Technical report on the technical analysis of the technical annex to the second biennial update report of Brazil submitted in accordance with decision 14/CP.19, paragraph 7, on 3 March 2017

Summary

This technical report covers the technical analysis of the technical annex submitted on a voluntary basis by Brazil on 3 March 2017 through its second biennial update report, in accordance with decision 14/CP.19. The technical annex covers data and information on the activity "reducing emissions from deforestation", which is one of the activities included in decision 1/CP.16, paragraph 70, and the same subnational territorial forest area as the assessed forest reference emission level proposed by Brazil for the Amazon biome. The technical annex is submitted for the purpose of obtaining and receiving results-based payments, pursuant to decisions 13/CP.19, paragraph 2, and 14/CP.19, paragraphs 7 and 8.

Brazil reported the results from the activity reducing emissions from deforestation for the period 2011–2015, which amount to 3,154,501,728 tonnes of carbon dioxide. The technical analysis concluded that the data and information provided by Brazil in the technical annex are transparent, complete and consistent overall with the assessed forest reference emission level that was established in accordance with decision 1/CP.16, paragraph 71(b), and decision 12/CP.17, chapter II.

The data and information provided in the technical annex are in overall accordance with the guidelines contained in the annex to decision 14/CP.19. This report contains the findings of the technical analysis and a few areas identified for capacity-building and further technical improvement, according to decision 14/CP.19, paragraph 14.

Contents

I. Introduction, overview and summary

A. Introduction

1.   This technical report covers the technical analysis (TA) of the technical annex provided by Brazil on 3 March 2017 in accordance with decision 14/CP.19, paragraph 7, included in the second biennial update report (BUR) of Brazil that was submitted in accordance with decision 2/CP.17, paragraph 41(a), and annex III, paragraph 19. In the technical annex, Brazil provided data and information used in the estimation of 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 the activities referred to in decision 1/CP.16, paragraph 70 (hereinafter referred to as REDD-plus[1] activities). The submission of the technical annex is voluntary and in the context of results-based payments, as per decision 14/CP.19, paragraph 8.

2.   In this context, Brazil underlined that the submission of the technical annex through its second BUR does not modify, revise or adjust in any way its nationally appropriate mitigation actions voluntarily submitted under the Bali Action Plan[2] or its nationally determined contribution under the Paris Agreement.[3]

3.   The TA of the technical annex is part of the international consultation and analysis (ICA) of BURs referred to in decision 2/CP.17, annex IV, paragraph 4. The objective of ICA is to increase the transparency of mitigation actions and their effects through analysis by a team of technical experts (TTE) in consultation with the Party and through a facilitative sharing of views, and it results in a separate summary report.[4]

4.   Brazil submitted a proposed forest reference emission level (FREL), in accordance with decision 13/CP.19, on 6 June 2014, which was subject to a technical assessment. The assessed FREL was included in the technical annex to the Party's second BUR in accordance with the guidelines contained in the annex to decision 14/CP.19. The findings of the technical assessment of the FREL are included in a separate report.[5]

5.   Brazil formerly submitted a technical annex with its first BUR on 31 December 2014. The results from the technical analysis thereof are contained in document FCCC/SBI/ICA/2015/TATR.1/BRA.

B. Process overview

6.   The TA of the second BUR took place from 22 to 26 May 2017 in Bonn, Germany, 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: Ms. María Fernanda Alcobé (Argentina), Mr. Nagmeldin Elhassan (Sudan), Ms. Maria José Lopez (Belgium), Ms. Lilian Portillo (Paraguay), Mr. Andrew Rakestraw (United States of

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[1]   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 the following activities: reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks.

[2]   See document FCCC/AWGLCA/2011/INF.1.

[3]   http://www4.unfccc.int/ndcregistry/PublishedDocuments/Brazil%20First/BRAZIL%20iNDC%20english%20FINAL.pdf.

[4]   FCCC/SBI/ICA/2017/TASR.2/BRA (document under preparation at the time of publication of this report).

