



Technical report on the technical analysis of the technical annex to the first biennial update report of the Lao People's Democratic Republic submitted in accordance with decision 14/CP.19, paragraph 7, on 28 July 2020

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 the Lao People's Democratic Republic on 28 July 2020 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 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 emission level (FREL)/forest reference level (FRL) proposed by the Party in its modified FREL/FRL submission of 28 May 2018.

The Lao People's Democratic Republic reported the results of the implementation of these activities for 2015–2018, which amount to emission reductions of 12,805,253 tonnes of carbon dioxide (t CO₂) and enhanced removals of 1,873,301 t CO₂ for the four years covered and were measured against the assessed FREL/FRL of 41,013,316 t CO₂/year emissions and 7,533,558 t CO₂/year removals.

The data and information provided in the technical annex are mostly in accordance with the guidelines contained in the annex to decision 14/CP.19. The technical analysis concluded that the data and information provided by the Lao People's Democratic Republic in the technical annex are mostly transparent and fully consistent with the assessed FREL/FRL established 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.



Abbreviations and acronyms

AD	activity data
BUR	biennial update report
CO ₂	carbon dioxide
EF	emission factor
first national REDD+ results report	<i>Lao People's Democratic Republic 1st National REDD+ Results Report for REDD+ Results-Based-Payment under the UNFCCC</i>
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
MRV	measurement, reporting and verification
NFI	national forest inventory
NFMS	national forest monitoring system
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 analysis
TTE	team of technical experts
2006 IPCC Guidelines	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>

I. Introduction

A. Introduction

1. This technical report covers the TA of the technical annex provided by the Lao People's Democratic Republic on 28 July 2020 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, the Party provided the data and information used for estimating its anthropogenic forest-related emissions by sources and removals by sinks, forest carbon stocks, and forest carbon stock and forest area changes resulting from the implementation of 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. In this context, the Lao People's Democratic Republic underlined that the submission of the technical annex through its first BUR does not modify, revise or adjust in any way its nationally determined contribution or any national legal instruments or binding agreements under the UNFCCC.

3. 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 the Party and through a facilitative sharing of views, resulting in a separate summary report.¹

4. The Lao People's Democratic Republic made its first FREL/FRL submission, in accordance with decision 12/CP.17, on 5 January 2018, 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 technical assessment, the Party provided a modified FREL/FRL submission on 28 May 2018.² The assessed FREL/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 FREL/FRL are included in a separate report.³

B. Process overview

5. The TA of the first BUR of the Lao People's Democratic Republic took place from 30 November to 4 December 2020 as a desk analysis⁴ 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: Ahmad Wafiq Aboelnasr (Egypt), Alexey Vladimirovich Cherednichenko (Kazakhstan), Ricardo Fernandez (European Union), Henrik Fliflet (Norway), Maria Ana Gonzalez Casartelli (Argentina), Karin Kindbom (Sweden), Nara Lee (Republic of Korea), Nicolo Macaluso (Canada), Athmane Mehadji (Algeria), Dinh Hung Nguyen (Viet Nam), Marcela Itzel Olguin-Alvarez (Mexico) and Orlando Ernesto Rey Santos (Cuba). Mr. Fliflet and Ms. Lee were the LULUCF experts who undertook the TA of the technical annex in accordance with decision 14/CP.19, paragraphs 10–13.

6. The TA of the technical annex provided by the Lao People's Democratic Republic 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.

¹ FCCC/SBI/ICA/2020/TASR.1/LAO.

² The original and modified FREL/FRL submissions are available at <https://redd.unfccc.int/submissions.html?country=lao>.

³ FCCC/TAR/2018/LAO, published on 22 January 2019.

⁴ Owing to the circumstances related to the coronavirus disease 2019, the TA of the BUR submitted by the Lao People's Democratic Republic had to be conducted remotely.

7. During the TA and subsequent exchanges, the LULUCF experts and the Lao People's Democratic Republic engaged in technical discussions, and the Party provided clarifications in response to the questions raised by 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.

