

***Revised Readiness Preparation Proposal (Revised R-PP)***

***for Country:*** Republic of Gabon

***Date of submission:*** July 24, 2018



**Forest Carbon Partnership Facility (FCPF)**

The United Nations Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (**UN-REDD**)

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## General Information

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### Summary of the R-PP

Dates of R-PP preparation (beginning to submission):	March 27, 2017 – July 28, 2017
Expected duration of R-PP implementation (month/year to month/year):	2 years
Total budget estimate:	\$19,946,122.50
Anticipated sources of funding:	from FCPF: \$1,946,122.50 from CAFI: \$18,000,000.00  National government contribution: \$194,612.25
Expected government signer of R-PP grant request (name, title, affiliation):	Regis IMMONGAULT, Minister of the Economy, Forecasting, and Sustainable Development Programming
Expected key results from the R-PP implementation process:	Outcome 1) A National Land Use Plan minimized future emissions from development Outcome 2) A tier 3 National Forest Observation and Monitoring System exists Outcome 3) Emissions reduced from forestry

## Executive Summary

The basins of the Congo and Ogooué rivers comprise the second largest expanse of tropical forest on earth. The region's forests remain relatively intact and are globally important as a reservoir for biodiversity and a sink for atmospheric CO<sub>2</sub>.

Gabon is a highly-forested nation, with 88% forest cover, and houses approximately 18% of the Congo-Ogooué Basin's forest. For decades, Gabon's economy has been driven by oil exports. Though timber harvest has been an important component of the economy, forests have remained relatively sheltered from activities that promote deforestation – resulting in a deforestation rate of only 0.04% annually. However, as oil prices decline, Gabon's development strategy depends on economic diversification to other sectors. Economic diversification is expected to increase resource exploitation by extractive industries and the rapid expansion of agricultural intensification. Indeed, one of the central objectives of the Emerging Gabon Development Plan is to make Gabon self-sufficient in foodstuff production and an exporter of cash crops. Today, local production only meets about 40% of the country's food needs, costing approximately \$500 million in food imports annually. Meeting the country's needs in local food production will require that at least 205,000 hectares of land be put into agricultural production. An additional 130,000 hectares of land are planned for industrial agriculture. Gabon's Sustainable Development Plan, however, estimates up to 5 million hectares of land could be put into some form of agricultural production, much of this converted to cash crops intended for export.

Logging concessions cover approximately 150,883 km<sup>2</sup>, or 57% of the surface area of the country (PNAT 2015). In 2013, approximately half of these concessions were subject to management plans meant to promote sustainability; it is unclear to what extent existing management plans are implemented. Lack of data hinders precise estimation of carbon emissions from the logging sector, but current approximations indicate that it accounts for a relatively high proportion of Gabon's total emissions (NDC). Furthermore, illegal logging is believed to have escalated in recent years, supported by well-organized criminal networks.

Without careful planning and mitigation, development activities initiated to support economic diversification and improved food security in Gabon could result in high rates of deforestation, habitat destruction, national insecurity, high species extinction and destabilization of livelihoods of forest-dependent communities. On the other hand, the country's exceptionally rich biodiversity, high forest cover, and low rate of deforestation offer tremendous opportunities for the design and implementation of innovative sustainable development models. Such models have the potential to diversify the nation's economic portfolio and enhance agricultural and extractive resource production, while ensuring biodiversity conservation and climate change mitigation - by both *minimizing and/or avoiding emissions* and *reducing emissions from the forestry sector through improved forestry practices*.

### Gabon's forward looking vision

The Government of Gabon (GoG) has embarked on a strategic planning process called *Le Gabon Emergent*, to diversify its economy and pursue sustainable development. Consistent with this strategic focus, Gabon has been an active participant in the UNFCCC negotiations. In 2010, the President established a National Climate Council to coordinate Gabon's response to climate change by developing a strategic, overarching plan called *Plan Climat*, which incorporates climate change considerations into the country's sectorial development strategies.

Understanding that sound land use planning is critical to the implementation of Gabon's Sustainable Development plan, the GoG launched a National Land Use Planning process (Plan National d'Affectation du Territoire - PNAT) in 2013 under the political coordination of the *Secrétaire Général du Gouvernement* and technical oversight of the Climate Council.

***The PNAT is the government's primary tool for the design and implementation of sustainable development policy and for the sound management of its national territory that promotes development while protecting Gabon's natural heritage and contributing to international commitments to prevent climate change.***

Gabon submitted its Intended Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC) in April of 2015. Because a high percentage of Gabon's estimated emissions are from the forest sector, the NDC is largely focused on sustainable management of

forests and sound land use planning. In this respect, the PNAT serves secondarily as a regulatory mechanism to ensure that Gabon respects its NDC. The completion of the Natural Resource and Forest Monitoring System (Component 4) will provide a transparent means to evaluate, monitor and report on the PNAT, as well as Gabon's compliance with the NDC commitments. Completion of both the PNAT and Natural Resource and Forest Monitoring System are of primary importance for Gabon to reach its goals of *minimizing and avoiding emissions from new development initiatives* – an effort supported in a partnership developed between Gabon and the Central Africa Forest Initiative (CAFI).

Given the high percentage of emissions estimated to come from the forestry sector (see Component 3), Gabon is also committed to *reducing emissions from the forestry sector* by: (1) improving knowledge and estimates of current emission levels from forest degradation in logging concessions; (2) defining and implementing guidelines for improved forestry management, with an emphasis on carbon (RIL-C); (3) examining the potential of reforestation, plantations and stock enhancement programs; and (4) examining the potential of a national “label” programs to incentivise operators to implement RIL-C, or other best practice forestry guidelines. The specific aim of Gabon's RPP is to compliment efforts addressed by the Gabon-CAFI partnership, which targets the anticipated drivers and causes of future deforestation, by reducing emissions from the forestry sector<sup>1</sup>.

**Three target outcomes will result from the full implementation of the combined activities defined within the Gabon NIF and this R-PP.**

- **Outcome 1:** Completion and implementation of a National Land Use Plan will result in minimized emissions from new development activities.
- **Outcome 2:** Completion of the Natural Resource and Forest Monitoring System will enable Gabon to both monitor the impacts of the NLUP and meet Tier 3 monitoring standards for GHG emissions / removals in the LULUCF sector.
- **Outcome 3:** Completion of activities to improve emissions estimates from degradation and improve forestry practices, including examining potential for reforestation, at a national scale will result in reduced emissions from the forestry sector.

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<sup>1</sup> Funding required to complete the work presented in this R-PP have come from multiple sources over the past decade. Much of this is from the State, other aspects funded by development, or other like minded organizations like AFD, WB, USFS and USAID. Smaller scale projects and studies, relying on independent resources, have also been an important part of Gabon's information gathering process. Reviving these sources and recreating old budget sheets was beyond the scope of this document and the capacity of its authors. As such, throughout this document, we provide budget numbers only for the specific activities described within the NIF and R-PP Framework. The structure of this R-PP document coupled with the incompatibility of various budget formats available to authors writing this document required that budget details be unified in Component 5 and Annex 3. We have organized the entire document around three central (color coded) outcomes to facilitate readability and ease of comprehension.

## List of frequently used abbreviations and acronyms

AB	Aerial biomass
ACCOPA	Agency for the Collection and Marketing of Food Products ( <i>Agence de collecte et de commercialisation des produits agricoles</i> )
AFD	French Development Agency ( <i>Agence française de développement</i> )
AGASA	Gabonese Agency for Food Security ( <i>Agence gabonaise de sécurité alimentaire</i> )
AGEOS	Gabonese Space Studies and Observations Agency ( <i>Agence gabonaise d'études et d'observations spatiales</i> )
ANINF	National Agency for Digital Infrastructure and Frequencies ( <i>Agence nationale des infrastructures numériques et des fréquences</i> )
ASECNA	Agency for Aerial Navigation Safety in Africa and Madagascar ( <i>Agence pour la sécurité de la navigation aérienne</i> )
CAFI	Central African Forest Initiative
CBD	Convention on Biological Diversity
CBERS	China-Brazil Earth Resources Satellite
CBFF	Congo Basin Forest Fund
CENAREST	National Scientific and Technological Research Center ( <i>Centre national de la recherche scientifique et technologique</i> )
CESM	Community Earth System Model
CHM	Canopy height model
CIRAD	French Center for International Cooperation in Agronomic Research for Development ( <i>Centre de coopération internationale en recherche agronomique pour le développement</i> )
CO <sub>2</sub>	Carbon dioxide
COFCCA	Congo Basin Forests and Climate Change Adaptation
COP	Conference of the Parties
COSMO	Constellation of Small Satellites for the Mediterranean Basin Observation
SKYMED	
CPAET	Temporary development, exploitation, and processing licenses ( <i>Conventions provisoires d'aménagement, d'exploitation et de transformation</i> )
CPRRAT	Natural Resources and Land Use Provincial Regulatory Commissions ( <i>Commissions provinciales de régulation des ressources naturelles et d'affectation des terres</i> )
CRRNAT	Natural Resources and Land Use Regulatory Commission ( <i>Commission de régulation des ressources naturelles et d'affectation des terres</i> )
DGAT	Directorate-General for Land Use Planning ( <i>Direction générale de l'aménagement du territoire</i> )
DGF	Direction General de la Forêt
DGM	Directorate-General of Meteorology ( <i>Direction générale de la météorologie</i> )
DGPEN	Directorate-General for Protection of the Environment and Nature ( <i>Direction générale de la protection de l'environnement et de la nature</i> )
DSM	Digital surface model
DTM	Digital terrain model
EGSP	Emerging Gabon Strategic Plan ( <i>Plan stratégique Gabon émergent</i> )
ENDR	National School for Rural Development ( <i>Ecole nationale de développement rural</i> )
ESIA	Environmental and Social Impact Assessment
ESMF:	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
EU	European Union
FCPF	Forest Carbon Partnership Facility
FCSM	Forest concession under sustainable management
FFEM	French Global Environment Facility ( <i>Fonds français pour l'environnement mondial</i> )
FGIS	Gabonese Strategic Investment Fund ( <i>Fond gabonais d'investissement stratégique</i> )

FIP	Forest Investment Programme
FLEGT	Forest Law Enforcement, Governance and Trade
FMCP	Forest Management Control Project ( <i>Contrôle de l'aménagement forestier</i> )
GCF	Green Climate Fund
GFCA	Gabon Forest Carbon Assessment
GGFR	Global Gas Flaring Reduction Partnership
GGOP	Green Gabon Operational Plan ( <i>Plan opérationnel Gabon Vert</i> )
GHG	Greenhouse gas
GRAINE	Gabonese Initiative for Achieving Agricultural Outcomes with Engaged Citizens ( <i>Gabonaise des réalisations agricoles et des initiatives des nationaux engagés</i> )
GSE-FM	Global Monitoring for the Environment and Security - Service Element on Forest Monitoring
GWP	Global warming potential
Ha	Hectare
HCS	High Carbon Stock
HCV	High Conservation Value
ICTA	International Center for Tropical Agriculture
IGN-FI	IGN France International (subsidiary of the French National Institute of Geographic and Forest Information)
INC	National Cartographic Institute ( <i>Institut national de cartographie</i> )
NDC	Nationally Determined Contribution
INPE	Brazilian National Space Research Institute ( <i>Instituto Nacional de Pesquisas Espaciais</i> )
INSAB	Institute of Agricultural and Forestry Research ( <i>Institut national supérieure d'agronomie et de biotechnologie</i> )
IP	Industrial permit
IPCC	Intergovernmental Panel on Climate Change
IRAF	Institute of Agricultural and Forestry Research ( <i>Institut de recherches agronomiques et forestières</i> )
IRD	French Research Institute for Development ( <i>Institut de recherche pour le développement</i> )
IRET	Research Institute for Tropical Ecology ( <i>Institut de recherche en écologie tropicale</i> )
JICA	Japan International Cooperation Agency
LAGRAC	Graphics and Cartography Laboratory ( <i>Laboratoire de graphique et cartographie</i> )
LEDs	Low-Emission Development Strategy
LiDAR	Laser Detection and Ranging
LULUCF	Land Use, Land Use Change, and Forestry
MAEPSA	Ministry of Agriculture, Livestock, Fisheries, and Food Security ( <i>Ministère de l'agriculture, de l'élevage, de la pêche et de la sécurité alimentaire</i> )
MEFDP	Ministry of the Economy, Forecasting, and Sustainable Development Programming ( <i>Ministère de l'économie, de la prospective et de la programmation du développement</i> )
MERIS	Medium Resolution <i>Imaging</i> Spectrometer
MFEPN	Ministry of Forests, the Environment, and Natural Resource Protection ( <i>Ministère de la forêt, de l'environnement et de la protection des ressources naturelles</i> )
MNV	Measurement, notification, and verification
MRV:	Measurement, Reporting and Verification System
NASA	U.S. National Aeronautics and Space Administration
NCAR	US National Center for Atmospheric Research
NCC	National Climate Council ( <i>Conseil national climat</i> )
NCP	Gabonese National Climate Plan ( <i>Plan national climat du Gabon</i> )
NRI	National Resource Inventory
NIF	National Investment Framework
NLUP	National Land Use Plan ( <i>Plan national d'affectation des terres</i> )

NNRFOS	National Natural Resources and Forestry Observation System ( <i>Système national d'observation des ressources naturelles et des forêts</i> )
NPA	National Parks Agency ( <i>Agence nationale des parcs nationaux</i> )
NPAIFNS	National Plan for Agricultural Investment and Food and Nutritional Security ( <i>Plan national d'investissement agricole, de la sécurité alimentaire et nutritionnelle</i> )
NRI	National Resources Inventory ( <i>Inventaire des ressources nationales</i> )
ONADER	National Rural Development Board ( <i>Office national du développement rural</i> )
ONALA	National Agricultural Laboratory Board ( <i>Office national des laboratoires agricoles</i> )
ORIAM	Plant Material Introduction, Adaptation, and Propagation Board ( <i>Office des recherches d'introduction, d'adaptation et de multiplication du matériel végétal</i> )
OSFAC	Central and West African Forests Spatial Observation Project ( <i>Observation spatiale des forêts d'Afrique Centrale et de l'Ouest</i> )
OSFT	Spatial Observation of Tropical Forests ( <i>Observation spatiale des forêts tropicales</i> )
PADAP	Peri-Urban Agricultural Development Support Project ( <i>Projet d'appui au développement de l'agriculture péri-urbaine</i> )
PADIACN	Project to Support the Development of Agricultural Infrastructure for Nerica Cultivation ( <i>Projet d'appui au développement des infrastructures pour la culture du riz Nerica</i> )
PAGDRFG	Project to Support the Sustainable Management of Forest Resources in Gabon ( <i>Projet d'appui à la gestion durable des ressources forestières au Gabon</i> )
PAPPFG	Project to Develop Small-Scale Forestry Permits in Gabon ( <i>Projet d'appui aux petits permis forestiers Gabonais</i> )
PFA	Associated forestry permit
PNAE	National Environmental Action Plan ( <i>Plan national d'action environnementale</i> )
PNG	National Geomatic Plan ( <i>Programme national géomatique</i> )
PRECIS	Providing Regional Climates for Impact Studies
PRODIAG	Gabonese Agricultural Development and Investment Project ( <i>Projet de développement et d'investissement agricole au Gabon</i> )
PTE	Temporary logging permit
REDD:	Reducing Emissions from Avoided Deforestation and Forest Degradation
RL/REL:	Reference Level/ Reference Emission Level
RIL	Reduced Impact Logging
SDNI	National Infrastructure Master Plan ( <i>Schéma directeur national des infrastructures</i> )
SEAS	Satellite-assisted environmental monitoring
SESA:	Strategic Environmental and Social Assessment
SGG	General Secretary of the Government ( <i>Secrétaire général du Gouvernement</i> )
SIRS	<i>Systèmes d'Information à Référence Spatiale</i> (French company specializing in spatial reference information systems)
SNAT	National Land Use Plan ( <i>Schéma national d'aménagement du territoire</i> )
SNM	National Meteorological Service ( <i>Service national de la météorologie</i> )
t <sub>e</sub> CO <sub>2</sub>	Ton of CO <sub>2</sub> equivalent
THEOS	Thailand Earth Observation System
TNC	The Nature Conservancy
ToR:	Terms of Reference
UN-REDD:	UN-REDD Programme
UNCCD	United Nations Convention to Combat Desertification
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
US\$	US dollar
USFS	US Forest Service
USGS	US Geological Survey
VPA	Voluntary partnership agreement
WRI	World Resources Institute
WWF	World Wildlife Fund



## Component 1: Organize and Consult

### 1a. National Readiness Management Arrangements

**Standard 1a the R-PP text needs to meet for this component:  
National Readiness Management Arrangements:**

The cross-cutting nature of the design and workings of the national readiness management arrangements on REDD-plus, in terms of including relevant stakeholders and key government agencies in addition to the forestry department, commitment of other sectors in planning and implementation of REDD-plus readiness. Capacity building activities are included in the work plan for each component where significant external technical expertise has been used in the R-PP development process.

#### Governance framework

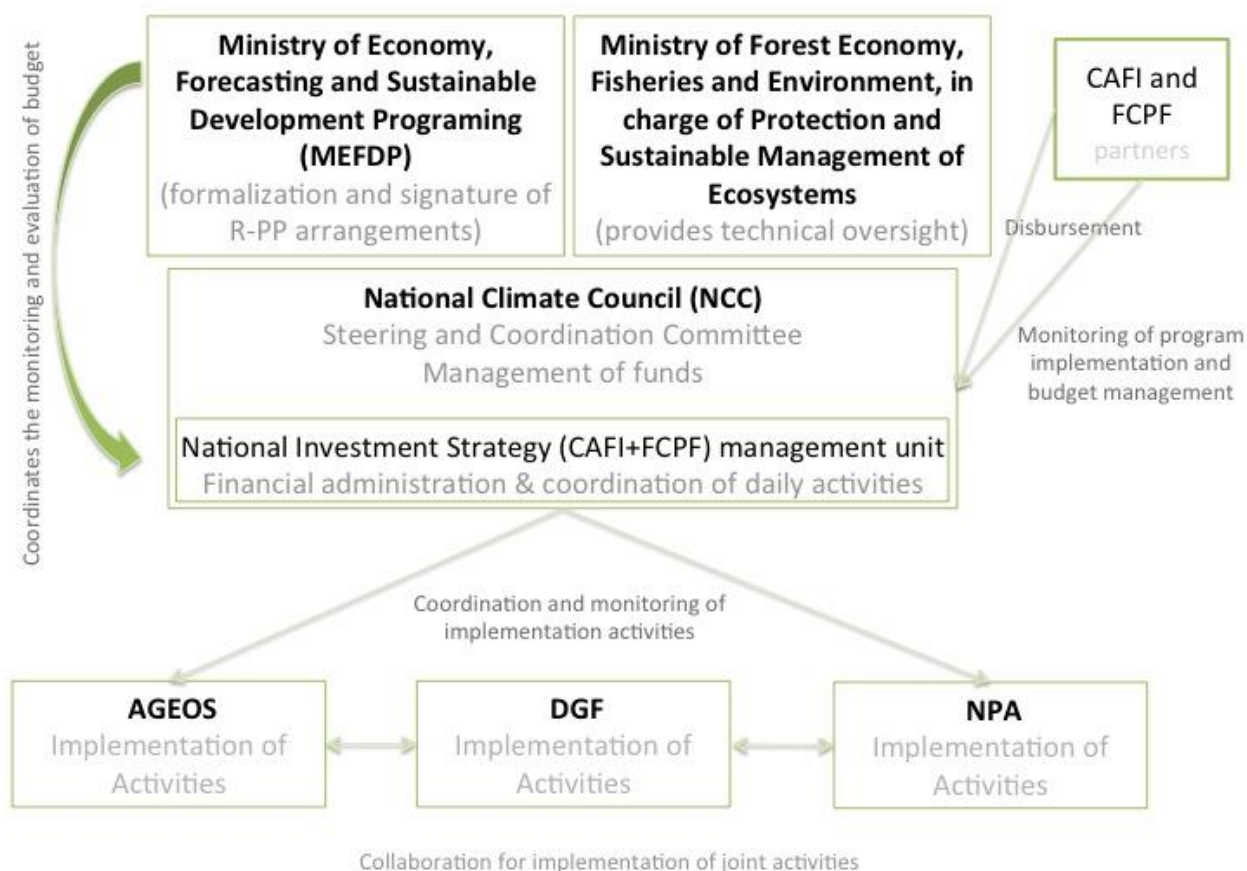
The Ministry of the Economy, Forecasting, and Development Programming (MEFDP), is charged with the formalization, validation and submission of the Government's RPP. The Ministry of Forest Economy, Fisheries and Environment, in charge of Protection and Sustainable Management of Ecosystems is charged with the technical oversight of all activities related to forestry exploitation. The National Climate Council (NCC) will lead the planning and implementation process. The NCC is an inter-ministerial body chaired by the President of the Republic. It includes a Technical Committee led by a representative of the President's cabinet that will serve as the NCC's coordinating committee. AGEOS and the National Parks Agency (NPA) will lead implementation of the activities and receive support from other national agencies and international partners.

Once the Gabon RPP is accepted by the FCPF, the GoG will work with the World Bank to define the management and control procedures for implementation of R-PP activities that are not already managed within the Gabon-CAFI structure<sup>2</sup>. A budget monitoring and oversight committee will be created and include the following actors: the MEFS DP, NCC, World Bank, AGEOS and NPA. Figure 1 summarizes the governance and implementation arrangements, which clearly integrates support from CAFI and FCPF into the national planning and implementation structures<sup>3</sup>.

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<sup>2</sup> Because Gabon views all programs defined within the R-PP and CAFI frameworks to be integrated and synergistic, it is expected that governance and financial management agreements put into place by all partners will be implemented with common management and oversight agreements. Thus, we do not create parallel structures within the RPP framework.

<sup>3</sup> Note: Given the linkages and synergies between this R-PP and the CAFI NIF framework, and to avoid any potential confusion among partners and donors, we describe the Gabon's governance structures and sustainable development processes almost precisely as they were presented in the CAFI NIF. Where the envisioned processes or legal frameworks presented in the NIF have evolved or been modified, we provide this information as footnotes.



**FIGURE 1 - INSTITUTIONAL ARRANGEMENTS FOR THE IMPLEMENTATION OF THE NIF AND R-PP**

#### **Additional institutional arrangements associated with outcomes defined within the NIF and R-PP**

##### *The National Land Use Planning:*

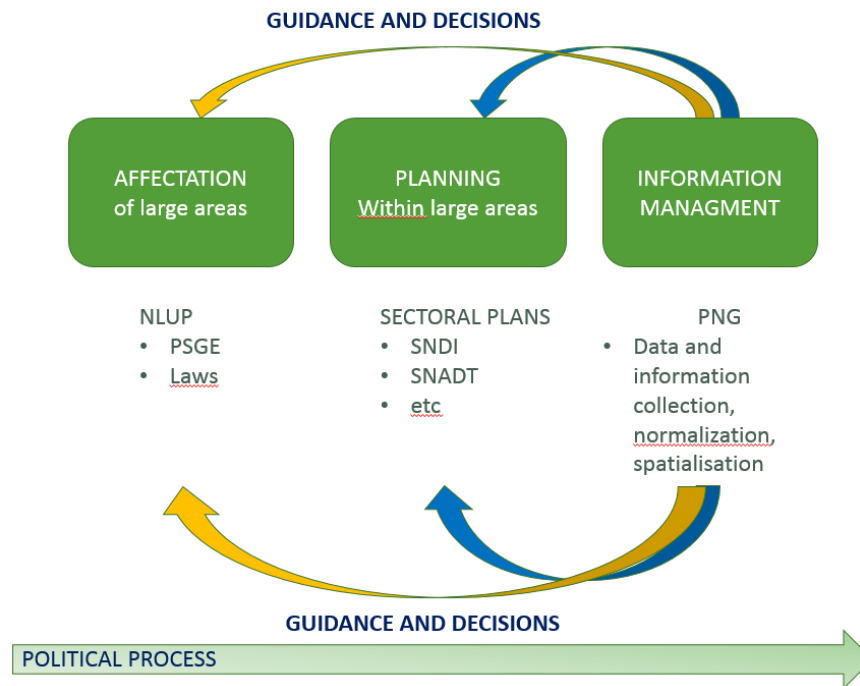
Gabon places significant importance on the completion and implementation of the National Land Use Plan – the primary mechanism for the achievement of its sustainable development, forest conservation, and climate change mitigation goals. Given the multi-ministerial nature of this initiative, considerable efforts were taken to formally define the institutional arrangements and terms of reference for governing the process. These arrangements are defined below.

The Terms of Reference for a National Land Use Plan were developed in 2012 by the National Climate Council and validated by the General Secretary of the Government (SGG). An Inter-Ministerial Planning Commission was created to coordinate spatial planning across 21 administrations. The Commission's technical and legal working groups have been at work since July 2013.

According to the PSGE guidelines, the NLUP should oversee all political and technical aspects related to national-scale spatial planning. Therefore, the NLUP is linked to and collaborating with several additional national initiatives, including:

- The National Geomatics Plan (PNG), piloted by the National Agency for Digital Infrastructure and Frequencies (ANINF), which provides a common framework for the production, exchange and sharing of geographic information;
- The national spatial planning scheme (SNAT), created by the Directorate-General for Spatial Planning (DGAT), which sets land-use planning objectives throughout the country;

- The National Infrastructure Master Plan (SDNI), which defines infrastructure guidelines in the energy, industry, services, tourism, mining, agriculture, transport, housing, and health and education sectors.



**FIGURE 2 – LINKS BETWEEN NLUP AND OTHER GOVERNMENT PROGRAMS (PR, 2015)**

Optimal inter-ministerial coordination will be formalized by the creation of the Natural Resources and Land Use **Regulatory Commission CRRNAT**<sup>4</sup>. Once adopted, the CRRNAT will supplant the Inter-Ministerial Planning Commission created in 2012. The CRRNAT, in principle, will be chaired by the Prime Minister, with ten member Ministers (Table 1).

The CRRNAT will be tasked with defining the guidelines and objectives of the NLUP related to the PSGE, updating the legal framework of the NLUP and submitting recommendations to the Council of Ministers – which is responsible for political validation of the process. Subsequently, the CRRNAT will be responsible for evaluating and monitoring the effectiveness of the NLUP guidelines.

To partially decentralize this process and ensure multi-level input into the land use planning process, Natural Resources and Land Use **Provincial Regulatory Commissions (CPRRNATs)** will be created to facilitate political, technical and consultative activities at the provincial level. Chaired by the provincial governors, nine CPRRNATs will be composed of senior executives from the province's key sectoral agencies (e.g. forestry offices, NPA, etc.), major economic operators in each province (agriculture, forestry, mining, etc.) and representatives of civil society.

<sup>4</sup> This was adopted in June 2017.

