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FOREST REFERENCE
[EMISSION] LEVELS
FOR REDD+

REDD+ ACADEMY

LEARNING JOURNAL

EDITION 3 - DECEMBER 2018

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ISBN: 978-92-807-3647-2

Job No: DEP/2101/NA

Published in September 2018

Acknowledgements

Thanks are due to the lead and contributing authors for the development of this learning journal.

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Contributing authors and reviewers: Charlotte Hicks (UNEP/WCMC), Pierre-Yves Guedez (UNDP/UN-REDD), Elina Vaananen (UNEP/WCMC), Marco Chiu (UNDP/UN-REDD), Joel Scriven (UNDP/UN-REDD), Elizabeth Eggerts (UNDP/UN-REDD)

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The UN-REDD Programme is the United Nations collaborative initiative on Reducing Emissions from Deforestation and forest Degradation (REDD) in developing countries. The Programme was launched in 2008 and builds on the convening role and technical expertise of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP).

The UN-REDD Programme supports nationally-led REDD+ processes and promotes the informed and meaningful involvement of all stakeholders, including Indigenous Peoples and other forest-dependent communities, in national and international REDD+ implementation.

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The REDD+ Academy is a comprehensive response to capacity building needs identified by the countries receiving support from the UN-REDD Programme. The main aim of the REDD+ Academy is to empower potential “REDD+ champions” with the requisite knowledge and skills to promote the implementation of national REDD+ activities.

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MONIKA GAIL MACDEVETTE

DIRECTOR, A.I.
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The journals have been designed to accompany you in your learning journey and equip you with the necessary knowledge to understand the various components of REDD+, from the basics to the finer points of setting reference levels, monitoring, allocation of incentives and stakeholder engagement.

With deforestation and forest degradation being the third largest source of greenhouse gas emissions globally, action to reduce deforestation and to rebuild forests globally is vital. By realizing social and economic benefits, REDD+ is also fundamental to delivering on the Sustainable Development Agenda.

Following the adoption of the Paris Agreement, the focus of many developing countries is now firmly on REDD+ implementation. I encourage you to take the REDD+ Academy online course, and apply your knowledge to make REDD+ a national and a global success!

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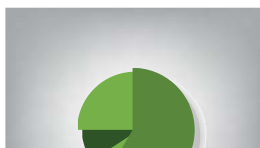
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Elements of REDD+





Forest Reference [Emission] Levels for REDD+

This module presents one of the four elements countries need to develop to participate in REDD+, Forest Reference (Emission) Levels



The module includes sections about:

- What a FREL/FRL is
- How to construct a FREL/FRL
- How to submit a FREL/FRL



What do you already know about this topic?

FOREST REFERENCE [EMISSION] LEVELS FOR REDD+

INTRODUCTION

What is a FREL/FRL?

A Forest Reference Emission Level and/or Forest Reference Level (FREL/FRL) is a benchmark for assessing the performance of each country in implementing REDD+ activities.

The United Nations Framework Convention on Climate Change (UNFCCC) refers to Forest Reference Emission Levels and/or Forest Reference Levels. Although the difference between the two concepts has not been clarified, UN-REDD has provided the following interpretation:

- A **Forest Reference Emission Level (FREL)** is a benchmark for activities that reduce emissions only. Thus the scope of a FREL would be, for example, emissions from deforestation and/or forest degradation.
- A **Forest Reference Level (FRL)** is a benchmark for both activities that reduce emissions and activities that increase removals (adding the 'plus' to REDD+). Thus the scope of a FRL could include enhancement of forest carbon stocks as well as deforestation and forest degradation.

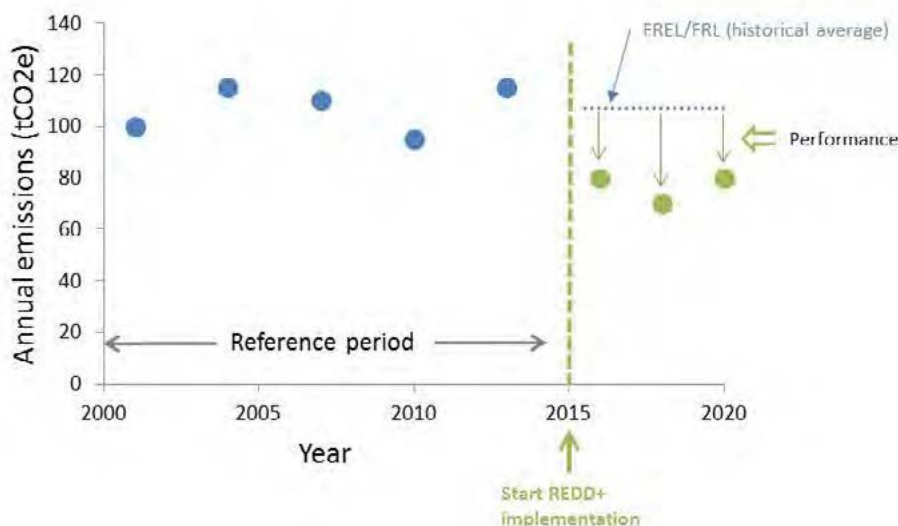
Figure 1 gives an example where a country uses a simple historical average of forest emissions as its FREL/FRL.



