

Gabon's BUR REDD+ Technical Annex

Results achieved by Gabon from REDD+ for REDD+ Results-Based Payments

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1 Introduction

Gabon welcomes the opportunity to submit a Technical Annex to its Biennial Update Report (BUR) in the context of Results-Based Payments (RBPs) for Reducing emissions from deforestation and forest degradation, conservation of forest carbon stocks, sustainable management of forests, and enhancement of forest carbon stocks in developing countries (REDD+), under the United Nations Framework on Climate Change (UNFCCC).

Gabon notes that the submission of this Technical Annex with REDD+ results is voluntary and exclusively for the purpose of obtaining and receiving RBPs for its REDD+ actions, pursuant to decisions 13/CP.19, paragraph 2, and 14/CP.19, paragraphs 7 and 8.

This submission, therefore, does not modify, revise or adjust in any way the Nationally Appropriate Mitigation Actions ([NAMA](#)) voluntarily submitted by Gabon under the Bali Action Plan ([FCCC/AWGLCA/2011/INF.1](#)), nor does it interfere with its Nationally Determined Contribution (NDC) under the Paris Agreement under the UNFCCC.

This submission was developed by the Gabonese government and presents the national results achieved in reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks, which are the five activities included in decision 1/CP.16, paragraph 70, in the 2010-2018 period.

2 Summary of Information from the assessed FRL

Gabon's national Forest Reference Level (FRL) for REDD+ RBPs under the UNFCCC from 2010 to 2018, was submitted on a voluntary basis for a technical assessment in the context of RBPs and covers the five REDD+ activities as included in paragraph 70 of decision 1/CP.16.

Gabon submitted its FRL on 8 February 2021 in accordance with decisions 12/CP.17 and 13/CP.19. The remote technical assessment took place from 19 to 23 April 2021. As a result of the facilitative interactions with the Assessment Team (AT), Gabon provided a modified version of its submission on 6 October 2021, which took into consideration the technical inputs of the AT. Finally, the technical assessment report was published on 31 October 2021.

For its submission, Gabon developed a national FRL. The modified FRL presented by Gabon in its submission to the UNFCCC is for the historical period 2000–2009 and includes all five REDD+ activities. Gabon applied the 2006 IPCC Guidelines and used the 2019 Refinement to the 2006 IPCC Guidelines solely for guidance purposes, where necessary.

The Report on the technical assessment of the proposed forest reference level of Gabon submitted in 2021 is available [here](#) and the modified submission on the proposed reference level is available [here](#). This BUR REDD+ Technical Annex contains information taken directly from Gabon's modified FRL submission as well as from the UNFCCC technical assessment report.

2.1 Information on forest definition, forest subdivisions and land tenure classes

Gabon's definition of forests is: "Tree formation covering at least 30 per cent of the soil over more than 1 ha and more than 20 m wide with trees at least 5 meters high at maturity, but not subject to any agricultural

practice. It does not include land that is predominantly under agricultural or urban land-use". All forest land in Gabon is considered managed, under the Forestry Code of 2001.

Gabon's forests are categorized as "tropical rainforest" and subdivided at the national level into dense forest, secondary forest, flooded forest and mangrove forest. Gabon's modified FRL provides the definitions of each subcategory, as well as the definitions of further subcategories in order to better align the forest types with the most appropriate country-specific Emission Factors and Removal Factors. The further subcategories are old growth forest, old secondary forest (20 to 100 years old), young secondary forest (less than 20 years old), older logged forest (more than 25 years old), logged forest (subdivided into logged forest between 1 and 10 years old (LF10); and logged forest between 11 and 25 years old (LF25)), mangrove forest, colonizing forest and degraded forest. Dense forest comprises old growth forest, old secondary forest, older logged forest and logged forest (LF25); and secondary forest includes young secondary forest, logged forest (LF10), colonizing forest and degraded forest. Flooded forest and mangrove forest do not include any further subcategories.

Gabon's land is subdivided into the following land tenure classes: logging concessions, protected areas, rural areas, agricultural areas, community forests and conservation set-aside zones. Any land that does not fall into one of these six land tenure classes is labelled as unallocated land. Gabon combined conservation set-aside zones, agricultural areas and unallocated land into a single category referred to as other land tenure, and combined community forests with logging concessions. Gabon acknowledged in its submission an allocation error of 200,000 ha of land under logging concessions to unallocated land between 2015 and 2018 and indicated that this error will be corrected in the next submission. The land tenure classes were used to identify the REDD+ activities for which emissions and removals are reported for the purposes of the FRL.

2.2 Estimation of area changes and carbon stock changes

Activity Data were obtained to estimate biomass carbon losses and gains in forest land converted to other land uses (deforestation) and forest land remaining forest land (forest degradation) and for logging in forest land remaining forest land. For both deforestation and forest degradation, the Activity Data were extracted from remotely sensed data and volume production estimates for logging. Activity Data were provided for each land tenure class, IPCC land-use category, REDD+ activity and forest type.

Emission Factors (including Emission Factors for carbon losses and Removal Factors for carbon gains) were obtained separately for the different forest types and land tenure classes to improve accuracy. Gabon used primarily country-specific data derived from the national resource inventory, as well as measurements obtained from logging concessions and other national data (collected as part of the [AfriTRON network](#)). As no observations were available to estimate carbon gains in mangrove forest and young secondary forest, IPCC default values were used instead.

