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## **Report of the technical assessment of the proposed forest reference emission level of Zambia submitted in 2016**

### *Summary*

This report covers the technical assessment of the submission of Zambia, on a voluntary basis, on its proposed forest reference emission level (FREL), in accordance with decision 13/CP.19 and in the context of results-based payments. The FREL proposed by Zambia covers the activity “reducing emissions from deforestation”, which is one of the activities included in decision 1/CP.16, paragraph 70. In its submission, Zambia has developed a national FREL. The submission is in overall accordance with the guidelines contained in the annex to decision 12/CP.17. The assessment team (AT) notes that the data and information used by Zambia in the construction of the FREL could have been more clearly and transparently presented in the submission to ensure the reproducibility (completeness) of the proposed FREL. The AT acknowledges that the clarifications, data and information provided by Zambia during the technical assessment allowed the AT to better understand the methodological approaches used. This report contains the assessed FREL and some areas identified by the AT for future technical improvement, according to the scope of the technical assessment in the annex to decision 13/CP.19.

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## I. Introduction and summary

### A. Overview

1. This report covers the technical assessment (TA) of the submission of Zambia on its proposed forest reference emission level (FREL),<sup>1</sup> submitted on 4 January 2016 in accordance with decisions 12/CP.17 and 13/CP.19. The TA took place (as a centralized activity) from 14 to 18 March 2016 in Bonn, Germany, and was coordinated by the UNFCCC secretariat.<sup>2</sup> The TA was conducted by two land use, land-use change and forestry (LULUCF) experts from the UNFCCC roster of experts<sup>3</sup> (hereinafter referred to as the assessment team (AT)): Ms. Thelma Krug (Brazil) and Ms. Naoko Tsukada (Japan). In addition, Mr. Kamel Djemouai, an expert from the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention, participated as an observer<sup>4</sup> during the centralized activity in Bonn.

2. In response to the invitation by the Conference of the Parties (COP) and in accordance with the provisions of decision 12/CP.17, paragraphs 7–15, and its annex, Zambia submitted its proposed FREL on a voluntary basis. The proposed FREL is one of the elements<sup>5</sup> to be developed in the implementation of the activities referred to in decision 1/CP.16, paragraph 70. The COP decided that each submission of a proposed FREL or forest reference level (FRL), as referred to in decision 12/CP.17, paragraph 13, shall be subject to a TA in the context of results-based payments, pursuant to decision 13/CP.19, paragraphs 1 and 2, and decision 14/CP.19, paragraphs 7 and 8.

3. In this respect, Zambia underlined that the submission does not prejudice its intended nationally determined contribution or its nationally appropriate mitigation actions in the land and forestry sectors undertaken pursuant to the Bali Action Plan.

4. The objective of the TA was to assess the degree to which the information provided by Zambia was in accordance with the guidelines for submissions of information on reference levels<sup>6</sup> and to offer a facilitative, non-intrusive, technical exchange of information on the construction of the FREL with a view to supporting the capacity of Zambia for the construction and future improvement thereof, as appropriate.<sup>7</sup>

5. The TA of the FREL submitted by Zambia was undertaken in accordance with the guidelines and procedures for the TA of submissions from Parties on proposed FRELs and/or FRLs as contained in the annex to decision 13/CP.19. This report on the TA was prepared by the AT following the guidelines and procedures in the same decision.

6. Following the process contained in those guidelines and procedures, a draft version of this report was communicated to the Government of Zambia. The facilitative exchange during the TA allowed Zambia to provide clarifications and information that were considered by the AT in the preparation of this report.<sup>8</sup>

### B. Proposed forest reference emission level

7. In decision 1/CP.16, paragraph 70, the COP 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, in the context of the provision of adequate and predictable support. The FREL proposed by Zambia, on a voluntary basis, for a TA in the context of

<sup>1</sup> The submission of Zambia is available at <https://redd.unfccc.int/submissions.html?country=zmb>.

<sup>2</sup> Decision 13/CP.19, annex, paragraph 7.

<sup>3</sup> Decision 13/CP.19, annex, paragraphs 7 and 9.

<sup>4</sup> Decision 13/CP.19, annex, paragraph 9.

<sup>5</sup> Decision 1/CP.16, paragraph 71(b).

<sup>6</sup> Decision 12/CP.17, annex.

<sup>7</sup> Decision 13/CP.19, annex, paragraph 1(a) and (b).

