC decisions for technical assessments do not address the choice of reference periods⁴⁸. As such, the assessment teams have not raised any issues on the choices countries made as to reference periods, the length of accounting periods, or the choice of time period for recalculations. The exception is Malaysia, which was advised to change its choice of time period (starting in 1992 instead of 1990) to ensure consistency in management practices applied in the reference period. These were established under the revised national forestry policy.

Box 3: Using the IPCC guidelines for REDD+ reporting

The information provided in REDD+ results annexes and included in the FREL/FRL submissions “should be guided by the most recent IPCC guidance and guidelines, as adopted or encouraged by the COP, as appropriate”^{1,2}. Growing country experience with the technical assessment of FREL/FRL submissions and the technical analysis of REDD+ results strongly reinforced the importance of using the IPCC guidelines. The key methodological references for the estimation of forest-related emissions and removals are the IPCC guidelines; the relevant UNFCCC decisions and the IPCC guidance and guidelines together guide the assessment and analysis. Furthermore, countries are required to provide, in the REDD+ results annex, a description of how IPCC guidance has been taken into account³.

Despite this, there are limitations to the use of the IPCC guidelines for establishing FREL/FRLs and calculating REDD+ results. IPCC guidance and guidelines are developed specifically for the purposes of national GHG inventory reporting and, in this regard, they provide advice on estimating emissions and removals in all sectors. But, they are not meant to provide guidance on accounting issues⁴, such as the construction approaches for FREL/FRLs, or approaches for the management of displacement and reversals. Moreover, in practice, developing countries sometimes find it challenging to follow IPCC guidance on complex issues. For example, not all FREL/FRLs include complete uncertainty assessments (Section 4.5 and see Box 2) or apply land-use based definitions (Section 4.1). To facilitate, the Global Forest Observations Initiative has put forward further REDD+ specific advice in its Methods and Guidance Documentation⁵.

The TACCC criteria

The IPCC guidelines define a set of procedures designed to ensure the quality of all steps of GHG inventory compilation. The guidelines aim for estimates that are transparent, accurate, comparable, consistent and complete (TACCC). Regarding reporting aspects, four of these five criteria are also mentioned in UNFCCC decisions on FREL/FRLs and REDD+ results reporting (transparency, accuracy, consistency and completeness). However, completeness is defined differently by the UNFCCC. For national GHG inventories, completeness means that “estimates are reported for all relevant categories of sources and sinks, and gases”⁶. For REDD+, the concept of completeness is defined as: “the provision of information that allows for the reconstruction of forest reference emission levels and/or forest reference levels”⁷.

Comparability is not among the criteria guiding FREL/FRLs and REDD+ results reporting. For national GHG inventories, comparability means that “the national greenhouse gas inventory is reported in a way that allows it to be compared with national greenhouse gas inventories for other countries. This comparability should be reflected in appropriate choice of key categories (...), and in the use of the reporting guidance and tables ...”⁸. But for REDD+, countries follow a stepwise approach to building their national forest monitoring systems.

1 Decision 14/CP.19

2 Decision 12/CP.17, annex

3 Decision 14/CP.19 annex, paragraph 6

4 The exception is guidance provided for countries with obligations under the Kyoto Protocol.

5 Global Forest Observations Initiative. 2016. Methods and Guidance Documentation. (Available at: www.gfoi.org)

6 IPCC 2006 guidelines for national GHG inventories.

7 Decision 12/CP.17 and decision 13/CP.19

8 IPCC 2006 guidelines for national GHG inventories.

Estimates of full and abrupt carbon-stock losses during deforestation

In the REDD+ context, it is common to apply a set of IPCC tier 1 methods for estimating emissions from deforestation that assume full and abrupt carbon-stock losses⁹. These assume that land-use conversion results in the instantaneous emission to the atmosphere of all carbon contained in biomass, and no carbon from living biomass is added to the deadwood and litter carbon pools¹⁰.