2.3 Construction of FRL

Individual FRLs were constructed for each of the five REDD+ activities and CO₂ emissions and removals were estimated for each IPCC land-use category, land tenure class and forest type. Gabon provided a 10-year historical reference period centred around 2005 (2000–2009), which includes the net CO₂ removals from the five REDD+ activities. The national FRL is presented in the context of RBPs for 2010–2018.

The total average annual net removals from Deforestation, Forest Degradation, Sustainable Management of Forests, Conservation of Forest Carbon Stocks and Enhancement of Forest Carbon stocks is 107,186,873

tonnes of carbon dioxide equivalent per year (tCO₂eq/year) (Table 1, which can be found in Table 30 in Gabon’s FRL and FRL accompanying Workbook Table W10.3).

Table 1 Summary of the average historical gross and net removals for Gabon (2000-2009) by REDD+ activity (FRL accompanying Workbook Table W10.3).

REDD+ Activity	Biomass Losses (Emissions)		Biomass Gains (Removals)		Gains- Losses (Net Removals)	
	Mean	U	Mean	U	Mean	U
	tCO ₂ eq/yr	%	tCO ₂ eq/yr	%	tCO ₂ eq/yr	%
Deforestation	5,242,334	7.4%	0	0.0%	-5,242,334	7.4%
Degradation	349,169	26.4%	43,845,150	5.3%	43,495,981	5.3%
SFM	29,480,629	6.2%	87,959,162	4.1%	58,478,533	6.8%
Conservation	0	0.0%	10,349,239	6.0%	10,349,239	6.0%
Enhancement	0	0.0%	105,454	8.7%	105,454	8.7%
Total	35,072,131	1.6%	142,259,005	3.02%	107,186,873	4.4%

Gabon applied an adjustment of 10 per cent to the annual average net removals for 2000–2009 by including the maximum allowed adjustment as per the Green Climate Fund (GCF) REDD+ RBPs methodology for countries with High Forest cover and Low Deforestation (HFLD). The justification of the inclusion of the 10 percent adjustment is based on a set of measures taken by Gabon to protect the natural environment and on policies implemented by the country in the 2000s that led to drastic emission reductions in the forestry sector from 2007 onward.

The proposed national adjusted FRL, including the 10 per cent adjustment therefore corresponds to – 96,468,186 tCO₂/year (Figure 1).



Figure 1 Gabon’s proposed FRL for increased net removals. The FRL indicates the average historical net removals for 2000-2009 which is applied to the upwards adjusted FRL for 2010-2018 (FRL accompanying Workbook Figure W11.1).

3 Results in tonnes of CO₂ per year, consistent with the assessed forest reference emission level

3.1 Gabon's national differentiation of REDD+ results

Gabon considers its annual net sequestration of CO₂ to be its overall contribution to **the fight against climate change through the REDD+** process. Gabon distinguishes 3 categories of potential REDD+ results:

1. "Classic" REDD+ results linked to reductions in deforestation and degradation and enhancement in sequestration as a result of forest management, expressed as **"increased net sequestration"**.
2. **"Adjusted increased net sequestration"** REDD+ results, calculated by applying an adjustment of 10 per cent to the annual average net removals for 2000–2009, by including the maximum allowed adjustment as per the GCF REDD+ RBPs methodology for HFLD countries. These are the REDD+ results that Gabon is presenting to the UNFCCC through this BUR REDD+ Technical Annex.
3. REDD+ results corresponding to **"net carbon sequestration"** resulting from sound management and conservation practices which result in the enhancement of carbon stocks in secondary and logged forests through the process of carbon sequestration. However, in accordance with its second NDC, in which it committed unconditionally to remain carbon neutral, Gabon will adjust its post-2020 claims for REDD+ ITMO (Internationally Transferred Mitigation Outcomes) credits downwards by an amount equivalent to carbon emissions from all sectors other than the forest (which have already been deducted), as reported in its second NDC, 3rd National Communication, and first BUR .Gabon is assessing how these net carbon sequestration REDD+ results could be used as Internationally Transferred Mitigation Outcomes given the recent agreement (December 2021) of the [UNFCCC Glasgow Pact](#).

3.2 Results against the assessed FRL

Decision 14/ CP.19, paragraph 3, "decides that the data and information used by Parties in the estimation of anthropogenic forest-related emissions by sources and removals by sinks, forest carbon stocks, and forest carbon stock and forest-area changes, as appropriate to the activities referred to in decision 1/CP.16, paragraph 70, undertaken by Parties, should be transparent, and consistent over time and with the established forest reference emission levels and/or forest reference levels in accordance with decision 1/CP.16, paragraph 71(b) and (c) and section II of decision 12/CP.17".

As indicated in Table 34 of the modified FRL submitted to the UNFCCC, and Table W13.3 of the FRL accompanying workbook, Gabon already presented its results against various possible crediting levels in the FRL submission. The relevant part of this table is reproduced here (Table 2), showing Gabon's results as net sequestration and against its modified FRL with and without the 10% upwards adjustment. **Gabon's REDD+ results for 2010-2018 against its adjusted FRL total 187,104,289 tCO₂eq.**

Table 2 Gabon's FRL without and with the HFLD adjustment and net removals (for indicative purposes only) as well as results for 2010-2018.