[5]   FCCC/TAR/2014/BRA, published on 1 December 2014.

America), Mr. Orlando Ernesto Rey Santos (Cuba) and Mr. Harry Vreuls (Netherlands). Ms. Alcobé and Ms. Lopez were the co-leads. Mr. Elhassan and Mr. Vreuls were the land use, land-use change and forestry (LULUCF) experts that undertook the TA of the technical annex in accordance with decision 14/CP.19, paragraphs 10–13.

7.   The TA of the technical annex provided by Brazil 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 of the TTE following decision 14/CP.19, paragraph 14.

8.   During the TA and subsequent exchanges, the LULUCF experts and Brazil engaged in technical discussions in relation to the data and information provided in the technical annex. Brazil provided clarification in response to the questions raised by the LULUCF experts, which facilitated a common understanding of the technical issues and the identification of areas for technical improvement. Following the TA of the technical annex, the LULUCF experts prepared and shared the draft technical report with Brazil for its review and comment.

9.   The LULUCF experts responded to and incorporated Brazil's comments and finalized this technical report in consultation with the Party.

C.   Summary of results

10.   In decision 1/CP.16, paragraph 70, the Conference of the Parties encourages developing country Parties to contribute to mitigation actions in the forest sector by undertaking a number of activities, as deemed appropriate by each Party and in accordance with their respective capabilities and national circumstances. Pursuant to that decision and in the context of results-based payments, Brazil, on a voluntary basis, submitted a technical annex to its second BUR containing results from the activity reducing emissions from deforestation for the purpose of a technical assessment in accordance with decision 14/CP.19. The activity is being implemented in Brazil's Amazon biome, which covers an area of 4,197,000 km^2, making up 49.29 per cent of the national territory and 68.6 per cent of the country's total forest land.

11.   Brazil's assessed FREL for the Amazon biome, used for estimating the results included in the technical annex to the second BUR, is a dynamic mean of the carbon dioxide (CO_2) emissions associated with gross deforestation since 1996 and is updated every five years. It is based on the historical CO_2 emissions from the above-ground biomass, below-ground biomass and litter pools associated with deforestation (defined as conversion of primary forests and characterized by clear-cut patterns of deforestation). Brazil submitted its first set of results from the activity reducing emissions from deforestation in the technical annex to its first BUR on 31 December 2014. Those results for the period 2006–2010[6] were measured against its assessed FREL[7] for the Amazon biome and amounted to 2,971.02 Mt CO_2 emission reductions. The results for the subsequent period 2011–2015 were submitted in the technical annex to the Party's second BUR and were calculated against the assessed FREL[8] for the period 1996–2010. The results amounted to emission reductions of 3,154,501,728 t CO_2.

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[6] Refer to document FCCC/SBI/ICA/2015/TATR.1/BRA.

[7] The assessed FREL for the period 1996–2005 (referred to as FREL A in Brazil's submission) is equal to 1,106,027,617 t CO_2. Brazil's modified submission on its FREL is available at http://redd.unfccc.int/submissions.html?country=bra.

[8] The assessed FREL for the period 1996–2010 (referred to as FREL B in Brazil's submission) is equal to 907,959,466 t CO_2. See footnote 7 above for the link to the submission.

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

A. Technical annex

12.   For the technical annex to the second BUR submitted by Brazil, see the annex to this report.[9]

B. Technical analysis

13.   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 methodologies, definitions, comprehensiveness and the information provided between the assessed FREL and the results of the implementation of REDD-plus 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.

14.   The remainder of this chapter presents the results of the TA of the technical annex to Brazil's second BUR according to the scope outlined in paragraph 13 above.

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

15.   In accordance with paragraph 3 of decision 14/CP.19, the data and information used by Parties in the estimation of anthropogenic forest-related emissions by sources and removals by sinks, forest carbon stocks, and forest carbon stock and forest-area changes related to REDD-plus activities undertaken by Parties should be transparent and consistent over time and with their established FRELs in accordance with decision 1/CP.16, paragraph 71(b) and (c), and decision 12/CP.17, chapter II.