**Table 1. Composition and mission of the CRRNAT and the NLUP Technical Committee (PR, 2016).** The table describes the composition and the missions of the CRRNAT and its Technical Committee. The technical committee, which will involve sectoral and specialized agencies, will support the CRRNAT, consolidating the data, and producing analytical documents to support the land-use decision-making process. The Technical Committee will also monitor and evaluate the implementation and results of the various technical activities and studies planned during the process.<sup>5</sup>

	Composition	Missions
CRRNAT and National Land Use Commission	<ul style="list-style-type: none"> <li>- President : <ul style="list-style-type: none"> <li>o the Minister in charge of Sustainable Development (MEFDP) or his representative,</li> </ul> </li> <li>- Members <ul style="list-style-type: none"> <li>o the Secretary General of the Ministry of National Defense,</li> <li>o the Secretary General of the Ministry of the Interior,</li> <li>o the General Coordinator of the Coordination Office of the Emerging Gabon Strategic Plan,</li> <li>o the Director General of the Economy,</li> <li>o the Director General of Health,</li> <li>o the Director General of Regional Development,</li> <li>o the Director General of Energy,</li> <li>o the Director General of Hydraulic Resources,</li> <li>o the Director General of Agriculture,</li> <li>o the Director General of Rural Development,</li> <li>o the Director General of Mines,</li> <li>o the Director General of Hydrocarbons,</li> <li>o the Director General of the Forest,</li> <li>o the Director General of the Environment,</li> <li>o the Director General of Urban Planning and Land Development,</li> <li>o the Director General of the National Agency for Digital Infrastructure and Frequencies,</li> <li>o the Director General of the Gabonese Agency for Space Studies and Observations,</li> <li>o the Director General of the National Agency for Urban Planning, Topographic Works and Cadastre,</li> <li>o the Director General of the National Agency for Major Infrastructure Works,</li> <li>o the Director General of the National Parks Agency,</li> <li>o the Director of Legislation,</li> <li>o the Permanent Secretary of the National Climate Council,</li> <li>o the General Director of the Merchant Marine,</li> <li>o the Director General of the Law of the Sea,</li> <li>o the Director General of the National Agency for Fisheries and Aquaculture.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>o Collect and centralize all information relating to land use in the national territory;</li> <li>o Conduct consultations with local authorities and communities;</li> <li>o Collect the needs of administrations relating to land use in accordance with the objectives of the Emerging Gabon Strategic Plan in view of proposing a better land use;</li> <li>o Produce and publish the National Land Use Plan;</li> <li>o Formulate in the transitional phase technical advice on land-use conflicts.</li> </ul>

**Institutional consultation framework:** The National Land Use Plan process has included an intensive data gathering and organization phase and the clarification of current land zoning and uses. Over the next 5 years, the planning process will culminate in the completion of a multi-sectoral land allocation blueprint to optimize Gabon's development, conservation and climate mitigation goals (see Component 2). A strategy for continued consultations at multiple stakeholder scales is in progress, and includes the creation of permanent district-based information and consultation centers, designed to share information, gather input, and adaptively manage land in a transparent and inclusive manner. More details on this process and the public consultations are provided in the following sections.

**Institutional monitoring framework:** To ensure that NLUP implementation is monitored properly, Gabon created AGEOS to conduct satellite-based observations and technical studies. AGEOS operates a satellite image reception center to produce data and images for the NLUP, but it can also provide information and

<sup>5</sup> When the final text was adopted, the President of the Technical Committee was named the Minister of Economy and Sustainable Development, rather than the Prime Minister.

technical capacity to the majority of West and Central Africa's rainforests. More details regarding this process are provided in sections 2c and Section 4.

*National Natural Resources and Forestry Observation System:*

The National Climate Council initiated the National Natural Resources and Forestry Observation System (NNRFOS) in 2014. The National Parks Agency (NPA) was charged with developing and implementing a methodology for this system to ensure it simultaneously meets Gabon's carbon and co-benefit monitoring needs – e.g. to quantify biodiversity, forest carbon patterns, changes and the impacts of climate change, and anthropic impacts on plant and animal abundance and distributions. The specific methodology selected is defined in Component 4. Importantly, specific attention was placed on creating a systematic design that would ensure permanent field-based plots would be suitable for the ground truthing and interpretation of various types of satellite imagery – with the end goal that AGEOS, once operational, would be able to make use of the NNRFOS System for forest mapping and monitoring over the long term<sup>6</sup>.

Institutional Arrangement between NPA and AGEOS: NPA currently manages Gabon's network of National parks, RAMSAR sites, and a number of other protected areas. It has the technical capacity to design and implement field-based monitoring programs. NPA is responsible for conducting the ground-based monitoring of forest (NRI) and for conducting field validation missions for any disturbing or potentially confusing data observed by AGEOS. AGEOS is responsible for monitoring the national territory from Space – and to a certain extent from the air. One of its responsibilities is to monitor the implementation of the PNAT, including monitoring of any planned and illegal deforestation. It is also already working to improve its capacity to detect forest degradation.

**Reduced emissions from the forestry sector with improved forestry practices**

Gabon's NDC makes a cross-sector commitment to reduce CO<sub>2</sub> emissions by 50% by 2025 compared to a business as usual scenario. To do so, emissions from the forest sector – which is estimated to represent the majority of the country's emissions – will have to be significantly reduced. Part of these savings will be achieved by increased harvest rotation cycles but further targeted reductions will be necessary. Preliminary work to improve emissions estimations from degradation and to develop techniques to reduce emissions from the forestry sector has been initiated<sup>7</sup>. These activities are the cornerstone of Gabon's request for funding from the FCPF and are further developed as Outcome 3 in section 2c of this document.

Institutional Arrangement between Ministries: MINEF is responsible for forest management in Gabon's permanent forest estate as well as for the implementation of the Forestry and Environmental Protection Laws. MEFD is responsible for the sustainable management of Gabon's Natural Capital through the implementation of the Sustainable Development Law. As such, these two ministries work together to fix quotas for timber export, which has a direct impact on carbon emissions from forestry. Both Ministries will be integrally involved in the implementation of R-PP activities and will hold chairs on the Technical Advisory Committee.

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<sup>6</sup> The System requires the establishment of 500 randomly located 1-ha botanical plots, with associated wildlife inventories to be permanently monitored on a 5-yearly basis. To date about 200 have been completed. The Gabon-CAFI project will provide funding for the completion of the establishment of the system. A complimentary system of scientific plots and inventories is also maintained by NPA, which is in the process of compiling a database containing all natural resource scientific research undertaken in Gabon.

<sup>7</sup> Partners involved preliminary studies include The Nature Conservancy, UCLA, Duke University and the USFS

## **Feedback and Grievance Redress Mechanisms**

Gabon has defined a detailed process so that stakeholders have regular access to information on the NLUP process and to guarantee that stakeholder feedback and grievances are taken into account. This role will be played by each of the 48 district-based Information and Consultation Centers, supported by communications experts who will serve as liaisons between district offices and Libreville-based committee members. More detail has been provided in section 1c and Component 2c of this document. The district-based Information and Consultation Centers will form the hub of stakeholder engagement in the formulation and implementation of the NLUP at the level of individual activities. The communication and consultation experts charged with managing the centers will utilize a system that integrates data on current land use and zoning, results of the planning process, as well as input from all relevant stakeholder groups, including private sector, local communities, and forest-dependent communities. This system will serve both as a transparent and formal stakeholder input mechanism, so that stakeholder feedback is integrated into the NLUP in an iterative manner, and as a grievance reporting mechanism, to ensure that stakeholders have clear access to grievance reporting and redress. The design and implementation of this system has been included in the National Investment Framework agreed with CAFI, and will be financed through the CAFI partnership. The grievance redress process will follow the relevant legal statutes and comply with the consultation and safeguards requirements as described in the following sections.

## 1b. Information Sharing and Early Dialogue with Key Stakeholder Groups

### Box 1b-1: The Cancun COP *Decision 1/CP.16, Appendix I: Indigenous Peoples and Local Communities* (selected text)

*"...2. When undertaking the activities referred to in paragraph 70 of this decision, the following safeguards should be promoted and supported:*

*...(c) Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples;*

*(d) The full and effective participation of relevant stakeholders, in particular, indigenous peoples and local communities, in actions referred to in paragraphs 70 and 72 of this decision; ...*

<sup>1</sup> *Taking into account the need for sustainable livelihoods of indigenous peoples and local communities and their interdependence on forests in most countries, reflected in the United Nations Declaration on the Rights of Indigenous Peoples, as well as the International Mother Earth Day."*

Note: The Cancun COP *Decision 1/CP.16* Paragraph 70 and 72 are included in Box b2-1, in component 2b.

Source: <http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf>

### Standard 1b the R-PP text needs to meet for this component: Information Sharing and Early Dialogue with Key Stakeholder Groups:

The R-PP presents evidence of the government having undertaken an exercise to identify key stakeholders for REDD-plus, and commenced a credible national-scale information sharing and awareness raising campaign for key relevant stakeholders. The campaign's major objective is to establish an early dialogue on the REDD-plus concept and R-PP development process that sets the stage for the later consultation process during the implementation of the R-PP work plan. This effort needs to reach out, to the extent feasible at this stage, to networks and representatives of forest-dependent indigenous peoples and other forest dwellers and forest dependent communities, both at the national and sub-national level. The R-PP contains evidence that a reasonably broad range of key stakeholders has been identified, voices of vulnerable groups are beginning to be heard, and that a reasonable amount of time and effort has been invested to raise general awareness of the basic concepts and process of REDD-plus including the SESA.

The design and implementation of a National Land Use Plan is one of the cornerstones of Gabon's sustainable development strategy, known locally as "Gabon Vert". As such, it is the mechanism by which the country will minimize emissions from economic diversification activities, ensuring the country bypasses the "deforestation curve" characteristic of the development observed in other forested nations. The strategy, as a whole, was a core component of President Bongo Ondimba's election manifestos in 2009 and 2016. It was also subject to an inclusive national validation in 2015 in the Plan Opérationnel Gabon Vert - which included government, political, civil society and business constituencies.

Gabon made the decision to retract itself from the REDD+ and FCPF processes to focus its limited human and financial resources on this ambitious domestic Land Use Planning process (see Component 2, Box 1). **Thus, the NLUP couples as the cornerstone of this R-PP and the stakeholder engagement strategy for R-PP development is the same as that defined within the NLUP process.**

Early stakeholder engagement, information sharing and dialogue required to initiate the National Land

Use Planning process necessarily occurred at upper-levels of the government, where multiple, uncoordinated land allocation initiatives were being independently proposed within individual Ministries<sup>8</sup>. Government-level information sharing took the form of data sharing and the compilation of a unified database collated from multiple Ministries. It also included the creation of a Multi-Ministerial committee to promote dialogue, transparency and improved collaboration among sectors. Resulting governance and coordination structures emerging from this dialogue are outlined in Component 1a. Technical progress resulting from the early government level information-sharing initiatives is described in Component 2c and is available as Supplementary Material to this R-PP. Results of these early information-sharing Ministerial efforts have been communicated and shared with the broader public and civil society stakeholders via the creation of an interactive website <http://wri.github.io/pnat-landing-page/#l=fr> and through regular meetings and updates of the Climate Council, including on its website <http://www.conseilnationalclimat.ga/fr/actions/plan-national-daffectation-des-terres-pnat>, as well as on national television.

**Having completed the government level information sharing and dialogue process – which was required to first understand the existing state of land allocation and to resolve existing Ministerial level land disputes - the next phase of the Land Use Planning process will include a component to design and implement a broader stakeholder engagement and information sharing plan.** This activity will be initiated very early in the Land Use Planning process and will be fully implemented long before the National Land Use Plan is finalized and validated (see Component 2c and Table 14). The general process by which information sharing and stakeholder dialogue will occur is defined within the CAFI Investment Framework, summarized in Component 2c of this R-PP (budget details are provided in Tables 15 and 18, Outcome 1\_Output 2). Though specific details will be better developed during the first phase of the CAFI Investment Framework implementation, Gabon is committed to ensuring the LUP information sharing and dialogue process is inclusive in approach and incorporates Inter-Ministerial coordination, a decentralization process, and the full participation of relevant stakeholders, particularly local populations. It will also include engagement of forest-dependent populations and discussions of traditional land-use patterns and rights through a rural participatory mapping exercise (see Table 18, Output 3 for budget details)<sup>9</sup>.

Specifically, (1) an Expert Consultant will be hired to develop a communication and consultation strategy and plan which will include a transparent, cross-scale information sharing and community dialogue component. The consultant will work with the CRRNAT Technical Committee to make certain implementation is context-appropriate, consensus building, and inclusive; (2) Information Centers will be established in each of the 48 departmental Prefectures. Each of the 48 Information Centers will be manned with an Extension Officer and armed with communication materials that provide updated information on the Land Use Planning process – including interactive GIS data bases to help local populations and private sector operators visualize proposed activities relative to their priority use zones (which will also be mapped at the village scale as part of the LUP data collection process). In this way, proposed development activities or land policy decisions that could directly impact local populations and forest dependent communities will be shared and discussed prior to land allocation; and (3) several Communication Experts will be hired to work with the Expert Consultant in the development of communication and outreach materials for information exchange. The Communication Experts will travel to the field regularly to work with the 48 Departmental Extension Agents, local authorities and the CPRRNATs. They will also organize and facilitate annual Departmental and Provincial meetings and workshops involving local populations (notably the Chiefs of Cantons), civil society, relevant economic operators and representatives of the main sectoral agencies.

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<sup>8</sup> At the beginning of the National Land Use Planning process, it was discovered that sectoral concession overlaps were created due to multiple, uncoordinated land allocation activities that were in progress among the different Ministries in charge of extractives and/or land use activities. These would include among others the Forestry, Mining, Hydrocarbons, and Agriculture Ministries.

<sup>9</sup> The village mapping exercise will serve as both as a data layer for the NLUP and a process by which village engagement, consulting and consensus will be achieved. This activity is summarized in Component 2c.



## 1c. Consultation and Participation Process

### Box 1c-1: The Cancun COP Decision 1/CP.16, Considerations to Address in National Action Plans

*"72. Also requests developing country Parties, when developing and implementing their national strategies or action plans, to address, inter alia, the drivers of deforestation and forest degradation, land tenure issues, forest governance issues, gender considerations and the safeguards identified in paragraph 2 of appendix I to this decision, ensuring the full and effective participation of relevant stakeholders, inter alia indigenous peoples and local communities;..."*

Source: <http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf>

### Box 1c-2: The Cancun COP Decision 1/CP.16, Appendix I: Guidance and safeguards for policy approaches to REDD-plus (selected text)

*"(c) Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples;*  
*(d) The full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities, in the actions referred to in paragraphs 70 and 72 of this decision;..."*

Source: <http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf>

### Standard 1c the R-PP text needs to meet for this component: Consultation and Participation Process:

Ownership, transparency, and dissemination of the R-PP by the government and relevant stakeholders, and inclusiveness of effective and informed consultation and participation by relevant stakeholders, will be assessed by whether proposals and/ or documentation on the following are included in the R-PP (i) the consultation and participation process for R-PP development thus far (ii) the extent of ownership within government and national stakeholder community; (iii) the Consultation and Participation Plan for the R-PP implementation phase (iv) concerns expressed and recommendations of relevant stakeholders, and a process for their consideration, and/or expressions of their support for the R-PP; (v) and mechanisms for addressing grievances regarding consultation and participation in the REDD-plus process, and for conflict resolution and redress of grievances.

### ***Communications and consultations at the provincial and departmental level***

One of the most important aspects of the NLUP process will be enlisting the support and fostering a sense of ownership by the multiple stakeholders, including government and civil society members at the provincial, departmental and local levels. Government outreach to non-centralized stakeholders has historically been challenging due to a lack of resources and logistical constraints. Thus, provincial leaders and rural populations have often been relegated to the margins of national-level decision-making processes, even in the presence of a strong political will for inclusion (see legal framework, section 1b).

The development of a communication and consultation strategy will be an integral component of the NLUP process. Specific outreach strategies will be developed in the first year of the National Investment Framework (see Component 2c) and an international expert will be engaged to design a context-appropriate consensus-building and communication plan. Focus will be devoted to the system for the collection,

analysis and integration of information resulting from NLUP consultations (“safeguards information system/SIS”). A workshop will be organized to validate the strategy and to define its implementation procedures. After its adoption, national communication and outreach professionals will be trained to implement the plan and to serve as liaisons between provincial and rural populations, the CPRRNAT, and other national-level decision makers.

Provincial scale consultation: Permanent committees (CPRRNATs<sup>10</sup>) will be created to facilitate political, technical and consultative activities at the provincial level. During the first year of the initiative, a two-day meeting of the members of the CRRNATs and the nine provincial Governors will be organized in Libreville to introduce the NLUP process to the provincial heads. The meeting will define and formally establish the CPRRNATs. Regular discussions and exchanges (frequency to be determined) within the CPRRNATs will facilitate government outreach to stakeholders involved in land use and ensure they are informed and updated on the NLUP progress. The CPRRNATs will also ensure participation of local stakeholders through the establishment of district-based information centers (described below).

District scale consultation: To further ensure a transparent, inclusive and consensual LUP process, the GoG will establish a consultation and information center for land-use planning in each departmental prefecture – 48 centers nationwide. Each information and consultation center will employ a trained extension agent, equipped with a computer, cartography tools, regional resource and land allocation maps, and up-to-date information on potential land-use options under consideration. Centers will be open to the public 5 days weekly to guarantee that the local population, sectorial agencies and economic stakeholders have un-impeded access to information. Extension agents will also accompany district leaders on village visits to foster broad outreach and to respond to solicitations/questions from the public on land-use issues.

Village scale consultation and village mapping: To make certain that activities proposed as part of the national development strategy serve the intended purpose of improving livelihoods and promoting economic development opportunities for all citizens, the NLUP technical team will conduct participatory village mapping exercises in each of the country's 2,589 villages to integrate the needs of forest-dependent communities and other marginalized groups into the NLUP. Participatory mapping will simultaneously achieve several goals: (1) determine the spatial nature of rural land use, thereby, assisting in the development of solutions and/or preventing conflicts among State-driven economic activities and village-scale livelihood activities; (2) provide an avenue for rural populations to directly engage in the land-use planning process; and, (3) serve as a tool for communication, outreach, and consensus building among rural populations and national-scale decision makers. Further details outlining the village-based mapping exercises are provided in section 2c.

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<sup>10</sup> Provincial scale committees to be chaired by the provincial governors, with representation from senior executives from the key sectoral agencies and national parks, major economic operators (agriculture, forestry, mining, etc.) and representatives of civil society in each province.

## Component 2: Prepare the [REDD+] Strategy – See Box 1

### Gabon's statement on REDD+

Historically, Gabon was an active proponent of REDD. Indeed, in 2005 the Gabon's UNFCCC focal point co-sponsored the RED concept with Papua New Guinea. Later, Gabon joined several other nations in support of the addition of degradation (the second "D") to the dialogue. Gabon was also an early and active member of the FCPF, a rewarding process that enabled the country to critically evaluate the REDD framework from its own context, even as it was developing.

Through this assessment, Gabon concluded that the REDD+ framework, as presented in Durban in 2011, was unlikely to provide sufficient incentives and flexibility for high forest, low deforestation countries (HFLD) to simultaneously pursue their climate change mitigation and development goals. With 88% forest cover, and almost zero deforestation, Gabon, like its HFLD neighbor countries, will face increasing pressure on its forest and land resources as it develops. Faced with this reality, Gabon stepped away from the REDD+ and FCPF process because leaders concluded that significant investment and engagement in the process could slow, rather than accelerate, the multi-sectoral reform initiatives necessary to protect Gabon's forests as the country developed. Further, the future of REDD+ appeared uncertain and the international finance mechanisms for the REDD+ 'fast start' programs were already failing to meet funding commitments. To honor the promises made to its citizens and the international community, Gabon's leaders instead embarked on an ambitious domestic process to develop an innovative model of sustainable development tailored to Gabon's needs and priorities, that would allow it to bypass the "deforestation curve" characteristic of the development of other forested nations.

The development pathway on which Gabon has embarked is described within the text of this R-PP. It has been imperfect, dynamic, and has progressed in starts and staggers. But, it emerged from the country's conviction that Gabon's development strategy must be nationally driven, created by Gabonese institutions (those existing and to later be created) and governed by Gabonese Laws and legislative reform. Though REDD+ demonstrated potential to serve as a useful tool for certain aspects of the country's development strategy (such as managing protected areas or improving forestry practices), decision-makers believed REDD+ would not provide the foundation for comprehensive reform required to achieve a sustainable future. As such, Gabon could not commit to the REDD+ process without first defining, and taking ownership of, their own development strategy.

Today, in partnership with CAFI, Gabon will accelerate the LUP process and National Natural Resource and Forest Observation System (NNRFOS) defined as Outcome 1 and 2 of this R-PP. This will facilitate the final step in what Gabon articulates as **"la Maitrise des Emissions liées à la Déforestation et la Dégradation des Forêts, la Conservation des Forêts et la restauration et reforestation des zones dégradées"** – with the focus of minimizing emissions into the future.

Having significantly advanced along this process, Gabon is now ready to open the door for discussions regarding how to potentially engage in the REDD+ process for specific sectors, such as the conservation and forestry sectors, where the LUP is advanced. Outcome 3 of this document highlights one such potential program – reducing emissions from the forestry sector. However, Gabon retains the view that the national-scale LUP process must be completed before the country can critically evaluate the degree to which its development process and land-use decisions are compatible with the emerging REDD+ framework.

## 2a. Assessment of Land Use, Land Use Change Drivers, Forest Law, Policy and Governance

**Standard 2a the R-PP text needs to meet for this component:  
Assessment of Land Use, Land Use Change Drivers, Forest Law,  
Policy and Governance:**

A completed assessment is presented that: identifies major land use trends; assesses direct and indirect deforestation and degradation drivers in the most relevant sectors in the context of REDD-plus; recognizes major land tenure and natural resource rights and relevant governance issues and shortcomings; documents past successes and failures in implementing policies or measures for addressing drivers of deforestation and forest degradation; identifies significant gaps, challenges, and opportunities to address REDD-plus; and sets the stage for development of a national REDD-plus strategy to directly address key land use change drivers.

### ***Gabon Country Overview***

Gabon is an equatorial country located in Central Africa, at the western end of the Congo Basin rainforest. The country enjoys a stable and prosperous economy and extensive programs for sustainable development. Substantial oil and mineral resources contribute to making Gabon one of the wealthier countries in Africa. A fortunate consequence is that forest covers 88% of the area of Gabon (24 Million ha), making it the second most forested country in the world after Surinam. To date, the country also enjoys extremely low rates of deforestation.

The relative lack of deforestation can largely be attributed to several factors: (1) historically, the country relied largely on offshore oil production, rather than intensive forestry exploitation and/or industrial agriculture development, as its primary source of economic revenue; (2) small-scale, slash-and-burn agriculture is relatively limited and spatially concentrated because the country is sparsely populated – a population of 1.8 million people inhabit Gabon, more than 85% of whom live in urban population centers and 50% in the metropolitan area of Libreville; and, (3) Gabon's leaders have adopted a relatively environment-friendly governance. The Government's policy of *Gabon Emergent* strives to diversify the economy and develop competitive manufacturing and service sector industries, while conserving Gabon's unique natural heritage. Even as logging, mining, and agriculture are expected to increase as the economic portfolio of the country diversifies, the sustainable use of resources and conservation of the environment remains at the core of the development agenda. For example, 17% of its total area has been set-aside as national parks and protected areas (NPA 2011).

Gabon's forests are botanically diverse (Pomeroy 1993), with an estimated 6,000-10,000 plant species (Breteler, 1989). There are three major forest types:

1. The *evergreen rainforest* in the west and the coastal zone (0-300 m elevation) has a relatively high level of degradation along the coast and near major urban zones and settlements. The coastal forests are heavily harvested, degraded and in some areas reduced to secondary forest characterized by an abundance of *Aucoumea klaineana* (okoumé) and *Dacryodes buettneri* (ozigo). Away from the coast, these forests are largely intact, with low impact of degradation or deforestation.
2. The *central Gabonese forest*, covering most of the country and areas of medium elevation (300-1000 m), is very similar to the closed humid forest found elsewhere in the Congo Basin and in Liberia, with many of the same tree species (e.g. *Canarium schweinfurthii* – aiélé, *Lophira alata* – azobé, *Entandrophragma* spp, *Khaya* spp and *Triplochiton scleroxylon* – ayous).
3. The *semi-deciduous forest* in the northeast is characterized by a predominance of Maranthaceae in the sub-layer and trees such as *Terminalia superba* (limba), *Millettia laurentii* (wengé) and *Triplochiton scleroxylon* (ayous).

Forest type varies roughly with precipitation, which ranges from >3000 mm along Gabon's northwestern coast to <1500 mm in the south- and northeastern forests. Coastal forests include a mixture of mangroves, flooded forest, and raphia swamps that transition into a low elevation forest in the western Ogooué delta plain. The plain is interrupted by the Chaillu mountain chain that separates it from the Okoumé-dominated forests characteristic of most of Gabon and the Congo-Guinean forests that extend east starting at the end of the Okoumé distribution. Continuous savanna is found in the southeastern and most eastern sections of Gabon, where the forests run into the Batéké plateau.

### ***Analysis of drivers of deforestation and degradation***

Below is an analysis of the primary drivers of deforestation and forest degradation in Gabon, classified in accordance with Geist and Lambin (2001)<sup>11</sup>. Note that certain direct or indirect drivers are of little significance for Gabon. In sections 2b and 2c, we provide a summary of the primary measures (laws) or national strategy plans either in effect or planned by the Government to mitigate the key drivers of deforestation and degradation.

#### **Driver 1. Agricultural expansion**

##### **→ Current situation**

Gabon's agricultural sector is currently not well developed. Agriculture and stockbreeding areas are relatively limited and the production of farming operations is generally poor. In 2000, agricultural areas were estimated at approximately 250,000 ha, less than 1 percent of the terrestrial surface area.

Over the years, agricultural production has continued to decline, dropping from 15 percent of GDP in the 1960s to less than 5 percent and 1 percent in 2002 and 2010, respectively. Only a sixth of the population gains employment from the agricultural sector, which continues to lose manpower as rural communities migrate from villages toward population centers.

As such, Gabon imports approximately 60 percent of the food needed to nourish its 1.8 million inhabitants costing the country more than US\$ 500 million/year.

*In sum, agriculture has not been a significant driver of deforestation in Gabon in recent years. The data on deforestation presented in the National Climate Plan (NCP) suggest that conversion of forests to agricultural crop-raising land was marginal, accounting for approximately 4 percent of total deforestation between 1990 and 2000 and less than 0.4 percent between 2000 and 2010.*

The lack of agricultural production, which is beneficial to forest conservation and emissions reduction from the LULUCF perspective, is unfavorable for food security, national sovereignty, and economic diversification. Gabon's agricultural potential is currently underexploited, but could be grown to increase food crops for the national market and develop cash crops as a source of job creation and economic growth. One of the major objectives of the Emergent Gabon Strategic Plan is "*drawing value from the country's agricultural potential and guaranteeing food security for its citizens*". The EGSP outlines a plan for agricultural expansion to achieve food self-sufficiency and develop as an exporter of agricultural products. The plan (described in section 2b) consists of nine core activities for creating agricultural lands and building infrastructure to refine products and create access to relevant markets.

**Since 2010, with the development of the agricultural development program, and resulting emergent agro-industry sector, deforestation from agricultural production is on the rise, representing almost 20% of gross deforestation in the country between 2010 and 2015.**

**Cash Crops:** As outlined in the Green Gabon Operational Plan (GGOP), Gabon aims to become: (1) Africa's second-largest producer of dry rubber, with a production target of 128,000 tons per year by 2025; (2) Africa's third-largest producer of crude palm oil, with a production target of 425,000 tons per year by 2025; and, (3) a competitive exporter of sugar in Central Africa by 2025. To achieve these goals, Gabon would need to develop approximately 55,000 ha of oil palm plantations, 57,000 ha of rubber-tree plantations and 15,000 ha of sugar cane plantations – totaling approximately 127,000 ha of plantations. As of 2017,

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<sup>11</sup> Geist H.J. and Lambin E.F. What Drives Tropical Deforestation? A meta-analysis of proximate and underlying causes of deforestation based on subnational case study evidence. Louvain-la-Neuve - LUCC International Project Office, 2001. 136 pp.

three major agro-industrial operators in Gabon -- OLAM, SIAT and SUCAF -- were already working a total area of 104,000 ha of land. New land will be identified and put into production based on the NLUP's land optimization processes to support the country's agro-industrial ambitions for the year 2025.

**Food Crops:** The GGOP also aims to increase production of food products suited to growth in Gabon. Production targets are defined in Table 2. To achieve this, greater areas of land will be put into production. The intent is to optimize production and minimize land conversion by spatially planning agricultural zones (avoiding HCV and high biomass forests) as part of the NLUP and adopting agricultural techniques (e.g. mechanization, irrigation and fertilization) and products (e.g. improved seeds) to increase output. Along these lines, a National Plan for Agricultural Investment and Food and Nutrition Security (French abbreviation PNIASAN) was initiated in March 2015. Example flagship programs are described below.