REFLECTION POINT

Why might the past not be a good indicator of future emissions from forests, particularly in HFLD countries?

Figure 1 Forest Reference Level example using only historical data

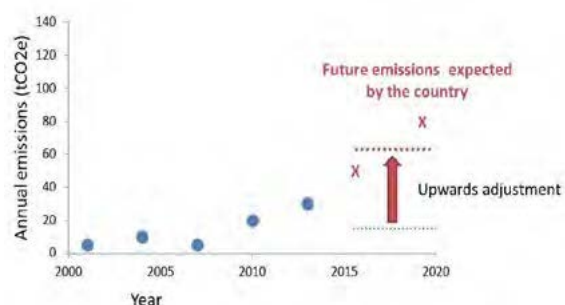


Source: UN-REDD Programme

When developing a FREL/FRL, a country should carefully consider what emissions/removals it expects from forest-related activities if it were not to take any REDD+ actions. In the example above, with no clear trend in historical emissions, a historical average may provide a good predictor of future emissions expected in the absence of REDD+ implementation, or 'business as usual' emissions. However, in some countries the past may be a poor predictor of

the future, for example in high forest cover and low deforestation countries (HFLD countries). A country may propose an adjustment for national circumstances (as illustrated in Figure 2). The proposal must be supported by transparent, accurate, consistent and complete information that justifies the adjustment and allows for the reconstruction of the FREL/FRL.

Figure 2 Forest Reference Level example including an adjustment for national circumstances



Source: UN-REDD Programme

Why develop a FREL/FRL?

There are several reasons for developing FREL/FRLs:

- Countries may wish to express their contribution to international mitigation through REDD+ actions under the UNFCCC;
- Countries may wish to assess progress on the outcomes of Policies and Measures (PAMs) taken to mitigate climate change in the forestry sector for domestic reasons; and
- Countries may wish to access results-based payments (RBP). According to UNFCCC decisions,¹ eligibility for results-based payments requires an assessed FREL/FRL.

REDD+ results are calculated by measuring emissions after the implementation of REDD+ activities against the FREL/FRL and should be reported in a technical annex to the biennial update report (BUR) (Decision 14/CP.19). The BUR and technical annex will be subject to an International Consultation and Analysis (ICA) which will result in a summary report for the main contents of the BUR and a technical report for the REDD+ results published on the [UNFCCC website](http://unfccc.org).

RBP under the UNFCCC can come from various sources, including the Green Climate Fund, the official financial entity of the UNFCCC. The Green Climate Fund has not yet made any

investments, but it hopes to begin accepting proposals soon, although the conditions under which RBP will be provided have not yet been clarified. Decision 14/CP.19 agrees that RBPs may be subject to further modalities for verification.

Several other initiatives have begun using reference levels to provide RBP for demonstration REDD+ activities. Under the Carbon Fund of the World Bank's Forest Carbon Partnership Facility (FCPF), for example, Reference Levels² are proposed to the fund in an Emission Reduction Program Idea Note (ERPIN), and then further developed for use in an Emission Reduction Payment Agreement (ERPA). The FCPF Carbon Fund provides guidance on Reference Levels consistent with that of the UNFCCC, but also details additional requirements for RBP.

An overview of approaches to FREL/FRLs is provided in the UN-REDD Programme publication [Emerging approaches to FREL/FRLs for REDD+](#), which largely summarizes ERPINs submitted by September 2014. Up-to-date information on Emission Reduction Program Documents (ERPD) submitted to the Carbon Fund can be found on the [country pages of the Carbon Fund](#)³. After submission, an ERPD is reviewed by a technical advisory panel after which it may be selected for an ERPA. More information on finance for REDD+ activities can be found in the module on REDD+ Finance.

How does the FREL/FRL relate to the other elements of REDD+?

As was seen before, the UNFCCC has set a framework for REDD+ (Decision 1/CP. 16) requesting four elements to be developed by a country in order to participate in REDD+:

² The Carbon Fund uses the term 'Reference Level' while the UNFCCC generally uses 'Forest Reference Level'

³ By July 2016, DRC and Costa Rica have submitted an ERPD.

¹ The text of all UNFCCC decisions relevant to REDD+ are gathered in the 'Decision booklet REDD+' (UNFCCC, 2014).

