United Nations

Framework Convention on
Climate Change

FCCC/SBI/ICA/2021/TATR.1/BLZ

Distr.: General
7 September 2022

English only

Technical report on the technical analysis of the technical annex to the first biennial update report of Belize submitted in accordance with decision 14/CP.19, paragraph 7, on 30 August 2021

Summary

This technical report covers the technical analysis of the technical annex submitted on a voluntary basis, in the context of results-based payments, by Belize on 30 August 2021 through its first biennial update report in accordance with decision 14/CP.19. The technical annex provides data and information on 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 activities included in decision 1/CP.16, paragraph 70, and covers the same national territorial forest area as the assessed forest reference level (FRL) proposed by Belize in its modified FRL submission of August 2020.

Belize reported the results of implementing these activities for 2016–2018, which amount to 81,794 (2016), 940,385 (2017) and 4,580,384 (2018) tonnes of carbon dioxide equivalent and were measured against the assessed FRL of 4,606,875 (2016), 4,850,928 (2017), 5,094,981 (2018), 5,339,034 (2019) and 5,583,087 (2020) tonnes of carbon dioxide equivalent.

The data and information provided in the technical annex are in overall accordance with the guidelines contained in the annex to decision 14/CP.19. The technical analysis concluded that the data and information provided by Belize in the technical annex are mostly transparent and overall consistent with the data and information used for establishing the assessed FRL in accordance with decision 1/CP.16, paragraph 71(b), and decision 12/CP.17, section II. This report contains the findings from the technical analysis and a few areas identified for capacity-building and future technical improvement in accordance with decision 14/CP.19, paragraph 14.

Please recycle

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
2019 Refinement to the 2006 IPCC Guidelines	*2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AD	activity data
BUR	biennial update report
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
EF	emission factor
FRL	forest reference level
GHG	greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
LULUCF	land use, land-use change and forestry
MRV	measurement, reporting and verification
NFI	national forest inventory
NFMS	national forest monitoring system
N_2O	nitrous oxide
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)
SFMP	sustainable forest management plan
TA	technical analysis
TTE	team of technical experts

I. Introduction

A. Introduction

1.   This technical report covers the TA of the technical annex provided by Belize on 30 August 2021 in accordance with decision 14/CP.19, paragraph 7, included in its first BUR, which was submitted in accordance with decision 2/CP.17, paragraph 41(a), and annex III, paragraph 19. In the technical annex, Belize provided the data and information used for estimating its anthropogenic forest-related emissions by sources and removals by sinks, forest carbon stocks, and changes in forest carbon stock and forest area resulting from implementing REDD+ activities. The submission of the technical annex is voluntary and in the context of results-based payments in accordance with decision 14/CP.19, paragraph 8. The TA was coordinated by Jenny Wong (secretariat).

2.   The TA of the technical annex is part of the international consultation and analysis of BURs referred to in decision 2/CP.17, annex IV, paragraph 4, the objective of which is to increase the transparency of mitigation actions and their effects through analysis by the TTE in consultation with Belize and through a facilitative sharing of views, resulting in a separate summary report.[1]

3.   Belize made its first FRL submission, in accordance with decision 12/CP.17, on 14 January 2020, which was subject to a technical assessment following the guidance provided in decision 13/CP.19 and its annex. As a result of the facilitative interactions with the assessment team during the TA, Belize provided a modified FRL submission on 4 August 2020, which took into consideration the technical input of the assessment team.[2] The assessed FRL was included as one of the elements of the technical annex to its first BUR in accordance with the guidelines contained in the annex to decision 14/CP.19. The findings from the technical assessment of the FRL are included in a separate report.[3]

B. Process overview

4.   The TA of the first BUR of Belize took place from 29 November to 3 December 2021 as a desk analysis[4] and was undertaken by the following TTE drawn from the UNFCCC roster of experts on the basis of the criteria defined in decision 20/CP.19, annex, paragraphs 2–6: Menouer Boughedaoui (Algeria), Manuel Estrada (Mexico), Lawrence Ibhafidon (Nigeria), Hassan Ibrahim (Singapore), Tsutomu Koyama (Japan), Rocio Lichte (Germany), Kakhaberi Mdivani (Georgia), Awassada Phongphiphat (Thailand), Orlando Ernesto Rey Santos (Cuba), Dalia Abdelhamid Mahmoud Sakr (Egypt), Emma Salisbury (United Kingdom of Great Britain and Northern Ireland), Janka Szemesova (Slovakia), Marcelo Theoto Rocha (Brazil), Maarten van der Eynden (Norway), Robin White (Canada) and Alexander Zahar (Australia). Manuel Estrada (Mexico) and Maarten van der Eynden (Norway) were the LULUCF experts who undertook the TA of the technical annex in accordance with decision 14/CP.19, paragraphs 10–13.