- PRODIAG was an agricultural project included under the EGSP and implemented by the Intergovernmental Authority for Development (IGAD) from 2011-2016<sup>12</sup>. The project sought to create 3,000 jobs and achieve 1,090 production units (agricultural holdings) with a total production capacity of 13,600 tons per year and target cumulative revenues of 3.5 billion CFA francs. The results of the project in 2016 consisted of 904 tracked agricultural holdings over approximately 430 ha with total revenue of 3.6 billion CFA francs.
- The Gabonese Initiative for Achieving Agricultural Outcomes with Engaged Citizens (French abbreviation GRAINE),<sup>13</sup> was launched in December 2014. GRAINE is anticipated to facilitate the goal of food self-sufficiency while at the same time creating jobs, income and securing titles to land (land tenure) for farmers, a large proportion of whom are women. GRAINE operates through the creation of local cooperatives, the extension of agricultural training courses to civil society, the provision of land, plants and agricultural equipment, and the organization and purchasing of the outputs/agricultural products. In 2015, the GRAINE program had already established 14,662 cooperative farms, opened an information center in Libreville and five regional centers, cleared more than 2,700 ha of land for food crops (820 ha of which 820 were already planted), and created 914 direct jobs and 489 indirect jobs.

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<sup>12</sup> Cf. <http://igad-gabon.com/spip.php?rubrique2>

<sup>13</sup> Cf. [www.graine-gabon.com](http://www.graine-gabon.com)

**Table 2. Agricultural Production Targets for 2025 (PR, 2016) <sup>14</sup>**

	2012	2025		Trend
Crop	2012 production (t)	Production estimate (t)	Area (ha)	Production Multiplier 2012-2025
Plantain	278,000	564,000	78,200	x 2
Sheep and goats	1,029	11,000	-	x 10.7
Ignam & taro	ND	278,000	21,400	-
Coffee/cocoa	500	10,000	15,500	x 20
Vegetable farming	6700	82,605	2,754	x 12.3
Peanut	14,812	25,000	10,000	x 1.7
Manioc	ND	126,940	8,463	-
Beef	ND	7,000	-	ND
Pork	ND	55,000	-	ND
Rice	1,100	113,921	27,800	x 104
Corn	ND	170,000	23,000	-
Soy	ND	80,000	10,000	-
Fruit trees	24,000	300,000	-	x 13
Poultry	3,800	150,000	-	x 39
Eggs	2,100	50,400	-	x 24
Sugar	26,850	55,000	8,200	X 2
Beekeeping	ND	59	-	-

*Governance:* Under the GGOP, the MAEPSA is expected to adopt new operational mechanisms to support the expanding agricultural sector. Existing agencies -- the Agency for Collecting and Marketing of Food Products (ACCOPA), the Gabonese Agency for Food Security (AGASA), the National Agricultural Laboratory Board (ONALA) and the Plant Material Introduction, Adaptation, and Propagation Board (ORIAM) -- will be strengthened. Two new agencies will be created:

- The Gabonese Agriculture Development Agency (ADAG) will assist in preparing and finalizing agricultural lands that could be made available to agricultural entrepreneurs;
- The National Agricultural and Rural Guidance Agency (ANCAR) will provide extension agents and train farmers and stockbreeders working with the GRAINE program.

At the provincial scale, multi-service centers will be established near major production sites. These Service Centers will provide various supports to the agricultural community (supply of inputs, technical support to farmers, and storage places for harvested product), and serve as the formal interface between the administration's technical services and the farmers and stockbreeders.

Given the high forest cover of Gabon, meeting the agricultural development goals outlined in the EGSP and Green Gabon Policy will likely require increased conversion of at least some forested land for agricultural production. If unplanned or unmitigated, the agricultural sector could become a significant driver of deforestation.

<sup>14</sup> Office of the President of the Republic. Green Gabon Operational Plan – 2025 Timeline. Libreville – Office for Coordination of the Emergent Gabon Strategic Plan, February 2016. 204 pp



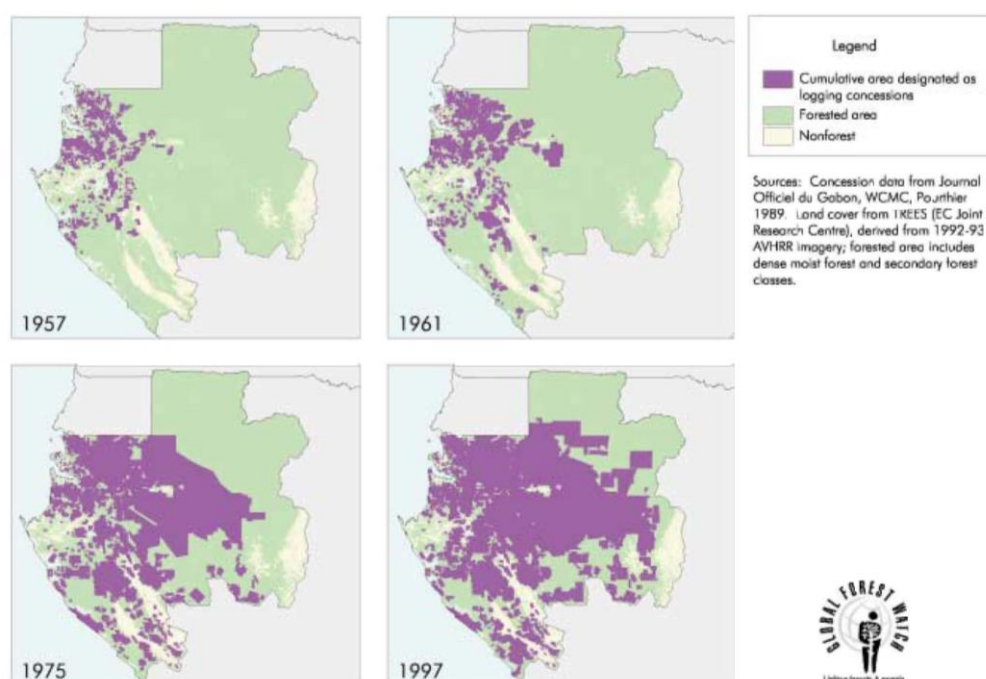
The EGSP estimates Gabon's suitable agricultural land at approximately 5.2 Mha. The National Climate Plan calculates that forest conversion will reach approximately 320,000 ha between 2008 and 2020 to meet EGSP targets.

## Driver 2. Timber Extraction

### ➔ Current situation

With 24 million ha of dense forest, timber production has held a strong historical role in Gabon. Indeed, the forestry sector was the primary source of economic activity in the country until 1968, when the industry was supplanted by crude oil as an earner of foreign exchange.

Figures 3 and 4 illustrate the expansion of logging concessions from the mid-1950s to 2008. In 1957, fewer than 10 percent of Gabon's forests were allocated as logging concessions. By 2008, logging concessions covered more than half of the country's forests.



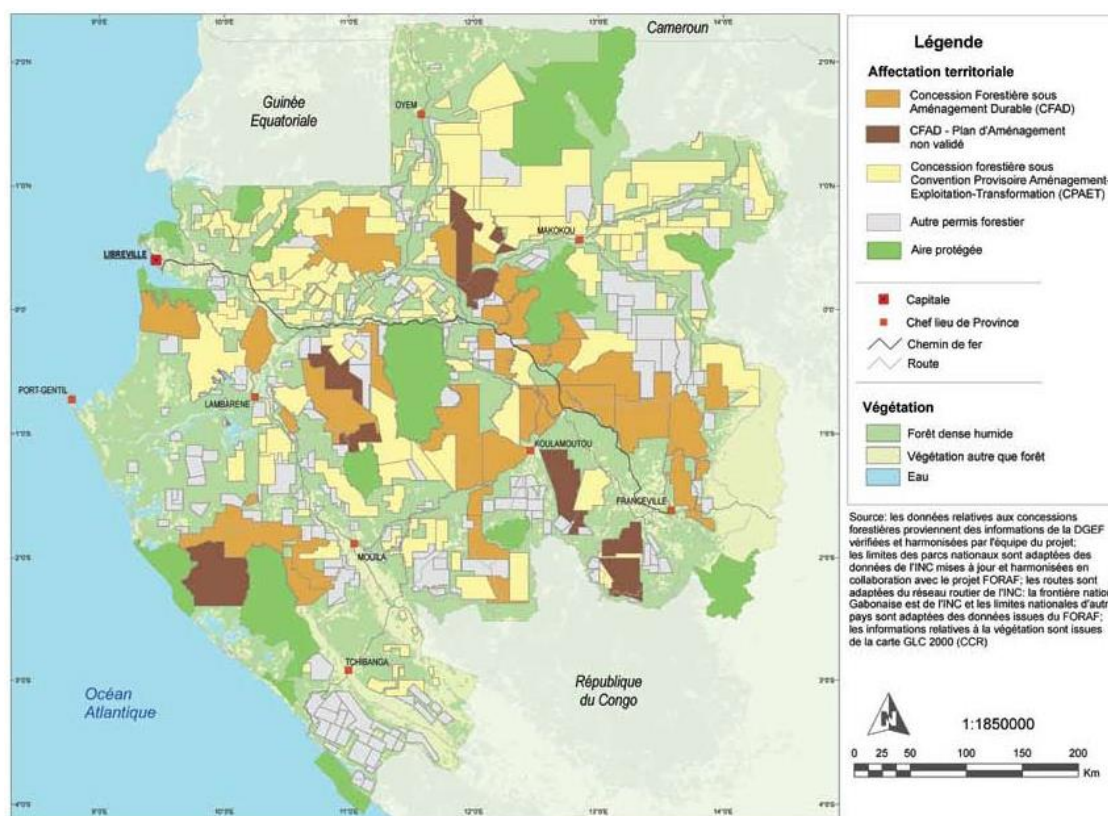
**FIGURE 3 – DEVELOPMENT OF THE AREAS COVERED BY LOGGING CONCESSIONS BETWEEN 1957 AND 1997 (GFW, 2000)<sup>15</sup>**

The first companies operating in the sector primarily harvested a single species, okoumé, and practiced selective, high-grading operations, felling an average of one tree per hectare. In the mid-1980s, operators began extracting a greater variety of hardwood species and associated damage to the forest increased.

Prior to the adoption of the Forest Code in 2001, logging was not subject to planning and forestry exploitation was a significant driver of forest degradation, and to some degree, deforestation. The historical logging cycle followed a pattern whereby: (1) large companies (mostly European), with the capital and the capacity to build roads and base camps, were allocated permits, extracted the most valuable timber, and then abandoned their concessions for new permits of unexploited forest. More modestly sized companies replaced the larger operators, maintaining the road network left behind, and progressively extracting trees and species of lesser value. This model of exploitation resulted in relatively short harvesting cycles (10 to 15 years) and high residual forest damage.

<sup>15</sup> Global Forest Watch. A First Look at Logging in Gabon: A Global Forest Watch Report. Washington - World Resources Institute, 2000. 50 pp





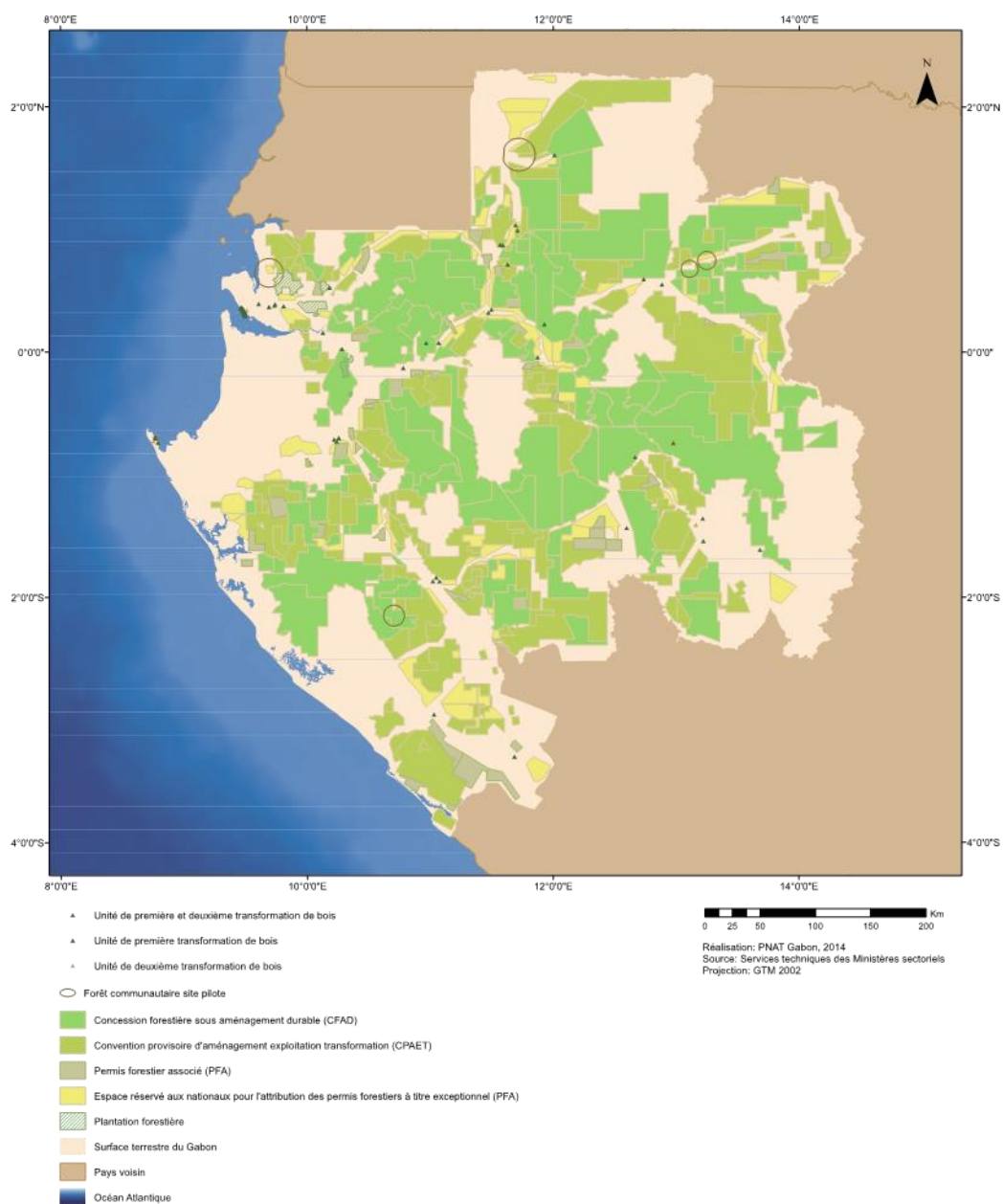
**FIGURE 4 - MAP OF THE LOGGING CONCESSIONS IN 2008 (WRI, 2009)<sup>16</sup>**

In the early 1990s (no data is available prior to this time) forest damage caused by timber extraction was estimated at 10 to 15 percent. The “First Harvesting Zone” surrounding Libreville (a radius of approximately 100 km) had already experienced a minimum of five harvesting cycles. Forest structure in the First Zone was significantly altered - primary forests were converted to secondary forests, which were often converted to cropland.

In 2013, logging concessions covered 150,883 km<sup>2</sup>, or 57% of the surface area of the country (PNAT 2015; Figure 5). About half of the concessions were subject to management plans meant to promote sustainability (CFAD: concession forestière sous aménagement durable), as required by the law.

Gabon sees great potential to increase forestry productivity and reduce emissions, through a better understanding of the role of degradation in the country's emissions profile, and by improving technology and methodologies in the sector. Section 2c includes more detail on Gabon's intentions for improving this sector both economically and environmentally.

<sup>16</sup> Cf. <http://www.wri.org/resources/maps/gabon-am%C3%A9nagement-forestier>



**FIGURE 5. 2013 MAP OF LOGGING CONCESSIONS IN GABON**

### **Driver 3 Extraction of fuel wood**

#### **→ Current situation**

Owing to the small size of the population relative to the forest resources available, the low population density in the rural environment, and the overriding use of gas for cooking in the urban environment, fuel wood is not a significant driver of forest degradation or deforestation in Gabon.

Annual fuelwood production in Gabon was estimated in 2009 at approximately 1.1 Mm<sup>3</sup>, or 776,000 tons. This production corresponds to an extraction of fuelwood at approximately 0.03 tons per hectare per year -- far lower than the average annual net increase for Afro-tropical forests of 3.1 tons (Penman and al. 2003)<sup>17</sup>.

In the urban environment, where 85% of all Gabonese live, there is reliable access to fuelwood alternatives. 62.3 percent of Gabonese households use gas for cooking, whereas only 34.1 percent rely on fuelwood (Daurella and Foster 2009)<sup>18</sup>.

A charcoal and deadwood market, though limited, does exist in Gabon. The products are primarily consumed by households that cannot afford gas and in periods of gas shortages.

#### **Driver 4. Extension of infrastructures**

##### **➔ Current situation**

The expansion of mining, industrial and transport infrastructure inevitably results in deforestation in high forest cover countries like Gabon. However, no accurate quantification of such deforestation is currently available. Detailed analysis of the rates of deforestation in 1990, 2000 and 2010 allow rough estimates of deforestation related to the development of infrastructure, but their accuracy is likely low.

Between 1990 and 2000, deforestation related to the development of infrastructure represented roughly 6.9 percent of the total deforestation observed – or less than 700 ha/year on average. The abandonment of mining infrastructure over the same period resulted in the natural reforestation of roughly 65 ha/year on average.

Between 2000 and 2010, infrastructure development represented roughly 7.8 percent of the total observed deforestation (NCC, 2012).

Between 2010 and 2015, the construction of the Grand Poubara dam resulted in approximately 4,288 ha of deforestation.

Thus, infrastructure development and expansion of mining and other extractive industries does not currently appear to constitute a significant driver of deforestation in Gabon. However, the economic potential of this sector remains underexploited and several large-scale mineral deposits have been identified in Gabon. The below resources could be developed or put into production in the future (Figure 6):

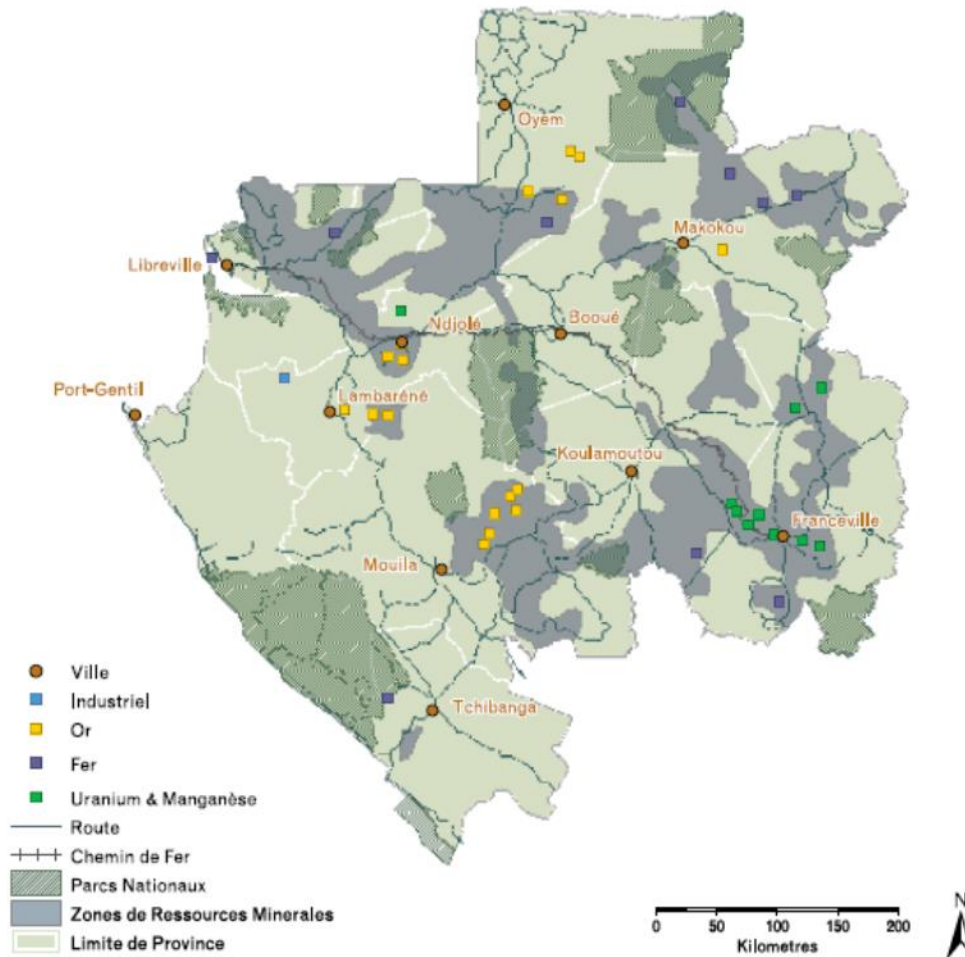
- Uranium, extracted from 1961-1999 around Franceville by COMUF, a subsidiary of COGEMA. The mine was closed because of low market value and exhaustion of the reserves.
- Manganese, mined in Moanda by COMILOG, a subsidiary of the ERAMET group, which is the world's second-largest producer of manganese.
- Iron in the Belinga deposits, with an estimated workable reserve of one billion tons, is believed to have significant economic value.
- Carbonatites (niobium, phosphate ores, rare earths, uranium, thorium) in the Mabounié deposits, located in the center of Gabon, are ranked among the largest in the world.

Other deposits of a more modest scale are also being developed or are planned for development: the Bakoudou gold mine, the manganese deposit in Ndjolé, the manganese deposits in Franceville and the iron deposits in Milingui.

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<sup>17</sup> Penman, J., Gytarsky, M., Hiraishi, T., Krug, T., Kruger, D., Pipatti, R., Buendia, L., Miwa, K., Ngara, T., Tanabe, K., and Wagner, F. Good practice guidance for Land-Use, Land-Use Change and Forestry - IPCC National Greenhouse Gas Inventories Programme. Vienna – IPCC, 2003. 590 pp

<sup>18</sup> Daurella D.C., Foster V. What can we learn from household surveys on inequalities in cooking fuels in sub-Saharan Africa? Washington DC – World Bank, February 2009. 38 pp



**FIGURE 6 – MAP OF MINERAL RESOURCES IN GABON (PR, 2012)**

## **Driver 5. Land governance and land planning**

### **➔ Current situation**

The Government of Gabon recognizes land and water use and planning as fundamental, transversal elements of its national development -- essential to promoting wise stewardship of global goods such as carbon and biodiversity. For decades, Gabon's land allocation process was largely unplanned and non-optimized. Administrative departments worked independently of one another, often allocating the same parcel of land to multiple, mutually exclusive, uses (Figure 7) -- 52 percent of the terrestrial surface area is allocated to a single activity, 31 percent to two activities, 4 percent to three activities, 1 percent to four activities or more, and 12 percent is non-allocated.

Overlapping land allocation has resulted in several juridical and technical challenges for the Government and, if continued, could result in significant degradation and deforestation of the forest estate. For Gabon to effectively manage the economic, environmental, and climate profiles of the drivers of deforestation and degradation, the status and overlap of current land uses (and the formalization of the land use planning process) must be identified. This logic drives the significant focus on land use planning in the NIF (National Investment Framework) initiated between CAFI donors and Gabon.

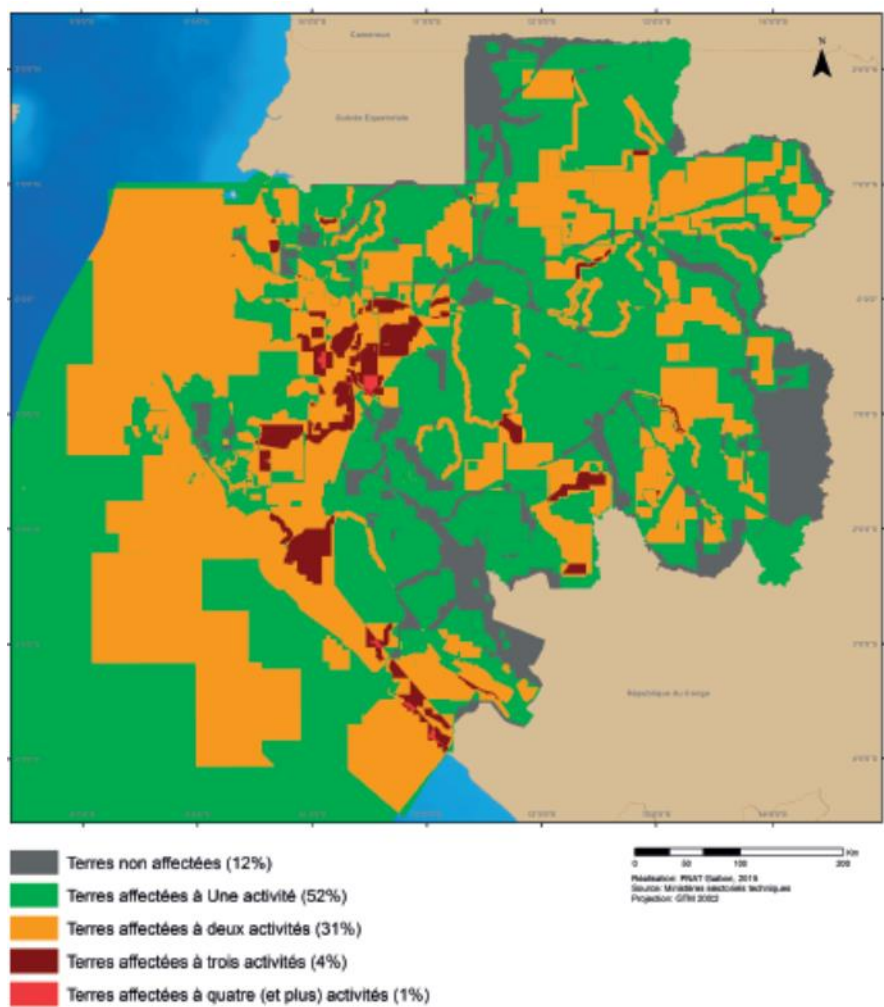


Figure 7- Areas of Multiple Allocations in the Main Sectors of Activities in Gabon (PR, 2015)

## Driver 6. Demographics

### → Current situation

Gabon hosts approximately 1.8 million inhabitants, with a population density 6.7 people/km<sup>2</sup> and 87 percent of the total population residing in urban areas in 2015<sup>19</sup>.

Population growth has continuously declined since 1980 and, relative to other countries in the sub-region, is low - approximately 2.2 percent per year in 2015.

Population growth does not currently represent a major underlying driver of deforestation and forest degradation in Gabon. The NLUP and the NNRFOS are mechanisms by which Gabon will continuously accumulate spatial data on the distribution and impacts of human population and activities across the country.

<sup>19</sup> Cf. [www.donnees.banquemondiale.org](http://www.donnees.banquemondiale.org)



## 2b. [REDD-plus] Strategy Options- see Box 1

### **Box 2b-1: The Cancun COP Decision 1/CP.16, Considerations to developing and implementing National Action Plans**

*70. Encourages developing country Parties to contribute to mitigation actions in the forest sector by undertaking the following activities, as deemed appropriate by each Party and in accordance with their respective capabilities and national circumstances:*

- (a) Reducing emissions from deforestation;*
- (b) Reducing emissions from forest degradation;*
- (c) Conservation of forest carbon stocks;*
- (d) Sustainable management of forests;*
- (e) Enhancement of forest carbon stocks;*

*72. Also requests developing country Parties, when developing and implementing their national strategies or action plans, to address, inter alia, the drivers of deforestation and forest degradation, land tenure issues, forest governance issues, gender considerations and the safeguards identified in paragraph 2 of appendix 1 to this decision, ensuring the full and effective participation of relevant stakeholders, inter alia indigenous peoples and local communities;*

### **Standard 2b the R-PP text needs to meet for this component: REDD-plus strategy Options**

The R-PP should include: an alignment of the proposed REDD-plus strategy with the identified drivers of deforestation and forest degradation, and with existing national and sectoral strategies, and a summary of the emerging REDD-plus strategy to the extent known presently, and/or of proposed analytic work (and, optionally, ToR) for assessment of the various REDD-plus strategy options. This summary should state: how the country proposes to address deforestation and degradation drivers in the design of its REDD-plus strategy; a plan of how to estimate cost and benefits of the emerging REDD-plus strategy, including benefits in terms of rural livelihoods, biodiversity conservation and other developmental aspects; socioeconomic, political and institutional feasibility of the emerging REDD-plus strategy; consideration of environmental and social issues and risks; major potential synergies or inconsistencies of country sector strategies in the forest, agriculture, transport, or other sectors with the envisioned REDD-plus strategy; and a plan of how to assess the risk of domestic leakage of greenhouse benefits. The assessments included in the R-PP eventually should result in an elaboration of a fuller, more complete and adequately vetted REDD-plus strategy over time.