8. Following the TA of the technical annex, the LULUCF experts prepared and shared the draft technical report with the Lao People's Democratic Republic for its review and comments. The LULUCF experts responded to the Party's comments and incorporated them into and finalized this technical report in consultation with the Party.

C. Summary of results

9. 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, the Lao People's Democratic Republic, on a voluntary basis, proposed a national FREL/FRL covering the activities reducing emissions from deforestation, reducing emissions from forest degradation 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 the Party's national territory, covering an area of 236,800 km², of which 13.7 million ha (as at 2015) are under forest cover. The assessed FREL/FRL of the Lao People's Democratic Republic is 41,013,316 t CO₂/year emissions and 7,533,558 t CO₂/year removals.

10. The Party's FREL/FRL is based on its annual average historical CO₂ emissions associated with the activities reducing emissions from deforestation, reducing emissions from forest degradation and enhancement of forest carbon stocks for the historical reference period 2005–2014. The Party did not include emissions and removals from conservation of forest carbon stocks or sustainable management of forests because it does not have national definitions for those activities. The Party reported the results of the implementation of the included activities for 2015–2018, calculated against the assessed FREL/FRL, which amount to emission reductions of 12,805,253 t CO₂ and enhanced removals of 1,873,301 t CO₂ for the four years covered.

II. Technical analysis of the information reported in the technical annex to the first biennial update report

A. Technical annex

11. For the technical annex to the first BUR submitted by the Lao People's Democratic Republic, 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) There is consistency in the methodologies, definitions, comprehensiveness and information provided between the assessed FREL/FRL and the results of the implementation of REDD+ activities;

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

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

(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 BUR according to the scope outlined in paragraph 12 above.

1. Consistency in the 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 Parties for estimating anthropogenic forest-related emissions by sources and removals by sinks, forest carbon stocks, and forest carbon stock and forest area changes related to REDD+ activities undertaken by them should be transparent and consistent over time and with their established FREL/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 the Lao People’s Democratic Republic ensured overall consistency between its FREL/FRL and its estimation of the results of the implementation of the activities reducing emissions from deforestation, reducing emissions from forest degradation (resulting from forest-class transitions and selective logging) and enhancement of forest carbon stocks (due to restoration and reforestation activities) in 2015–2018 by:

(a) Using consistent methodologies and data to generate AD, including the proxy-based approach to estimating the impacts of selective logging on emissions;

(b) Using consistent methodologies and data to generate EFs and removal factors, in particular the same stratification of forest classes and the same methodology for classifying regenerating vegetation,⁶ bamboo, forest plantations and other land or forest classes;

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

(d) Including the same gases: CO₂ only;

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

(f) Assuming that the tree stumps observed during the NFI were from trees felled as a result of selective logging within 12 years of the time of observation, and that selective logging is evenly distributed across all forest classes;

(g) Using the same forest definition as that used in constructing its FREL/FRL.

16. In view of the above, the LULUCF experts concluded that the results presented of the implementation of the activities reducing emissions from deforestation, reducing emissions from forest degradation and enhancement of forest carbon stocks are consistent with the assessed FREL/FRL, if the information in the first national REDD+ results report⁷ shared by the Party is also taken into consideration. The LULUCF experts commend the Lao People’s Democratic Republic for ensuring the consistency of the data and methodologies described in the FREL/FRL submission for 2005–2014 and in the technical annex with the results of the implementation of the included activities for 2015–2018.

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

17. The LULUCF experts noted that the technical annex provides a summary of the information specified in the annex to decision 14/CP.19, and contains links and references to the supplementary information in the first national REDD+ results report as well as references to the Party’s FREL/FRL submission. The LULUCF experts were unable to assess the consistency, completeness⁸ and accuracy of the data and information on the basis of the

⁶ Defined as previously forested areas in which the crown density has been reduced to less than 20 per cent owing to logging or heavy disturbance, including shifting cultivation. The areas are expected to become forest again if left undisturbed.