Figure 3 Elements of REDD+

Source: UN-REDD Programme

There is a logical relation between these elements:

1. REDD+ actions are implemented through a National Strategy, discussed in **the module on National National Strategies or Action Plans**;
2. Emissions and removals from the forest are monitored through the National Forest Monitoring System (NFMS), discussed in **the module on National Forest Monitoring Systems for REDD+**;
3. The FREL/FRL discussed in this module is the benchmark against which performance in implementing REDD+ is assessed; and
4. The Safeguard Information System (SIS) should ensure no harm is done when implementing REDD+, as discussed in **the module on REDD+ Safeguards under the UNFCCC**.

Information needs to be submitted to the UNFCCC for FREL/FRL and SIS. However, FREL/FRL is the only element which will be technically assessed. Some relations between the REDD+ elements are 'formalized' in UNFCCC Decisions, namely the relation between the NFMS and the FREL/FRL: the NFMS should provide data and information suitable for measuring, reporting and verifying (MRV) anthropogenic forest-related emissions by sources and removals by sinks (Decision 11/CP.19, p.3), and MRV should maintain consistency with the established or updated FREL/FRL (Decision 14/CP.19).

Consistency between the data collected through the NFMS and the data used to establish the FREL/FRL is crucial to ensure that results – the difference between measured and reported emissions/removals and the FREL/FRL – reflect performance and not a difference in data, methodologies or other.

Guidance from the UNFCCC on FREL/ FRLs

Guidance on FREL/FRLs is provided through Decisions 4/CP.15, 12/CP.17 and 13/CP.19. Decision 4/CP.15 is the first decision mentioning FREL/FRLs. It states that FREL/FRLs should be established transparently taking into account historic data, and adjusted for national circumstances. Accordingly, Decision 12/CP.17 provides guidance on FREL/FRL construction (modalities for FREL/FRLs) and the annex to this decision provides guidance on the information which needs to be included in a FREL/FRL submission to the UNFCCC. Decision 13/CP.19 provides details on the technical assessment of the FREL/FRLs.

From these three decisions, some elements can be extracted which countries will need to consider and on which countries have to make choices. These elements are:

- Scale (area covered by the FREL/FRL);
- Scope (REDD+ activities, pools and gases included in the FREL/FRL);
- Forest definition;
- Historical data (selection and analysis of Activity Data (AD) and Emission Factors (EF)); and
- National circumstances and FREL/FRL construction approach.

The UNREDD publication [Technical considerations for Forest Reference Emission Level and/or Forest Reference Level construction for REDD+ under the UNFCCC](#) provides a description of possible benefits and risks associated with different choices for each of these elements and offers practical advice to facilitate decision-making.



REFLECTION POINT

Can you explain, in your own words, why it is so important to have consistency of data collection for both NFMS and FREL/FRLs?

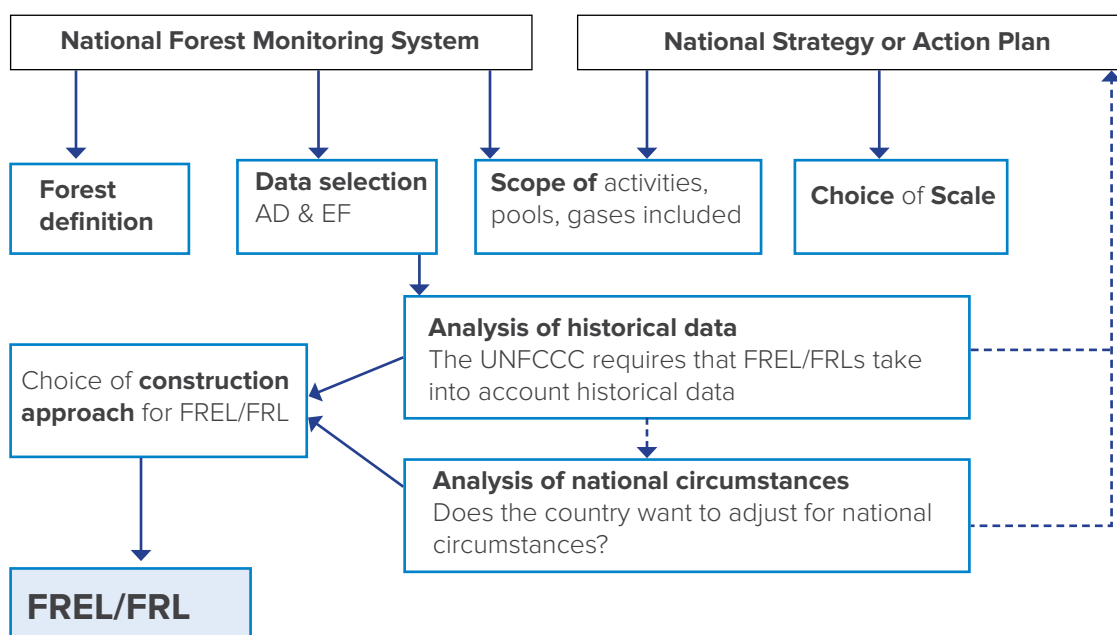
Combining the elements to construct a FREL/FRL