16.   The LULUCF experts note that Brazil has ensured overall consistency between the FREL and the estimation of results from the implementation of the activity reducing emissions from deforestation during the period 2011–2015. This includes:

(a)   Using consistent methodologies and data to generate activity data on gross deforestation of primary forests, in particular the same forest monitoring system (the Amazon Deforestation Monitoring Project – PRODES), which detects deforestation as areas with a clear-cut pattern; using the same approach (adjusted deforestation increments) to assess the deforestation area for each year; using the same minimum mapping unit (6.25 ha); and using a spatially explicit identification system for identifying deforestation;

(b)   Using consistent methodologies and data to generate emission factors, in particular the same carbon map and the same stratification of primary forest of the Brazilian Amazon biome into 22 different forest types with different carbon stocks depending on forest type and location;

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[9] Decision 14/CP.19, paragraph 14(a).

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

(d)   Including the same gases: CO_2 only;

(e)   Covering the same area of primary forests: the Brazilian Amazon biome of approximately 4,197,000 km^2;

(f)   Using the assumption that all carbon from the three carbon pools is lost in the year of the deforestation event and not including any subsequent removals of CO_2 in the area;

(g)   Using a forest definition that is fully consistent with the forest definition used for the construction of the FREL.

17.   In view of the above, the LULUCF experts conclude that the presentation of the results from the implementation of the activity reducing emissions from deforestation is consistent with the assessed FREL for the Amazon biome. The LULUCF experts commend Brazil for ensuring full consistency of the data and methodologies described in the FREL for the years 1996–2010 and in the technical annex with the results from the implementation of the activity reducing emissions from deforestation for the years 2011–2015.

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

18.   The LULUCF experts note that, as part of the TA process, Brazil provided additional information, in particular on: (1) adjusted increments of deforestation related to cloud-covered areas; (2) territorial forest area covered; (3) plans for continued improvements and potential future FREL submissions; (4) how to reconstruct the results for 2011–2015; (5) possible displacement of emissions; and (6) uncertainty assessment. Brazil also provided information during the technical exchanges that is normally available on the website[10] of the Ministry of the Environment but, as the website was under reconstruction, it could not be accessed during the TA. The LULUCF experts commend Brazil for its efforts to increase the transparency and ensure the completeness[11] of the data and information provided, allowing for the reconstruction of the results.

19.   Referring to decision 12/CP.17, paragraph 8, the FREL shall be established by taking into account decision 4/CP.15, paragraph 7, and maintaining consistency with anthropogenic forest-related greenhouse gas (GHG) emissions by sources and removals by sinks as contained in each country's GHG inventory. The assessment team for the FREL noted that, overall, Brazil's FREL maintains consistency, in terms of sources for the activity data and emission factors, with the GHG inventory included in Brazil's second national communication.[12] The LULUCF experts note that this is also true for the estimated results from the implementation of the activity reducing emissions from deforestation for the period 2011–2015. Additionally, the LULUCF experts note that Brazil provided additional data for the years 1996–2010 on adjusted increments of deforestation to avoid overestimating or underestimating emissions due to the non-observation of potential deforestation polygons in areas covered by cloud.

20.   The LULUCF experts note that Brazil uses a wall-to-wall approach for accurately tracking gross deforestation of primary forests over time. This ensures that only gross deforestation of primary forests is included in the estimates. In the construction of the

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[10]   http://redd.mma.gov.br/en/infohub.

[11]   Complete here means the provision of information that allows for the reconstruction of the results.

[12]   http://unfccc.int/national_reports/non-annex_i_natcom/items/10124.php.

FREL, the increments of deforestation were adjusted to avoid the overestimation or underestimation of emissions from deforestation due to the non-observation of potential deforestation polygons in areas covered by cloud. In the technical annex, chapter 4, Brazil provided information on how the annual increments of deforestation in the period 2011–2015 were adjusted, consistent with the method adopted in the construction of the FREL.