More advanced IPCC tier 2 and 3 methodologies introduce higher methodological complexity to better capture the carbon fluxes. These apportion carbon losses to decay processes for the carbon pools and rely on the use of decay functions. Although closer to the reality of the ecological systems, tracking biomass decay over time has the effect of delaying the associated emissions.

Estimates that neglect regrowth after deforestation

IPCC tier 1 assumptions commonly applied in a REDD+ context also relate to zero-carbon stocks after conversion. It is not only assumed that vegetation is removed entirely and immediately (as above) but also that no biomass grows back in the post-conversion land-use system¹¹. This IPCC tier 1 assumption is valid for most carbon pools except SOC and for post-conversion systems with annual crops but not for systems with woody vegetation (e.g. perennial crops, shrub lands, agroforestry systems, shifting cultivation)¹².

More advanced IPCC tier 2 and 3 methodologies require calculating post-conversion growth, even for annual crops. Doing so yields lower emission estimates than applying simplified tier 1 estimates and more accurately reflects the emissions associated with deforestation activities.

Definitions based on land cover instead of land use

The IPCC guidelines rely on land-use-based definitions of GHG inventory categories. In a REDD+ context, countries have used either land cover (often as a proxy for land use) or land use to track REDD+ activities. Using land cover in lieu of land use can generate incorrect results, for example when temporary unstocking for plantation renewal is confused with deforestation or when fallow phases in shifting cultivation are taken for reforestation.

Since many countries rely on satellite images to develop activity data, measuring land-cover changes is a more immediate data product than measuring changes in land use, which requires additional data and further analytical steps. Measuring regrowth using remote sensing methods is technically demanding. Despite technical difficulties, separating land-cover changes from land-use changes is required to be fully consistent with IPCC guidance.

The issue of “gross deforestation”

A number of FREL/FRLs for deforestation are based on estimates of gross forest-cover loss, referring to resulting estimates as “gross deforestation”. Typically, these estimates do not fully separate land-cover changes from land-use changes, reflect abrupt carbon stock losses, and neglect regrowth after deforestation.

There are several problems with this. These estimates typically assume that any forest-cover loss is permanent and therefore assume transient changes in forest cover to be deforestation, which can lead to overestimating deforestation area¹³. Also, these estimates typically exclude carbon gains from forest regrowth or other types of regrowth (e.g. the resulting cropland or grassland after conversion), leading to overestimation of emissions.

Countries that only account for such gross deforestation in their FREL/FRLs for the most part suggest that, in line with a stepwise approach, they intend to broaden the scope and eventually include regrowth to arrive at more solid data on deforestation emissions, which would then be in line with the national GHG inventory.

9 IPCC 2006 guidelines for national GHG inventories. (Available at: www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_05_Ch5_Cropland.pdf#page=26)

10 Very few countries include harvested wood products in their estimations (and assume full and instantaneous oxidation of timber that may, in fact, be converted to harvested wood products).

11 IPCC 2006 guidelines for national GHG inventories. (Available at: http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_05_Ch5_Cropland.pdf#page=26)

12 Some FREL/FRLs also apply this assumption to the case of post-conversion land-use systems with woody vegetation, which is not supported by the IPCC guidelines.

13 The degree of overestimation of deforestation areas may depend on the frequency of land-cover measurements. In some countries, land-cover inventories are conducted over longer periods of 8–10 years where fluctuations have less impact on observed trends. Some of the detected forests may include vegetation that had been temporarily unstocked and already grown back during the assessment period.

5. Initial country experiences on REDD+ results reporting

Brazil⁴⁹, Colombia⁵⁰, Malaysia⁵¹ and Ecuador⁵² were the first four countries to submit REDD+ results (Figure 16). To date, the technical analysis of REDD+ results has been completed only for Brazil. The analysis often refers back to the corresponding FREL/FRL and its technical assessment as this is the basis for REDD+ results reporting.