5.   The TA of the technical annex provided by Belize was undertaken in accordance with the procedures contained in decisions 2/CP.17, 14/CP.19 and 20/CP.19. This technical report on the TA was prepared by the LULUCF experts in the TTE in accordance with decision 14/CP.19, paragraph 14.

6.   During the TA and subsequent exchanges, the LULUCF experts and Belize engaged in technical discussions, and Belize provided clarifications in response to questions raised by

---

[1] FCCC/SBI/ICA/2021/TASR.1/BLZ. (At the time of publication of this report, the summary report was under preparation).

[2] Available at https://redd.unfccc.int/submissions.html?country=blz, where links to all relevant submissions and reports referred to in this document are also provided.

[3] FCCC/TAR/2020/BLZ, published on 18 May 2021.

[4] Owing to the circumstances related to the coronavirus disease 2019, the TA of the first BUR submitted by Belize had to be conducted remotely.

the LULUCF experts, in order to reach a common understanding on the identification of the capacity-building needs of the Party and areas for technical improvement.

7. Following the TA of the technical annex (see para. 1 above), the LULUCF experts prepared and shared the draft technical report with Belize for its review and comments. Belize informed the secretariat on 27 June 2022 that it had reviewed the draft technical report and acknowledged the recommendations contained therein. On the basis of this information and as requested by the Party, the LULUCF experts finalized this technical report to complete the TA process in August 2022. Also in August 2022, Belize provided additional information relating to its technical annex and shared this information with the LULUCF experts. The experts acknowledge the additional information and note that Belize could consider including it in future submissions to further enhance their transparency.

C. Summary of results

8. In decision 1/CP.16, paragraph 70, the Conference of the Parties 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 in accordance with its respective capabilities and national circumstances. In the context of results-based payments and in line with decision 12/CP.17, Belize, on a voluntary basis, proposed a national FRL covering 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 for the purpose of a technical assessment in accordance with decision 13/CP.19 and its annex. The activities are being implemented in Belize's national territory. The assessed FRL of Belize is 4,606,875 (2016), 4,850,928 (2017), 5,094,981 (2018), 5,339,034 (2019) and 5,583,087 (2020) t CO_2 eq.

9. The Party's FRL is based on projections obtained by linear extrapolation of historical net emissions in managed land associated with 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 for the historical reference period 2001–2015.

10. Belize reported the results of implementing 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 for 2016–2018, calculated against the FRL, which amount to net emission reductions of 81,794 (2016), 940,385 (2017) and 4,580,384 (2018) t CO_2 eq. A total of 5,602,563 t CO_2 eq emission reductions against the projected values of the FRL were achieved for the three years.

II. Technical analysis of the information reported in the technical annex

A. Technical annex

11. For the technical annex to the first BUR submitted by Belize, see annex I.[5]

B. Technical analysis

12. The scope of the TA is outlined in decision 14/CP.19, paragraph 11, according to which the TTE shall analyse the extent to which:

(a) The methodologies, definitions, comprehensiveness and information provided are consistent between the assessed FRL and the results of implementing REDD+ activities;

---

[5] In accordance with decision 14/CP.19, para. 14(a).

(b)   The data and information provided in the technical annex are transparent, consistent, complete and accurate;

(c)   The data and information provided in the technical annex are consistent with the guidelines referred to in decision 14/CP.19, paragraph 9;

(d)   The results are accurate, to the extent possible.

13.   The remainder of this chapter presents the results of the TA of the technical annex to the Party's first BUR according to the scope outlined in paragraph 12 above.

1.   Consistency in methodologies, definitions, comprehensiveness and information provided between the assessed reference level and the results in the technical annex

14.   In accordance with decision 14/CP.19, paragraph 3, the data and information used by a Party for estimating its anthropogenic forest-related emissions by sources and removals by sinks, forest carbon stocks, and changes in forest carbon stock and forest area resulting from implementing REDD+ activities should be transparent and consistent over time and with the data and information used for establishing its FRL in accordance with decision 1/CP.16, paragraph 71(b–c), and decision 12/CP.17, section II.