⁷ Referred to in chap. 3 of the technical annex; available at <http://dof.maf.gov.la/en/publications/>.

⁸ “Complete” here means the provision of the information necessary for the reconstruction of the results.

technical annex alone: they had to repeatedly refer to the first national REDD+ results report, which was indispensable for assessing the consistency, completeness and accuracy of the data and information provided in the technical annex. Hence, the LULUCF experts noted that the Lao People's Democratic Republic could enhance the transparency and ensure the completeness of the data and information that will be used for the estimation of results by including this first national REDD+ results report as part of the official submission of a technical annex to its BUR.

18. The LULUCF experts noted that, as part of the TA process, the Party provided additional information, in particular on the structure and operation of the NFMS, the generation of AD, the third NFI, and the calculations and assumptions used in the proxy-based approach for estimating emissions from forest degradation due to selective logging. The LULUCF experts also noted the Party's intention of making all data and information on the NFMS web portal⁹ publicly available. The LULUCF experts commend the Lao People's Democratic Republic for its efforts to increase the transparency and ensure the completeness of the data and information provided, allowing for the reconstruction of the results.

19. Details on the methodology for estimating AD and EFs were provided in the first national REDD+ results report. The same methodology and approaches used for estimating AD and EFs for constructing the FREL/FRL were used for estimating the results. The AD for the results were based on the forest-type map for 2019, which was developed using the same methods, scale, minimum mapping unit, and land and forest classification system as for the forest-type maps for 2005, 2010 and 2015 used in constructing the FREL/FRL. The same reference sampling method (i.e. design-based area estimation) was used for estimating AD for both the FREL/FRL and the results. Emissions from forest degradation due to selective logging were estimated using the same proxy-based approach applied in constructing the FREL for emissions from forest degradation. The same methodology and assumptions were used for developing EFs and removal factors for constructing the FREL/FRL as for estimating the results. The same approach was applied to developing EFs and removal factors, using data from the second NFI for constructing the FREL/FRL and data from the third NFI for estimating the results. In the case of regenerating vegetation, the same methodology was applied for both the first regenerating vegetation survey, used for constructing the FREL/FRL, and the second such survey, used for calculating the results.

20. According to decision 12/CP.17, paragraph 8, the FREL/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 the Lao People's Democratic Republic's FREL/FRL in 2018 was unable to confirm whether the Party maintained consistency in terms of sources of AD and EFs with the GHG inventory included in its second national communication (2013)¹⁰ because the GHG inventory was for 2000 and therefore outside the historical reference period of the FREL/FRL (2005–2014). In the modified FREL/FRL submission, the Party reported that it will submit a GHG inventory for the base year of 2010 as part its third national communication, which has yet to be submitted. The LULUCF experts noted that there is also inconsistency between the estimated results and the GHG inventory for 2000 in terms of sources of AD and EFs.

21. To generate AD, the Party used visual interpretation of optical satellite imagery to create mosaic land-cover maps and forest-type maps. To develop the 2015 forest-type map, satellite imagery obtained between November 2014 and February 2015 was used, and the resulting map was considered to represent land cover on 1 January 2015. For the 2019 forest-type map, satellite imagery obtained between January and March 2019 was used, and the resulting map was considered to represent land cover on 1 January 2019. The results presented in the technical annex were estimated for the calendar years 2015–2018. As a consequence, some of the estimated emissions and removals included in the FREL/FRL took place during the results period, and some of the emissions and removals included in the results took place in the first three months of 2019. During the TA, the Party highlighted the difficulty of obtaining cloud-free satellite imagery, which required the inclusion of imagery

⁹ <https://nfms.maf.gov.la>.

¹⁰ Available at <https://unfccc.int/non-annex-I-NCs>.

for additional months in the land-use mosaics. The LULUCF experts recognized that dealing with clouds is a recurring challenge in the use of optical satellite imagery and noted that further elaboration on the impact of the observation periods selected could increase the transparency and accuracy of future submissions.

