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Report on the technical assessment of the proposed forest reference emission level and forest reference level of Costa Rica submitted in 2025

Summary

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

For its submission, Costa Rica developed a national FREL/FRL. The FREL/FRL presented in the original submission, based on the reference period 2010–2019, corresponds to –592,127 tonnes of carbon dioxide equivalent per year. As a result of the facilitative process during the technical assessment, the FREL/FRL was modified to 76,938 tonnes of carbon dioxide equivalent per year.

The assessment team notes that the data and information used by Costa Rica in constructing its FREL/FRL are transparent, complete and in overall accordance with the guidelines contained in the annex to decision 12/CP.17. This report contains information on the assessed FREL/FRL 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.

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AD	activity data
AT	assessment team
BTR	biennial transparency report
CH_4	methane
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
IPCC	Intergovernmental Panel on Climate Change
N_2O	nitrous oxide
NFI	national forest inventory
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 submission of Costa Rica on its proposed FREL/FRL,[1] submitted on 7 January 2025, in accordance with decisions 12/CP.17 and 13/CP.19. The TA took place from 24 to 28 March 2025 and was coordinated by the secretariat.[2] The TA was conducted by the AT, consisting of two land use, land-use change and forestry experts from the UNFCCC roster of experts:[3] Takayuki Ishikawa (Japan) and Tracy Smith (Guyana). The Consultative Group of Experts was invited to participate in the TA as an observer[4] but no representative was available. The TA was coordinated by Luca Birigazzi (secretariat).

2. In response to the invitation of the COP and in accordance with the provisions of paragraphs 7–15 of and the annex to decision 12/CP.17, Costa Rica submitted its proposed FREL/FRL on a voluntary basis. The proposed FREL/FRL is one of the elements[5] to be developed in implementing the activities referred to in paragraph 70 of decision 1/CP.16. Pursuant to paragraphs 1–2 of decision 13/CP.19 and paragraphs 7–8 of decision 14/CP.19, the COP decided that each submission of a proposed FREL/FRL, as referred to in paragraph 13 of decision 12/CP.17, shall be subject to a TA in the context of results-based payments.

3. The objective of the TA is to assess the degree to which the information provided by Costa Rica is in accordance with the guidelines for submissions of information on reference levels[6] and to offer a facilitative, non-intrusive, technical exchange of information on the construction of the FREL/FRL with a view to supporting the capacity of Costa Rica to construct and improve its FREL/FRL in the future, as appropriate.[7]

4. The TA of the FREL/FRL submitted by Costa Rica was undertaken in accordance with the guidelines and procedures for the TA of submissions from Parties on proposed FRELs and/or FRLs.[8] This report on the TA was prepared by the AT following the same guidelines and procedures.

5. Following the process set out in those guidelines and procedures, a draft version of this report was communicated to the Government of Costa Rica. The facilitative exchange during the TA allowed Costa Rica to provide clarifications and additional information, which were considered by the AT in preparing this report.[9] As a result of the facilitative interactions with the AT during the TA, Costa Rica provided a modified version of its submission on 28 April 2025, which took into consideration the technical input of the AT. The modifications improved the clarity and transparency of the submitted FREL/FRL. This TA report was prepared in the context of the modified FREL/FRL submission.

B. Proposed forest reference emission level and forest reference level

6. In paragraph 70 of decision 1/CP.16, 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/FRL proposed by Costa Rica, on a voluntary basis for a TA in the context of results-based payments, covers the activities reducing emissions from deforestation, reducing emissions from forest degradation and enhancement of forest carbon stocks, which are three

[1] The submission of Costa Rica is available at https://redd.unfccc.int/submissions.html?country=CRI.
[2] As per decision 13/CP.19, annex, para. 7.
[3] As per decision 13/CP.19, annex, paras. 7 and 9.
[4] As per decision 13/CP.19, annex, para. 9.
[5] See decision 1/CP.16, para. 71(b).
[6] Decision 12/CP.17, annex.
[7] Decision 13/CP.19, annex, para. 1(a–b).
[8] Decision 13/CP.19, annex.
[9] As per decision 13/CP.19, annex, paras. 1(b), 13 and 14.

