



---

## **Report on the technical assessment of the proposed forest reference emission level of Cuba submitted in 2025**

### *Summary*

This report covers the technical assessment of the voluntary submission of Cuba 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 Cuba covers the activities reducing emissions from deforestation, sustainable management of forests and enhancement of forest carbon stocks, which are among the activities included in paragraph 70 of decision 1/CP.16.

For its original submission, Cuba developed a subnational FREL for its eastern region and part of its central region with the aim of transitioning to a national FREL in the future. The FREL presented in the original submission, based on the reference period 2014–2019, corresponds to 19,225,955 tonnes of carbon dioxide equivalent per year. As a result of the facilitative process during the technical assessment, the FREL was modified to 20,414,991 tonnes of carbon dioxide equivalent per year based on a reduced reference period (2014–2018), an expanded geographical coverage (the entire country) and the selection of different activities (conservation of forest carbon stocks was included in the original but not in the modified submission and reducing emissions from deforestation was included in the modified but not in the original submission).

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



## Abbreviations and acronyms

2006 IPCC Guidelines	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
AD	activity data
AT	assessment team
BCEF	biomass conversion and expansion factor for converting merchantable growing stock volume to above-ground biomass
BTR	biennial transparency report
CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> 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
GIS	geographic information system
HWP	harvested wood products
IPCC	Intergovernmental Panel on Climate Change
N <sub>2</sub> O	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 Cuba on its proposed FREL,<sup>1</sup> submitted on 17 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.<sup>2</sup> The TA was conducted by the AT, consisting of two land use, land-use change and forestry experts from the UNFCCC roster of experts:<sup>3</sup> Doru Leonard Irimie (Romania) and Thelma Krug (Brazil). The Consultative Group of Experts was invited to participate in the TA as an observer<sup>4</sup> but no representative was available. The TA was coordinated by Roman Payo (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, Cuba submitted its proposed FREL on a voluntary basis. The proposed FREL is one of the elements<sup>5</sup> 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, 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. Cuba provided its submission in Spanish.

4. The objective of the TA is to assess the degree to which the information provided by Cuba is in accordance with the guidelines for submissions of information on reference levels<sup>6</sup> 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 Cuba to construct and improve its FREL in the future, as appropriate.<sup>7</sup>

5. The TA of the FREL submitted by Cuba was undertaken in accordance with the guidelines and procedures for the TA of submissions from Parties on proposed FRELs and/or FRLs.<sup>8</sup> This report on the TA was prepared by the AT following the same guidelines and procedures.

6. Following the process set out in those guidelines and procedures, a draft version of this report was communicated to the Government of Cuba. The facilitative exchange during the TA allowed Cuba to provide clarifications and additional information, which were considered by the AT in preparing this report.<sup>9</sup> As a result of the facilitative interactions with the AT during the TA, Cuba provided a modified version of its submission on 29 July 2025, which took into consideration the technical input of the AT. The modifications improved the clarity and transparency of the submitted FREL, which expanded in scope from a subnational to a national FREL in line with the stepwise approach. This TA report was prepared in the context of the modified FREL submission. The AT commends Cuba for its efforts to incorporate the modifications suggested by the AT during the TA.

### B. Proposed forest reference emission level

7. 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 original FREL proposed by Cuba, on a voluntary basis for a TA in the context of results-

<sup>1</sup> The submission of Cuba is available at <https://redd.unfccc.int/submissions.html?country=CUB>.

<sup>2</sup> As per decision 13/CP.19, annex, para. 7.

<sup>3</sup> As per decision 13/CP.19, annex, paras. 7 and 9.

<sup>4</sup> As per decision 13/CP.19, annex, para. 9.

<sup>5</sup> See decision 1/CP.16, para. 71(b).

<sup>6</sup> Decision 12/CP.17, annex.

<sup>7</sup> Decision 13/CP.19, annex, para. 1(a–b).

<sup>8</sup> Decision 13/CP.19, annex.