Figure 4 below provides a simplified possible flow for FREL/FRL construction, combining the elements or building blocks discussed above. Certain choices on FREL/FRL elements are more likely to be driven by the quality and type of data collected through the NFMS while other choices may be taken in view of the National Strategy/Action Plan (NS/AP). Depending on the circumstances of a particular country, other flows are possible. For example, a country may decide to include certain types of woodland in its NS, if the country wanted to assess REDD+ performance in these woodlands, it would ensure the forest definition would include the types of woodland in question.

When constructing a FREL/FRL, and identifying its scale and scope, countries may choose to involve REDD+ stakeholders in their decision making, particularly those who depend on forests for their survival and livelihoods, such as local communities and indigenous people, including equitably both women and men from those groups.

It should be noted that while FRELs/FRLs are related to potential future results-based finance, there is no explicit relation under the UNFCCC between FREL/FRLs and future benefit sharing (at least to date). Nevertheless, a transparent, participatory and gender equitable decision-making process around FREL/FRL, including on how it is constructed, may be beneficial in avoiding confusion and enhancing country ownership at the national and local level.

Figure 4 Simplified flow for FREL/FRL construction



Source: [FAO \(2015\)](#)

Assessment of significant activities, pools and gases, should drive the choice for scope, but may be influenced by the availability and quality of data from the NFMS and other sources. Additionally, choices for scope may be guided by what activities a country proposes in its NS/AP. A country may decide to take a stepwise approach, starting with a simple methodology or a narrow scope (e.g. deforestation, above and below ground biomass only) with the intention of improving the methodology or adding other activities, pools and gases over time.

A country may also decide to start at the subnational level, keeping in mind that the final objective under the UNFCCC is a national FREL/FRL. The NS/AP could inform the choice of the initial scale of implementation for REDD+ but other elements may come into consideration, including data availability as well as implementation and monitoring capacity.

Before selecting an approach to FREL/FRL construction (e.g. a simple historical average or an adjustment), a country may want to analyze its data and try to understand the dynamics



REFLECTION POINT

Why is it so important to consider national circumstances and how drivers might affect future trends of forest-related emissions and removals?

of anthropogenic forest-related emissions and removals. The analysis of historical data and national circumstances should provide the country with a better understanding of drivers of deforestation and forest degradation, information which not only informs FREL/FRL construction but may also inform the process of the NS/AP. An analysis of national circumstances may provide a country with an enhanced understanding of how drivers may affect future trends of forest-related emissions and removals, which in turn can support decision-making on potential adjustments. More information on such an analysis can be found in **in the module on Drivers of Deforestation and Forest Degradation**. Altogether, these analyses can help countries take informed decisions on approaches to the construction of FREL/FRLs and provide a robust basis for an eventual submission to the UNFCCC.

Submitting a FREL/FRL

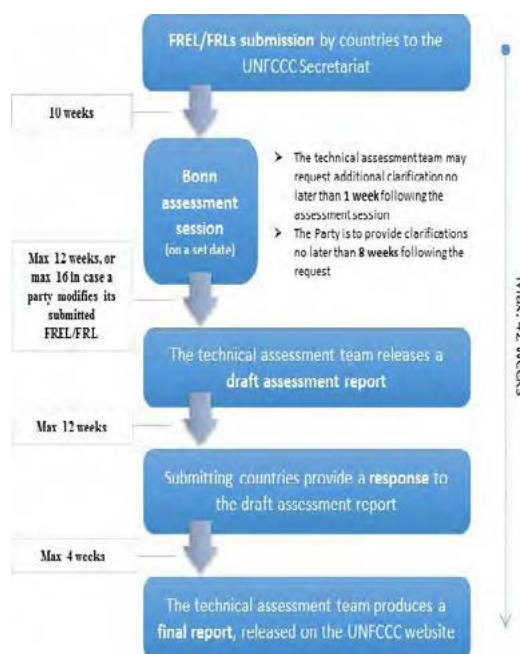
Once it is constructed, developing countries may, on a voluntary basis and when deemed appropriate, submit their proposed FREL/FRLs to the UNFCCC. The subsequent technical assessment is intended to support the capacity of developing country Parties in the construction and future improvement of their FREL/FRL. It offers a facilitative, non-intrusive, technical exchange of information on FREL/FRL construction. The assessment team will comprise two Land Use Land Use Change and Forestry (LULUCF) experts from the UNFCCC expert roster.