Crediting Level	Gabon's FRL without HFLD adjustment	Gabon's FRL with HFLD adjustment	Net removals (absolute values) [for indicative purposes only]
Baseline for calculation	2000-2009	2000-2009 (historical average with 10% HFLD adjustment included)	No baseline
Crediting level value (tCO₂eq)	107,186,873	96,468,186	Not applicable
Accounting type	Increased net removals (tCO ₂ eq)	Increased net removals (tCO ₂ eq)	Net removals(tCO ₂ eq)
2010	17,089,570	27,808,257	124,276,443
2011	12,882,393	23,601,080	120,069,266
2012	13,575,172	24,293,859	120,762,045
2013	10,622,107	21,340,794	117,808,980
2014	9,698,020	20,416,707	116,884,893
2015	10,543,516	21,262,203	117,730,389
2016	8,871,535	19,590,223	116,058,408
2017	4,866,160	15,584,848	112,053,033
2018	2,487,631	13,206,318	109,674,504
Total	90,636,103	187,104,289	1,055,317,962

3.2.1 Further justification for the 10 per cent adjustment

In the FRL technical assessment report, the assessment team was of the view that an adjustment, if applied, should be based on projected changes in net removals due to national circumstances during the crediting period, in accordance with decision 13/CP.19, annex, paragraph 2(h). The assessment team also noted that the simple application of the maximum allowed adjustment following the GCF REDD+ RBP methodology was not *per se* a justification for the use of that level of adjustment and identified the justification of the percentage applied in the adjustment and the need to adjust future removals by taking into consideration Gabon's national circumstances as an area for technical improvement.

Following the view of the assessment team, Gabon has further improved the calculations of total projected net removals presented in the FRL (section 17 of the modified FRL). These improved projections are presented in Gabon's Nationally Determined Contributions (2021) and in Gabon's BUR, and for the forest sector only, are reproduced here (Figure 2). The solid green line in Figure 2 shows that during the historical reference period (2000-2009), a number of key policy decisions adopted by Gabon (2001 forestry law, 2007 national parks law, 2009 raw timber export ban) coincided with a dramatic decrease in gross emissions, increasing Gabon's overall net removals. During the crediting period (2010-2018), further policy decisions (such as the 2014 sustainable development law, the 2018 announcement by President Bongo Ondimba that all concessions would be FSC certified by 2022) as well as massive investment in parks management helped Gabon to maintain low emissions at levels well below those observed in the 1990s.

The Business as Usual (BAU) scenario (dotted red line, Figure 2), projects historical and future net removals under a theoretical scenario in which Gabon had not implemented those key policy decisions from 2001 onwards. The calculated total projected net removals under the BAU scenario during both the historical reference period and crediting period are 1,938,006,738tCO₂eq, compared to 2,127,196,694tCO₂eq for the measured historical net removals; a difference of 189,179,956tCO₂eq, which represents a 10% increase in net removals. By 2030, projected net removals are expected to be 56% higher under managed conditions with strong policy actions (as outlined in Gabon’s NDC), compared to a BAU scenario.

Furthermore, the net sequestration in the forest sector during the crediting period was 1,055,317,962 tCO₂eq (Gabon modified FRL page 128), whilst total emissions across all other sectors (transport, industry, agriculture, cities, etc.) are under 10 million tCO₂eq per year – so net sequestration across all sectors was over 950 million tCO₂eq. In applying the maximum adjustment Gabon is only claiming 20% of its net sequestration across all sectors as REDD+ credits.

Gabon believes that the additional net sequestrations should be rewarded, including through non market mechanisms – and will re-assess our reference level in the post 2020 period in line with the Paris agreement when creating ITMOs.

Therefore, Gabon applies the maximum allowed adjustment as per the GCF RBP pilot programme, although we present both the unadjusted and unadjusted results.