15.   The LULUCF experts noted that Belize ensured overall consistency between its assessed FRL and estimated results of implementing 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 in 2016–2018 by:

(a)   Using consistent methodologies and data to generate AD on the net change in land-use categories for all managed forests associated with the five REDD+ activities. The AD used in constructing the FRL and estimating the results from country-specific land use and land-use change assessments were developed using the Collect Earth[6] tool to analyse 21,991 virtual plots. Belize applied the gain–loss method for estimating changes in forest carbon stocks;

(b)   Using consistent methodologies and data to generate EFs, in particular using NFI results from a network of 31 permanent forest plots and national estimates of mangrove carbon stocks. In addition, expert judgment and IPCC default values were used for several EFs;

(c)   Covering the same two carbon pools: above-ground biomass and below-ground biomass;

(d)   Covering the same gases: CO_2, CH_4 and N_2O;

(e)   Covering the same area: managed land in the entire national territory;

(f)   Assuming that carbon stocks in unmanaged land remain stable and that areas under an SFMP do not emit significant amounts of GHGs;

(g)   Using the same forest definition, where a forest is defined as an area of at least 0.5 ha with the height of mature trees of 5 m or more and having at least 30 per cent canopy cover. Some other forest types (e.g. dwarf mangrove) that do not meet the 5 m height criterion are also included.

16.   In view of the above, the LULUCF experts concluded that the results presented of implementing 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 are overall consistent with the assessed FRL. The LULUCF experts commend Belize for ensuring consistency of data and methodologies between the FRL submission for 2001–2015 and the technical annex with the results of implementing 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 for 2016–2018.

---

[6] Available at https://openforis.org/tools/collect-earth/.

2. Transparency, consistency, completeness and accuracy of the data and information provided in the technical annex

17. As part of the TA process, Belize provided additional information, in particular on the classification and tracking of managed as opposed to unmanaged land, the definitions of REDD+ activities, the tracking of carbon stocks for the five REDD+ activities, land-use change dynamics in general, and notably, for 2018, the carbon dynamics of areas with SFMPs, the use of expert judgment for estimating EFs, the carbon pools included in the reported results, and how the reported AD used in constructing the FRL and in estimating results compared with other available data sources. The LULUCF experts noted that the transparency and completeness of the data and information used for estimating results that were shared during the TA could be further enhanced by making the information publicly available and providing additional summary tables and figures describing, for example, year-by-year area change and emissions and removals for both managed and unmanaged land. The LULUCF experts commend Belize for its efforts to increase the transparency and contribute to the completeness[7] of the data and information provided, thus allowing for reconstruction of the results.

18. The LULUCF experts noted that a summary table in the technical annex listed the carbon pools litter and deadwood as included in the FRL and reported results (see table 6 of the technical annex). They further noted that this contradicts other sections in the technical annex which state that only the two biomass pools were included (see chaps. 2–3 of the technical annex). Following a question from the LULUCF experts, Belize clarified that the inclusion of additional carbon pools as noted in the technical annex, and that resulted in the contradictory information, was an error and confirmed that the included pools are above- and below-ground biomass. The LULUCF experts appreciate this clarification and note the inclusion of additional pools, such as litter and deadwood, as an area for future technical improvement.

19. Expert judgment was used to estimate EFs in situations where data were not available. The LULUCF experts asked Belize to elaborate on the procedures applied for such expert judgment. Belize clarified that at least three experts needed to reach consensus on the values to be used as EFs, and that those values were compared with other regional values from literature. The LULUCF noted this clarification, and further noted that Belize may wish to consider developing additional national EFs, in particular for the situations that currently rely on expert judgment, as an area for future technical improvement.

20. In its technical annex, Belize reported changes in net emissions from managed land. During the TA, it became clear to the experts that areas under an SFMP are assumed not to produce emissions and are not included in the managed land category. The LULUCF experts asked how areas with an SFMP could be defined as unmanaged, as the existence of an SFMP suggests some degree of land management. Belize explained that areas under SFMPs have very low intensity harvesting and therefore do not experience greater carbon losses than the losses due to natural disturbances in areas with no forest management. The LULUCF experts noted that previous studies (e.g. Pearson, Brown and Casarim, 2014) have indicated a potentially significant carbon impact even under low intensity logging operations and asked whether this type of impact had been considered. Belize stated that long-term studies in this regard are being carried out but have not yet concluded, although preliminary results indicate a very low impact in terms of emissions from SFMP areas. The LULUCF experts appreciated the additional information and commend Belize for working to improve the information on the carbon impacts of SFMP areas. The experts note improved quantification of the carbon impact from SFMP operations as an area for technical improvement. Furthermore, the LULUCF experts are of the view that areas under an SFMP should be included in the managed land category in future, as such areas suggest anthropogenic activity. Belize confirmed that this is being considered for the update of its future FRLs.