<sup>9</sup> As per decision 13/CP.19, annex, paras. 1(b), 13 and 14.

based payments, covered the activities conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks. In the modified submission, Cuba included the activity reducing emissions from deforestation, removed the activity conservation of forest carbon stocks and maintained the other two activities, thus covering three of the five activities referred to in paragraph 70 of decision 1/CP.16. In response to a question from the AT regarding the reason for the change in activities, the Party explained that after conducting an internal review, it concluded that it presently lacks reliable data on managed protected forest areas (thus it excluded the activity conservation of forest carbon stocks) but does have verifiable data and appropriate methodologies for including in the FREL the activity reducing emissions from deforestation. The activity reducing emissions from forest degradation was not included in either submission owing to lack of accurate data. Emissions and removals from deforestation, sustainable management of forests and enhancement of forest carbon stocks were estimated considering the above- and below-ground biomass pools. Regarding gases, the original FREL included only CO<sub>2</sub>, whereas the modified submission also included non-CO<sub>2</sub> gases associated with forest fires. For its submission, Cuba applied a stepwise approach to developing its FREL 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.

8. The FREL submitted by Cuba in the modified submission corresponds to 20,414,991 t CO<sub>2</sub> eq/year based on the reference period 2014–2018.<sup>10</sup> The table contained in annex I summarizes the main features of the FREL 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.

9. For constructing its FREL, Cuba used the 2006 IPCC Guidelines.

10. The AD used in constructing the FREL were derived from visual interpretation of satellite imagery using Collect Earth Online and Google Earth Pro. The images were selected using a systematic sampling design covering the entire national territory. Cuba estimated changes in land cover from 2014 to 2018 using information derived from more than 5,590 parcels of land. The analysis focused on forest cover for the following categories: stable forest with trees remaining stable forest with trees; forest with no trees changed to forest with trees; forest with trees changed to forest with no trees; and forest with no trees remaining forest with no trees.

11. Net CO<sub>2</sub> removals from above- and below-ground biomass were estimated annually using the tier 2 approach from the 2006 IPCC Guidelines with some EFs being country-specific values derived from Cuba's ongoing NFI and some EFs being default values from the 2006 IPCC Guidelines (vol. 4, chap. 4, tables 4.4 and 4.7 for below- and above-ground biomass respectively). Wood densities and carbon fractions for forest plantations and natural forests were estimated using country-specific data, whereas for BCEF values and root-to-shoot ratios, Cuba used default values from the 2006 IPCC Guidelines (vol. 4, chap. 4, table 4.4). Mean annual biomass growth for each of the five forest categories considered in the FREL construction (natural coniferous forests, natural broadleaf forests, coniferous forest plantations, broadleaf forest plantations and mangroves) was estimated using the weighted average based on area and annual biomass growth of each subcategory within each category.

12. The FREL submission includes a summary of the uncertainties related to the sources of ADs and EFs used for total forest area, CO<sub>2</sub> removals in stable forests, total area affected by forest fires, GHG emissions from forest fires, volume of harvested fuelwood and emissions from harvested wood (section 7.3.2). The uncertainty associated with each source of AD or EFs is based on the standard deviation of the respective AD and EF values for each year. The uncertainty of the FREL (166,622.5 t CO<sub>2</sub> eq) represents approximately 0.81 per cent of the estimated FREL.

---

<sup>10</sup> In its original submission, Cuba proposed a FREL of 19,225,955 t CO<sub>2</sub> eq/year. The difference between the original and the modified submission is due mostly to the expansion in geographical scope (from subnational to national), the reduced length of the reference period (from 2014–2019 to 2014–2018) and the selection of different activities (conservation of forest carbon stocks was included in the original but not in the modified submission and reducing emissions from deforestation was included in the modified but not in the original submission).