## **Emerging Gabon Strategic Plan (EGSP)**

Gabon has abundant natural resources, particularly hydrocarbons, minerals, and forests. These resources include particularly rich biodiversity and constitute a significant potential for climate change mitigation via the reduction of GHG emissions from the LULUCF sector and increased carbon sequestration.

In the face of the gradual decline in oil revenues, Gabon's political leaders have chosen to promote economic diversification based, in part, on the sustainable use of the country's mining and natural resources, including forestry and agriculture. Faced with climate change, Gabon is engaging in a model of sustainable development that will reduce its GHG emissions, while securing the population's energy and food security and livelihood.

The goal of the EGSP is for Gabon to become an emerging economy by 2025. As the figure below illustrates, the EGSP is based on four foundational elements that promote balanced, sustainable development that will achieve prosperity shared by all Gabonese.

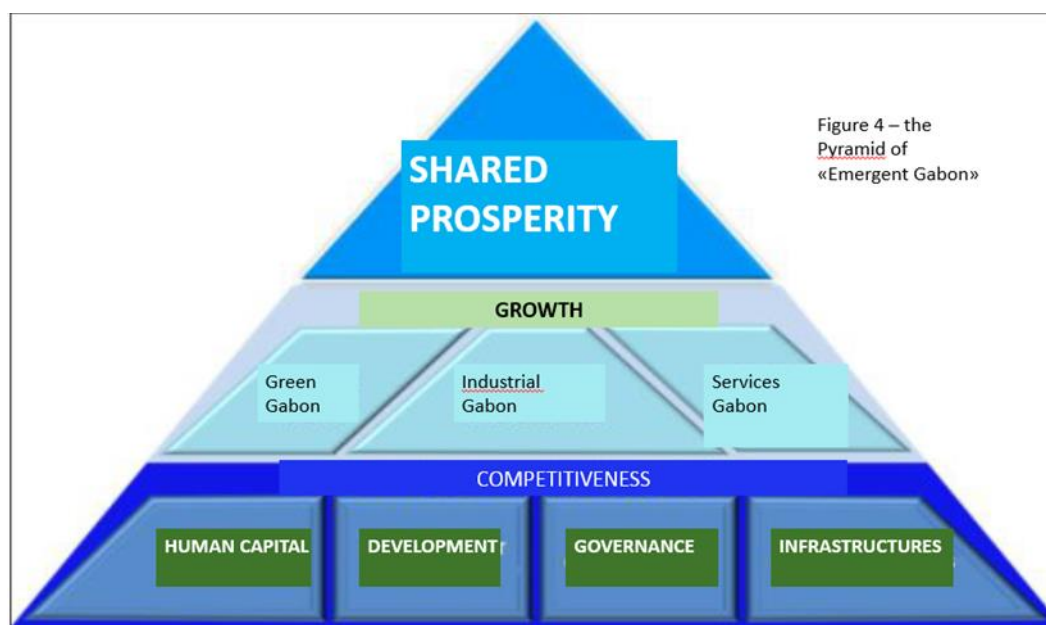
Sustainable development represents the first foundation of the EGSP and constitutes a new paradigm, which will be the basis of the entire strategy to transform Gabon's society and economy. Its dissemination should result in a new development model that integrates human well-being, social equity, sustainable growth, and environmental conservation.

The second foundation is governance, which must be strengthened legally, institutionally, and economically.

The third foundation is infrastructure, with significant, planned development of basic economic infrastructure (transportation, energy, and digital).

Human capital constitutes the fourth foundation. Both training and values must adapt to the requirements of emergence.

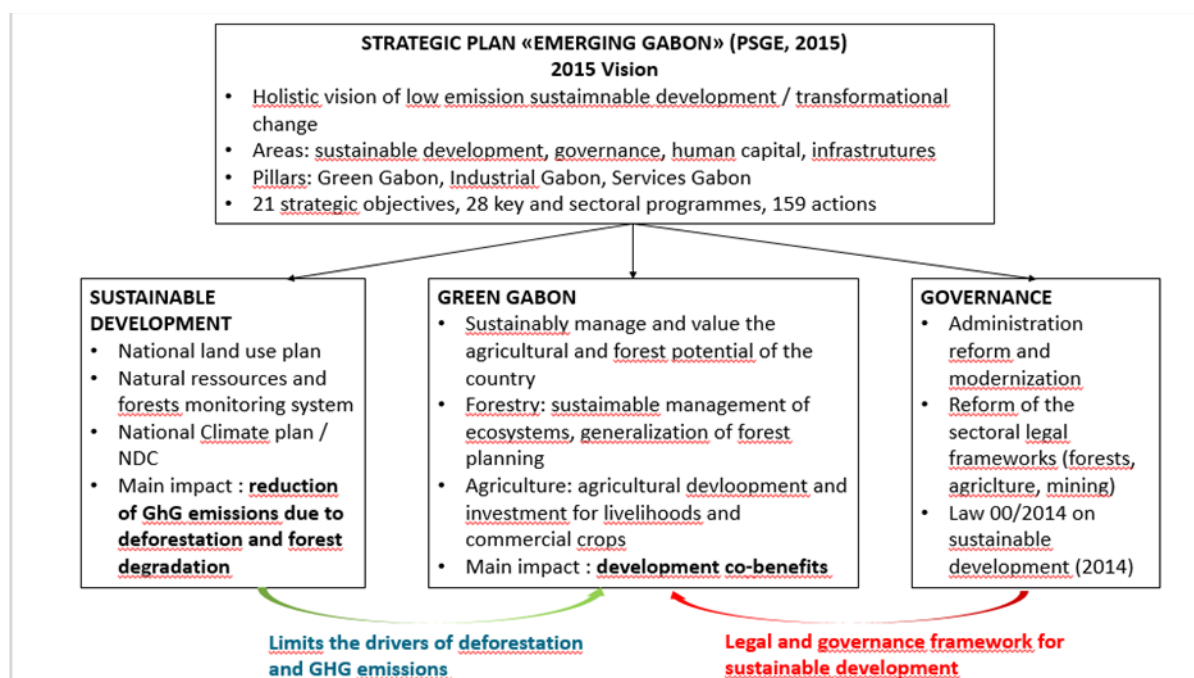
The first strategic component of the EGSP involves strengthening and consolidating these foundational elements. The second involves diversifying the three pillars of the country's sustainable growth: Green Gabon, Industrial Gabon, and Services Gabon. They are the drivers that will help to accelerate Gabon's sustainable economic growth and diversify its sources, while limiting its environmental impacts and, specifically, its GHG emissions.



**FIGURE 8 - PYRAMID OF EMERGING GABON (PR, 2012)<sup>20</sup>**

The EGSP is organized into 21 strategic objectives, 26 sectoral programs, two crosscutting flagship programs, and 159 actions broken down among these programs. Figure 8 outlines the main components of the EGSP that are relevant in the context of Gabon's NIF and RPP: the Green Gabon pillar and the two related areas of sustainable development and governance.

<sup>20</sup> Presidency of the Republic. Emerging Gabon Strategic Plan: Vision 2025 and Strategic Directions 2011-2016. Libreville – Gabonese Republic, July 2012. 149 pp.



**FIGURE 9 - GENERAL LINKS BETWEEN SUSTAINABLE DEVELOPMENT AND GOVERNANCE OF THE EGSP**

Despite the significant effort placed to the creation and the implementation of the EGSP in 2016 the country found itself in the midst of an economic crisis caused by a plunge in oil market value. In response the Government adopted an Economic Relaunch Plan, in June 2017, to implement the ESGP for the period of 2017-2019.

### **The Green Gabon pillar of the EGSP**

The objective of the Green Gabon pillar of the EGSP is to ensure that development opportunities – particularly those related to the forestry and agricultural sectors -- are considered in light of preserving the country's natural heritage, biodiversity, and forests for future generations. Two strategic objectives of the Green Gabon pillar are of particular importance to the development of Gabon's NIF and RPP:

- Strategic objective 10: Sustainably manage Gabonese forests and position Gabon as a world leader in certified tropical wood; and,
- Strategic objective 11: Develop the country's agricultural potential and ensure food security.

These two strategic objectives are reflected in two sectoral programs, "forestry" and "agriculture and livestock." Each includes a series of actions to be implemented (Table 3).

### ***Sustainable development programs***

As demonstrated in the ESGP, Gabon selected to make sustainable development the foundation of an emerging Gabon. Indeed, the ESGP specifically includes a strategic objective that seeks to "establish a new development model that integrates human well-being, social equity, sustainable growth, and environmental conservation." This objective is organized around four key programs, three of which are of particularly relevant here:

- Flagship program – Knowledge and preservation of natural resources;
- Flagship program – Strategic land use planning and development; and,
- Program – National Climate Plan

### **➔ Flagship program – Knowledge and preservation of natural resources**

This program seeks to address the lack of knowledge of natural resources in terms of spatial distribution, characterization, and change over time. Despite Gabon's natural resource wealth, the available data have



been inadequate, disorganized, and not aggregated, which has made them difficult to use. This flagship program will thus consolidate the skills and resources needed to coordinate the collection, updating, and sharing of data.

This flagship program also involves the NPA, which has carried out the NRI, the ground based component of the NNRFOS, that establishes a network of plots used to collect data on forests and biomass and carbon stocks (see Component 4 for more detail).

**Table 3– Links between the Green Gabon pillar of the EGSP and CA**

Area	Strategic objectives	Flagship programs and sectoral plans	Actions/activities/plans/projects
5. Green Gabon	Strategic objective SO10: Sustainably manage Gabonese forests and position Gabon as a world leader in certified tropical wood	P17. Wood and forest economy sectoral program	Implement the forestry legal framework
			Sustainable management of forest ecosystems
			Expand forest management
			Forestry area skills cluster
			Wood processing industrial infrastructure and support for local industry
	Strategic objective OS11: Develop the country's agricultural potential and ensure food security	P18. Agriculture and livestock sectoral program	Implement the agriculture and livestock legal framework
			Reorganize the National Rural Development Board (ONADER)
			Gabonese Agricultural Development and Investment Project (PRODIAG)
			Gabonese Initiative for Achieving Agricultural Outcomes with Engaged Citizens (GRAINE)
			Project to Support the Development of Agricultural Infrastructure for Nerica Cultivation (PADIACN)
			Agriculture skills cluster
			Agro-pastoral farms
			Integrated chicken complex

### ➔ **Flagship program – Strategic land use planning and development**

This program creates a planning tool for the optimization of land allocation for implementation of Gabon's sustainable development strategy. This program takes into account its natural resources and the country's biophysical and socio-economic attributes. By optimizing land use, the NLUP will minimize GHG emissions from LULUCF, while maximizing the co-benefits of development related to economic activities, and thus is a central component of Gabon's forest management strategy. Implementation of the NLUP will be completed in partnership with CAFI.

### ➔ **Program – National Climate Plan (NCP)**

In accordance with the EGSP, the GoG is determined to minimize the country's carbon footprint to the extent that it is compatible with its sustainable development goals.

The first version of the NCP was presented at the 17th UNFCCC Conference of Parties in Durban in December 2011. This plan outlines a climate-resilient, low carbon, and green development strategy and calls for the integration of climate considerations into the Government's sectoral development plans for energy, mining, forestry, agriculture, and national parks. The final NCP was published in 2012, and tasked the NCC to integrate low carbon planning across all ministries to support the Emergent Gabon Strategy.

Two key processes have been implemented under the NCP:

- Limit greenhouse gas emissions in the context of EGSP development and economic diversification projects; and,
- Ensure climate change adaptation in Gabon by preventing and containing ecosystem risks.

For each of the main sectors that produce GHG emissions/removals (forestry, agriculture, mining, oil, and housing), the NCP proposes an emissions/removal balance sheet, as well as “climate actions,” or specific measures intended to limit emissions from the main sectoral programs.

The NCP also addresses the cross-cutting issue of land use and provides details of the methodology and process to prepare the NLUP, which will organize land-use planning, limit potential land-use conflicts, and reduce GHG emissions from the various sectors.

In 2015, Gabon further demonstrated its commitment to Global initiatives to mitigate climate change through the submission of its NDC. Gabon’s NDC represents an integrated reflection of the country’s long political and technical reform process and outlines how these political decisions have resulted in avoided carbon emissions – specifically policies that obliged forestry companies to adopt sustainable harvest practices and avoided emissions through the creation of the national parks<sup>21</sup> (See Component 3).

### ***Environmental governance and reform***

**Sustainable Development Law:** The EGSP also incorporates the Flagship program – Legal framework for Gabon, which calls for the adoption of a sustainable development law and the reform of the legal frameworks governing the forestry, agriculture and livestock, and mining sectors to make them compatible with the EGSP’s sustainable development commitments.

In 2014, the GoG adopted a Sustainable Development Law No. 002/2014. This law, in combination with the Emerging Gabon Development Plan (PSGE) lays the foundation for transforming Gabon into an emerging, yet diversified economy while maintaining natural capital. The law outlines fundamental principles and objectives to be taken by the public authorities, economic operators and civil society.

*Article 3 of the Sustainable Development Law stipulates that the “State ensures the sustainable development of Gabon by way of a national strategy based on sustainable development fundamental principles, in particular:*

- *The rule of law;*
- *The principle of individual quality of life;*
- *The principle of equity and social solidarity;*
- *The principle of sovereignty and equity in development;*
- *The principle of homogeneity;*
- *The principle of costs internalisation;*
- *The principle of responsible production and consumption;*
- *The principle of economic efficiency;*
- *The principle of sharing and access to knowledge;*
- *The principle of safeguarding and protecting the environment;*
- *The principle of protecting cultural heritage and values;*
- *The principle of female participation;*
- *The principle of promoting traditional knowledge;*
- *The principle of protection and participation of local communities;*
- *The principle of preserving biodiversity and ecosystems;*
- *The principle of precaution;*
- *The principle of preventative and corrective action;*
- *The ‘polluter pays’ principle;*
- *The principle of international cooperation”.*

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<sup>21</sup>Estimated CO<sub>2</sub> emissions in the 2000-2010 period were about 350 million tons lower than those in the 1990-2000 period, as documented in the Plan Climat.

Article 5 of the sustainable development law calls for “*assessing the extent to which implementation of policies, programs, and projects complies with the principles and objectives of sustainable development by conducting sustainable development impact studies, controls, and audits.*” It also provides the legal basis to conduct a national assessment of sustainable development and create a national sustainable development registry to record sustainable development policies, programs, projects, concessions, rights, and credits.

Gabon’s Law on Sustainable Development also sets forth the following principles:

- Participation and access to knowledge: “Measures favouring education and access to information and research should be encouraged to stimulate innovation and improve public awareness of and participation in implementation of measures intended to achieve sustainable development;”
- Participation of women: “Women have a vital role in managing the environment and development. Their full participation is thus critical to achieving sustainable development;” and,
- Protection and participation of local communities: “Populations and local communities have a vital role to play in managing the environment and development based on their knowledge of the environment and their ancestral practices.”

In addition, sectoral reforms of legal frameworks governing forestry, agriculture and livestock, and mining are planned and underway. Analyses continue to be conducted on the issue of adapting and strengthening legal frameworks to face the new challenges and commitments of sustainable development in Gabon.

Achieving the bold national goals outlined in the Emerging Gabon development plan will require expansion of the mineral, transportation, water, energy, agricultural and communication sectors. Given the nation’s high forest cover, it follows that the expansion of these sectors will inevitably increase pressure on Gabon’s forests - and could result in increased greenhouse gas emissions (see specific Drivers of deforestation outlined in Component 2a).

Yet, the GoG is committed to minimizing the country’s carbon footprint, to the extent reasonably practicable, as outlined in the plans below.

**Table 4. Connections Between Sustainable Development and Governance Programs of the EGSP**

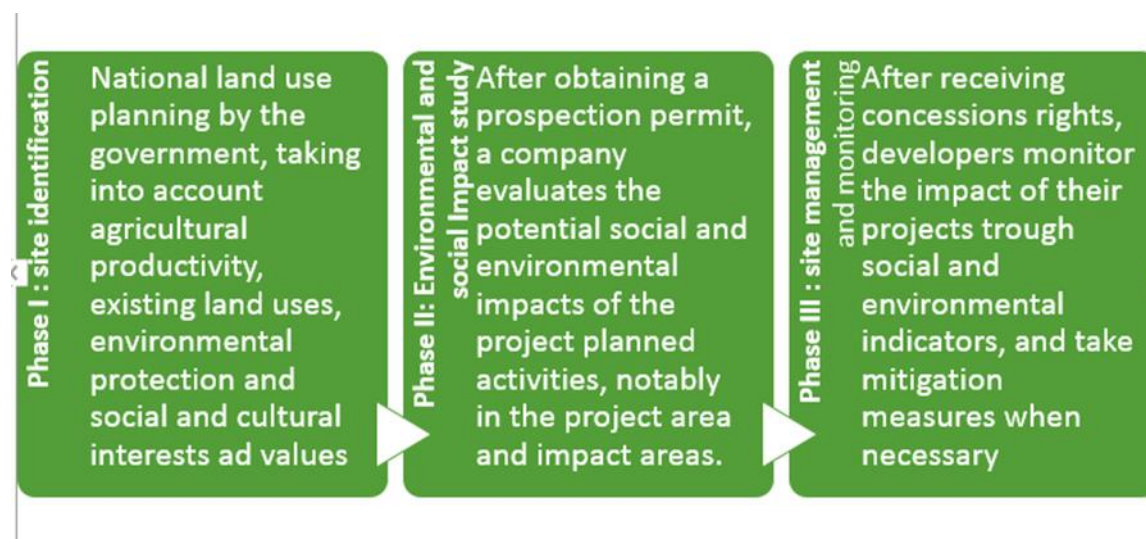
Area	Strategic objectives (SO)	Flagship programs and sectoral programs (P)	Actions/activities/plans/projects
1. Sustainable development	SO1. Establish a new development model that integrates human well-being, social equity, sustainable growth, and environmental conservation.	P1. Flagship program – Knowledge and preservation of natural resources	Create AGEOS
			NNRFOS
		P2. Flagship program – Strategic land use planning and development	Land-use planning and regional development plans
			Prepare an NLUP
2. Governance	SO2. Align the institutional framework to the EGSP	P6. Flagship program – Administrative reform and modernization	Promote and disseminate the new sustainable development paradigm
			NCP (2012); NDC (2015)
	SO3. Align the legal framework to the EGSP	P9. Flagship program – Legal framework for emerging Gabon	Six actions specific to the institutional framework and good governance
			Law No. 002/2014 on Sustainable Development (2014)
			Reform of the legal framework of the forestry sectors
			Reform of the agriculture and livestock legal framework
			Reform of the mining sector legal framework
			Investment Promotion Act

## Assessment of Additional Activities and Legal Frameworks Addressing Specific Drivers

### Driver 1: Agricultural Expansion:

**Legal framework:** The EGSP's "Legal Framework for Emergent Gabon," provides for the revision and improvement of the legal framework governing the agricultural sector, specifically Act No. 22/2008 enacting the Agriculture Code in the Gabonese Republic<sup>22</sup> and Act No. 23/2008 enacting the sustainable agricultural development policy<sup>23</sup>. The new Agriculture and Livestock Code will incorporate the principles of sustainable development and protection of the environment set down by Act No. 002/2014. The new Code will also include the provisions of Act No. 002/2013, extending fiscal incentives and customs relief to favor agricultural operators.

The EGSP aims to establish a center of agricultural excellence to develop research and training initiatives to support Gabon's agricultural sector. The center of excellence will bring together the National School for Rural Development (ENDR), the Institute for Agronomic and Forestry Research (IRAF) and the Higher National Institute for Agronomy and Biotechnology (INSAB). A new site for the Oyem Center for Agricultural Skills and Rural Development has been under construction since 2014. Approximately 400 technicians and advanced technicians will be trained there annually.



**FIGURE 10 – ENVIRONMENTAL AND SOCIAL MANAGEMENT OF AGRO-INDUSTRIAL PROJECTS (NPA, 2016<sup>24</sup>)**

**Best Practice Guidelines for Palm Oil Development and other Agro-Industry Operations:** In 2015, the NPA drafted a document to guide the "Management of the environmental and social impacts of the production of palm oil in Gabon", with economic operators and government ministries and agencies responsible for managing the sector as its intended audience. The document offered a detailed policy and technical analysis to guide agricultural site selection, environmental and social impact assessments, and management options to mitigate potential consequences of the industry in proximity to National Parks or other environmentally sensitive regions. Though created with the management of peripheral areas surrounding national parks in mind, the guidelines are applicable to the entire country. They incorporate an allowance for high conservation value (HCV) and high carbon stock (HCS) areas. This policy is currently

<sup>22</sup> Office of the President of the Republic. Act No. 22/2008 enacting the Agricultural Code in the Gabonese Republic. Libreville, Gabonese Republic, December 2008. 4 pp

<sup>23</sup> Office of the President of the Republic. Act No. 23/2008 enacting the sustainable agricultural development policy. Libreville, Gabonese Republic, December 2008. 7 pp

<sup>24</sup> NPA. Management of the environmental and social impacts of the production of palm oil in Gabon: Policy for site selection, surveillance and tracking, and for management of the environment in the case of developments in the peripheral areas of the national parks. Libreville, Gabonese Republic, July 2015. 46 pp

being revised by the Ministry of Agriculture, in collaboration with the NCC and the NPA, with the view of turning it into a general policy framework. Figure 10 outlines the three proposed phases of the NPA Best Practice Guidelines to ensure the maximization of agro-industry potential, while minimizing and managing the environmental and social impacts of agro-industry programs.

**RSPO:** The GoG intends to submit the entirety of the palm oil supply chain to RSPO certification. The process of drawing up an NLUP will make it possible to consolidate process like RSPO guidelines for palm development with other LUP decisions, thus optimizing the assignment of land for multiple stakeholders.

#### **Driver 2 – Timber Extraction:**

Gabon's forestry laws are relatively comprehensive and cover a variety of planning, mapping, and impact mitigation parameters.

In 2001, the country revised and updated its Forest Code (Law No 16/01 of 2001) to further improve forest governance and management. The new law set out a contractual framework, which became automatically applicable to operators in 2005 and serves as the umbrella under which all harvesting and procession entities must operate today<sup>25</sup>. Specifically, the Code provides for temporary development, exploitation and processing licenses (CPAET) with a progressive participation in the process of sustainable management that culminates to the status of forest concession under sustainable management (CFAD). The law lengthened harvest rotation to 25 years, required operators to employ several low impact harvesting techniques, and to submit 30-year management plans for approval.

Under this law, and with the support of the World Bank, the French Development Agency and other support entities, forest damage in the areas harvested with legal permits was reduced to 8 percent nationally and 6 percent in certified FSC concessions. (Since 2006, the logging permits of three companies cover more than 2 Mha with FSC certification).

In 2013, according to the data presented in the NLUP, Version 0, logging concessions covered almost 15.1 Mha. The CFAD concessions accounted for approximately 8 Mha (53 percent), 5.2 Mha (35 percent) fell under the CPAET category, while “non-managed” permits including Associated Forestry Permits (PFA), Temporary Logging Permits (PTE) and Industrial Permits (PI) accounted for 525,000 ha (3.5 percent).

In 2002, Gabon created 13 national parks (Act No. 003/2007 on National Parks<sup>26</sup>), setting aside 11 percent of the country's land area. At the same time, 1.3 Mha of logging concessions were cancelled.

In November 2009, the Council of Ministers strengthened the provision of Law 16/01 of the Forest Code, imposing restrictions on whole log export and requiring operators to transform timber in country. This resulted in decreased production of logs to 1.5 million cubic meters (Table 5) and a reduction of GHG emissions of approximately 11.5 million tC=2 /year, or 69.15 million tCO<sub>2</sub> over six years (World Bank, March 2017).

**Table 5. Evolution of the Production of Logs; Source: MEF**

Production (Millions de m3)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Grumes	3.220	3.433	3.169	2.666	1.841	1.590	1.221	1.613	1.625	1.450

**EGSP:** The EGSP outlines numerous objectives for reform of the forestry sector, including: (1) reform of the forest code with a focus on sustainable development targets, prohibition of tree-bark exportation, and development of more rigorous guidelines governing National Park and Protected Area preservation; and, (2) supporting companies that hold logging permits with the development and implementation of their

<sup>25</sup> A second updated, revised version of Gabon's Forest Code began in 2015, and is currently in the process of validation.

<sup>26</sup> Office of the President of the Republic. Act No. 003/2007 on the National Parks. Libreville, Gabonese Republic, August 2007, 10 pp

management plans – an AFD-funded program, Support Projects to Develop Small-Scale Forestry Permits in Gabon (French abbreviation PAPPFG), has been initiated for this purpose.

*FLEGT*: In 2009, Gabon began to negotiate a Voluntary Partnership Agreement (APV) related to Forest Law Enforcement, Governance and Trade Applications with the European Union. A technical Committee, composed of both government and civil society members, was established (CTC-FLEGT) to discuss the topics related to forest governance and law enforcement and provide a roadmap to negotiations to the Ministry. The APV underscores Gabon's commitment to halt illegal logging and associated corruption, which put the countries sustainable development and climate change mitigation commitments at risk. It is believed the Gabon-EU negotiation process will result in the establishment of a strong and transparent system to verify timber supply chains, legality, and sustainability.

*CAF*: The Forest Management Control (CAF) project (2016-2019) was recently initiated to ensure observance of all laws and regulations that govern logging permit awards.

*Community Forestry*: Gabon has recently initiated a process to promote and recognize community forestry. Thirty-eight villages have signed an agreement with the MFEPRN to obtain community forestry permits/tenure. Twelve of these villages have submitted and approved simple forestry management plans. Community forests currently average approximately 8,000 to 10,000 ha per village (Pers. comm. Hervé Charles, MFEPRN – December 2016).

### **Driver 3 – Extraction of Fuelwood:**

In rural areas, the use of deadwood by local populations for subsistence purposes is a legal customary usage right (Chapter VI of the Forest Code).

Laws governing the commercial production of charcoal are limited to a clause in the Environmental Code which stipulates that the production of charcoal must be preceded by an environmental impact assessment (PR-MRSEPN, 1979)<sup>27</sup>. This regulation is not currently enforced as it is incompatible with the current artisanal character and limited scale of this activity in Gabon.

With the exception of the 2001 Forest Code, which regulates extractions of timber from forests, no national program explicitly seeks to reduce fuelwood production and use in Gabon. Because this activity is not considered a significant driver of deforestation and degradation, it is not included in the National Investment Framework Theory of Change aimed at sustainable low-carbon development. Should the situation change, fuel wood production becomes a significant emissions source in the future, the NNRFOS will be able to detect this activity when fully operational.

### **Driver 4 – Extension of Infrastructure:**

Within the “Industrial Gabon” pillar, the EGSP outlines a policy to diversify the country's economic portfolio by developing the mining sector. While the expansion of mining could result in increased deforestation Gabon's NLUP process will minimize the impacts of infrastructure development.

The Environmental Code already requires that mining projects conduct an environmental impact assessment before beginning operations. In 2012, Gabon also created a National Infrastructure Master Plan (SDNI) (PR, 2012) that defines a strategy for establishing national guidelines *that are “respectful of both the State's environmental commitments and respond to the economic development objectives” (Ibid)*. The EGSP requires a review of the Mining Code, placing an emphasis on the importance of ensuring local processing of mineral resources, observance of high environmental standards and controls, and respect of human and local community rights.

