



Report on the technical assessment of the proposed forest reference level of Nigeria submitted in 2026

Summary

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

For its submission, Nigeria developed a national FREL. The FREL presented in the original submission, based on the reference period 2017–2021, corresponds to 58,403,033 per year. As a result of the facilitative process during the technical assessment, the FREL was modified to 58,610,840 tonnes of carbon dioxide equivalent per year based on the reference period 2017–2021.

The assessment team notes that the data and information used by Nigeria in constructing its FREL are mostly transparent, mostly complete and in overall accordance with the guidelines contained in the annex to decision 12/CP.17. This report contains information on the assessed FREL and a few areas identified by the assessment team for future technical improvement in accordance with the provisions on the scope of the technical assessment contained in the annex to decision 13/CP.19.



Abbreviations and acronyms

2006 IPCC Guidelines	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
2019 Refinement to the 2006 IPCC Guidelines	<i>2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
AD	activity data
AT	assessment team
BTR	biennial transparency report
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
COP	Conference of the Parties
EF	emission factor
eSBAE	ensemble sample-based area estimation
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	statistical database of the Food and Agriculture Organization of the United Nations
FREL	forest reference emission level
FRL	forest reference level
GFOI	Global Forest Observations Initiative
GHG	greenhouse gas
HWP	harvested wood products
IPCC	Intergovernmental Panel on Climate Change
N ₂ O	nitrous oxide
NC	national communication
NFI	national forest inventory
NICFI	Norway's International Climate and Forest Initiative
NID	national inventory document
QA/QC	quality assurance/quality control
REDD+	reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (decision 1/CP.16, para. 70)
SOC	soil organic carbon
TA	technical assessment

I. Introduction and summary

A. Overview

1. This report covers the TA of the submission of Nigeria on its proposed FREL,¹ submitted on 9 January 2026, in accordance with decisions 12/CP.17 and 13/CP.19. The TA took place from 23 to 27 March 2026 and was coordinated by the secretariat.² The TA was conducted by the AT, consisting of two land use, land-use change and forestry experts from the UNFCCC roster of experts:³ Joana Brandao de Melo (Guinea-Bissau) and Luba Volkova (Australia). In addition, Orlando Ernesto Rey Santos, an expert from the Consultative Group of Experts, participated as an observer⁴ during the session. The TA was coordinated by Luca Birigazzi (secretariat).

2. In response to the invitation of the COP and in accordance with the provisions of paragraphs 7–15 of and the annex to decision 12/CP.17, Nigeria submitted its proposed FREL on a voluntary basis. The proposed FREL is one of the elements⁵ to be developed in implementing the activities referred to in paragraph 70 of decision 1/CP.16. Pursuant to paragraphs 1–2 of decision 13/CP.19 and paragraphs 7–8 of decision 14/CP.19, the COP decided that each submission of a proposed FREL, as referred to in paragraph 13 of decision 12/CP.17, shall be subject to a TA in the context of results-based payments.

3. The objective of the TA is to assess the degree to which the information provided by Nigeria is in accordance with the guidelines for submissions of information on reference levels⁶ 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 Nigeria to construct and improve its FREL in the future, as appropriate.⁷

4. The TA of the FREL submitted by Nigeria was undertaken in accordance with the guidelines and procedures for the TA of submissions from Parties on proposed FRELs and/or FRLs.⁸ This report on the TA was prepared by the AT following the same guidelines and procedures.

5. Following the process set out in those guidelines and procedures, a draft version of this report was communicated to the Government of Nigeria. The facilitative exchange during the TA allowed Nigeria to provide clarifications and additional information, which were considered by the AT in preparing this report.⁹ As a result of the facilitative interactions with the AT during the TA, Nigeria provided a modified version of its submission on 30 May 2026, which took into consideration the technical input of the AT. The modifications improved the clarity and transparency of the submitted FREL without needing to alter the approach used to construct it. This TA report was prepared in the context of the modified FREL submission.

B. Proposed forest reference emission level

6. In paragraph 70 of decision 1/CP.16, the COP encouraged developing country Parties to contribute to mitigation actions in the forest sector by undertaking a number of activities, as deemed appropriate by each Party and in accordance with their respective capabilities and national circumstances, in the context of providing adequate and predictable support. The national FREL proposed by Nigeria, on a voluntary basis for a TA in the context of results-

¹ The submission of Nigeria is available https://redd.unfccc.int/submissions/by-country/country_detail/nga.html.

² As per decision 13/CP.19, annex, para. 7.

³ As per decision 13/CP.19, annex, paras. 7 and 9.

⁴ As per decision 13/CP.19, annex, para. 9.

⁵ See decision 1/CP.16, para. 71(b).

⁶ Decision 12/CP.17, annex.

⁷ Decision 13/CP.19, annex, para. 1(a–b).

⁸ Decision 13/CP.19, annex.

⁹ As per decision 13/CP.19, annex, paras. 1(b), 13 and 14.

based payments, covers the activities reducing emissions from deforestation and reducing emissions from forest degradation, which are two of the five activities referred to in paragraph 70 of decision 1/CP.16. Deforestation is defined as the permanent conversion of forest land to non-forest land (cropland, grassland, settlements, wetlands and other land), where the land no longer functions as a forest. Forest degradation is defined as changes within forested areas where the land continues to meet the national forest definition but experiences a decline in forest quality, such as reduced canopy density or biomass, without crossing the threshold into non-forest status. For its submission, Nigeria applied a stepwise approach to developing its FREL in accordance with paragraph 10 of decision 12/CP.17, which enables Parties to improve their FREL or FRL by incorporating better data, improved methodologies and, where appropriate, additional pools.

7. The FREL submitted by Nigeria in the modified submission corresponds to 58,610,840 t CO₂ eq/year based on the reference period 2017–2021.¹⁰ The table contained in annex I summarizes the main features of the FREL presented in the modified submission, with the aim of accessing results-based payments for REDD+ activities, including reference period, territorial coverage, and pools and gases included.

