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Report on the technical assessment of the proposed forest reference level of Saint Lucia submitted in 2021

Summary

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

For its submission, Saint Lucia developed a national FRL. The FRL presented in the original submission, for the reference period 2001–2013, corresponds to 24,200 tonnes of carbon dioxide equivalent per year. As a result of the facilitative process during the technical assessment, the FRL was modified to –121,333 tonnes of carbon dioxide equivalent per year.

The assessment team notes that the data and information used by Saint Lucia in constructing its FRL are transparent, complete and in overall accordance with the guidelines contained in the annex to decision 12/CP.17. This report contains 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	*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
AT	assessment team
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
COP	Conference of the Parties
DOM	dead organic matter
EF	emission factor
FAO	Food and Agriculture Organization of the United Nations
FREL	forest reference emission level
FRL	forest reference level
GHG	greenhouse gas
GSOCmap	Global Soil Organic Carbon map
IPCC	Intergovernmental Panel on Climate Change
N_2O	nitrous oxide
NFI	national forest inventory
REDD+	reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (decision 1/CP.16, para. 70)
SOC	soil organic carbon
TA	technical assessment
Wetlands Supplement	*2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*

I. Introduction and summary

A. Overview

1. This report covers the TA of the voluntary submission of Saint Lucia on its proposed FRL,[1] submitted on 11 January 2021, in accordance with decisions 12/CP.17 and 13/CP.19. The remote TA[2] took place from 19 to 23 April 2021 and was coordinated by the secretariat.[3] The TA was conducted by two land use, land-use change and forestry experts from the UNFCCC roster of experts[4] (hereinafter referred to as the AT): Oswaldo Ismael Carrillo Negrete (Mexico) and Florian Claeys (France). In addition, Gervais Ludovic Itsoua Madzous, an expert from the Consultative Group of Experts, participated as an observer[5] during the remote session. The TA was coordinated by Dirk Nemitz (secretariat).

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

3. The objective of the TA is to assess the degree to which the information provided by Saint Lucia is in accordance with the guidelines for submissions of information on reference levels[7] 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 Saint Lucia to construct and improve its FRL in the future, as appropriate.[8]

4. The TA of the FRL submitted by Saint Lucia was undertaken in accordance with the guidelines and procedures for the TA of submissions from Parties on proposed FRELs and/or FRLs.[9] This report on the TA was prepared by the AT following the same guidelines and procedures.

5. Following the process set out in those guidelines and procedures, a draft version of this report was communicated to the Government of Saint Lucia. The facilitative exchange during the TA allowed Saint Lucia to provide clarifications and additional information, which were considered by the AT in the preparation of this report.[10] As a result of the facilitative interactions with the AT during the TA, Saint Lucia provided a modified version of its submission on 30 June 2021, 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 modified FRL submission. The modified submission, containing the assessed FRL, and the original submission are available on the UNFCCC website.[11]

B. Proposed forest reference level

6. In decision 1/CP.16, paragraph 70, the COP encouraged developing country Parties to contribute to mitigation actions in the forest sector by undertaking a number of activities, as deemed appropriate by each Party and in accordance with their respective capabilities and

[1] The submission of Saint Lucia is available at https://redd.unfccc.int/submissions.html?country=LCA.
[2] Owing to the circumstances related to the coronavirus disease 2019, the TAs of the FREL and FRL submissions of developing country Parties in 2021 had to be conducted remotely.
[3] As per decision 13/CP.19, annex, para. 7.
[4] As per decision 13/CP.19, annex, paras. 7 and 9.
[5] As per decision 13/CP.19, annex, para. 9.
[6] See decision 1/CP.16, para. 71(b).
[7] Decision 12/CP.17, annex.
[8] Decision 13/CP.19, annex, para. 1(a–b).
[9] Decision 13/CP.19, annex.
[10] As per decision 13/CP.19, annex, paras. 1(b), 13 and 14.
[11] https://redd.unfccc.int/submissions.html?country=LCA.

national circumstances, in the context of providing adequate and predictable support. The FRL proposed by Saint Lucia, 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 and enhancement of forest carbon stocks, which are four of the five activities referred to in that paragraph. Pursuant to paragraph 71(b) of the same decision, Saint Lucia developed a national FRL that covers its entire territory. For its submission, Saint Lucia applied a stepwise approach to developing its FRL in accordance with decision 12/CP.17, paragraph 10. The stepwise approach enables Parties to improve their FRELs or FRLs by incorporating better data, improved methodologies and, where appropriate, additional pools.