22. The estimates of emissions from forest degradation include estimates of the impacts of selective logging on emissions, calculated using a proxy-based approach. In response to questions from the LULUCF experts, the Lao People's Democratic Republic clarified why this proxy-based approach was identified as the best available method for quantifying the impacts of selective logging given current conditions, and that it is well aware of the limitations of the approach. The LULUCF experts noted that, while the Party assumed an even distribution of the impacts of selective logging across all forest classes, the third NFI showed variation in the proportion of deadwood carbon stocks estimated from tree stumps (counted as deadwood) across forest classes, which is indicative of variation in impacts of selective logging. Furthermore, this assumption likely leads to an overestimation of emissions, as areas classified as restored or reforested in the historical land-cover maps are assumed to experience the same impacts of selective logging as stable forest areas. During the TA, the Party shared additional information on the estimation of emissions from selective logging, and clarified that the assumption is likely to have limited impact on the REDD+ results estimates as the same methodology was used for constructing the FREL/FRL and estimating the results in the technical annex. The LULUCF experts commend the Lao People's Democratic Republic for sharing this supplementary information. The Party noted during the technical exchanges with the LULUCF experts that testing new methodologies in order to improve or replace the proxy-based approach has been identified and prioritized as a capacity-building need. The LULUCF experts also commend the Party for prioritizing this needed improvement, as the uncertainty of the estimates resulting from the proxy-based approach is likely to have a significant impact on the reported results given that the emissions from selective logging account for a large proportion of the total emissions.

23. In response to a question from the LULUCF experts, the Lao People's Democratic Republic clarified that it intends to make all data (e.g. images and annual maps) publicly available, enabling stakeholders to reconstruct the emission and removal estimates (see para. 18 above). During the TA, the Party confirmed that standard operating procedures for the NFI were developed for the second NFI and updated before the third NFI was conducted. Data from the third NFI were used for estimating the results. In addition, the Party confirmed that standard operating procedures have also been developed for deriving the forest-type map, maintaining the NFMS database and web portal, and estimating emissions and removals for the REDD+ results and associated uncertainties. The LULUCF experts commend the Lao People's Democratic Republic for providing transparent information and continuing to improve the accuracy of its estimates.

24. The LULUCF experts concluded that the Lao People's Democratic Republic provided the necessary information to allow for the reconstruction of the results of the implementation of the activities reducing emissions from deforestation, reducing emissions from forest degradation and enhancement of forest carbon stocks. They found it necessary to use information from both the technical annex and the first national REDD+ results report to assess the completeness and transparency of the technical annex. The data and information provided in the technical annex, when considered together with the supplementary information in the first national REDD+ results report, are considered to be transparent, consistent, complete and accurate to the extent possible. The data and information provided in the technical annex alone are considered to be mostly transparent, fully consistent, mostly complete and accurate to the extent possible.

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

25. The Lao People's Democratic Republic 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 FREL/FRL; results in t CO₂/year, consistent with the assessed FREL/FRL; a demonstration that the methodologies used to produce the results are consistent with those used to establish the assessed FREL/FRL (as outlined in chap. II.B.1 above); a description of the forest

monitoring system and the institutional roles and responsibilities in the MRV of the results; the information necessary for the reconstruction of 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.

26. In its submission, the Party provided a summary table with the results of the implementation of the activities reducing emissions from deforestation, reducing emissions from forest degradation and enhancement of forest carbon stocks for 2015–2018, consistent with the assessed FREL/FRL and allowing for the reconstruction of the results. The results achieved in terms of reducing emissions from deforestation and forest degradation, and removals from enhancement of forest carbon stocks are listed in table 8 of the technical annex and amount to emission reductions of 12,805,253 t CO₂ and enhanced removals of 1,873,301 t CO₂ for the four years covered in the results period.

