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Report on the technical assessment of the proposed forest reference emission level of Peru submitted in 2021

Summary

This report covers the technical assessment of the voluntary submission of Peru on its proposed forest reference emission level (FREL) in accordance with decision 13/CP.19 and in the context of results-based payments. The FREL proposed by Peru covers the activity reducing emissions from deforestation, which is among the activities included in decision 1/CP.16, paragraph 70.

For its submission, Peru developed a subnational FREL for the Amazon biome, which covers 93.9 per cent of forests in the country (as at 2019), with the aim of transitioning to a national FREL in the future. The FREL presented in the original submission, for the reference period 2010–2019, corresponds to 75,774,039.55 tonnes of carbon dioxide equivalent per year. As a result of the facilitative process during the technical assessment, the FREL was modified to 78,927,827.50 tonnes of carbon dioxide equivalent per year.

The assessment team notes that the data and information used by Peru in constructing its FREL are transparent, complete and in overall accordance with the guidelines contained in the annex to decision 12/CP.17. This report contains the assessed FREL and a few areas identified by the assessment team for future technical improvement in accordance with the provisions on the scope of the technical assessment contained in the annex to decision 13/CP.19.

* Reissued for technical reasons on 27 October 2022.

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AD	activity data
AT	assessment team
BUR	biennial update report
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
COP	Conference of the Parties
EF	emission factor
FAO	Food and Agriculture Organization of the United Nations
FREL	forest reference emission level
FRL	forest reference level
GHG	greenhouse gas
INFFS	national forest and wildlife inventory of Peru
IPCC	Intergovernmental Panel on Climate Change
LULUCF	land use, land-use change and forestry
MIDAGRI	Ministry of Agricultural Development and Irrigation
REDD+	reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (decision 1/CP.16, para. 70)
TA	technical assessment

I. Introduction and summary

A. Overview

1. This report covers the TA of the voluntary submission of Peru on its proposed FREL,[1] submitted on 15 February 2021, in accordance with decisions 12/CP.17 and 13/CP.19. The remote TA[2] took place from 19 to 22 April 2021 and was coordinated by the secretariat.[3] The TA was conducted by two LULUCF experts from the UNFCCC roster of experts[4] (hereinafter referred to as the AT): Raúl Abad Viñas (European Union) and Cecilia Penengo (Uruguay). Although the Consultative Group of Experts was invited to participate as an observer[5] during the remote session, no expert was able to attend as a representative. The TA was coordinated by Jenny Wong (secretariat).

2. In response to the invitation of the COP and in accordance with the provisions of decision 12/CP.17, paragraphs 7–15 and annex, Peru submitted its proposed FREL on a voluntary basis. The proposed FREL is one of the elements[6] to be developed in implementing the activities referred to in decision 1/CP.16, paragraph 70. Pursuant to decision 13/CP.19, paragraphs 1–2, and decision 14/CP.19, paragraphs 7–8, the COP decided that each submission of a proposed FREL, as referred to in decision 12/CP.17, paragraph 13, shall be subject to a TA in the context of results-based payments.

3. Peru provided its submission in Spanish. The original submission is supported by four annexes (in Spanish), covering information on annual areas of deforestation, natural forest loss and total deforestation in the Amazon biome for the reference period (annex 1), area of annual natural forest loss by ecozone (annex 2), area of annual anthropogenic forest loss by ecozone (annex 3) and information supporting the reconstruction of Peru's FREL (annex 4). These annexes enhance the transparency and completeness of the FREL. In its modified submission, Peru included an additional annex[7] containing carbon densities derived from information available through the INFFS of MIDAGRI and on the ForestPlots.net platform.[8]

4. Peru underlined that its submission does not prejudge any nationally appropriate mitigation actions being considered or undertaken by the Party pursuant to the Bali Action Plan. This updated FREL will serve as the basis for measuring the impact of mitigation actions in the LULUCF sector and will contribute to the fulfilment of Peru's nationally determined contribution by 2030.

5. The objective of the TA is to assess the degree to which the information provided by Peru is in accordance with the guidelines for submissions of information on reference levels[9] and to offer a facilitative, non-intrusive, technical exchange of information on the construction of the FREL with a view to supporting the capacity of Peru to construct and improve its FREL in the future, as appropriate.[10]

6. The TA of the FREL submitted by Peru was undertaken in accordance with the guidelines and procedures for the TA of submissions from Parties on proposed FRELs and/or FRLs.[11] This report on the TA was prepared by the AT following the same guidelines and procedures.

7. Following the process set out in those guidelines and procedures, a draft version of this report was communicated to the Government of Peru. The facilitative exchange during

[1] The submission of Peru is available at https://redd.unfccc.int/submissions.html?country=per.
[2] Owing to the circumstances related to the coronavirus disease 2019, the TAs of the FREL and FRL submissions of developing country Parties in 2021 had to be conducted remotely.
[3] As per decision 13/CP.19, annex, para. 7.
[4] As per decision 13/CP.19, annex, paras. 7 and 9.
[5] As per decision 13/CP.19, annex, para. 9.
[6] See decision 1/CP.16, para. 71(b).
[7] Presented as annex 4 in the modified submission.
[8] https://forestplots.net/.
[9] Decision 12/CP.17, annex.
[10] Decision 13/CP.19, annex, para. 1(a–b).
[11] Decision 13/CP.19, annex.

the TA allowed Peru to provide clarifications and additional information, which were considered by the AT in the preparation of this report.[12] As a result of the facilitative interactions with the AT during the TA, Peru provided a modified version of its submission on 16 November 2021, which took into consideration the technical inputs of the AT. The modifications improved the clarity and transparency of the submitted FREL. This TA report was prepared in the context of the modified FREL submission. The modified submission, containing the assessed FREL, and the original submission are available on the UNFCCC website.[13]

B. Proposed forest reference emission level

8. In decision 1/CP.16, paragraph 70, the COP encouraged developing country Parties to contribute to mitigation actions in the forest sector by undertaking a number of activities, as deemed appropriate by each Party and in accordance with their respective capabilities and national circumstances, in the context of providing adequate and predictable support. The FREL proposed by Peru, on a voluntary basis for a TA in the context of results-based payments, covers the activity reducing emissions from deforestation, which is one of the five activities referred to in that paragraph. Pursuant to paragraph 71(b) of the same decision, Peru developed a subnational FREL for the Amazon biome, with the aim of transitioning to a national FREL incorporating all natural regions[14] in the country in the future.