of the five activities referred to in paragraph 70 of decision 1/CP.16. The FREL/FRL covers the entire national territory of Costa Rica with the exception of Cocos Island, which is 532 km from the country's continental territory and not subject to anthropogenic intervention. The FREL/FRL includes the emissions from deforestation associated with forest land conversion to other land uses, including both primary and secondary forest, with the former being defined as unmanaged (although if deforestation occurs in primary forest it is immediately classified as managed) and the latter as forest that has regenerated on previously disturbed land that was cleared for agricultural production or destroyed by natural disturbance events. It also includes emissions from forest degradation, defined as a decrease in canopy cover in primary forest, and average annual removals resulting from enhancement of forest carbon stocks in both primary and secondary forests. It excludes emissions and removals from primary forest areas located more than 500 m from roads and within protected areas (such as national parks and other forms of conservation area), and emissions associated with volcanic activity and river meandering, since only emissions assumed to result from anthropogenic activities are included. Enhancement of forest carbon stocks in secondary forest is defined as land converted to forest land, while enhancement of forest carbon stocks in primary forest is defined as an increase in canopy cover and is detected using the same methodology as that used to estimate emissions from forest degradation. For its submission, Costa Rica applied a stepwise approach to developing its FREL/FRL in accordance with paragraph 10 of decision 12/CP.17, which enables Parties to improve their FREL or FRL by incorporating better data, improved methodologies and, where appropriate, additional pools.

7. The FREL/FRL submitted by Costa Rica in the modified submission corresponds to 76,938 t CO_2 eq/year based on the reference period 2010–2019 (3,293,902 t CO_2 eq/year from deforestation, 2,443,599 t CO_2 eq/year from forest degradation and –5,660,563 t CO_2 eq/year from enhancement of forest carbon stocks).[10] The table contained in annex I summarizes the main features of the FREL/FRL presented in the modified submission, with the aim of accessing results-based payments for REDD+ activities, including reference period, territorial coverage and pools and gases included.

8. For constructing its FREL/FRL, Costa Rica used the 2006 IPCC Guidelines.

9. The AD for deforestation and enhancement of forest carbon stocks were obtained from land-use maps developed by the Ministry of Environment and Energy for 1985–1986 and 2019–2020 by counting the pixels of areas that remained in the same land-use category, or that were converted to other land uses, in a combined set of multi-temporal data. The AD for forest degradation were obtained from a systematic sample of visually interpreted plots within areas classified as forest land remaining forest land according to the land-cover map developed by the Ministry of Environment and Energy for 2012–2013. Changes in canopy cover were detected for each plot according to three degradation classes: intact forest (85–100 per cent forest cover), degraded forest (60–84 per cent forest cover) and very degraded forest (<60 per cent forest cover).

10. The EFs for deforestation of primary forest were obtained from Costa Rica's NFI and from scientific literature. Above-ground biomass carbon stocks in secondary forest (wet, rain, moist and dry) were obtained using growth models developed by Cifuentes (2008) and based on measurements of 54 plots in Costa Rica. For mangroves and palm forests, a linear function was used to calculate carbon stock as a function of age. EFs for forest degradation were obtained using ratios of above-ground biomass to canopy cover on the basis of measurements from 100 temporary field plots of all forest types.

11. The FREL/FRL proposed by Costa Rica is its second FREL/FRL submitted in the context of applying the stepwise approach. The previous FREL/FRL was submitted on 4 January 2016 and was subject to a TA in 2016; it covered the activities reducing emissions from deforestation and enhancement of forest carbon stocks based on the reference periods 1986–1996 and 1997–2009. It corresponded to 14,911,467 t CO_2 eq/year for 1986–1996 (17,064,070 467 t CO_2 eq/year from deforestation and –2,152,603 467 t CO_2 eq/year from

[10] In its original submission, Costa Rica proposed a FREL/FRL of –592,127 t CO_2 eq/year. The difference between the original and the modified submission is due mostly to updates to EFs and carbon stock values, and corrections to errors in formulas and links used in the Microsoft Excel calculation tool (see ID# 3 in the table below).

enhancement of forest carbon stocks) and 4,365,160 t CO_2 eq/year for 1997–2009 (8,590,840 t CO_2 eq/year from deforestation and –4,225,681 t CO_2 eq/year from enhancement of forest carbon stocks). The results for the previous FREL/FRL were therefore higher than the FREL/FRL proposed in the most recent submission (see finding ID# 14 in the table below for differences between the most recent FREL/FRL and the previous FREL/FRL).

12. The uncertainty of the FREL/FRL was estimated to be 445 per cent using a Monte Carlo simulation analysis involving 10,000 iterations (76,938 ± 342,269 t CO_2 eq/year). The sources of error included in the uncertainty analysis included sampling errors associated with the estimation of EFs for above-ground and below-ground biomass, deadwood and litter and the estimation of the change in the percentage of canopy cover in degraded and regenerated forest. For AD, error was calculated as the difference between pixel count predictions and bias-corrected area values, obtained through accuracy assessment of the relevant maps. The AT commends Costa Rica for reporting the results of the Monte Carlo analysis, which enhance the transparency of the FREL/FRL submission.