27. The LULUCF experts noted that the Party provided a description of the NFMS and a summary of the institutional roles and responsibilities for the MRV of the results in the technical annex, together with weblinks for accessing further information.¹¹ The roles and responsibilities of the agencies and institutions involved in MRV were transparently explained. During the consultation process, the Party explained that the NFMS is being developed following the stepwise approach and added that the NFMS Roadmap, which outlines the steps to be taken up to 2030, is at the final draft stage. Data management procedures for the NFMS, which currently comprises a web portal and database, are operational. The Party provided a weblink to the web portal (see para. 18 above) and shared a log-in code and password upon the request of the LULUCF experts, but explained that the portal also provides general information to users that do not have a log-in code. During the TA, the LULUCF experts commended the Lao People’s Democratic Republic for sharing this information, but noted in the draft report that transparency could be enhanced if all data and information on the web portal were publicly accessible. Following this suggestion, the Party took steps to make the data and information on the NFMS publicly accessible. The LULUCF experts acknowledge the follow-up efforts of the Party to enhance the transparency of data and information on the NFMS.

28. The forest monitoring system used is a national system covering the entire national territory. The system assesses AD on changes in land cover, namely current forest, potential forest and non-forest cover, through visual interpretation of remote sensing imagery. The remote sensing imagery is used to generate land-cover change maps using a 2010 land-cover map as the baseline. EFs and removal factors are generated mainly using biomass data from the second and third NFIs, supplemented by IPCC default values and data from Viet Nam. As noted by the Party and in the technical assessment of the FREL/FRL, increasing use of national biomass data and avoiding reliance on IPCC defaults and data from Viet Nam would likely decrease the uncertainties associated with the estimates. The LULUCF experts noted that this is an area for future technical improvement.

29. 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, the Lao People’s Democratic Republic explained that its land and forest classification system applies two levels of classification. Forests are classified into eight forest classes, ranging from natural forest to plantation forest, including regenerating vegetation under shifting-cultivation cycles. For the purpose of estimating forest-related emissions and removals, the national land and forest classification system (see table 2 of the technical annex) stratifies forest land into five strata according to carbon stocks, and plantation forests are separated from natural forests. In its submission, the Party noted that this approach has been adopted in order to reduce the uncertainty associated with land representation; however, it is not consistent with the approaches for land representation provided in the 2006 IPCC Guidelines (vol. 4, chap. 3). Nevertheless, the Party’s NFMS enables assessment of the different types of forest in the country, including natural forest.

¹¹ <http://dof.maf.gov.la/en/home/> and <http://nfms-lao.net/nfms>.

30. On the basis of the available information and noting that the NFMS and the results reported in the technical annex cover the entire national territory, the LULUCF experts noted that, so far, there is no evidence of displacement of emissions.

31. The Party provided a description of how IPCC guidance and guidelines were taken into account in accordance with decision 4/CP.15, paragraph 1(c). For the estimation of emission reductions and removals, it used the methodology and equations provided in the 2006 IPCC Guidelines for estimating carbon stock changes in forest land converted to other land uses. Accordingly, the emissions from deforestation and forest degradation and removals from enhancement of forest carbon stocks were estimated for 2015–2018 by combining AD (i.e. areas of annual change between forest strata) with the appropriate EF or removal factor (i.e. emissions or removals associated with the corresponding forest stratum transition).

32. The Party included in its FREL/FRL and estimation of results the most significant carbon pools, that is above-ground and below-ground biomass. Deadwood, litter and soils were not included owing to lack of data and the insignificance of the pools. The Party noted that methane and nitrous oxide are emitted from biomass burning resulting from slash and burn practices. While this is an important disturbance event at the national level, it was excluded from the FREL/FRL and the results owing to data constraints. Overall, the exclusion of the soil organic carbon pool and non-CO₂ gases was adequately justified. The LULUCF experts commend the Lao People's Democratic Republic for expressing its intention to obtain better information on soil organic carbon and non-CO₂ gases with the aim of including them in future FREL submissions and estimates of results as part of the stepwise approach.