## **II. Technical assessment of the proposed forest reference emission 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 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

<i>Finding ID#</i>	<i>Aspect of the scope of the TA (decision 13/CP.19, annex, para. 2)</i>	<i>Description of the issue, additional information shared by the Party during the TA and conclusion of the AT</i>	<i>Area for future technical improvement</i>
1	2(a) Consistency with the national GHG inventories	<p>The AT noted that, overall, Cuba did not maintain consistency, in terms of sources of AD and EFs used for its FREL, with those used for the national GHG inventory included in the BTR1 submitted on 31 December 2024. The AD used for the GHG inventory were obtained from statistics generated for the annual Forest Dynamics report, which are compiled and validated by the State Forestry Service, whereas for the FREL, the AD were obtained by visual interpretation of satellite imagery using Collect Earth Online and Google Earth Pro. Regarding EFs, because different forest classifications were used for the GHG inventory and the FREL, different EFs were used: for the FREL, weighted EFs were estimated for each forest category, whereas for the inventory, actual values were applied as EFs.</p> <p>During the TA, Cuba explained that it considers the differences in the AD and EFs from the various sources to be insignificant in terms of their impact on emissions and removals. However, the AT notes that consistency should be assessed in terms of the AD, EFs and methodologies used for the FREL and the latest national GHG inventory, not in terms of potential impact of any differences on emission and removal estimates. Cuba mentioned that it considers the AD, EFs and methods used for the FREL submission as more accurate than those used for the inventory and is thus seeking to ensure consistency by incorporating the former into the next GHG inventory. The AT commends the Party for this planned improvement to the GHG inventory.</p>	The AT notes that ensuring consistency in the methods, definitions, AD and EFs used in constructing the FREL and preparing the national GHG inventory is an area for future technical improvement of the FREL.
2	2(b) How historical data have been taken into account	<p>The AT noted that the FREL in the original submission was constructed using the average historical emissions and removals for 2014–2019. In the modified submission, Cuba proposed a different historical period, 2014–2018, explaining that the change was made to ensure the same duration for the estimation of emissions and removals in both the reference period and the crediting period (2019–2023); reflect representative conditions in terms of forest policies and institutional frameworks in place; and take advantage of the availability of satellite imagery (from Landsat and Sentinel). The FREL was constructed assuming the same value for removals for each year within each of the periods 2013–2015 and 2015–2017 and one single year 2017–2018. Cuba did not provide in the submission information regarding emissions and removals for 2013.</p> <p>During the TA, Cuba explained that satellite images prior to 2013 were used to estimate changes in AD if no relevant images were available for 2013. The AT noted that although Cuba did not include data for 2013 in the FREL submission, emission estimates for 2013–2015 were provided.</p>	The AT notes that describing all data used for constructing the FREL, including data on the reference year (2013) against which emissions and removals are estimated, is an area for future technical improvement of the FREL.
3	2(c) EFs – transparency	The AT noted that neither the original nor the modified FREL submission provides sufficient information on the sources of EFs used in constructing the FREL. For instance, in the original submission (table 7), Cuba reported annual CO <sub>2</sub> removal for mangroves as 5.9 t CO <sub>2</sub> /ha/year. In the modified submission (table 15), Cuba provided an annual CO <sub>2</sub> removal value of 4.1	The AT notes that providing information on and the sources for all EFs and the root-to-shoot ratio, fraction of carbon in above-ground