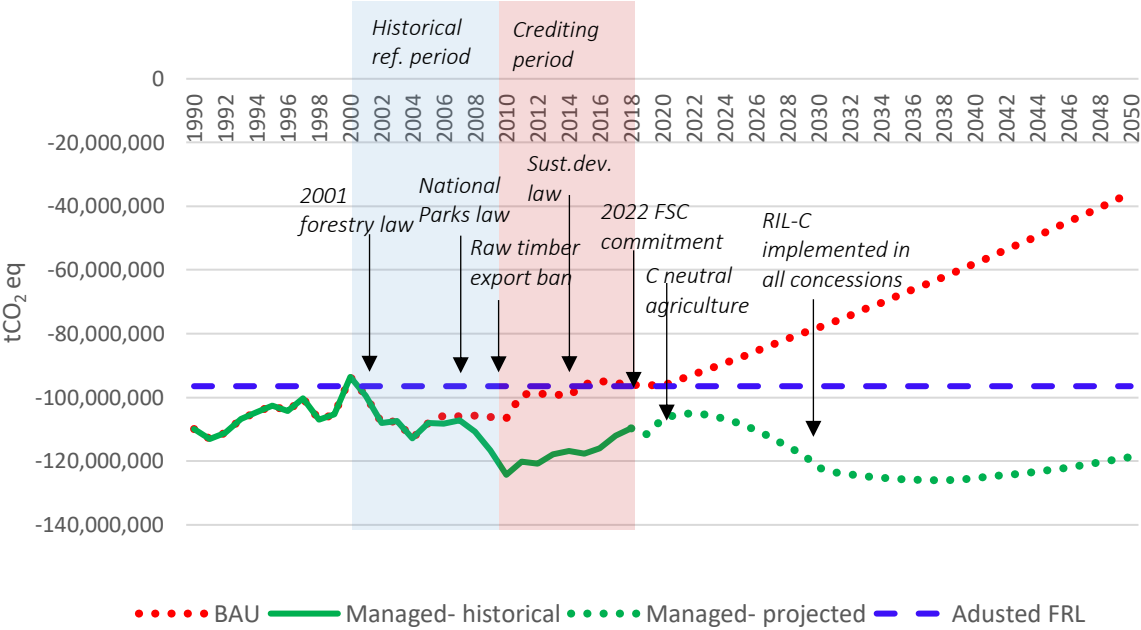


Figure 2- Historical and projected net removals with mitigation due to policy actions (“managed” scenario), and projected net emissions under a Business As Usual (BAU) scenario, 1990-2050, for the forest (FAT) sector (reproduced from Gabon’s BUR and NDC).

3.3 Results for which results-based payments have already been received by Gabon

On 27 June 2017 the GoG and the Central African Forest Initiative (CAFI) signed a [Letter of Intent](#) (LoI) to establish a partnership to implement the [National Investment Framework of Gabon](#).

In 2019, [Gabon and CAFI signed a 150 million US dollars agreement \(2019 addendum to the 2017 LoI\)](#). Through this, Gabon is rewarded a 10-year deal for both reducing its greenhouse gas emissions from deforestation and degradation, and increasing absorptions of carbon dioxide by natural forests.

The Partnership aims to reward Gabon, a High Forest Low Deforestation (HFLD) country, for maintaining a high forest cover and low deforestation rate, recognising the ecosystem services provided for by natural forests and the real and additional efforts needed to maintain a low deforestation rate. The Parties seek to do this in a way that ensures the highest environmental and social integrity and that can set a model for other countries.

Under the Addendum to the CAFI LoI, the Norwegian government agreed to a [first payment of USD 17 million which was made in June 2021](#) for a reduction in emissions in results years 2016 and 2017 compared to a ten-year historical baseline (Table 3), following submission of a National Results Report to the Norwegian Government, which underwent a third party independent verification. Gabon's National Results Report for RBPs presented national results in gross emissions reductions and removals for 2016 and 2017.

Based on the Addendum to the CAFI LoI and further negotiations, Gabon and Norway agreed to terms to treat statistical uncertainty, reversal risk, and possibly other risk factors, i.e. deductions. The following deductions were applied to determine the maximum number of emission reductions for Gabon under the current agreement:

- a) Uncertainty: a deduction of 20% is applied to reflect the risk of uncertainty in estimates for the reported emission reduction,
- b) Leakage: CAFI and Norway agreed to not apply any deduction on leakage as Gabon is presenting emission reduction and removal results at the national level. The national accounting approach is consistent with the GoG's draft FRL, NDC and BUR,
- c) On an exceptional basis, a 15% buffer is added to account for the novelty of the approach during this period. This figure is expected to be adjusted in subsequent years to accurately reflect the risk of uncertainty and reversal.

The awarded RBPs after deductions are presented in **Error! Reference source not found.** These amount to emissions reductions of 3,382,204 tCO₂eq totalling USD 16,911,021, which Gabon received in June 2021.

These 2016 and 2017 results will be entered into Gabon's REDD+ register once the UNFCCC has recognised Gabon's REDD+ credits and then retired, in line with our agreement with the Government of Norway.

Table 3 Summary of results and RBPs awarded under the Addendum to the CAFI Lol, after agreed deductions.

Finance Mechanism		Gabon-CAFI Partnership (Norwegian government)				
Date RBPs awarded		June 2021				
Accounting type		Gross Emissions				
Historical Reference Period		2006-2015				
Crediting Level (historical average)		27,368,740 tCO ₂ eq				
Results Year	Emissions (tCO ₂ eq)	Emissions Reductions (tCO ₂ eq)	35% deduction (tCO ₂ eq)	Eligible results (tCO ₂ eq)	Price/ton (USD)	Total awarded (USD)
2016	23,143,458	4,225,282	1,478,849	2,746,434	\$5.00	\$13,732,168
2017	26,390,631	978,109	342,338	635,771	\$5.00	\$3,178,853
Total		5,203,391	1,821,187	3,382,204	\$5.00	\$16,911,021

It is important to note that the National Results Report for the RBPs described above (only gross emissions) was based on Gabon’s initial FRL, submitted in February 2021, prior to the UNFCCC Technical Assessment (TA). As a result of the technical exchange between Gabon and the UNFCCC assessment team conducted in 2021, Gabon provided a modified version of its FRL submission in October 2021, in which gross emissions and net removals differed slightly to those from its initial submission. This was mainly due to the inclusion, in the modified version of the FRL based on the exchanges with the UNFCCC FRL Technical Assessment team, of post-disturbance carbon stocks for above- and below-ground biomass for conversions to cropland and grassland, and dead organic matter (litter and deadwood) applying a tier 1 approach.

The average gross emissions in the National Results Report (NRR) under the CAFI Lol Addendum and the average gross emissions in the modified FRL are summarised in Table 4.

Table 4 Average gross emissions (tCO₂eq) from Gabon’s National Results Report under the CAFI-Lol Addendum (NRR) and from Gabon’s modified FRL, presented for the FRL historical reference period 2000-2009 and the crediting period 2010-2018.

