



Technical report on the technical analysis of the technical annex to the first biennial update report of the Democratic Republic of the Congo submitted in accordance with decision 14/CP.19, paragraph 7, on 30 December 2022

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 Democratic Republic of the Congo on 30 December 2022 through its first biennial update report in accordance with decision 14/CP.19. The technical annex provides data and information on the activity reducing emissions from deforestation, which is an activity included in decision 1/CP.16, paragraph 70, and covers the same national territorial forest land area as the assessed forest reference emission level (FREL) proposed by the Democratic Republic of the Congo in its modified FREL submission of May 2018.

The Democratic Republic of the Congo reported the results of implementing this activity for 2015–2018, which amount to 524,240,000 tonnes of carbon dioxide equivalent per year and were measured against the assessed FREL of 1,078,235,017.8 tonnes of carbon dioxide equivalent per year.

The data and information provided in the technical annex are in overall accordance with the guidelines contained in decision 14/CP.19, annex. The technical analysis concluded that the data and information provided by the Democratic Republic of the Congo in the technical annex are partially transparent and partially consistent with the data and information used for establishing the assessed FREL 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
BFAST	Breaks for Additive Season and Trend
BUR	biennial update report
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
EF	emission factor
FREL	forest reference emission level
FRL	forest reference level
GHG	greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
LULUCF	land use, land-use change and forestry
MRV	measurement, reporting and verification
NFI	national forest inventory
NFMS	national forest monitoring system
NIR	national inventory report
REDD+	reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (decision 1/CP.16, para. 70)
TA	technical assessment
TTE	team of technical experts

I. Introduction, overview and summary

A. Introduction

1. This technical report covers the TA of the technical annex provided by the Democratic Republic of the Congo on 30 December 2022 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 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 the Democratic Republic of the Congo and through a facilitative sharing of views, resulting in a separate summary report.¹

3. The Democratic Republic of the Congo made its FREL submission, in accordance with decision 12/CP.17, on 10 January 2018, which was subject to a technical assessment following the guidance provided in decision 13/CP.19 and its annex. The assessed FREL was included as one of the elements of the technical annex to its first BUR in accordance with the guidelines contained in decision 14/CP.19, annex. The findings from the technical assessment of the FREL are included in a separate report.²

B. Process overview

4. The TA of the first BUR of the Democratic Republic of the Congo took place from 19 to 23 June 2023 as a centralized analysis in Bonn 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: Ménouér Boughedaoui (Algeria), Svetlana Gaidashova (Rwanda), Yao Eric Landry Konan (Côte d'Ivoire), Benoit Pierre Marie Mayer (France), Mame Coumba Ndiaye (Senegal), Robert Pismo (Cameroon) and Camille Reyniers (Belgium). Yao Eric Landry Konan and Camille Reyniers 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 the Democratic Republic of the Congo 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 the Democratic Republic of the Congo engaged in technical discussions, and the Party provided clarifications in response to questions raised by the LULUCF experts, in order to reach an understanding on the identification of the capacity-building needs of the Party and areas for future technical improvement.

7. Following the TA of the technical annex, the LULUCF experts prepared and shared the draft technical report with the Democratic Republic of the Congo 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.

¹ FCCC/SBI/ICA/2023/TASR.1/COD.

² FCCC/TAR/2018/COD, published on 3 December 2018.

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, the Democratic Republic of the Congo, on a voluntary basis, proposed a national FREL covering the activity reducing emissions from deforestation for the purpose of a technical assessment in accordance with decision 13/CP.19 and its annex. The activity is being implemented in the forest land of the Party's national territory, which covers an area of 1,500,000 km², as reported in the Party's first BUR, comprising up to 67 per cent of the national territory and 100 per cent of the country's total forest land. The assessed FREL of the Party is 1,078,235,017.8 t CO₂ eq/year, with the monitoring period, also referred to as the results period, being valid for 2015–2019.³

9. The Party's FREL is based on a linear extrapolation of CO₂ emissions associated with the activity reducing emissions from deforestation for the historical reference period 2000–2014 (constructed using data from 2000–2010 and 2011–2014). In accordance with decision 12/CP.17, paragraph 9, the Democratic Republic of the Congo modified its proposed FREL by including new and additional reference samples from less represented provinces, resulting in changes in AD. The Party noted in its technical annex that the assessed FREL was constructed to be valid for five years but that there could be a need to update the FREL before the end of the monitoring period. The Party reported the results of implementing the activity reducing emissions from deforestation for the 2015–2018 monitoring period, calculated against the FREL, which amount to 524,240,000 t CO₂ eq/year.⁴

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

A. Technical annex

10. For the technical annex to the first BUR submitted by the Democratic Republic of the Congo, see annex I.⁵

B. Technical analysis

11. 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 FREL and the results of implementing REDD+ activities;

(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.