8. For constructing its FREL, Nigeria used the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*, the 2006 IPCC Guidelines and the 2019 Refinement to the 2006 IPCC Guidelines. Emissions from deforestation were estimated from the net change in carbon stocks between forest land prior to conversion and the land use following deforestation. Post-deforestation carbon stocks for cropland (annual and perennial) and grassland were estimated using default values from the 2019 Refinement to the 2006 IPCC Guidelines, while carbon stocks for settlements, water bodies and other land were assumed to be zero. Emissions from forest degradation were estimated using a gain–loss approach, applying disturbance-specific mean carbon loss percentages by driver (fire, logging and other disturbances) to pre-disturbance forest carbon stocks. For fire-related forest degradation, non-CO₂ gases (CH₄ and N₂O) were estimated using equation 2.27 from the 2006 IPCC Guidelines (vol. 4, chap. 2, p.2.42). Nigeria used the 2019 Refinement to the 2006 IPCC Guidelines for estimating uncertainty using IPCC error propagation methods and a 90 per cent confidence interval.

9. The AD used in constructing the FREL were generated through a systematic sample-based area estimation approach covering the reference period 2017–2021, implemented using the Collect Earth tool. A national team of interpreters assessed land use and land-use change through visual interpretation of multi-source satellite imagery, including Google Earth Pro, Planet-NICFI annual composites, and Sentinel-2 and Landsat imagery accessed via Google Earth Engine. A total of 7,419 systematically distributed (11.2 km × 11.2 km) sample units were interpreted across Nigeria's ecological zones.

10. The estimates of carbon stocks were derived from Nigeria's NFI using a stratified sampling design based on the country's ecological zones that cover Nigeria's major forest types including lowland rainforest, mangrove and freshwater swamp, savannah forests and montane forests. The NFI field measurements include above-ground biomass, deadwood (standing and lying, assessed by decay class) and litter. For degradation, mean relative carbon loss values by disturbance driver (fire, logging and other disturbances) were sourced from scientific literature and applied to pre-disturbance forest carbon stocks. The EFs for net long-term forest degradation were derived by averaging immediate post-disturbance carbon losses against expected carbon recovery over a 20-year regrowth period for degraded forests in Africa.

11. The FREL proposed by Nigeria is its third FREL submitted in the context of applying the stepwise approach. The previous FREL was submitted on 4 January 2019 and was subject to a TA in 2019; it covered the activity reducing emissions from deforestation based on the reference period 2006–2016 and corresponded to 32,397,230 t CO₂ eq/year. It was therefore

¹⁰ In its original submission, Nigeria proposed a FREL of 58,403,033 t CO₂ eq/year. The difference between the original and the modified submission is due mostly to changes in the methodology used for estimating emissions from forest degradation (see finding ID#s 3 and 6 in the table below).

lower than the FREL proposed in the most recent submission (see finding ID# 14 in the table below for differences between the most recent FREL and the previous FREL).

12. The uncertainty of the FREL was quantified by combining the sampling uncertainties of the AD and EFs in line with the error propagation methods from the 2019 Refinement to the 2006 IPCC Guidelines, assuming independence between the two components. AD uncertainties reflect sampling errors from the stratified area estimation by ecological zone, while EF uncertainties were derived from NFI biomass sampling estimates and from the confidence intervals for disturbance-specific carbon loss values, as reported in the literature (e.g. Heinrich et al.). As part of the QA/QC procedures implemented for the AD, Nigeria quantified the consistency of land-area interpretation through a multiple-interpreter Kappa analysis and potential omission and commission errors were checked through cross-validation against global forest change products (e.g. the Global Forest Change data set and alerts from the RADD radar for detecting deforestation) and eSBAE time-series analysis. Nigeria reported the results in its submission, but did not formally include them in the error propagation analysis. All uncertainties were estimated using a 90 per cent confidence interval (see finding ID# 12 in the table below).

II. Technical assessment of the proposed forest reference emission level

13. The table below describes the findings from the TA of the data, methodologies and procedures used by the developing country Party under assessment in constructing its FREL within the scope of the TA in accordance with decision 13/CP.19 and its annex.

Findings from the technical assessment of the data, methodologies and procedures used by the developing country Party under assessment in constructing its forest reference emission level and/or forest reference level

<i>Finding ID#</i>	<i>Aspect of the scope of the TA (decision 13/CP.19, annex, para. 2)</i>	<i>Description of the issue, additional information shared by the Party during the TA and conclusion of the AT</i>	<i>Area for future technical improvement</i>
1	2(a) Consistency with the national GHG inventories	The AT noted that, overall, Nigeria did not maintain consistency, in terms of sources of AD and EFs used for its FREL, with those used for the GHG inventory included in its BTR1 submitted in December 2024. In its BTR1, Nigeria reported net emissions from forest land ranging between 305 and 336 Mt CO₂ eq year⁻¹ for 2017–2021. This magnitude is about 300 times larger than the FREL for forest degradation or 5–6 times larger than the total FREL for the same period. For the BTR1, data on fuelwood and roundwood harvesting were obtained from FAOSTAT. In contrast, the AD for the FREL were obtained from visual interpretation of satellite imagery and a sample-based area estimation approach, while the EFs were derived from the NFI and IPCC default values. Furthermore, the AT found it difficult to reconcile the definition of forest land between the FREL and the GHG inventory. Specifically, the terms “Forestland” and “Woodlands” were merged into a single forest land category in the GHG inventory (see NID p.140). In contrast, for the FREL, Nigeria applied biophysical thresholds (such as tree height and percentage tree cover) to determine forest land, while savannah woodland is explicitly considered as non-forest (see figure 7 and the annex to the original FREL submission). During the TA, Nigeria confirmed that the data used for the GHG inventory and the FREL are different, with the FREL representing an improved methodological approach. Nigeria clarified that the definitions used are the same, with a higher level of disaggregation applied for the FREL within the forest land category to facilitate the visual interpretation of remote-sensing data. Nigeria further confirmed that, for the FREL, land is assigned to forest land based not only on its ecological function but also on biophysical thresholds such as tree height and percentage tree cover. Consequently, savannah and savannah woodland areas may be classified as forest or non-forest depending on whether these biophysical thresholds are met. Nigeria recognized that strengthening alignment between the FREL and the national GHG inventory, including the integration of improved AD and updated EFs, is an area for future technical improvement. The AT welcomes the clarification provided by Nigeria during the TA and commends the Party for including this in the modified FREL submission as an area for future technical improvement.	The AT reiterates the finding of the previous AT that improving consistency between future FREL submissions and future national GHG inventories is an area for future technical improvement of the FREL.
2	2(b) How historical data have been taken into account	The average historical emissions for 2017–2021 (five years) used for constructing the FREL were estimated using a combination of AD from the visual interpretation of remote-sensing data using a systematic grid of sample units and EFs. Some EFs were obtained from the NFI (FAO, 2020), while others were tier 1 default values from the 2006 IPCC Guidelines. The AT noted that, for the AD, Nigeria collected information	

