



Report on the technical assessment of the proposed forest reference level of Belize submitted in 2024

Summary

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

For its submission, Belize developed a national FRL. The FRL presented in the original submission, based on the reference period 2001–2020, corresponds to 0 tonnes of carbon dioxide equivalent. Belize proposed it with the aim of seeking results-based payments for net removals after considering all forest-related anthropogenic greenhouse gas emissions by sources and removals by sinks in the country (referred to as the zero FRL approach). As a result of the facilitative process during the technical assessment, the FRL was modified to –2,218,935 tonnes of carbon dioxide equivalent per year based on the reference period 2011–2020.

The assessment team notes that the data and information used by Belize in constructing its FRL 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 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	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
2019 Refinement to the 2006 IPCC Guidelines	<i>2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
AD	activity data
AT	assessment team
BUR	biennial update report
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
COP	Conference of the Parties
EF	emission factor
FREL	forest reference emission level
FRL	forest reference level
GHG	greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
LULUCF	land use, land-use change and forestry
N ₂ O	nitrous oxide
NC	national communication
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 Belize on its proposed FRL,¹ submitted on 10 January 2024, in accordance with decisions 12/CP.17 and 13/CP.19. The TA took place from 18 to 22 March 2024 and was coordinated by the secretariat.² The TA was conducted by the AT, consisting of two LULUCF experts from the UNFCCC roster of experts:³ Oswaldo Ismael Carrillo Negrete (Mexico) and Maxence Rageade (France). In accordance with paragraph 9 of the annex to decision 13/CP.19, the Consultative Group of Experts was invited to nominate one of its experts to participate in the TA as an observer. However, no representative of the Consultative Group of Experts was able to participate during the session. The TA was coordinated by Milan Dhungana and Keiichi Igarashi (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, Belize submitted its proposed FRL on a voluntary basis. The proposed FRL is one of the elements⁴ 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 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. Belize provided its submission in English. The submission is supported by supplementary information, namely a worksheet from Belize's foundational platform tool for the national GHG inventory covering the LULUCF sector and calculation of the FRL and REDD+ results, which enhances the transparency of the FRL.

4. The objective of the TA is to assess the degree to which the information provided by Belize is in accordance with the guidelines for submissions of information on reference levels⁵ and to offer a facilitative, non-intrusive, technical exchange of information on the construction of the FRL with a view to supporting the capacity of Belize to construct and improve its FRL in the future, as appropriate.⁶

5. The TA of the FRL submitted by Belize was undertaken in accordance with the guidelines and procedures for the TA of submissions from Parties on proposed FRELs and/or FRLs.⁷ 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 Belize. The facilitative exchange during the TA allowed Belize to provide clarifications and additional information, which were considered by the AT in preparing this report.⁸ As a result of the facilitative interactions with the AT during the TA, Belize provided a modified version of its submission on 21 January 2026, which took into consideration the technical input of the AT. The modifications improved the clarity and transparency of the submitted FRL. This TA report was prepared in the context of the data provided in the modified FRL submission.

B. Proposed forest reference 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

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

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

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

⁴ See decision 1/CP.16, para. 71(b).

⁵ Decision 12/CP.17, annex.

⁶ Decision 13/CP.19, annex, para. 1(a–b).

⁷ Decision 13/CP.19, annex.

⁸ As per decision 13/CP.19, annex, paras. 1(b), 13 and 14.

national circumstances, in the context of providing adequate and predictable support. The FRL proposed by Belize, 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, conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks, which are the five activities referred to in paragraph 70 of decision 1/CP.16. The FRL includes emissions and removals estimated using a land-based approach, with carbon stock changes calculated using the gain–loss method and all forest land considered managed. The five activities were not reported separately but were instead reported implicitly through the estimation of emissions and removals associated with land-use change, forest growth, forest disturbances and forest regrowth during the reference period. For its submission, Belize applied a stepwise approach to developing its 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.

8. The FRL submitted by Belize in the modified submission corresponds to $-2,218,935$ t CO₂ eq/year based on the reference period 2011–2020.⁹ The table contained in annex I summarizes the main features of the 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.

9. For constructing its FRL, Belize used the 2006 IPCC Guidelines, the 2019 Refinement to the 2006 IPCC Guidelines and the *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. As part of its submission, Belize provided the AT with Excel spreadsheets and the foundational platform tool for the LULUCF sector. The historical data for the reference period 2011–2020 are the annual average emissions and removals of CO₂, CH₄ and N₂O associated with deforestation and forest degradation, and net removals of CO₂ associated with conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks. The historical data were constructed using the gain–loss method from the 2006 IPCC Guidelines.

10. The AD used in constructing the FRL were obtained from annual land-use and land-use change assessments conducted on the basis of a spatially explicit sample-based methodology (IPCC approach 3 for 2000–2020 using the Land Use Assessment application developed by the Coalition for Rainforest Nations).