9. The Peruvian Amazon biome covers 78,308,800.74 ha, representing 60.5 per cent of the total area of the country and making up 93.9 per cent of the total forest in the country (as at 2019). The biome has four ecozones:[15] *Selva Alta Accessible* (high forest accessible) (14.2 per cent of the area of the biome), *Selva Alta de Difícil Acceso* (high forest difficult to access) (14.0 per cent), *Selva Baja* (low forest) (60.6 per cent) and *Zona Hidromórfica* (hydromorphic zone) (11.8 per cent). The mean annual area deforested in the Amazon biome in 2010–2019 has been estimated as 131,520.79 ha. Deforestation in the ecozones *Selva Baja* and *Selva Alta Accesible* made up more than 80.0 per cent of this figure, while *Selva Alta de Difícil Acceso* and *Zona Hidromórfica* accounted for 12.5 and 3.5 per cent, respectively, of the total deforestation. For its submission, Peru applied a stepwise approach to developing its FREL in accordance with decision 12/CP.17, paragraph 10. The stepwise approach enables Parties to improve their FRELs or FRLs by incorporating better data, improved methodologies and, where appropriate, additional pools.

10. The subnational FREL[16] proposed by Peru corresponds to 78,927,827.50 t CO_2 eq/year and was submitted with the aim of accessing results-based payments for the activity reducing emissions from deforestation. The FREL is based on the annual average of the CO_2 emissions associated with gross deforestation, using data for the historical period 2010–2019. For constructing the FREL, the Party estimated annual emissions from deforestation for the reference period as 72,663,304.1 t CO_2 eq (2010), 76,886,222.1 t CO_2 eq (2011), 80,058,992.4 t CO_2 eq (2012), 99,093,085.7 t CO_2 eq (2013), 76,067,795.6 t CO_2 eq (2014), 68,439,857.8 t CO_2 eq (2015), 91,295,273.4 t CO_2 eq (2016), 65,954,688.1 t CO_2 eq (2017), 65,873,599.3 t CO_2 eq (2018) and 92,945,456.5 t CO_2 eq (2019).

11. According to its modified submission, Peru defines deforestation as the conversion of forest land to cropland, grassland or settlements induced by a reduction of the forest canopy to below 30 per cent in an area of 0.5 ha according to the observed period between 2010 and 2019. The FREL includes only gross emissions from deforestation; it excludes any

[12] As per decision 13/CP.19, annex, paras. 1(b), 13 and 14.

[13] https://redd.unfccc.int/submissions.html?country=per.

[14] In addition to the Amazon biome, Peru classifies its coastal region and mountain region, which cover 5.10 and 0.91 per cent, respectively, of the country's forest area, as natural regions.

[15] The determination of ecozones is based on physiographical, physiognomic, floristic (i.e. ecosystem and vegetation cover), carbon storage (i.e. primary productivity), wetland location and accessibility criteria.

[16] In its original submission, Peru proposed a subnational FREL of 75,774,039.55 t CO_2 eq/year for 2010–2019. The difference between the original and the modified submission is due mostly to the addition of emissions from litter and lying deadwood in the quantification of carbon stocks in dead organic matter.

subsequent emissions and removals from the converted lands. Following a request for clarification by the AT, Peru clarified that, given the fact forest plantations are included in the forest definition, the replacement of a natural forest by a forest plantation is not considered deforestation. Peru also provided quantitative information showing forest plantations are not common in the Amazon biome,[17] and further indicated that the replacement of natural forests by forest plantations is prohibited by law.[18] Furthermore, the proposed FREL excludes forest loss due to natural disturbances or natural events, which is defined as the conversion of forests to either of the IPCC land-use categories wetlands or other land (see para. 26 below).

12. The AD used in constructing the FREL were derived by photointerpretation of satellite images using the Collect Earth Online image analysis platform. The Peruvian Amazon biome was stratified for sampling in the four ecozones. Through visual interpretation of the sample plots included in a systematic grid, Peru collected annual data for the reference period (see para. 20 below). According to the dynamics observed, the land in each plot was classified as (1) forest, (2) non-forest or (3) area with forest loss. In addition, the photo interpreters classified the land according to the six IPCC land-use categories and any corresponding land-use changes. This information allowed the Party to differentiate between forest loss due to natural disturbances or natural events and deforestation (see para. 11 above).

13. Regarding EFs, Peru used dasometric information collected during the INFFS, complemented by information from the ForestPlots.net platform, which was used for estimating biomass using different allometric equations (see para. 22 below).

14. The proposed FREL includes the pools above-ground biomass, below-ground biomass, deadwood and litter. Regarding GHGs, the submission includes CO_2 only.

15. The FREL proposed by Peru is its second FREL submitted in the context of results-based payments and applying the stepwise approach in accordance with decision 12/CP.17, paragraph 10. Its previous subnational FREL (also covering the Amazon biome) was submitted on 29 December 2015 and was subject to a TA in March 2016;[19] it covered the activity reducing emissions from deforestation for 2015–2020. The previous assessed FREL corresponded to 77,570,486 t CO_2 eq, 80,797,169 t CO_2 eq, 84,023,853 t CO_2 eq, 87,250,536 t CO_2 eq, 90,477,220 t CO_2 eq and 93,703,903 t CO_2 eq for 2015, 2016, 2017, 2018, 2019 and 2020 respectively (see also para. 23(a) below). Overall, these projected annual estimates (2015–2020) are higher than the measured historical data for the same years (2015–2019) in the FREL proposed in the current submission.

16. The FREL proposed in the modified 2021 submission differs from that in the modified 2015 submission owing mainly to the different approach used for constructing the FREL, including a different methodology for assessing AD, different EF, different pools and different emission estimates (average of historical data in the 2021 FREL versus linear projection in the 2015 FREL).

17. Peru included in its modified submission five annexes (see para. 3 above) that were not subject to the TA. In addition, the Party shared with the AT several documents containing, among other information, (1) a description of the methods used to derive AD and EFs, (2) data related to AD and EFs and (3) the results of internal quality assurance/quality control procedures. This information enabled the AT to reproduce the estimates used in constructing the FREL. The AT commends Peru for providing this information during the TA and for making it publicly available.[20]

[17] In the construction of the FREL, only 19 sample units were classified as forest plantations which represents 0.05 per cent of the total sample units surveyed.

[18] Ley Forestal y de Fauna Silvestre No. 29763.

[19] See document FCCC/TAR/2016/PER.

[20] A detailed description of the information and weblinks for accessing it online are included in annex 5 to the modified submission.