Official submission of the FREL/FRL to the UNFCCC is made by the national focal point to the UNFCCC. The technical assessment of the submitted FREL/FRL will start with an assessment session organized in Bonn, Germany once a year. The timeline for the technical assessment is outlined below in Figure 5⁴.

⁴ The specific dates for each year's FREL/FRL submission deadlines and technical assessment sessions are [set by the UNFCCC](https://unfccc.int/forests/information/forests-reference-emission-levels).

FREL/FRL submissions, as well as the final report resulting from the technical assessment mentioned in the flow chart, and the modified submission after the technical assessment, are published on the [UNFCCC's REDD+ website](https://unfccc.int/forests/information/forests-reference-emission-levels).

Figure 5 Submission process for FREL/FRL



Source: UN-REDD Programme

Websites to get you started

<http://redd.unfccc.int/fact-sheets/forest-reference-emission-levels.html>

This page on the UNFCCC REDD+ website provides key information on FREL/FRLs and links to submissions already made.

<https://www.forestcarbonpartnership.org/carbon-fund-methodological-framework>

The FCPF Carbon Fund provides guidance for Reference Level construction that is consistent with UNFCCC but more restrictive on several issues. It contains a set of 37 criteria and related indicators associated with five major aspects of emission reductions programs: level of ambition, carbon accounting, safeguards, sustainable program design and implementation, and emission reduction program transactions.



REFLECTION POINT

Why do you think this process is as long as 42 weeks?

CASE STUDIES

ETHIOPIA'S FRL SUBMISSION TO THE UNFCCC

In January 2016, Ethiopia was among the first African countries (together with the Republic of Congo and Zambia) to submit its FRL to the UNFCCC. The technical assessment process is currently ongoing and as a result Ethiopia may propose modifications to its FRL submission.

REDD+ activities included: Ethiopia's FRL includes the REDD+ activities deforestation and afforestation (enhancement of forest carbon stocks). Afforestation includes restoration of degraded woodlands resulting in a transition above the thresholds in the forest definition. Though the activity forest degradation is not included in this FRL, Ethiopia explains efforts on natural forest restoration and the installation of plantations are expected to result in a reduction of forest degradation and deforestation. An example is quoted of some regions where the cultivation of plantation wood on farmers' land has been able to supply most of the fuelwood needed, thus reducing fuelwood collection from natural forest.

AD and EFs used: Several Ethiopian institutions (i.e. the Ministry of Environment, Forests and Climate Change, the Ethiopian Mapping Agency and the Central Statistical Agency of Ethiopia) have prepared land use/ land cover (LU/LC) maps of the country, including an assessment of forest cover. However, the maps do not allow the detection of forest area change in an accurate manner. As such, the Global Forest Change (GFC) product (Hansen et al., 2013) was used as an initial input to assess change within the existing LU/LC maps. The GFC global data set provided Ethiopia with a starting point for identifying areas of change, however the product needed modifications to correctly reflect the national forest definition (e.g. the minimum mapping unit was adjusted). Land cover and land use dynamics in Ethiopia are extremely complex and not fully captured by the global product. Therefore, a preliminary training dataset was generated automatically from the GFC product but inputs from national experts were needed to identify false detections (commission errors) and

missed losses and gains (omission errors) for a robust classification. Models of supervised classification were used to create a change map and combine it with the LU/LC maps. A stratified random sample was combined with the map to produce bias corrected estimates of stable forest, forest loss and forest gain. Ethiopia provides an example of how global datasets can inform NFMS if combined with national/local knowledge of the forest.

EFs for the associated carbon loss/gain per hectare deforestation/afforestation were obtained from Ethiopia's National Forest Inventory (NFI). Ethiopia recently launched an NFI which provides estimates of average carbon contents for forest in four biomes. Ethiopia compared the average forest biomass estimated from the NFI against existing national studies on forest within the biomes and found that the existing studies largely over-estimated forest biomass. Ethiopia explained that the existing studies were performed mostly in the remaining pristine forest pockets and were therefore not representative for carbon estimates in the national forest area and for forest area change.

Future submissions and areas for improvement: Though forest degradation is considered a significant source of emissions in Ethiopia, due to the lack of accurate, reliable and consistent data at the national scale, forest degradation is omitted in this FRL. It is Ethiopia's intention to gradually account for forest degradation following a step-wise approach. To achieve this, Ethiopia is exploring whether successful attempts at the local level may be transferred into a cost-effective accounting mechanism at the national level.

Regarding the recently launched NFI, at the time of submission, only data from Oromia province had been analyzed, while plot data collection in the remaining provinces was still ongoing. Ethiopia therefore submitted its NFI with EFs based on Oromia province data only, indicating its intention to replace these with national data in the course of the technical assessment.