11. The EFs used in constructing the FRL were obtained from national forest inventories for country-specific values, and from research studies, the 2006 IPCC Guidelines, the 2019 Refinement to the 2006 IPCC Guidelines and the *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands* for default values, as well as from expert judgment.

12. The FRL proposed by Belize is its second FRL submitted in the context of applying the stepwise approach. The previous FRL was submitted on 14 January 2020 and was subject to a TA in 2020; it covered the activities reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stock based on the reference period 2001–2015 and corresponded to 4,606,875, 4,850,928, 5,094,981, 5,339,034 and 5,583,087 t CO₂ eq/year for 2016, 2017, 2018, 2019 and 2020 respectively. It was therefore higher than the FRL proposed in the most recent submission (see finding ID# 14 in the table below for differences between the most recent FRL and the previous FRL).

13. For most of the EFs used, uncertainties were estimated on the basis of national forest inventories, IPCC default values and research studies. Uncertainties were reported for some of the AD used, namely uncertainty associated with overall accuracy in interpreting sampling data (89 per cent). Uncertainties associated with AD sampling errors were not provided,

⁹ In its original submission, Belize proposed a FRL of 0 t CO₂ eq/year. The difference between the original and the modified submission reflects mainly a change in the approach to constructing the FRL (from defining the FRL as zero in order to seek results-based payments for net removals only to taking the historical average of forest-related emissions and removals) and a change in the reference period (from 2001–2020 to 2011–2020).

despite sampling errors often being the primary source of AD uncertainty. Total propagated uncertainties associated with emissions and removals were not provided.

II. Technical assessment of the proposed forest reference level

14. 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 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

<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 TA by 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, Belize did not maintain consistency, in terms of sources of AD and EFs used for the historical data reported in its FRL submission, with those used for the GHG inventory included in its NC4 owing to the use of new AD and EFs in constructing the historical data for the FRL. In view of the stepwise approach used by the Party and the use of updated and improved AD and EFs, the AT noted that consistency with previous submissions may not be feasible.</p> <p>During the TA, Belize reported that it will use the same AD and EFs for the historical data reported in its FRL submission for its upcoming biennial transparency report, thereby demonstrating a commitment to improving the consistency of its reporting over time.</p> <p>The AT acknowledged that Belize submitted its first biennial transparency report, including an updated national GHG inventory, on 31 December 2024, and noted that Belize ensured consistency between the AD and EFs used for the FRL submission with those used for that national GHG inventory. The AT commends Belize for its efforts.</p>	
2	2(c) Transparency – EFs	<p>The AT noted that the land classification used by the Party for the AD, as outlined in section 4.4 of the modified submission, is consistent with that used for the EFs applied to the same subcategories (level 2), as illustrated in table 24 of the submission, on carbon stocks by forest type. This alignment between the land classification system used for the AD and the EFs for the corresponding forest subcategories ensures a coherent and methodologically sound approach to calculating carbon stocks, and emissions and removals.</p> <p>The AT commends the Party for maintaining coherence in estimating emissions and removals.</p>	
3	2(c) Transparency – EFs	<p>The AT noted that, in the historical data provided by the Party, some of the sources of EFs were classified as IPCC tier 3 values for secondary broadleaf forest growth, which would usually be classified as tier 1 values. Additionally, the Party did not report a data source for dead organic matter in mature broadleaf forest in its submission.</p> <p>During the TA, the Party clarified that the classification of secondary broadleaf forest growth rate as tier 3 was due to a computational error within the GHG inventory. The Party confirmed that the values used aligned with IPCC tier 1 values, and not with tier 2 or 3 values as previously described.</p>	