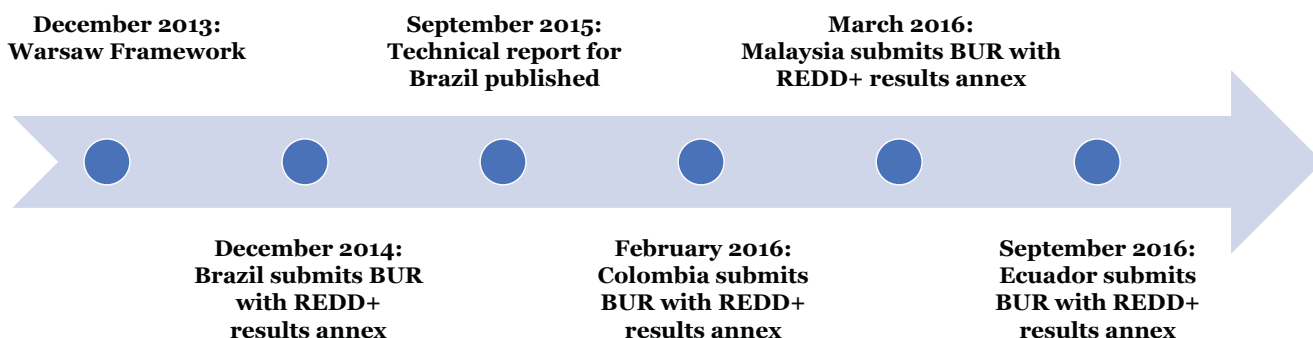


Figure 16: Timeline of REDD+ results reporting to the UNFCCC.

5.1. Objective of REDD+ results reporting

All countries state that the submission of FREL/FRLs and REDD+ results annexes are voluntary and for the purpose of obtaining and receiving results-based payments/finance. Some countries state additional purposes for their FREL/FRL submissions, such as “to build capacity and to have a facilitative exchange with technical LULUCF experts” or “to measure the impacts of policies and measures for domestic purposes”. Few countries link their REDD+ results directly to the implementation of domestic policies as there is no such requirement under the UNFCCC. Also, the submissions often state they do not prejudice any NDC that countries could propose.

5.2. Construction approaches and REDD+ results

The REDD+ activities for which results have been submitted are deforestation (Brazil, Colombia, Ecuador) and the sustainable management of forests (Malaysia).

All four countries that submitted a REDD+ results annex have proposed a simple historical average of forest-related emissions (and removals, in Malaysia’s case), with one country (Colombia) including an adjustment of 10 percent. Two countries have also proposed FREL/FRLs in their initial FREL/FRL submission for subsequent accounting periods. The method chosen to update FREL/FRLs for a second accounting period differs between these two countries. Brazil proposes a “dynamic mean” where the second FREL is calculated by extending the reference period by five years but always calculating back to the same start year (1996 in this case). Malaysia has instead proposed a “rolling average” for updating its FRL. The FRL is recalculated every five years while the length of the reference period remains the same, meaning the start date of the FRL is moved forward in time by five years (Figure 17).

49 <http://unfccc.int/resource/docs/2015/tatr/eng/bra.pdf>.

50 http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/colombia_technical_annex.pdf