4. Accuracy of the results proposed in the technical annex

33. The LULUCF experts noted that the Party's estimation of the results of the implementation of the activities reducing emissions from deforestation, reducing emissions from forest degradation and enhancement of carbon stocks in the national area of the Lao People's Democratic Republic was undertaken using a transparent and consistent approach. The LULUCF experts commend the Lao People's Democratic Republic for its significant long-term efforts to build a robust NFMS that is capable of providing transparent estimates of AD, EFs, emissions from deforestation and forest degradation and changes in forest carbon stock.

34. Both the established FREL/FRL and the results obtained in 2015–2018 from the implementation of the activities reducing emissions from deforestation, reducing emissions from forest degradation and enhancement of forest carbon stocks are based on the assumption that annual emissions and removals occur evenly during the reference and the results period. Also, the Party assumed the transition period from non-forest to forest to be 40 years, deducting 5 years for the transition period for regenerating vegetation areas. In addition, 20 years was assumed as the transitional period for forest with lower biomass to become forest with higher biomass.

35. Regarding emissions from selective logging, which make up a substantial proportion of the emissions from forest degradation, the Party assumed that the tree stumps observed during the NFI were of trees felled within 12 years of the time of observation and that the tree stumps were evenly distributed across all forest classes. During the TA, this issue was raised by the LULUCF experts (see para. 22 above) and the Party responded that the proxy-based approach for estimating emissions from selective logging was the most appropriate considering the national situation, given the lack of robust data on the distribution of selective logging or tree stumps across the country. To address this lack of data, the Party multiplied the tree stump data by the area (in ha) of each forest class to estimate the total emissions. The LULUCF experts noted that this assumption could likely lead to an overestimation of emissions for both the FREL/FRL and the results. In addition, the Party clarified that the method was consistently applied for estimating the results and the FREL/FRL to eliminate any possibility of bias.

36. During the TA, the LULUCF experts noted that supplementary documents (e.g. the first national REDD+ results report, the NFMS Roadmap) described the Party's intention to monitor and track the reported results of carbon trading projects (e.g. Voluntary Carbon Standard registered projects) whose accounting areas and periods overlap with the national estimates of results. They also noted that the register for tracking and monitoring these results

is yet to be developed. The Party clarified that avoidance of double counting will be ensured when national REDD+ results are proposed in relevant payment schemes. The LULUCF experts noted that finalizing the national REDD+ registry and including information about the registry in future submissions is an area for future technical improvement.

37. As mentioned in paragraph 17 above, the Lao People's Democratic Republic provided brief information on accuracy and uncertainty in the technical annex and more detail in the first national REDD+ results report. Overall, consistent methodologies and approaches were applied for estimating both the FREL/FRL and the results. During the TA, the issue of increasing sampling intensity in the third NFI to reduce uncertainty, which was suggested during the technical assessment of the proposed FREL/FRL, was also raised by the LULUCF experts. The Party clarified that the sampling intensity was not increased for the third NFI, but the uncertainty had been reduced, with the smaller standard deviation maintaining the same level of accuracy as the second NFI without changing the target precision. On the basis of the first national REDD+ results report and clarification provided by the Party, the LULUCF experts concluded that the results are accurate to the extent possible.

C. Areas identified for technical improvement

38. The LULUCF experts concluded that the following areas for technical improvement identified in the report on the technical assessment of the Lao People's Democratic Republic's FREL/FRL¹² also apply to the provision of information on the results of the implementation of the activities reducing emissions from deforestation, reducing emissions from forest degradation and enhancement of forest carbon stocks:

(a) Implementing land representation based on the six land-use categories and their conversions, and applying the methods specific to land-use categories provided in the 2006 IPCC Guidelines;

(b) Using the existing information on the areas of post-deforestation land use and the associated carbon stocks to estimate the emissions from forest land conversions to those specific land uses;