21. The LULUCF experts noted that the emissions reported for 2018 were significantly lower than for previous years in the time series. In addition, the experts noted that when comparing the estimates of reported area change with estimates from global forest-change data sets, the most notable source being Global Forest Watch, the forest-change dynamics

---

[7] "Complete" here means including the information necessary for reconstructing the results.

reported by Belize in the technical annex seemed to differ from those observed in these global data sets. In the global data sets, forest conversion to cropland (e.g. commodity-driven deforestation) seemed to be a significant change category for 2018, whereas this was not the case in the reported results in the technical annex. Following a question from the LULUCF experts, Belize stated that there are several methodological reasons as to why these data sets are not directly comparable and that, in general, the global data sets seem to be reporting higher estimates that the NFMS. In addition, during the TA, an error in the underlying spreadsheet connected to figure 5 in the technical annex was discovered. After the correction of the values in figure 5, it became evident that changes of forest land into cropland were indeed a significant part of the forest change observed in 2018. The LULUCF experts welcomed the explanation and the correction of figure 5 in the technical annex and encourage Belize to investigate further the differences observed between the NFMS and other available data sources in the future.

22.   In addition, the LULUCF experts noted that in 2018, the carbon dynamics of several land-use change categories changed abruptly compared with those of previous years in the time series. Most notably, deforested land converted to grassland was a significant source in 2016 and 2017 but a very small source in 2018. Furthermore, the number of hectares changing from forest land to grassland did not seem to be in line with this very large shift in those same years. In response, Belize noted that the estimates of land area in hectares and emissions from those areas differed significantly, as the tables presented estimates in hectares and included both the managed and unmanaged land categories, whereas the emission calculations only included the managed land category.

23.   Moreover, the LULUCF experts noted that forest land remaining forest land was a small emissions source in 2017 but a very significant carbon sink in 2018. Belize listed a number of policy interventions to explain this shift in carbon dynamics in forest land remaining forest land. The LULUCF experts welcomed this explanation but noted the difficulty of following the carbon dynamics in different land-use change categories, as some information relates only to managed land, while other information includes both managed and unmanaged land. The LULUCF experts note that Belize may wish to consider providing simplified and more easily accessible information on the land-use change categories in future submissions as an area of technical improvement.

24.   Belize used approach 1 (the propagation of error approach) from the 2006 IPCC Guidelines (vol. 1, chap. 3) for the uncertainty assessment of the reported results. The LULUCF experts asked Belize if there were plans for further developing the uncertainty assessment methodology for future FRLs and results reports and Belize confirmed that this was the case, as it is currently in the process of conducting an updated accuracy assessment. The LULUCF experts commend Belize for its continuing efforts to develop further the uncertainty assessment as part of the stepwise approach.

25.   The LULUCF experts asked the Party how it treated the carbon dynamics related to the activity conservation of forest carbon stocks, as conservation areas appear to be classified as unmanaged land. In response, Belize clarified that conservation areas are generally considered unmanaged and therefore the carbon stock changes in such areas are not included in the reported REDD+ results. The LULUCF experts asked how human-induced disturbances were treated if such disturbances happened in a conservation area. Belize confirmed that these human-induced disturbances would be accounted for as deforestation or forest degradation. The LULUCF experts appreciated this clarification and noted that Belize could provide detailed information as to how emissions that are due to human-induced disturbances in conservation areas are treated to enhance the transparency of future REDD+ technical annexes. The LULUCF experts note this as an area of future technical improvement.