51 <http://unfccc.int/resource/docs/natc/malbur1.pdf>

52 <http://unfccc.int/resource/docs/natc/ecubur1.pdf>

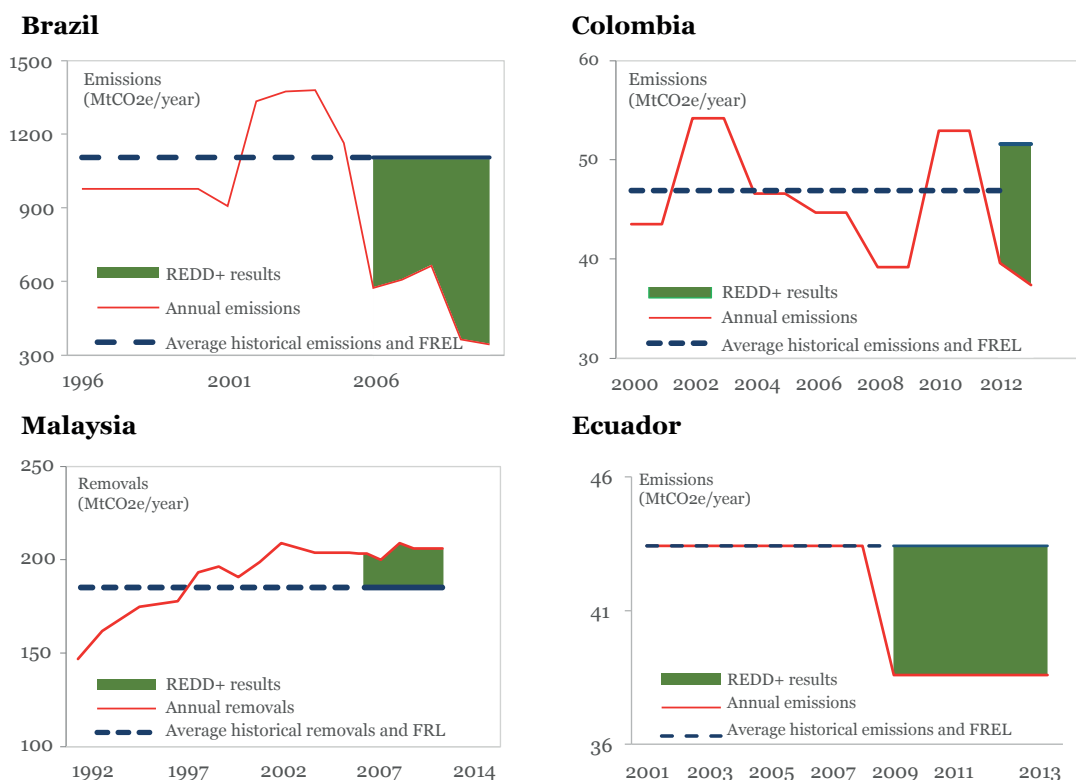


Figure 17: REDD+ FREL/FRLs and REDD+ results for four countries. (Charts are based on a recalculation of information included in the submissions.)

The four countries which to date have submitted REDD+ results annexes, have all used different reference periods (Section 4.7) and accounting periods. Brazil and Malaysia report results from as early as 2006, while Colombia proposes a more recent date (2013). The length of the accounting periods also vary greatly, from two to six years (Table 4).

Table 4: Details on REDD+ results for Brazil, Colombia, Malaysia and Ecuador.

	Brazil	Colombia	Malaysia	Ecuador
Cumulative REDD+ results (MtCO₂e)	2 971	26	97	29
First accounting period	2006–2010	2013–2014	2006–2010	2009–2014
Duration of first accounting period	5 years	2 years	5 years	6 years
Annual REDD+ results (MtCO₂e/year)	594	14	19	4.8
FREL/FRL (MtCO₂e/year)	1 106	51	-183	43
Area (million ha)	419.7	45.9	12.3–13.0	24.9

So far, Brazil has reported the greatest amount of REDD+ results, much larger than those reported by Colombia, Ecuador and Malaysia. The area covered by Brazil’s FREL (Amazonia biome) is also many times larger than the area covered by the other FREL/FRLs (Table 4).

Two countries (Brazil and Malaysia) have included two accounting periods in their FREL/FRLs (Section 5.2), but both report results for the first accounting period only.

5.3. Technical analysis and areas for improvement

Plans for improvement are a key to promote learning and continuous advancement through exchanges with international experts from other countries. The technical analyses (as well as the technical assessment of FREL/FRLs) identify areas for improvement. They are guided by UNFCCC decisions and the applicable IPCC guidance.