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4	2(c) Transparency – EFs	<p>The AT acknowledges that the error in the GHG inventory tool was addressed and that appropriate tier classifications were applied in the modified submission. The AT commends Belize for correcting the relevant information in the modified submission.</p> <p>The AT acknowledges Belize’s efforts to develop country-specific emission and removal factors using data from a number of different national forest inventories and research studies. However, the AT noted that, as those forest inventories were undertaken for different objectives and periods and using different assumptions and methods, there might be several differences in relation to their technical features.</p> <p>With the aim of increasing transparency and completeness, the AT asked the Party to provide a detailed description of the assumptions (e.g. objective, period, random/target sample), methods (e.g. sample size, sample allocation, plot shape, plot size, information collated) and databases (at tree level) for each of the forest inventories used by the Party in preparing its submission to enable the AT to reproduce the country-specific emission and removal factors.</p> <p>During the TA, the Party provided a general description of the assumptions and methods used, agreed to provide a table with a detailed description of the assumptions (e.g. objective, period, random/target sample) and methods (e.g. sample size, sample allocation, plot shape, plot size, information collated) for each of the forest inventories used in preparing its submission and shared the reference documents used. The AT also asked the Party to share the raw forest inventory data used to estimate the EFs.</p> <p>The AT appreciates the additional information provided by the Party on its national forest monitoring system (2001–2020), which essentially includes the same information as contained in section 4.8.2 of Belize’s modified submission.</p>	<p>The AT notes that including detailed and comprehensive explanations of the assumptions and methods used for each forest inventory is an area for future technical improvement that would enhance the transparency of the FRL submission.</p>
5	2(c) Transparency and completeness – EFs	<p>The AT noted that, for 2001–2020, the average carbon removals in undisturbed forest remaining forest amount to 2,561,702 t CO₂ eq/year. The AT also noted that 79.7 per cent of the removals (relating to primary/mature broadleaf forest) were calculated using an EF obtained from a research study (which the Party considers to be a tier 2 method), while 19.8 per cent of the removals (relating to secondary broadleaf forest, mangroves and forest plantations) were calculated using EFs based on IPCC default values (equating to a tier 1 method). Considering the important contribution of primary/mature broadleaf forest to the total annual carbon removals, to assess the transparency, completeness and accuracy of the removal estimates, the AT requested that Belize clarify the number of plots used to estimate the EF for the annual growth rate for primary/mature broadleaf forests and provide supporting raw data. The AT also</p>	<p>The AT notes that including a detailed and comprehensive description of the assumptions and specific methods used to calculate the annual growth rate for estimating removals for primary and mature broadleaf forest is an area for future technical improvement of the FRL.</p>

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		<p>sought details about the sampling design and stratification criteria used to estimate the growth rate.</p> <p>In response to these requests, the Party explained that a total of 10 plots were used to estimate the annual growth rate for primary/mature broadleaf forest and the data used were from a study by Cho (2013b). Belize also shared a summary of the plot allocations and related methodologies used.</p> <p>The AT noted that the summary of the related methodologies used for the forest inventories shared by the Party is insufficient to clearly understand the specific inputs, methodologies and data used to estimate the annual growth rate for primary/mature broadleaf forest, which resulted in a lack of transparency. The AT also noted that the raw data used by the Party to estimate the annual growth rate for primary/mature broadleaf forest (which contributed to almost 80 per cent of removals in undisturbed forest remaining forest in 2001–2020) were not made available to the AT, which limited its assessment of completeness.</p> <p>During the TA, Belize clarified that the entirety of the national forest area has been affected by hurricanes and subsequent fires and, therefore, the annual growth rate used was representative of these conditions. It explained that the fact that there was no evidence of disturbances in some forest areas during the reference period does not mean that these forests had not been affected by hurricanes and fires in the past, but rather that they are still recovering. It noted that, overall, all forests in Belize are in constant turnover as a result of recurrent hurricanes and subsequent fires and, to a lesser extent, selective logging, as explained in Cho (2013a).</p> <p>To better understand the size of the area of primary/mature broadleaf forest affected by hurricanes and fires in Belize during the reference period and to assess the representativeness of the annual growth rate for estimating removals for primary/mature broadleaf forest, the AT asked the Party to provide an estimation of the area of forest affected by hurricanes and fires annually using the sample-based approach it used to estimate AD, given that each Collect Earth Online plot was labelled with information describing the specific natural disturbance and when it occurred. The Party explained that, despite having all the information needed to estimate the area of forest affected by hurricanes and fires over the last 20 years using a sample-based approach, additional analyses would need to be carried out that are beyond the scope of the FRL submission. The AT noted that this lack of quantitative information limits its ability to assess the representativeness of the annual growth rate for this type of vegetation.</p> <p>The AT noted that the 10 plots used to estimate the annual growth rate for primary/mature broadleaf forest are located in mature, hurricane-disturbed and/or selectively logged broadleaf forests in Belize, which means that the</p>	