12. 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 11 above.

³ The FREL values (in t CO₂ eq), based on a linear extrapolation of the Party's historical emissions presented in the modified submission, are 979,151,857 (2015), 1,028,693,438 (2016), 1,078,235,018 (2017), 1,127,776,598 (2018) and 1,177,318,178 (2019), resulting in an average of 1,078,235,017.8 t CO₂ eq/year.

⁴ The annual emission reductions (in t CO₂ eq/year) achieved were 449,930,000 (2015), 499,470,000 (2016), 549,010,000 (2017) and 598,550,000 (2018), as presented in table 6 of the technical annex.

⁵ As per decision 14/CP.19, para. 14(a).

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

13. 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 FREL in accordance with decision 1/CP.16, paragraph 71(b–c), and decision 12/CP.17, section II.

14. On the basis of the information contained in the technical annex and the technical exchanges with the Party, the LULUCF experts noted that the Democratic Republic of the Congo ensured consistency with regard to the following elements in developing its assessed FREL and estimating the results of implementing the selected REDD+ activity:

(a) Using the same forest definition as a basis for identifying forest land linked to deforestation;

(b) Covering the same REDD+ activity: reducing emissions from deforestation;

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

(d) Covering the same gas: CO₂.

15. The LULUCF experts noted that the Democratic Republic of the Congo did not maintain consistency regarding the following elements in developing its assessed FREL and estimating the results of implementing the selected REDD+ activity (see chap. II.B.2 below):

(a) Using different methodologies and sources of data for estimating AD;

(b) Using different IPCC tier approaches to develop EFs.

16. In view of the above, the LULUCF experts concluded that the results presented of implementing the activity reducing emissions from deforestation are partially consistent with the assessed FREL. The LULUCF experts note that the Party may wish to enhance the consistency of the elements identified in paragraph 15 above between future proposed FREL/FRL submissions and technical annexes with the results of implementing the selected REDD+ activity, in accordance with paragraphs 3 and 5 of decision 14/CP.19.

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

17. As part of the TA process, the Democratic Republic of the Congo provided additional information, in particular the calculation spreadsheets containing the data used for estimating the emission reductions achieved, as well as supporting documentation relating to the algorithms applied for detecting land-cover changes on forest land, information on the dates applied to all national land-cover change maps and the methodology used for developing the land-use transition matrix for the FREL. The LULUCF experts commend the Party for its efforts to increase the transparency and ensure the completeness⁶ of the data and information provided, with the aim of facilitating reconstruction of the results. The experts also appreciate the sharing of the calculation spreadsheets by the Party to facilitate the technical analysis.

18. The Democratic Republic of the Congo, in its FREL submission, presented in detail the methodology and sources of data and information used to develop the AD, such as the use of high-resolution satellite imagery and the visual interpretation of those images to detect land-use changes. Although the technical annex contains estimates of the results of implementing the selected REDD+ activity, the LULUCF experts noted that the Party did not present sufficiently detailed information on the methodology and data sources applied for estimating the results for 2015–2018. As part of the TA process, the Party provided additional clarification in response to questions raised by the experts and information on the methodology, AD and EFs used. The experts noted that one of the spreadsheets, which presents information on the REDD+ results, contains estimates of net emissions (expressed in t CO₂ eq), but the values do not correspond with those reported in the spreadsheets

⁶ “Complete” here means including the information necessary for reconstructing the results.

containing the GHG emission estimates for the LULUCF sector included in the 2023 NIR (the GHG inventory was for 2000–2018). The spreadsheet includes net emissions from forest land and deforestation for the following land-use categories: forest land remaining forest land; and forest land converted to cropland, grassland and other land, for 2000–2016. However, the experts noted that the estimates presented in the spreadsheet are only for 2015–2016 and not for the entire monitoring period. No estimates were presented for 2017, and the data for 2018, which are also part of the monitoring period, are missing. On further examining the estimates presented in the spreadsheets, the experts noted that the Democratic Republic of the Congo appeared to have applied the estimates calculated for the LULUCF sector of the NIR in estimating the results of implementing the selected REDD+ activity (see also paras. 20, 24, 25 and 39 below).