II. Data, methodologies and procedures used in constructing the proposed forest reference emission level

How each element in the annex to decision 12/CP.17 was taken into account in constructing the forest reference emission level

1. Information used by the Party in constructing its forest reference emission level

18. Peru considered the activity reducing emissions from deforestation in constructing its FREL. The Party used estimates from a time series of historical CO_2 emissions for the reference period 2010–2019. Peru included in its submission information on its plan to include the activities reducing emissions from forest degradation, sustainable management of forests and enhancement of forest carbon stocks in future submissions as part of the stepwise approach. The Party acknowledged that forest degradation could contribute to significant emissions in the forestry sector; accordingly, inclusion of the activity reducing emissions from forest degradation is a priority for the country. The submission provides information on the Party's ongoing efforts to estimate emissions from forest degradation as well as information on the causes and magnitude of those emissions. The submission also indicates that Peru is assessing the impacts of logging, fuelwood collection and forest fires on the degradation of forests.

19. For constructing its FREL, Peru used the methodology in the 2006 IPCC Guidelines as a basis for estimating annual CO_2 emissions from deforestation. With regard to AD, Peru used IPCC approach 3 to ensure consistent land representation. Using a systematic grid (see para. 12 above), land was classified according to one of the six IPCC land-use categories and taking into account changes in the land during 2010–2019. For developing EFs, Peru used the model developed by Mokany, Raison and Prokushkin (2006) to estimate below-ground biomass as a function of above-ground biomass in trees and, in the case of palms, one of the default factors from the 2006 IPCC Guidelines (by Cairns et al., 1997). The default factor of 0.47 t carbon/t dry matter given in the 2006 IPCC Guidelines was applied to estimate the carbon content in dry living biomass and approach 1 (error propagation method) was used to estimate the overall uncertainty of the FREL.

20. The satellite imagery used to generate AD came from various sources and had different resolutions (see para. 28 below for details). Spatial sample units were systematically distributed over the Amazon biome in a 5 km × 5 km grid, with each unit representing 1 ha and containing 25 plots, and each plot representing 0.04 ha (4 per cent of the sample unit). In order to increase the sample size, Peru determined the final number of samples for each of the four ecozones using the accumulated areas of three strata that were determined on the basis of annual maps for 2001–2018.[21] The sample sizes of the ecozones *Selva Alta de Difícil Acceso* and *Zona Hidromórfica* were increased by adding sample units over a grid of 500 m from the centre of the sample units in the 5 km × 5 km grid until the optimal sample size was reached. As a result, the overall sample size increased from 31,285 to 37,419 sample units. In addition, Peru included 1,119 plots from the INFFS in the overall sample size. These additional plots were located using the centroid of the original sample units as a reference, and they were adapted in shape and size to the other sample units. As a result, a total of 38,538 sample units classified through multitemporal visual interpretation of satellite images were used to derive the AD.

21. Peru used dasometric information from the INFFS and the ForestPlots.net platform for developing EFs. The total of 845 sample plots[22] comprised 312 measured during the

[21] These annual maps, generated by the National Forest Conservation Program for Climate Change Mitigation, were used to classify the land as (1) areas with forest loss, (2) forest land remaining forest land and (3) non-forest land remaining non-forest land. The same maps served as the main input for AD in the 2015 FREL submission. They are available at http://geobosques.minam.gob.pe/geobosque/view/perdida.php.

[22] The distribution of the sample units within each ecozone was as follows: 131 for *Selva Alta Accesible* (83 ForestPlots.net, 48 INFFS), 33 for *Selva Alta de Difícil Acceso* (22 ForestPlots.net, 11 INFFS), 540 for *Selva Baja* (319 ForestPlots.net, 221 INFFS) and 141 for *Zona Hidromórfica* (109 ForestPlots.net, 32 INFFS).

INFFS[23] and 533 added from ForestPlots.net. Information from the INFFS sample plots served to estimate carbon stocks in all pools included in constructing the FREL, while information from ForestPlots.net enhanced the estimates of carbon stocks in living biomass and deadwood (i.e. dead standing trees and stumps).

22. To estimate EFs for above-ground biomass, allometric equations developed in pantropical forests for trees (Chave et al., 2014), palms (Goodman et al., 2013) and lianas (Schnitzer, DeWalt and Chave, 2006) were applied, all of them having diameter at breast height as the main parameter. In the case of trees, the allometric equation also included information on wood density and the environmental stress index.[24] These equations were used for both living and dead standing trees. In accordance with the INFFS methodological framework, the wood density of dead trees, palms and lianas was corrected on the basis of decomposition status. In the case of tree stumps, the volumetric equation for the cylinder was applied using diameter, height[25] and wood density (adjusted for decomposition status). EFs for below-ground biomass of living and dead standing trees and palms were estimated using the model developed by Mokany, Raison and Prokushkin (2006) for trees and the root-to-shoot ratio for palms (Cairns et al., 1997). Regarding EFs for lying deadwood, the volume of the trunks and of branches higher than 10 cm from the ground was estimated using length and diameter and then volume was multiplied by the wood density (adjusted for decomposition status) to derive biomass. For litter, carbon stock was derived from samples of material less than 1.5 cm in diameter. These samples were dried in a laboratory to determine the dry matter weight, and this figure was then converted to carbon. Following these approaches, carbon stocks for each carbon pool were estimated. EFs for each ecozone and carbon pool were based on the average of the carbon stocks of the pools estimated in all the sample units of the ecozone (see para. 29 below).

2. Transparency, completeness, consistency and accuracy of the information used in constructing the forest reference emission level

(a) Methodological information, including description of data sets, approaches and methods

23. The FREL proposed by Peru is its second FREL submitted in the context of applying the stepwise approach in accordance with decision 12/CP.17, paragraph 10. The previous FREL submission was subject to a TA in 2016.[26] In its most recent submission, Peru described changes from previously submitted information[27] in accordance with decision 12/CP.17, annex, paragraph (b). The Party described the following changes:

(a) The current FREL is based on the average estimated historical emissions from deforestation during the reference period 2010–2019. The FREL in the 2015 submission corresponded to a linear projection based on the historical deforestation data for 2001–2014 for the projected FREL period 2015–2020;

(b) For the current FREL, areas of deforestation for each stratum are based on a systematic grid for which land use and land-use change is assessed annually by analysis of satellite images. For the 2015 submission, the areas of deforestation were based on a wall-to-wall analysis of satellite images at the pixel level;

(c) For the current FREL, AD on the land-use category following deforestation are included and they take into consideration the six IPCC land-use categories. In the 2015 submission, the land-use category after deforestation was not considered because the pixel-level analysis distinguished land as either forest, non-forest or forest loss;

[23] These plots were visited during field work under the INFFS between 2013 and 2020.