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
4	2(c) EFs – accuracy	<p>t CO<sub>2</sub>/ha/year, estimated using annual biomass growth for mangroves of 2 t biomass/ha/year; a root-to-shoot ratio of 0.2; and a carbon fraction of above-ground biomass of 0.47. The AT noted that the annual CO<sub>2</sub> removal of 4.1 t CO<sub>2</sub>/ha/year is lower than the CO<sub>2</sub> removals calculated using default data in the <i>2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands</i> (chap. 4, tables 4.3–4.6).</p> <p>During the TA, in response to a question from the AT, Cuba explained that the value used comes from validated national information, is considered to be more representative of Cuban conditions than the default value and is consistent with the value used for the national GHG inventory.</p> <p>The AT noted that in its original submission Cuba reported using a default BCEF value from the 2006 IPCC Guidelines (vol. 4, chap. 4, table 4.5) for the “Mediterranean, dry tropical, subtropical” climate zone for merchantable growing stock of 21–40 m<sup>3</sup> (1.9 t biomass/m<sup>3</sup>). However, the AT noted that this BCEF value is not consistent with the one used in the calculation spreadsheet provided by the Party during the TA (1.5 t biomass/m<sup>3</sup> wood volume). In the modified submission, this inconsistency was resolved, with Cuba using the default value of 1.9 t biomass/m<sup>3</sup> wood volume in its calculations. The AT commends the Party for addressing this inconsistency.</p>	<p>biomass and annual above-ground growth would increase the transparency of the FREL and is an area for future technical improvement of the FREL.</p>
5	2(c) EFs – accuracy	<p>The AT noted that Cuba reported in its submission using default values from the 2006 IPCC Guidelines for root-to-shoot ratio (vol. 4, chap. 4, table 4.4) for the “Humid tropical” climate zone. However, the AT noted that the default value for tropical moist deciduous forest in areas with above-ground biomass of less than 125 t/ha is 0.20 (range: 0.09–0.25), which differs from the value (0.27) reported in the calculation spreadsheet provided by the Party during the TA.</p>	<p>The AT notes that using the default values for the root-to-shoot ratio for the “Humid tropical” climate zone provided in the 2006 IPCC Guidelines is an area for future technical improvement of the FREL.</p>
6	2(c) AD – completeness	<p>The AT noted that in the original submission, information on areas of forest land and volumes of wood affected by harvesting of roundwood (for which the Party reported “0” for 2014–2015) and by fires (for which the Party reported “0” for 2016–2017) was not provided. In addition, the AT identified inconsistencies in the information provided for different wood uses between the submission and both the calculation spreadsheet and the written responses to the questions of the AT during the TA.</p> <p>During the TA, the Party acknowledged that significant areas and/or volumes could have been omitted in the calculation of biomass losses in forest land, thus leading to emissions being underestimated. In the modified submission, Cuba included some of the missing information and provided a complete time series of AD for both roundwood extraction and forest fires.</p> <p>The AT commends the Party for the improvements made in the modified submission but notes that significant categories of wood extracted, such as firewood, are still not included in the time series and that the values provided for roundwood extraction are low given the total national forest area.</p>	<p>The AT notes that ensuring that all relevant information (e.g. firewood extraction values, clarification of roundwood extraction values) is provided in the FREL submission and the correct values are used in the calculation of volume of woody biomass losses is an area for future technical improvement of the FREL.</p>

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
7	2(c) AD – accuracy	<p>During the TA, in response to a question from the AT regarding whether its estimates for mean annual above-ground biomass growth are gross or net, Cuba clarified that the estimates are net, given that they include emissions from natural mortality calculated by dividing forest carbon stock by its age. Cuba also confirmed that forest areas with less than 30 per cent canopy cover were not included in its calculation of emissions and removals.</p> <p>The AT noted that, while this calculation method is appropriate for even-aged forest plantations, it is only applicable to a limited extent to uneven-aged natural forests. The AT considers that estimating above-ground biomass growth in forest plantations and extrapolating it to estimate biomass growth in all forest areas may lead to an overestimation of removals and, consequently, of the FREL.</p> <p>The AT considers that using default values for mean annual above-ground biomass growth from the 2006 IPCC Guidelines or country-specific values based on parcels of land sampled as forest land would be a more suitable alternative to the Party's calculation approach.</p>	<p>The AT notes that revising the approach to estimate mean annual above-ground biomass growth of uneven-aged forests (moving away from the current approach of estimating the values on the basis of forest area and extrapolating them to estimate such values for all forest areas) is an area for future technical improvement of the FREL.</p>
8	2(c) Approaches – transparency	<p>Cuba included in the modified submission details of its uncertainty assessment.</p> <p>During the TA, the AT raised a question regarding why Cuba considered in the uncertainty assessment the standard deviation of the FREL calculated over the five-year reference period rather than the standard deviation of the estimated values from hypothetical 'real' values. In response, Cuba informed the AT that emission estimates were hypothetical because the AD used to calculate them were inferred from land samples and default EFs in some cases, assumed to be the same for each year as they were derived from weighted average values. The AT noted that, as such, the calculated standard deviation is already a hypothetical value.</p> <p>The AT considers that the Party's uncertainty assessment is not in line with the 2006 IPCC Guidelines (vol. 1, chap. 3, in particular 3.1.1), which requires the uncertainties of individual variables used to be estimated and aggregated to determine the total uncertainty.</p>	<p>The AT notes that revising the uncertainty assessment to ensure methodological consistency with the 2006 IPCC Guidelines (vol. 1, chap. 3) is an area for future technical improvement of the FREL.</p>
9	2(c) Subnational FREL/FRL	<p>Pursuant to paragraph 71(b) of decision 1/CP.16, Cuba developed in its original submission a subnational FREL that included Cuba's eastern region and part of its central region with the aim of transitioning to a national FREL incorporating all regions in the country in the future.</p> <p>During the TA, Cuba explained that as at the time of finalizing its original submission it had almost concluded the interpretation and processing of the relevant imagery for the remaining regions in the country, noting its plan to submit a modified FREL with national coverage in due course.</p> <p>The AT noted that the new national forest area provided in the modified FREL submission (section 2.1.3) is 3,269,492 ha for 2018, but that the summary table includes a forest area of 3,385,637 ha for the same year. In the same section, the Party also referred to 506,209 ha for areas that are considered to be national forests but are currently not forested, but the AT noted that this figure exceeds the difference between the amounts of 3,385,637 and 3,269,492 ha referred to above.</p>	<p>The AT notes that maintaining consistency in the reporting of Cuba's national forest area is an area for future technical improvement of the FREL.</p>