19. The technical annex does not clearly present the AD used to estimate areas of deforestation and does not contain a land-use change matrix, which could have facilitated the experts' understanding of land-use conversions, in particular forest land converted to other land. Further, the technical annex does not specify which part of the national territorial forest area is covered by the results of implementing the selected REDD+ activity, in accordance with decision 14/CP.19, annex, paragraph 1(c). During the TA, the LULUCF experts asked the Party to share its AD and clarify the methodology used to generate the AD for estimating the REDD+ results and which REDD+ activities were covered by the AD, specifically whether reducing emissions from deforestation was the only activity covered. As part of its response, the Party provided the LULUCF experts with several estimation spreadsheets. The experts noted that the estimates of forest areas and areas of deforestation varied across the spreadsheets. For example, there were different estimates for the forest areas for 2016, which varied between 131,509,599 ha and 143,984,965 ha across four separate spreadsheets. In these same spreadsheets, the areas of deforestation between 2014 and 2016 were presented as 1,287,551 ha and 1,663,321 ha and one of the spreadsheets contained no estimates for the period. The experts asked the Party for further clarification regarding the sources of AD used to estimate the REDD+ results. In response, the Party clarified that it used improved data for estimating the emissions for 2014–2016. The LULUCF experts were not provided with access to the full set of calculations used for estimating the REDD+ results and information on how the AD were developed; however, the explanations provided by the Party suggest that the methodology used to produce the AD is not consistent between the two monitoring periods (2015–2016 and 2017–2018), and between the two monitoring periods and the reference period for the FREL.

20. The Party acknowledged that the values, estimates and information presented in the calculation spreadsheets were based on the IPCC reporting tables on land use and land-use change contained in the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* and were used in compiling the national GHG inventory; hence, they are not the same as those used to construct the FREL, leading to consistency issues. The Party noted that errors or differences are likely to be due to different AD estimates. When analysing the “REDD+ results” spreadsheet, the experts found discrepancies in the reported deforestation trends and the resulting estimates of REDD+ results. Between 2000 and 2010, annual forest land conversions remained, or were assumed to be, stable. Emissions for the forest land category were positive, indicating that it was considered to be a net source of CO₂ emissions. Emissions from deforestation decreased slightly in 2011–2014 but decreased significantly by more than half in 2015–2016, which is part of the results period 2015–2018. However, the experts noted that the conversion of forest land to grassland is reported as “0” for 2015–2016, possibly indicating missing data. The experts noted that the missing data for and information on the conversion of forest land to grassland could lead to an underestimation of emissions from such conversions. Conversely, removals from forest land remaining forest land increased by approximately three times between 2010 and 2011 and by 60 per cent between 2014 and 2015. Therefore, these values appear to indicate that forests became a net sink from 2015 onward. The experts noted that the technical annex does not provide transparent information to clarify these emission and removal trends in forest land and deforestation. In addition, the experts did not find in the spreadsheets shared by the Party the same estimates presented in table 6 of the technical annex, which summarizes the REDD+ results.

21. In response to additional questions raised by the LULUCF experts, the Party reiterated that the results cover all forest land in the national territory. On the basis of this information,

the experts were able to confirm that the results of implementing the selected REDD+ activity cover all the forest areas of the country and that the Party applied a national approach. Hence, the scope applied for estimating the results is consistent with that used for constructing the FREL. However, the experts were not able to clearly identify the areas of deforestation covered by the REDD+ results. They also noted that the total area of forest land is not consistently reported between the technical annex and the FREL (156 million ha)⁷ and the BUR (152 million ha).

22. The LULUCF experts noted that the inconsistency in the AD for the reference period and for the monitoring period is also related to the use of different methodologies and sources to create the land-use change maps. During the TA, the Party clarified that it used different map data to estimate the AD for the FREL (2000–2010 and 2010–2014) and for the REDD+ results (2015–2016 and 2017–2018). The Party acknowledged that it used a different methodology to produce the land-cover change map for each of the periods. For creating the two maps and identifying the corresponding changes in forest land in constructing the FREL, a Random Forest algorithm was used. For creating the land-cover change maps for the monitoring period, the BFAST algorithm was used to detect the spatial–temporal dynamics of forest-cover changes over time. In addition to this difference in methodology used for detecting forest-cover changes, the Democratic Republic of the Congo did not provide clear information on the satellite sensors and resulting images used when applying the BFAST algorithm. From the documentation shared by the Party, the experts noted that the satellite imagery used include those from Sentinel, in addition to Landsat (the satellite imagery used for constructing the FREL). In assessing this information, the LULUCF experts noted that the sources of the data and methodology used to produce the AD are mostly inconsistent between the reference period for the FREL and the monitoring period reported in the technical annex. The LULUCF experts further noted that the Party may wish to consider assessing the impacts on the estimates of forest-cover changes of applying two different algorithms and whether the estimates produced are significantly different.