<sup>8</sup> Decision 13/CP.19, annex, paragraphs 1(b), 13 and 14.

results-based payments, covers the activity “reducing emissions from deforestation”,<sup>9</sup> which is one of the five activities included in decision 1/CP.16, paragraph 70. Pursuant to paragraph 71(b) of the same decision, Zambia has developed a FREL for its entire national territory, covering an area of 752,614 km<sup>2</sup>. For its submission, Zambia applied a stepwise approach to the development of its FREL, in accordance with decision 12/CP.17, paragraph 10. The stepwise approach enables Parties to continually improve their FRELs/FRLs by incorporating better data, improved methodologies and, where appropriate, additional pools and activities.

8. Zambia’s proposed FREL was estimated at 25,420,000 tonnes of carbon dioxide equivalent per year. It was constructed on the basis of the historical average emissions from deforestation occurring in natural forest and plantations for timber production using data for 2000–2010 and 2010–2014. The reference period of 2005–2014 was chosen in order to capture the recent increase in deforestation in Zambia.

9. The proposed FREL includes the above-ground biomass, below-ground biomass and deadwood pools, but does not include litter or soil organic carbon. Regarding greenhouse gases (GHGs), the submission includes only CO<sub>2</sub>.

## **II. Data, methodologies and procedures used in the construction of the proposed forest reference emission level**

### **How each element in the annex to decision 12/CP.17 was taken into account in the construction of the forest reference emission level**

#### **1. Information that was used by the Party in the construction of the forest reference emission level**

10. Zambia applied a stepwise approach to the development of its FREL, in accordance with decision 12/CP.17, with the intention to progressively improve the methodologies used and incorporate more pools and activities over time. Zambia understands that, with a view to the FREL evolving under the stepwise approach, its FREL submission served as an opportunity to build capacity and have a facilitative exchange with LULUCF experts from the UNFCCC roster of experts. The Party made use of the best available information at the time of the submission and was guided, as appropriate, by the most recent guidance provided by the Intergovernmental Panel on Climate Change (IPCC), namely the *IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF) and the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

11. Zambia’s FREL includes emissions from deforestation only. Deforestation is defined as the conversion of forest land to non-forest land, where forest land is any land with tree canopy cover of more than 10 per cent, an area of more than 0.5 ha and a tree height of at least 5 m (see paras. 28 and 29 below). Non-forest land is any other land that falls below one or more of those thresholds. According to Zambia’s FREL submission, regrowth after deforestation was not included in the FREL construction. Zambia indicated during the TA that estimating regrowth is particularly challenging in the Zambian context because of the physiognomy of Zambia’s native forest types. During the TA, Zambia also indicated that in the situation where forest is lost and then regrows in the time between remote-sensing images, this would in fact be captured as regrowth when it reaches the forest definition thresholds, but any regrowth below the forest definition thresholds would be excluded. However, the AT notes that this might be a specific situation that is not clearly addressed in the submission. The AT emphasizes the need to improve the clarity and transparency of the FREL description in future submissions.

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<sup>9</sup> Emissions from deforestation are defined as those resulting from the conversion of forest land to non-forest land, assuming that all carbon stocks are instantaneously emitted as CO<sub>2</sub>. No CO<sub>2</sub> removals from regrowth of the deforested areas were considered.

12. Zambia mentioned in the submission that the FREL construction was not consistent with its first (2004) and second (2014) national GHG inventories<sup>10</sup> because they were based on data collected between 2000 and 2004 while the FREL used data collected between 2012 and 2014. The AT notes that Zambia should describe in future FREL submissions the impact on the FREL of the use of the activity data and emission factors used for its GHG inventories. The AT acknowledges that transparency could be improved through the provision of the above information and encourages Zambia to provide such information in its next FREL submission.

13. Zambia did not indicate the expected date of submission of its third national communication to the UNFCCC. The AT acknowledges the requirement for the consistency of the FREL to be checked against the most recent inventory submission. However, the AT notes that, according to Zambia's FREL submission, as reflected in paragraph 12 above, there is no consistency between the FREL and the previous GHG inventories provided in the first and second national communications. Nevertheless, the GHG inventory to be included in the third national communication is expected to be consistent with the FREL submission.