26.   Further, the LULUCF experts noted that the inclusion of a land area under the conservation activity suggests a form of management regime; however, Belize considers conservation areas as being in the unmanaged land category. The LULUCF experts asked the Party how an area designated as a conservation area could be defined as unmanaged, as a conservation area suggests a form of management. Belize responded that the country follows a land-based approach in its reporting and not an activity-based approach. Hence, as conservation areas are generally kept free from human interference, they are considered

unmanaged. In addition, Belize explained that, as there is no set definition for the activity conservation of forest carbon stocks, countries can define this in their national context. The LULUCF experts appreciated the additional clarification and noted that more detailed definitions of the various REDD+ activities could enhance the transparency of future submissions of REDD+ results.

27.   On the basis of the issues identified in paragraphs 22–26 above, the LULUCF experts note that it was challenging to follow the forest-change dynamics in the reported results from Belize. The definitions of managed and unmanaged land in general and, more specifically, the differentiation between natural and human-induced disturbances were not immediately clear to the LULUCF experts. Following a question from the LULUCF experts, Belize shared additional tables and accompanying explanations, which helped to clarify the various forest-change definitions and categories. The LULUCF experts appreciated the additional explanation and noted that including additional simplified graphs and figures and accompanying explanatory text could enhance the clarity and transparency of future technical annexes.

28.   According to decision 12/CP.17, paragraph 8, the FRL shall be established taking into account decision 4/CP.15, paragraph 7, and maintaining consistency with the anthropogenic forest-related GHG emissions by sources and removals by sinks reported in the Party's GHG inventory. The team assessing Belize's FRL submission noted that the submission did not include sufficient information to confirm whether or not the FRL maintained consistency in terms of sources of AD and EFs with those used for the GHG inventory included in its third national communication.[8] The LULUCF experts noted that since the time of the assessment of the FRL, Belize has submitted an updated national GHG inventory in the country's first BUR.[9] Belize explained that the national GHG inventory, and the REDD+ FRL and results reporting now use the same database, methods and assumptions and apply the same estimation procedures. The LULUCF experts commend Belize for working to ensure consistency between REDD+ results reporting and the national GHG inventory.

29.   In response to a question from the LULUCF experts, Belize clarified that not all data (e.g. images and annual maps) are publicly available because it does not have an online platform for sharing this information. Nevertheless, the Party recognizes this as an area for future technical improvement. Belize further explained that requests for information can be sent to the Ministry of Sustainable Development, Climate Change and Disaster Risk Management.

30.   The LULUCF experts concluded that Belize provided most of the information necessary for reconstructing the results of implementing the five REDD+ activities. The LULUCF experts noted that the inclusion of the additional information provided during the TA in future technical annexes or making such information publicly available would further increase the transparency and completeness of future submissions. In addition, they noted that the data and information provided in the technical annex and during the TA are considered to be mostly transparent, and overall consistent, complete and accurate to the extent possible.

3.   **Consistency with the guidelines on elements to be included in the technical annex**

31.   Belize provided data and information on all the required elements in accordance with the guidelines contained in the annex to decision 14/CP.19, namely summary information from the final report containing the assessed FRL; results in t CO_2 eq/year, consistent with the assessed FRL; a demonstration that the methodologies used to produce the results are consistent with those used to establish the assessed FRL (as outlined in chap. II.B.1 above); a description of forest monitoring systems and institutional roles and responsibilities in MRV of the results; the information necessary for reconstructing the results (as outlined in chap. II.B.2 above); and a description of how the elements contained in decision 4/CP.15, paragraph 1(c–d), have been taken into account.

---

[8]   Available at https://unfccc.int/documents/67667.
[9]   Available at https://unfccc.int/documents/274001.

32.   In its technical annex, Belize provided a summary of the results of implementing 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 for 2016–2018, which are consistent with the assessed FRL, thus allowing for reconstruction of the results. The results achieved in terms of emission reductions and removals from enhancement of forest carbon stocks, sustainable management of forests and conservation of forest carbon stocks are listed in table 5 of the technical annex and amount to 5,602,563 t CO_2 eq/year for the three years covered.

33.   The LULUCF experts noted that Belize provided a description of the NFMS and a transparent summary of the roles and responsibilities of the agencies and institutions involved in MRV of the results in the technical annex, together with weblinks for accessing further information. The LULUCF experts commend Belize for sharing this information.