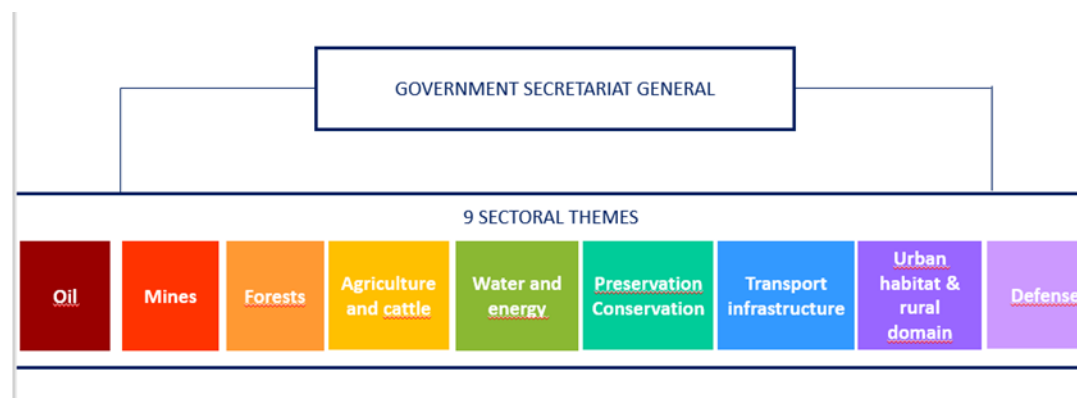
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<sup>27</sup> Office of the President of the Republic – Ministry of Scientific Research, Environment and Protection of Nature. Decree No. 39/PR-MRSEPN, relating to the classification of industries and the determination of the factors to be considered in the assessment of pollution. Libreville, Gabonese Republic, January 1979. 21 pp

## Driver 5. Land governance and land planning

In October 2011, the “Secrétaire Général du Gouvernement” (General Secretary of the Government, the senior public servant in the Prime Minister’s office, responsible for cross government coordination) convened the first inter-ministerial meeting on national land use in Gabon.

Two months later, a first compilation of existing land allocation data across the country’s major sectors was completed and presented to the President of the Republic. This exercise allowed the Government to: (1) account for how its land and water resources were allocated across different uses; (2) identify potentially conflicting land allocations; and, (3) begin the process of envisioning how resources might be more optimally allocated to achieve national development and climate change objectives. This process raised general awareness of the technical, legal and political complexities that would need to be addressed in comprehensive national spatial planning.



**FIGURE 11 – NINE SECTORAL THEMES IDENTIFIED IN THE CONTEXT OF THE NLUP (PR, 2015)**

To launch this phase of activities, the Inter-Ministerial Committee was subdivided into a Technical Committee charged with geographical and cartographic aspects, and a Legal Committee, responsible for legal issues related to land use (see Table 6 for the composition and objective of these committees). The work of the committees began in July 2013.

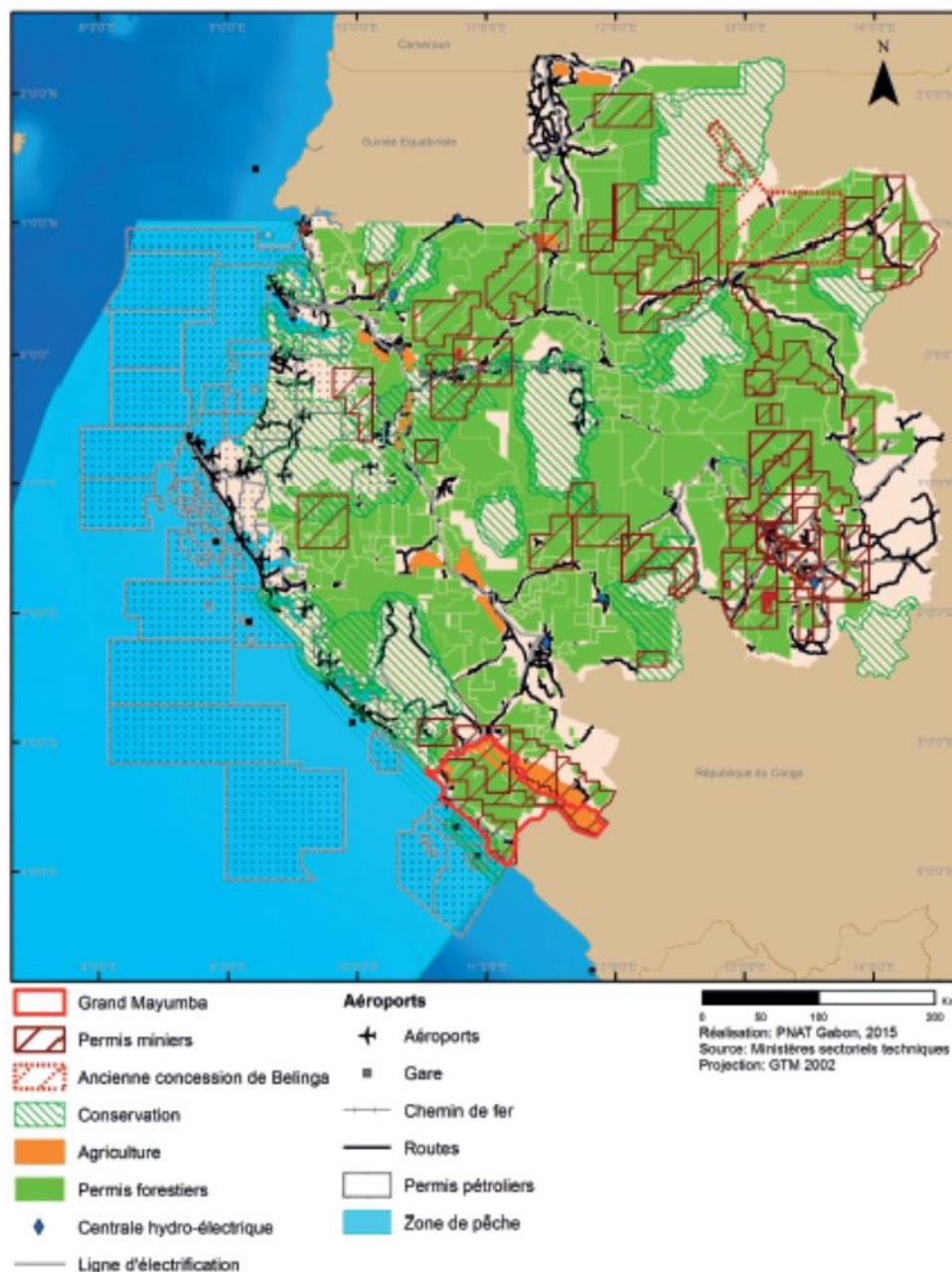
**Table 6 - Composition and Objectives of the Technical Committee and national Legal Committee (PR, 2015)**

	TECHNICAL COMMITTEE	LEGAL COMMITTEE
Goals	Organize all types of land use planning included in the NLUP List all associated permits or geographical data	Organize all legal texts related to land use planning Produce a draft decree
Composition	President: expert in charge of the technical team Members: an expert from each ministry	President: a jurist from SGG Members: a jurist from each ministry

The technical coordination for the development of the NLUP V0 was entrusted to the NCC. Several ministerial departments and government agencies were involved in the implementation of the NLUP, notably through the provision of data and participation in technical exchanges on the various data and information provided.

The main technical product of the first phase was PNAT 0, which was composed of a database and technical document synthesizing the state of knowledge of existing land use across Gabon (Supplementary Material b). The PNAT 0 serves as the point of departure for future gap analysis and strategic, legal and technical discussion among stakeholders – such as identifying territorial land allocations by sector to pinpoint cases of overlapping land allocation (Figure 12). To coordinate this phase, a National Land Use Planning Commission was created by the Prime Minister on 22 November 2012 (Arrete 9660/PM).





**FIGURE 12 - LAND ALLOCATION AMONG DIFFERENT SECTORS IN GABON (PR, 2015)**

The PSGE "Flagship Program - Strategic Planning and Spatial Planning" deems the NLUP as one of the essential steps for the establishment of a new model of sustainable development. The NCP justifies the development of the NLUP as a cross-sectoral "climate action" that will contribute to the reduction of GHG emissions and fulfill commitments made by Gabon in its NDC. Finally, the GGOP (2016-2020) calls the NLUP an essential step for sustainable development of the territory.

Through its initial experiences with land-use planning, the GoG realized that to successfully complete the process would require additional resources and partners - the majority of these needs are being realized by the Gabon-CAFI partnership.

**Assessment of environmental and social issues and Environmental and Social Management Framework (ESMF):** A risk assessment that addresses the political, environmental and social risks



associated with the implementation of Gabon's Low Emission Development Strategy, and more specifically, the successful implementation of the NIF and RPP activities is provided below.

Specific plans to ensure prior and informed stakeholder consent and consensus building have been outlined as part of the NLUP program implementation plan (Component 1 and Component 2c). Furthermore, as outlined in Component 1, *Article 5* of the sustainable development law specifically addresses the country's Environmental and Social Management Framework by requiring that Social and Environmental Assessments be completed prior to implementation *of policies, programs, and projects complies sustainable development objectives.*

**Table 7. Assessment of Potential Risks Associated with the Implementation of Gabon's Emissions Minimization and Reduction Strategy**

GABON CAFI INVESTMENT PLAN RISK ASSESSMENT			Risk rating	Mitigation	Timing for Mitigation	Risk rating
	Risk components considered	Description	1- 4			after mitigation
1 - REALISM						
OPERATING ENVIRONMENT RISKS						
Country Risk						
	Politics & Governance	The Government of Gabon is deeply committed to Sustainable Development and has embarked on a high-level political and strategic sustainable and green development strategy.	1	No mitigation required.	N/A	1
	Recent country history, political stability tenets, quality of government and commitment of the government towards the project	Gabon is politically stable, though the Presidential election scheduled for 2016 could present project delays due to the engagement of Government officials into political campaigns.	1	No mitigation required. Technical teams will be hired and trained immediately as part of the "quick start" phase of the project to ensure field-based data collection continues on target irrespective of higher-level government priorities that may supersede these program objectives during the campaign and election period	N/A	1
	Clear government leadership and engagement in favor of the project	Several Ministers and Agencies are actively engaged in the development and implementation of the project and strong leadership will be taken directly by the General Secretary of the Government.	1	No mitigation required.	N/A	1
	Society	Rural poverty and historical marginalization from national conservation policy development coupled with limited access to information in much of the country could lead to conflictual situations with respect to land allocation decisions.	3	A critical component of the project, as designed, is dedicated to mitigating this potential risk – a full 1/4 of the program budget will be allocated to the design and implementation of strong communication and community integration strategies including the establishment of land-use planning consultation and information centers in each district. Additionally, the proposed participatory village mapping activities will importantly ensure that the existing needs and land-use practices of rural people are appropriately considered in the land-allocation decision process.	Throughout Project	1

		<i>Security</i>	Gabon has been a historically stable country and risk of insecurity is extremely low. Because it is an election year, the risk is slightly elevated relative to other years, however.	2	The "quick start" activities to be conducted during the election cycle have been designed to ensure that even if the political situation becomes tense or complex, technical activities (occurring predominately in the field and with the support of external technical experts) can be conducted on schedule.	Quick Start Phase	1
		<i>Civil Society Capacity</i>	Understanding of the implications of land use planning and forest monitoring and observation for Gabon to meet its development and needs are broadly understood by the larger, more well organized (and internationally supported) NGO's. Civil society has very limited financial, technical or human resource capacity to contribute to these efforts without additional technical and financial support.	2	Understanding of the implications of land use planning and forest monitoring and observation for Gabon to meet its development and needs are broadly understood by the larger, more well organized (and internationally supported) NGO's. Civil society has very limited financial, technical or human resource capacity to contribute to these efforts without additional technical and financial support.	Throughout Project	1
		<i>Systemic Fraud &amp; Corruption</i>	Fraud and corruption have been highlighted as an obvious risk throughout Africa. Gabon is no exception. Though the Government takes reform of these systems seriously and has demonstrated willingness to remove and even imprison government officials engaged in corruption, complete reform will not happen overnight.	3	A strict process of organizational and financial accountability will be established during the quick start phase of the project. The process of hiring and capacity building of program managers will be completed in collaboration with the CAFI steering committee and a strict code of conduct will be developed and adhered to, and audited by 3rd parties as appropriate. These steps and program oversight will limit corruption and fraud temptation.	Throughout Project	1
		<i>Economic Management</i>	Weak institutional capacity to manage and account for funds using internationally accepted verification and reporting standards could lead to difficulties with the economic management of program funds.	3	Due to the relatively low capacity and training opportunities for Gabon Nationals in internationally accepted financial management and reporting standards, it is expected that, at least during the "quick start" phase of the program, technical support and oversight will be provided by an internationally trained program manager. Key staff member will be trained and progressively incorporated into management oversight as the program evolves to ensure a progressive and results based handover of responsibility by the project end.	Throughout Project	1

PROJECT RISKS						
Design Risk						
	Technical Complexity	The entire project, from start to finish, requires a high degree of technical understanding of complex concepts and techniques for which current national capacity is limited. This represents a fundamental risk.	3	Within each project activity, technical support and capacity transfer has been integrated into the project concept. These capacity building and transfer aspects of the program have been specifically tailored to ensure that the expertise is delivered in a manner that promotes both timely product completion and progressive transfer of technology and side-by side technical transfer of skills to national staff - with the idea of achieving national technical competence within 5 years.	Throughout Project	1
	Complexity of the project	The Land Use Planning and Optimization component of this project requires the collection of multiple data layers the range cover a range of disciplines (social, environmental, climate, geological, agriculture, etc.) and these data must be integrated into decision making systems that are political, economic and legal in nature. Complexity, by definition, is inherent to all Land Use Planning processes.	4	While the number of overall activities developed in the CAFI investment plan appears high and complex, the integration of targeted technical support at each phase, coupled with the tailored and progressive capacity reinforcement and transfer components of this project should importantly mitigate this complexity risk. Further, the project seeks to employ a technically diverse (broadly trained) professional Project Coordinator to help navigate the inherent complexity of integrating multiple disciplines into a single project objective (scientific, legal, and political).	Throughout Project	1
	Geographic Dispersion	This project covers the entire territory of Gabon and entails collaboration and several scales (national, provincial, district, village).	2	The project has been designed to specifically address cross-scale dispersion risks through the development and integration of committees and representatives.	Throughout Project	1
	Design Flexibility	Though methodologies for land use planning and monitoring are widely available and broadly agreed upon in the academic community, the risk of attempting to apply methods that do not meet the context specific situation of Gabon could put the validity of the LUP process at risk.	2	All technical assistance provided by international experts will work hand-in hand with the Gabon National technical staff and the program steering committee to ensure all technical methods and communication and outreach activities are flexibly designed to ensure contextual appropriateness while simultaneously meeting the most rigorous standards.	Throughout Project	1

		<i>Arrangement Complexity</i>	The multi-ministerial and multi-disciplinary nature of this program represents inherent organizational complexity risk that could, at times, slow down or hinder progress.	3	The creation of the multi-ministerial committee to oversee all activities defined within the CAFI Investment strategy and development of clear organizational structure and terms of reference mitigates the risk of organizational complexity.	Throughout Project	1
<b>2 - USE OF THE COUNTRY'S SYSTEMS</b>							
	<b>STAKEHOLDER RISKS FOR THE OPERATION</b>						
	<b>Stakeholder Risk</b>						
		<i>Donor Relations</i>	The multiplicity of potential and engaged donor organizations with sometimes disparate institutional objectives represents a risk that inadequate coordination or communication among funding agencies and Gabon could result in strained relationships or a breakdown between Gabon and donor organizations.	3	The complexity of coordinating multiple sources of technical and financial support has been acknowledged by all parties engaged in this CAFI initiative. The creation of the CAFI Secretariat and Board of Directors coupled with the direct lines of feedback between CAFI and Gabon should mitigate this risk. Further, the development of complimentary programs to the CAFI investment plan during the "quick start" phase of the program will further foster multi-lateral collaboration, coordination and communication.	Throughout Project	1
		<i>Multi-Ministerial Relations</i>	Several government Ministries, Agencies, Committees and Councils will be actively involved in the implementation of the CAFI Investment Plan. Inter-institutional jealousy or priority disagreements could result in the breakdown of relations among partners and result in project delays and implementation risks.	2	The creation of the multi-ministerial committee to oversee all activities defined within the CAFI Investment strategy and development of clear organizational structure and terms of reference mitigates the risk of organizational complexity.	Throughout Project	1

OPERATING ENVIRONMENT RISKS						
Technical risk						
		Teams: enough people for the size of the technical and financial management components	The multiple activity and ambitious program defined within the CAFI Investment Plan represents a significant human resources capacity risk, the number of people and teams required to ensure the information is collected systematically, entered into appropriate data management systems, analyzed, and reported across a range of disciplines with be high and costly and complex to hire and coordinate. There is a risk that identifying and training a merit based recruited group of national and international human resources to implement the activities will be prohibitively complex and expensive.	2	Because Gabon has already engaged in the initial stage of the PNAT process (PNAT 0) and has strong existing relationships with international technical support staff, the risk of being able to identify appropriate technical competence is relatively low. Similarly, Gabon has invested heavily in national technical capacity building efforts at the University level and several competent national technical staff are already trained to implement the field-based NRI program and monitor basic forest characteristics and patterns of change from space. NGO partnerships with WRI and other actors have historically (and will continue) to reinforce the LUP and Monitoring activities. All required additional workforce will be identified and hired on a verified "merit and experience base" system.	1
		Team members - verified competences	The evaluation of competences for such a large human resource base represents a huge undertaking and will require specialists with knowledge of the value of qualifications presented in CVs. A risk of inadequate recruitment exists.	2	The program Coordinator will be charged with ensuring appropriate specialists are identified and consulted during the hiring process to ensure TORs clearly state the required core competencies for each position and that experts capable of ensuring the best candidates to fill the positions review CVs are hired.	1
3 - PREPARATION FOR PROCUREMENT						
OPERATING ENVIRONMENT RISKS						
Institutional Risk (Sector / Multi-Sector Level)						
		Ownership	The CAFI Investment Plan was envisioned and written entirely by Gabon National leaders with consultation and with multiple Ministers and Agency Directors. Risk of lack of country ownership of this program is extremely low.	0-1	No Mitigation required	0-1
		Accountability & Oversight	Lack of well developed Terms of Reference with clear attribution of responsibilities among actors could result in a situation in which activities lack supervision and individual actors accountability. This represents significant risk of not achieving desired outputs.	2	As described in figure 4.2, cross institutional arrangements have been defined and a dedicated multi-ministerial program oversight committee will be established prior to program implementation. The CAFI program Coordinator will also serve to ensure accountability and oversight of all activities and financial management.	1

		<i>Institutional Capacity</i>	Existing Institutional Capacity to implement activities as outlined in the NIP is weak, which represents a significant program risk.	3	Within each project activity, technical support and capacity transfer has been integrated into the project concept. These capacity building and transfer aspects of the program have been specifically tailored to ensure that the expertise is delivered in a manner that promotes both timely product completion and progressive transfer of technology and side-by side technical transfer of skills to national staff - with the idea of achieving national technical competence within 5 years.	Throughout Project	1
		<i>Institutional Fraud &amp; Corruption</i>	Lack of institutional capacity, undefined responsibility chains and lack of project management and implementation protocols that meet international standards represent significant opportunities for institutional fraud or corruption to occur during project implementation.	3	A strict process of organizational and financial accountability will be established during the quick start phase of the project. The process of hiring and capacity building of program managers will be completed in collaboration with the CAFI steering committee and a strict code of conduct will be developed and adhered to, and audited by 3rd parties as appropriate. These steps and program oversight will limit corruption and fraud temptation.	Throughout Project	1
		<i>Decision Making</i>	The CAFI Investment Plan was designed by high-level Gabon national officials with legal mandate to make decisions. Lack of decision-making mandate is of little to no risk to project success.	0-1	No mitigation required	N/A	0-1
		<i>Policy</i>	All outcomes, outputs and activities defined within the CAFI Investment Plan are integrally linked with the Gabon National Development Strategy and national policy development. Outputs will directly impact Gabon national policy.	0-1	No mitigation required	N/A	0-1



## 2c. [REDD-plus] Implementation Framework – see Box 1

### Standard 2c the R-PP text needs to meet for this component: REDD-plus implementation framework:

Describes activities (and optionally provides ToR in an annex) and a work plan to further elaborate institutional arrangements and issues relevant to REDD-plus in the country setting. Identifies key issues involved in REDD-plus implementation, and explores potential arrangements to address them; offers a work plan that seems likely to allow their full evaluation and adequate incorporation into the eventual Readiness Package. Key issues are likely to include: assessing land ownership and carbon rights for potential REDD-plus strategy activities and lands; addressing key governance concerns related to REDD-plus; and institutional arrangements needed to engage in and track REDD-plus activities and transactions.

### Gabon's vision for low emissions sustainable development within the international REDD+ context

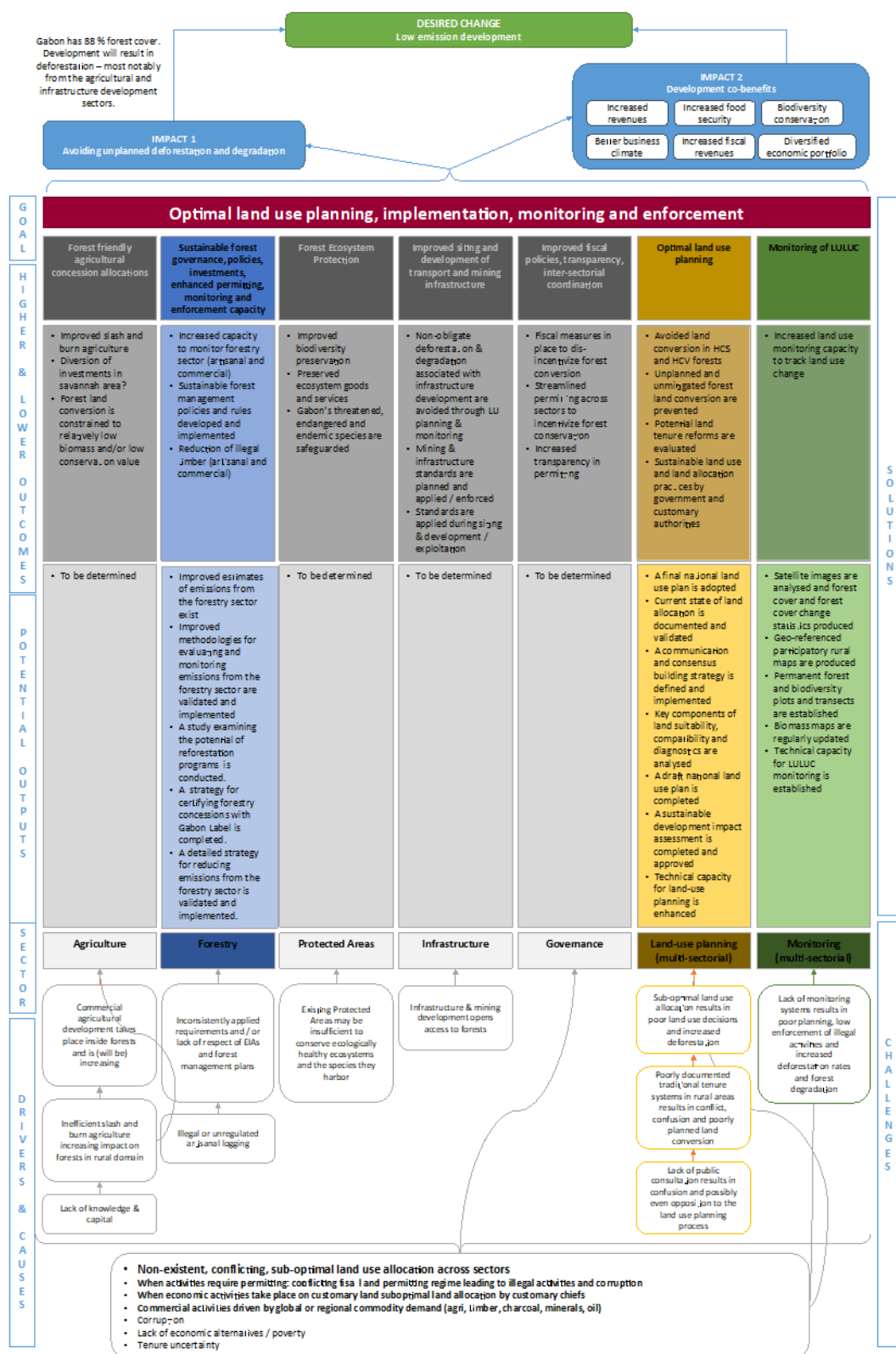
Each of the policy initiatives described above reflects Gabon's commitment to design and implement a national development plan based on **a holistic, multi-sectoral approach that incorporates a commitment to protect forests and achieve socio-economic development goals**. Gabon believes this vision can and must be attained through the implementation of a low emissions development framework that includes national policy reforms, measures to address drivers of deforestation and forest degradation, optimization of land allocation and ambitious conservation goals.

Specifically, if the related goals of economic expansion, poverty reduction, food security, biodiversity conservation, and climate change mitigation are to be achieved, Gabon will require:

1. Enhanced, spatially explicit understanding of how natural resources might be more optimally distributed, and a coordinated process for determining land allocation among various stakeholders;
2. A long-term monitoring program to evaluate the impacts of various development decisions on Gabon's forests (cover, diversity, ecological health, and carbon sequestration potential) and to facilitate transparent reporting and communication with national and international partner institutions (including the UNFCCC);
3. The ability to respond to and rectify any deviations from the NLUP resulting from illegal or unplanned activities and to monitor changes in forest cover and dynamics due to land-use planning decisions;
4. The ability to reduce emissions from the forestry sector while growing the contribution of logging to the national economy through improved forestry practices.

Figure 13 illustrates linkages between Gabon's low emissions development policy framework and specific emission minimization and reduced emissions outcomes. The framework was first outlined within the NCP, and then expanded as part of Gabon's National Investment Framework (NIF). The framework addresses the anticipated drivers and causes of future deforestation, which will go hand-in-hand with the economic diversification and sectorial development activities. Coloured sections illustrate where activities defined within the CAFI program (brown and green) and this R-PP (blue) fit into the Theory of Change Framework. Taken together, the diagram broadly equates to what the R-PP framework refers to as a REDD+ strategy.

Higher order impacts expected to result from the implementation of the NIF and RPP programs are outlined in Table 7.



**FIGURE 13. LINKAGES BETWEEN THE EGSP AND THE NIF & R-PP WITHIN THE CONTEXT OF THE THEORY OF CHANGE**

**Table 7. Higher-order Impact Indicators of Gabon's National Investment and R-PP Framework**

Impact 1: Minimization of greenhouse gas emissions related to deforestation and forest degradation and increase in carbon storage in biomass				
Impact indicator (5 years)	Reference point	Objective after 5 years	Means of verification	Assumptions
Emissions limited and absorption increased in the LULUCF sector	Emissions from the year 2005 and trend scenario of Gabon's NDC (PR, 2015b)	Reduction in emissions from the LULUCF sector at the 2025 horizon (PR, 2015b)	Data from the NNRFOS and updated biennial UNFCCC reports	<ul style="list-style-type: none"> <li>Funding for the benefit of conservation and sustainable management of the forests continues and increases and has a real impact on the ground</li> <li>Expansion of agriculture and mining developments avoid as far as possible deforestation of high carbon stock areas</li> <li>Optimum inter-ministry coordination makes it possible to resolve conflicts and to finalize an NLUP incorporating the objectives of low-emission development</li> </ul>
Impact 2: Development co-benefits				
Impact indicator	Reference point	Objectives after 5 years	Means of verification	Assumptions
Reduction in the proportion of food products imported relative to national production (increased food security)	Import of 280 billion CFA francs of food products in 2012 (PR, 2016)	At least X percent* increase in national agricultural production of foodstuffs and Y percent* reduction in imports <i>* Objectives to be set by the NCC after thorough discussion</i>	National agricultural production statistics (MAEPSA)	<ul style="list-style-type: none"> <li>Current and future projects of support to agricultural production of foodstuffs give positive results</li> <li>National agricultural product prices are competitive on the national market relative to imported products</li> <li>A sufficient number of agricultural entrepreneurs is committed to developing production for the national market and receives sufficient support</li> </ul>
Poverty rate reduced	Around 30 percent of the population lives below the poverty line in 2013	Reduction of X percent* in the poverty rate <i>* Objectives to be set by the NCC after thorough discussion</i>	Survey of the poverty rate, World Bank data	<ul style="list-style-type: none"> <li>Production and prices of oil stabilize at a level favorable to the Gabonese economy</li> <li>Diversification of the economy gives positive results in terms of jobs and increased income for the population</li> <li>The poor rural population benefits from new opportunities related to agricultural expansion, forestry and the development of the mining sector</li> </ul>

To fully realize and implement the activities to meet the outcomes outlined in the Theory of Change, extensive consultations with all levels of government and with local communities will be vital. Therefore, the NIF processes as well as additional activities outlined in the R-PP are designed to be publicly accessible. Significant effort will be taken to ensure that all stakeholders have access to information and mechanisms to provide input throughout the decision process. Protocols are defined below and will be further developed during the first year of program implementation.