7. The national FRL proposed by Saint Lucia for the historical reference period 2001–2013 is the annual average of emissions and removals of CO_2, CH_4 and N_2O associated with deforestation and forest degradation and net removals of CO_2 associated with conservation of forest carbon stocks and enhancement of forest carbon stocks. The proposed FRL was constructed using the gain–loss method from the 2006 IPCC Guidelines. The AD used in constructing the FRL were extracted from a database that provides an assessment of land use and land-use change for each year in 2001–2013 based on a systematic 500 m × 500 m sampling approach and using the Collect Earth software. The database contains a collection of remote sensing images acquired from various satellite technologies (i.e. Sentinel, Landsat 8, Landsat 7) available through Google Earth and Microsoft Bing Maps and processed through the Google Earth Engine. The EFs were obtained from Saint Lucia's NFI carried out in 2009 and the FAO GSOCmap, and complemented by IPCC default values from the 2006 IPCC Guidelines, the Wetlands Supplement and the 2019 Refinement to the 2006 IPCC Guidelines. Saint Lucia used global warming potential values from the IPCC Second Assessment Report based on the effects of GHGs over a 100-year time-horizon to convert CH_4 and N_2O emissions into CO_2 eq emissions. The FRL presented in the modified submission, with the aim of accessing results-based payments for REDD+ activities for 2001–2013, corresponds to –121,333 t CO_2 eq/year.[12]

8. The proposed FRL includes the above- and below-ground biomass, DOM and SOC pools. Harvested wood products were excluded owing to lack of data. The AT welcomes Saint Lucia's intention to collect data on harvested wood products and estimate emissions and removals from this pool for future submissions. Regarding GHGs, the submission includes CO_2, CH_4 and N_2O. The AT welcomes Saint Lucia's intention to improve the AD and EFs for biomass burning using local field data.

9. During the TA, Saint Lucia provided a copy of the "Foundational Platform for greenhouse gas inventories, forest reference levels and monitoring, reporting and verification of the forest and land use sector" spreadsheet developed under the Reporting for Results-based REDD+ project of the Coalition for Rainforest Nations, funded by the Norwegian Agency for Development Cooperation. The AT noted that this tool was used to elaborate the proposed FRL and to demonstrate the methodological steps involved in its construction (see paras. 19 and 24 below).

[12] In its original submission, Saint Lucia proposed a national FRL of 24,200 t CO_2 eq/year for 2001–2013. The difference between the original and the modified submission is due mostly to the inclusion of the activity conservation of forest carbon stocks and the inclusion of emissions and removals from the SOC pool.

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

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

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

10. For constructing its FRL, Saint Lucia used the 2006 IPCC Guidelines, the Wetlands Supplement and the 2019 Refinement to the 2006 IPCC Guidelines.

11. The FRL includes the activities reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks and enhancement of forest carbon stocks for the reference period 2001–2013. Deforestation is defined as the conversion of forest land to non-forest land. Forest degradation refers to the process whereby a forest is disturbed but remains a forest. Forest disturbance is categorized as occurring either as a result of anthropogenic causes (i.e. logging, fires and shifting cultivation) or natural causes (e.g. hurricanes). During the TA and in its modified submission, Saint Lucia provided further information on the relative importance of each type of forest disturbance. The modified submission includes the activity conservation of forest carbon stocks, defined as forest land remaining forest land that is not disturbed either by natural or human activity. Enhancement of forest carbon stocks is defined as the conversion of non-forest land to forest land due to afforestation or restoration of forest through human intervention.

12. The Party sourced its AD using a systematic 500 m × 500m sampling approach (i.e. 2,051 sampling plots of 1 ha) with a combination of high and medium spatial resolution imagery (i.e. 15 m resolution Landsat imagery, 2.5 m resolution SPOT imagery and high-resolution imagery from several other sources) accessible through the Google Earth, Bing Maps and Google Earth Engine platforms. The Party used the Collect Earth tool to synchronize the view of each sampling point on the three platforms and incorporate the land-use condition for each year of the time series 2001–2013. Forest land was stratified by forest type (montane forest: elfin, cloud montane, montane rainforest; seasonal forest: semi-evergreen, semi-deciduous; littoral evergreen; mangroves; and plantations). Cropland was classified as either annual or perennial cropland, while grassland and settlements were classified as woody and non-woody. The Party did not report a further subclassification of wetlands. Other land was divided into other land and mining.