[24] This index was used to enhance the estimation of above-ground biomass as the information on tree height was not available. It is based on potential primary productivity, which is, in turn, derived from a map of rainfall, temperature and hydric stress for the Amazon biome.

[25] For stumps with a height of less than 1.35 m, the actual height was used in the volumetric equation; for stumps with a height of more than 1.35 m, 1.35 m was used in the volumetric equation.

[26] See document FCCC/TAR/2016/PER.

[27] See table 1 of the modified submission.

(d) For the current FREL, anthropogenic deforestation is differentiated from natural forest loss by determining the IPCC land-use category that follows the forest loss event. For the 2015 submission, anthropogenic deforestation and natural forest loss were classified by means of photointerpretation of the land at the pixel level;

(e) For the current FREL, dasometric information from the INFFS and the ForestPlots.net platform was used to derive EFs for each of the four ecozones of the Amazon biome. For the 2015 submission, EFs were based on several studies and forest inventories;

(f) For the current FREL, carbon content was estimated for above-ground and below-ground biomass and dead organic matter using allometric equations specific to the Peruvian Amazon biome (see table 23 in the current submission). For the 2015 submission, the carbon contents of above-ground biomass and below-ground biomass were considered and they were estimated using general allometric equations (see table 7 in the 2015 submission).

24. As part of the stepwise approach, for the current submission, when acquiring AD, the land-use category following a deforestation event was assessed. The AT commends Peru for this technical improvement but noted that, despite having information on land use following deforestation, the Party still assumed carbon stocks to be zero after deforestation. During the TA, the AT sought more information on this matter, and Peru explained that carbon stocks were assumed to be zero owing to the lack of data on carbon stocks for non-forest land categories. While efforts are being made to collect these data and some are available, thus far, they are not considered representative. The Party indicated it has no plans to include information on carbon stocks for the land use that follows deforestation in FREL submissions in the short or medium term. However, the Party also mentioned that institutional efforts to assess the carbon dynamics in each IPCC land-use category are being undertaken by academic and governmental organizations, such as MIDAGRI, the Center for International Forestry Research and the World Agroforestry Center in Peru. The AT appreciates this clarification on institutional efforts being taken, and notes that the lack of such information prevents Peru from applying properly the relevant equations in the 2006 IPCC Guidelines (vol. 4, chap. 2), which require information on carbon stocks of the initial and final land use. As a result, emissions from deforestation may be overestimated. As such, the AT considers this an area for future technical improvement.

25. During the TA, the AT sought clarification on the observed period mentioned in the Party's definition of deforestation (see para. 11 above). Peru clarified that the observed period refers to the historical period 2010–2019 used as the FREL reference period, from which deforested areas were estimated annually. The AT acknowledges this clarification and noted that Peru corrected this by adding specific reference to 2010–2019 as the observed period in its modified submission. In addition, the AT considers that Peru may wish to continue including information on the observed period and the annual assessment of deforested areas in future FREL submissions in order to enhance the transparency of the definition. The AT considers this an area for future technical improvement. In response to another question raised by the AT related to the canopy threshold value, the Party indicated that the reduction in forest canopy refers to forest conversions that result in the forest canopy falling below 30 per cent and had improved the clarity of the canopy threshold value in the modified submission.

26. In accordance with the definition of deforestation, the construction of the FREL is based on estimates of historical emissions arising from the conversion of forests to cropland, grassland or settlements. Peru considers the conversion of forests to IPCC categories wetlands or other land as natural forest loss, which is induced mostly by landslides and river meanders. During the TA, the AT raised the question of whether some of these land-use changes could be ultimately human-induced rather than natural events, resulting, for example, from landslides and meanders caused by increased river flow following forest cover loss due to harvesting. The Party explained that the visual interpretation of the sample plots for each year of the reference period avoids such potential misinterpretation, and that when a land-use change is classified as deforestation, future changes to wetlands or other land are not double counted as natural forest loss. The AT welcomed and commends Peru for this explanation and notes that the risk of misinterpretation is indeed very low given the method used by Peru to derive AD.

27. The AT noted that, although the FREL is based on the average gross emissions from deforestation that occurred during the reference period 2010–2019, the submission describes an assessment of deforested areas being carried out for 2007–2019. The AT sought clarification on the rationale for assessing areas of deforestation for years prior to the reference period. Peru explained that annual areas of deforestation are estimated by photointerpretation of satellite images taken over the sample plots distributed in a systematic grid (see para. 28 below). This assessment is carried out for each year of 2007–2019 because of the desire to know the dynamics of changes in the Amazon biome and their trends for years prior to the reference period used in constructing the FREL. Moreover, 2007 was chosen as the base year when the analysis of forest degradation began. However, Peru considered that for the purpose of constructing the FREL, a historical reference period of 10 years, that is 2010–2019, was adequate according to its national circumstances. The AT welcomed this clarification and commends Peru for its ongoing efforts to assess emissions from forest degradation as part of the stepwise approach included in decision 12/CP.17, paragraph 10.

28. Peru derived AD through photointerpretation of satellite images of different resolutions over spatial sample units systematically distributed over the Amazon biome in a 5 km × 5 km grid. During the TA, the AT sought further information on the satellite images used, the period for which the images were used and the need to include RapidEye images for 2011–2012 to support the photointerpretation. In its modified submission, Peru provided a summary table (table 15) of the satellite imagery used, which came from Landsat 5, 7 and 8 (30 m resolution) for 2010–2019, RapidEye (5 m resolution) for 2011–2012, Sentinel 2 (10 m resolution) for 2017–2019 and Planet[28] (5 m resolution) for 2017–2019. In addition, supporting satellite imagery from Bing Maps, Mapbox, Yandex and Google Earth was used, when available. Owing to the higher resolution of the RapidEye images, Peru was able to derive more detailed information relating to IPCC land-use categories for 2011–2012. The AT appreciated the information provided and commends Peru for its efforts to improve the collection and analysis of AD. However, the AT notes that the photointerpretation was largely based on medium-resolution satellite images, complemented by high-resolution images when available. The AT considers that, given the method used to derive AD, the greater availability and use of higher-resolution satellite images for the entire reference period would reduce the uncertainty and increase the accuracy of the AD. Therefore, the AT considers this an area for future technical improvement.