As of May 2017, only Brazil's technical report on the technical analysis of the REDD+ results annex has been published⁵³. The report concludes that the same areas for technical improvement identified in the technical assessment of Brazil's FREL apply to the provision of information on the REDD+ results. The areas for improvement include supplementing the emission factors with data from the first NFI (already indicated by Brazil itself as an area for improvement), expanding the scope (carbon pools, non-CO₂ GHGs, continued monitoring of forest degradation) and covering additional biomes (already named by Brazil as an area planned for improvement).

5.4. Information related to safeguards

The Cancun safeguards⁵⁴ are not part of FREL/FRLs, REDD+ results reporting or of the technical assessments and analyses. Nonetheless, several issues related to safeguards have arisen in these reports; specifically, the UNFCCC decisions include reference to the displacement of emissions⁵⁵ and to natural forests⁵⁶.

As well as including the definition of forest used in the construction of FREL/FRLs, many countries in their UNFCCC submissions also specifically define what they consider to be natural forests in the REDD+ context.

For example, Ecuador justifies its decision to calculate historical emissions associated with the conversion of natural forest to forest plantations “in order to avoid the creation of incentives for [such] conversion”, although it “only happened occasionally in the historical reference period”. Chile has assigned exotic species plantations with a carbon stock of zero – despite their potential to have a carbon stock higher than “native forests” – “with the objective of safeguarding non-carbon benefits in native forests”.

The *displacement of emissions* can be either the geographical displacement of emissions (e.g. from one province to another, not monitored in a subnational FREL/FRL), or the displacement of emissions among REDD+ activities (e.g. toward an activity not included in the FREL/FRL). In the former case, displacement might be understood, for example, as emissions reductions being achieved in one forest area, but emissions increasing in another forest area as a result. In the latter, displacement might occur if a country only includes deforestation in its FREL and reduces deforestation (in the reporting period), but as a result forest degradation (which is not counted) has increased.

The technical assessment report of Ecuador's FREL/FRL suggested that it provide information to “facilitate understanding of the relationship between deforestation and degradation (including any risk of displacement of emissions among activities)”. And Brazil's first technical assessment report noted that for the accounting period “the forest monitoring system in place did not allow Brazil to fully estimate possible displacement of emissions at the national level”. The technical experts accordingly looked at available information from other sources, such as harvest data from FAO and the Brazilian Forest Service website, and noted that thus far there is no evidence of displacement of emissions. Brazil also explained that it could use various monitoring systems to provide information on possible displacement inside and outside the Amazon region for the accounting period.

⁵³ The technical report is available at: <http://unfccc.int/resource/docs/2015/tatr/eng/bra.pdf>

⁵⁴ Decision 1/CP.16, annex

⁵⁵ Decision 1/CP.16, paragraph 71(c), footnote 7

⁵⁶ Decision 11/CP.19, paragraph 4(b)

5.5. Consistency with the national GHG inventory

The modalities for FREL/FRLs and REDD+ results reporting contained in various UNFCCC decisions require countries to ensure consistency with national GHG inventories to the extent possible^{57,58}. In practical terms, maintaining consistency between FREL/FRLs and REDD+ results reporting and national GHG inventories is not straightforward. Possible discrepancies may exist in terms of scope and scale, methodology and definitions.

For example, in terms of scope, national GHG inventories should report on all “key categories”⁵⁹, but FREL/FRLs have a narrower scope, focusing only on a subset of land-use-related emissions (i.e. the five REDD+ activities). Moreover, because most countries submit FREL/FRLs in the context of results-based payments, there is also concern about the relative accuracy of emissions (and removals) estimates. For this reason, many countries include a narrower scope of REDD+ activities, carbon pools and GHGs in their FREL/FRL submissions compared with national GHG inventories, often citing a lack of good data.