BRAZIL'S FREL SUBMISSION TO THE UNFCCC

In June 2014, Brazil became the first country to submit a FREL to UNFCCC. Before the end of 2014, Brazil submitted a modified FREL providing more detailed information in response to the facilitative exchange with the technical assessment team. The Technical Assessment Report (TAR) was posted on the [UNFCCC website](http://unfccc.int/submissions.html)⁵.

Stepwise approach: The evolution from Brazil's deforestation baseline⁶ used in the Amazon Fund, a national demonstration fund for REDD+, to the FREL submitted to the UNFCCC could be considered an illustration of a stepwise approach. The pools considered in the FREL expanded compared to the Amazon Fund approach and more detailed information was used for EF estimations. In its baseline calculation, the Amazon Fund first adopted a conservative estimate of 100 tC/ha for above ground biomass (other estimates ranged from 130 and 320 tC/ha). For the subsequent UNFCCC submission, a carbon map was produced resulting in multiple forest type and location-specific EFs. Brazil's FREL submission states that over time that it will include additional activities such as degradation, as well as other biomes beyond the Amazon as steps towards development of a national FREL.

REDD+ activities included: The FREL only includes deforestation of primary forest, where Brazil considers deforestation any clear cut of primary forest with a minimum mapping unit of 6.25 ha. The reason provided by Brazil for including only deforestation is that this activity represents the largest source of emissions and the time series available for assessing degradation is too short to allow an adequate understanding of the degradation process. In an Annex to the submission (not

subject to the technical assessment), Brazil provides preliminary results of the assessment of degradation, which estimates emissions from degradation at approximately 59 per cent of those from deforestation. In the TAR, the AT acknowledges that Brazil included the most significant activity, the most important biome and the most significant pools in terms of emissions from forests. Furthermore, the AT considers that degradation is a significant activity based on the estimates provided by Brazil. The AT also notes that there is no evidence of displacement of emissions (i.e. decreased deforestation in the Amazonia biome resulting in increased degradation) and the current exclusion appears to be conservative in the context of constructing the FREL.

Future submissions and areas for improvement:

Brazil indicates its intention to scale up to the national level in the future, developing FRELS for the remaining biomes in order of emissions importance. Brazil also expects that its understanding of degradation will improve with time as new data becomes available, allowing for the future submission of a FREL for degradation. Brazil mentions in its submission some areas for improvement e.g. currently the carbon map is based on a combination of sample-plot data (RADAMBRASIL) and literature. Brazil will replace this with data from its first NFI cycle as it expects that by 2017 the NFI will be completed in all states.

Areas for improvement identified by the AT are digitization of deforestation maps (AD for 1996-1997 are in analogue format, later dates in digital format), continuation of improvement of the carbon map, future treatment of emission from dead-wood and non-CO₂ gases to be consistent with the GHG inventory (where the AT notes that the current omission is likely to be conservative), and future treatment of degradation.