29. During the TA, the AT sought clarification regarding the rationale behind developing EFs using two different data sources (see para. 21 above). Peru explained that the INFFS is the official data source for the EFs required for constructing the FREL. However, owing to challenges such as accessing certain sample plots, budget constraints and lack of qualified personnel, the number of sample plots measured was only 312. Further, the information on the sample plots used for constructing the FREL in 2015 was no longer available. Hence, in order to increase the sample size, Peru decided to use information available on the ForestPlots.net platform. The Party informed the AT of its ongoing efforts to overcome the above-mentioned challenges and continue with collecting information on the remaining INFFS sample plots. It also indicated that completion of the INFFS will remove the need to use supplementary information from ForestPlots.net. The AT welcomed the Party's intention to improve its EF data source. However, it notes that despite combining two data sources, the sample size for some ecozones remains small. For example, the EFs for *Selva Alta Accesible* were derived from only 33 sample plots. The AT considers that because of the extent and the internal variability that the ecozones show, small sample sizes could affect the representativeness of the EFs used to construct the FREL. The AT notes the completion of the INFFS as an area for future technical improvement (see also para. 30 below).

30. The AT also requested clarification on how the dasometric information from both data sources was applied in deriving EFs for each of the ecozones – in particular, the reasons for using a weighted average approach. Peru explained that the information available on ForestPlots.net introduces a bias as the aim of the platform is to collect information on mature, primary and intact forests. This also explains why the ecozone carbon stocks derived using information from this platform are higher than those derived from INFFS information.

[28] Provided under Norway's International Climate and Forests Initiative.

To reduce this bias, and to address the bias of the different sampling approaches of the two data sets, a weighted average using the inverse of the variance (Thomas and Rennie, 1987) was used to combine the data sets. The AT appreciated this information and agrees with the approach as an interim solution to the small sample size of the INFFS. However, the AT considers that the use of a larger sample size from a single source, such as the INFFS, would allow for more representative EFs to be developed. Thus, as noted in paragraph 29 above, the AT identifies the completion of the INFFS as an area for future technical improvement.

31. Regarding the accuracy of the EFs, the AT sought clarification on the potential impact of using allometric equations for estimating above-ground biomass without data on tree height. In addition, the AT noted that the same allometric equations were used for live and dead vegetation when estimating the above-ground biomass of trees, palms and lianas. Peru explained that it chose to use allometric equations that do not consider tree height as a parameter because of the lack of this information on the ForestPlots.net platform and incomplete information from INFFS. To compensate for the lack of tree height data, an environmental stress index was included in the allometric equations. Furthermore, to consider the difference in biomass between live and dead vegetation, the wood density of the dead vegetation was adjusted according to decomposition status (see para. 22 above). The AT commends Peru for this clarification and for its efforts to develop EFs that are the most accurate possible given the information available. However, the AT is of the view that the lack of tree height information and the application of the same allometric equations for live and dead vegetation to estimate above-ground biomass of trees, palms and lianas affect the accuracy of the carbon stock estimates of above-ground biomass and, ultimately, of the FREL. Therefore, the AT considers the enhancement of the estimation of carbon content in the above-ground biomass pool by using tree height information and separate allometric equations for live and dead standing vegetation to be an area for future technical improvement.

32. During the TA, Peru explained how the biomass of tree stumps was estimated using the volumetric equation of a cylinder. Upon a request of the AT, the Party shared information from the INFFS on the height of the stumps, which was used to derive their carbon stocks. The AT noted stump height values were a minimum of 0.3 m and a maximum of 18 m, which seemed unusual. Therefore, the AT sought clarification on how these stumps were differentiated from dead standing trees. Peru, acknowledging the atypical values, clarified that it faced difficulties in separating stumps from dead standing trees. To minimize the potential overestimation of biomass attributable to these atypical stump height values, the minimum height used to estimate the volume of the stumps was fixed at 1.35 m. The AT is of the view that this interim solution could underestimate the carbon stocks of dead standing trees and have an impact on the accuracy of the estimates of carbon stocks of the stumps. Therefore, the AT considers the enhancement of the estimation of carbon content in stumps and dead standing trees to be an area for future technical improvement.

33. The AT inquired about the rationale for and any potential impacts of the changes introduced since constructing the FREL submitted in 2015 (see para. 23 above). Specifically, the current FREL is based on the average emissions from deforestation during the reference period 2010–2019, while the previous FREL was based on linear projection of historical gross emissions from deforestation occurring in 2001–2014. Peru explained that a preliminary analysis of the data conducted before constructing the current FREL found that the linear extrapolation approach used in 2015 overestimated the area of deforestation for the years covered by the 2015 FREL. The AT welcomed this clarification and commends Peru for its efforts to assess the impact of the change, thus allowing it to select a more accurate approach for the current submission.

34. During the TA, the AT sought clarification on the rationale behind the new approach implemented by Peru to estimate the uncertainty of the FREL. Specifically, while the uncertainty assessment approaches applied for the current and previous FRELs both come from the 2006 IPCC Guidelines, the AT noted that the current FREL uses approach 1 (error propagation method), which involves addition of uncertainties, and the FREL from 2015 used approach 2 (Monte Carlo simulation). Peru explained that the reason it opted for approach 1 for the current FREL is that only two sources of uncertainty were known, one for the AD and one for the EFs. The Party indicated that it plans to implement approach 2 again for

uncertainty assessments when more sources of uncertainty are quantified. The AT welcomed this information and Peru's intention to assess and quantify other sources of uncertainty that affect the accuracy of the FREL. The AT considers the provision of more comprehensive information on the uncertainty of future FRELs an area for future technical improvement.

(b) Description of relevant policies and plans, as appropriate

35. Peru provided information on the national legal framework related to REDD+ readiness and implementation of REDD+ activities in the modified submission (section 2.3). This information focuses on the approval of the National Strategy on Forests and Climate Change in July 2016.[29] The main objective of the Strategy is to reduce GHG emissions due to forest loss and forest degradation and enhance the resilience of forest landscapes and communities. Its goals are aligned with Peru's nationally determined contribution 2030 targets. In addition, Peru included information on the implementation of the Strategy with support from the Governments of Germany and Norway. The AT commends Peru for providing information on relevant policies and plans related to REDD+ and on its efforts to develop and implement the National Strategy on Forests and Climate Change.

3. Pools, gases and activities included in constructing the forest reference emission level

36. According to decision 12/CP.17, annex, paragraph (c), reasons for omitting a pool or activity in constructing the FREL should be provided, noting that significant pools and activities should not be excluded.