23. In accordance with the findings set out in paragraph 18 above, the LULUCF experts identified several areas for future technical improvement with regard to estimating AD and ensuring the transparency, consistency and accuracy of the estimates used for calculating the REDD+ results, including:

(a) Ensuring that all AD estimates are fully provided in the calculation spreadsheets and are consistent in both the technical annex and the NIR, and providing sufficient details on the methodology and data sources applied for estimating the results (see para. 18 above);

(b) Ensuring consistency in the methodology applied to generate the AD for both the FREL and the REDD+ results, and presenting detailed information on the methodology used for both submissions (see para. 19 above);

(c) Providing transparent clarification of the emission and removal trends for the forest land and deforestation areas, and ensuring that all missing data for the emission and removal trends are addressed, in the technical annex (see para. 20 above);

(d) Ensuring the clarity and consistency of the estimates of forest land and deforestation areas in the NIR and in the BUR and the technical annex, and, in particular, clearly noting any difference in the estimates of the areas of forest land for the reference period and the monitoring period to enhance transparency, comprehensiveness and completeness (see para. 21 above);

(e) Considering the assessment of the impacts on the estimates of forest-cover changes of applying two different algorithms that may use different estimation parameters and whether the estimates produced are significantly different (see para. 22 above).

24. The technical annex describes the calculation steps for estimating the REDD+ results, namely by subtracting the emissions from the forest land category reported in the 2023 NIR from the projected emissions for the FREL for 2015–2016 and 2017–2018. During the TA, the Party confirmed that it used this approach for estimating the REDD+ results and clarified

⁷ Based on the operational definition that applies a forest-cover threshold of 50 per cent.

that it used the data on CO₂ emissions from forest land reported in the NIR to estimate the emissions from deforestation. The experts noted that the NIR presents emissions from the forestry and other land use sector and that the emissions are mainly caused by above- and below-ground biomass mortality, harvesting, logging and forest fires, and changes in carbon stocks in the litter and above- and below-ground biomass pools. Hence, the emission estimates reported in the NIR cover a broader scope of emissions sources and are not limited to emissions from deforestation.

25. Table 1 of the technical annex presents the EFs used to estimate the REDD+ results and the LULUCF experts noted that these were the same EFs reported and used in the FREL submission (see table 7-4 of the submission). In the case of the FREL, the EFs were developed using a tier 2 approach and country-specific EFs were developed for the various forest types.⁸ However, the LULUCF experts noted that the technical annex and the calculation spreadsheets do not provide details of how those EFs were used to estimate the REDD+ results. During the TA, the LULUCF experts requested the Party to provide data on deforestation areas disaggregated by forest category in the form of a transition (land-use change) matrix, in order to facilitate the identification of the EFs corresponding to each land-use transition. In response, the Party acknowledged that the deforestation data used for estimating the REDD+ results came from the 2023 NIR and that the EFs applied were based on IPCC default factors (i.e. a tier 1 approach). Taking into consideration this clarification by the Party, the LULUCF experts noted that the EFs applied for estimating the REDD+ results are not necessarily consistent with those used for constructing the FREL.

26. The technical annex defines forest as all land occupying an area of more than 0.5 ha, with trees reaching a height of 3 m or more and with tree cover of 30 per cent or more. The technical annex also indicates that the operational definition of forest might take into account a fraction of forest degradation. The LULUCF experts noted that this possible inclusion of emissions from forest degradation could also result in an overestimation of emissions during the monitoring period. In addition, the experts noted that the methodology used for estimating emissions in 2017–2018 evaluates separately the emissions from deforestation and from forest degradation, which could lead to an underestimation of emissions from deforestation, and raised an inconsistency issue regarding the operationalization of the forest definition for identifying forest land and conversions. During the TA, the Party clarified that its operational definition of forest excludes forest degradation, and that it uses the same forest definition for all three national submissions to the UNFCCC, namely the FREL, the NIR and the technical annex. It also specified that it is planning to develop a specific methodology to estimate emissions from forest degradation and to include this REDD+ activity in future FREL submissions and technical annexes. The LULUCF experts identified the estimation of emissions from forest degradation and their inclusion in future submissions as an area for future technical improvement. The experts concluded that the Party ensured consistency in terms of the forest definition applied for the reference and results periods.

27. The technical annex mentions that the trend of forest emissions was estimated on the basis of the conservation of primary forests, the decrease in deforestation, activities relating to forest restoration and the enhancement of forest carbon stocks and forest growth. These activities reflect a broader scope of forest mitigation activities than the reduction of emissions from deforestation alone. Furthermore, the experts noted that the technical annex seems to indicate that other REDD+ activities, such as reducing emissions from forest degradation, conservation of forest carbon stocks and enhancement of forest carbon stocks, were included as part of the results. The experts noted that this is not consistent with the REDD+ activity selected to construct the national FREL. In addition, the LULUCF experts recalled that the Democratic Republic of the Congo noted in its technical annex that emissions from deforestation may include emissions from forest degradation as the data were taken from the NIR, which does not distinguish between these activities (see also para. 26 above). During the TA, the Party confirmed that the technical annex covers only the activity reducing emissions from deforestation. As an area for future technical improvement, the Party may wish to develop a suitable monitoring methodology that would clearly separate the emissions from these two REDD+ activities in order to improve the accuracy of the results reported, evaluate the significance of emissions from forest degradation and consider including that

⁸ FCCC/TAR/2018/COD, para. 19.

activity in future FREL submissions and in estimating REDD+ results. Further, the Party could improve the coherence and consistency of the information presented on the REDD+ activities covered by the REDD+ results in future submissions of technical annexes.