21. The LULUCF experts conclude that Brazil provided the necessary information allowing for the reconstruction of the results from the implementation of the activity reducing emissions from deforestation. The data and information provided in the technical annex are considered to be transparent, consistent, complete and accurate to the extent possible.

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

22. Brazil provided data and information on all the elements according to the guidelines contained in the annex to decision 14/CP.19, namely: summary information from the final report containing the assessed FREL; results in t CO_2 per year, consistent with the assessed FREL; a demonstration that the methodologies used to produce the results are consistent with those used to establish the assessed FREL (as outlined in chapter II.B.1 above); a description of forest monitoring systems and the institutional roles in and responsibilities for measuring, reporting and verifying the results; necessary information that allows for the reconstruction of the results (as outlined in chapter II.B.2 above); and a description of how the elements contained in decision 4/CP.15, paragraph 1(c) and (d), have been taken into account.

23. In its submission, Brazil provided a summary table with results from the implementation of the activity reducing emissions from deforestation for the years 2011–2015, consistent with the assessed FREL. The emission reduction results achieved are listed in table 2 of the technical annex and amount to a total of 3,154,501,726.77 t CO_2 for the five years covered.

24. The LULUCF experts noted that Brazil provided a description of the forest monitoring system and a summary of the institutional roles in and responsibility for the measurement, reporting and verification of the results in the technical annex, together with weblinks for accessing further information. The roles and responsibilities of the agencies and institutions involved are transparently reported. During the consultation process, Brazil explained that all institutes are involved in the preparation of a potential submission of a national FREL by 2020. The LULUCF experts acknowledge this information shared by Brazil.

25. The forest monitoring system used, PRODES, is a subnational system covering the Legal Amazonia, which is a slightly larger area than the Amazon biome. The system assesses gross deforestation on an annual basis using wall-to-wall mapping with a minimum mapping unit of 6.25 ha.

26. According to decision 11/CP.19, paragraph 4(b), the national forest monitoring system (NFMS) should enable the assessment of different types of forest in the country, including natural forest. Brazil conducts spatially explicit identification of 22 different natural forest types using a carbon density map.

27. Referring to decision 1/CP.16, paragraph 71(c), footnote 7, the subnational monitoring and reporting should include: monitoring and reporting of emissions displacement at the national level, if appropriate, and reporting on how displacement of emissions is being addressed, and on the means to integrate subnational monitoring systems into a national monitoring system. The LULUCF experts noted that in the technical

assessment report[13] the assessment team noted that "so far, there is no evidence of displacement of emissions (i.e. decreased deforestation in the Amazon biome resulting in increasing degradation)". During the consultation process, Brazil provided information on deforestation in the Cerrado biome, which is the adjacent forest biome likely to be affected by displacement. For the proposed FREL for the Cerrado biome,[14] Brazil reconstructed its deforestation time series for the Cerrado biome and the estimates show that deforestation has gone down in the Cerrado biome since 2004. Therefore, Brazil is of the view that there is no displacement of emissions from the Amazon to other biomes. Given the available information, the LULUCF experts note that, so far, there is no evidence of displacement of emissions from the Amazon biome to the Cerrado biome.

28. Brazil provided a description of how the Intergovernmental Panel on Climate Change (IPCC) guidance and guidelines were taken into account, in accordance with paragraph 1(c) of decision 4/CP.15. For the estimation of emission reduction results for the Amazon biome, Brazil used a modification of the methodology provided in the 2003 IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* for estimation of carbon stocks in forest land converted to other land-use categories, which does not take into account subsequent land use. Accordingly, the gross emissions from deforestation for 2011–2015 were estimated by combining activity data (i.e. areas of annual gross deforestation) with the appropriate emission factors (i.e. emissions associated with the corresponding forest type).