II. Technical assessment of the proposed forest reference emission level and forest reference level

13. The table below describes the findings from the TA of the data, methodologies and procedures used by the developing country Party under assessment in constructing its FREL/FRL within the scope of the TA in accordance with decision 13/CP.19 and its annex.

Findings from the technical assessment of the data, methodologies and procedures used by the developing country Party under assessment in constructing its forest reference emission level and/or forest reference level

Finding ID#	*Aspect of the scope of the TA (decision 13/CP.19, annex, para. 2)*	*Description of the issue, additional information shared by the Party during the TA and conclusion of the AT*	*Area for future technical improvement*
1	2(a) Consistency with the national GHG inventories	The AT noted that, overall, Costa Rica mostly maintained consistency in terms of sources of AD and EFs used for its FREL/FRL with those used for the GHG inventory included in its BTR1. In its original FREL/FRL submission, the Party listed a number of methodological differences between the FREL/FRL and the GHG inventory included in its second biennial update report, submitted in 2019, but did not provide information on the differences between the FREL/FRL and the GHG inventory included in its BTR1, submitted in 2024. During the TA, Costa Rica explained the key methodological differences between the FREL/FRL and the GHG inventory in its BTR1, which are due to the different scopes and specific requirements of the results-based payment initiatives that the country participates in: (a) The exclusion of harvested wood products, which are not mandatory for inclusion in carbon accounting for results-based payment initiatives, and CH_4 and N_2O emissions, on account of their insignificance, from the FREL/FRL; (b) The inclusion of emissions from forest degradation, and the deadwood and litter carbon pools in the FREL/FRL; (c) The estimation of carbon stocks in above-ground biomass of forest land using the asymptotic value of the equations developed by Cifuentes (2008), which are specific to Costa Rica, for the FREL/FRL and the re-calculation of forest carbon stocks using NFI results, involving a representative sample of 289 plots, for the FREL/FRL; (d) The calculation of annual average emissions from deforestation and annual average removals from enhancement of forest carbon stocks using a spreadsheet developed by the National Institute of Meteorology for the inventory; (e) The calculation of the uncertainty of the GHG inventory, including emissions from forestry and other land use, using error propagation equations according to approach 1 from the 2006 IPCC Guidelines. In its modified submission, Costa Rica included the explanation above and outlined the methodological differences between the FREL/FRL and the GHG inventory included in its BTR1. The AT considers that the additional information provided by Costa Rica in its modified submission increased the transparency of the proposed FREL/FRL.	The AT notes that maintaining consistency between the FREL/FRL and the corresponding estimates in the national GHG inventory is an area for future technical improvement of the FREL submission.
2	2(b) How historical data have been taken into account	The FREL/FRL was calculated as the average of historical emissions and removals in 2010–2019. In its submission, Costa Rica noted that it intended to use this FREL/FRL	

Finding ID#	*Aspect of the scope of the TA (decision 13/CP.19, annex, para. 2)*	*Description of the issue, additional information shared by the Party during the TA and conclusion of the AT*	*Area for future technical improvement*
		to obtain results-based payments for REDD+ activities for the implementation period 2020–2029.	
3	2(c) Approaches – accuracy	The carbon stock database and the tools used for calculating emissions from deforestation and forest degradation for the original FREL/FRL submission included a number of material errors and inconsistencies that affected the accuracy of the FREL/FRL. For its modified submission, Costa Rica revised its calculation tools and associated databases to address these issues. Key revisions include: (a) Correcting discrepancies and workbook links between the summary table of carbon stock derived from tree-level biomass values and the data in the plot summary file in the calculation tool; (b) Adjusting the carbon fraction applied to biomass data obtained from the NFI from 0.5 to 0.47 to align with the methodology applied for the calculation of other EFs; (c) Updating the carbon stock value for above-ground biomass in non-trees on grassland, which was incorrectly reported as 3.0 t carbon/ha in the original submission owing to a data entry error, to 4.10 t carbon/ha; (d) Correcting data entry errors for the canopy cover values from a field plot used to obtain the AD for forest degradation; (e) Correcting erroneous formulas in Excel spreadsheets used for estimating emissions from forest degradation. Following these revisions, the FREL/FRL value changed from –592,127 ± 598,048 t CO_2 eq/year (with an overall uncertainty of 101 per cent) to 76,938 ± 342,269 t CO_2 eq/year (with an overall uncertainty of 445 per cent). The AT commends Costa Rica for taking proactive steps towards addressing errors and inconsistencies in the calculation tools, thereby improving the accuracy of the FREL/FRL.	
4	2(c) Approaches – accuracy	Emissions and removals from forest degradation and enhancement of forest carbon stocks in primary forest were calculated by multiplying the percentage of canopy cover changes, visually interpreted using remote-sensed imagery, by ratios of above-ground biomass to canopy cover, calculated as the arithmetic mean of the ratios of above-ground biomass to the percentage of canopy cover values observed in 100 field plots. Costa Rica provided the data from these 100 field plots, including the results of an analysis of the linear relationship between canopy cover and above-ground biomass by forest type, in an Excel spreadsheet “Calculo_FE_041220.xlsx” referenced in the FREL/FRL submission. The AT commends Costa Rica for providing this supplementary information, which enhanced the transparency and completeness of the FREL/FRL.	The AT notes that improving the accuracy of the models used to estimate emissions from forest degradation and removals from enhancement of carbon stocks in primary forest, especially for wet and rain forests, is an area for future technical improvement that would increase the accuracy of the FREL/FRL submission.