(c) Including all the emissions and removals from forest land remaining forest land by applying the default method provided in the 2006 IPCC Guidelines together with above-ground biomass increment factors appropriate to the national circumstances derived from local or regional scientific research;

(d) Including emissions from natural disturbances on managed land;

(e) Including sites that have been abandoned for more than nine years in order to more accurately reflect the dynamics of conversion of abandoned upland crops to mixed deciduous forests for determining the years required for the regenerating vegetation areas to meet the national forest definition;

(f) Explaining that the FREL/FRL values are separated by type of activity rather than by emissions and removals;

(g) Revisiting the methodology for projecting the FREL/FRL when more information is available in order to better reflect the future evolution of emissions and removals.

39. Furthermore, the LULUCF experts noted that the Party could consider:

(a) Including the information contained in the first national REDD+ results report as part of the technical annex in order to enhance transparency and provide a technical annex that enables the reconstruction of the results as a stand-alone submission (see para. 17 above);

(b) Avoiding overlap of the AD collection period between the FREL/FRL reference period and the results period (see para. 21 above);

(c) Continuing to improve the transparency of all data and information via the NFMS web portal as part of the stepwise approach (see para. 27 above);

¹² FCCC/TAR/2018/LAO.

(d) Increasing the use of national biomass data and avoiding reliance on IPCC defaults and data from Viet Nam in order to decrease the uncertainties associated with the estimates (see para. 28 above);

(e) Including information on the national REDD+ registry system for avoiding potential double counting with existing Voluntary Carbon Standard registered projects (see para. 36 above).

D. Comments and responses of the Party

40. During the consultation process, the Lao People's Democratic Republic noted a number of areas of capacity-building needs. The Party also noted that addressing those needs could potentially enable it to improve its data and methodologies and include additional activities and gases in future FREL/FRL submissions. After exchanges with the LULUCF experts, the Party identified the following capacity-building needs:

(a) Testing emerging remote sensing techniques for monitoring and estimating the impacts of selective logging on emissions given that the proxy-based approach applied for the current submission has a number of limitations;

(b) Finding the most suitable and cost-effective method for collecting robust data for estimating emissions from selective logging;

(c) Collecting data on other carbon pools, namely deadwood, litter and soils, to enable their inclusion in future submissions of the FREL/FRL and the results.

III. Conclusions

41. The LULUCF experts conclude that the Lao People's Democratic Republic reported the results of the implementation of three activities, reducing emissions from deforestation, reducing emissions from forest degradation and enhancement of forest carbon stocks, following a national approach that covers the entire national territory. The results include for the three activities estimates of emission reductions and removals of CO₂ from two carbon pools: above-ground and below-ground biomass. The results of the activities were reported using methodologies, definitions, assumptions and information that are consistent with those used for the assessed FREL/FRL.

42. The LULUCF experts consider the data and information provided in the technical annex to be mostly transparent, fully consistent, mostly complete and accurate to the extent possible (see para. 24 above).

43. The LULUCF experts found that the data and information provided in the technical annex are mostly in accordance with the guidelines referred to in decision 14/CP.19, paragraph 9.

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

45. In conclusion, the LULUCF experts commend the Lao People's Democratic Republic for showing a strong commitment to the continuous improvement of the data and information used for calculating the results, in line with the stepwise approach, which are consistent with those used to establish its assessed FREL/FRL. Some areas for future technical improvement identified by the LULUCF experts and capacity-building needs identified by the Party have been included 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 the Party.¹⁴

¹³ In accordance with decision 2/CP.17, para. 57.

¹⁴ In accordance with 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 is not reproduced here. It is available on the UNFCCC website at <https://unfccc.int/BURs>.