34.   The forest monitoring system covers the national area. The system uses a three-phase monitoring approach, with tree-level forest inventory data continuously producing estimates of carbon stocks and carbon stock changes due to natural and anthropogenic activities. These estimates are then extrapolated to the national level using remotely sensed landscape-level data on forest distribution and cover change resulting from natural and anthropogenic activities. The estimates are then validated and confirmed periodically against wall-to-wall maps of land cover and land use. The country does not yet have an NFI for generating country-specific EFs beyond the data and information available from the existing network of 31 permanent forest plots. The only country-specific source available is Cho (2013), which was a forest inventory based on selective distribution and sampling plots located in areas usually affected by hurricanes. In its BUR, Belize pointed out that it is unclear whether this is representative of the carbon dynamics of the whole country, and that there is a possibility of bias in the estimations. The Party is in the process of setting new permanent sampling plots, following the same methodology for generating data to develop EFs and including strata that are not currently included (such as dry forests). The reporting of forest-related information obtained from the NFMS is centralized in the Forest Department and National Climate Change Office and the information is applied in the development of the GHG inventory, the FRL, the BUR and the technical annex on REDD+ results.

35.   According to decision 11/CP.19, paragraph 4(b), the NFMS should enable the assessment of different types of forest in the country, including natural forest. During the consultation process, Belize explained that its NFMS assesses several different categories of forest land, namely broadleaf mature forest, broadleaf secondary forest, pine forest, mangrove and plantation.

36.   Belize provided a description of how IPCC guidance and guidelines were taken into account in accordance with decision 4/CP.15, paragraph 1(c). For estimating emission reductions and removals in the national forest area, Belize used the methodology provided in the 2006 IPCC Guidelines for estimating changes in carbon stocks in forest land converted to other land uses. The emissions from deforestation and forest degradation were estimated for 2016–2018 by combining AD (i.e. areas of annual deforestation) with the appropriate EF (i.e. emissions associated with the corresponding forest type).

37.   In constructing its FRL and estimating the results, Belize covered the most significant pools and non-CO_2 GHGs, namely CH_4 and N_2O (these two gases are limited to biomass burning on forest land for the activities reducing emissions from forest degradation and conservation of forest carbon stocks). Overall, the exclusion of the dead organic matter and soil organic carbon pools was adequately justified. The LULUCF experts commend Belize for its efforts to obtain accurate data for the biomass pools, with the aim of including them in future forest reference emission levels and FRLs and estimates of results as part of the stepwise approach.

4.   **Accuracy of the results proposed in the technical annex**

38.   The LULUCF experts noted that the Party estimated the results of implementing 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 in the entire forest area of the country using a mostly transparent and

overall consistent approach. They commend Belize for its significant long-term efforts to build up a robust NFMS that is capable of providing transparent estimates of emissions from deforestation.

39.   Both the established FRL and the results obtained for 2016–2018 from implementing the activities are based on country-specific land use and land-use change assessments, conducted using the Collect Earth tool. For estimating changes in forest carbon stocks, Belize applied the gain–loss method. In order to identify land use and land-use changes, Belize implemented approach 3 from the 2006 IPCC Guidelines and based it on nationwide sampling using the Collect Earth tool, which uses various remote sensing products as its main inputs. Using a sampling grid of 1 km by 1 km, the Party established 21,991 sampling points and associated sample plots of 0.5 ha each, which is consistent with its forest definition. On the basis of this sampling approach, a time series of annual spatially explicit data for 2000–2018 was obtained. The LULUCF experts reiterate the point noted in the TA report of the FRL that, in addition to the spatial information on the plots, auxiliary information such as district, climatic zones, conservation areas and forest concessions could be used.[10] For each plot and year, it was possible to deduce the land use or land-use change occurring within the plot. Belize also used information on human impacts (i.e. anthropogenic disturbances) and natural disturbances (e.g. hurricanes, fires and pests) when defining land use and land-use change. This system allows for a detailed annual analysis of the dynamics of land use in the country. The EFs used in constructing the FRL were obtained from research studies (for country-specific values), the 2006 IPCC Guidelines and the 2019 Refinement to the 2006 IPCC Guidelines (for default values), and expert judgment. The assessment team noted that EFs are crucial for estimating emissions and removals, in particular when country-specific values are used, and so EFs representative of forest type are needed to reduce the level of uncertainty. The LULUCF experts agree with the assessment team of the FRL that some of the Party's EFs (e.g. those for above-ground biomass growth and pine forests) may not be representative and, therefore, the Party may wish to consider using representative EFs as an area for future technical improvement,[11] with the aim of enhancing accuracy of the estimates.