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		from remote-sensing data up until 2024, not 2021, which is the last year of the reference period. During the TA, Nigeria clarified that the AD were collected through a multipurpose survey designed to meet multiple reporting needs, and although the data-collection period extended beyond 2021, only information within the reference period 2017–2021 was used for constructing the FREL. Nigeria further clarified that it intends to use the reference period 2017–2021 as a benchmark for assessing the impact of the implementation of the National REDD+ Strategy (as per finding ID# 13 below) launched in 2021. The results of this assessment are expected to be reported in Nigeria's next BTR. Nigeria explained that the reference period was selected to ensure consistency with the methodological requirements of the Green Climate Fund results-based payment scorecard and the REDD+ Environmental Excellence standard of the Architecture for REDD+ Transactions. The AT welcomes the clarification provided by Nigeria during the TA and commends the Party for including in the modified FREL submission the clarification that the analysis of the results of the interpretation starts with the identification of the land-use class in 2021 and that an area is classified as deforested when the land use in 2021 was non-forest and the previous land use was forest, thereby enhancing the transparency and completeness of the FREL.	
3	2(c) EFs – transparency, accuracy and completeness	The AT noted that, for the original FREL submission, the EFs for forest degradation were estimated using disturbance-specific carbon loss assumptions derived from a study by Heinrich et al. (2026), which was unpublished at the time of the TA. During the TA, Nigeria provided the AT with a revised version of the study, in which the carbon loss values were higher than those used for the FREL. The carbon loss values used for the FREL correspond to those included in an earlier version of the study, which was not shared with the AT. Nigeria explained that, following an expanded literature review, the revised study includes higher carbon loss values for fire, selective logging and other disturbances (48.0, 17.4 and 33.0 per cent respectively) compared with those used for the FREL (44.1, 12.7 and 26.3 per cent respectively). The AT commends the Party for providing a copy of the unpublished study, while noting, however, that the values used for the FREL do not correspond to the revised values and cannot be traced to a publicly available source, thereby limiting transparency and potentially affecting accuracy. It further noted that values that had not yet been published at that time could still change before publication, or the study might not be published at all. In the modified submission, the Party updated the carbon loss values for fire, selective logging and other disturbances to those included in the revised version of the study, which had since been published (Heinrich et al., 2026) (48.0, 17.4 and 33.0 per cent respectively) and included a reference to the	

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		publicly available associated data set (Heinrich et al., 2026b; available at https://zenodo.org/records/19470704), thereby enhancing the transparency and accuracy of the FREL.	
4	2(c) EFs – transparency and accuracy	The AT noted that the formula used by Nigeria for estimating the EFs for forest degradation related to fires, logging and other disturbances provided in the Excel calculation file, including the parameters applied and how it accounted for post-disturbance recovery, was not clearly documented in the FREL submission. During the TA, Nigeria explained that it estimated a long-term forest degradation EF by averaging the immediate post-disturbance loss and the net carbon loss remaining after 20 years. The AT noted that recurring fires or other disturbances may occur, meaning that the projected recovery may not be fully achieved. Nigeria acknowledged the limitation of applying a single EF for long-term forest degradation related to fires, logging and other disturbances and noted its relevance as an area for future methodological improvement.	The AT notes that clearly documenting the formula, parameters and approach used to estimate the EF for fires, logging and other disturbances, including how post-disturbance recovery is accounted for, is an area for future technical improvement that would increase the transparency and accuracy of the FREL submission. The AT further notes that refining the approach used for estimating the EF for forest degradation to account for the possibility of recurring disturbances and incomplete recovery is an area for future technical improvement that would increase the accuracy of the FREL submission.
5	2(c) EFs – transparency and completeness	The AT noted that the calculation spreadsheets used by Nigeria to estimate the AD and EFs were referenced in the FREL submission but there was no indication of how or where they could be accessed. Prior to the TA, Nigeria made the spreadsheets used to construct the FREL available to the AT, including the raw data for the 7,419 sample units that were visually interpreted to estimate the AD. However, the raw data required for reconstructing the EFs for the above- and below-ground biomass, litter and deadwood pools were not provided. Instead, Nigeria provided average values by ecological zone. During the TA, the Party provided the NFI field data used to estimate the EFs. The AT notes that 283 plots were measured to estimate biomass (in 104 clusters), 65 plots were measured to estimate deadwood and 115 to measure litter. The plot measurements provided in the calculation spreadsheets were not grouped by ecological zone and the AT was not able to reconstruct the carbon stocks before conversion (see table 7 of the modified FREL submission). Nevertheless, the AT commends Nigeria for providing the raw data used to derive the AD and EFs.	The AT reiterates the finding of the previous AT that adding a link in the FREL submission to the spreadsheets containing the estimates of the FREL is an area for future technical improvement of the FREL.
6	2(c) EFs – accuracy and transparency	While reviewing the calculation spreadsheets, the AT noted that a combustion factor derived from the study by Heinrich et al. (2026) (i.e. 44 per cent; see also finding ID# 3 above) was used for estimating fire-related CO ₂ emissions from forest degradation, whereas the IPCC default value of 55 per cent was applied for estimating the	