13. For forest land, the Party used (1) the default EFs from the 2006 IPCC Guidelines for the carbon fraction of wood for all forest classes except mangroves; (2) the default values from the Wetlands Supplement for the carbon fraction of wood, average annual above-ground biomass, ratio of below-ground to above-ground biomass, and above-ground biomass, litter and deadwood stocks for mangroves; (3) the default values from the 2019 Refinement to the 2006 IPCC Guidelines for the average annual above-ground biomass, ratio of below-ground to above-ground biomass, litter and deadwood stocks for all forest classes except mangroves, above-ground biomass of forest plantations, and CH_4 and N_2O EFs; (4) country-specific values estimated using the equation from Chave et al. (2014) and data from the NFI for the above-ground biomass of all forest classes except mangroves and forest plantations; and (5) local expert judgment for the fraction of biomass loss due to disturbance for all forest classes. For cropland, the Party used the default EFs from the 2006 IPCC Guidelines for the carbon fraction, biomass accumulation rate, above-ground biomass, litter and deadwood stocks for all cropland classes; and the default values from the 2019 Refinement to the 2006 IPCC Guidelines for the ratio of below-ground to above-ground biomass for perennial cropland. For grassland, Saint Lucia used the EFs from the 2006 IPCC Guidelines for all carbon pools covered by the FRL. For settlements, the default EFs from the 2006 IPCC Guidelines were used for the carbon fraction of woody settlements; and the default values from the 2019 Refinement to the 2006 IPCC Guidelines were used for the ratio of below-ground to above-ground biomass for woody settlements. Saint Lucia indicated that it used EFs from various IPCC guidelines as they were the most up-to-date values available and considered most appropriate to the national circumstances.

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

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

14. Saint Lucia included emissions associated with natural disturbance (hurricanes) in the original FRL submission. The AT noted that the approach proposed by Saint Lucia deviates from the methods included in the IPCC guidance (specifically the *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol* and the 2019 Refinement to the 2006 IPCC Guidelines) and sought a number of clarifications. The AT explained that both approaches of either including or excluding emissions associated with natural disturbance are acceptable as long as they are applied consistently for the FRL and the national GHG inventory. However, the two approaches have different effects on the Party's realization of REDD+ results given the increasing frequency and intensity of hurricanes in the Caribbean, as well as different requirements for land monitoring (IPCC guidance requires subsequent removals from affected areas to be monitored and excluded if emissions from natural disturbance are excluded). The AT noted that, in the modified submission, emissions due to hurricanes were measured and reported but excluded from the calculation of the FRL.

15. In the Party's FRL submission, the AT noted that features of land-use classes and subcategories of forest land are described in general terms. Specific details of the process, workflow and criteria applied to the interpretation of the images of each land-use class using very high, high and medium resolution satellite imagery were not fully described. The AT noted that including a more detailed explanation of the process used to identify land-use classes and forest land subcategories by analysing satellite imagery using Collect Earth could help to improve the transparency of the Party's FRL, and considered it as an area for future technical improvement.

16. Regarding the conversion of land use, the AT noted that Saint Lucia assumed that each piece of land was subject to a maximum of one change of land use over the reference period. During the TA, the AT requested information on the reasons for excluding the possibility of several changes of land use. Saint Lucia confirmed that, while the calculation tool used allows for multiple transitions to be accounted for, only one land parcel out of 2,501 was subject to multiple land-use changes during the reference period. The AT is of the opinion that the assumption of a single change for each piece of land is therefore an acceptable assumption for the reference period. The AT welcomes Saint Lucia's intention to address multiple land-use changes on the same parcel of land if such a situation occurs after the reference period.

17. The AT found that Saint Lucia reported some land conversions from forest land to wetlands and requested clarification. During the TA, Saint Lucia explained that these reported land conversions could be errors. The AT commends Saint Lucia for correcting these errors in the modified FRL submission, which improved the accuracy of its FRL.

18. The AT found that some values for the carbon fraction of dry matter and ratio of below-ground to above-ground biomass were assumed to be zero for grassland, which could lead to an overestimation of emissions from conversion of forest land to other land. During the TA, Saint Lucia indicated that these values could be errors. The AT commends Saint Lucia for correcting these errors using default values from the 2006 IPCC Guidelines in the modified FRL submission, which improved the accuracy of its FRL. The AT considers the more accurate estimation of the carbon fraction of dry matter and ratio of below-ground to above-ground biomass, particularly for grassland, as an area for future technical improvement.