Period	NRR (tCO ₂ eq)	Modified FRL (tCO ₂ eq)
2000-2009	34,247,229	35,072,131
2010-2018	24,011,032	25,539,917

3.4 Remaining results against the assessed FRL to avoid double counting

To avoid double counting, the emissions reductions for which RBPs were awarded under the Gabon-CAFI partnership (3,382,204 tCO₂eq, Table 3) will be clearly listed in the Lima REDD+ Information Hub and indicating the Government of Norway as the entity paying for the results as shown below in Table 5.

Table 5 Deduction of results for which RBPs have already been awarded, for years 2016 and 2017 to avoid double counting.

Results Year	Eligible results awarded under Gabon-CAFI Lol (tCO ₂)	Amended Results (without HFLD adjustment)	Amended Results (with HFLD adjustment),
2016	2,746,434	6,125,102	16,843,789
2017	635,771	4,230,390	14,949,077
Total	3,382,204	10,355,491	31,792,866

Gabon's remaining adjusted results (to avoid double counting) excluding the already awarded results under the CAFI Lol addendum are presented in Column C of Table 6.

Table 6 Gabon's FRL with the HFLD adjustment and net removals (for indicative purposes only) as well as adjusted results for 2010-2018. (Values in red refer to the results for years 2016 and 2017 with RBPs already awarded deducted to indicate remaining results, See Table 5).

Results type	Remaining results without HFLD adjustment (A)	Additional results with HFLD adjustment (B)	Remaining results with HFLD adjustment (C=A+B)	Net removals (absolute values) [for indicative purposes only] (D)
Baseline for calculation	2000-2009 (historical average)	2000-2009 (historical average with 10% HFLD adjustment included)	2000-2009 (historical average with 10% HFLD adjustment included)	No baseline
Crediting level value (tCO₂eq)	107,186,873	96,468,186	96,468,186	Not applicable
Accounting type	Increased net removals	Increased net removals	Increased net removals	Net removals
2010	17,089,570	10,718,687	27,808,257	124,276,443
2011	12,882,393	10,718,687	23,601,080	120,069,266
2012	13,575,172	10,718,687	24,293,859	120,762,045
2013	10,622,107	10,718,687	21,340,794	117,808,980
2014	9,698,020	10,718,687	20,416,707	116,884,893
2015	10,543,516	10,718,687	21,262,203	117,730,389
2016	6,125,102	10,718,687	16,843,789	116,058,408
2017	4,230,390	10,718,687	14,949,077	112,053,033
2018	2,487,631	10,718,687	13,206,318	109,674,504
Total	87,253,899	96,468,186	183,722,085	1,055,317,962

4 Demonstration that the methodologies used to produce the results are consistent with those used to establish the assessed forest reference emission level

4.1 Activity Data

Gabon used three types of Activity Data in the FRL, which were used to calculate the results: (i) Activity Data based on remote sensing, (ii) Activity Data derived from volume estimates for logging, and (iii) Activity Data for biomass gains. These three different types of Activity Data are described in detail in the FRL.

The Activity Data for all forest cover change – with the exception of logging activities (see below) - were derived from remote sensing products (see Section 5). The semi-random sampling method described by (Sannier et al., 2014) was used.

The Activity Data for logging emissions were derived from national timber production statistics, which were analysed and validated at a national level to identify and remove error sources and ensure the highest level of accuracy for use in the FRL. Gabon conducted a study to produce a corrected time series after comparing multiple available sources of declared timber production volumes with exported volumes and identifying any unregistered or undeclared timber in the production volume data.

The Activity Data for carbon biomass gains was derived from a combination of the Activity Data for remote sensing data as well as the Activity Data derived from volume estimates of logging and ensuing emissions. This approach was taken to enable the estimation and inclusion of the area of Logged Forest.

4.2 Emissions and Removals Factors

Emissions Factors for all forest types except logged forests were primarily derived from Gabon's National Resource Inventory, supplemented with national data from other sources, as well as IPCC default values where national data were unavailable. Emissions Factors for logged forests were based on measurements obtained from logging concessions. Gabon included post-disturbance carbon stocks for above- and below-ground biomass for conversions to cropland and grassland; here, data from the national literature was used in conjunction with IPCC default values. Post-disturbance carbon stocks for other land categories were assumed to be zero.

Removals Factors for all forest types were derived from national studies, supplemented with regional data from Central Africa and IPCC default values where national data were unavailable.

Above -ground carbon gains and losses were estimated through measurement of trees with a diameter at breast height greater than 10 cm using a pantropical model (Chave et al., 2014) and wood densities derived from the Global Wood Density database (Zanne et al., 2009). Below-ground biomass was estimated using Root-to-shoot ratios for tropical moist forest (Mokany et al. 2006) and biomass estimates were converted to carbon using a wood carbon concentration for tropical forest from Martin et al. (2018).

4.3 Carbon pools

Above-ground live biomass (AGB), below-ground live biomass (BGB) and Dead Organic Matter (DOM, dead wood and litter) are included in the FRL. Carbon stocks for Soil Organic Carbon (SOC) are not included, as Gabon considers that changes in soil organic carbon are currently insignificant. As a consequence, for soil

organic carbon in forest land remaining forest land, Gabon applied the IPCC default assumption of no change. For forest land converted to other land-use categories, Gabon provides detailed rationale in its FRL to justify their exclusion at this time.