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		corresponding non-CO₂ emissions. The AT notes that this represents an inconsistency in the assumptions regarding the proportion of biomass burned during forest fires. In the modified FREL submission, the Party corrected the calculations and applied the combustion factor from the study by Heinrich et al. (2026) for non-CO₂ emissions as well. The AT commends Nigeria for using consistent combustion factor values for estimating both CO₂ and non-CO₂ emissions, which enhanced the accuracy of the modified FREL submission.	
7	2(c) EFs – accuracy	The AT noted that, to estimate carbon stocks in litter, Nigeria collected samples from three ecological zones: lowland rainforest (60 sample units), montane forest (45 sample units) and derived savannah (8 sample units). The AT noted that the small sample size for derived savannah may not be representative of the average carbon stock in litter in that ecological zone. During the TA, Nigeria clarified that it was constrained by the incidence of wildfires, which often resulted in the absence of litter in many parts of the savannah ecosystem. The AT notes, however, that sample units visited that had no litter should still be included in the analysis and treated as having zero carbon in the calculations, rather than being excluded. The Party explained that it plans to intensify the sampling design and that additional data collected will be incorporated into the NFI database to improve representation and reduce the uncertainty of future assessments of carbon stocks in litter.	The AT notes that increasing the accuracy of the EFs, including by increasing the sample size used to estimate carbon stocks in litter, is an area for future technical improvement that would increase the accuracy of the FREL submission.
8	2(c) AD – accuracy	The AT noted that Nigeria used a systematic sampling design of equal spacing (11.2 km × 11.2 km) covering the entire country to estimate areas of deforestation and forest degradation. The AT also noted that estimating rare events such as deforestation and forest degradation is inherently challenging and that the literature highlights the potential limitations of using a systematic sampling design to represent these events unless the sample size is very large or stratification is applied (e.g. Stehman, 2012; Olofsson et al., 2014; GFOI, 2020). The AT further noted that, in the FREL submission, only 14 sample units were attributed to forest degradation in the entire reference period (see table 3 of the submission), including only 1 sample unit attributed to fire as a driver, and no sample units were attributed to forest degradation in 2017. The small number of sample units identified resulted in high uncertainty of the estimates of forest degradation (close to 200 per cent in most ecological zones, with a 90 per cent confidence interval; see table 5 of the submission). The AT noted that the estimated area of forest degradation of 0.177 Mha for the entire reference period (approximately 35 kha/year), with corresponding emissions ranging from 0.38 to 1.67 Mt CO₂ eq year⁻¹, is substantially lower than the estimates reported to FAO for the Global Forest Resources Assessment and in the Party's GHG inventory included in its BTR1. According to the FAO Global Forest Resources Assessment 2025,	The AT notes that increasing the sample size for estimating the AD, especially for forest degradation, and refining the sampling intensity in areas with a higher likelihood of rare land-use change events is an area for future technical improvement that would increase the accuracy of the FREL submission.

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		Nigeria reported 66.5 Mm³ harvested roundwood and 65.6 Mm³ fuelwood for 2019, while in the GHG inventory (see the BTR1 and NID table 6.4) the Party reported 67.5 Mm³ harvested roundwood and 47.2 Mm³ fuelwood for 2021. The AT notes that extracting 114 Mm³ wood from 0.177 Mha forest land would imply harvest levels exceeding the standing stock of most forests, indicating an inconsistency in the estimates calculated for the FREL with the harvest levels reported in the national GHG inventory and to FAO for the Global Forest Resources Assessment. On the basis of these observations, the AT considers that the high uncertainties reported by Nigeria for forest degradation, the comparatively low estimates relative to other national reporting and the known limitations of systematic sampling designs in detecting rare land-use change events suggest that the sampling design used for the FREL may not be sufficient to accurately estimate forest degradation. During the TA, Nigeria explained that it considered it methodologically preferable to report an estimate of forest degradation with a clearly quantified uncertainty rather than omit this activity entirely. Nigeria indicated that robust QA/QC procedures were consistently applied across all land-use classes to minimize the risk of systematic misclassification. The Party clarified that, because the number of sample units included for the FREL was substantially larger (7,419) than the number included for the FREL submitted in 2019 (1,215), the sampling intensity and design were considered sufficient for collecting AD to represent all land use and land-use change categories at the national level without introducing a sampling bias. Nigeria explained that such large confidence intervals are due to the rarity of the land-use class and is therefore an expected and transparent reflection of statistical uncertainty, rather than evidence that the estimate is unreliable. Nigeria further explained that the AD were collected with technical assistance from Landell Mills Ltd. through the Climate Action Africa Programme funded by Global Affairs Canada, and that the time and scope limitations of this support meant that it was unfeasible to extend data collection by national experts beyond the planned systematic sampling grid. The Party indicated that, in line with the stepwise approach, increasing the sample size and refining the sampling intensity in areas with a higher likelihood of rare land-use change events could be considered an area for future improvement in relation to assessing AD. The AT commends Nigeria for including the activity reducing emissions from forest degradation in the FREL and for implementing robust QA/QC procedures to ensure the consistent attribution of land use to the sample units. Nevertheless, considering the very limited number of sample units attributed to forest degradation and the high associated uncertainties, the AT considers that the current sampling design may limit the ability to detect forest degradation events across the country. Consequently, some occurrences of forest degradation may not be fully captured in the estimates reported in the FREL submission.	

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9	2(c) AD – accuracy and transparency	The AT noted that, for the FREL, Nigeria reported fire-related forest degradation for 2021 only, with no such events reported for 2017–2020. The AT also noted that, according to the FREL submission, no forest fires occurred in the country from 2017 to 2020. Within the reference period, forest fires were therefore recorded in 2021 only. The AT further noted that, according to the FAO Global Forest Resources Assessment 2025, an average of approximately 2 Mha forest was affected by fires annually in Nigeria in 2017–2021. The AT noted that, given the high frequency of fires in African savannahs and the rapid recovery of vegetation following fire events, fire occurrence may be difficult to identify through visual interpretation of Google Earth imagery with low temporal resolution. In addition, when asked about the low number of sample plots for measuring carbon stocks in litter, Nigeria informed the AT that wildfires had occurred in the country, preventing the collection of litter samples (see also finding ID# 7 above). In the light of these observations, the AT sought clarification from Nigeria regarding the apparent discrepancy between the limited fire-related forest degradation reported in the FREL submission and the indications of fire occurrence in the Global Forest Resources Assessment 2025 and in the information provided by Nigeria during the TA. During the TA, Nigeria reiterated that wildfires did occur during the reference period and that their occurrence affected the availability of litter during field sampling for the NFI, as reported in the Nigeria National Forest (Carbon) Inventory. Nigeria explained that only fire events visually interpreted as causing forest degradation (i.e. within forest remaining forest) were recorded. During the reference period 2017–2020, no degradation events attributable to fires were detected in the interpreted sample units and, therefore, no fire-related forest degradation emissions were reported for those years for the FREL. Nigeria further clarified that data on the drivers of land-use change were collected only for forest degradation and not for deforestation. Consequently, fire events that may have led directly to deforestation were not identified as fire-related in the AD, and the total forest area affected by fires cannot be quantified or directly compared with other estimates such as those reported to FAO for the Global Forest Resources Assessment 2025. In the modified FREL submission, Nigeria acknowledged that estimation of emissions from forest degradation represents an area for future technical improvement. The AT welcomes the clarification provided by Nigeria during the TA, which increased the transparency and completeness of the information reported on estimating forest degradation from fires. The AT acknowledges that a comprehensive QA/QC process was carried out by Nigeria following the completion of data collection for the reference period. However, the AT is of the view that this QA/QC process was not specific to forest fire occurrence, and that independent fire-related products, such as satellite-based active fire detection and burned area mapping, could	The AT notes that developing measures to ensure that emissions from fires are neither over- nor underestimated for the FREL, including specific checks in relation to forest fires as part of the QA/QC procedures, is an area for future technical improvement of the FREL.