28. Despite the additional data and information shared by the Party during the TA, the LULUCF experts were not provided with access to the sources of data and calculations used for developing the AD and the resulting emission estimates. Owing to the unclear references to the values and estimates contained in the different spreadsheets, the experts were unable to clearly identify the actual AD and EFs used to estimate the REDD+ results. In addition to the inability to fully assess the consistency of the methodology and data used for constructing the FREL and estimating the REDD+ results, the experts were also not fully able to reconstruct the results presented in the technical annex. However, the LULUCF experts acknowledged the Party's efforts to enhance the transparency of the information provided in the technical annex and the completeness of the data and information applied in estimating the results, while recognizing the stepwise approach, in accordance with decision 12/CP.17, paragraph 10. Nevertheless, the experts noted that the Democratic Republic of the Congo may wish to continue improving the transparency of the information and completeness of the data reported in future technical annex submissions to allow for the reconstruction of the results proposed. The experts noted that the Party could consider presenting the AD used for the different forest categories and resulting land-use changes, the EFs applied and the estimates of changes in carbon stocks for each of the land-use change categories as areas for future technical improvement and that this would enhance the transparency, consistency and completeness of the results presented.

29. According to decision 12/CP.17, paragraph 8, the FREL 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 national GHG inventory. The assessment team for the TA of the Democratic Republic of the Congo's FREL noted that the Party did not maintain consistency in terms of sources of AD and EFs with those used for the GHG inventory included in its third national communication (submitted in 2015).⁹ The LULUCF experts noted that this inconsistency is also true for the estimated results of implementing the activity reducing emissions from deforestation for 2015–2018. The LULUCF experts acknowledged the Party's efforts to harmonize the definitions, methods, AD and EFs between its NFMS and its national GHG inventory and to ensure consistency in its reporting to the UNFCCC.¹⁰

30. The LULUCF experts noted that there appear to be overlaps in the years for which REDD+ results are reported. For example, the country indicated a monitoring period of 2014–2016 in table 4 of the technical annex during which results were measured, while 2014 is part of the reference period. In addition, the emission estimates for 2014 were missing from table 6 of the technical annex, and instead the start of the monitoring period was reported as 2015. The Party also indicated in several parts of the technical annex that the final year for which the REDD+ results were estimated is 2019 (e.g. in section 3.1.3 and table 6 of the technical annex), but there were no results proposed for 2019. The experts pointed out to the Party that the references to results periods were not reported consistently in the technical annex, and that such overlaps in years or missing estimates affect the clarity of the submission and may lead to inconsistencies and inaccuracies in the estimation of REDD+ results. In response, the Democratic Republic of the Congo clarified that the FREL reference period covers 15 years between 2000 and 2014 and that two monitoring periods, 2015–2016 and 2017–2018, were reported in the technical annex. In addition, it shared a document providing information on the dates or periods applied to all national forest cover change maps¹¹ and on the experts who provided additional information on the matter. The LULUCF experts noted that the information contained in this document improved clarity regarding the years included in the monitoring period. The experts identified as an area for future technical improvement

⁹ Available at <https://unfccc.int/documents/89096>.

¹⁰ See document FCCC/TAR/2018/COD, para. 19.

¹¹ The document provided by the Party specifies the periods during which the satellite images used for producing the national forest-cover change maps were acquired and is to be applied by all relevant national institutions to ensure coherence and consistency in developing estimates and reporting.

the need for enhanced clarity, consistency and transparency in reporting the monitoring period and avoiding overlaps in the years selected for the monitoring period.

31. In addition, the LULUCF experts noted that measurement units in tables, graphs and text and the titles of tables and figures presented in the technical annex were not always consistent and complete. This inconsistency and missing information or data impact the transparency of the submission, makes it difficult to follow the logic of the information presented and hinders the understanding of how the REDD+ results were achieved (e.g. table 2 on the stratification of forest types, and tables 5 and 6 on emission reductions and REDD+ results). The experts encourage the Party to undertake quality assurance/quality control and editorial improvements in order to enhance the transparency and understanding of future technical annex submissions.