Here, we broadly define the specific activities Gabon will implement within the next 5 years as a means of achieving three primary outcomes.

**Outcome 1: Completion and implementation of a National Land Use Plan** will result in minimized emissions from new development activities.

**Outcome 2: Completion of the National Natural Resources and Forestry Observation System** will enable Gabon to both monitor the impacts of the NLUP and meet Tier 3 monitoring standards for GHG emissions/removals in the LULUCF sector.

**Outcome 3: Completion of activities to improve estimates of emissions estimates from degradation and upgrade forestry practices at a national scale** will result in reduced emissions from the forestry sector.

Timelines, budgets, outputs and monitoring framework information is provided in Component 5 and 6 of this document.

## **Avoiding or minimizing future emissions from development through a National Land Use Planning Process**

### **Outcome 1: Completion and implementation of a National Land Use Plan**

#### **National Land Use Planning**

The Government of Gabon recognizes land and water use and planning as fundamental, transversal elements of its national development. Land and water resource planning is also essential to promoting wise stewardship of global goods such as carbon and biodiversity. A substantial number of activities outlined in the PSGE and NCP are based on the careful planning and judicious use of land and water resources through the completion and adoption of a NLUP. These frameworks and the current state of the NLUP planning process have been described in previous sections of this document. The following activities are included in the Gabon-CAFI partnership and remain to be completed or are in the early stages of implementation.

#### **→ Distribution of NLUP V0 to participating parties**

The NLUP V0 is a document and a database (freely accessible interactive<sup>28</sup> web platform), with a cartographic focus, summarizing the state of knowledge of current land allocation in Gabon. The 244-page document is organized in six parts containing numerous maps and legal analyses: (i) Context, (ii) Presentation of Current Land Use and Allocation in Gabon, (iii) Legal Presentation of Land Use in Gabon, (iv) Presentation of cases of land-use overlap, (v) Identification of land-use conflicts, (vi) Summary of overlaps.

AGEOS is using the NLUP V0 for multi-level and multi-stakeholder discussions, including with relevant ministries and sectoral agencies.

#### **→ Implementation of CRRNATs and CPRRNATs**

The CRRNAT and CPRRNAT have been previously described in the institutional framework components of this R-PP. The establishment of the commissions and implementation of their activities will be completed during the very early stages of the LUP process (see Activities calendar, Component 5).

#### **→ Resolution of Land Use Conflicts and Validation of NLUP V1**

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<sup>28</sup> Cf. <http://www.pnatgabon.ga>

An important step in the NLUP process is to resolve land-use conflicts (e.g., areas where mutually exclusive land titles have been issued by various Ministries). This activity focuses on overlapping land-use allocations and the determination of the activities that are compatible within different zones.

Five high-level workshops are being organized to facilitate this process, with the involvement of representatives from each of the CRRNAT Ministries and legal and technical advisors. These workshops will define the legal issues that must be resolved to validate the NLUP V1 and propose legally-appropriate solutions to land-use conflicts.

These solutions will be approved by the CRRNAT and CPRRNATs at a national validation workshop. The conference will adopt the NLUP V1, which will present the state of Gabon's land-use after the resolution of land-use disputes.

#### → Establishment of a Mapping and Data Management Unit within AGEOS

The development of the NLUP requires a high level of organization and technical expertise, particularly in the storage, management, analysis and production of spatial data. AGEOS will host a Data Management Unit to create (or guide the creation) of the main data layers required by the NAP, as well as ensure the safe management of spatial data and related non-spatial data.

The Data Management Unit will identify key information needs, generate or acquire information, and ensure the application of best practices in data evaluation, documentation, storage and good management.

The Data Management Unit will be responsible for the preparation of land-use maps upstream and downstream of the resolution of disputes relating to land allocation (see activity 1.3 above), the production of thematic maps, and the integration of new information into the NLUP.

The Data Management Unit will be supervised by an AGEOS engineer and consist of a national database manager, GIS expert and two national GIS technicians, and a land-use planning advisor. Legal counsel will support the Units' work.

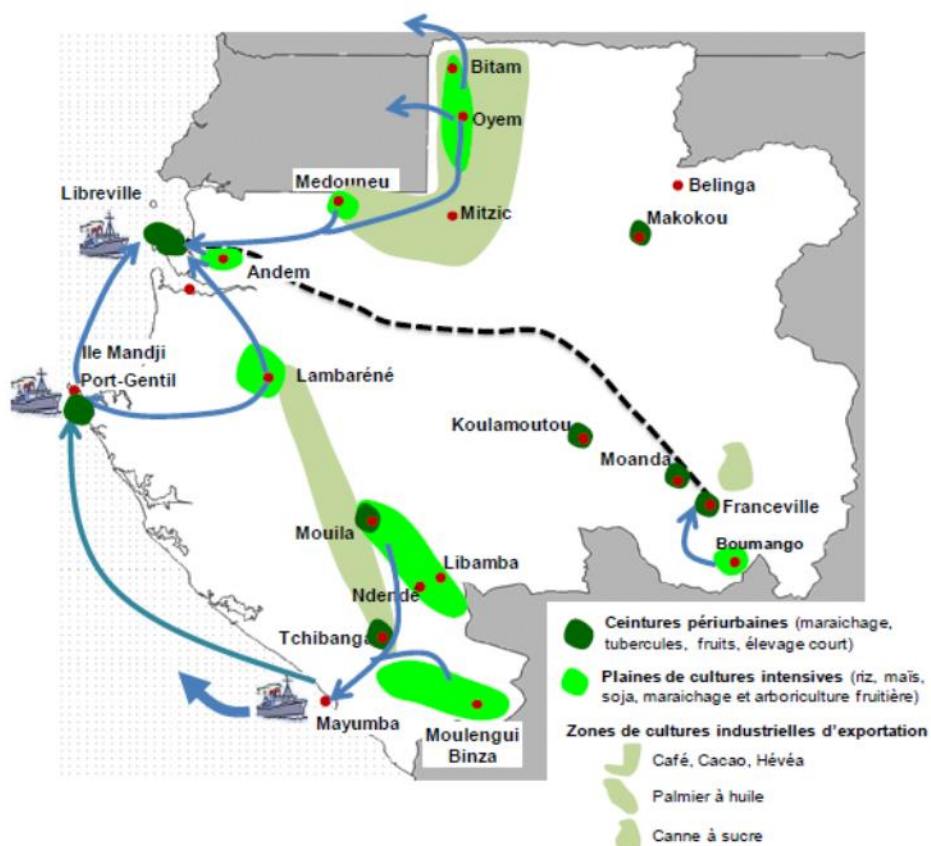
#### → Consultation with provincial and departmental level agencies

We have previously described how stakeholder consultation is envisioned. Here we underscore the importance of this process to Gabon and highlight the stage of the NLUP process in which these consultations will begin in the activity calendar and budget provided in Component 5. Several steps were included in the CAFI-Gabon NIF to ensure public engagement. (1) The development of a communication and consultation strategy and plan, formulated by an international consultant. The consultant will work with the CRRNAT Technical Committee to make certain implementation is context-appropriate, consensus building, and inclusive. (2) The establishment of consultation and information centers on land-use planning in each of the 48 departmental prefectures. The 48 centers will be manned with an extension officer trained in land-use planning who will interact with the population, local sectoral agencies and economic stakeholders. (3) Regular interface between extension agents and the Libreville-based offices through the hiring of local communication experts responsible for information exchange among partners and stakeholders. Specifically, the communication experts will work with the departmental extension agents, the local authorities and the CPRRNATs to organize annual departmental and provincial meetings and workshops involving local populations (notably the Chiefs of Cantons), civil society, relevant economic operators and representatives of the main sectoral agencies. See Component 1 for further details.

#### → Provision of key information for NLUP V2

Seven priority activities are described below that will provide information necessary for the development of NLUP V2.

## 1. Mapping the agricultural potential of land



**FIGURE 14. TARGET MAP FOR AGRICULTURE IN GABON UP TO 2025 (PR, 2012)**

The agricultural suitability of land has been studied only at six sites in Gabon during the 1970s. The only existing soil map is, therefore, out-of-date and derived from too little data for current needs. The PSGE has developed a potential zoning system for peri-urban agriculture, intensive subsistence agriculture, and industrially agriculture (Figure 33). However, agricultural suitability of the soil was not incorporated in this draft zoning; thus, the PSGE and the PGV are collecting and analyzing new data to ensure an appropriate zoning.

Through the Gabon-OLAM partnership, studies on agricultural suitability have been carried out for the cultivation of oil palm, including assessing the potential productivity of crops based on factors such as temperature, precipitation, altitude, topography, soil texture, and pH. The methodology used for oil palm can be applied to other potential crops, such as rubber, coffee, cocoa and sugar cane.

The methodology is based on three types of analysis:

- Remote sensing: data on geology, topography, flooding, radiometric signals and isotopic compositions of the upper soil strata will identify soil mineral composition and physical accessibility of land;
- Terrain: soil samples will be taken to validate the remote sensing information and to precisely identify soil in certain zones;
- Laboratory: soil samples will be analyzed in a soils laboratory.

This activity will lead to the development of an agriculture suitability map.

## *2. Modeling the impacts of climate change on land use*

Various recent international projects highlight the importance of modeling climate change and its potential impacts in Central Africa. The German Federal Ministry for the Environment financed a comprehensive assessment of climate change in the Congo Basin (HAENSLER et al., 2013<sup>29</sup>). More recently, the Congo Basin Forests and Climate Change Adaptation (CoFCCA) project carried out a first attempt to model climate in the region using the Climate Model for Impacts Studies (PRECIS)<sup>30</sup>. These projects have improved knowledge on climate change in Central Africa (temperatures, rainfall, etc.) and its impacts (hydrology, vegetation, etc.), but the results are too coarse spatially and temporally to clarify how Gabon will be affected by climate change.

Thus, additional scientific information and predictive models of future climate impacts are necessary to inform policy decisions.

An international consultant specialized in climate change will evaluate existing models to identify and map the areas most vulnerable to the impacts of climate change in the medium term. The consultant will also support Gabonese authorities in assessing the risks and impacts of climate change in the longer term.

## *3. Village mapping of rural land use and tenure*

The village mapping exercise will serve as both as a data layer for the NLUP and a process by which village engagement, consulting and consensus will be achieved. This activity has been previously described, thus we briefly summarize activities below.

According to NLUP V0, Gabon has 2,589 villages, most of which lie along roads. Many villages are in concessions or protected areas: 643 villages lie within different types of forestry licenses, but only 64 villages benefit from an established and demarcated agricultural series that recognizes their customary rights. 454 villages lie within area allocated to mining licenses (exploration and exploitation), and 555 villages are in protected areas (mostly in Ramsar sites, with 34 located in national parks or their buffer zones). In the absence of formal land titles or maps representing their areas of activity, rural communities generally cannot claim rights to the land and natural resources surrounding their villages.

Although Gabon is highly urbanized, most Gabonese maintain close ties with their rural families and land. There is, however, little information to characterize land use and tenure in rural areas, let alone to plan future use of land. To improve land tenure, village outlines (dwellings, cleared areas, etc.) are currently being mapped from high-resolution satellite images (SPOT and / or Sentinel) and data are being collected to assess the impacts of industry (forestry, agriculture, protected areas, activities by NGOs, etc.) on villages<sup>31</sup>. Participatory rural mapping activities will be conducted to gather detailed information on village-scale land use practices, following methodologies employed by the Buffer Zone Project in Congo<sup>32</sup>.

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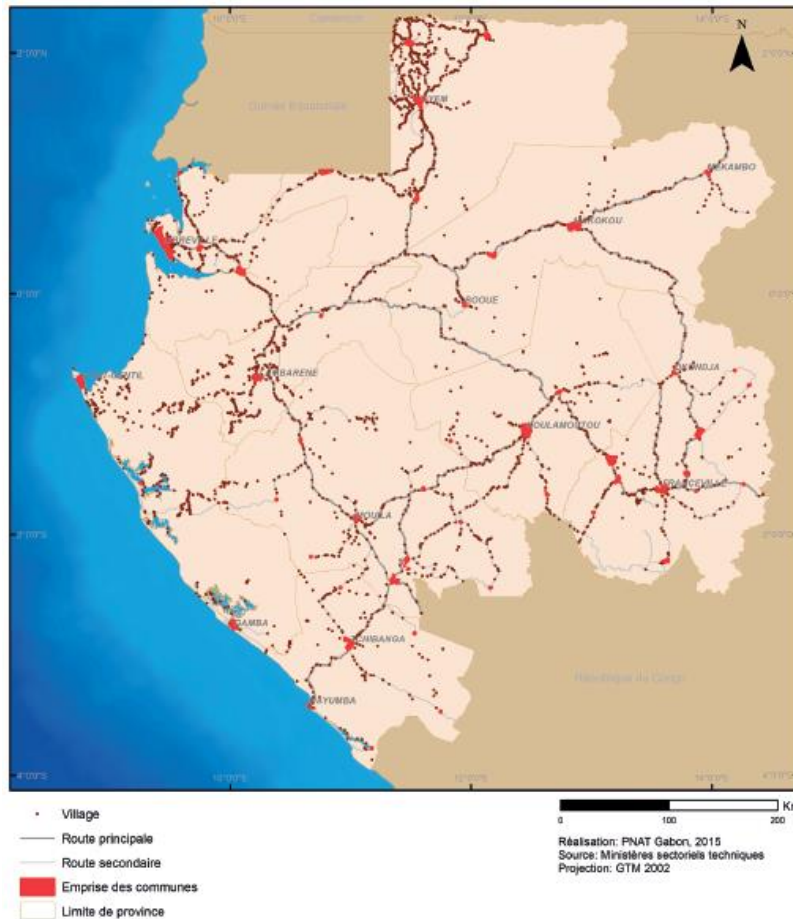
<sup>29</sup> HAENSLER A., JACOB D., KABAT P., LUDWIG F. Climate Change Scenarios for the Congo Basin. Hamburg - Climate Service Centre, 2013. 210p

<sup>30</sup> Cf. <http://www.climateplanning.org/tools/providing-regional-climates-impact-studies-precis>

<sup>31</sup> These data are being collected from logging companies – which are required to establish village series within their concessions.

<sup>32</sup> CLARK C.J. and POULSEN J.R. 2012. Tropical Forest Conservation and Industry Partnership: An Experience from the Congo Basin. Chichester – Wildlife Conservation Society, mars 2012. 259p





**FIGURE 15. MAP OF VILLAGES AND**

#### **AGGLOMERATIONS OF GABON (FOR, 2015)**

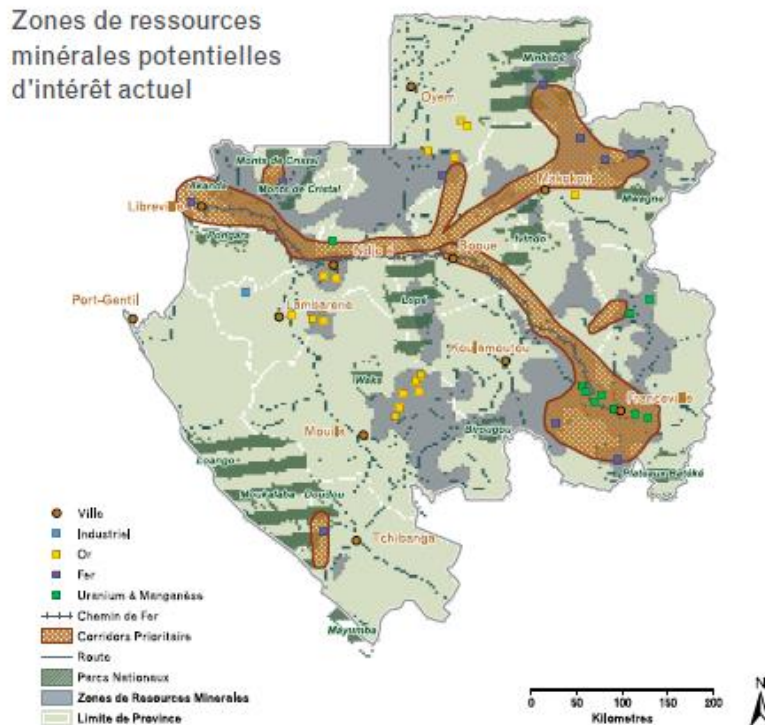
##### *4. Mapping of hydrocarbon and mineral deposits and potential for development*

Gabon's forest is well preserved because of its past economic dependence on hydrocarbon and mineral deposits. The identification and mapping of these non-renewable resources are of great importance for land-use planning that limits impacts on forests.

A considerable amount of data has been gathered on oil and natural gas deposits in the coastal sedimentary basin of Gabon. In 2009, the European Development Fund (EDF) funded the completion of the third edition of the Geological Map and Mineral Resources of the Gabonese Republic to the 1/1,000,000th.

The first step in carrying out this activity is to clarify and improve the map of mineral resources (Figure 35).

A second step is to model spatialized scenarios of minerals and hydrocarbon exploitation, including oil, gas, gold, chromium, diamonds, manganese, rare metals, uranium, iron, potash, among others. For each hydrocarbon and mineral, two to three scenarios will be developed by incorporating international demand, national context (legal, fiscal, etc.) and logistical requirements (transport infrastructure and accessibility of the deposits).



**FIGURE 16. MAP OF POTENTIAL MINERAL RESOURCES OF CURRENT INTEREST (PR, 2012)**

##### *5. Economic analysis of the sustainable extraction of natural resources*

The GGOP presents Gabon's strategy for diversifying the pillars of growth based on the exploitation and management of natural resources and land. A robust economic analysis of the sustainability of renewable resources and land, its production, use and renewal, needs to be conducted.

Little explicit spatial and temporal economic information is available for renewable resource sectors, such as logging, agriculture or management of flora and fauna. An international consultant, with an expertise in natural resource econometrics, will conduct studies and analyses to provide an economic analysis containing comparative data, analyses and scenarios to support planned decision-making.

##### *6. Botanical surveys by the national herbarium to refine the national analysis of lands with high conservation value*

The NLUP decision-making process requires spatialized environmental data to minimize the adverse impacts of certain types of land use (agriculture, mining, etc.). The botanical survey will benefit from the data collected by the NNRFOS (see Component 4), that will be used for several purposes, including:

- Identification of potential HVC and HSC forests outside of protected areas;
- Streamlining the granting of logging permits to meet timber production targets;
- Facilitation of the follow-up and evaluation of the implementation of the NLUP.

Further details of this activity are provided in Component 4 because data collection will be integrated into the NNRFOS.

7. Address the fundamental gaps in knowledge of climate<sup>33</sup> by establishing a *network of national meteorological monitoring stations*

A network of at least 20 permanent weather stations in Gabon will be established under the CAFI-Gabon partnership. These will be installed in the national parks and in other strategic sites covering the entire territory. Stations will provide data to be used for climate modeling using the models included in the fifth IPCC (GIEC) report, including the National Center for Atmospheric Research (NCAR)<sup>34</sup> Community Earth System Model (CESM).

➔ Support of analysis and decision-making for the development of NLUP V2

A crucial step in decision-making is to gather all the technical, scientific and input information from consultations and use them to generate and evaluate land-use scenarios. Multiple scenarios can be compared to provide decision-makers with an understanding of the advantages and disadvantages of their decisions. Spatial measurements and optimization techniques (using Marxan<sup>35</sup> software) have already been used effectively in Gabon, and other methods of multi-criteria analysis of decision support are being evaluated for the third phase of NLUP process.

Policy decisions on NLUP are being made based on multiple, diverse scenarios. This activity will lead to the establishment of a NLUP V2 by the CRRNATs, which will nevertheless be subject to an environmental and social impact assessment and to local and national consultations.

➔ Evaluation of the impact of sustainable development of the NLUP V2

The impact assessment component of the LUP process has been defined in previous components of this document and will be further highlighted in section 2d. Importantly, Gabon is committed to ensuring that the potentially negative environmental and social consequences of the NLUP V2 are acknowledged and mitigated through regulatory measures. The following laws underscore this principle:

- Law No. 016/1993, which lays down the principle of Environmental and Social Impact Assessment (EIES) and designates the Directorate General for the Protection of the Environment and Nature (DGPEN) as being responsible for the supervision of Procedures for EIES, the validation of EIES reports, and the review and approval of the Environmental and Social Management Plan (PGES);
- Law No. 002/2014, which lays down the principle of a Sustainable Development Impact Assessment (SIA or EIDD) to assess "the compliance of the implementation of policies, programs and projects with the principles and objectives of sustainable development". The law provides, *inter alia*, for mitigation or compensation measures where environmental, social, cultural and economic impacts exceed a sustainable development threshold (to be determined by regulation).

The EIES is not a separate activity, but an integral component of an overall NLUP planning process. The NLUP process contributes to data collection, whether social, environmental or economic, to be considered in decision-making.

Attention will be paid to impacts related to deforestation and forest degradation, particularly in terms of GHG emissions. The social considerations and co-benefits of development will likewise be studied and taken into consideration.

➔ Local and national consultations to finalize and validate NLUP VF<sup>36</sup>

Consultation processes being conducted as part of the NIF and R-PP have been defined in previous sections of the document. Here, we underscore the final step in the consultancy process, which will be conducted prior to the official adoption of a final NLUP.

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<sup>33</sup> From the second half of the 19th century until 1980, the meteorological observation network in Gabon had 97 stations (data archived by the National Meteorological Service (SNM)). However, since the 1980s, the number of meteorological stations in operation has decreased considerably; and in 2009, only three of these synoptic stations were operational (MALOBA MAKANGA, 2009).

<sup>34</sup> Cf. <http://www.cesm.ucar.edu/models/cesm1.0/pop2/>

<sup>35</sup> Cf. <http://marxan.net/>

<sup>36</sup> This activity is further defined in section 2d.

In the final year of the NLUP process, consultations will be conducted at the departmental, provincial and national levels to finalize and adopt the NLUP. These meetings will allow stakeholders to take stock of the completed work, to express their opinions, and to make revisions.

CRRNAT multidisciplinary teams will conduct validation workshops in each province. This activity will finalize the process of communication and local consultations initiated in previous years. To reach a wide public, both in civil society and the private sector, the teams will:

- Improve access to information on the NLUP;
- Communicate the technical, legal and political data incorporated in the NLUP V2;
- Facilitate access to NLUP databases via the Internet;
- Gather information on people's opinions of the NLUP.
- Identify potential disputes and ensure *ad hoc* resolution.

This activity will result in a ready-to-implement NLUP VF, which will be adopted into law.

➔ Capacity building for the establishment and strengthening of the Spatial Data Management Unit within AGEOS and the CRRNATs

Some of the above-mentioned activities require specific training for national staff, particularly the AGEOS database organization, data analysis and mapping.

On-the-job training is the most effective approach to strengthen the capacity of national agents. In some cases, international experts will be engaged to train national agents and assist in carrying out technical activities for developing the NLUP. Additional training in the form of workshops and conferences will be provided according to the needs of national staff.

**Outcome 2: Completion of the National Natural Resources and Forestry Observation System** will enable Gabon to both monitor the impacts of the NLUP and meet Tier 3 monitoring standards for GHG emissions/removals in the LULUCF sector.

Given the structure requirements of the R-PP template document, details of the activities initiated by Gabon to begin the establishment of the NNRFOs are provided in Component 4. Activities required to complete its development are included in the CAFI-Gabon partnership agreement. The activity calendar, budgets and monitoring and evaluation framework for this component of the NIF and R-PP framework are included in Components 5 and 6 of this document.

**Outcome 3: Completion of activities to improve emissions estimates from degradation and improve forestry practices at a national scale will result in reduced emissions from the forestry sector.**

### **Reduce emissions from the forestry sector**

Since 2001, Gabon has adopted an ambitious policy process to improve forest management and conserve the country's biodiversity and natural heritage. However, as outlined in Component 2a, and further detailed in Component 3, most of Gabon's current emissions stem from the forestry sector. There is great potential to reduce emissions by improving logging practices and controlling illegal logging.

Understanding the spatial extent and status of permitting (including multi-sectorial overlapping permits) is an initial step to securing the sustainable management of Gabon's forests and emission reductions from this sector. Furthermore, the NLUP will help define the boundaries of forestry operations and resolve land allocation conflicts. The clarity provided to the sector by the NLUP will also influence the FLEGT process and community forestry initiatives.

Though the land use planning and optimization initiatives described within Gabon's NIF and this RPP will minimize future emissions associated with economic diversification, additional work will be required to address the country's goal of reducing emissions from the forestry sector while simultaneously growing its contribution to the national economy<sup>37</sup>.

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<sup>37</sup> World Bank Group. 23 May 2016. Impact de la mesure d'interdiction d'exportation des grumes sur la forêt, l'industrie du bois et l'économie du Gabon, y compris identification d'options pour un programme d'appuis au développement économique du secteur industriel du bois.

To accomplish this, Gabon is requesting support from the FCPF to facilitate: (1) improving knowledge and estimates of current emission levels from forest degradation in logging concessions; (2) defining and implementing guidelines for improved forestry management, with an emphasis on carbon (RIL-C); (3) examining the potential of reforestation, plantations and stock enhancement programs; and (4) examining the potential of a national “label” programs to incentivize operators to implement RIL-C, or other best practice forestry guidelines. These activities are described in greater detail below.

### **Sub-Objective 1: Improve baseline emission calculations from forestry sector**

Gabon has initiated a robust and transparent national forest monitoring system that combines remote sensing and ground-based forest carbon inventory approaches to estimate anthropogenic forest-related greenhouse gas emissions and removals that can be monitored and validated at the UNFCCC level (NNRFOS; see Component 4). The NNRFOS will support forest law enforcement agencies in their task of monitoring and verifying forest management operations and identifying illegal logging operations. Specifically, the deforestation alert system that will be developed by the NNRFOS will inform law enforcement agencies in real time of any unplanned occurrence of deforestation, enabling them to respond. More generally, satellite surveillance of Gabon’s forests will serve as a deterrent to cheating, thereby promoting the implementation of best practices by forestry operators.

Even though the NNRFOS meets the country’s goal of monitoring land-use plan implementation and identifying un-planned deforestation events, **taken alone it is not sufficient to accurately estimate and monitor emissions from the forestry sector.**

The technical, financial and human resource challenges associated with calculating emissions from forest degradation --‘the second D’ -- are widely acknowledged (Pearson et al. 2014). Uncertainty in quantifying carbon loss from degradation, particularly from selective logging, can be large. Conventional methods of remote sensing and surveying are generally not sufficiently sensitive to alleviate this uncertainty because: (1) degradation from logging may be low intensity, sometimes less than one stem per ha (Medjibe et al. 2011); (2) before-and-after harvest data from forest inventories are rarely available because survey methods are generally focused on commercial trees, companies may be unwilling to share proprietary data, and/or companies do not provide data if they are engaging in illegal harvest.

Several technological and methodological advances, such as high-resolution remote sensing techniques using Light Detection and Ranging (LiDAR), have been proposed to more accurately monitor areas affected by degradation. However, the high cost and capacity requirements of implementing these techniques are not always feasible for implementation in developing countries like Gabon<sup>38</sup>.

To develop and implement methodologies for improved emission estimates from degradation, Gabon will hire an international technical advisory team, which will work in close collaboration with the Institute of Tropical Research. The team will evaluate various methodological options to improve emissions calculations from forestry activities and make recommendations. Upon adoption of a specific methodology and sampling strategy, the technical advisory team will design an appropriate sampling strategy and train members of the NNRFOS teams to implement these methodologies<sup>39</sup>. All data will be included as an integral component of the NNRFOS.