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		also have been used to help mitigate any omission errors related to forest degradation caused by fires.	
10	2(c) AD – transparency	During the TA, Nigeria shared with the AT the spreadsheet containing information on the sample units from Collect Earth that it used to estimate the AD for deforestation and forest degradation. The AT noted that the spreadsheet does not provide any information on the data source for each sample unit, including the quality and availability of high-resolution imagery. The AT further noted that factors including poor coverage of high-resolution imagery, poor temporal consistency between available images, distortion error and positional accuracies could affect the accuracy of the estimates. In response, Nigeria acknowledged that the use of Google Earth imagery presents certain limitations, including variable spatial coverage of very high-resolution imagery, temporal inconsistencies between available images and potential positional inaccuracies. Nigeria clarified that, to address these limitations, a multi-source imagery approach was applied. Google Earth was primarily used for high-resolution visual confirmation, where available, while Sentinel-2, Landsat and Planet-NICFI time-series data were used to ensure consistent temporal coverage and support the identification and timing of land-use changes. Nigeria concluded that this approach ensures that both the spatial details (from very high-resolution imagery) and temporal consistency (from Planet-NICFI, Sentinel-2 and Landsat time-series data) are used to determine the precise year of change. Nigeria acknowledged that the survey for collecting the AD did not explicitly request information on which imagery source was used for each plot, and only allowed interpreters to mark plots as “uncertain” or indicate “No data available” when imagery was missing. Further, Nigeria clarified that no sample units were indicated as “No data available”.	The AT considers that adding quantitative information on the data source and spatial resolution for each sample unit is an area for future technical improvement that would enhance the transparency of the FREL submission.
11	2(c) AD – accuracy and transparency	It was not clear to the AT whether the survey design used for collecting the AD included multiple interpretation of all sample units or how the level of confidence for each sample unit was attributed. During the TA, Nigeria explained that the visual interpretation team consisted of 16 trained interpreters. The 7,419 samples were evenly distributed among the interpreters to ensure equal and unbiased distribution and each sample unit was interpreted only once. Multiple interpretations were conducted only on a subset of 200 samples prior to AD collection to calibrate the interpretation of sample units among the interpreters. Nigeria clarified that, when uncertain about the data, the interpreter selected a reason for the uncertainty from a predefined list (e.g. land-use identification or year of event). All samples flagged with any level of uncertainty were re-evaluated to ensure the accuracy and consistency of the data set as part of the QA/QC procedures. For the QA/QC procedures, convergence of evidence between data sets was checked and the eSBAE approach was followed, but the sample units were not interpreted by multiple interpreters.	The AT notes that incorporating in the survey design the interpretation of sample units by multiple interpreters and developing methods for quantifying the variability in the estimates resulting from interpreter errors is an area for future technical improvement that would further enhance the accuracy of the FREL submission.

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		The AT acknowledges the robust QA/QC procedures implemented by Nigeria for estimating the AD and commends the Party for its efforts to reduce systematic errors in area estimation, as well as for reporting important statistics to assess data quality, such as the pairwise agreement among interpreters for assessing land-use change classes, which enhanced the transparency and accuracy of the FREL. However, the AT notes that visual image interpretations, even by well-trained professional interpreters, are subject to substantial interpreter disagreement and error. Options for further reducing bias associated with photographic interpretation include multiple interpretation of sample units, with the land-use classification selected on the basis of consensus or unanimous interpretation, or even the use of hybrid inference to account for variability in interpretation (McRoberts et al., 2018).	
12	2(c) AD – transparency	The AT noted that, in the FREL submission, statistical uncertainties were provided as confidence intervals by class and ecological zone. During the TA, Nigeria shared with the AT the spreadsheet with the calculations for the AD. The AT noted that, for the calculations, a 90 per cent confidence interval was used, not a 95 per cent confidence interval as mentioned in the FREL submission. Nigeria multiplied the standard error of the area estimate by 1.645, which is the z-score for a 90 per cent confidence interval (and not by 1.96, which would correspond to a 95 per cent confidence interval). Nigeria clarified that a 95 per cent confidence interval was initially applied for the AD to maintain consistency with the previous FREL. However, a 90 per cent confidence interval was subsequently used to ensure alignment with the EFs used for the current FREL. Therefore, the final emission estimates are based on a 90 per cent, rather than a 95 per cent, confidence interval. The AT welcomes the clarification provided by Nigeria during the TA, which increased the transparency and completeness of the FREL.	
13	2(d) Description of relevant policies and plans, as appropriate	Nigeria's FREL is developed within a broader framework of national policies and institutions that support forest and climate governance. These include the National Forest Policy, which is aimed at promoting sustainable forest management, conservation of forest resources and improved governance of forest land across the federal and state level; the National REDD+ Strategy, which is aimed at addressing the drivers of deforestation and forest degradation through strategic responses; and the Climate Change Act, which defines coordination and reporting for climate action. The national forest monitoring system is the technical basis for forest-related monitoring, reporting and verification and includes the NFI.	
14	2(e) Changes to previously submitted FREL	In its original FREL submission, Nigeria described the following changes from previously submitted information in accordance with paragraph (b) of the annex to decision 12/CP.17:	