14. Zambia used colour composite satellite imagery from Landsat 7 and Landsat 8 from two periods (2000–2010 and 2010–2014) to identify changes in land cover from 2000 to 2010 and from 2010 to 2014. In doing so, the best pixel composites for each year were used to avoid the effects of periods of cloud cover. Supervised classification using training data for areas of forest, non-forest and deforestation was applied. Since the definition of deforestation is conversion from forest land to non-forest land, the AT raised a question during the TA regarding whether the training sets could be used to identify the change from forest land to non-forest land (i.e. whether there is sufficient sensitivity to be used to identify when a forest pixel in 2000 has become a deforestation pixel in 2010 as a result of one or more forest thresholds not being met). The AT suggests that Zambia, in future FREL submissions, provide information that demonstrates that the training sets can be used to identify when a certain pixel no longer meets the forest definition adopted.

15. Zambia provided estimates of emissions from deforestation for five strata of very different carbon contents. The AT notes that Zambia did not provide in the submission a description of the vegetation type in each stratum, and also notes that the provision of this information would help to increase transparency. In addition, the AT notes that it would be helpful to clarify how the training sets mentioned in paragraph 14 above were obtained for each stratum.

16. The AT notes that the methodology used to identify changes in land cover (especially from forest to non-forest) does allow for estimates of the area deforested between periods of time to be generated. However, that process requires continual refinements and assumptions that make it difficult for an independent reviewer, if interested, to reproduce the estimates generated as well as the associated uncertainties. The AT notes that Zambia did not provide in the submission or during the TA the relevant error matrix. Further, the AT notes that, although Zambia provided in table 3 of the submission information on the calculation of the adjusted forest area (e.g. for stratum 2, the area change from 2000 to 2010, equal to 120,179.52 ha, was adjusted to 454,778.10 ha), it was not clear to the AT how the methods from Olofsson et al.<sup>11</sup> were applied and how the adjusted area thus obtained was further adjusted. The AT suggests that Zambia provide, in its next FREL submission, an example demonstrating how the total area of a stratum was adjusted, in order to increase the transparency of the FREL submission.

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<sup>10</sup> Available at <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-update-reports-non-annex-i-parties/national-communication-submissions-from-non-annex-i-parties>.

<sup>11</sup> Olofsson P, Foody GM, Stehman SV and Woodcock CE. 2013. Making better use of accuracy data in land change studies: Estimating accuracy and area and quantifying uncertainty using stratified estimation. *Remote Sensing of Environment*. 129: pp.122–131.

17. As part of its efforts to continually improve its FREL and its implementation of REDD-plus<sup>12</sup> activities, Zambia indicated its intention to develop subnational FRELs at the provincial level, without compromising the national evaluation of the REDD-plus results against its national FREL. The objective of developing subnational FRELs is to increase transparency and provide more detailed, disaggregated and better organized information. The TA agrees that this initiative may lead to more accurate estimates but notes that this will require completeness and consistency to be demonstrated for each provincial-level FREL. The AT commends the Party for this initiative, which, if well developed, may lead to more accurate estimates of the national FREL, because each subnational FREL would target specific subnational circumstances that are better reflected through province-specific emission factors and activity data and better monitoring of the efficiency of policies and measures applied.

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

### Methodological information, including description of data sets, approaches and methods

18. The above-ground biomass pool was estimated using data collected through Zambia's national forest inventory (NFI), which covered 6,283 sample plots systematically distributed across the country, separated by an interval of approximately 10 km. A country-specific, validated equation was used to estimate the above-ground biomass of different forest types from the sampled ground data (diameter at breast height). In response to a question raised by the AT, Zambia shared with the AT an example based on tree data collected at three sample plots. The AT commends Zambia for the provision of the example, which helped to enhance the transparency of the submission, but notes that the allometric equation provided in the submission is not the same as that used to generate the above-ground biomass tree estimates in the example provided during the TA. The AT notes that it is difficult to analyse the results when they are generated by different sources that are not explicitly indicated in the submission, and emphasizes the importance of documenting calculations in future submissions to ensure transparency and consistency at all stages of the FREL development.

19. Zambia used data from the Global Forest Change study<sup>13</sup> and the Open Foris Collect Earth tool<sup>14</sup> for the deforestation training data. After an initial classification, experts from a number of government institutions used their expert knowledge to identify forest conversion to non-forest areas that occurred during the periods of interest (2000–2010 and 2010–2014). In response to a request from the AT during the TA, Zambia provided an example of the process using a specific satellite image. The AT acknowledges that Zambia used global data products to, among other things, facilitate the creation of local data sets suitable for training classifiers for supervised change detection to support the generation of locally derived training data for deforestation. The AT notes that it is important to ensure that data and information from global data products are consistent with the definitions adopted by the Party, including the boundaries of the forest and deforestation areas.