Specific activities to achieve improved baseline emission estimates from forestry sector include:

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<sup>38</sup> Though often too expensive for government monitoring in the long-term, national governments could select to require logging companies to acquire LiDAR imaging of their concessions as part of the EISA process if it is deemed the most effective way to monitor emissions from this sector.

<sup>39</sup> The choice of appropriate method will depend on i) degradation intensity, ii) extent of analysis area and iii) technique used (visual or automated). For example, if degradation intensity is low and the area is large, indirect methods are often preferred because the costs to acquire fine-resolution images can be prohibitive. To minimize costs, researchers should first assess the causes of degradation in an area and then adapt the monitoring techniques to meet the local needs (Herold 2008). A direct approach is to monitor the forest canopy for any gaps or pattern of gaps using Landsat or MODIS data to identify specific zones of degradation activity. This would need to be done annually because the canopy changes rapidly, and there will be problem with cloud cover. This would entail some ground-truthing and automated techniques to identify gaps, roads, etc... in canopy. An indirect approach would be to categorize forested land and intact and logged, and apply emissions factors. This is generally assumed less interesting to national governments because it has low potential to catch cheaters and is relatively coarse in scale, and provides less precise emissions estimates.



- *Activity 1.1. Hire technical experts to develop and compare improved methodologies for calculating emissions from degradation.*
- *Activity 1.2. Design national scale study and train inventory team to conduct work at a national scale.*
- *Activity 1.3. Implement selected methodology on a national scale to calculate emissions from forestry sector.*

## **Sub-Objective 2: Design and Implement an emissions reduction strategy for the forestry sector**

- *Activity 2.1. Design a strategy to Reduce Emissions from logging operations.*

Following pilot work conducted by the technical advisory committee, the data will be used to identify emissions factors associated with specific aspects of logging operations (e.g. residual damage from felling, skid trails, road creation, wood transformation and wood waste management, etc.). Based on these calculations, experts will work with the Gabon technical teams to identify non-obligate emissions from the industry and define the most effective and feasible technical and legal mechanisms to reduce these emissions from the entire sector<sup>40</sup>. The strategy will take into consideration the specific context of the country (high contribution of Okoumé to forestry production, transport difficulties, etc.), integrate technological advancement options, and inform decision-makers of any institutional and governance reforms that may be required to achieve emission reduction targets (e.g. Does the forestry code require modification? Do wood transformation techniques need better definition or regulation? Do existing forestry certifications schemes effectively reduce emissions?)

- *Activity 2.2. Evaluate the potential of reforestation and or stock enhancement programs, particularly in highly degraded landscapes around regional capitals, as an additional means of reducing emissions from the forestry sector.*

Reforestation, the natural or intentional restocking of forests in degraded or depleted landscapes, is often cited as a viable option to improve or rebuild natural forest landscapes and/or to decrease pressure on 'pristine' or HCV forests by increasing and intensifying forest production in more degraded landscapes. Intensive plantations with demonstrated potential for high productivity could replace "natural" forests as providers of forest goods, especially commodity-grade wood for pulp and construction material. This concept has been proposed as "*Preserving nature through intensive plantation forestry*" (Binkley 1997). The suggestion is that the demand for industrial woods could be better met if a small fraction of the world's forest area were allocated to fast-growing plantations (Sedjo and Botkin 1997), thus reducing pressure on primary and old-growth forests (Sedjo 1999), and ecologically sensitive logging practices were developed and implemented (e.g. ecosystem-based management and reduced-impact logging). But, plantation forestry has also acquired a bad ecological reputation, mainly resulting from intensive, large-scale monocultures with low diversity and occasional negative ecosystem-level impacts.

Gabon places high value on the evaluation of all reasonable options for meeting the country's development, conservation and climate change mitigation objectives. Thus, an evaluation of well-designed plantations and other reforestation programs as a means of increasing economic revenue while decreasing emissions is timely. An international consultant or consultancy group will be hired to evaluate the degree by which well-designed, multi-purposed plantations and reforestation programs could reduce emissions from the forestry sector through either carbon sequestration or by avoiding degradation of HCV/HCS forests. A full evaluation of how these activities could contribute to growing the economic contribution of forestry to the nation's economy will also be explored.

- *Activity 2.3. Design and implement a strategy for certifying forestry concessions engaged in the Gabon emissions reduction program with the "Green Gabon" Label.*

The NCC is charged with managing Gabon's Climate Change strategy. As per article 15 of the Sustainable Development Law, the Ministry of Economy and Sustainable Development governs domestic and/or

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<sup>40</sup> Some research has shown that logging improvements can maintain timber production and reduce carbon emissions by 30-50%. These improved harvest practices are known as Climate Effective Reduced Impact Logging, or RIL-C. Considering the need to balance human demand for timber products with climate change mitigation, RIL-C deserves attention as a potential strategic conservation intervention in Gabon.

international transactions based on GHG emissions reductions following reductions in deforestation and/or forest degradation (this framework is designed within a Sustainable Development Credits context, rather than a purely Carbon-based system<sup>41</sup>, but would include Carbon Credits), in coordination with the Forestry Ministry - this is the case currently for timber exports<sup>42</sup>.

As such, the Ministry of Sustainable Development would like to evaluate the potential for utilizing this legal mechanism as a means of simultaneously incentivizing the private sector and adding economic market value to Gabon's wood products. They seek a team of international experts to facilitate a study to this end. The study will require two parts as defined below. It will be composed of both desk and field based research and discussions with multiple stakeholders, including potential private sector actors.

- Develop and design a sustainability standard specific to the forestry/agricultural sector based on the principles of sustainable development contained in the Sustainable Development Law, which also takes into account the reduction of GHG emissions in the forest/agriculture sector in agreement with the NDC of Gabon.
- Design a sustainable development credit mechanism to encourage the best practices and the best operators. These credit mechanisms will rely on a sustainable development register. The previously best practice guidelines for emissions reduction in the forestry sector will be directly lined to this credit mechanism.

Activity calendars, budgets and monitoring frameworks for implementation of each activity described in section 2c are provided in components 5 and 6 of this document.

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<sup>41</sup> Article 4, Paris Accord

<sup>42</sup> By Gabonese law, the government owns the Land and is able to grant concessions for exploitation of natural or mineral resources. Within this context, carbon could be included as a natural resource and use rights could be granted to private sector companies, communities, individuals, agencies or government departments. However, questions of carbon ownership are currently not well defined legally.



## 2d. Social and Environmental Impacts during Readiness Preparation and REDD-plus Implementation

### Box 2d-1: The Cancun COP *Decision 1/CP.16*, Safeguards (selected text)

"71. ... (d) A system for providing information on how the safeguards referred to in appendix I to this decision are being addressed and respected throughout the implementation of the activities referred to in paragraph 70, while respecting sovereignty;"

#### Appendix I: Guidance and safeguards

"... 2. When undertaking the activities referred to in paragraph 70 of this decision, the following safeguards should be promoted and supported:

- (a) That actions complement or are consistent with the objectives of national forest programs and relevant international conventions and agreements;
- (b) Transparent and effective national forest governance structures, taking into account national legislation and sovereignty;
- (c) Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples;
- (d) The full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities, in the actions referred to in paragraphs 70 and 72 of this decision;
- (e) That actions are consistent with the conservation of natural forests and biological diversity, ensuring that the actions referred to in paragraph 70 of this decision are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits;
- (f) Actions to address the risks of reversals;
- (g) Actions to reduce displacement of emissions.

Source: <http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf>

### Standard 2d the R-PP text needs to meet for this component: Social and environmental impacts during readiness preparation and REDD-plus implementation:

The proposal includes a program of work for due diligence in the form of an assessment of environmental and social risks and impacts as part of the SESA process. It also provides a description of safeguard issues that are relevant to the country's readiness preparation efforts. For FCPF countries, a simple work plan is presented for conducting the SESA process, cross referencing other components of the R-PP as appropriate, and for preparing the ESMF.

## Environmental and Social Impact Management Strategy

### Overview of Gabon's Approach

Section 2b and 2c provide an outline of how political, environmental and social risks associated with the implementation of Gabon's Low Emission Development Strategy, NIF and RPP programs will be managed.

**It is important to underscore that Gabon views the entire National Land Use Planning Process to be an iterative environmental, social and economic assessment of the country's sustainable development plan.** By the end of the process (see section 2c), data layers that define the terrestrial forest environment (including HCV and HCS forests, areas of high timber value, and areas of importance for national and cultural heritage), village customary use zones and practices, regions of high potential for agriculture or mineral extraction, and infrastructure and energy development needs will all be mapped. A consultation process for exchange with multiple stakeholders, including forest-dependent people, is defined as an integral component of the LUP process. The decision-making process will include a full assessment of positive and negative potential impacts of land-use decisions and a NLUP that optimizes economic benefits, conservation values, and local needs will be produced over 3 years of data collection and consultation. It is through this process that the requirements of all international partners, including AFD and the World Bank SESA guidance will be met. At the close of the LUP process, the Sustainable Development Law requires that a formal Environmental and Social Evaluation be completed prior to its validation, which is in line with the requirements of the ESMF and will be utilized to develop the ESMF. The specific methodological standards adopted to meet this legal requirement will be advanced as part of the program objectives and outcomes (See Outcome 1, Output 5, Table 18). Terms of Reference defined for this activity will clearly state that safeguard guidelines for both AFD and World Bank must be clearly addressed within the final Environmental and Social Evaluation report. Gabon holds the position that, by integrating safeguard guidelines from a range of partners (current and future) into the development of national methodological standards for the Environmental and Social Evaluation conducted as part of this program (Output 5), partner synergies and funding will be maximized. Costs associated with the Land Use Planning Process, and more specifically for the completion of the Environmental and Social Evaluation (Output 5), have been outlined in Table 18, lines "*Development of a methodology and guidelines for conducting a Sustainable Development Impact Assessment*" and "*Conducting the Sustainable Development Impact Assessment*". As outlined in Table 14, this activity will be undertaken with financing from CAFI.

In sum, the NLUP process sets forth the mechanism for the collection and provision of relevant information required to meet the SESA standards as defined by the World Bank. This is an iterative and multi-step process that will give rise to milestones and decisions in phases, and includes a stakeholder consultation plan, and will result in a completed SESA and general ESMF as outlined in the Common Approach.

Specific plans to ensure prior and informed stakeholder consent, and consensus building have been outlined as part of the NLUP program implementation plan (See Components 2b and 2c Component 1 of this document).

### Review of Legal framework for conducting Environmental and Social Impact Assessments for Gabon

Article 5 of the sustainable development law specifically addresses Gabon's Environmental and Social Management Framework by requiring that Social and Environmental Assessments be completed prior to implementation of policies, programs, and projects complies sustainable development objectives. The activities identified in this R-PP for financing through the FCPF fall within this legal statute, which specifies the following principles relevant to World Bank safeguards

- Participation of women: "Women have a vital role in managing the environment and development. Their full participation is critical to achieving sustainable development;" and,
- Protection and participation of local communities: "Populations and local communities have a vital role to play in managing the environment and development based on their knowledge of the environment and their ancestral practices."

Specific guidelines for the implementation of the Environmental and Social Impact Assessments defined

within the Sustainable Development Law are currently being drafted. Early draft versions refer to text provided by Gabon's Environmental Code, a legal framework that would also be applied to all activities developed as part of the NIF and R-PP process, and cover the implementation of activities that fall under the Sustainable Development Law, avoiding any gaps in safeguards and stakeholder engagement legal requirements. Like the Sustainable Development Law, the Environment Code requires Environmental and Social Impact Assessments for economic activities. Appendix A of the Code provides a procedural manual for the completion of ESIA's, in which the following requirements are specified.

**Table 8. Identification of the World Bank Safeguards Policies that Could be Triggered by the Implementation of Programs Outlined within the NIF and R-PP Process.** A brief overview of potential negative impact risks for each of the national initiatives outlined within the NIF and R-PP processes. WB= World Bank safeguard language, C = Cancun safeguard language, CBD= CBD safeguard language.

\* L= Low Risk; M=Medium/Average Risk; H = Higher than average risk

WB Safeguard	Land Use Planning	Forest Observation and Monitoring	Reduced Emissions Forestry	Overlay of WB, Cancun and CBD Safeguards	Risk Mitigation Notes
Environmental Assessment	L	L	L	(C) Actions complement or are consistent with the objectives of national forest programs and relevant international conventions and agreements; (C) Actions to address the risks of reversals; (C, CBD) Actions to reduce displacement of emissions; (CBD) Increased pressure on non-forest ecosystems with high biodiversity value; (CBD) Afforestation in areas of high biodiversity value.	The LUP process is intended to minimize these risks by optimizing land use such that the objectives of national forest programs, international agreements, national development goals, and other important factors are taken into consideration. The goal of the plan is to minimize emissions in the forest sector from the implementation of the Sustainable Development Plan and ensure HCV forest and HCS forests, Protected Areas and non-forest habitats with high biodiversity or cultural value are also protected where appropriate.
Natural Habitats	L	L	L	(C) Actions are consistent with the conservation of natural forests and biological diversity, ensuring that actions are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits; (CBD) Conversion of natural forests to plantations and other land uses of low biodiversity value and low resilience; and the introduction of growing of biofuel crops.	A cornerstone of Gabon's Sustainable Development Strategy is to preserve and protect areas defined as retaining high conservation, biodiversity, carbon sequestration or cultural importance while balancing this with the intensification and diversification of development opportunities. The Green Gabon pillar outlines a vision for this and the LUP will serve as the mechanisms by which it is achieved.
Forests	L	L	L	(C) Transparent and effective national forest governance structures, taking into account national legislation and sovereignty.	The goal of the Forest Observation and Monitoring Program is to provide for and ensure transparency with respect to how national policy translates into land-use practices. Governance reform already underway to promote more effective national forest governance has been described throughout the document. Initiatives intended to reduce emissions from the forestry sector through improved forest management (and governance) and by halting illegal logging are the mechanisms by which risks associated with poor governance, legislation, and application of existing laws will be minimized.
Pest Management	L	L	L		Pests could be introduced to Gabon's landscape with the opening of roads and expansion of agriculture production and trade. However, Gabon's Environmental Code outlines strong procedures are implemented to prevent this and that these are addressed within each project EIA.
Safety of Dams	N/A	N/A	N/A		No Dam or water projects are included within the NIF-R-PP framework.

Physical and Cultural Resources	L	L	L		Physical and cultural resources are considered as part of the environmental risks above
Indigenous Peoples	M	L	M	(C) Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples; (C) The full and effective participation of relevant stakeholders, in particular, indigenous peoples and local communities; (CBD) Loss of traditional territories and restriction of land and natural resource rights; (CBD) Lack of tangible livelihood benefits to indigenous peoples and local communities and lack of equitable benefit sharing.	Gabon holds the view that all Gabonese are indigenous - though during Bantu migrations they may have arrived at different migration phases. Article 2 of the National Constitution clearly states that the Gabonese Republic assures equality for all citizens, by law, regardless of origin, race, sex or religion. Having so stated, Gabon recognizes that rural populations and forest dependent people of many groups (not just Baka) are often marginalized from decision-making processes that occur at the national scale. Thus, significant thought has been devoted to the design and implementation of consultation process as outlined in the Environmental Code, the Sustainable Development Law, and the Implementation Plan described in section 2c of this document.
Involuntary Resettlement	M	L	M		During the land-use planning process, it is possible, but not likely (given the consultation and multi-stakeholder approach being adopted) that small populations of people (some of Gabon's villages have fewer than 10 people) could be negatively impacted or asked to relocate to implement a development model. The ESIA process of the Environmental Code and the Sustainable Development law specify mechanisms by which these potential situations are managed and what types of compensation measures would be required should that occur.
International Waterways	N/A	N/A	N/A		N/A
Disputed Areas	H	L	M	(C) The full and effective participation of relevant stakeholders, in particular, indigenous peoples and local communities	The full and effective participation of relevant stakeholders, in particular, indigenous peoples and local communities is intended to minimize this risk at local scales. The legal technical team working with the multi-ministerial Land Use Planning Committee has been put into place to resolve disputed areas (or areas currently allocated to mutually exclusive land uses) as the process moves from PNAT0-PNATV2. See Section 2c for additional detail

### ***Evaluation of the impact of sustainable development strategies***

As underscored throughout this R-PP, Gabon is committed to ensuring that the potentially negative environmental and social consequences of proposed decisions taken during the implementation of activities defined in Component 2c are taken into account and that regulatory measures are in place during the implementation of the plan. The following laws integrate these aspects:

- Law No. 016/1993, which lays down the principle of Environmental and Social Impact Assessment (EIES) and designates the Directorate General for the Protection of the Environment and Nature (DGPEN) as responsible for the supervision of Procedures for EIES, the validation of EIES reports, and the review and approval of the Environmental and Social Management Plan (PGES);
- Law No. 002/2014, which lays down the principle of a Sustainable Development Impact Assessment (SIA or EIDD) to assess "the compliance of the implementation of policies, programs and projects with the principles and objectives of sustainable development". The Act provides, *inter alia*, for mitigation or compensation measures where environmental, social, cultural and economic impacts exceed a sustainable development threshold (to be determined by regulation).

Gabon is currently in the process of defining the EIDD process. An implementing decree will have to be adopted by Gabonese authorities to formalize the legal framework, but the process is well advanced.

### ***Additional Local and national consultations to be taken during program implementation***

In the final year of the process, consultations will be conducted at the departmental, provincial and national levels to validate and finalize the NLUP and associated activities prior to its implementation. This will allow non-governmental stakeholders assess the technical work and express concerns or grievances – which would ultimately feedback to reasonable adjustments.

Multidisciplinary teams mandated by the CRRNATs will conduct validation workshops in each province and in each department by mobilizing the departmental staff (see Component 1 and 2c). Consultation teams will reach all stakeholders, including rural and urban-based Gabonese citizens, forest-dependent communities, civil society groups, and the private sector. The tasks of these teams will be:

- Improve access to information;
- Communicate the technical, legal and political data;
- Facilitate access to public databases via the Internet;
- Collect stakeholder opinions and ensure that potential disputes are resolved;

**Information Dissemination** will occur using the following mechanisms (see section 2c):

- Workshops and committee meetings at national scale;
- TV and radio emissions at national and regional scale;
- 48 Information and centers at district scale;
- Regular village level meetings with extension agents at village scale (inclusion of forest dependent and/or marginalized people)

**Stakeholder Dialogue** will occur using the following mechanisms (see section 2c):

- Inter-ministerial at national, governmental level;
- 48 extension agents at district scale – collaboration with prefectures;
- Participatory mapping of local land use practices at village scale (> 2000).

### Component 3: Develop a National Forest Reference Emission Level and/or a Forest Reference Level

#### Standard 3 the R-PP text needs to meet for this component: Develop a National Forest Reference Emission Level and/or a Forest Reference Level:

Present work plan for how the reference level for deforestation, forest degradation (if desired), conservation, sustainable management of forest, and enhancement of carbon stocks will be developed. Include early ideas on a process for determining which approach and methods to use (e.g., forest cover change and GHG emissions based on historical trends, and/or projections into the future of historical trend data; combination of inventory and/or remote sensing, and/or GIS or modeling), major data requirements, and current capacity and capacity requirements. Assess linkages to components 2a (assessment of deforestation drivers), 2b (REDD-plus strategy activities), and 4 (monitoring system design).

(FCPF and UN-REDD recognize that key international policy decisions may affect this component, so a stepwise approach may be useful. This component states what early activities are proposed.)

### 3. Objectives

A national reference scenario estimates trends in forest cover and other land uses in the absence of REDD+ policy interventions so that the effectiveness of activities to reduce emissions from deforestation and degradation can be assessed. It therefore serves as a tool for national planning and decision-making, as well as monitoring and evaluation.

With 88% forest cover, Gabon is a high-forest-cover/low-deforestation country, and thus its national reference emission level (REL) must account for its unique national circumstances. In fact, CO<sub>2</sub> sequestration by forests in Gabon has historically been almost double the losses from deforestation and degradation

As presented in its 2015 NDC, Gabon proposes a historical reference level based on its GHG emissions from development activities in 2000, and excluding carbon sequestration by forests. Since 2000, the Government of Gabon has already initiated policy measures to reduce its emissions, and thus the estimated effects of these activities on emissions are compared to business-as-usual (BAU) emissions to demonstrate a significant decline in emissions from 2000 to 2025.

This section first presents an evaluation of Gabon's forest cover and carbon stocks. Second, we provide a diagnosis of its GHG emissions. Third, we present the activities Gabon took to limit its emissions, specifically in the LULUCF strategic sector, and demonstrate their estimated effect on emissions through 2025. Finally, we present a plan for updating Gabon's reference scenario, focusing on refining estimates of forest degradation from legal and illegal logging activities.

### Gabon's land cover, land cover change, and GHG emissions

#### *Forest cover and deforestation between 1990-2015*

Thanks to the Global Monitoring for the Environment and Security Service Element on Forest Monitoring project (GSE Forest Monitoring, GSE-FM)<sup>43</sup> and the project to build capacity and access to satellite data to monitor Central and West African forests (GEOFORAFRI),<sup>44</sup> Gabon has a complete map of its forest cover for 1990, 2000, and 2010, providing a basis for estimating changes in land use (Table 9).

<sup>43</sup> Cf. <https://www.redd-services.info/content/gse-fm-redd.html>

<sup>44</sup> Cf. <http://www.geoforafri.org/>



**Table 9. Deforestation and Reforestation Between 1990 and 2010 in Gabon (NCC, 2012)**

	Changes from 1990 to 2000		Changes from 2000 to 2010	
	Area (ha)	Area (%)	Area (ha)	Area (%)
<b>From forest to non-forest</b>				
Forest to crops	4,257	4.16	101	0.39
Forest to grassland	37,025	36.17	5,148	20.14
Forest to wetlands	2,418	2.36	651	2.55
Forest to infrastructure	6,949	6.79	2004	7.84
Forest to forest roads	48,399	47.28	16,340	63.91
Forest to tree crops	3,329	3.25	1,323	5.17
<i>Total</i>	<i>102,378</i>	<i>100</i>	<i>25,567</i>	<i>100</i>
<b>From non-forest to forest</b>				
Crops to forest	545	1.32	45	0.2
Grassland to forest	25,477	61.8	7,183	32.2
Wetland to forest	1,204	2.92	1,269	5.69
Infrastructure to forest	651	1.28	381	1.71
Forest roads to forest	10,356	25.12	12,865	57.68
Tree crops to forest	2,994	7.26	532	2.52
<i>Total</i>	<i>41,227</i>	<i>100</i>	<i>22,305</i>	<i>100</i>

Over the 1990-2000 period, Gabon recorded a net deforestation rate estimated at 0.26 percent, or a loss of forest cover of slightly more than 61,000 ha over 10 years, and an annual deforestation rate of 0.026 percent.

This rate is low and remains below that of earlier estimates, published by FAO. Over that period, gross deforestation was estimated at slightly more than 100,000 ha, nearly half of which appeared to be due to logging and, specifically, to the opening of roads, while nearly one-third of deforestation appeared to be due to the conversion of forest into prairie/fallows.

Over the period 2000-2010, deforestation declined significantly: 0.04 percent over 10 years, or an average of 0.004 percent per year. Gross deforestation recorded between 2000 and 2010 was approximately 25,000 ha, or one-quarter of that observed during the 10 years prior. This is the result, specifically, of actions by the Gabonese government, such as the 2001 revision of the Forest Code and the creation of a network of national parks.

Conversions of forest into logging roads and of forest into prairie/fallows and planted, thus fell sharply. Over the period 2000-2010, gross deforestation was almost entirely offset by the growth of forest areas in non-forested lands (58 percent of the total was related to the spontaneous reforestation of abandoned logging roads).

AGEOS has mapped the evolution of forest cover loss between 2010 and 2015. This loss is mainly associated to agro-industrial activities, logging and mining, the establishment of large infrastructure such as hydro-electric dams and road, and to the conversion of forests into fallows and pastures in rural areas. Between 1990 and 2010, this loss was mainly associated with forest logging and to new roads, as well as to conversion of forests into pasture and fallows.

**Table 10. Quantification of Drivers 2010-2015**

	Loss		Gain (Ha)	
	Ha	%	Ha	%
Within forest concessions	32499.91	33.78	12067.4	34.85
Within agro-industrial concessions	19895.85	20.67	709.2	2.05
Within mining concessions	162.93	0.17	70.0	0.20
Large infrastructure (Grand Poubara dam)	4288.71	4.46	----	----
Others (urban centers, roads, rural activities etc.)	39382.59	40.91	23977.3	62.88
Total	96230	100	36824	100

Since the submission of its NDC, Gabon has continued to monitor the evolution of its forest cover. Before the 22<sup>nd</sup> Conference of the Parties of the UNFCCC in 2016, AGEOS updated its map of the state of the forest cover in 2015: the forest of Gabon represents 23.59 million hectares, or 88.97% of its territory, compared to 23.66 million hectares in 2010 (89.21% of the territory). Between 2010 and 2015, forest cover loss is estimated at 96,230 ha, or 0.40% and gains were up to 36,824 ha (or 0.15%), representing a net loss of 59,406 ha, or 0.05% per year. Meanwhile, recent studies on degradation provide new data on its contribution to emissions from the LULUCF sector.

### ***Gabon's greenhouse gases emissions***

Gabon's NCP and NDC both produced estimates of GHG emissions and absorption for the various sectors development activities. The overwhelming conclusion of both analyses is that **Gabon has an enormous potential for sequestration, through its LULUCF (Land Use, Land-Use Change and Forestry) sector. CO<sub>2</sub> sequestration is nearly double the estimated emissions from deforestation and degradation combined.** The contribution of Gabon to international efforts to reduce greenhouse gas emissions to mitigate the effects of climate change could therefore be broadly positive if that sector reduced its emissions of greenhouse gases. The LULUCF sector (biomass and soil) absorbs 74.8 Mt<sub>e</sub>CO<sub>2</sub>/year on average (PR, 2015b).

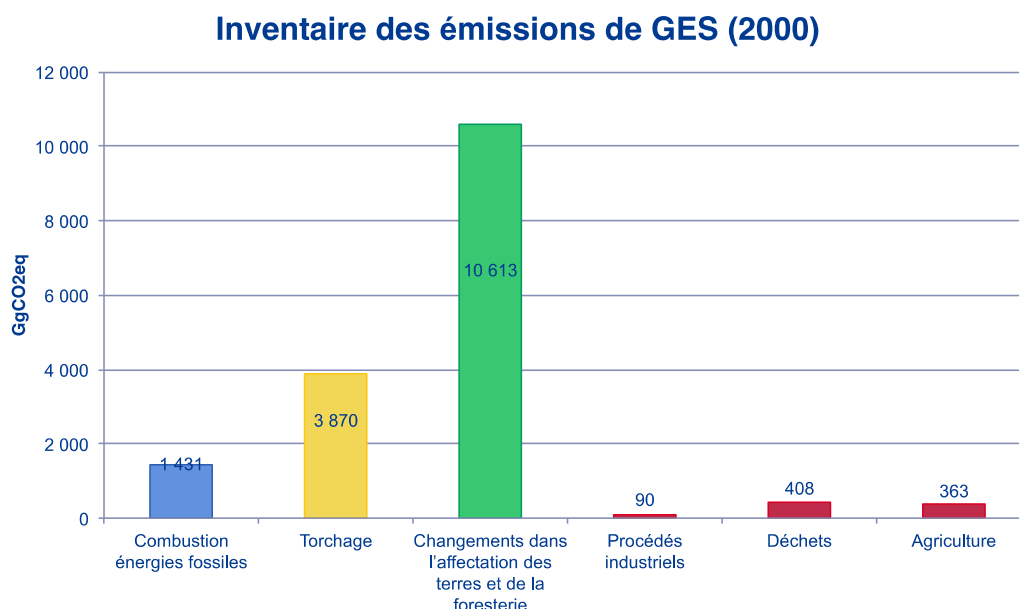
**Table 11. Historical Emissions in GgCO<sub>2</sub>Eq**

Year	1990	2000	2005	2010	2015	Average
Deforestation	6,675,840	6,675,840	1,390,800	333,792	12,183,042	5,451,863
Degradation	24,400,000	74,326,895	78,901,895	14,446,752	17,664,038	41,947,916
Sequestration	(81,386,874)	(81,063,096)	(80,978,104)	(81,215,553)	(81,122,728)	(81,122,728)
Net emissions	(50,311,034)	(60,360)	(685,408)	(51,368,473)	(33,722,948)	(33,722,948)

In 2000, deforestation and degradation represented 93 percent of GHG emissions (Figure 14), with degradation accounting for nearly 79 percent of the LULUCF emissions. The other principal emitting sectors are the oil industry due to flaring (44% of emissions), energy (2% of emissions) and agriculture (1% of emissions).