<i>Finding ID#</i>	<i>Aspect of the scope of the TA (decision 13/CP.19, annex, para. 2)</i>	<i>Description of the issue, additional information shared by the Party during the TA and conclusion of the AT</i>	<i>Area for future technical improvement</i>
		(a) The historical reference period for the previous FREL submission was 2006–2016, whereas the reference period for the current submission is 2017–2021; (b) Emissions from forest degradation are included in the current FREL submission, which was identified as an area for future technical improvement during the TA of the previous FREL submission; (c) The litter pool for the activity reducing emissions from deforestation was not included in the previous FREL submission but is included in the current submission; (d) Estimates of non-CO₂ emissions from forest degradation attributed to forest fires were not included in the previous FREL submission but are included in the current submission; (e) A stratified sampling approach that relied on the Global Forest Change map was used for estimating AD for the previous FREL submission, whereas a systematic sampling approach was used for the current submission; (f) The number of sample units interpreted to estimate the AD increased from 1,215 for the previous FREL submission to 7,419 for the current FREL submission; (g) The QA/QC framework was improved for the current FREL submission to include a process for the convergence of evidence based on algorithms and multiple-interpreter agreement, whereas for the previous FREL submission a visual interpretation conducted by multiple interpreters based on majority agreement was implemented, which could have led to an underestimation of the deforestation area. The AT concludes that the FREL proposed in the most recent submission differs from that in the modified 2019 submission previously assessed (32,397,230 t CO₂ eq/year) owing mainly to the different reference period used, the different methodology used to assess AD and the inclusion of the activity reducing emissions from forest degradation. The visual interpretation of sample units by multiple interpreters based on majority agreement applied for the FREL submitted in 2019 may have led to an underestimation of the deforestation area for that FREL. The AT notes that changes in the sampling design from stratified sampling to a systematic sampling grid may also have contributed to changes in the estimates of AD. By implementing these changes, Nigeria has addressed some areas for future technical improvement identified during the previous TA, specifically the inclusion of the activity reducing emissions from forest degradation and the improvement of the treatment of non-CO₂ gases and the collection of AD relating to forest fires.	
15	2(f) Pools – SOC	The SOC pool was not included in the FREL. According to paragraph (c) of the annex to decision 12/CP.17, reasons for omitting a pool in constructing the FREL should be provided, noting that significant pools should not be excluded. Nigeria reported that, during the preparation of its previous FREL, it assessed national soil characteristics using available global data sets, which confirmed the dominance of mineral soils and	The AT reiterates the finding of the previous AT that the treatment of emissions from SOC (i.e. including the pool) is an area for future technical improvement of the FREL.

<i>Finding ID#</i>	<i>Aspect of the scope of the TA (decision 13/CP.19, annex, para. 2)</i>	<i>Description of the issue, additional information shared by the Party during the TA and conclusion of the AT</i>	<i>Area for future technical improvement</i>
		the absence of peatlands, with emissions from deforestation occurring mainly on mineral soils. Nigeria stated that as no new evidence has emerged since then and owing to continued limitations in relation to obtaining reliable data, the SOC pool was excluded from the modified FREL submission. During the TA, in response to a question from the AT, Nigeria clarified that no national study has been conducted to assess the presence of peatlands. However, Nigeria recognizes the importance of confirming their occurrence and indicated that it will explore the possibility of doing so for future FREL submissions as relevant data and resources become available. During the TA, the AT noted the significance of the SOC pool, especially in wetlands (i.e. peatlands and mangrove ecosystems), given its potential contribution to emissions. Nigeria acknowledged the importance of the SOC pool in mangrove ecosystems and considers this an area for future research for potential inclusion in the FREL, subject to the availability of appropriate data and methodologies.	
16	2(f) Pools – HWP	The HWP pool was not included in the FREL. During the TA, Nigeria confirmed that no national estimates are currently available on the contribution of HWP to total GHG emissions and removals. The AT noted that this pool was reported in the Party's latest GHG inventory included in the BTR1 and corresponds to net removals of –4,351 t CO₂ eq/year on average for 2017–2021. Nigeria explained that the inclusion of HWP in the FREL is recognized as important but requires additional data and methodological development. The Party indicated that it plans to include this pool in future FREL submissions as data availability and methodological capacity improve in line with the stepwise approach.	The AT considers the treatment of emissions from HWP (i.e. including the pool or providing more information justifying its omission) to be an area for future technical improvement of the FREL.
17	2(f) Gases – CH ₄ and N ₂ O	The AT noted that, for the current FREL submission, CO₂ emissions were estimated for deforestation and forest degradation, while CH₄ and N₂O emissions (expressed in CO₂ eq) were estimated only for fires occurring on forest land that result in forest degradation. The AT also noted that fires can potentially be a significant source of non-CO₂ emissions during land conversion. During the TA, Nigeria clarified that only fires associated with forest degradation are currently tracked and that information on the magnitude and significance of fires related to land conversion is not yet available to support their inclusion in the FREL. Nigeria acknowledged that a significant amount of non-CO₂ gases can be emitted during deforestation, but explained that the drivers of deforestation are not currently identified in the survey design used for collecting AD. Consequently, the proportion of deforestation resulting from fires is not known. The Party also clarified that the exclusion of non-CO₂ emissions from forest fires associated with deforestation is not due to technical challenges, but rather reflects the original scope of the project under which the AD were collected, which did not include a targeted analysis of the drivers of deforestation or the use of fires in land-use conversion owing to time and funding	The AT considers the quantification and inclusion of non-CO ₂ emissions from deforestation to be an area for future technical improvement of the FREL.