Regarding DOM, Gabon adopts the IPCC Tier 1 assumption that DOM is in equilibrium in land remaining in the same land-use category (i.e. Forest Land remaining Forest Land (IPCC, 2006a). Therefore, CO₂ gains and losses from DOM are not reported in Forest Land remaining Forest Land. However, changes in DOM carbon biomass are reported from Forest Land converted to non-Forest Land-use categories and non-Forest Land-use categories converted to Forest Land following IPCC Guidelines (IPCC, 2006b).

An Approach 1 key category analysis was conducted on the different carbon pools; this indicated that at least 95% net removals are contributed by AGB and BGB; based on this, Gabon considers that DOM and SOC are not significant carbon pools (see Supporting Information).

For the above reasons, Gabon would like to recall paragraph 10, of decision 12/CP.17 enabling countries to undertake the gradual improvement of their data and methods, including additional pools as appropriate.

4.4 REDD+ activities

The REDD+ activities included in the FRL are:

- Deforestation,
- Forest Degradation,
- Sustainable Management of Forests (SMF),
- Conservation of Forest Carbon Stocks,
- Enhancement of Forest Carbon Stocks.

Gross emissions (from forest cover losses and logging) are accounted for separately under REDD+ Activities Deforestation, Forest Degradation, SMF and Conservation of forest carbon stocks. Gross removals are accounted for under REDD+ Activities Forest Degradation, Sustainable Management of Forests, Conservation of forest carbon stocks and Enhancement of forest carbon stocks.

4.5 Uncertainties

Gabon applied the error propagation methods from the 2006 IPCC Guidelines (vol. 1, equations 3.1 and 3.2), as well as the 2019 Refinement to the 2006 IPCC Guidelines (vol. 1, equations 3.1 and 3.2) to calculate uncertainty associated with the AD, EFs and RFs. The accuracy and uncertainty of the wall-to-wall forest-cover maps produced for 1990, 2000, 2010 and 2015 were assessed using samples following the semi-random sampling method in Sannier et al. (2014), based on 95% confidence limits. Reported uncertainty was based on one standard error rather than on the commonly applied two standard errors. The overall uncertainty for net removals is 7.4% for 2000-2009 and 6.76% for 2010-2018 (Gabon's modified FRL, page 122).

5 Description of the National Forest Monitoring System (NFMS) and the institutional roles and responsibilities for Measuring, Reporting and Verifying the results (MRV)

In 2011, Gabon initiated the establishment of the National Observation System of Natural Resources and Forests (SNORNF) to effectively monitor, evaluate and adapt Gabon's low emissions development activities in the Agriculture, Forestry and Other Land Use (AFOLU) sector, including sustainable forestry, management of protected areas and buffer zones, agricultural expansion, and land-use planning. The SNORNF will ensure effective implementation of national land-use activities and achievement of emission reductions, including increasing forest carbon sequestration potential through the expansion of its protected area network and avoiding or minimizing future emissions from the agricultural sector while meeting the country's food consumption needs through land-use optimization. It uses satellite image analysis, field inventories and modelling in order to evaluate, monitor and report on the National Land-Use Plan (PNAT – [interactive platform](#)) (République Gabonaise, 2015a).

The PNAT is cross-ministerial and is Gabon's primary tool for the implementation of the country's sustainable development policy and for optimizing management of its national territory that promotes development while protecting Gabon's natural heritage and contributing to international commitments to prevent climate change.

Two presidential agencies also work in close alignment with MINEF and are key to the implementation of Green Gabon. Gabon's National Parks Agency (ANPN – soon to be restructured as the Nature Preservation Agency) manages Gabon's protected areas, including the network of 13 National Parks and buffer zones. Gabon's Space Agency (AGEOS) runs a national programme of spatial observation and analysis for strategic land-use and environmental planning. Both ANPN and AGEOS are responsible for implementing the SNORNF and are closely tied to the PNAT. The relevant institutional arrangements for data collection and reporting to the UNFCCC in relation to forests are presented in Figure 3.