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6	2(c) Transparency – EFs	<p>growth rate used for undisturbed primary/mature broadleaf forest could in fact be more representative of disturbed primary/mature broadleaf forest. This could result in an overestimation of the annual growth rate for primary/mature broadleaf forest for undisturbed forest remaining forest.</p> <p>The AT concludes that Party could improve the transparency and completeness of historical data reported in future submissions by comprehensively describing the assumptions and methods used to calculate the annual growth rate used for estimating removals for primary/mature broadleaf forest.</p> <p>The AT noted that, in section 4.8.2 of the submission, Belize explained the inputs used to estimate above-ground biomass for mature broadleaf forest. The AT noted that it understood the data used to estimate above-ground biomass in the table on emission and removal factors for forest land remaining forest land (with no disturbance) contained in a spreadsheet from the foundational platform tool for Belize’s national GHG inventory. To assess the transparency of the historical data used for the FRL, the AT requested the Party to share more details on the specific assumptions and methods used to calculate above-ground biomass for mature broadleaf forest, as well as to provide any available reference data for above-ground biomass for undisturbed mature broadleaf forest, in order to enable the AT to understand the saturation point of above-ground biomass for this forest type.</p> <p>During the TA, the Party explained that, for all forest types, including mature broadleaf forest, it sets a maximum number of years when applying the corresponding annual growth rates (i.e. 45 years for mature broadleaf forest, as shown in the aforementioned spreadsheet), which prevents the assumption of a perpetual accumulation of carbon in growing forests. Further, as part of the stepwise approach, Belize noted that it intends to make efforts to further understand the saturation point of above-ground biomass for mature broadleaf forest, and for this purpose it may develop growth accumulation curves as a future area for improvement, subject to sufficient financial and technical support. However, the Party explained that the unlimited saturation point approach was applied to the current submission.</p> <p>The AT welcomes the Party’s intention to develop growth accumulation curves in order to understand the saturation point of above-ground biomass for mature broadleaf forest.</p>	<p>The AT notes that including a comprehensive description of the assumptions and specific methods used to estimate stocks of above-ground biomass and emissions from undisturbed mature broadleaf forest is an area for future technical improvement that would enhance the transparency of the FRL submission.</p>
7	2(c) Transparency – EFs	<p>The AT noted that table 20 of Belize’s submission presents the tree and understory component for the fraction of biomass loss due to fires. Nevertheless, it was not clear to the AT how the “burn” percentage values were estimated or the reason for assuming that the proportion of below-ground biomass lost due to fires is the same as the proportion of above-ground biomass</p>	<p>The AT notes that including a rationale, scientific documentation or other relevant technical information supporting the application of expert judgment that equates the proportion of</p>

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8	2(c) Transparency – AD	<p>lost due to fires. The AT considers that equating the proportion of below-ground biomass lost due to fires with the loss of above-ground biomass due to fires may lead to an overestimation of emissions.</p> <p>During the TA, the AT requested the Party to provide information on the assumptions, methods and references used to estimate the “burn” percentage values, as well as its rationale for equating the proportion of below-ground biomass lost due to fires with the loss of above-ground biomass due to fires. In response, the Party explained that the assumptions, method (field observation) and references used to estimate the “burn” percentage values reported in table 20 for mature and secondary broadleaf forest were derived from national expert judgment.</p> <p>The AT considers that providing a detailed description of the rationale, assumptions and methods used for estimating the EFs for forest fires will help in reconstructing the emissions from forest fires and assessing the completeness of the historical data on GHG emissions shared by the Party.</p>	<p>below-ground biomass lost due to fires with the loss of above-ground biomass due to fires, or using field data and scientific studies to calculate the fraction of biomass lost due to fires, is an area for future technical improvement of the FRL.</p>
		<p>The AT noted that the methodology used for estimating AD through a sampling approach appears to be consistent overall. However, the AT noted that the interpretation process involved various sources of remote sensing data, which differed in availability across the time series.</p> <p>During the TA, the Party clarified how it managed the limitations associated with the availability of high-resolution satellite imagery. To compensate for these limitations, the Party augmented its analysis with additional remote sensing data sources and auxiliary data. These included the integration of various shapefiles of disturbances, such as those outlining the paths of hurricanes, as well as the use of heat maps and fire point data to enhance the detection of fire incidents.</p> <p>The AT concludes that the Party ensuring consistency in its use of data sources across the time series and relying on the same primary data source, where feasible, would enhance the comparability of estimates over time.</p>	<p>The AT notes that using the same data sources throughout the reported time series is an area for future technical improvement of the FRL.</p>
9	2(c) Transparency – AD	<p>The AT noted that for the historical data provided in its submission the Party transparently outlined the process of obtaining AD via a land-use and land-use-change assessment, using a spatially explicit sample-based methodology (IPCC approach 3) alongside the Land Use Assessment application.</p> <p>During the TA, the Party provided further clarification, specifying that the assessment of land use for each plot is conducted annually for the entire time series, and included this information in the modified submission.</p> <p>The AT commends Belize for this clarification of the methodology used to assess AD.</p>	