32. The LULUCF experts concluded that the Party did not fully provide the information necessary for reconstructing the results of implementing the activity reducing emissions from deforestation. The data and information provided in the technical annex are considered to be partially transparent, partially consistent, partially complete and partially accurate.

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

33. The Democratic Republic of the Congo provided data and information on most of the required elements in overall accordance with the guidelines contained in decision 14/CP.19, annex, namely summary information from the final report containing the assessed FREL; results in t CO₂ eq/year; a description of the forest monitoring system and institutional roles and responsibilities in MRV of the results; and a description of how the elements contained in decision 4/CP.15, paragraph 1(c–d), have been taken into account. However, the technical annex only partially provides a demonstration that the methodologies used to produce the results are consistent with those used to establish the assessed FREL (as outlined in chap. II.B.1 above) and the information necessary for reconstructing the results (as outlined in chap. II.B.2 above). In addition, in the summary of information on its FREL, the Party noted only the month and year of the FREL submission but did not specify the date of the technical assessment report, in accordance with decision 14/CP.19, annex, paragraph 1(d) (see para. 3 and footnote 2 above).

34. The Democratic Republic of the Congo provided a summary table with the results of implementing the activity reducing emissions from deforestation for 2015–2018. The emission reductions achieved are listed in table 6 of the technical annex and amount to an average of 524,240,000 t CO₂ eq/year for the four years covered (see also para. 30 above).

35. The Democratic Republic of the Congo provided a description of its 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. The Party also described the REDD+ registry developed as a public electronic database to document online all information on REDD+ investments and their registration and approval, and the related validation and control procedures. In addition, the Party mentioned a technical consultation platform for the country's various technical and financial partners active in the forestry sector aimed at harmonizing methods and at monitoring and developing evaluation policies, interventions and activities as part of implementing the NFMS. The LULUCF experts noted that the Party may wish to consider, as an area for future technical improvement, providing public access to relevant forest-related information available on the NFMS through weblinks, which could enhance the transparency of its REDD+ efforts. In addition, the LULUCF experts noted that the Party could enhance transparency and ensure the completeness of the data and information used for estimating the REDD+ results by making available such information on the website of the Ministry of Environment and Sustainable Development.

36. The NFMS covers the forest land in the national territory. The system facilitates forest monitoring and MRV of REDD+ activities, particularly in terms of monitoring GHG emissions and removals. Outputs of the system include estimates of anthropogenic GHG emissions and removals by carbon sinks, and land-use changes in forest land and changes in carbon stocks related to REDD+ activities, which facilitates the Party's reporting on the results of mitigation actions in the forest sector to the UNFCCC. The NFMS uses a combination of remote sensing and ground-based forest carbon inventory approaches for

estimating emissions and removals. The Party plans to update the AD every two years. The NFMS also includes an NFI, which encompasses studies that enable the development of country-specific EFs for the FREL. An inventory improvement plan has been developed with a view to producing country-specific EFs for future FREL and technical annex submissions. The LULUCF experts commend the Democratic Republic of the Congo for its significant long-term efforts to build a robust NFMS that is capable of providing transparent estimates of emissions from deforestation. For future submissions, the experts noted that the Party could consider using the updated AD and country-specific EFs from the NFMS for calculating the estimates for constructing the FREL and for estimating the REDD+ results in order to enhance the accuracy of the estimates and reduce uncertainties.

37. 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 Democratic Republic of the Congo explained that it has four different forest types: (1) dense humid forest on hydromorphic soil, (2) dense humid forest on dry land, (3) secondary forest and (4) dry forest. However, during the consultations, and on the basis of the information provided in the technical annex, the LULUCF experts noted that it was not clear whether the NFMS is able to assess the different forest types in the country. In addition, on the basis of the available information, the LULUCF experts noted that, so far, there is no evidence of displacement of emissions.

38. The Democratic Republic of the Congo 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 from deforestation, it used the methodology provided in the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* to estimate changes in carbon stocks in forest land converted to other land uses. Accordingly, the emissions from deforestation were estimated for 2015–2018 by combining AD (i.e. areas of annual deforestation) with the appropriate EF (i.e. emissions associated with the corresponding forest type).

39. In constructing its FREL and estimating the results, the Democratic Republic of the Congo covered the carbon pools above- and below-ground biomass and only CO₂ emissions from these pools. The carbon pools deadwood, litter and soil organic carbon and non-CO₂ gases were excluded. Since the Party used data from the NIR for estimating the REDD+ results, the LULUCF experts noted during the TA the possible inclusion of emissions from other carbon pools and non-CO₂ gases considered in the GHG inventory as part of the estimates of REDD+ results. The LULUCF experts commend the Party for its intention to obtain better information on the deadwood, litter and soil organic carbon pools and non-CO₂ gases either through its NFMS or NFI and national studies, with the aim of including them in future FRELs/FRLs and estimates of REDD+ results as part of the stepwise approach.