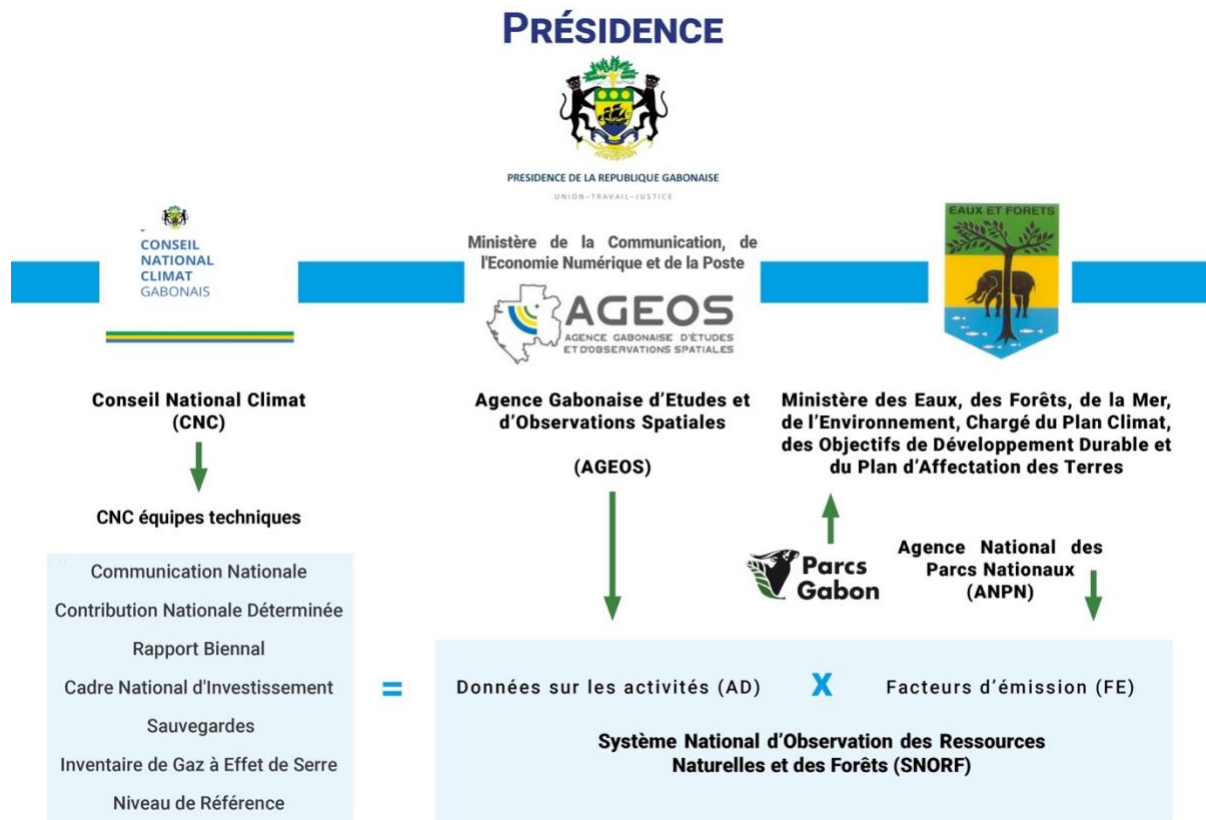


Figure 3 Institutional arrangements for data collection for the FRL and reporting to the UNFCCC.

Gabon's National Forest Monitoring System (NFMS) is a subset of the SNORF (Figure 4). ANPN is responsible for the collection and analysis of field data through Gabon's National Resource Inventory (NRI), while AGEOS is responsible for the collection and analysis of the remote sensing data. It is supported by SIRS (Systèmes d'Information à Référence Spatiale) which has a long-term partnership agreement with AGEOS to provide technical assistance and transfer of capacity. Information on reduced impact logging to support sustainable forest management practices is being gathered by ANPN with support from The Nature Conservancy. MINEF is responsible for the reporting and data management systems of timber production.

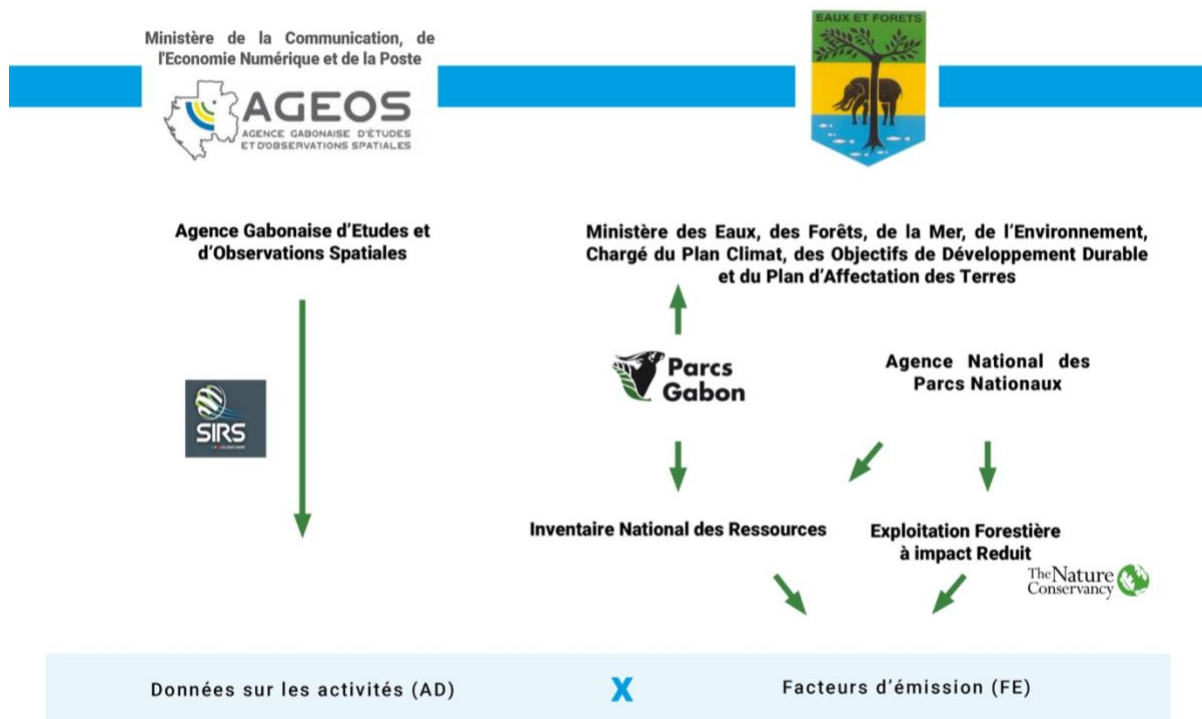


Figure 4 Institutional arrangements for Gabon's NFMS.