19. The AT commends Saint Lucia for providing information in its submission on the time taken to reach maximum stock value for several land classes and including these values as thresholds in various calculations in the "Foundational Platform" spreadsheet used to construct the FRL. The AT considers that including this information contributed to improving the transparency of the FRL.

20. With regard to emissions and removals from above-ground biomass, the AT acknowledged the use of default EFs from various IPCC guidelines for some forest classes (see para. 13 above), as well as the use of country-specific EFs derived from the NFI and the equation from Chave et al. (2014) for the four forest classes elfin and cloud forest, deciduous coastal forest, montane forest and semi-evergreen forest. During the TA, Saint Lucia provided a comparison between the country-specific values and default values provided in the 2006 IPCC Guidelines. The AT noted that the country-specific values were significantly lower than the default values for the forest classes elfin and cloud forest, and deciduous coastal forest and significantly higher for montane forest and semi-evergreen forest. During the TA, the Party explained that these differences were due to the uniqueness of Saint Lucia's ecosystems and their differences compared with other rainforest ecosystems in South and Central America on which the IPCC default values are based. The AT requested further clarification on the use of the equation from Chave et al. (2014) and NFI data to estimate above-ground biomass for montane forest and semi-evergreen forest. Saint Lucia noticed some errors in the way in which the equation from Chave et al. (2014) had been used for the original FRL submission. For the modified FRL submission, these errors were corrected and above-ground biomass was re-estimated for the four forest classes elfin and cloud forest, deciduous coastal forest, montane forest and semi-evergreen forest. The AT considers that the recalculated estimates more closely reflect the correct use of the Chave et al. (2014) equation and that the country-specific values are significantly closer to the IPCC default values. The AT commends Saint Lucia for its efforts to improve the estimates of above-ground biomass.

21. Regarding the changes in carbon stock in pools during deforestation and forest degradation, Saint Lucia used the default values from various IPCC guidelines (see para. 13 above), supplemented by local expert judgment. The AT welcomes the Party's intention to improve the estimates of emissions and removals from carbon pools for forest land classes, including by developing country-specific EFs through a new NFI and the collection of local data on wood density values, biomass losses and growth rates, and noted this as an area for future technical improvement.

22. The AT found that, while a transition period of 20 years is assumed for carbon stock changes in DOM for converted forest land, this is not the case for carbon stock changes in SOC, for which no transition period is applied for forest land converted to other land categories, thus leading to an assumption of instantaneous carbon stock changes. The AT notes that this assumption implies an overestimation of SOC emissions from conversion of forest land to other land categories. The AT considers that assuming a transition period – either the IPCC default of 20 years associated with the default EFs or a country-specific transition period for country-specific EFs – would avoid the overestimation of SOC emissions from conversion of forest land to other land categories and improve the accuracy of the Party's FRL, and noted this as an area for future technical improvement.

23. The AT noted that, in the Party's original submission, increases in forest annual biomass associated with undisturbed forest and forest land before land conversion were considered as GHG removals from forest land remaining forest land, while increases in forest annual biomass associated with forest land after disturbance and forest land after land conversion were considered in the other land categories. The AT considers that this approach results in an underestimation of GHG removals from forest land remaining forest land. The AT commends Saint Lucia for including in the modified submission GHG removals from forest land after disturbance and forest land after conversion as part of GHG removals from forest land remaining forest land, which improved the transparency, accuracy and comprehensiveness of the FRL.

24. The AT sought a number of clarifications regarding the calculations in the "Foundational Platform" spreadsheet used by the Party in constructing the FRL. The AT noted the following in particular:

(a) Where there was a conversion from forest land to annual cropland, the annual increase in biomass was reported as zero, but, where there was a conversion from forest land to perennial cropland, the annual increase in biomass was reported as the value of the annual biomass increase in perennial cropland after conversion. The net balance of GHG emissions and removals from deforestation resulting from forest land converted to cropland therefore

considers emissions associated with the initial change in biomass carbon stocks on land converted to cropland and removals associated with the annual increase in biomass in perennial cropland after conversion;