20. The activity data (deforestation area) were estimated following IPCC approach 3 for land classification, based on spatially explicit data, as described in the IPCC good practice guidance for LULUCF. Data on the six land-use categories suggested by that guidance were used for the reference year 2010. The AT commends Zambia for using approach 3 when assessing the deforestation data and for using the most up-to-date IPCC guidance as encouraged in relevant UNFCCC decisions. This approach allows for verification of the deforestation data, thus enhancing the transparency of the FREL. The AT also commends

<sup>12</sup> In decision 1/CP.16, paragraph 70, the COP 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.

<sup>13</sup> Hansen MC, Potapov PV, Moore R, Hancher M, Turubanova SA, Tyukavina A, Thau D, Stehman SV, Goetz SJ, Loveland TR, Kommareddy A, Egorov A, Chini LC, Justice O and Townshend JRG. 2013. High-resolution global maps of 21<sup>st</sup>-century forest cover change. *Science*. 342(6160): pp.850–853. Available at <https://earthenginepartners.appspot.com/science-2013-global-forest>.

<sup>14</sup> See <http://www.openforis.org/tools/collect-earth.html>.

Zambia for using approach 3, which provides more accurate information about land transitions.

Description of relevant policies and plans, as appropriate

21. Zambia included in the FREL submission references to a number of policies, strategies and laws aligned with its National Development Plan and Vision 2030 that support the establishment of a low-carbon and climate-resilient development pathway. The National Policy on Environment (2007), a new National Forestry Policy (2014), the National Energy Policy (2008), the National Agricultural Policy (2014), the National Strategy for Reducing Emissions from Deforestation and Forest Degradation (2015), a revision of the Forest Act No. 4 (2015) and the Urban and Regional Planning Act No. 3 (2015) are among the policies, strategies and laws mentioned by Zambia in the FREL submission. As the FREL is based only on historical deforestation data, no changes in policies were taken into account in its construction.

**3. Pools, gases and activities included in the construction of the forest reference emission level**

22. The pools included in the FREL are above-ground biomass, below-ground biomass and deadwood. Litter and soil organic carbon were not included.

23. Zambia explained that the selection of the pools took into consideration the quality of the data available as well as their significance. Although the NFI of Zambia, which is the source of the data used in the construction of the FREL, also includes information on litter, the data have yet to be analysed. However, that pool is expected not to be significant. Likewise, the NFI includes data on soils but the data still require analysis. Also, additional data are still necessary to better understand the impact of forest conversion on the soil organic carbon pool. Zambia informed the AT during the TA that the litter and soil organic carbon pools might be included in a future FREL submission. The AT considers the provision of more information on the litter and soil organic carbon pools or a justification of why their contributions to the total emissions are deemed not significant as an area for future technical improvement of the FREL.

24. The description of how deadwood was estimated in the construction of the FREL was not transparently reported in the submission. In response to a question raised by the AT, Zambia clarified that all pieces of deadwood on the sample plots were measured in the same way as the living trees. The raw diameter measurements collected in the field were converted to volume and subsequently to biomass using a conversion factor of 619 kg m<sup>3</sup>. For deadwood in the process of decomposition, a decay function was applied and this was provided to the AT during the TA. The response provided by Zambia to the question of the AT helped to increase the transparency of the submission. The AT suggests that Zambia provide this information in future FREL submissions.

25. Zambia included in the FREL only CO<sub>2</sub> emissions from deforestation from the pools considered (above-ground biomass, below-ground biomass and deadwood), and stated that non-CO<sub>2</sub> gases from Zambia's forests are mainly due to forest fires. However, the fires burn mainly grass, leaves and woody litter that contribute little to overall emissions. Zambia acknowledges that non-CO<sub>2</sub> emissions will be considered in the future, in line with the adopted stepwise approach and as data become more accurate. The AT considers the treatment of non-CO<sub>2</sub> gases as an area for future technical improvement, noting that only non-CO<sub>2</sub> emissions associated with the activities selected by the Party need to be assessed and included in the FREL.