40.   As mentioned in paragraph 24 above, Belize provided some information related to uncertainties; however, this information was not used in assessing the uncertainty of the emission estimates. The effect of the uncertainty on the accuracy of the results of implementing the activity reducing emissions from deforestation could therefore not be assessed. Despite this, and given the assumptions used, the LULUCF experts concluded that the results are accurate to the extent possible.

C.   Areas identified for technical improvement

41.   The LULUCF experts concluded that the following areas for technical improvement identified in the report on the technical assessment of Belize's FRL[12] also apply to the provision of information on the results of implementing 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:

        (a)   Including all relevant GHG inventory data, complete definitions for all five REDD+ activities, and detailed descriptions of the selected activities and links between the GHG inventory, the activities and the FRL;

        (b)   Clarifying more explicitly the land areas allocated to the various REDD+ activities, and providing country-specific definitions of the activities and categories of land use and land-use change;

        (c)   Including the time series of land-use changes underlying the relevant GHG inventory information to enhance clarity and understanding (rather than providing a separate GHG inventory tool spreadsheet), such as AD by REDD+ activity and the associated trends over time; information on land use versus land cover; information on natural versus

---

[10] See document FCCC/TAR/2020/BLZ, para. 19.
[11] See document FCCC/TAR/2020/BLZ, para. 20.
[12] See document FCCC/TAR/2020/BLZ, para. 45.

anthropogenic disturbances on managed land; consistent data on emissions and removals from managed land; and methodological information relating to these data and information.

42. Furthermore, the LULUCF experts noted that Belize could consider the following areas for technical improvement:

(a) Including emissions from the deadwood, litter and soil organic carbon pools in future FRLs and estimation of results (see para. 18 above);

(b) Developing more country-specific EFs that do not rely on expert judgment (see paras. 19 and 39 above);

(c) Further exploring the carbon impacts of SFMP areas and including these areas in the managed land category (see para. 20 above);

(d) Analysing differences in reported results from the NFMS and area change estimates from global data sets (see para. 21 above);

(e) Providing simplified and more easily accessible information on the land-use change categories in future submissions (see para. 23 above);

(f) Further developing methods for uncertainty assessment and including these uncertainties in the reporting of results (see para. 24 above);

(g) Providing detailed information on how emissions due to human-induced disturbances in conservation areas are treated to enhance the transparency of future REDD+ technical annexes (see para. 25 above);

(h) Including more detailed definitions of the five REDD+ activities with the aim of enhancing the transparency of future submissions of REDD+ results (see para. 26 above);

(i) Including additional simplified graphs and figures and accompanying explanatory text to enhance the clarity and transparency of future technical annexes (see para. 27 above);

(j) Establishing an online platform that enables easy access to the underlying data and information used for calculating the REDD+ FRLs and results (see paras. 29–30 above).

D. Comments and responses of the Party

43. During the consultation process, Belize noted a number of areas of capacity-building needs. Addressing those needs could enable Belize to improve its data and methodologies and include additional pools and gases in future FRL submissions. After exchanges with the LULUCF experts, Belize identified the following capacity-building needs:

(a) Understanding the IPCC guidelines for the inventory of the forest and land-use sector, including the updated methodologies in the 2019 Refinement to the 2006 IPCC Guidelines, and the relevant decisions relating to Article 6 of the Paris Agreement;

(b) Measuring carbon stock changes in the soil organic carbon pool;

(c) Developing methods for measuring and tracking carbon dynamics within conservation areas, including conservation of forest carbon stocks in all pools;

(d) Developing methods for measuring and tracking carbon dynamics in all carbon pools in areas under sustainable forest management;

(e) Developing methods for measuring the carbon footprint of harvested wood products and firewood;

(f) Institutionalizing data exchanges and archiving of data and facilitating the dissemination of such data to the public;

(g) Developing a registry system for integrating, supervising and tracking carbon credits generated and sold under all projects at the national and project level;

(h) Institutionalizing collaboration and technical arrangements for the NFMS and engaging stakeholders in the NFMS process;

(i)   Implementing improvements of the evolving techniques for estimating AD and developing EFs.

III. Conclusions

44.   The LULUCF experts conclude that Belize reported the results of implementing five activities. Belize reported the net change in land-use categories for all managed forests associated with the five activities. The AD used in constructing the FRL and estimating the results were based on country-specific land use and land-use change assessments of virtual plots from the Collect Earth tool. The EFs were developed on the basis of the NFI, as well as expert judgment and IPCC default values being used for several EFs. Belize applied the gain–loss method for estimating changes in forest carbon stocks, and the results include the carbon pools above- and below-ground biomass and the gases CO_2, CH_4 and N_2O. The Party estimated the results of all five activities using methodologies, definitions, assumptions and information that are overall consistent with those used for constructing the assessed FRL (see paras. 15(a)–(d) above).