For measuring activity data, emission factors and emissions in a consistent way, countries should rely on an NFMS that could underlie reporting in several contexts. For example, the first available technical report noted that “overall, Brazil’s FREL maintains consistency, in terms of sources for the activity data and emission factors, with the GHG inventory included in Brazil’s second national communication”.

The technical assessment and technical analysis reports include sections on whether the information provided in the FREL/FRL submission and REDD+ results annex is consistent with the information provided in the national GHG inventory (through the NC or the BUR).

5.6. Relation between Forest Reference (Emission) levels and REDD+ results annexes

For the four REDD+ results submissions, the scale, scope, definitions and datasets used are the same as those in the technically assessed FREL/FRLs, as mandated by the UNFCCC⁶⁰, and the REDD+ results annex should demonstrate this consistency. The technical analysis addresses, among other things, the level of consistency in methodologies, definitions, comprehensiveness and information provided with the latest technically assessed FREL/FRL⁶¹.

With this, using different methodologies or data for estimating the FREL/FRL and REDD+ results is unlikely to be found acceptable because it could introduce potentially large inconsistencies. There are many examples of how the use of different methodological approaches can yield widely varying results that may not easily be reconciled⁶².

Generally, countries are encouraged to improve data and methodologies over time, in line with the stepwise approach. In doing so, consistency between the FREL/FRL and REDD+ results reporting must be maintained⁶³. If the FREL/FRL is already established when better data and methodologies become available, the FREL/FRL should be recalculated and updated before it is compared with emissions and removals during the (future) accounting period to generate REDD+ results-based on such improved data and methodologies⁶⁴.

57 Decision 12/CP.17, paragraph 8

58 Decision 14/CP.19, paragraph 5, paragraph 11, annex

59 A category that is prioritized within the national GHG inventory because it has a significant influence on absolute level, the trend, or the uncertainty in emissions and removals.

60 Decision 14/CP.19, paragraph 3 and annex, paragraph 2

61 Decision 14/CP.19, annex

62 For example, Global Forest Watch Climate (available at: <http://climate.globalforestwatch.org/>) compares forest-related emissions from independent data sources to national reports; such difference are further explained in the working paper “GHG fluxes from forests: an assessment of national reporting and independent science in the context of the Paris Agreement” (Available at: www.climateandlandusealliance.org/reports/ghg-fluxes-from-forests)

63 Decision 14/CP.19, annex

64 IPCC 2006 guidelines on recalculations of emissions and removals to ensure consistency.

6. Conclusions

The Paris Agreement on climate change creates a new context for mitigation as REDD+ matures from capacity development to producing results. The Paris Agreement entered into force on 4 November 2016. REDD+ is enshrined in its Article 5, but also in the call for all countries to include significant emissions in their NDCs, sending a strong political signal to mobilize action in the forest sector. At the same time, Brazil, Colombia, Ecuador and Malaysia have submitted REDD+ results to the UNFCCC, and several other countries are pursuing results-based finance through the FCPF Carbon Fund, which will begin this year to negotiate its first Emission Reduction Program Agreements (ERPAs). In addition, the Green Climate Fund (GCF) has begun selecting its first REDD+ investments and is developing a request for proposals for REDD+ results-based payments.

Countries have made progress on the MRV of REDD+ activities. The MRV of REDD+ is maturing as more countries report and undergo technical assessment and analysis. Some 25 countries had submitted FREL/FRLs to the UNFCCC as of early 2017, including many of the largest tropical forest countries: Brazil, Colombia, Indonesia, Malaysia, Mexico, Papua New Guinea, Peru, the Congo and Viet Nam. This process has enabled countries to gain experience with technical assessment and analysis for REDD+ and was designed to enhance countries' technical capabilities, as well as build trust among countries in their emission reduction and reporting efforts. This effort marks the first time that developing countries have undergone such international assessment/analysis processes.