(b) Where there was a conversion from forest land to grassland, the immediate annual increase in biomass was the annual increase in biomass in grassland after conversion, which is zero. The net balance of GHG emissions and removals from deforestation resulting from forest land converted to grassland therefore considers emissions associated with the initial change in biomass carbon stocks on land converted to grassland and removals associated with the annual increase in biomass in grassland after conversion;

(c) Where there was a conversion from forest land to settlements, the annual increase in biomass was zero, but, where there was a conversion from forest land to woody settlements, the annual increase in biomass was reported as the values of the annual increase in biomass in woody settlements after conversion. The net balance of GHG emissions and removals from deforestation resulting from forest land converted to settlements therefore considers emissions associated with the initial change in biomass carbon stocks on land converted to settlements and removals associated with the annual increase in biomass in woody settlements after conversion.

25. As the annual increase in biomass after a conversion from forest land to perennial cropland, grassland or woody settlements is not part of the annual increase in biomass in forest land, the AT considered that this approach is not in line with IPCC guidance as these emissions and removals should not be considered in the balance of emissions and removals from forest land. The AT commends the Party for not including this post-conversion annual increase in biomass in the balance of emissions and removals from forest land in the modified submission, which improved the transparency and accuracy of the FRL.

26. The AT welcomes Saint Lucia's intention to develop an uncertainty analysis, including for AD, and noted this as an area for future technical improvement.

27. The AT found several differences between the methodology used for constructing the FRL and the 2010 national GHG inventory, which was submitted in 2015. The AT noted that a more detailed explanation of methodological differences between the 2010 GHG inventory report and the current FRL submission would help to increase understanding of differences between the two reports. During the TA, Saint Lucia provided the draft version of its 2020 national GHG inventory, which the Party is aiming to submit as part of its first biennial update report. The draft version showed that the same methodologies and data sets were used for both the FRL and the 2020 national GHG inventory. The AT considers that the information provided by Saint Lucia in the modified FRL submission regarding the methodological differences between the FRL, the 2010 national GHG inventory and the 2020 national GHG inventory improved the transparency of the FRL.

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

28. At the time of submission of the FRL, the national REDD+ strategy had not yet been finalized. During the TA, Saint Lucia provided the AT with a 2017 report on the establishment of a national REDD+ strategy, which includes information not only on REDD+ activities but also on the institutional arrangements and measurement, reporting and verification system necessary for implementing the activities. The report outlines a REDD+ strategy built on the Saint Lucia Forests and Land Resources Strategy 2015–2025 and details the relevant steps required, including the need for consistency with the nationally determined contribution under the Paris Agreement, adaptation of the institutional and legal framework, fulfilment of various REDD+ requirements, consultation with stakeholders and the private sector, and establishment of a results verification system. The report also mentions the National Climate Change Policy and Plan and the National Strategy for Adaptation to Climate Change as policies and plans relevant to the national REDD+ strategy.

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

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

30. The AT noted that Saint Lucia excluded the activity conservation of forest carbon stocks from its original FRL submission, but still provided a time series of removals associated with this activity. The figures provided indicate that the activity conservation of forest carbon stocks is the most significant activity in Saint Lucia of the five activities identified in decision 1/CP.16, paragraph 70, in accordance with its national capabilities and circumstances. The AT commends the Party for including this activity in the modified FRL submission and clarifying the differences between this activity and the activity enhancement of forest carbon stocks, which improved the accuracy of the FRL.

31. The pools included in the Party's original FRL submission are above- and below-ground biomass and DOM. In its modified submission, SOC is also included. Harvested wood products were excluded due to lack of data. The AT welcomes Saint Lucia's intention to consider including harvested wood products in future FRL submissions.

32. With regard to emissions and removals from below-ground biomass, the AT notes that the Party used a combination of default EFs from various IPCC guidelines (see para. 13 above) and the country-specific EFs used for above-ground biomass (see para. 20 above). The AT welcomes the Party's intention, as stated in its original submission, to develop country-specific EFs for this pool for future FRL submissions and noted this as an area for future technical improvement.

33. For emissions and removals from DOM, including deadwood and litter, the AT notes that the Party used a combination of default EFs from various IPCC guidelines (see para. 13 above). The AT welcomes the Party's intention to develop country-specific EFs for this pool for future FRL submissions and noted this as an area for future technical improvement.