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		The AT noted, however, that the coefficient of determination for the linear regression of above-ground biomass to canopy cover for wet forest and rainforest is 0.04, indicating that there is a very weak correlation between canopy cover and above-ground biomass. This suggests that increases or decreases in canopy cover do not necessarily correspond to increases or decreases in above-ground biomass values, potentially affecting the accuracy of the reported estimates. In addition, the reported regression analysis for wet forest and rainforest shows that the slope of the fitted line is 2.3, indicating that each 1 per cent increase in canopy cover corresponds to an estimated increase of 2.3 t CO_2/ha in above-ground biomass. However, the ratio of above-ground biomass to canopy cover used for the FREL/FRL was 4.9 t CO_2/ha, which is more than double the value indicated by the linear regression analysis. The AT notes that this might have led to an overestimation of changes in above-ground biomass for wet forest and rainforest.	
5	2(c) Approaches – transparency	The AT noted inconsistencies between the information reported in the text and in the tables in the original FREL/FRL submission, particularly regarding whether emissions from forest land remaining forest land in primary forest were included in the FREL/FRL, and inaccuracies in the mathematical formulas used for estimating AD for forest degradation and enhancement of forest carbon stocks, which did not account for the 500 m buffer in the calculations. During the TA, the Party clarified that emissions from forest land remaining forest land in primary forest were included in the FREL/FRL and that these inconsistencies and the inaccuracies in the mathematical formulas were corrected in the modified FREL/FRL submission.	
6	2(c) AD – transparency	The AT noted that neither the definition of primary forest nor the method for determining the proportion of primary and secondary forests at the beginning of the land-use change time series was clear from the FREL/FRL submission. During the TA, Costa Rica explained that primary forest was defined as forest land remaining forest land for 20 years. Moreover, the Party clarified that an ancillary map for 1978–1980 developed in 2013 was used to determine the proportion of primary and secondary forests at the beginning of the land-use change time series. This proportion was also applied for the 1985–1986 on the assumption that it had remained unchanged. The 1978–1980 map is composed of Landsat images from March 1975 to December 1979. However, the AT noted that the information provided by Costa Rica still lacked a description of how those images were used to create the 1978–1980 map.	The AT notes that including more detailed information on the definition of primary forest and the method for distinguishing between primary and secondary forests at the beginning of the time series, including the use of Landsat images for 1975–1979 to create a 1978–1980 ancillary map, is an area for future technical improvement that would increase the transparency of the FREL submission.
7	2(c) AD – transparency	The AT noted that variables for input and the parameters of the random forest algorithm used to generate the land-use maps were not described in the original FREL/FRL submission. During the TA, Costa Rica explained the parameters, predictor variables and data sources used in the random forest methodology, the script process and the validation and testing samples. This information was also included by the Party in its modified FREL/FRL submission.	