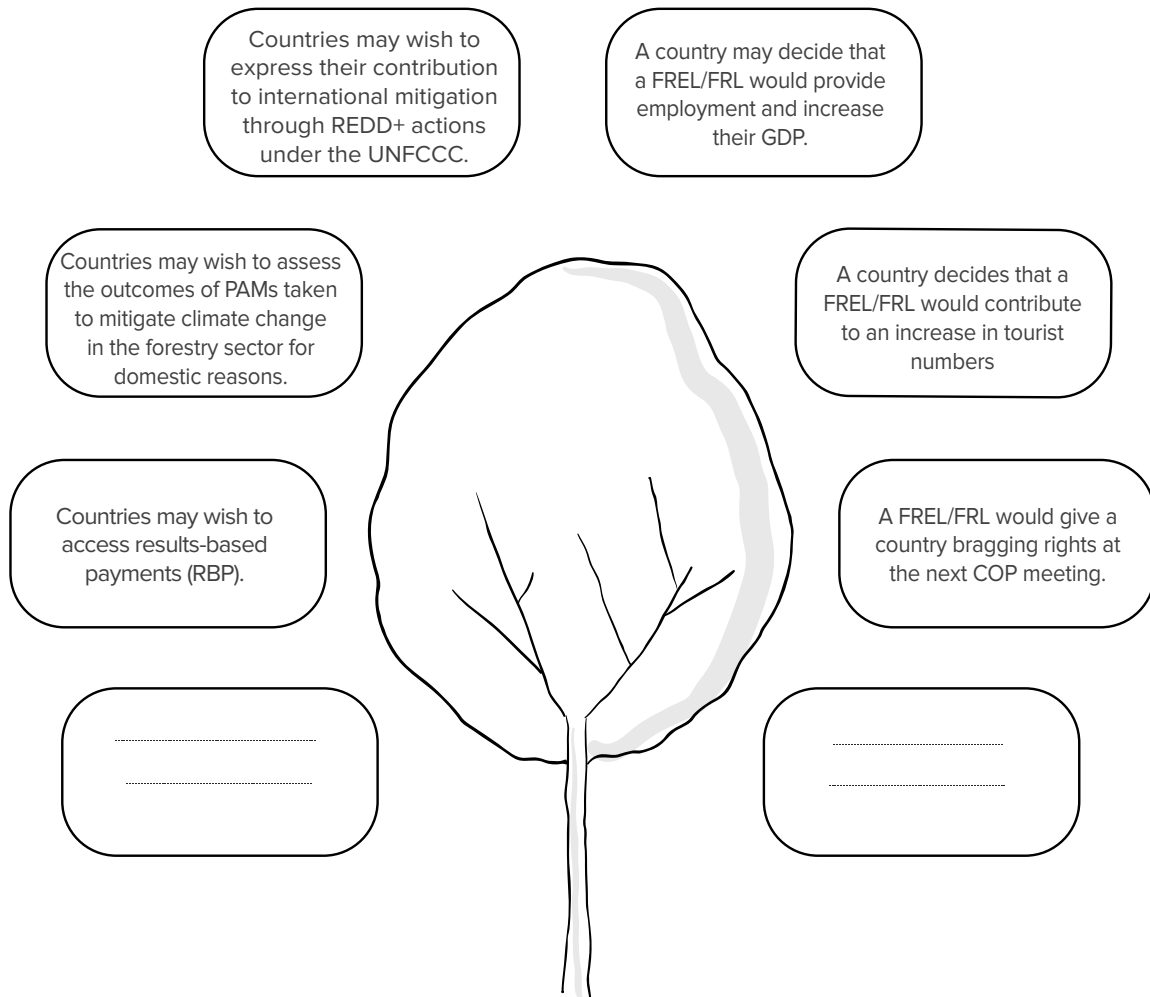
5 UNFCCC FREL/FRL submissions and TARs are available at <http://redd.unfccc.int/submissions.html>

6 Brazil uses the term 'baseline' for the Amazon Fund, the term FREL refers to Brazil's UNFCCC submission.



EXERCISE

There are many reasons for a country to develop FREL/FRLs. Circle the correct reasons among the ones listed below, and use the empty boxes to suggest two additional reasons:

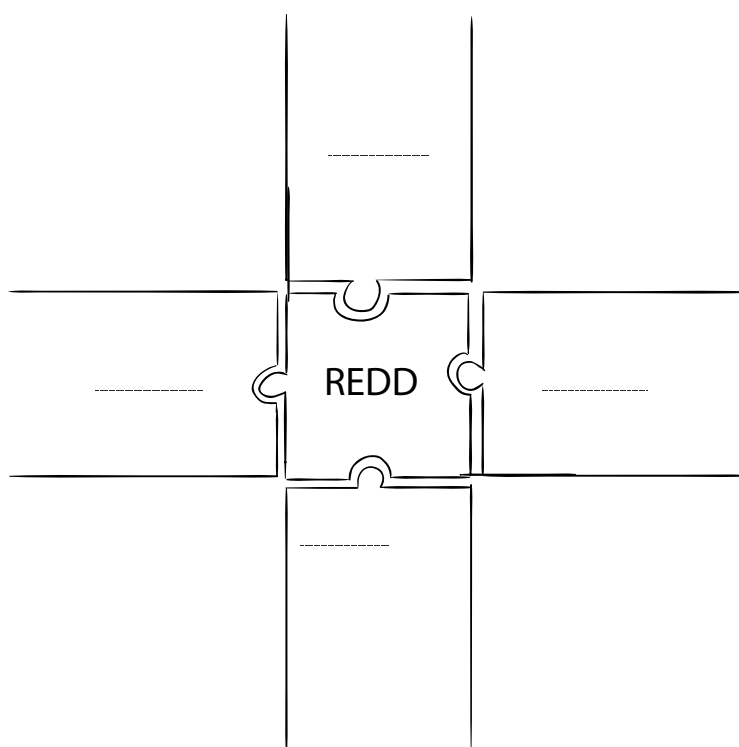




EXERCISE

There are four required elements for participation in REDD+. Use four of the six below elements and fill the drawing.

A National Strategy or Action Plan	A national vote on REDD+ activities	Safeguards Information System (SIS)
A Forest Reference Emission Level or Forest Reference Level (FREL/FRL)	National Forest Monitoring System (NFMS)	A referendum on climate change



KEY MESSAGES:

- Forest Reference Emission Levels and Forest Reference Levels (FREL/FRLs) are benchmarks for assessing the performance of each country in implementing REDD+ activities.
- The FREL/FRL submission is the only REDD+ element that undergoes a technical assessment.
- The type of approach to FREL/FRL construction a country chooses will depend on analysis of drivers of deforestation and forest degradation and national circumstances.