37. The pools included in the Party's FREL are above-ground and below-ground biomass and dead organic matter (i.e. deadwood and litter). Emissions for soil organic carbon in mineral and organic soils arising from deforestation were not included. In its original submission, Peru excluded estimates of carbon stocks and associated emissions from deadwood on the forest floor and litter. The AT noted that according to decision 12/CP.17, annex, paragraph (c), significant pools and activities should not be excluded from the FREL and if they are, the reasons for their omission should be provided in the submission. As a result, in its modified submission, the Party included emission estimates for deadwood and litter. The AT commends Peru for including these additional carbon pools in its modified submission and for its efforts to meet the guidelines set out in decision 12/CP.17, annex, paragraph (c).

38. As a result of the technical exchange with the AT, Peru elaborated on the exclusion of emissions from soil organic carbon in the modified FREL submission. Given the importance of soil organic carbon, a point noted by the previous AT during the TA of the 2015 FREL, Peru carried out an analysis of emissions from deforested peatlands, but the preliminary results did not allow for the inclusion of emissions for this pool in the current submission. Owing to the difficulties in identifying peatlands using the maps available and in generating consistent AD, the Party considers there is a risk of overestimating emissions for these areas. The AT commends Peru for its ongoing efforts to collect information on emissions from soils with a view to including this pool in future FREL and/or FRL submissions. The AT noted that (1) given the high primary productivity of the forests in the Amazon biome, carbon content in soil is likely to be significant, (2) Peru stated in the submission that peatlands occupy a vast area of Peruvian Amazonia and (3) emissions from soil organic carbon from minerals soils were also excluded, for which Peru cited the lack of adequate data as the cause. The AT considers that significant carbon stocks are likely to be found not only in peatlands but also in other mineral and organic soils of the Amazon biome and is of the view that collecting data and information and estimating EFs for soil organic carbon in these soils could allow the inclusion of this pool in future FREL and/or FRL submissions. Therefore, the AT notes this as an area for future technical improvement.

39. Peru's GHG inventory for 2014, submitted in 2019 as part of its second BUR,[30] included information on emissions from mineral and organic soils resulting from the conversion of forests to cropland and grassland. During the TA, in response to a request for clarification on this matter, the Party informed the AT that the emissions reported in the GHG

[29] By supreme decree 007-2016-MINAM.

[30] Available at https://unfccc.int/BURs.

inventory were estimated using IPCC tier 1 methods and that because of the lack of country-specific data for estimating emissions from soil organic carbon, this pool was not included in the current FREL submission. The AT determined, from the information included in annex VII to the GHG inventory, that emissions from soils represent about 2.2 per cent of the emissions from deforestation estimated for 2014 in the current FREL. In addition, the AT noted that the emissions from soils included in the GHG inventory were derived using IPCC default factors and that they excluded emissions arising from the conversion of forest to settlements as well as emissions of non-CO_2 gases. Therefore, the AT considers that developing country-specific data would allow for a more accurate assessment of the significance of emissions from soil organic carbon and thereby allow Peru to meet the guidelines set out in decision 12/CP.17, annex, paragraph (c). Thus, the AT considers assessment of the significance of emissions from soil organic carbon and, if found to be significant, the inclusion of this pool in future FREL and/or FRL submissions to be areas for future technical improvement.

40. The AT acknowledges that Peru included in its FREL the most significant activity (reducing emissions from deforestation) of the five activities identified in decision 1/CP.16, paragraph 70, in accordance with its national capabilities and circumstances. However, the AT noted that other activities could also be significant, in particular, reducing emissions from forest degradation. The Party provided information on its ongoing efforts to collect data that will allow it to assess and include emissions for this activity in future FREL submissions as part of the stepwise approach as well as to implement the corresponding area for improvement raised by the previous AT during the TA of the 2015 FREL. For example, Peru informed the AT during the TA that emissions from forest land remaining forest land that were included in its second BUR (2019) were used as a proxy to assess the impact of forest degradation, and it estimated that emissions from forest land remaining forest land represent 17 per cent of total GHG emissions when other inventory sectors are included, and 38 per cent of LULUCF sector emissions. The AT commends Peru for providing information relating to its plan to include emissions from forest degradation in future FRELs. The AT considers the inclusion of this activity to be an area for future technical improvement.

41. According to Peru's second BUR (2019), the category land converted to forest land was identified as a key category, representing a carbon sink of 25,155 Gg CO_2 in 2014. During the TA, Peru explained that the activity enhancement of forest carbon stocks was not included in the current FREL submission owing to the lack of data on biomass increment in the new forest areas. The Party also explained that as part of its plan to submit a national FREL in the future, it intends to include the activities reducing emissions from forest degradation and enhancement of forest carbon stocks. The AT commends Peru for providing information on its ongoing efforts to improve the FREL by extending the scope to cover the entire country and to include additional activities.

42. Peru included only gross CO_2 emissions from deforestation in the FREL. Emissions of non-CO_2 gases resulting from deforestation were excluded from the FREL. The AT noted that, according to the submission, 73 per cent of deforested areas underwent "slash and burn practices" and that such practices have shown a steady trend over the years. Taking into consideration the common use of slash and burn agriculture and its expansion into forested areas, the AT sought clarification on Peru's plan to include non-CO_2 gases in its future FRELs. The Party informed the AT that in its GHG inventory (2014), non-CO_2 emissions were estimated as 2,481.42 Gg CO_2 eq on the basis of the assumption that the entire area of forest converted to cropland or grassland is burned to clear vegetation. In addition, Peru informed the AT of its ongoing efforts to identify burned areas in the Amazon biome for 2001–2018. On this point, the AT noted that the estimated emissions from burned areas represent approximately 3.2 per cent of the emissions from deforestation in 2014. The AT commends Peru for its efforts to collect data that will allow a better assessment of the significance of non-CO_2 gases from deforestation. Noting that the use of fire is one of the drivers of deforestation in the country, the AT considers the treatment of non-CO_2 gases to be an area for future technical improvement so as to maintain consistency with the national GHG inventory.