34. With regard to emissions and removals from SOC, the AT requested clarification of the reasons for omitting the pool. Saint Lucia explained that the pool was omitted due to lack of data. The AT considers that this pool is likely to be significant given the nature of tropical rainforest ecosystems and notes that the 2006 IPCC Guidelines provide a method for estimating carbon stock changes in SOC. The AT acknowledges the Party's use of a tier 1 approach to estimate SOC emissions for the modified FRL submission on the basis of information from the 2019 GSOCmap developed by FAO. The AT welcomes the Party's intention to develop country-specific EFs for this pool for future FRL submissions and noted this as an area for future technical improvement.

35. Saint Lucia included in its FRL CO_2 emissions and removals associated with changes in carbon pools and CO_2, CH_4 and N_2O emissions from forest fires. Saint Lucia confirmed to the AT that forest fires occurred only in deciduous coastal forests.

36. On the basis of the information provided by the Party, the AT notes that the emissions and removals from sustainable forest management are not significant. During the TA, Saint Lucia explained that historical timber plantations were abandoned before the reference period and no sustainable forest management activity took place during the reference period. The AT considered this sufficient evidence that sustainable forest management is not a significant activity in Saint Lucia.

37. The AT acknowledges Saint Lucia's intention to identify steps being taken by the Party to improve its future FRL submissions when new and adequate data and better information become available, as part of the stepwise approach.

4. Definition of forest

38. Saint Lucia provided in its submission the definition of forest used in constructing its FRL. The definition used in constructing the FRL (i.e. minimum area of 1 ha, height of 3 m or more and at least 60 per cent canopy cover) is different from that used by the Party for its 2010 national GHG inventory and its reporting to FAO for the 2020 Global Forest Resources Assessment (which includes scrub forests, defined as areas with shrubs or stunted trees covering more than 20 per cent of the area, and which are not primarily used for agriculture or non-forestry purposes). During the TA, Saint Lucia provided the AT with the draft version of its 2020 national GHG inventory, for which it used the same definition of forest as for constructing the FRL. Saint Lucia also provided detailed documentation on the process of creating the forest definition, explaining in particular that the forest definition is based on a

forest typology from the 2009 NFI, includes oil palm plantations (although Saint Lucia has no such plantations) and excludes tree stands in agriculture production systems such as agroforestry systems.

III. Conclusions

39. The information used by Saint Lucia in constructing its FRL for reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks and enhancement of forest carbon stocks is transparent, complete and in overall accordance with the guidelines for submissions of information on reference levels.

40. The FRL presented in the modified submission, for the reference period 2001–2013, corresponds to –121,333 t CO_2 eq/year.

41. The AT acknowledges that Saint Lucia included in its FRL emissions and removals from deforestation and forest degradation and net removals from conservation of forest carbon stocks and enhancement of forest carbon stocks by forest type (montane forest: elfin, cloud montane, montane rainforest; seasonal forest: semi-evergreen, semi-deciduous; littoral evergreen; mangroves; and plantations) and the above- and below-ground biomass, DOM and SOC pools. The AT considers that, in doing so, Saint Lucia followed decision 1/CP.16, paragraph 70, on activities undertaken, and decision 12/CP.17, paragraph 10, on applying the stepwise approach. The AT commends Saint Lucia for providing information on its ongoing work to develop FRLs using country-specific EFs for above-ground biomass (annual increases), DOM and SOC, as well as EFs for other IPCC land-use categories.

42. As a result of the facilitative interactions with the AT during the TA, Saint Lucia 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, without having to alter the approach used to construct the FRL, and commends Saint Lucia on its efforts. The new information provided in the modified submission, including the data made available online[13] and the examples of how estimates of CO_2 emissions from deforestation were calculated, increased the reproducibility of the FRL calculations.

43. The AT notes that, overall, Saint Lucia did not maintain consistency, in terms of sources of AD and EFs used for its FRL, with those used for the 2010 GHG inventory included in its third national communication.[14] Nevertheless, the AT noted during the TA that Saint Lucia maintained consistency, in terms of sources of AD and EFs and the approach used to estimate emissions and removals for its FRL, with those used for the 2020 national GHG inventory, which the Party is aiming to submit as part of its first biennial update report. The AT commends Saint Lucia for its efforts to maintain consistency between its FRL and the 2020 national GHG inventory.