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		The AT commends Costa Rica for providing this additional information, which enhanced the transparency of the submission.	
8	2(c) AD – accuracy	Costa Rica, in its modified FREL/FRL submission, reported the results of an accuracy assessment of the land-use change map used to generate its AD by counting pixels. The analysis was conducted for three classes of land-use change: deforestation, stable forest and stable non-forest land converted to forest land. Reference values were derived from visual interpretation of the 10,325 plots from the National Land Use, Land Cover and Ecosystems Monitoring System sampling grid. The AT noted that the accuracy assessment for the AD for deforestation showed 59 per cent producer accuracy and 62 per cent user accuracy for the deforestation class (forest to non-forest). However, the AT noted that the AD used to construct the FREL/FRL were the pixel count estimates that were not corrected for bias. The percentage difference between the pixel count and bias-corrected estimates, as reported in table 11 of the original FREL/FRL submission, ranges from –40 per cent to 0.3 per cent for deforestation and from –51 per cent to 15 per cent for land converted to forest land, depending on the year analysed. In some years, the pixel count estimates for deforestation and land converted to forest land did not fall within the 90 per cent confidence interval of the bias-corrected estimates, while the pixel count estimate for stable forest did not fall within the confidence interval in any year. During the TA, Costa Rica explained that it was considering changing the method for estimating AD from a wall-to-wall approach to a sample-based approach with a view to enhancing the accuracy of the AD in the future. To this end, the Party conducted a preliminary analysis of land-use change from 1998 to 2019. A second phase of this analysis will be carried out, with the support of the World Bank Scaling Climate Action by Lowering Emissions programme, which will include implementing visual interpretation of land use and revising the process for calculating AD and uncertainty values using a sample-based approach. The AT commends the Party for taking proactive steps towards increasing the accuracy of future FREL/FRL submissions.	
9	2(c) AD – transparency	In its original FREL/FRL submission, Costa Rica did not explain the assumption that only emissions and removals from primary forest located no further than 500 m from roads were considered anthropogenic. During the TA, Costa Rica clarified that, according to current logging practices in Costa Rica and vehicular limitations, it assumed that anthropogenic emissions from primary forest occurred only in areas where logging was feasible, specifically areas no further than 500 m from roads accessible by logging trucks. In its modified submission, Costa Rica enhanced transparency by including this explanation. During the TA, the AT also sought clarification regarding the possibility that emissions from primary forest were	

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		underestimated in the FREL/FRL owing to the construction of new roads that were not accounted for in the map used for the FREL/FRL, which was developed in 2007. Costa Rica explained that, owing to forest regulations, there had been no significant increase in the construction of roads accessible by logging trucks since 2007. The AT commends Costa Rica for providing this additional information, which enhanced the transparency of the FREL/FRL submission.	
10	2(c) AD – transparency, accuracy	The AT noted that assuming all emissions produced within 500 m of roads and outside protected areas in primary forest were anthropogenic could lead to an overestimation of anthropogenic emissions and removals from primary forest. Decreases and increases in canopy cover within 500 m of roads can also be caused by natural disturbances, such as wind or storms, and natural growth. The AT noted that comparing emissions and removals occurring inside the 500 m buffer zone with those outside of it could help to assess the extent to which the observed carbon fluxes were attributable to anthropogenic or natural causes. The AT also noted that, since information on natural emissions and removals outside of the buffer zone was not reported, it is not possible to ascertain the extent to which this overestimation is significant. During the TA, Costa Rica stated that it will look for more robust ways of estimating emissions from forest degradation and removals from enhancement of forest carbon stocks within the 500 m buffer zone in primary forest. The AT commends Costa Rica for taking proactive steps towards identifying more robust methods for distinguishing anthropogenic causes of changes in canopy cover from natural ones within the 500 m buffer zone in primary forest.	The AT notes that reporting information regarding baseline emissions and removals from undisturbed forests and identifying more robust methods for distinguishing anthropogenic emissions and removals from natural ones in the 500 m buffer area in primary forest are areas for future technical improvement that would enhance the transparency and accuracy of FREL/FRL submissions.
11	2(c) AD – transparency	The AT noted that the number of sampling units analysed to carry out the accuracy assessment of the land-cover change maps varied between the monitoring periods, with 6,222 units used in 2014–2015, 10,325 units in 2016–2017 and 9,988 units in 2018–2019. During the TA, Costa Rica explained that the level 1 systematic grid of 10,325 points of the National Land Use, Land Cover Ecosystems Monitoring System was used for all accuracy assessments and that the total reference data points varied between the different periods owing to changes in the availability of high-resolution imagery for land-use interpretation during the entire monitoring period. The Party further explained that there was no clear correlation between the number of reference data plots and the estimated bias associated with deforestation and forest regeneration estimates. The Party stated that the results of the uncertainty analysis did not suggest that the AD uncertainty level was either over- or underestimated. Costa Rica explained that its access to high-resolution imagery had been increasing and that, in future, there will be fewer sampling points missing for monitoring periods of accuracy assessments.	