4. Definition of forest

43. Peru provided in its submission the definition of forest used in constructing its FREL. The Party explained that the adopted definition is based on the country's Law No. 29763 on Forestry and Wildlife and is aligned with the methodological framework of the INFFS. Forests are defined as ecosystems dominated by trees with an area greater than 0.5 ha, a minimum width of 20 m and at least 30 per cent canopy cover; this definition was chosen from an operational and functional standpoint. The Party also explained that, in Peruvian Amazonia, the predominant vegetation consists of woody trees with a minimum height of 5 m. This definition applies to natural and secondary forests and to forest plantations. The definition is different from that used by the Party for its national GHG inventory (2014), its reporting to FAO for the Global Forest Resources Assessment (2015) and its project activities on afforestation and reforestation under the clean development mechanism of the Kyoto Protocol.

44. In line with the new method used for estimating areas of deforestation in the current submission (see para. 23 above), Peru used a forest definition that differs from the one used in constructing the FREL submitted in 2015. In the current submission, a minimum width threshold of 20 m was added, and the minimum area was changed from 0.09 to 0.5 ha. The Party included a transparent explanation of the reasoning behind these changes in its submission (section 3.2), which included that the new minimum area is now consistent with that applied in the INFFS and that the method now used for estimating areas of deforestation does not require information at the pixel level, hence the 0.09 ha threshold applied in the previous submission is no longer necessary. During the TA, the AT requested clarification on the impact that the use of different forest definitions has on the estimation of areas of deforestation. In response, the Party informed the AT that:

(a) An assessment of the impact on estimates of forest area resulting from the different forest definitions applied was carried out. Peru explained that the size of forest area was estimated for 2019 using a minimum forest area threshold of 0.09 ha (i.e. one pixel) as was applied for the 2015 FREL and merging six pixels (equivalent to 0.54 ha) as a proxy for the minimum area threshold applied in the current FREL. The result of this assessment showed that the forest area for 2019 was 97,583 ha less when the 0.54 ha minimum area threshold was used to define forest compared with the former minimum area threshold of 0.09 ha;

(b) The AD used for the current FREL identify the land-use category of the 25 plots contained in a sample unit of 1 ha. Irrespective of the area that each plot represents, only those plots falling in patches of forest of 0.5 ha or greater, no matter whether the entire patch falls inside the sample unit or partly outside, are classified as forest, and consequently as deforestation, during the reference period.

45. Despite two assessment methods being used in estimating AD, the AT is of the view that the difference in the resulting forest area estimates, representing 0.14 per cent of the forest area in the Amazon biome in 2019, is not likely to have a significant impact on the areas of deforestation used for constructing the FREL. Moreover, the AT agrees with the Party's rationale for not using the minimum mapping unit of the satellite images as the threshold to define forests in the current submission. Finally, the AT acknowledges and welcomes the efforts of Peru to apply a minimum area threshold as part of the forest definition used for the current FREL, which ensures consistency with the forest definition used for the INFFS and that stipulated by national law. The AT commends Peru for this technical improvement.

46. The minimum canopy cover threshold applied to define forests in the current FREL submission is 30 per cent, which differs from the 10 per cent threshold applied in the INFFS. In addition, the INFFS uses a minimum tree height of 2–5 m, in line with the different forest types found in the arid and semiarid regions of the country and the Amazon biome. Furthermore, the Law on Forestry and Wildlife defines forests using a unique parameter: a quantitative canopy cover threshold of 10–25 per cent. The AT noted that differences in the forest definition used for the INFFS and the FREL could have an impact on the accuracy of the EFs as some of the dasometric information used to derive carbon contents could have been measured for areas defined as forests in the INFFS but not considered as forests for the

FREL. The AT considers consistency between the forest definition used for conducting the INFFS and for constructing the FREL to be an area for future technical improvement.

47. In line with decision 13/CP.19, annex, paragraph 2(g), the AT assessed the extent to which the FREL is consistent with the latest national GHG inventory included in the Party's second BUR (2019). Peru provided in its submission a clarification of the differences in the forest definition used under the reporting obligations referred to in paragraphs 43–44 above, and indicated that the forest definition used for the current FREL differs from that used for the GHG inventory because the latter used the forest definition applied in the 2015 FREL. Peru also provided additional information on its plan to ensure consistency of the forest definition between that used for the current FREL and future national GHG inventories. The AT welcomed this clarification and commends Peru for its efforts to ensure consistency of the forest definition across FREL and GHG inventory submissions. The AT considers this an area for future technical improvement.

48. Decision 12/CP.17, annex, paragraph (d), requires Parties to explain any differences between the forest definition used in constructing the FREL and the definitions used for other international reporting. The AT noted that, in line with this requirement, Peru included in its submission (table 4) the thresholds used to define forests under the various national and international reporting frameworks. The AT noted that the forest definition used by Peru for its reporting to FAO for the Global Forest Resources Assessment (2015) differs from the definition used in the current FREL submission (see paras. 43–44 above) in relation to the forest canopy threshold (which is 10 per cent in the Global Forest Resources Assessment) and the minimum width of forest (which is not a parameter used in the Global Forest Resources Assessment). The AT commends Peru for including this information in the submission and for sharing information during the TA on its plan to harmonize the forest definitions as part of the stepwise approach. The AT considers ensuring consistency of all parameters in the forest definition across all reporting frameworks to be an area for future technical improvement.

III. Conclusions

49. The information used by Peru in constructing its FREL for reducing emissions from deforestation is transparent, complete and in overall accordance with the guidelines for submissions of information on reference levels.

50. The FREL presented in the submission is Peru's second FREL. The previous FREL was submitted on 29 December 2015 and was subject to a TA in 2016; it covered the activity reducing emissions from deforestation for 2015–2020.

51. The FREL presented in the modified submission, for the reference period 2010–2019, corresponds to 78,927,827.50 t CO_2 eq/year.

52. The AT acknowledges that Peru included in its FREL the most significant activity, the most important forest biome and the most significant pools in terms of emissions from forests. The AT considers that, in doing so, Peru followed decision 1/CP.16, paragraph 70, on activities undertaken, and paragraph 71(b), on elaborating a subnational FREL as an interim measure, and decision 12/CP.17, paragraph 10, on applying the stepwise approach. The AT commends Peru for providing information on its ongoing work to develop FRELs and/or FRLs for other activities, as well as for other forest areas of the country, as a step towards constructing a national FREL.

53. As a result of the facilitative interactions with the AT during the TA, Peru provided a modified submission that took into consideration the technical input of the AT. The AT notes that the transparency and completeness of the information provided were significantly improved in the modified FREL submission and commends Peru on its efforts. The new information provided in the modified submission, including the data made available online,[31] increased the reproducibility of the FREL calculations. The FREL in the modified submission is 4 per cent higher than that reported in the original submission.

[31] See annex 5 to the modified submission.