<i>Finding ID#</i>	<i>Aspect of the scope of the TA (decision 13/CP.19, annex, para. 2)</i>	<i>Description of the issue, additional information shared by the Party during the TA and conclusion of the AT</i>	<i>Area for future technical improvement</i>
		<p>In response to a question on this matter from the AT, Cuba explained that the area of 3,269,492 ha corresponds to the figure for 2018 reported in Cuban official statistics, while the figure of 3,385,637 ha comes from Collect Earth Online data for the same year and includes forested areas not reflected in official records. Cuba noted that the difference of 116,145 ha arises from differences in how each source of data identifies forest area. Cuba seeks to progressively transition to using satellite observation exclusively as the official source of information for its FREL.</p> <p>The AT commends Cuba for transitioning from a subnational FREL to a national FREL in the modified submission and for its ongoing efforts to increase the accuracy of its national forest area estimates.</p>	
10	2(d) Description of relevant policies and plans, as appropriate	Cuba described in detail in its submission (section 2.2) the legal and policy framework for forest management and climate change that has guided the country's actions to reduce emissions and increase removals from forests.	
11	2(f) Pools – deadwood, HWP, litter and soil organic matter	<p>The deadwood, HWP, litter and soil organic matter pools were not included in constructing the FREL. According to paragraph (c) of the annex to decision 12/CP.17, reasons for omitting a pool in constructing the FREL should be provided, noting that significant pools should not be excluded.</p> <p>During the TA, Cuba indicated that the reason for omitting those pools was lack of adequate data for generating estimates for them. The AT considers that exclusion of the pools was not adequately justified in the submission but commends the Party for its intention to gradually incorporate the omitted pools into the national GHG inventory, as reflected in the inventory improvement plan, with the aim of including them in future FREL submissions as part of the stepwise approach.</p> <p>The AT noted that the deadwood, litter and soil organic matter pools excluded by Cuba are likely to be insignificant in the context of the FREL because most forest land remained forest land and no significant conversions occurred during the reference period. The tier 1 method in the 2006 IPCC Guidelines (vol. 4, chaps. 4.2.2–4.2.3) assumes that carbon stock changes in the deadwood, litter and soil organic matter pools are zero in forest land remaining forest land. Regarding the HWP pool, the AT noted that the 2006 IPCC Guidelines (vol. 4, chap. 12) provide methodologies for assessing its significance and noted that, if significant, the Party could consider including this pool in the next FREL submission.</p>	The AT considers the treatment of the deadwood, litter and soil organic matter pools (i.e. either including tier 1 emission/removal estimates for these pools or providing information about their insignificance to justify their omission) to be an area for future technical improvement of the FREL.
12	2(f) Gases	The AT noted that CO <sub>2</sub> was the only gas considered in constructing the FREL in the original submission, although Cuba included in the estimated emissions losses from natural disturbances, such as forest fires. Considering there is specific guidance in the 2006 IPCC Guidelines (vol. 4, chap. 2.4) for estimating CH <sub>4</sub> and N <sub>2</sub> O emissions from forest fires, the AT considered that the Party could include CH <sub>4</sub> and N <sub>2</sub> O emissions in the modified FREL. The Party implemented this improvement in the modified submission.	