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		In its modified submission, Costa Rica clarified the reason why the number of sampling units varied between monitoring periods and how this might have influenced the uncertainty estimates. The AT commends Costa Rica for providing this additional information, which increased the transparency of the FREL/FRL submission.	
12	2(c) AD – transparency	In its original submission, Costa Rica classified its forest land as primary and secondary, and managed and unmanaged. The Party explained that secondary forest is land that transitioned to forest land during the historical reference period. During the TA, the Party clarified that primary forest is forest land that has remained forest land for 20 years or more. However, the AT noted that the proportions of primary and secondary forest along with managed and unmanaged areas in the permanent forest land sampled for degradation were not clear. Costa Rica explained that the permanent forest land sampled for degradation only included primary forest. Within that area, all land outside protected areas and within 500 m of a road accessible by logging trucks was considered susceptible to anthropogenic disturbance and was therefore included in the FREL/FRL. This area under anthropogenic influence represents 64 per cent of the total permanent forest area sampled for degradation. A total of 2,814 sample units were located within this area. In its modified submission, Costa Rica included a clearer description of how permanent forest land sampled for degradation had been classified as primary forest, as well as managed and unmanaged areas, and provided quantitative information on the proportion of sampled areas under each management category and their relation to the areas included in the FREL/FRL. The AT considers that the additional information provided by Costa Rica in its modified submission increased the transparency of the proposed FREL/FRL.	
13	2(d) Description of relevant policies and plans, as appropriate	In its modified FREL/FRL submission, Costa Rica included one table with information on the main international conventions and agreements ratified by the Party. The Party also included descriptions of its national REDD+ strategy policy and its legal framework on climate change and the forestry sector and for REDD+. It also provided information on implementing REDD+ according to the objectives of its national forest policies and programmes. The Party's national REDD+ strategy (for 2017–2025) serves as the cornerstone of its forest sector climate policy, aimed at reducing emissions from the forest sector, enhancing forest carbon stocks and promoting sustainable rural development. The strategy outlines six key policies: promoting low-carbon emitting production systems through agro-silvo-pastoral practices; increasing control of and preventing land-use change and forest fires to reduce illegal logging and improve fire management; incentivizing conservation and sustainable forest management through forest emission reduction contracts; restoring forest ecosystems and degraded landscapes through	

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		reforestation under the Payments for Ecosystem Services scheme; ensuring the active participation of Indigenous Peoples in REDD+ through targeted consultation and implementation plans; and ensuring technical readiness for REDD+ under the enabling conditions policy, including facilitating monitoring systems, stakeholder engagement and alignment with REDD+ safeguards. These policies are supported by Costa Rica's robust legal and institutional frameworks, such as the Forestry Law (Law 7575), the Organic Law of Environment (Law 7554) and specific executive decrees for compliance with REDD+. The policies align with broader national development priorities such as the Party's national development plans for implementing REDD+, its national decarbonization plan (2018–2050) and its nationally determined contribution.	
14	2(e) Changes to previously submitted FREL/FRL	In its original FREL/FRL submission, Costa Rica did not describe changes from previously submitted information in accordance with paragraph (b) of the annex to decision 12/CP.17. During the TA, and in its modified submission, the Party provided a summary of the changes from the previous FREL/FRL submission, identifying the inclusion of: (a) Emissions from forest degradation (2,443,599 t CO_2 eq/year), which was an area for future technical improvement identified during the TA for Costa Rica's first FREL/FRL submission; (b) An overall uncertainty calculation for the FREL/FRL using Monte Carlo simulation; (c) Revised versions of emission and removal calculation tools, which were updated on the basis of the validation and verification processes that the Party participated in, improving the estimation of emissions and removals. The AT commends Costa Rica for providing this additional information and for estimating the uncertainty associated with emission and removal estimates using approach 2 from the 2006 IPCC Guidelines, enhancing the transparency of the FREL/FRL submission. The AT concludes that the FREL/FRL proposed in the most recent submission differs from that in the modified 2016 FREL submission previously assessed owing mainly to the inclusion of the activity reducing emissions from forest degradation.	
15	2(f) Activities – conservation of forest carbon stocks and sustainable management of forests	The activities conservation of forest carbon stocks and sustainable management of forests were not included in the FREL/FRL. Pursuant to paragraph (c) of the annex to decision 12/CP.17, reasons for omitting an activity in constructing the FREL/FRL should be provided, noting that significant activities should not be excluded. Costa Rica, in its original FREL/FRL submission, noted that the estimated annual emissions caused by sustainable forest management equal about 44,729 t CO_2 eq/year and that they represent 1 per cent of the annual emissions from deforestation and forest	The AT notes that providing information justifying the omission of the activity conservation of forest carbon stocks is an area for future technical improvement of the FREL/FRL submission.