54. The AT notes that, overall, Peru did not maintain consistency, in terms of gases, pools and the forest definition used for its FREL, with those used for the GHG inventory for 2014 included in its second BUR (2019).[32]

55. Pursuant to decision 13/CP.19, annex, paragraph 3, the AT identified the following areas for future technical improvement:

(a) Determining the carbon stock of the land use that follows deforestation to allow the relevant equations from the 2006 IPCC Guidelines (vol. 4, chap. 2) to be properly used (see para. 24 above);

(b) Enhancing the transparency of the deforestation definition by including specific information on the observed period and the annual assessment applied to derive areas of deforestation (see para. 25 above);

(c) Using satellite images of high resolution to derive AD for all the years of the reference period (see para. 28 above);

(d) Continuing efforts to complete the field data collection of the INFFS (see paras. 29–30 above);

(e) Including information on tree height in the estimation of above-ground biomass and applying separate allometric equations for live and dead vegetation (trees, palms and lianas) to enhance the accuracy of the estimates (see para. 31 above);

(f) Continuing efforts to improve the information used for deriving carbon stocks in dead standing trees and tree stumps in order to enhance their accuracy (see para. 32 above);

(g) Assessing all possible sources of uncertainty to enhance the accuracy of the FREL and providing comprehensive information on the uncertainties associated with future FRELs (see para. 34 above);

(h) Harmonizing the different forest definitions used for various reporting processes, such as the FREL, INFFS, FAO Global Forest Resources Assessment and national GHG inventory, and as adopted in national law (see paras. 46–48 above).

56. Pursuant to decision 13/CP.19, annex, paragraph 2(f), in assessing the pools and gases included in the FREL, the AT noted that some of the activities, pools and gases excluded by Peru are likely to be significant in the context of the FREL. Pursuant to decision 13/CP.19, annex, paragraph 3, the AT identified the following areas for future technical improvement regarding pools and gases excluded from the FREL:

(a) Collecting data and information, especially country-specific, that would allow the inclusion of emissions from soil organic carbon in mineral and organic soils in future FRELs or FRLs, or the assessment of the insignificance of such emissions in order to justify the exclusion of this pool from the FRELs or FRLs (see paras. 38–39 above);

(b) Continuing efforts to obtain information that would allow the inclusion of the activity reducing emissions from forest degradation in future FRELs (see para. 40 above);

(c) Continuing efforts to obtain information for estimating carbon stocks in land converted to forest land that would allow the inclusion of the activity enhancement of forest carbon stocks in future FRELs or FRLs (see para. 41 above);

(d) Continuing efforts to obtain information on emissions of non-CO_2 gases resulting from deforestation (see para. 42 above);

(e) Continuing efforts to enhance consistency between the information included in the FREL and in the GHG inventory (see paras. 39, 42 and 47 above).

57. The AT acknowledges and welcomes the Party's intention to:

(a) Include emissions from forest degradation in future FRELs when adequate data are available;

(b) Continue with collecting field data under the INFFS;

[32] In reference to the scope of the TA, as per decision 13/CP.19, annex, para. 2(a).

(c) Identify and quantify additional sources of uncertainty, and then apply approach 2 from the 2006 IPCC Guidelines to estimate the overall uncertainty of future FRELs;

(d) Include emissions from soil organic matter in future FRELs, as part of the stepwise approach;

(e) Ensure consistency between the forest definitions used for the FREL and future national GHG inventories.

58. In conclusion, the AT commends Peru for showing strong commitment to continuously improving its FREL estimates in line with the stepwise approach. A number of areas for the future technical improvement of Peru's FREL have been identified in this report. At the same time, the AT acknowledges that such improvements are subject to national capabilities and policies, and notes the importance of providing adequate and predictable support.[33] The AT also acknowledges that the TA was an opportunity for a rich, open, facilitative and constructive technical exchange of information with Peru.

59. The table contained in annex I summarizes the main features of Peru's proposed FREL.

[33] As per decisions 13/CP.19, annex, para. 1(b); and 12/CP.17, para. 10.

Annex I

Summary of the main features of the proposed forest reference emission level based on information provided by Peru

Main features of the FREL		*Remarks*
Proposed FREL	78 927 827.50 t CO_2/year	Includes gross emissions from deforestation and excludes any subsequent emissions and removals (see para. 10 of this document)
Type and reference period of FREL	FREL= average of historical emissions in 2010–2019	See paragraph 10 of this document
Application of adjustment for national circumstances	No	–
National/subnational	Subnational	The FREL covers the Amazon biome (see paras. 8–9 of this document)
Activity included	Reducing emissions from deforestation	Deforestation is defined as the conversion of forest land to cropland, grassland or settlements induced by a reduction of the forest canopy to below 30 per cent in an area of 0.5 ha according to the observed period between 2010 and 2019. It excludes natural forest loss (i.e. defined as the conversion of forests to wetlands or other land) (see para. 11 of this document)
Pools included	Above-ground biomass Below-ground biomass Deadwood Litter	Soil organic carbon in mineral and organic soils was excluded (see para. 38 of this document)
Gas included	CO_2	Emissions of non-CO_2 gases from deforestation were excluded (see para. 42 of this document)
Forest definition	Included	Forests are defined as ecosystems dominated by trees with an area greater than 0.5 ha, a minimum width of 20 m and at least 30 per cent canopy cover. This includes natural and secondary forests and forest plantations (see paras. 43–44 of this document)
Consistency with latest GHG inventory	Methods used for estimating the FREL are not consistent with those used for the latest GHG inventory (2014)	The forest definition, carbon pools and gases included in the 2014 GHG inventory are not consistent with those in the FREL (see paras. 39, 42 and 47 of this document)
Description of relevant policies and plans	Included	Peru provided information on the legal and policy frameworks related to REDD+ readiness and implementation (see para. 35 of this document)
Description of assumptions on future changes to domestic policy, if included in constructing the FREL	Not applicable	–
Description of changes to previous FREL	Included	Peru provided a transparent description of changes since the previous FREL (see para. 23 of this document)
Identification of future technical improvements	Included	Several areas for future technical improvement have been identified (see paras. 55–56 of this document)

Annex II

Reference documents

A. Reports of the Intergovernmental Panel on Climate Change

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"Guidelines and procedures for the technical assessment of submissions from Parties on proposed forest reference emission levels and/or forest reference levels". Annex to decision 13/CP.19. Available at https://unfccc.int/sites/default/files/resource/docs/2013/cop19/eng/10a01.pdf#page=36.

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C. Other documents

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