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10	2(c) Transparency and consistency – AD	<p>The AT noted that, regarding the historical data provided, significant improvements in the methodology used for analysing land use and land-use change compared with its previous reporting under national and international mechanisms resulted in AD for 2000–2018 that differ from the values reported in the Party’s NC4 and REDD+ technical annex to the first BUR submitted in 2021 for the same period. This discrepancy poses a challenge in maintaining consistency with the historical data and reporting frameworks as required by the modalities for FRELs and FRLs contained in decision 12/CP.17 and its annex.</p> <p>During the TA, the Party explained that the methodological advancements were aimed at enhancing the accuracy and reliability of land-use change data. The AT acknowledged that the differences between the newly generated AD and the previously reported values were due to the application of more precise and updated analytical techniques.</p> <p>The AT commends the Party for its significant methodological advancements in analysing land use and land-use change.</p>	<p>The AT notes that providing a clearer and more detailed explanation of the differences in AD used across national and international reporting frameworks to facilitate understanding of methodological changes in developing AD over time is an area for future technical improvement that would enhance the transparency and consistency of the FRL submission.</p>
11	2(c) Transparency and accuracy – AD and EFs	<p>The AT noted that Belize’s modified submission does not provide explicit information on the methodology used for estimating uncertainty, including uncertainty values for the EFs and estimates or descriptions of the uncertainties for the AD.</p> <p>During the TA, in response to questions raised by the AT on the methodology used for estimating uncertainties across REDD+ activities, pools and gases, Belize reported that its approach aligns with the guidance in decisions 4/CP.15 and 12/CP.17, which does not require reporting by specific activity in cases where Parties adopt a land-based approach aligned with the 2006 IPCC Guidelines. The Party indicated its ongoing efforts to estimate uncertainty for AD and EFs and the related error propagation in accordance with IPCC land-use classes, rather than by REDD+ activity.</p> <p>The AT concludes that the systematic reporting by the Party of the methodology used for estimating uncertainties of EFs and AD, as well as the associated uncertainty values, together with clear documentation of these elements, including by REDD+ activity where feasible, would facilitate a better understanding of the reliability of estimates.</p>	<p>The AT notes that elaborating and refining the methodology used for estimating uncertainties of EFs and AD, including the propagation of uncertainty in emission estimates, is an area for future technical improvement that would enhance the transparency and accuracy of the FRL submission.</p>
12	2(c) Completeness – Approaches	<p>In the original submission, Belize indicated a reference period of 2001–2020 for the construction of its FRL. For the modified submission, Belize changed its approach to developing its FRL (see finding ID# 19 below), resulting in a revision of the FRL from 0 t CO₂ eq/year to –2,218,935 t CO₂ eq/year. However, the AT noted that the modified submission does not explicitly indicate that the reference period had been revised to 2011–2020, with 2001–</p>	<p>The AT notes that explicitly reporting the reference period used to derive the FRL value in the submission is an area for future technical improvement that would enhance the completeness of the FRL submission.</p>

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13	2(d) Description of relevant policies and plans, as appropriate	<p>2020 still referred to in many places, which creates confusion regarding the reference period used to derive the FRL value.</p> <p>During the TA, Belize explained that the reference period applied in the modified submission is 2011–2020 and confirmed that the FRL value corresponds to the average of annual net emissions and removals over this period.</p> <p>The AT commends the Party for the clarification and concludes that the FRL value is consistent with the revised reference period applied for the modified submission.</p> <p>Belize included in its submission detailed information on its legal and policy frameworks to underscore its commitment to sustainable development and climate change mitigation. The Party outlined the country’s progression from working towards the Millennium Development Goals to ratifying the Paris Agreement in 2016, demonstrating national ownership of the Sustainable Development Goals. Belize has developed and implemented several key policy frameworks over the last decade aimed at fostering sustainable development and addressing climate change challenges. Notably, these frameworks include Horizon 2030, the National Energy Policy Framework, the Sustainable Energy Action Plan 2014–2033, the National Climate Resilience Investment Plan 2013, the Growth and Sustainable Development Strategy 2016–2019 and the National Climate Change Policy, Strategy and Action Plan 2015–2020. Furthermore, Belize updated its nationally determined contribution in 2020 and is in the process of reviewing existing policies, including those related to forests and land use, to enhance their effectiveness and alignment with national climate commitments. The Party’s submission also highlights a detailed policy review entitled “Legal and Institutional Framework for REDD+ implementation in Belize”, conducted by the Ministry of Sustainable Development, Climate Change and Disaster Risk Management, which provides policy guidance for the forest and land-use sector, among others.</p> <p>The AT commends Belize for including a description of relevant policies and plans in its FRL submission.</p>	
14	2(e) Changes to previously submitted FRL	<p>In its FRL submission, Belize described several methodological advancements and data enhancements for constructing the historical data compared with previously submitted information in accordance with paragraph (b) of the annex to decision 12/CP.17:</p> <p>(a) Belize transitioned from using the Open Foris and Collect Earth Desktop tool developed by the Food and Agriculture Organization of the United Nations to the more advanced Collect Earth Online tool and subsequently the Land Use Assessment application developed by the Coalition for Rainforest Nations,</p>	