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
13	2(f) Activities – reducing emissions from forest degradation	<p>The AT commends Cuba for considering non-CO<sub>2</sub> emissions associated with forest fires (CH<sub>4</sub> and N<sub>2</sub>O), as well as GHG precursors (carbon monoxide and nitrogen oxides), in the modified FREL, thus enhancing its transparency.</p> <p>The activity reducing emissions from forest degradation was not included in constructing the original or the modified FREL. Pursuant to paragraph (c) of the annex to decision 12/CP.17, reasons for omitting an activity in constructing the FREL should be provided, noting that significant activities should not be excluded.</p> <p>During the TA, Cuba explained that degradation – caused by natural and anthropogenic drivers, including pests and diseases, invasive plant species, soil erosion, fires, hurricanes and illegal logging – is the main threat facing the country’s forests. The AT acknowledged Cuba’s efforts, as reported in the modified submission, to address forest degradation but noted that, despite those efforts, limited official information is available on the extent of forest degradation in the country and on potential measures to address it. Cuba mentioned that the only available information source on the harvesting of commercial roundwood is the Agroforestry Business Group. However, harvesting of commercial roundwood by members of the Group represents only a portion of the total harvested roundwood. The AT noted that data on areas affected by fires and hurricanes were included in the calculation spreadsheet provided with the modified FREL submission. In response, Cuba mentioned that despite that information being available, other data needed to estimate the associated emissions, such as the combustion factor, were unavailable. The AT noted that Cuba could apply the protocol for using expert judgment set out in the 2006 IPCC Guidelines (vol. 1, chap. 2, annex 2A.1) to estimate average damage due to forest fires (mass of above-ground biomass burned) and then apply equation 2.27 from the 2006 IPCC Guidelines (vol. 4, chap. 2) to estimate the corresponding emissions. A similar approach could be used to estimate damage and emissions from hurricanes and other disturbances.</p> <p>Although it did not include the activity reducing emissions from forest degradation in the modified FREL submission, Cuba followed guidance provided by the AT and included emissions from forest fires in constructing the modified FREL. The AT commends the Party for this improvement. The AT, considering emissions from forest degradation as a potentially significant activity, acknowledges the Party’s intention to improve future FREL submissions by including this activity in the FREL when new, more suitable data become available, as part of the stepwise approach.</p> <p>The AT notes that estimating emissions from forest degradation using the information available (either collected or obtained from expert judgment) will allow the significance of the activity to be estimated, better aligning the submission with the requirements in the annex to decision 12/CP.17.</p>	<p>The AT notes that including the activity reducing emissions from forest degradation in the FREL is an area for future technical improvement of the FREL, in particular if emissions from the activity are estimated to be significant.</p>
14	2(g) Definition of forest	<p>Cuba provided in its submissions the definition of forest used in constructing its FREL. The definition is an area of more than 0.5 ha, with minimum tree height of 5 m and at least 30 per cent canopy cover, not used predominantly for agriculture or livestock. Furthermore, Cuba</p>	<p>The AT notes that excluding areas that do not meet the forest definition thresholds from the</p>