WHAT FURTHER QUESTIONS DO YOU HAVE ABOUT THIS TOPIC?



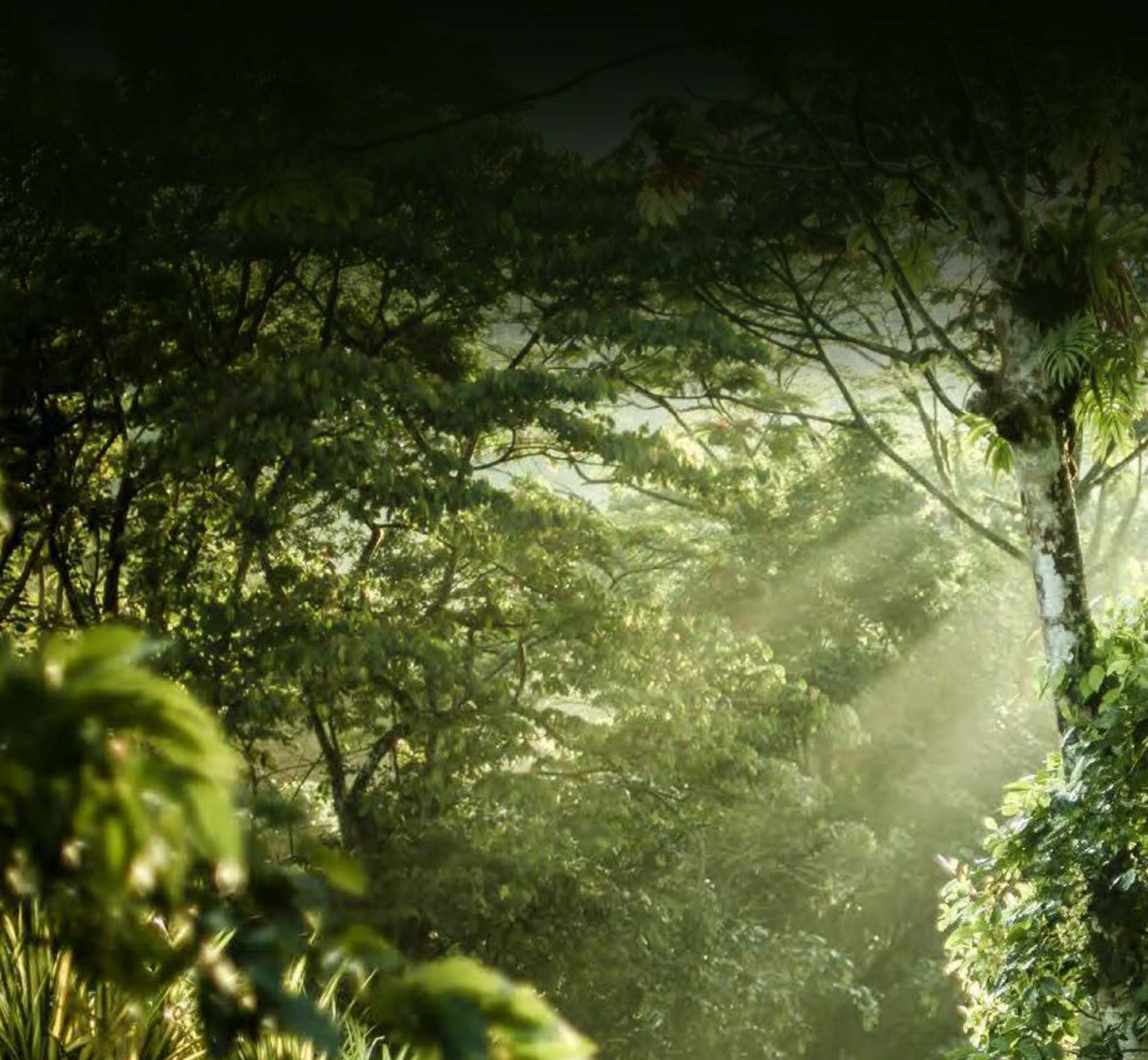
NOTES

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Video

- UN-REDD Programme (2015). UN-REDD webinar on Forest Reference Levels for REDD+ under the UNFCCC. Available at: <https://www.youtube.com/watch?v=EGqXTM2xXII>
- UN-REDD Programme (2015). UN-REDD introductory presentation on Forest Reference Emission Levels and/or Forest Reference Levels for REDD+. Available at: https://www.youtube.com/watch?v=blldJfe_DUK&feature=youtu.be



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