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15	2(f) Activities	<p>enabling the use of a broader range of imagery and enhanced detection of land-use changes and disturbances, thus improving the accuracy and granularity of the AD;</p> <p>(b) The Party moved towards using national allometric equations and incorporating additional carbon pools such as deadwood and litter, providing a more precise estimation of forest carbon stocks;</p> <p>(c) With regard to the national GHG inventory tool, the Party implemented upgrades, including the introduction of macros for complex calculations to minimize human error, the integration of 2006 IPCC Guidelines directly within the tool’s functions and the inclusion of detailed classifications for disturbances and land-use changes, leading to a more accurate and efficient land-use assessment process.</p> <p>During the TA, Belize explained the improvements in its methodology and data sources, providing clarity on the advancements since its first FRL submission. It also clarified that, for its first FRL (2020), it adopted the inter-annual variability provision from the 2019 Refinement to the 2006 IPCC Guidelines (vol. 4, chap. 2.6), to distinguish between natural and anthropogenic emissions and removals; however, in line with the 2019 Refinement to the 2006 IPCC Guidelines, all land was monitored, which enabled a comparison with the current FRL since information on national territory was provided in both submissions. Belize further noted that the definition of managed land in its current FRL submission is considered to cover a wider range of management practices than previously, including management of hurricane- and fire-affected areas.</p> <p>The AT concludes that the historical data reported in the most recent submission differ from those reported in Belize’s first FRL submission (2020) owing to the incorporation of new AD and EFs, the inclusion of new pools, the consideration of all land as managed and the use of a different approach for calculating emissions and removals, namely on the basis of historical data. By doing so, Belize addressed several areas for technical improvement identified during the previous TA, especially regarding AD, EFs and the methodology used for the GHG inventory. However, the AT observed that classifying all forest land as managed significantly limits the ability to perform a consistent comparative analysis of historical data provided in the most recent submission with the previous submission.</p> <p>In its modified submission, Belize indicated that it included all five activities identified in paragraph 70 of decision 1/CP.16 in constructing historical emissions, electing to report a consolidated historical data value for all emissions and removals across these activities, but did not report emissions and removals for each separate activity.</p>	<p>The AT reiterates the finding of the previous AT that providing disaggregated information on emissions and removals by REDD+ activity, where feasible, in addition to</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 TA by the AT	Area for future technical improvement
16	2(f) Activities	<p>During the TA, The Party clarified that the consolidated value reported for emissions and removals, encompassing all five activities without disaggregating by individual activity, is based on a land-based methodology (managed land proxy) in accordance with the 2006 IPCC Guidelines. The AT understands that while the land-based approach inherently limits direct reporting by REDD+ activity, a more detailed breakdown could potentially be achieved by aligning the definition of REDD+ activities with IPCC land categories and subcategories as per the land-based approach. The AT notes that this alignment was undertaken by the Party for the REDD+ technical annex to the first BUR (table 3, depicting associated REDD+ activities, source categories and subcategories, along with emission estimates for 2016–2018).</p> <p>The AT noted and sought clarification on why the rationale used for the REDD+ technical annex was not extended to the historical data reported in the most recent FRL submission (in particular considering that the country used distinct definitions of REDD+ activities for labelling the plots identified through the Land Use Assessment application, according to its protocol for assessing land-use and land-cover change using the Collect Earth tool), which could be used to enhance the transparency of the Party’s reporting.</p> <p>According to Belize’s submission, the net balance of historical GHG emissions and removals includes net emissions from hurricanes and fires. The approach to accounting for emissions and subsequent removals associated with natural disturbances is provided in IPCC guidance (including the <i>2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol</i>, and the 2019 Refinement to the 2006 IPCC Guidelines). The inclusion of net emissions from hurricanes, fires and pests deviates from the methods proposed in the IPCC guidance and appears to contradict Belize’s intention to reflect net emissions in the accounting of REDD+ activities. The AT therefore requested the Party to clarify the reason for not subtracting net emissions from natural disturbances (hurricanes, fires and pests) and to provide disaggregated information on emissions and removals from anthropogenic and natural disturbances.</p> <p>During the TA, the Party clarified that it considers all disturbances, such as hurricanes, pests and fires, as anthropogenic activities under the managed land proxy, which means that there is no need to separately subtract net emissions and removals. While acknowledging that the 2019 Refinement to the 2006 IPCC Guidelines allows for inter-annual variability for Parties able to differentiate between natural and anthropogenic emissions, Belize emphasized that the 2019 Refinement to the 2006 IPCC Guidelines (vol. 4, chap. 1, p.1.5) reaffirms the applicability of the managed land proxy approach outlined in the 2006 IPCC Guidelines (vol. 1, chap. 1.1), which defines emissions and</p>	<p>consolidated estimates based on the land-based approach, is an area for future technical improvement that would enhance the transparency of the FRL submission.</p> <p>The AT notes, considering all disturbances are well labelled in the foundational platform tool, that disaggregating emissions and removals by anthropogenic and natural disturbance is an area for future technical improvement that would increase the transparency of the FRL submission.</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 TA by the AT	Area for future technical improvement