<i>Finding ID#</i>	<i>Aspect of the scope of the TA (decision 13/CP.19, annex, para. 2)</i>	<i>Description of the issue, additional information shared by the Party during the TA and conclusion of the AT</i>	<i>Area for future technical improvement</i>
		<p>provided in its modified FREL submission a list of vegetation formations, areas and forest plantations that although considered as forest do not meet the canopy and/or height thresholds of the forest definition.</p> <p>During the TA, in response to a question from the AT, Cuba clarified that no measurements were carried out to delineate areas that do not meet the definition thresholds and noted that the status of those areas as forest or non-forest needs to be evaluated. Cuba is progressing in establishing its national forest monitoring system, supported by the NFI and the use of more precise monitoring tools, which will allow the identification and exclusion of non-forest areas presently included as forests in the FREL. The AT noted that the annual biomass growth applied to these vegetation types (1.05 t biomass/ha/year) is well below the factor used for broadleaf natural forests (3.55 t biomass/ha/year). The AT stresses the importance of re-evaluating the status of those areas, and their consideration as forest without meeting the forest definition, so as to increase the transparency and accuracy of the FREL.</p>	<p>construction of the FREL is an area for future technical improvement that would increase the transparency and accuracy of the FREL submission.</p>
15	2(g) Definition of forest	<p>The definition of forest used in the construction of the FREL is different from that used by the Party for its national statistics, the national GHG inventory included in the BTR1 and its reporting to FAO for the Global Forest Resources Assessment.</p> <p>During the TA, in response to a question from the AT, the Party explained how and why the definition differs, namely that the definition established under Cuban forestry law does not set thresholds for minimum area, tree height and canopy cover.</p>	<p>The AT notes that reconciling the forest definitions used domestically and for international reporting, or justifying the need for different definitions, is an area for future technical improvement of the FREL.</p>
16	2(h) Inclusion of future changes to policies	<p>Cuba did not include assumptions about future changes to domestic policies in constructing its FREL. This implies that Cuba did not expect any major changes to be made to its national policy framework guiding the country's efforts towards reducing emissions and increasing removals from forest land, particularly under the activity enhancement of forest carbon stocks.</p>	
17	2(i) Consistency of the FREL with the information and descriptions provided by the Party	<p>The AT noted that the information provided in the original FREL submission does not fully comply with the modalities contained in decision 12/CP.17 and its annex in that there are differences in the forest areas covered by the FREL submission and the national GHG inventory included in the BTR1 due to the FREL being limited to the eastern region and part of the central region of the country. In the original FREL submission, Cuba reported its assumption that similar estimates would be observed for the western region and remaining part of the central region. However, the AT considered that the information available in the submission was insufficient to make this inference.</p> <p>During the TA, Cuba provided additional information, including calculation spreadsheets, that gave the AT a more comprehensive overview of the submission. Furthermore, Cuba submitted a modified FREL, extending its coverage from subnational to national.</p>	

### III. Conclusions

14. The FREL presented in the modified submission, based on the reference period 2014–2018, corresponds to 20,414,991 t CO<sub>2</sub> eq/year.

15. The AT acknowledges that Cuba included in its FREL the most significant pools in terms of emissions from forests. The AT acknowledges that Cuba, in excluding the activity reducing emissions from forest degradation from the construction of its FREL, did so owing to lack of reliable data and notes that the Party indicated its intention to include this activity in future FRELs, referring to paragraph 10 of decision 12/CP.17 on applying the stepwise approach. However, the AT notes that as per paragraph (c) of the annex to decision 12/CP.17, significant activities should not be excluded from the construction of the FREL, and given that Cuba highlighted in the modified FREL submission that degradation is a major threat to its forests, the AT considers that exclusion of the activity reducing emissions from forest degradation could result in an underestimation of emissions. The AT commends Cuba for providing information on its intention to include the activity in its future FRELs, if significant.

16. As a result of the facilitative interactions with the AT during the TA, Cuba 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, which expanded in geographical scope from subnational to national and considered additional gases, namely non-CO<sub>2</sub> gases from forest fires. The AT commends Cuba for the changes introduced in the modified FREL and the provision of calculation spreadsheets.

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

18. The information used by Cuba in constructing its FREL for reducing emissions from deforestation, sustainable management of forests and enhancement of forest carbon stocks is mostly transparent (see finding ID# 3 in the table above), mostly complete (see finding ID#s 6 and 11 in the table above) and mostly in accordance with the guidelines for submissions of information on reference levels (see finding ID#s 1–2, 5, 7–9, 11 and 13–15 in the table above).