29. The LULUCF experts note that the technical annex presents in table 1 for the first time a mean for the annual CO_2 emissions from gross deforestation for the period 1996–2015, and it was indicated that this mean will be used for the results to be submitted for the period 2016–2020, while also noting that these numbers were not assessed during the technical assessment of the FREL. In response to this observation by the assessment team, Brazil informed the assessment team that it intends to use the dynamic mean of the CO_2 emissions associated with deforestation for the period 1996 to 2015 for payments for results from 2016 to 2020 as there were no methodological changes in the estimates. Brazil is of the view that the dynamic mean is a consistent continuation of the two previous figures used for the assessed FRELs.

4. Accuracy of the results in the technical annex

30. The LULUCF experts commend Brazil for its significant long-term efforts to build up a robust NFMS that is capable of providing data for transparent estimation of emissions from deforestation.

31. The LULUCF experts note that the estimation of results from the implementation of the activity reducing emissions from deforestation of primary forests in the Amazon biome has been undertaken using well-established sources of data and a transparent and consistent methodological approach, as with the assessed FREL for 1996–2010.

32. Brazil provided detailed information on adjusted emissions in table 3 of the technical annex. From that table, the LULUCF experts noticed that there is a difference between the emissions and the adjusted emissions for the years 1996–2010 while there is no such difference for the years 2011–2015. During the consultation process, Brazil provided clarification on the method used to adjust data for recent observation of cloud-covered areas (see para. 20 above). According to Brazil, the calculation for the years 2011–2015 was done in 2016, when the adjustment for the previous years (1996–2010) was made. Brazil also

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[13] FCCC/TAR/2014/BRA, paragraph 39.

[14] At the time of this TA process, the proposed FREL for the Cerrado biome was undergoing the technical assessment of FRELs. The submission with the proposed FREL is available at http://redd.unfccc.int/files/brazil_frel-cerrado-en-20160106-final.pdf.

indicated that it is possible that, by the time it submits its results for 2016–2020, the results for 2011–2015 will need some adjustment due to cloud-covered areas being detected in images after 2016. However, Brazil considers the risk of such adjustments to be minimal because it now uses new technology with more images and with a longer observation window. The LULUCF experts commend Brazil for the clarification provided and encourage Brazil to provide such clarification on adjustment of estimates for cloud-covered areas in future FREL and results submissions.

33.   As mentioned in paragraph 22 above, and taking into account decision 4/CP.15, paragraph 1(d), Brazil provided information related to uncertainty estimation. Brazil clarified that the uncertainty analysis for its REDD-plus submissions related to the Amazon biome is undertaken during the mapping phase and for the biomass values. The deforestation data on the Amazon biome were subject to strict quality control by researchers from the Brazilian National Institute for Space Research and the Brazilian Ministry of Science, Technology, Innovations and Communications to reduce uncertainties. Uncertainties associated with the biomass values are usually related to the absence of studies for some phyto-physiognomies (entailing the use of values from other biomes and phyto-physiognomies with similar structure and composition) and to limitations in the spatial representativeness of the secondary data obtained from the scientific literature. The first national forest inventory will provide important information on biomass values for all Brazilian biomes and will also result in reducing the uncertainties associated with the use of secondary data. The LULUCF experts commend Brazil for sharing this information on ongoing work relating to uncertainty assessment, and encourage Brazil to continue its efforts to provide uncertainty estimates as encouraged in decision 17/CP.8, annex, paragraph 24. The LULUCF experts conclude that the results are accurate to the extent possible.

C.   Areas identified for technical improvement

34.   Pursuant to paragraph 14(c) of decision 14/CMP.19, the LULUCF experts conclude that the areas for technical improvement identified in the final report on the technical assessment of Brazil's FREL[15] and the areas for improvement identified by the LULUCF experts in the technical analysis of the first set of results[16] from the activity reducing emissions from deforestation in the Amazon biome also apply to the provision of data and information on the second set of results from the implementation of the activity reducing emissions from deforestation submitted in the technical annex to the Party's second BUR. These include the following:

        (a)   Continuation of updating and improving the carbon density map, including through the use of improved ground data from Brazil's first national forest inventory, possibly prioritizing geographical areas where deforestation is more likely to occur;

        (b)   Expansion of the coverage of carbon pools, including deadwood, and improving the understanding of soil carbon dynamics after the conversion of forest to non-forest;

        (c)   Consideration of the treatment of non-CO_2 gases to maintain consistency with the GHG inventory;

        (d)   Continuation of improvements related to the monitoring of forest degradation;

        (e)   Expansion of the forest monitoring system to cover additional biomes;

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[15] FCCC/TAR/2014/BRA.
[16] See FCCC/SBI/ICA/2015/TATR.1/BRA, chapter II, section C.