		<p>removals within managed land as inherently anthropogenic. By designating its entire national territory as managed land, Belize treats all emissions and removals as anthropogenic, rendering the subtraction of natural disturbances unnecessary.</p> <p>Belize further clarified that all land in the country was classified in terms of land use, land-use change and forest degradation. It pointed out that the worksheets on gains and losses from its foundational platform tool for the national GHG inventory contain information relating to the areas in which hurricanes, fires and other disturbances were observed. However, it noted that, since management of those areas occurs in the form of human intervention, all land in the country is considered managed, which is also in line with the managed lands proxy set out in the IPCC guidance.</p> <p>The AT noted that the 2019 Refinement to the 2006 IPCC Guidelines (vol. 4, chap. 2) considers it good practice for countries to apply the managed land proxy and estimate and report all emissions and removals that occur on managed land, and provides guidance on reporting disaggregated emissions and subsequent removals associated both with human activity and with natural disturbances within the total emissions and subsequent removal estimates using the managed land proxy.</p> <p>The AT noted that the Party did not provide in its modified submission information on disaggregated emissions and removals by anthropogenic and natural disturbance, noting instead that the information could be obtained directly from the foundational platform tool for the national GHG inventory. Owing to the complexity of the foundational platform tool, the AT was unable to obtain such information.</p>	
17	2(g) Definition of forest	<p>Belize provided in its submission the definition of forest used in constructing its historical data. The definition is a plot of land with a minimum area of 0.5 ha, with a tree height of 5 m or more and a canopy cover of at least 30 per cent. This definition also includes forest plantations and accommodates an ecosystem in which, owing to biotic conditions (e.g. terrain, soil type, rainfall), trees cannot grow taller than 5m. The AT acknowledges this inclusive forest definition, which includes forest plantations regardless of maturity and dwarf mangrove forests irrespective of the minimum height criterion.</p>	
18	2(g) Definition of forest	<p>The definition of forest used by Belize for its submission aligns with the definition used for the REDD+ technical annex to the Party's first BUR. However, this definition was not included in the Party's NC4, making it difficult to assess consistency across national reports. This raises questions about the alignment between the forest definitions used for the FRL submission and for the latest national GHG inventory reported in the NC4. Additionally, the</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 TA by the AT	Area for future technical improvement
19	Zero FRL approach	<p>AT noted that Belize's reporting to the Food and Agriculture Organization of the United Nations for the Global Forest Resources Assessment in 2020 does not include a forest definition, while that for 2015 defines forest as having a canopy cover threshold of more than 10 per cent, which differs from the definition in Belize's FRL submission of a canopy cover of at least 30 per cent.</p> <p>During the TA, the Party confirmed that the forest definitions used for its FRL submission and its latest national GHG inventory were aligned. Further, the Party noted that its reporting for the Global Forest Resources Assessment focuses on land cover, while the national GHG inventory and the FRL submission, which both use the same forest definition, focus on land use. Therefore, Belize uses different definitions to accommodate different types of forest monitoring.</p> <p>The AT noted that, in its original submission, Belize provided data and information on the estimation of historical anthropogenic GHG emissions by sources and removals by sinks, which it used to justify its zero FRL approach.</p> <p>The AT is of the view that, taking into consideration the annex to decision 12/CP.17, even significant changes in the data, methodologies and procedures used for estimating emissions and removals would not change the reported FRL value of 0 t CO₂ eq/year. The AT therefore concluded that a TA of the FRL value is not possible. In particular, the AT noted that the FRL value of 0 t CO₂ eq/year does not take into account historical data as required by paragraph 7 of decision 4/CP.15 and that it was not possible to reconstruct the FRL value in assessing completeness in accordance with paragraph 2(c) of the annex to decision 13/CP.19.</p> <p>Furthermore, the AT observed that the following aspects of the FRL cannot be assessed:</p> <ul style="list-style-type: none"> (a) The extent to which the FRL value of 0 t CO₂ eq/year maintains consistency with corresponding anthropogenic forest-related GHG emissions by sources and removals by sinks as contained in the national GHG inventories; (b) The pools, gases and activities included in the FRL; (c) The accuracy and uncertainty of the FRL. <p>As a result of the facilitative process during the TA, Belize provided a modified submission with a FRL developed using the average of historical net emissions and removals during the reference period 2011–2020. Consequently, the FRL value was revised from 0 t CO₂ eq/year to –2,218,935 t CO₂ eq/year. The AT commends Belize for the modified submission, which enabled the AT to complete the TA.</p>	