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		degradation observed during the reference period. Consequently, sustainable management of forests was not considered to be a significant source of emissions. With regard to emissions from conservation of forest carbon stocks, the AT requested clarification of the reasons for omitting the activity. In response, Costa Rica explained that, under the activity reducing emissions from forest degradation, the Party reported carbon flux in primary forests, including net emissions from illegal logging and carbon flux from sustainable management of forests and conservation of forest carbon stocks. The AT acknowledges that Costa Rica included in its FREL/FRL the most significant activities of the five activities identified in paragraph 70 of decision 1/CP.16, in accordance with its national capabilities and circumstances.	
16	2(f) Pools – soil organic carbon and harvested wood products	Soil organic carbon and harvested wood products were not included in the FREL/FRL. According to paragraph (c) of the annex to decision 12/CP.17, reasons for omitting a pool in constructing the FREL/FRL should be provided, noting that significant pools should not be excluded. During the TA, Costa Rica explained that harvested wood products are not a primary pool and, consequently, do not have to be included in carbon accounting for results-based payment initiatives. In its submission, Costa Rica explained that it plans to include soil organic carbon in future FREL/FRL submissions.	The AT reiterates the finding of the previous AT that the treatment of emissions from soil organic carbon (i.e. including the pool or providing more information justifying its omission) is an area for future technical improvement of the FREL/FRL.
17	2(f) Gases – CH_4 and N_2O	CH_4 and N_2O emissions from biomass burning were included in the estimates for forest conversion to cropland and grassland for 1986–1996. These emissions were excluded from the post-1996 estimates as the conversion of forest land was made illegal in 1997, which led to a dramatic decrease in slash-and-burn practices. As a result, it was assumed that such emissions did not occur after 1996. The AT noted that Costa Rica included CH_4 and N_2O emissions from biomass burning in the national GHG inventory included in its BTR1, including from forest land remaining forest land, providing a complete time series from 1990 to 2021. Consequently, excluding those emissions from biomass burning in forest land remaining forest land in the post-1996 estimates meant that the FREL/FRL was inconsistent with the national GHG inventory included in the Party's BTR1.	The AT reiterates the finding of the previous AT that the treatment of CH_4 and N_2O emissions from biomass burning (i.e. the inclusion of this pool or the provision of more information justifying its omission) is an area for future technical improvement of the FREL/FRL to maintain consistency with future GHG inventories.
18	2(g) Definition of forest	Costa Rica provided in its submission the definition of forest used in constructing its FREL/FRL. The definition is land with a minimum area of 1 ha and 30 per cent canopy cover from trees that exceed 5 m in height. The definition is the same as that used by the Party for its national GHG inventory and under the clean development mechanism but is different from that used by the Party for its reporting to FAO for the Global Forest Resources Assessment. The Party explained in its submission how and why it differs, specifically the minimum area (0.5 ha) and canopy cover (10 per cent). The definition used in constructing the	

Finding ID#	*Aspect of the scope of the TA (decision 13/CP.19, annex, para. 2)*	*Description of the issue, additional information shared by the Party during the TA and conclusion of the AT*	*Area for future technical improvement*
		FREL/FRL is also different from the national forest definition, as described in the Forestry Law (Law 7575), which refers to a minimum area of 2 ha; tree crown cover of 70 per cent; minimum tree height (unavailable); and a minimum number of trees of 60 per hectare. Costa Rica stated in its FREL/FRL submission that it considered it appropriate to maintain consistency across all GHG-related reports and, therefore, chose to use the forest definition used for the national GHG inventory and under the clean development mechanism. During the TA, Costa Rica explained that the plan of the Ministry of Environment and Energy is to harmonize the information used for reporting to FAO for the Global Forest Resources Assessment with the sources used for reporting to the UNFCCC, specifically through FREL/FRL submissions, technical annexes on REDD+ and BTRs, with a view to eliminating inconsistencies between the reports submitted by the Party to international organizations. The AT commends the Party for taking a proactive step towards adopting a forest definition that is consistent with that used for reporting to FAO for the Global Forest Resources Assessment.	

III. Conclusions

14. The FREL/FRL presented in the submission is Costa Rica's second FREL/FRL.

15. The FREL/FRL presented in the modified submission, based on the reference period 2010–2019, corresponds to 76,938 t CO_2 eq/year.