4. Accuracy of the results proposed in the technical annex

40. The Democratic Republic of the Congo did not provide an uncertainty assessment of the proposed REDD+ results. The technical annex provides detailed descriptions of error estimation, including sources of error, as well as formulas and methods that could be applied. The information appears to have been derived from the FREL submission. However, the technical annex does not provide the outcomes of the error estimation. In decision 4/CP.15, paragraph 1(d)(ii), the Conference of the Parties requested developing country Parties to provide estimates that are transparent, consistent, as far as possible accurate, and that reduce uncertainties, taking into account national capabilities and capacities. The LULUCF experts were not able to assess the accuracy of the proposed REDD+ results or the uncertainty associated with the data, as the Party did not report on the outcomes of the error estimation and the information and data that were shared by the Party did not provide details of the accuracy assessment that may have been carried out. As an area for future technical improvement, the experts encourage the Party to provide information on and estimates of error estimation and the associated uncertainties according to its national capabilities and capacities in order to enhance the transparency and comprehensiveness of the technical annex submission.

C. Areas identified for future technical improvement

41. The LULUCF experts concluded that the areas for future technical improvement identified in the report on the technical assessment of the Democratic Republic of the Congo's FREL¹² also apply to the provision of information on the results of implementing the activity reducing emissions from deforestation.

42. Furthermore, the LULUCF experts noted that the Democratic Republic of the Congo could also consider the following additional areas for technical improvement noted in this report in order to enhance the transparency, consistency and completeness of its future technical annex submissions:

(a) Ensuring that all AD estimates are fully provided in the calculation spreadsheets and are consistent in both the technical annex and the NIR, and that sufficient details are provided on the methodology and data sources applied for estimating the REDD+ results (see para. 18 above);

(b) Ensuring consistency in the methodology applied to generate AD for both the FREL and the REDD+ results and providing a detailed presentation of the methodology in the submissions (see para. 19 above);

(c) Providing transparent clarification of the emission and removal trends for forest land and deforestation areas in the technical annex and ensuring that all missing data for the emission and removal trends are addressed in the technical annex (see para. 20 above);

(d) Ensuring the clarity and consistency of the AD estimates of forest land and deforestation areas in the NIR and in the BUR and the technical annex, and, in particular, clearly noting the difference in the estimates of areas of forest land during the reference period and the monitoring period (see para. 21 above);

(e) Considering an assessment of the impacts on estimates of forest-cover changes of applying two different algorithms that may use different estimation parameters and whether the estimates produced are significantly different (see para. 22 above);

(f) Developing a suitable monitoring methodology to separate the emissions from deforestation and from forest degradation (see paras. 26–27 above);

(g) Evaluating the significance of the emissions from forest degradation and considering the inclusion of the activity reducing emissions from forest degradation in future FREL and technical annex submissions (see paras. 26–27 above);

(h) Presenting the AD for the different forest categories and resulting land-use changes, the EFs applied and the estimates of changes in carbon stocks for each of the land-use change categories to allow for the reconstruction of results proposed (see para. 28 above);

(i) Enhancing the clarity, consistency and transparency of the reporting on the monitoring period and avoiding overlaps in the years selected for the monitoring period (see para. 30 above);

(j) Undertaking quality assurance/quality control and editorial improvements to enhance the transparency and understanding of future technical annex submissions (see para. 31 above);

(k) Providing access to relevant forest-related information available on the NFMS through public weblinks to enhance the transparency of national REDD+ efforts (see para. 35 above);

(l) Obtaining better information on the deadwood, litter and soil organic carbon pools and non-CO₂ gases either through its NFMS or NFI and national studies, with the aim of including them in future FRELS/FRLs and estimates of REDD+ results (see para. 39 above);

¹² FCCC/TAR/2018/COD, paras. 37–38.

(m) Providing information on and estimates of error estimation and associated uncertainties in accordance with national capabilities and capacities to enhance the transparency and comprehensiveness of the submission (see para. 40 above).

D. Comments and responses of the Party

43. The Democratic Republic of the Congo, together with the assessment team for the TA of the FREL, identified several areas for the technical improvement of future submissions of FRELs and the results of implementing the selected REDD+ activity.¹³ The LULUCF experts acknowledge these areas for future technical improvement and commend the Party for developing an improvement plan for undertaking such improvements as part of the stepwise approach. The experts acknowledge that addressing those needs could enable the Party to improve its data and methodologies and include additional activities and gases in future FREL/FRL and technical annex submissions.