<i>Finding ID#</i>	<i>Aspect of the scope of the TA (decision 13/CP.19, annex, para. 2)</i>	<i>Description of the issue, additional information shared by the Party during the TA and conclusion of the AT</i>	<i>Area for future technical improvement</i>
18	2(f) Activities – enhancement of forest carbon stocks, conservation of forest carbon stocks and sustainable management of forests	limitations. It also explained that it is not aware of any national statistics that could be used to estimate the magnitude of such emissions. Nigeria indicated that it intends to make efforts to include non-CO₂ emissions associated with deforestation in future FREL submissions, subject to the availability of data and resources. The activities enhancement of forest carbon stocks, conservation of forest carbon stocks and sustainable management of forests were not included in the FREL. Pursuant to paragraph (c) of the annex to decision 12/CP.17, reasons for omitting an activity in constructing the FREL should be provided, noting that significant activities should not be excluded. In the original FREL submission, regrowth was considered during the design of the survey for collecting AD. However, the activity enhancement of forest carbon stocks was not included in the FREL to avoid underestimating or misrepresenting this activity. The reason presented in the FREL was that the sampling intensity was not sufficient to support a robust national-level estimation of afforestation, reforestation and regrowth. The AT noted that the total number of sample units attributed to forest regrowth in the sampling grid (16 according to table 5 of the FREL submission) is larger than the number of plots attributed to forest degradation (14) and requested clarification regarding the considerations that influenced the decision to exclude the activity enhancement of forest carbon stocks and include the activity reducing emissions from forest degradation and how the criteria differed between these activities. During the TA, Nigeria clarified that forest degradation was included in the FREL because it can be consistently identified in the implemented land-representation system using established interpretation rules. In contrast, Nigeria does not yet have a national methodology in place for consistently detecting the enhancement of forest carbon stocks, particularly one capable of distinguishing policy-driven long-term biomass gains from short-term seasonal or inter-annual variability. As a result, enhancement signals could not be detected with sufficient confidence within the methodological framework used for the current FREL. Nigeria further clarified that time and budget constraints during the preparation of the current submission limited the possibility of developing an intensified sampling or targeted mapping approach specifically for the activities enhancement of forest carbon stocks and reducing emissions from forest degradation. Nigeria therefore considered it more transparent and conservative not to include the activity enhancement of forest carbon stocks until the necessary spatial information, methodological refinements and data to ensure time-series consistency can support an operational and verifiable estimation approach. On the basis of the information provided by the Party, the AT acknowledges that Nigeria included in its FREL the most significant activities, reducing emissions from deforestation and reducing emissions from forest degradation, of the five activities identified in paragraph 70 of decision 1/CP.16, in accordance with its national capabilities and circumstances. The AT notes that other activities could also be	The AT considers the treatment of emissions from the enhancement of forest carbon stocks (i.e. including the activity) to be an area for future technical improvement of the FREL.

<i>Finding ID#</i>	<i>Aspect of the scope of the TA (decision 13/CP.19, annex, para. 2)</i>	<i>Description of the issue, additional information shared by the Party during the TA and conclusion of the AT</i>	<i>Area for future technical improvement</i>
		significant, in particular enhancement of forest carbon stocks and conservation of forest carbon stocks. The AT commends Nigeria for including the activity reducing emissions from forest degradation in its FREL, which was considered an area for future technical improvement by the previous AT. Furthermore, the AT commends Nigeria for the efforts undertaken to include the activity enhancement of forest carbon stocks in the current FREL and acknowledges the Party's intention to include this activity in future FREL submissions when new and adequate data and better information become available, in line with the stepwise approach.	
19	2(g) Definition of forest	Nigeria provided in its submission the definition of forest used in constructing its FREL. The definition is an ecological community predominated by trees and other layers of woody plants with a minimum area of 0.5 ha, a minimum tree height of 3 m and a minimum tree canopy cover of 15 per cent, or stands with the potential to reach the above thresholds in situ. For consistency with the previous FREL, the NFI and other national reporting, the national territory is stratified into six ecological zones: derived savannah, Guinea savannah, lowland rainforest, mangrove and freshwater swamp, montane forest, and Sudan and Sahel savannah. Forests are allocated to one of these ecological zones according to their location. Forest is further stratified into five subclasses: dense forest, sparse forest, mangrove, freshwater swamp and forest plantation (see table 2 of and appendix 1 to the original FREL submission). For the FREL, fallow land and tree stands in agricultural production systems are explicitly excluded from the definition of forest (see table 2 of the submission). The AT noted that only three sample units were identified as forest plantations and all three sample units are classified as stable forest. The AT notes that transitions from natural forest to plantations were not identified in the response design (i.e. the classification protocol applied when interpreting the sample units to collect AD) and, therefore, their potential occurrence cannot be excluded from the FREL. It was not entirely clear to the AT why Nigeria stratifies forest land into the subclasses dense forest, sparse forest, mangrove, freshwater swamp and forest plantation. During the TA, Nigeria explained that these forest subclasses represent ecological or structural attributes used to support the visual interpretation and classification of land cover during the assessment of sample units and the interpretation of land-use transitions. With regard to the concern raised by the AT relating to the classification of forest plantations, Nigeria clarified that, under the national methodological approach applied for the FREL, a conversion from natural forest to plantation would be treated as forest remaining forest with a change in forest condition and would therefore be recorded as forest degradation, rather than as stable forest. Accordingly, such areas would not be included in the stable forest category used for the FREL. The AT welcomes the clarification provided by Nigeria during the TA. However, given that no such conversions were recorded for the current FREL, the AT is of the view	The AT reiterates the finding of the previous AT that developing methodologies for deducting the areas of forest plantations from the areas of natural forest is an area for future technical improvement of the FREL.

<i>Finding ID#</i>	<i>Aspect of the scope of the TA (decision 13/CP.19, annex, para. 2)</i>	<i>Description of the issue, additional information shared by the Party during the TA and conclusion of the AT</i>	<i>Area for future technical improvement</i>
20	2(g) Definition of forest	that both the methodology and the FREL would benefit from the explicit inclusion of these criteria. The forest definition used in constructing the FREL is different from that used by the Party for its national GHG inventory and its reporting to FAO for the Global Forest Resources Assessment. The Party explained that, while the same ecological zones are used for both the FREL and the Global Forest Resources Assessment, the definition used for the Global Forest Resources Assessment includes ecological attributes and tree height thresholds for some forest classes. For the FREL, Nigeria used the same ecological zones but further stratified forest into subclasses and applied tree height and percentage tree cover as biophysical thresholds. Furthermore, savannah woodland is explicitly considered a non-forest class for the FREL (see figure 7 of and the annex to the original FREL submission), while forest and woodlands are aggregated in the national GHG inventory. During the TA, Nigeria clarified that the forest definitions used in constructing the FREL and for its reporting to FAO for the Global Forest Resources Assessment are the same, with the only difference being that a higher level of disaggregation within the forest land category was used in constructing the FREL to facilitate the visual interpretation of remote-sensing data. Nigeria confirmed that, for the FREL, the assignment of land to forest land is based not only on its ecological function but also on biophysical thresholds such as tree height and percentage tree cover. Consequently, savannah and savannah woodland areas may be classified as forest or non-forest depending on whether these biophysical thresholds are met. It is not clear to the AT if the same criteria are used for the national GHG inventory.	The AT notes that clear explaining the differences between the forest definition used in constructing the FREL and that used for the national GHG inventory (including the treatment of savannah woodland and the application of biophysical thresholds for tree height and percentage tree cover) is an area for future technical improvement that would increase the transparency of the FREL submission.