16. The AT acknowledges that Costa Rica included in its FREL/FRL the most significant activities and the most significant pools in terms of emissions from forests. The AT considers that, in doing so, Costa Rica followed paragraph 70 of decision 1/CP.16, on activities undertaken, and paragraph 10 of decision 12/CP.17, on applying the stepwise approach.

17. As a result of the facilitative interactions with the AT during the TA, Costa Rica provided a modified submission that took into consideration the technical input of the AT. The AT notes that the transparency of the information provided was significantly improved in the modified FREL/FRL submission and commends Costa Rica on its efforts.

18. Pursuant to paragraph 3 of the annex to decision 13/CP.19, the AT identified areas for future technical improvement (see the table above).

19. The information used by Costa Rica in constructing its FREL/FRL for reducing emissions from deforestation, reducing emissions from forest degradation and enhancement of forest carbon stocks is transparent, complete and in overall accordance with the guidelines for submissions of information on reference levels.

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

(a) Re-estimate AD using a sample-based approach for the time series;

(b) Differentiate between forest plantations and secondary forest, ensuring traceability of harvested plantation areas;

(c) Estimate removals using new growth models for palm forests and mangroves;

(d) Estimate soil organic carbon emissions.

21. In conclusion, the AT commends Costa Rica for showing strong commitment to continuously improving its FREL/FRL estimates in line with the stepwise approach. A number of areas for the future technical improvement of Costa Rica's FREL/FRL 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.[11] The AT also acknowledges that the TA was an opportunity for a rich, open, facilitative and constructive technical exchange of information with Costa Rica.

[11] 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 and forest reference level based on information provided by Costa Rica

Main features of the FREL/FRL		*Remarks*
Proposed FREL/FRL	76 938 t CO_2 eq/year	See paragraph 7 of this document. See also finding ID# 3 in the table in this document
Type and reference period of FREL/FRL	FREL/FRL = average of historical emissions and removals in 2010–2019	See paragraph 7 of this document. See also finding ID# 2 in the table in this document
Application of adjustment for national circumstances	No	
National/subnational	National	The FREL/FRL covers the entire national territory of Costa Rica with the exception of Cocos Island, which is 532 km from the country's continental territory and not subject to anthropogenic intervention
Activities included	Reducing emissions from deforestation Reducing emissions from forest degradation Enhancement of forest carbon stocks	See also paragraphs 6–7 of this document. See also finding ID# 15 in the table in this document
Pools included	Above-ground biomass Below-ground biomass Deadwood Litter	See finding ID# 16 in the table in this document
Gases included	CO_2	See finding ID# 17 in the table in this document
Forest definition	Included	See finding ID# 18 in the table in this document
Consistency with latest national GHG inventory	Methods used for estimating the FREL/FRL are mostly consistent with those used for the latest national GHG inventory	See finding ID# 1 in the table in this document
Description of relevant policies and plans	Included	See finding ID# 13 in the table in this document
Description of assumptions on future changes to domestic policy, if included in constructing the FREL/FRL	Not applicable	
Description of changes to previous FREL/FRL	Included	See finding ID# 14 in the table in this document
Identification of future technical improvements	Included	Several areas for future technical improvement have been identified (see finding ID#s 1, 4, 6, 10 and 15–17 in the table and para. 20 in this document)

Annex II

Reference documents

A. Reports of the Intergovernmental Panel on Climate Change

IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/2006gl.

B. UNFCCC documents

BTR1 of Costa Rica. Available at https://unfccc.int/first-biennial-transparency-reports.

First and second biennial update reports and national inventory reports of Costa Rica. Available at https://unfccc.int/BURs.

First modified FREL/FRL submission of Costa Rica. Available at https://redd.unfccc.int/submissions.html?country=CRI.

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

"Guidelines for submissions of information on reference levels". Decision 12/CP.17, annex. Available at https://unfccc.int/sites/default/files/resource/docs/2011/cop17/eng/09a02.pdf#page=19.

Report on the TA of the proposed FREL/FRL of Costa Rica submitted in 2016. FCCC/TAR/2016/CRI. Available at https://unfccc.int/resource/docs/2017/tar/cri.pdf.

C. Other documents

The following references may not conform to UNFCCC editorial style as some have been reproduced as received or as cited in the submission:

Cifuentes-Jara M. 2008. *Aboveground biomass and ecosystem carbon pools in tropical secondary forests growing in six life zones of Costa Rica*. Oregon State University.