Annex II

Summary of the main features of the proposed results of the implementation of the activities referred to in decision 1/CP.16, paragraph 70, based on information provided by the Lao People's Democratic Republic

	<i>Key elements</i>	<i>Remarks</i>
Results reported	12 805 253 t CO ₂ emission reductions 1 873 301 t CO ₂ enhanced removals	The Party reported two separate values for the results for emissions and removals (see para. 10 of this document)
Results period	2015–2018	This is within the FREL/FRL validity period of 2015–2025 (see para. 10 of this document)
Assessed FREL/FRL	41 013 316 t CO ₂ /year emissions 7 533 558 t CO ₂ /year removals	The Party proposed two separate values for its FREL (for deforestation and forest degradation) and FRL (for enhancement of forest carbon stocks) (see para. 9 of this document)
Reference period	2005–2014	The FREL/FRL was estimated on the basis of the annual averages of historical emissions in 2005–2014 (see para. 10 of this document)
National/subnational	National	See paragraph 9 of this document
Activities included	Reducing emissions from deforestation Reducing emissions from forest degradation Enhancement of forest carbon stocks	Enhancement of forest carbon stocks includes removals from restoration and reforestation. The Party did not include emissions and removals from conservation of forest carbon stocks or sustainable management of forests owing to lack of national definitions of the activities (see para. 10 of this document)
Pools included	Above-ground biomass Below-ground biomass	The Party did not include deadwood or litter on the basis of the insignificance of the pools and lack of data (see para. 32 of this document). It identified collecting such data as a capacity-building need (see para. 40 of this document)
Gas included	CO ₂	While recognizing the importance of including methane and nitrous oxide emissions from biomass burning due to slash and burn practices, the Party excluded non-CO ₂ gases owing to data constraints (see para. 32 of this document)
Consistency between assessed FREL/FRL and the results	Methods, definitions and information used for the assessed FREL/FRL are consistent with those used for estimating the results	The Party used the same methodology and approaches for AD and EFs to construct the FREL/FRL and estimate the results (see paras. 15–16 of this document)
Description of NFMS and institutional roles	Included	The Party also provided access to the NFMS web portal and database (see paras. 27–30 of this document)
Identification of future technical improvements	Included	Several areas for future technical improvement were identified in the technical assessment report of the FREL/FRL, during the TA and by the Party in the first national REDD+ results report (see paras. 38–40 of this document)

Annex III

Documents and information used during the technical analysis

A. Reference documents

First (original and modified) FREL/FRL submission of the Lao People's Democratic Republic. Available at <https://redd.unfccc.int/submissions.html?country=lao>.

“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/resource/docs/2013/cop19/eng/10a01.pdf>.

“Guidelines for submissions of information on reference levels”. Annex to decision 12/CP.17. Available at <https://unfccc.int/resource/docs/2013/cop19/eng/10a01.pdf>.

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>.

Report on the TA of the proposed FREL/FRL of the Lao People's Democratic Republic submitted in 2018. FCCC/TAR/2018/LAO. Available at <https://redd.unfccc.int/submissions.html?country=lao>.

B. Other documents

The following references have been reproduced as received:

Department of Forestry, Ministry of Agriculture and Forestry. 2020. *Lao People's Democratic Republic 1st National REDD+ Results Report for REDD+ Results-Based Payment under the UNFCCC*. Vientiane Capital, Lao PDR: Department of Forestry, Ministry of Agriculture and Forestry. Available at: <http://dof.maf.gov.la/en/publications/>.

Forest/Land Use Classification in Lao. December 2017. Department of Forestry. Ministry of Agriculture and Forestry, Lao PDR.

National Forest Monitoring System Roadmap (Draft). October 2020. Department of Forestry. Ministry of Agriculture and Forestry, Lao PDR.

NFMS web portal is accessible at: <https://nfms.maf.gov.la>.

The 2nd National Forest Inventory Survey in Lao People's Democratic Republic, August 2017. Department of Forestry. Ministry of Agriculture and Forestry, Lao PDR.

The 3rd National Forest Inventory Survey in Lao People's Democratic Republic. September 2019. Department of Forestry. Ministry of Agriculture and Forestry, Lao PDR.

Worksheets on estimation of emissions from selective logging.