In many countries, unprecedented transparency of countries' forest-sector data and information has resulted from the MRV of REDD+ as, for the first time, data at this level of detail have been reported internationally. The submission of FREL/FRLs and REDD+ results to the UNFCCC provides detailed statistics on countries' forest sectors. The level of detail has proven to be much greater than that included in past reporting (e.g. NCs and FAO's Global Forest Resources Assessments), and reports undergo third-party technical assessment and analysis. The reports provides important information to not only inform country policies, but to also inform the global stocktake.

A country's NFMS should provide data and information for the MRV of REDD+, the national GHG inventory, and NDC progress reporting, to enhance sustainability and consistency. To ensure effective use of limited resources for the MRV of forest-related emissions and removals, a country's NFMS should provide data and information for REDD+ reporting as well as for the national GHG inventory and for reporting progress on a country's NDCs. This will also help improve consistency among such reports. Capacity development will be required to further enhance the NFMS, because new guidance on the MRV of REDD+ results is continually becoming available (e.g. from the Paris Agreement's transparency framework, on the GCF's modalities and other sources of results-based financing). To ensure the sustainability of data collection in this evolving context, it is key to connect the MRV of REDD+ and the NFMS with the national GHG inventory. This is particularly relevant because the components of an NFMS are often spread across several government agencies that engage in periodic data collection.

Experience to date in improving NFMSs, and the development of FREL/FRLs, has demonstrated that such systems can provide needed evidence for policy-makers to make decisions that support the implementation of strategies for sustainable development, including for the NDCs. Policy-makers require reliable information to design effective policies and measures to mitigate climate change while supporting sustainable development. These include policies at the core of the 2030 Agenda for Sustainable Development⁶⁵, which form an integral part of rural development

⁶⁵ In particular, regarding Sustainable Development Goal 15 (Life on land)

strategies, including restoring landscapes, improved forest governance and sustainable forest management. As countries step up such efforts, they are discovering that improved NFMSs and methods to measure results (e.g. through the development of FREL/FRLs) can support these efforts by providing information on drivers of deforestation and forest degradation as well as on the impacts of policies and measures to address them.

Continued experience with FREL/FRLs, REDD+ results reporting and the associated technical assessment and analysis may provide useful lessons in drawing up the Paris Agreement's transparency framework. The MRV of REDD+ is designed to flexibly respond to country circumstances. Countries have diverse technical and process-related capabilities for estimating forest-related emissions and removals. Technical assessments and analyses identify areas for improvement, allowing countries to apply a stepwise approach to REDD+ MRV.

More clarity is needed concerning how REDD+ results can trigger results-based payments/finance through their FREL/FRLs and REDD+ results annexes as submitted to the UNFCCC. It is generally expected that the GCF will become an important source of results-based payments/financing, although the GCF has not yet clarified how this financing could be obtained. For market-based approaches, a UNFCCC decision states that additional modalities of verification may be required⁶⁶. Several other schemes that provide results-based payments/finance are progressing, and some of these apply more detailed guidance to MRV than those under the UNFCCC.

FAO will continue supporting capacity development at the country level for FREL/FRLs, REDD+ results reporting, and NFMSs that can underpin NDC progress reporting. FAO aims to support countries' national contributions to climate change mitigation through REDD+ when these are measured, reported and verified with the necessary institutional arrangements in place.

The UN-REDD Programme puts NFMS, FREL/FRLs and REDD+ results reporting at the centre of its capacity development objectives while enhancing support to countries moving towards the implementation of REDD+ actions. This includes support to develop FREL/FRLs and submit REDD+ results reporting, as well as for the improvement of national GHG inventories. Through the Paris Agreement, a transparency framework will help track progress towards achieving the NDCs, which draw on national GHG inventories in the context of other necessary information⁶⁷. Technical and functional capacities developed for REDD+ on NFMS, FREL/FRLs and REDD+ results reporting help countries to estimate progress on mitigation in the forest sector that may be included in their NDCs. Further capacity development is needed to build robust GHG inventory systems and to integrate data and information from FREL/FRLs and REDD+ results reporting. To contribute to these diverse contexts, FAO's capacity development in this regard is built on a set of core elements (Figure 18).