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

(a) Periodically conduct the NFI, which will be the primary activity under the national forest monitoring system (expected to be established by 2028), to ensure that up-to-date information on forests is used in future FREL submissions;

(b) Refine the procedures for collecting and analysing data for the Forest Dynamics report to ensure that the data are adequate for use in preparing the national GHG inventory, including by better identifying stable forests and the conversion of forests to and from other land-use categories, noting that following the establishment of the national forest monitoring system, improved methods for collecting AD tailored to the requirements of the inventory and future FREL submissions are anticipated to be implemented by 2028;

(c) Apply the most advanced tools available, including image interpretation techniques and GIS, to assess forest and non-forest areas and associated conversions;

(d) Gradually incorporate into the national GHG inventory, to the extent possible, data on activities and pools not yet included in the FREL;

(e) Extend the control of HWP to all forest management types, taking into account the established classification of forest types and the economic value of timber, including by collecting data associated with fuelwood extraction;

(f) Expand the monitoring of disturbances at the country level and assess their impacts on emissions and removals, by affected forest type, enabling forest degradation to be assessed for the entire country as part of preparing the national GHG inventory;

(g) Establish a process for conducting a nationwide assessment of the outcomes of actions taken to reduce or prevent forest degradation, increase the productivity of production forests and improve ecosystem services;

(h) Continue making efforts to develop country-specific EFs for forest and other land-use categories, taking into account different levels of canopy cover and biomass carbon stock;

(i) Move progressively towards replacing the gain–loss method used to estimate changes in carbon stock with the stock difference method, taking advantage of the information available from the NFI;

(j) Build and strengthen national capacity to combat climate change in general and improve the monitoring and evaluation of GHG emissions specifically.

20. Cuba identified the following capacity-building needs:

(a) Strengthening the national forest monitoring system, including by modernizing tools used for collecting data in the field in order to improve the precision of monitoring, introducing remote-sensing systems (GIS and software for satellite image analysis) and staff training;

(b) Enhancing the national GHG inventory by improving the methods for estimating emissions, the use of software and the calculation of uncertainties;

(c) Designing and implementing the National Forest Carbon Registry.

21. In conclusion, the AT commends Cuba 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 Cuba’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.<sup>11</sup> The AT also acknowledges that the TA was an opportunity for a rich, open, facilitative and constructive technical exchange of information with Cuba.

---

<sup>11</sup> 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  
Cuba**

	<i>Main features of the FREL</i>	<i>Remarks</i>
Proposed FREL	20 414 991 t CO <sub>2</sub> eq/year	–
Type and reference period of FREL	FREL = average of historical emissions and removals in 2014–2018	See also finding ID# 2 in the table in this document
Application of adjustment for national circumstances	No	–
National/subnational	National	See also finding ID# 9 in the table in this document
Activities included	Reducing emissions from deforestation Sustainable management of forests Enhancement of forest carbon stocks	See also finding ID# 13 in the table in this document
Pools included	Above-ground biomass Below-ground biomass	See also finding ID# 11 in the table in this document
Gases included	CO <sub>2</sub> (and, for forest fires, CH <sub>4</sub> and N <sub>2</sub> O)	–
Forest definition	Included	See also finding IDs# 14–15 in the table in this document
Consistency with latest national GHG inventory	Methods used for estimating the FREL are not consistent with those used for the national GHG inventory included in the BTR1	See also finding ID# 1 in the table in this document
Description of relevant policies and plans	Included	–
Description of assumptions on future changes to domestic policy, if included in constructing the FREL	Not applicable	–
Description of changes to previous FREL	Not applicable	–
Identification of future technical improvements	Included	Several areas for future technical improvement have been identified (see finding ID#s 1–3, 5–9, 11 and 13–15 in the table 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>.

IPCC. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Geneva: IPCC. Available at <https://www.ipcc-nggip.iges.or.jp/public/wetlands/>.

#### B. UNFCCC documents

BTR1 of Cuba. Available at <https://unfccc.int/first-biennial-transparency-reports>.

First biennial update report of Cuba. Available at <https://unfccc.int/BURs>.

First modified FREL submission of Cuba. Available at <https://redd.unfccc.int/submissions.html?country=CUB>.

First, second and third national communications of Cuba. Available at <https://unfccc.int/non-annex-I-NCs>.

“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>.

---