26. Zambia included in the FREL submission the most significant activity (reducing emissions from deforestation) of the five activities identified in decision 1/CP.16, paragraph 70, in accordance with national capabilities and circumstances. However, Zambia acknowledged during the TA that emissions from forest degradation, due to charcoal and firewood extraction, uncontrolled and late bushfires, mining and infrastructure development, could also be significant. According to Zambia, a lack of accurate, representative and reliable data to estimate forest degradation meant that it could not include emissions from forest degradation in the present FREL. However, Zambia stated that emissions from forest degradation will be included in a future FREL submission. The

AT recognizes the complexities of addressing emissions from this type of activity and encourages Zambia to prioritize the collection of forest degradation data in accordance with the most relevant forest degradation activities already identified in the submission.

27. The AT notes that the current exclusion of forest degradation from the FREL appears to be conservative. Overall, the AT commends Zambia for the information provided in the submission and acknowledges Zambia's intention, expressed in the submission, to improve future FREL submissions when better and new data and information become available, as part of the stepwise approach.

#### **4. Definition of forest**

28. Zambia provided in its submission the definition of forest used in the construction of the FREL. The definition is the same as that used by the Party for its most recent (2014) GHG inventory included in its second national communication and for its reporting to the Food and Agriculture Organization of the United Nations for the Global Forest Resources Assessment 2015<sup>15</sup> (i.e. minimum area of 0.5 ha, height of 5 m or more and at least 10 per cent canopy cover).

29. The AT noted during the TA that the FREL submission did not provide enough information for it to determine whether there is consistency between (1) the forest definition and the methodologies used for the forest data collected in the period 2000–2003 for all the provinces and the fourth estimate of Zambian woody biomass resources (which seems to be the basis for the estimations provided in the GHG inventory included in the second national communication) and (2) the recent thresholds used by Zambia in its forest definition for its Integrated Land Use Assessment phases I and II. In response to the question raised by the AT, Zambia indicated that the same forest definition was used across all the reports and communications. The AT suggests that Zambia cite publications or publicly available information in its next FREL submission with explicit reference to the forest definitions applied in all sources of data used, to ensure the transparency of the submission.

### **III. Conclusions**

30. The information used by Zambia in constructing its FREL for “reducing emissions from deforestation” is transparent and in overall accordance with the guidelines for submissions of information on reference levels (as contained in the annex to decision 12/CP.17); however, more detailed documentation of methodologies and data used will improve the transparency of future submissions.

31. The use of tools and global data sets that have not been directly generated by the Party is understood to be part of the stepwise approach applied by Zambia. The AT stresses the importance for Zambia to continually improve its capacity to generate its own activity data, which would facilitate the reproduction of the FREL and thus ensure the completeness of the submission.

32. The AT acknowledges that Zambia included in its FREL the most significant activity and the most significant pools in terms of emissions from forests in accordance with available data. In doing so, the AT considers that Zambia followed decision 1/CP.16, paragraph 70, on activities undertaken and decision 12/CP.17, paragraph 10, on implementing a stepwise approach. The AT commends the Party for the information provided on the ongoing work on the development of its FREL in relation to other relevant activities as well as for other relevant gases (see para. 35 below).

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

(a) Demonstrating that the training sets can be used to identify when a certain pixel no longer meets the forest definition adopted (see paras. 14 and 15 above);

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<sup>15</sup> See <http://www.fao.org/3/a-az377e.pdf>.



(b) Estimating the uncertainty associated with the training data based on global sources (see para. 19 above);

(c) Providing information that allows for the reproduction of the FREL and improves its completeness, particularly the error matrix and the steps taken to calculate the adjusted forest area (in table 3 of the submission) (see para. 16 above);

(d) Providing the literature reference and documentation for the allometric equation used to estimate above-ground biomass (see para. 18 above).

34. In assessing the pools and gases included in the FREL, pursuant to decision 13/CP.19, annex, paragraph 2(f), the AT noted that the current omissions of pools and gases are likely to be conservative in the context of the FREL. Nevertheless, the AT identified the following additional areas for future technical improvement:

(a) Addressing emissions from litter and soil organic carbon (i.e. including the pools or providing more information to justify their omission) (see para. 23 above);

(b) Including non-CO<sub>2</sub> gases in the FREL, to maintain consistency with the GHG inventory included in the most recent national communication (see para. 25 above).