⁶⁶ Decision 14/CP.19, paragraph 15

⁶⁷ Paris Agreement, article 13, paragraph 7



Figure 18: Key elements of FAO's capacity development approach for FREL/FRLs and REDD+ results reporting.

7. Annex: Reporting processes to the UNFCCC for developing countries

Methodological guidance for REDD+ results reporting and related issues is based on guidance for national GHG inventories. The currently adopted guidelines for national GHG inventories of developing countries were agreed in 2002. In 2011, these were extended to Biennial Update Reporting. In 2009–2013, several UNFCCC decisions were taken to embed guidelines for FREL/FRL submissions and REDD+ results reporting in the framework of the national GHG inventories.

The NCs are countries' key reporting vehicle to the UNFCCC. Most developing countries have submitted initial and second reports, and some developing countries have submitted third NCs. Developing countries are required to submit a BUR every two years. LDCs and SIDSs can submit their BURs at their own discretion⁶⁸.

NCs includes information on⁶⁹:

- national circumstances;
- relevant institutional arrangements, potentially including information on domestic MRV;
- national GHG inventory;
- mitigation actions, as well as actions for adaptation to climate change, their effects, and related methodologies and assumptions;
- constraints and gaps, and related financial, technical and capacity needs, including a description of support needed and received, including to enable the preparation and submission of BURs;
- other relevant information, including on transfer of technologies, research and systematic observation, education, training and public awareness, capacity development and information and networking.

BURs provide updates on the most recent NCs on⁷⁰:

- relevant institutional arrangements;
- national GHG inventory;
- mitigation actions, their effects, and related methodologies and assumptions;
- constraints and gaps, and related financial, technical and capacity needs, including a description of support needed and received;
- support received to enable the preparation and submission of BURs;
- domestic measurement reporting and verification;
- other information.

Both NCs and BURs include national GHG inventories. The national GHG inventory reporting guidelines were first specified in the context of NCs⁷¹ and later extended for the BURs⁷². Among others, there is mandatory and optional guidance for the national GHG inventories. Some points of importance for the land-use sector and REDD+ include BURs should or could:

- cover a calendar year that does not precede the submission date by more than four years⁷³, providing a consistent time series back to the years reported in earlier NCs and including summary tables for

68 Decision 2/CP.17, paragraph 41(f)

69 Decision 17/CP.8, annex

70 Decision 2/CP.17, annex III

71 Decision 17/CP.8, paragraphs 8–24

72 Decision 2/CP.17, annex III, paragraph 3-10

73 Decision 2/CP.17, paragraph 41(g)

- inventory years contained therein⁷⁴;
- follow the IPCC guidance, including either the revised 1996 guidelines or newer versions such as the 2003 Good Practice Guidance on LULUCF or the 2006 guidelines⁷⁵;
 - include standard reporting tables⁷⁶;
 - improve transparency, consistency, comparability, completeness and accuracy⁷⁷;
 - undertake a key source analysis⁷⁸;
 - describe procedures and arrangements undertaken to collect and archive data as a continuous process, including information on the role of the institutions involved⁷⁹;
 - identify areas of improvement through capacity-building⁸⁰;
 - provide information on the level of uncertainty⁸¹.

74 Decision 2/CP.17, annex III, paragraph 7-8

75 Decision 2/CP.17, annex III, paragraph 5

76 Decision 2/CP.17, annex III, paragraph 6, 9

77 Decision 17/CP.8, annex, paragraph 11

78 Decision 17/CP.8, annex, paragraph 12

79 Decision 17/CP.8, annex, paragraph 13

80 Decision 17/CP.8, annex, paragraph 21

81 Decision 17/CP.8, annex, paragraph 24

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