(f)   Consideration of the application of uncertainty analysis to the estimates provided, as encouraged in decision 17/CP.8, annex, paragraph 24.

35.   The LULUCF experts noted that Brazil has continued to develop its NFMS and made remarkable progress in the above-mentioned areas for improvement, including the development of new carbon maps, data on deadwood and non-CO_2 gases and ongoing work on forest degradation. The LULUCF experts commend Brazil on the progress reported in these areas identified for technical improvement. They encourage Brazil to use these improvements for its future FREL and results submissions to enhance transparency and improve the accuracy of the estimates.

36.   Furthermore, the LULUCF experts note that Brazil could consider the following areas for future technical improvement:

(a)   Continuation of the ongoing efforts in developing the NFMS to improve activity data (gross deforestation area), emission factors (carbon stock change for each forest type) and estimates of forest degradation in order to improve the accuracy of the results;

(b)   Consideration of providing information demonstrating that displacement of emissions is not occurring as a result of the activity reducing emissions from deforestation in the Amazon biome. Such information may include monitoring of deforestation and forest degradation in biomes that might be affected by displacement of emissions.

D.   Comments and/or responses from the Party concerned

37.   During the consultation process, Brazil identified capacity-building needs for the further improvement of activity data and the estimation of emission factors for the activity reducing emissions from forest degradation.

III.   Conclusions

38.   The LULUCF experts conclude that Brazil has reported results from the implementation of the activity reducing emissions from deforestation in the Amazon biome for the period 2011–2015 on the basis of the assessed FREL for the Amazon biome for the period 1996–2010. The results achieved represent the reduction in emissions associated with gross deforestation in the primary forests in the Amazon biome, which represents 68.6 per cent of the total forest area and about 50.0 per cent of the national territory of Brazil. The estimates of results include the carbon stock changes in three pools, namely above-ground biomass, below-ground biomass and litter. Brazil applied consistent approaches, assumptions, methodologies, activity data and emission factors in reporting these results, as used for the assessed FREL for the Amazon biome.

39.   The LULUCF experts consider that the data and information provided in the technical annex are transparent, consistent, complete and accurate to the extent possible.

40.   The LULUCF experts found that the data and information provided in the technical annex are consistent with the guidelines referred to in paragraph 11 of decision 14/CP.19.

41.   The results are accurate to the extent possible, based on the activity data, emission factors, methodologies and assumptions used, which are consistent with the assessed FREL for the Amazon biome. Brazil reported continuous improvements to its NFMS and provided detailed information on how gross deforestation areas were derived using well-established time series data made available through PRODES and adjusted for cloud-covered areas. Brazil also provided information, including time series data, showing a

declining trend in deforestation in the Cerrado biome, justifying the assumption that there is no risk of emissions displacement from the Amazon biome to other biomes.

42.   In conclusion, the LULUCF experts commend Brazil for showing a strong commitment to the continuous improvement of its data and information used for producing results, in line with a stepwise approach, which are consistent with those used to establish its assessed FREL. 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.[17] The LULUCF experts also acknowledge that the TA process was an opportunity for a facilitative and constructive technical exchange of views and information with Brazil.[18]

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[17] Decision 2/CP.17, paragraph 57.
[18] Decision 14/CP.19, paragraph 13.

Annex

Technical annex to the second biennial update report

Owing to the complexity and length of the submitted technical annex to the second biennial update report and in order to maintain the original formatting, the technical annex is not reproduced here. It can be downloaded from the UNFCCC website at http://unfccc.int/8722.