III. Conclusions

15. The FRL presented in the submission is Belize's second FRL.
16. The FRL presented in the most recent modified submission, based on the reference period 2011–2020, corresponds to –2,218,935 t CO₂ eq/year.
17. The AT acknowledges that Belize included in its FRL all REDD+ activities, the most important forest types and areas and the most significant pools in terms of emissions from forests. The AT considers that, in doing so, Belize followed paragraph 70 of decision 1/CP.16, on activities undertaken, and paragraph 10 of decision 12/CP.17, on applying the stepwise approach.
18. As a result of the facilitative interactions with the AT during the TA, Belize 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 FRL submission and commends Belize on its efforts. The new information provided in the modified submission, arising from the change in approach from a zero FRL to a FRL based on the historical average of forest-related emissions and removals, increased the reproducibility of the FRL calculations.
19. Pursuant to paragraph 3 of the annex to decision 13/CP.19, the AT identified areas for future technical improvement (see the table above).
20. The information used by Belize in constructing its FRL is mostly transparent (see finding ID#s 4–8 and 10–11 in the table above), mostly complete (see finding ID# 12 in the table above) and mostly in accordance with the guidelines for submissions of information on reference levels (see finding ID#s 10, 11, 15 and 16 in the table above).
21. The AT acknowledges and welcomes the Party's intention to:
 - (a) Apply the AD and EFs for the historical data reported in the FRL submission in its upcoming biennial transparency report;
 - (b) Develop growth accumulation curves for natural forests, ensuring more accurate and consistent estimates of forest growth;
 - (c) Work on estimating the uncertainty for the AD, EFs and related propagation by IPCC land-use class.
22. Belize identified the following capacity-building needs:
 - (a) Using machine learning and artificial intelligence to establish comprehensive wall-to-wall monitoring of forest cover;
 - (b) Enhancing institutional arrangements for data-sharing, which could be formalized to ensure smoother collaboration on the collection, sharing and archiving of relevant data;
 - (c) Conducting climate change related research as a priority;
 - (d) Building the capacities of national institutions in monitoring land-cover changes.
23. In conclusion, the AT commends Belize for showing strong commitment to continuously improving its FRL estimates in line with the stepwise approach. A number of areas for the future technical improvement of Belize's 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.¹⁰ The AT also acknowledges that the TA was an opportunity for a rich, open, facilitative and constructive technical exchange of information with Belize.

¹⁰ 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 level based on information provided by Belize

	<i>Main features of the FRL</i>	<i>Remarks</i>
Proposed FRL	-2 218 935 t CO ₂ eq/year	See also paragraph 8 of this document
Type and reference period of FRL	FRL = average of historical net emissions and removals in 2011–2020	See also paragraph 8 of this document
Application of adjustment for national circumstances	No	
National/subnational	National	
Activities included	Reducing emissions from deforestation Reducing emissions from forest degradation Conservation of forest carbon stocks Sustainable management of forests Enhancement of forest carbon stocks	See also finding ID#s 15–16 in the table in this document
Pools included	Above-ground biomass Below-ground biomass Deadwood Litter Soil organic carbon	
Gases included	CO ₂ , CH ₄ and N ₂ O	
Forest definition	Included	See also finding ID#s 17–18 in the table in this document
Consistency with latest national GHG inventory	Methods used for estimating the FRL are consistent with those used for the latest national GHG inventory (2024)	See also finding ID# 1 in the table in this document
Description of relevant policies and plans	Included	See also finding ID# 13 in the table in this document
Description of assumptions on future changes to domestic policy, if included in constructing the FRL	Not applicable	
Description of changes to previous FRL	Included	See also 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 4–8, 10–12 and 15–16 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 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Geneva, IPCC. Available at <https://www.ipcc.ch/publication/2013-revised-supplementary-methods-and-good-practice-guidance-arising-from-the-kyoto-protocol/>.

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/>.

IPCC. 2019. *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*. E Calvo Buendia, K Tanabe, A Kranjc, et al. (eds.). Geneva: IPCC. Available at <https://www.ipcc-nggip.iges.or.jp/public/2019rf/index.html>.

B. UNFCCC documents

First and second modified FRL submissions of Belize. Available at <https://redd.unfccc.int/submissions.html?country=blz>.

First biennial transparency report of Belize. Available at <https://unfccc.int/first-biennial-transparency-reports>.

First BUR and national inventory report of Belize. Available at <https://unfccc.int/BURs>.

“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>.

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NC1, NC2, NC3 and NC4 of Belize. Available at <https://unfccc.int/non-annex-I-NCs>.

Report on the TA of the proposed FRL of Belize submitted in 2020. FCCC/TAR/2020/BLZ. Available at <https://unfccc.int/documents/274296>.

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:

Percival Cho (2013a). Diversity, dynamics and carbon budget of tropical forests subject to hurricane and anthropogenic disturbance: Field Research Methods.

Percival Cho (2013b). An investigation of tropical forest response to hurricane disturbance with evidence from long-term plots and earth observation in Central America.