45.   The LULUCF experts consider the data and information provided in the technical annex to be mostly transparent, and overall consistent, complete and accurate, to the extent possible.

46.   The LULUCF experts find the data and information provided in the technical annex to be overall consistent with the guidelines referred to in decision 14/CP.19, paragraph 9.

47.   The results are accurate to the extent possible, based on the assumptions used.

48.   In conclusion, the LULUCF experts commend Belize for showing strong commitment to continuously improving the data and information used for calculating the results, in line with the stepwise approach, which are consistent with those used for constructing its assessed FRL. Some areas for future technical improvement and capacity-building needs identified by Belize have been identified in this report. At the same time, the LULUCF experts acknowledge that such improvements are subject to national capabilities and circumstances, and note the importance of adequate and predictable support.[13] The LULUCF experts also acknowledge that the TA process was an opportunity for a facilitative and constructive technical exchange of views and information with Belize.[14]

---

[13] As per decision 2/CP.17, para. 57.
[14] As per decision 14/CP.19, paras. 12–13.

Annex I

Technical annex to the biennial update report

Owing to the complexity and length of the submitted technical annex to the BUR, and in order to maintain the original formatting, the technical annex has not been reproduced here. It is available on the UNFCCC website at https://unfccc.int/BURs.

Annex II

Summary of the main features of the reported results of implementing the activities referred to in decision 1/CP.16, paragraph 70, based on information provided by Belize

Key elements		*Remarks*
Results reported	81 794 (2016), 940 385 (2017) and 4 580 384 (2018) t CO$_2$ eq	Belize reported the results of implementing the five REDD+ activities, which amount to a total emission reduction of 5 602 563 t CO$_2$ eq for the three years (see para. 10 of this document)
Results period	2016–2018	See paragraph 10 of this document
Assessed FRL	4 606 875 (2016), 4 850 928 (2017), 5 094 981 (2018), 5 339 034 (2019) and 5 583 087 (2020) t CO$_2$ eq	Belize's FRL is based on projections obtained by linear extrapolation of historical net emissions in managed land associated with the five REDD+ activities. The TA report is available at https://redd.unfccc.int/submissions.html?country=blz (see paras. 3, 8 and 9 of this document)
Reference period	2001–2015	See paragraph 9 of this document
National/subnational	National	The FRL and corresponding results cover managed land in the national territory of Belize (see para. 15(e) of this document)
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 paragraphs 8–10 of this document
Pools included	Above-ground biomass Below-ground biomass	Exclusion of the dead organic matter and soil organic carbon pools was adequately justified. The inclusion of these carbon pools is noted as an area of future technical improvement (see paras. 15(c), 18 and 37 of this document)
Gases included	CO$_2$, CH$_4$, N$_2$O	Non-CO$_2$ gases are limited to biomass burning on forest land for the activities reducing emissions from forest degradation and conservation of forest carbon stocks (see paras. 15(d), 37 and 44 of this document)
Consistency with assessed FRL	Methods, definitions and information used for the assessed FRL are consistent with those used for the results	Belize submitted a new GHG inventory through its first BUR (2021) and explained that the GHG inventory, REDD+ FRL and associated results now use the same database, methods and assumptions and apply the same estimation procedures (see para. 28 of this document)
Description of NFMS and institutional roles	Included	See paragraphs 33–35 of this document
Identification of future technical improvements	Included	Several areas for future technical improvement have been identified (see paras. 41–42 of this document)

Annex III

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. 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 modified FRL submissions of Belize. Available at https://redd.unfccc.int/submissions.html?country=blz.

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

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

Report on the TA of the proposed FRL of Belize submitted in 2020. FCCC/TAR/2020/BLZ. Available at https://redd.unfccc.int/submissions.html?country=blz.

C. Other documents

The following references have been reproduced as received:

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

Pearson TRH, Brown S and Casarim FM. 2014. Carbon emissions from tropical forest degradation caused by logging. *Environ. Res. Lett.* 9(3): 11pp. Available at: http://dx.doi.org/10.1088/1748-9326/9/3/034017.