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

(a) Including a more detailed explanation of the process used to identify land-use classes and forest land subcategories by analysing satellite imagery using Collect Earth (see para. 15 above);

(b) Improving the estimates of emissions and removals from carbon pools for forest land classes, including by developing country-specific EFs (see para. 21 above);

(c) Assuming a transition period for carbon stock changes in SOC for forest land converted to other land categories (see para. 22 above);

(d) Including a complete uncertainty analysis of the emission and removal estimates for all activities, carbon pools and gases (see para. 26 above);

[13] https://drive.google.com/drive/folders/1yjb5B8H24vXR05ZYkIbbJlF4oTJkBydb?usp=sharing.

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

(e) Developing country-specific EFs for emissions and removals from the below-ground biomass, DOM and SOC pools (see paras. 32–34 above).

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

(a) Improve the AD and EFs for biomass burning by using local field data (see para. 8 above);

(b) Collect data on harvested wood products to estimate emissions and removals from this pool (see para. 8 above);

(c) Improve the estimates of emissions and removals from carbon pools for forest land classes (see para. 21 above);

(d) Develop an uncertainty analysis, including for AD (see para. 26 above).

46. In conclusion, the AT commends Saint Lucia 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 Saint Lucia'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.[15] The AT also acknowledges that the TA was an opportunity for a rich, open, facilitative and constructive technical exchange of information with Saint Lucia.

47. The table contained in annex I summarizes the main features of Saint Lucia's proposed FRL.

[15] 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 Saint Lucia

Main features of the FRL		*Remarks*
Proposed FRL	–121 333 t CO_2 eq/year	In the modified submission, Saint Lucia provided a FRL based on the average emissions and removals of CO_2, CH_4 and N_2O associated with deforestation and forest degradation and net removals associated with conservation of forest carbon stocks and enhancement of forest carbon stocks in 2001–2013 (see para. 7 of this document)
Type and reference period of FRL	FRL = average of historical emissions and removals in 2001–2013	See paragraph 7 of this document
Application of adjustment for national circumstances	No	
National/subnational	National	The FRL includes all forest regions and types in the country (see para. 7 of this document)
Activities included	Reducing emissions from deforestation Reducing emissions from forest degradation Conservation of forest carbon stocks Enhancement of forest carbon stocks	See paragraph 6 of this document
Pools included	Above-ground biomass Below-ground biomass DOM SOC	See paragraphs 7–8 of this document
Gases included	CO_2, CH_4, N_2O	See paragraph 8 of this document
Forest definition	Included	Minimum area of 1 ha, height of 3 m or more and at least 60 per cent canopy cover (see para. 38 of this document)
Consistency with latest GHG inventory	Methods used for estimating the FRL are not consistent with those used for the latest GHG inventory (2010)	Several methodological improvements were implemented for estimating the FRL compared with the methods used for the 2010 GHG inventory. The 2020 GHG inventory will benefit from these improvements and consistency with the FRL submission will be maintained (see para. 27 of this document)
Description of relevant policies and plans	Included	Information on relevant policies was included in the modified FRL submission (see para. 28 of this document)

Main features of the FRL		*Remarks*
Description of assumptions on future changes to domestic policy, if included in constructing the FRL	Not applicable	
Description of changes to previous FRL	Not applicable	
Identification of future technical improvements	Included	Several areas for future technical improvement have been identified (see para. 44 of 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.). Hayama, Japan: Institute for Global Environmental Strategies. 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.ch/publication/2013-supplement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories-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 modified FRL submission of Saint Lucia. Available at https://redd.unfccc.int/submissions.html?country=LCA.

“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.

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:

Chave, Jérôme, Maxime Réjou-Méchain, Alberto Búrquez, Emmanuel Chidumayo, Matthew S. Colgan, Welington B. C. Delitti, Alvaro Duque, Tron Eid, Philip M. Fearnside, Rosa C. Goodman, Matieu Henry, Angelina Martínez-Yrízar, Wilson A. Mugasha, Helene C. Muller-Landau, Maurizio Mencuccini, Bruce W. Nelson, Alfred Ngomanda, Euler M. Nogueira, Edgar Ortiz-Malavassi, Raphaël Pélissier, Pierre Ploton, Casey M. Ryan, Juan G. Saldarriaga, and Ghislain Vieilledent. 2014. “Improved Allometric Models to Estimate the Aboveground Biomass of Tropical Trees.” Global Change Biology 20(10):3177–90. doi: 10.1111/gcb.12629. 1–11. doi:10.1007/s004420050201.