6 Necessary information that allows for the reconstruction of the results

Gabon's BUR REDD+ Technical Annex is accompanied by its own Workbook, which extracts relevant sections from the FRL accompanying Workbook in order to allow for the reconstruction of the results.

6.1 Use of the most recent IPCC guidance and guidelines

The IPCC 2006 Guidelines for National Greenhouse Gas Inventories: Agriculture, Forestry and Other Land-use (IPCC, 2006c) and were used as a technical framework for the formulation of the FRL. The 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC, 2019a) was consulted as a guiding framework for the simple propagation of error uncertainty and land representation, as well as default values for perennial crops.

6.1.1 Good practice

Paragraph (b) of the annex of decision 12/CP.17 (Guidelines and procedures for the technical assessment of submissions from Parties on proposed forest reference emission levels and/or forest reference levels) (UNFCCC, 2011) states that the information provided by countries during the FRL submission should be transparent, complete, consistent and accurate. Gabon has followed this as outlined below.

- **Transparency:** Gabon’s FRL information (including the results) is openly available online at the following link: <https://www.dropbox.com/sh/Obk6j8zhhnf1go1/AABtfmpJpiwHfAHzhHc---cFa?dl=0> (please copy link and paste into a new browser). The FRL document is accompanied by an Excel workbook, a user-guide and a folder of Supplementary Information containing all raw data, publications and reports used to construct the FRL. Due to its complexity, it was not possible to present all calculations and data-points in the written document to allow independent reconstruction of the FRL. Therefore, it is necessary to consult the FRL accompanying workbook in order to fully understand the FRL document. To facilitate cross-referencing of data and calculations, Tables and Figures in the FRL accompanying Workbook are referenced throughout the written document.
Gabon is currently working on publishing relevant spatially explicit and non-spatial information through the open-access geoportal of the SNORF (currently under construction). The PNAT is accessible through this [interactive platform](#). The data on the National Resources Inventory are published (Carlson et al., 2017; Poulsen et al., 2020; Wade et al., 2019).
- **Completeness:** as per the annex of decision 13/CP.19 (Guidelines and procedures for the technical assessment of submissions from Parties on proposed forest reference emission levels and/or forest reference levels) (UNFCCC, 2013), all data, methodologies, procedures used are presented and shared to allow for the independent reconstruction of the FRL (as described in the point above).
- **Consistency:** The methodologies and data used are consistent with the guidance provided in the relevant UNFCCC decisions. The net removals are estimated in a way that is consistent and will remain functionally consistent as Gabon implements its various national policies and measures. The FRL is established maintaining consistency with anthropogenic forest-related greenhouse gas emissions by sources and removals by sinks as will be contained in Gabon’s updated greenhouse gas inventory.
- **Accuracy:** Estimates of emissions and removals are accurate and include estimates of uncertainty represented at the 95% confidence interval.

The Technical Assessment of the modified FRL found that the data and information used by Gabon in constructing its FRL are transparent, complete and in overall accordance with the guidelines contained in the annex to decision 12/CP.17.

6.1.2 Tiers and approaches

Regarding the estimation of emissions and removals from Forest Land, the IPCC has released extensive Guidance and Guidelines (IPCC, 2003, 2006c, 2019a), that Gabon took into account for the development of its FRL and the calculation of the results presented here.

Gabon is mainly collecting information at Tier 2 and Tier 3 level. In terms of Emissions Factors, national data-sets include carbon stock data from Gabon’s NRI which currently consists of a series of 104 permanent 1 ha plots and logging Emissions Factors collected from twelve logging concessions as part of three separate studies (Ellis et al., 2019; Medjibe et al., 2013, 2011) (see Section **Error! Reference source not found.**).

In terms of Removals Factors data are collated for old-growth forest from a national network of 134 permanent ‘research’ plots which are regularly re-measured, part of the Afritrion network (www.forestplots.net) and have been widely published. Newly collected re-measures from a subset of plots from the NRI and from previously studied logging concessions are also included to provide preliminary estimates of sequestration in logged and secondary forests. Gabon intends to take steps to improve Tier 2

data by completing re-measures in all 104 NRI plots, and to increase the robustness of the NRI inventory by establishing a total of 500 plots.

In terms of Activity Data, national remote sensing data-sets collected and compiled by SIRS are used to provide information to calculate all emissions and removals with the exception of logging emissions. For logging emissions, national timber harvest production data are used, which have been nationally validated (Conseil National Climat, 2020). Other data concerning forestry management and national land tenure are sourced from national archives and government sources.

6.1.3 Consistency with the national greenhouse gas inventory

The FRL and the national greenhouse gas inventory are consistent. The data used for the development of the FRL were integrated in Gabon's national greenhouse gas inventory and NDC.

6.2 Establish, according to national circumstances and capabilities, robust and transparent national forest monitoring system

Gabon's NFMS is a subset of the SNORF. Both the SNORF and the NFMS continue to be improved and strengthened to provide robust and transparent information for the AFOLU sector, including sustainable forestry, management of protected areas and buffer zones, agricultural expansion, land-use planning and calculations of greenhouse-gas emissions.