44. During the TA, the LULUCF experts raised the issue of capacity-building needs relevant to the implementation of REDD+ and monitoring of results. However, no additional areas of capacity-building needs were identified by the Democratic Republic of the Congo. However, the Party noted in its technical annex its improvement plan for the following areas:

- (a) Updating its AD every two years;
- (b) Undertaking the NFI and considering data from various studies as a basis for developing country-specific EFs;
- (c) Ensuring progress in the development of an NFMS that provides robust and transparent forest data at the national level.

III. Conclusions

45. The LULUCF experts conclude that the Democratic Republic of the Congo reported the results of implementing the activity reducing emissions from deforestation for 2015–2018 on the basis of the assessed FREL for the same activity for 2000–2014. The REDD+ activity covers all forest land in the national territory. The results include estimates of CO₂ emission reductions from two carbon pools: above- and below-ground biomass. The results of the activity were estimated and reported using methodologies, definitions, assumptions and information that are partially consistent with those used for constructing the assessed FREL.

46. The LULUCF experts consider the data and information provided in the technical annex to be partially transparent, partially consistent, partially complete and partially accurate.

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

48. The technical annex provides detailed descriptions of error estimation, including sources of error, as well as the formulas and methods that could be applied. However, the technical annex does not provide the outcomes of the error estimation. As a result, the LULUCF experts were not able to assess the accuracy of the results or the uncertainty associated with the data. Nevertheless, on the basis of the information provided by the Party, the displacement of emissions does not appear to be a major issue.

49. In conclusion, the LULUCF experts commend the Democratic Republic of the Congo for showing strong commitment to continuously improving the data and information used for calculating the results with the aim of enhancing consistency with those used for constructing its assessed FREL, in line with the stepwise approach. Some areas for future technical improvement 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.¹⁴ The LULUCF experts also

¹³ See section 3.4.3 of the technical annex and document FCCC/TAR/2018/COD, paras. 37–38.

¹⁴ As per decision 2/CP.17, para. 57.

acknowledge that the TA process was an opportunity for a facilitative and constructive technical exchange of views and information with the Democratic Republic of the Congo.¹⁵

¹⁵ 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 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 the Democratic Republic of the Congo

	<i>Key elements</i>	<i>Remarks</i>
Results reported	524 240 000 t CO ₂ eq/year	See paragraph 9 and footnote 4 of this document
Results period	2015–2018	See paragraph 9 and footnote 4 of this document
Assessed FREL	1 078 235 017.8 t CO ₂ eq/year	See document FCCC/TAR/2018/COD, published on 3 December 2018, available at https://redd.unfccc.int/submissions.html?country=cod The assessed FREL was constructed to be valid for the monitoring period 2015–2019. See paragraph 8 and footnote 3 of this document
Reference period	2000–2014	See paragraph 9 of this document
National/subnational	National	See paragraph 8 of this document
Activity included	Reducing emissions from deforestation	See paragraphs 8–9 of this document
Pools included	Above-ground biomass Below-ground biomass	The possible inclusion of other carbon pools (e.g. deadwood, litter and soil organic carbon) in the overall estimates of the reported REDD+ results. See paragraphs 14(c) and 39 of this document
Gas included	CO ₂	The possible inclusion of non-CO ₂ gases in the overall estimates of the reported REDD+ results. See paragraphs 14(d) and 39 of this document
Consistency with assessed FREL	Methods, data and information used for the assessed FREL are partially consistent with those used for the results	Data and information on the AD used for estimating the results were partially consistent with the AD used for constructing the FREL (see paras. 18–22 of this document). The EFs applied for estimating the results were taken from the NIR and are not consistent with the EFs applied for the FREL (see para. 25 of this document)
Description of NFMS and institutional roles	Included	See paragraphs 35–37 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>.

B. UNFCCC documents

First biennial update report and national inventory report of the Democratic Republic of the Congo. Available at <https://unfccc.int/BURs>.

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

“Guidelines for submissions of information on reference levels”. Decision 12/CP.17, annex. Available at <https://unfccc.int/sites/default/files/resource/docs/2011/cop17/eng/09a02.pdf#page=19>.

Original and modified FREL submissions of the Democratic Republic of the Congo. Available at <https://redd.unfccc.int/submissions.html?country=cod>.

Report on the technical assessment of the proposed FREL of the Democratic Republic of the Congo submitted in 2018. FCCC/TAR/2018/COD. Available at <https://redd.unfccc.int/submissions.html?country=cod>.

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:

Calculation spreadsheets with data for estimating the emission reductions achieved and supporting documentation relating to the algorithms applied for detecting land cover changes on forest lands;

Calculation spreadsheets for the AFOLU sector used in the national GHG inventory report;

Convention of dates applied to all national maps on land cover changes;

Methodology used for developing the land use transition matrix for the FREL.