III. Conclusions

14. The FREL presented in the submission is Nigeria's third FREL.
15. The FREL presented in the modified submission, based on the reference period 2017–2021, corresponds to 58,610,840 t CO₂ eq/year.
16. The AT acknowledges that Nigeria included in its FREL the most significant activities, the most important forest types and the most significant pools in terms of emissions from forests. The AT considers that, in doing so, Nigeria followed paragraph 70 of decision 1/CP.16, on activities undertaken, and paragraph 10 of decision 12/CP.17, on applying the stepwise approach.
17. As a result of the facilitative interactions with the AT during the TA, Nigeria provided a modified submission that took into consideration the technical input of the AT. The AT notes that the transparency and completeness of the information provided were significantly improved in the modified FREL submission, and commends Nigeria for its efforts.
18. Pursuant to paragraph 3 of the annex to decision 13/CP.19, the AT identified areas for future technical improvement (see the table above).
19. The information used by Nigeria in constructing its FREL for the activities reducing emissions from deforestation and reducing emissions from forest degradation is mostly transparent (see finding ID#s 4, 5, 9, 10 and 11 in the table above), mostly complete (see finding ID# 5 in the table above) and in overall accordance with the guidelines for submissions of information on reference levels.
20. The AT acknowledges and welcomes the Party's intention to:
 - (a) Improve the accuracy and precision of the AD for forest degradation, including by increasing sampling intensity in areas with a higher likelihood of rare land-use change events and exploring refinements to the current sampling design;
 - (b) Include the activity enhancement of forest carbon stocks (afforestation, reforestation and natural regeneration or regrowth) in future FREL submissions once sufficient sampling intensity has been achieved and adequate data become available;
 - (c) Strengthen consistency between future FREL submissions and national GHG inventories by harmonizing the land definitions and category mapping used and progressively integrating improved AD and updated EFs into the GHG inventory;
 - (d) Update the EFs for future FREL submissions using new NFI data, subject to data availability and methodological feasibility;
 - (e) Further explore how fires can be better characterized as a driver of both forest degradation and land-use change, including the potential use of independent fire-related products to improve how fire-related information is captured within the framework for interpreting the sample units.
21. In conclusion, the AT commends Nigeria for showing strong commitment to continuously improving its FREL estimates in line with the stepwise approach. A number of areas for the future technical improvement of Nigeria's FREL have been identified in this report. At the same time, the AT acknowledges that such improvements are subject to national capabilities and policies, and notes the importance of providing adequate and predictable support.¹¹ The AT also acknowledges that the TA was an opportunity for a rich, open, facilitative and constructive technical exchange of information with Nigeria.

¹¹ As per decisions 13/CP.19, annex, para. 1(b); and 12/CP.17, para. 10.

Annex I

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

	<i>Main features of the FREL</i>	<i>Remarks</i>
Proposed FREL	58 610 840 t CO ₂ eq/year	See paragraph 7 of this document
Type and reference period of FREL	FREL = average of historical emissions in 2017–2021 (five years)	See finding ID# 2 in the table in this document
Application of adjustment for national circumstances	No	
National/subnational	National	The FREL covers the entire territory of Nigeria
Activities included	Reducing emissions from deforestation Reducing emissions from forest degradation	See paragraphs 6–7 of this document. See also finding ID# 18 in the table in this document
Pools included	Above-ground biomass Below-ground biomass Deadwood Litter	See finding ID#s 15–16 in the table in this document
Gases included	CO ₂ , CH ₄ and N ₂ O	CO ₂ emissions were estimated for deforestation and forest degradation, while CH ₄ and N ₂ O emissions were estimated only for fire-related forest degradation. Non-CO ₂ emissions from deforestation were not estimated. See finding ID# 17 in the table in this document
Forest definition	Included	See finding ID#s 19–20 in the table in this document
Consistency with latest national GHG inventory	Methods used for estimating the FREL are not consistent with those used for the latest national GHG inventory (2024)	See finding ID# 1 in the table in this document
Description of relevant policies and plans	Included	See finding ID# 13 in the table in this document
Description of assumptions on future changes to domestic policy, if included in constructing the FREL	Not applicable	
Description of changes to previous FREL	Included	See finding ID# 14 in the table in this document
Identification of areas for future technical improvement	Included	Several areas for future technical improvement have been identified (see finding ID#s 1, 4, 5, 7–11 and 15–19 in the table in this document)

Annex II

Reference documents

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II. UNFCCC documents

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III. 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:

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GFOI. 2020. *Integration of remote-sensing and ground-based observations for estimation of emissions and removals of greenhouse gases in forests: Methods and Guidance from the Global Forest Observations Initiative*. Global Forest Observations Initiative.

Heinrich, V., et al. A meta-analysis of carbon losses and gains from tropical moist forest degradation and regeneration. *Sci. Adv.* 12,eadz1923. 2026, <https://www.science.org/doi/10.1126/sciadv.adz1923>.

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McRoberts R, Stehman S, Liknes G, et al. 2018. *The effects of imperfect reference data on remote sensing-assisted estimators of land cover class proportions*. ISPRS Journal of Photogrammetry and Remote Sensing. 142: pp.292–300.

Olofsson P, Foody G, Herold M, et al. 2014. *Good practices for estimating area and assessing accuracy of land change*. Remote Sensing of Environment. 148: pp.42–57.

Stehman S. 2012. *Impact of sample size allocation when using stratified random sampling to estimate accuracy and area of land-cover change*. Remote Sensing Letters. 3: pp.111–120.