35. The AT acknowledges and welcomes Zambia's intention to:

(a) Continue to identify and monitor drivers of forest degradation, in order to assess whether the reduction of deforestation is leading to the displacement of emissions, and to include emissions from forest degradation in a future FREL submission when new data and better information become available;

(b) Analyse additional forest changes in 2006, in order to assess whether the FREL appropriately captures the recent increasing trend in deforestation, and to update the FREL using the activity data calculated for the new time period in the near future;

(c) Collect data for quantifying gain and regrowth on deforested/degraded land;

(d) Analyse the data collected for soil organic carbon and litter in order to cover the carbon pools, if significant, in future FRELs;

(e) Include emissions associated with fires in future FRELs, combining spatial data capturing fire occurrences (e.g. MODIS<sup>16</sup> burn scar maps) with emission factor data collected as part of the recently completed NFI;

(f) In general, provide more information on the methodologies and data used to generate the estimates underpinning the FREL.

36. In conclusion, the AT commends Zambia for showing a strong commitment to the continual improvement of its FREL estimates in line with the stepwise approach. A number of areas for future technical improvement of Zambia's FREL have been identified in this report. The AT acknowledges that such improvements are subject to national capabilities and policies, and notes the importance of adequate and predictable support.<sup>17</sup> The AT recognizes that the assessment process was an opportunity to build capacity and to have a rich, open, facilitative and constructive technical exchange of information with Zambia, thus allowing the Party to continually improve its FREL submissions as part of the stepwise approach.

37. The table contained in the annex summarizes the main characteristics of Zambia's proposed FREL.

<sup>16</sup> Moderate Resolution Imaging Spectroradiometer.

<sup>17</sup> Decision 13/CP.19, annex, paragraph 1(b), and decision 12/CP.17, paragraph 10.

## Annex

### Summary of main features of the proposed forest reference emission level based on information provided by the Party

<i>Main features of the FREL</i>		<i>Remarks</i>
Proposed FREL (in t CO <sub>2</sub> eq/year)	25 420 000	The FREL includes gross emissions from deforestation (i.e. those associated with forest conversion to non-forest land) and excludes any subsequent removals from the deforested areas (see paras. 8 and 11 of this document)
Type and duration of FREL	FREL = historical emissions during 2005–2014	Zambia constructed its FREL on the basis of the historical average emissions from deforestation during the period 2005–2014. The Party did not indicate the period of applicability of the FREL (see para. 8 of this document)
Adjustment for national circumstances	No	–
National/subnational <sup>a</sup>	National	See paragraph 7 of this document
Activities included <sup>b</sup>	Deforestation	Zambia selected only one activity (reducing emissions from deforestation) (see paras. 7 and 26 of this document)
Pools included <sup>b</sup>	AB, BB, DW	The litter and soil organic carbon pools were not included owing to the lack of knowledge about the dynamics of land-use change following deforestation (see paras. 9 and 22–24 of this document)
Gases included	CO <sub>2</sub>	Non-CO <sub>2</sub> gases were not included owing to lack of data (see para. 25 of this document)
Forest definition <sup>c</sup>	Included	Minimum tree crown cover of 10 per cent; minimum land area of 0.5 ha; minimum tree height of 5 m (see paras. 11 and 28 of this document)
Relationship with latest GHG inventory	Methods and data used for the FREL differ from those used for the latest GHG inventory (2014)	Zambia used the <i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i> for its FREL, but used the <i>Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories</i> for the GHG inventory in its second national communication  Zambia intends to use the updated values for its third national communication, which will then be consistent with the FREL submission (see paras. 12 and 13 of this document)
Description of relevant policies and plans <sup>d</sup>	Included	A brief list of relevant policies was included for information purposes (see para. 21 of this document)

<i>Main features of the FREL</i>		<i>Remarks</i>
Description of assumptions on future changes in policies <sup>d</sup>	Not applicable	–
Description of changes to previous FREL	Not applicable	–
Future improvements identified	Yes	Several areas for future technical improvement were identified (see paras. 33 and 34 of this document)

*Abbreviations:* AB = above-ground biomass, BB = below-ground biomass, DW = deadwood, FREL = forest reference emission level, GHG = greenhouse gas, IPCC = Intergovernmental Panel on Climate Change.

<sup>a</sup> If subnational, comments should include information on the treatment of displacement of emissions.

<sup>b</sup> In the case of omitted pools or activities, comments should include the justification provided by the country.

<sup>c</sup> The forest definition should be summarized, and it should be stated if it differs from the definition used in the greenhouse gas inventory or in reporting to other international organizations.

<sup>d</sup> May be relevant to the description of national circumstances, which is required in the case of adjustment.