Gabon's low level of emissions is the result of its high forest cover and low deforestation, which stem from its relatively small population and its past economic reliance on oil production. With a growing population and shrinking oil stocks, diversification of the economy will be critical to development and food security.

Therefore, like other high-forest-cover/low-deforestation nations, Gabon's emissions from the LULUCF sector will increase compared to past levels.



Source: 2<sup>ème</sup> Communication Nationale

**FIGURE 17 – DISTRIBUTION OF GHG EMISSIONS BY SECTOR IN GABON IN 2000 (OPR, 2015b)<sup>45</sup>**

### **Gabon's GHG emissions reductions**

As a developing country with a growing population, Gabon cannot reduce its absolute level of emissions. Indeed, the population of Gabon is growing at an annual rate of 2.5 percent and economic growth has been around 10 percent since 2010 (not including the oil sector). Therefore, Gabon is focusing on a strategy of low-emissions development through which it will grow its economy while keeping GHG emissions as low as possible. Gabon's Climate Policy seeks to reduce emissions from all sectors of its economy, not just through the conservation of forests.

In its NDC, Gabon developed two GHG emission scenarios, using 1990-2000 as a reference level. The business-as-usual (BAU) scenario corresponded to emissions levels without any policy intervention by the Government. The low-emissions scenario corresponded to emissions levels accounting for policy interventions enacted since 2000, such as:

- Adoption of the new Forestry Code
- Creation of the Protected Area Network
- National Plan to Reduce Flaring
- National Climate Plan
- PSGE Plan for low carbon industrial development,
- National Land Use Plan.

While the NDC describes changes in policies and emissions in each of the different sectors (electricity, oil, transport, waste, agriculture, forests), here we focus on LULUCF which makes up most emissions. The

<sup>45</sup> Office of the President of the Republic, Intended Nationally Determined Contribution – Submitted to the 21st Conference of the Parties. Libreville, Gabonese Republic, March 2015b. 14 pp. Note that Gabon's 2<sup>nd</sup> National Communication did not account for emissions from degradation; consequently, different figures may be found in some documents. In this figure, the English labels are: Fossil fuels, Flaring, LULUCF, Industry, Waste, and Agriculture.

scenario for BAU, uncontrolled emissions, was developed based on two assumptions for the LULUCF sector:

- Increase in areas covered by logging permits, based on observed trends since 1950;
- Population growth and rising food needs, resulting in development of agricultural crops at the loss of the forests.

An alternative scenario was proposed in the NDC, with three main characteristics:

- Already achieved: Adoption and implementation of a Forest Code in 2001 requiring forest operators to manage their concessions sustainably, including extending harvest rotations from 15 to 25 years and reducing damage from logging operations;
- Already achieved: Creation of 13 national parks in 2002, prohibiting forestry operations on 11 percent of the territory, plus two hunting reserves and two fauna reserves, covering 1.9 percent of the territory.
- In progress: Adoption of a national LUP enabling optimum allocation of zones to different uses, and excluding old-growth forests, HCV forests<sup>46</sup> and HSC forests<sup>47</sup>.

Accounting for emissions from logging, these different measures related to LULUCF would reduce GHG emissions more than 1,500,000 GgGO<sub>2</sub> over 2010-2025, a 68% reduction compared to the BAU scenario.

Overall, Gabon's interventions across all sectors would reduce GHG emission by 65% compared to the BAU in 2000.

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<sup>46</sup> Cf. [www.hcvnetwork.org](http://www.hcvnetwork.org)

<sup>47</sup> Cf. <http://highcarbonstock.org>

## Component 4: Design Systems for National Forest Monitoring and Information on Safeguards

### 4a. National Forest Monitoring System

#### Standard 4a the R-PP text needs to meet for this component: National Forest Monitoring System

The R-PP provides a proposal and workplan for the initial design, on a stepwise basis, of an integrated monitoring system of measurement, reporting and verification of changes in deforestation and/or forest degradation, and forest enhancement activities. The system design should include early ideas on enhancing country capability (either within an integrated system, or in coordinated activities) to monitor emissions reductions and enhancement of forest carbon stocks, and to assess the impacts of the REDD-plus strategy in the forest sector.

The R-PP should describe major data requirements, capacity requirements, how transparency of the monitoring system and data will be addressed, early ideas on which methods to use, and how the system would engage participatory approaches to monitoring by forest-dependent indigenous peoples and other forest dwellers. The R-PP should also address the potential for independent monitoring and review, involving civil society and other stakeholders, and how findings would be fed back to improve REDD-plus implementation. The proposal should present early ideas on how the system could evolve into a mature REDD-plus monitoring system with the full set of capabilities.

(FCPF and UN-REDD recognize that key international policy decisions may affect this component, so a staged approach may be useful. The R-PP states what early activities are proposed.)

Forests cover almost 88 percent of the territory of Gabon, making it the second most forested country on the planet (SANNIER et al., 2013<sup>48</sup>). As a result, Gabon's forests constitute an important natural resource that provides ecosystem services: biodiversity, carbon sequestration, habitats, fauna, erosion control, water cycle regulation, weather regulation and climate stabilization.

A cornerstone of good management of any initiative, regardless of scale (project or program, sub-national or national), is a robust monitoring system to quantify the resource and monitor changes over time and to provide information that informs management decisions.

To develop a robust monitoring system, Gabon began the acquisition of AGEOS in 2008 and then set up the National Natural Resource Forest Observation System (NNRFOS) in 2011. Within the framework of this NNRFOS, AGEOS is designed to monitor deforestation, forest degradation and reforestation, combining the analysis of remote sensing data and data collected in the field. This has been done by adapting methods and techniques that have proven successful in other contexts to the specificities of the forests of Gabon and Central Africa. An online database enables end-users, such as decision-makers, to access information in near-real-time.

Remote sensing data for the UTCF will be compared to the NLUP mapping data (*shapefiles*) covering all areas that have an impact on land management. This will make it possible to verify that any change observed via the NNRFOS is in line with the guidelines of the NLUP. For example, logging data from the NNRFOS will be superimposed on maps of annual harvesting plans included in concession management plans to determine whether management plans are being adhered to and to detect illegal activities.

<sup>48</sup> SANNIER, C., MAC ROBERTS, R. E., FICHET, L-V., and MAKAGA, E. M. K. 2013. Using the regression estimator with Landsat data to estimate proportion forest cover and net proportion deforestation in Gabon Remote Sensing of Environment <<http://dx.doi.org/10.1016/j.rse.2013.09.015>>

In accordance with the recommendations of the Conference of the Parties (COP) to the CCNUCC, the NNRFOS will be designed following technical recommendations (PENMAN et al., 2003)<sup>49</sup> and recent guidelines (EGGLESTON et al, 2006)<sup>50</sup> relating to estimates of GHG emissions / removals from the UTCF sector. In this way, the estimates will be based on common international approaches for Measurement, Reporting and Verification (MRV).

The GoG has set the 2000 emissions reference level for forests as its baseline level. Future emission levels will be compared with this baseline to assess the impact of policies, such as the creation of national parks or reforms in the forest sector.

### **Gabon's National Forest Monitoring System -- NNRFOS**

The NNRFOS is designed to meet Tier 3 standards for GHG emissions / removals in the LULUCF (UTCf in French) sector (PENMAN et al., 2003). Tier 3 is the most complex, but also the most accurate method (SalvaTerra, 2014)<sup>51</sup> of carbon estimation, and requires country-specific emission factors derived from inventories of carbon stocks in the field that disaggregate different pools of carbon and that are repeated periodically to quantify change. Tier 3 standards require detailed data on stocks and carbon emissions at regional and national levels through a combination of plot inventories, satellite mapping and modeling. The NNRFOS will comply with these standards:

- By producing country-specific data for most carbon pools (aboveground biomass, soil carbon and dead biomass);
- Providing multi-temporal inventory data;
- Combining forest inventory data with remote sensing data to provide spatially explicit and high-resolution activity data;
- Providing uncertainty estimates with field data<sup>52</sup>.

Forest inventory data available in the past were insufficient to produce accurate estimates of carbon stocks and GHG emissions/removals: Gabon used default emission factors to estimate emissions from forest degradation and carbon stock estimates that were based on the plots established for different purposes and with different methods.

As a result, in 2011 the GoG embarked on a process of quantifying biomass and forest carbon based on a combination of field data and remote sensing data. The NCC commissioned the NPA to implement the National Resource Inventory (NRI), with an initial assessment of forest carbon stocks. The NRI is based on a network of permanent one-hectare forest plots distributed according to a systematic, random sampling design across the country (Figure 18). A 50-km grid was overlaid on a map of Gabon, and the positions of the plots were randomly selected in each grid cell using the *Reverse Randomized Quadrant-Recursive Raster* algorithm (THEOBALD et al., 2007)<sup>53</sup>.

The NRI will be used to measure co-benefits (e.g. quantification of soil and nutrient types in the country, terrestrial and underground biodiversity, etc.), but its initial objective is to estimate biomass and forest carbon stocks for purposes of national planning.

The project has benefitted from technical support from the US SilvaCarbon<sup>54</sup> program, the University of California in Los Angeles, Duke University, Leeds University, and from Olam-Gabon and the SilvaCarbon program.

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<sup>49</sup> PENMAN, J., GYTARSKY, M., HIRAISHI, T., KRUG, T., KRUGER, D., PIPATTI, R., BUENDIA, L., MIWA, K., NGARA, T., TANABE, K., & WAGNER, F. *Good practice guidance for Land-Use, Land-Use Change and Forestry - IPCC National Greenhouse Gas Inventories Programme*. Vienna – IPCC, 2003. 590p

<sup>50</sup> EGGLESTON, H. S., BUENDIA, L., MIWA, K., NGARA, T., TANABE, K. *Lignes directrices 2006 du GIEC pour les inventaires nationaux de GES - Chapitre 4: Terres forestières*. Tokyo – IGES/GIEC, 2006. Téléchargeable avec notices et tableaux sur <http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html>

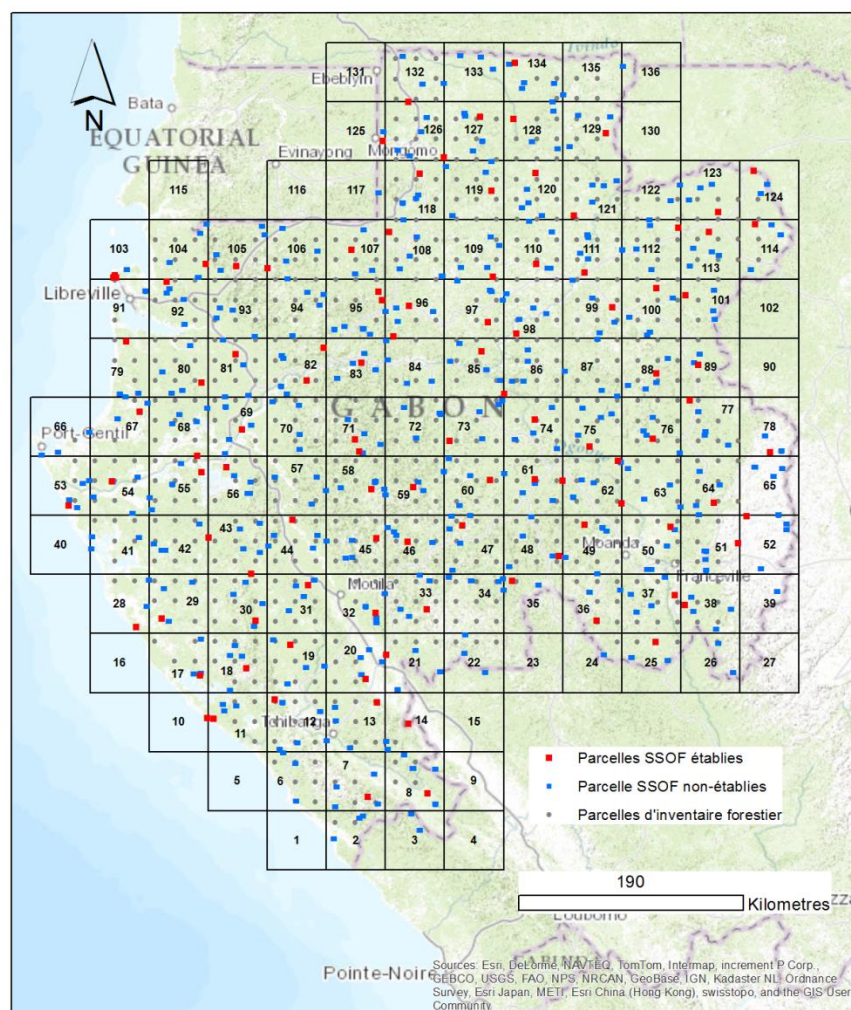
<sup>51</sup> SalvaTerra. *Évaluer les avantages et inconvénients des différentes définitions de la forêt en Côte d'Ivoire - État de l'art des bonnes pratiques et expériences internationales en matière de système de suivi des forêts*. Paris – SalvaTerra, octobre 2014. 72p

<sup>52</sup> MANIATIS D. & MOLLICONE D. Options for sampling and stratification for national forest inventories to implement REDD+ under the UNFCCC. Carbon Balance and Management 5:9, décembre 2010. 14p

<sup>53</sup> THEOBALD D.M., STEVENS D.L., WHITE D., URGUHART N.S., OLSEN A.R. NORMAN J.B. Using GIS to generate spatially balanced random survey designs for natural resource applications. Environmental Management 40 : 134, mai 2007. 12p

<sup>54</sup> Cf. <http://www.silvacarbon.org/>





**FIGURE 18 - LOCATION OF NRI PLOTS (AUTHORS, 2016). RED CIRCLES REPRESENT PLOTS ESTABLISHED BETWEEN 2011-2012. BLUE POINTS REPRESENT PLOTS TO BE ESTABLISHED TO COMPLETE THE NRI.**

In 2013, the first phase of the NRI was finalized, with the collection of data on 104 plots. Although detailed analysis of this first phase is still ongoing, a preliminary analysis of the data has already yielded several important results (Republic of Gabon, 2013)<sup>55</sup>:

- Based on data from 73 plots, forest biomass is estimated at 273.8 Mg / ha (95% CI = [245.3, 301.2]), an average carbon stock of 136.9 Mg / ha across the country;
- The density of forest biomass is higher in Gabon National Parks (287.3 Mg / ha) than in areas allocated for other types of land use;
- Estimates of forest biomass are lower than those previously reported, which were based on "research plots" established for scientific studies. The NRI is based on a robust sampling design so that there is no bias in estimates compared to "research plots" that are often located in large, pristine forests – "majestic forest bias";
- To monitor the trends of forest biomass over time, a network of 400 to 600 plots will be developed to detect a 7 percent change in biomass with a Type I error of 10 percent (Annex B);

<sup>55</sup> République du Gabon. Gabon forest carbon assessment: 1st Technical Report. Libreville – République du Gabon, octobre 2013. 25p



- Combining NRI data with remote sensing data estimates makes it possible to estimate that carbon stored in Gabonese forests is 7.3 Gt.

Gabon has made great strides in understanding its carbon stocks and the diversity of trees in its forests, but management and reporting require greater precision and the detection of change over time.

### **Growing NNRFOS to Meet Tier 3 Monitoring Criteria**

Gabon is growing its existing monitoring system (AGEOS and NRI) to establish a fully operational NNRFOS in line with the GIEC and CCNUCC guidelines for Tier 3 monitoring. The NNRFOS will estimate carbon stocks and GHG flows and facilitate modeling of how forests behave under climate change and land-use change.

The NNRFOS will support the implementation of the NLUP and monitor the sectoral effects of forestry, agriculture and infrastructure to reduce deforestation and forest degradation. Specifically, the NNRFOS will track and monitor the implementation of forest management, illegal logging and mining activities, and the identification of new agricultural land.

1. *Formulate and implement a methodology for analyzing satellite images and updating maps and statistics related to changes in forest cover.*

Gabon has the satellite infrastructure and data suited to develop its NNRFOS. With AGEOS's recently created satellite reception station, Gabon can acquire and provide various types of remote sensing data for forest monitoring. However, accurate methodologies for using remote sensing data to monitor and assess forest cover and forest-cover change (as well as UTM in general) need to be optimized and implemented.

- The SEAS project included the installation of a direct X-band satellite receiving station that allows for the programming and acquisition of multi-source optical data and medium- and high-resolution radar data in real time, such as LANDSAT<sup>56</sup> and the *Constellation of Small Satellites for The Mediterranean Basin Observation* (COSMO-SKYMED).
- As part of its procurement diversification policy, AGEOS is also evaluating opportunities to acquire data from the *China-Brazil Earth Resources Satellite* (CBERS)<sup>57</sup> and the *Thailand Earth Observation System* (THEOS)<sup>58</sup>.
- AGEOS also acquires SPOT 4 and 5 satellite imagery and is expected to obtain SPOT 6 and 7 free access images in 2017 as part of the OSFACO project. In addition, Laser Detection and Ranging (LiDAR)<sup>59</sup> data are available for parts of the country through partnerships with the private sector and universities.

To date, AGEOS has been able to map forest cover in Gabon for 2015 to show a net deforestation rate of about 0.05 per cent per year between 2010 and 2015. Within the GEOFORAFRI project, the SIRS company provided technical trainings so that a team of five to six GIS engineers and technicians could complete the mapping in 2016. As part of this work, AGEOS developed a semi-automatic methodology to analyze satellite images, including stitching together Landsat images to remove cloud cover, and annually update maps and statistics on forest-cover change.

Additional work with the US Forest Service (USFS) and SIRS indicates that the World Map of Forest Changes<sup>60</sup> developed by WRI and the University of Maryland, could be combined with field data to produce reliable forest statistics at the national level. The methodology makes it possible to organize a remote sensing image processing chain to produce a map of forest cover at five year intervals.

The ability to superimpose changes in forest cover and land-use change in LUP data will enable the Government to detect whether unplanned changes are underway and to take appropriate action to stop

<sup>56</sup> Cf. <http://landsat.usgs.gov/>

<sup>57</sup> Cf. <http://www.cbcrs.inpe.br/ingles/>

<sup>58</sup> Cf. <https://directory.eoportal.org/web/eoportal/satellite-missions/t/theos>

<sup>59</sup> Cf. <http://oceanservice.noaa.gov/facts/lidar.html>

<sup>60</sup> Cf. <http://www.globalforestwatch.org>

them (e.g. using teams deployed in the field, high-resolution satellite imagery, or observation flights with drones).

## 2. *Satellite monitoring for the spatial coverage of villages*

Through the NNRFOS, Gabon will monitor the spatial area of villages. Monitoring spatial coverage of villages over time is essential to understand UTCF dynamics, to grasp the impacts of the rural population on the extraction and management of natural resources, and to assess options for land tenure in rural areas.

Remote sensing imagery (mainly Landsat) will be used to determine the reference state of villages, with periodic updates (at intervals to be defined) used to assess change in spatial coverage of villages, particularly their agricultural zones. The resulting maps will be the foundation of village participatory mapping, and subsequent GPS data relating to village boundaries, sacred sites and natural resource use areas can be integrated into them. These activities will also facilitate the detection of unauthorized deforestation.

## 3. *Satellite monitoring of activities related to the development of forests, industrial and small-scale agriculture, mining, and rural and urban spread*

Gabon will test whether NNRFOS can effectively monitor and evaluate logging activities (legal and illegal), industrial and subsistence agriculture, mining, infrastructure development, and rural and urban sprawl through satellite imaging. This activity will lead to the development of a system of operational monitoring, such as a deforestation alert system.

Various alert systems for forest-cover change based on satellite image analysis already exist and are effectively used in other contexts:

- FORMA alert<sup>61</sup>, a monthly deforestation index at 500m resolution using a cloud computing algorithm developed by WRI and *Medium Resolution Imaging Spectrometer* (MERIS) images applied to humid intertropical areas;
- The Terra-i alert<sup>62</sup>, a monthly index of vegetation and presence of water at 250m resolution developed by the *International Center for Tropical Agriculture* (CIAT) and its partners for Latin America;
- The SAD alert<sup>63</sup>, a monthly deforestation and degradation index of 250m resolution developed by the NGO Imazon for the Brazilian Amazon;
- The GLAD<sup>64</sup>, a weekly 30-m resolution deforestation index developed by the University of Maryland, already used in Congo, Peru and Indonesia.

An evaluation of the above methodologies and their indices will assist in the production of a Gabon-specific index. Observations, measurements and field surveys will be used in the calibration and validation of the index.

The satellite monitoring system for deforestation will be strengthened and complemented by various contributions from the field. Using computerized tools such as *Collect Earth from Open Foris*<sup>65</sup> developed by FAO, Survey123<sup>66</sup> for ArcGIS or *Open Data Kit*<sup>67</sup>, field observations from NPA or MEFPE agents and other contributors such as NGOs, economic operators, and citizens, will be centrally stored in an AGEOS databased.

Finally, logging in managed and unmanaged concessions will be monitored under this activity, using free Sentinel-1 radar images with 5 m resolution. Additional radar data will be used, including COSMO-SkyMed images (40 x 40 km at 3 m resolution and 10 x 10 km at 1 m resolution), which would allow for precise

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<sup>61</sup> Cf. <http://www.wri.org/blog/2014/03/forma-near-real-time-alert-system-tropical-forest-loss>

<sup>62</sup> Cf. <http://www.terra-i.org/terra-i.html>

<sup>63</sup> Cf. <https://www.arcgis.com/home/item.html?id=9c4a16f9520447349159fa30abcea08b>

<sup>64</sup> Cf. <http://glad.umd.edu/>

<sup>65</sup> Cf. <http://www.openforis.org/tools/collect-earth.html>

<sup>66</sup> Cf. <https://survey123.arcgis.com/>

<sup>67</sup> Cf. <https://opendatakit.org>

monitoring of logging and verification of logging company compliance with the Annual Operating Plans. A robust method of analyzing these images to detect irregularities in logging will be developed within AGEOS.

#### 4. *Establish NNRFOS on the ground*

As described above, the NRI established a network of permanent forest plots that have been used to assess aboveground carbon stocks<sup>68,69</sup>, soil carbon stocks, and necromass<sup>70</sup>. The NRI also resulted in the establishment of a team of trained, experienced field technicians.

In addition to supporting the MRV function of carbon stocks and GHG flows under the CCNUCC REDD+ mechanism, the NRI also supports the development of the NLUP and contributes to capacity-building at the national and regional levels:

- Land-use planning will be based on the best available information on the current categories and uses of land. NRI field data will be used to validate land-use planning maps and to monitor compliance with land-use decisions;
- The first phase of its NRI employed a methodology that is different from those typically used in the forest sector. This is a positive development because it will permit a comparison of methods to determine the most effect MRV systems at subnational, national and regional levels;

The NNRFOS can also facilitate the GHG emissions accounting of neighboring countries that employ less precise default emission factors. Gabon will share lessons learned with the regional community through meetings, conferences and publications, and is willing to train technicians from neighboring countries in its field and analytical methods.

This implementation of NNRFOS field activities are divided into two sub-activities:

##### **Establishment of permanent NRI plots**

This sub-activity will complete the establishment of the NRI by 2023, enabling the measurement and mapping of Gabon's natural resources, including: terrestrial carbon, soil types, carbon and nutrients; tree species and diversity.

Analysis conducted during the first phase of the NRI determined that a network of 400 to 600 forest plots is needed to detect a 7 percent change in biomass in five years with a margin of error between 5 and 10 percent (see Annex B). Therefore, 300 plots will be added over the next three years to create a network of 500 one-hectare permanent plots (Figure 36). After their establishment, plots will be re-measured every five years to quantify forest change. A network of 500 plots will ensure good coverage of the country, with appropriate power to detect change in carbon stocks over time and variation in carbon across environmental and land use gradients. Biomass and carbon stocks will be estimated for GIEC-recognized land-use categories (forest, meadow, cropland, wetland, settlements and other land) as well as for the main forest types (coastal, upland forest, okoumé, Congolese-Guinean and savannah) and management types (forest concessions, national parks, secondary forest, etc.).

The NRI implements a field protocol adapted from RAINFOR<sup>71</sup>, which is very widely used in tropical environments for its rigor and robustness. It is based on the establishment and inventory (trees and lianas) of permanent one-hectare plots, linked with four satellite plots of 0.16 hectares each (see Figure below). Soil sampling is also carried out for each plot and then analyzed in the laboratory.

Although the NRI initially focused on forest biomass and carbon, Gabon's forests provide many related co-benefits. We will therefore test and refine methods of measuring these benefits (animal occupation and presence, wood resources, non-timber forest products, etc.). This was already piloted in northeastern

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<sup>68</sup> POULSEN, J.R., S.E. KOERNER, Z. MIAO, V. MEDJIBE & L.J.T. WHITE. Large liana abundance and biomass increase with tree biomass in Gabon. *Global Biogeography and Ecology*: 26(4), 2016, 472-485.

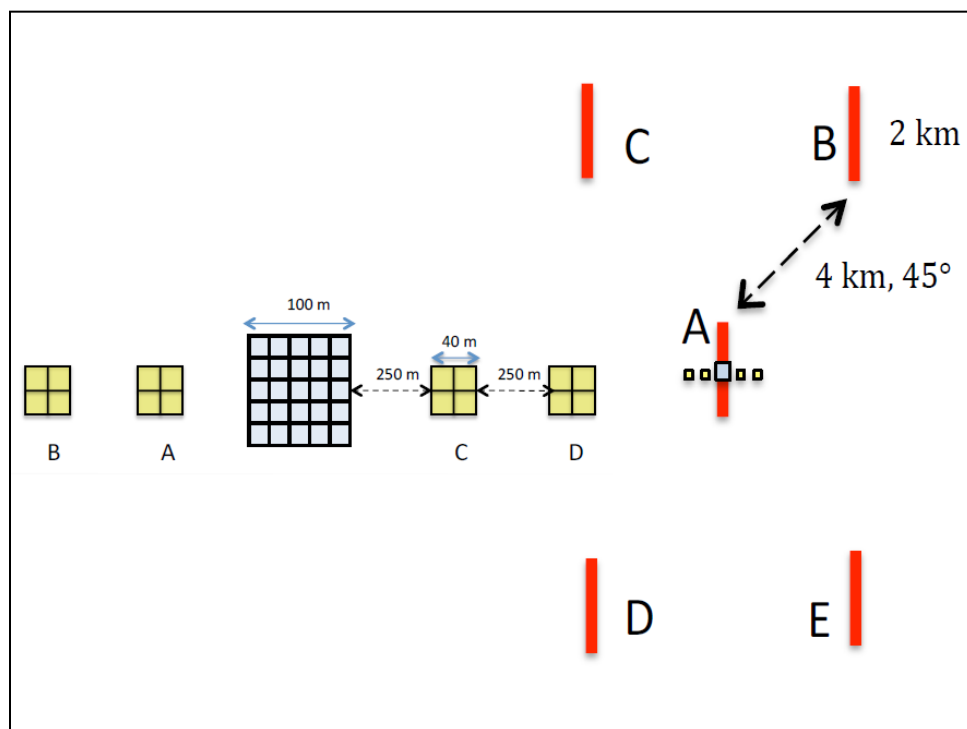
<sup>69</sup> BURTON, M.E.H., J.R. POULSEN, M.E. LEE, V.P. MEDJIBE, C. STEWART, A. VENKATARAMAN, L.J.T. WHITE. Reducing carbon emissions from forest conversion for oil palm agriculture in Gabon. *Conservation Letters* 10(3), 2017. 297-307.

<sup>70</sup> CARLSON, B.S., S.E. KOERNER, V.P. MEDJIBE, L.J.T. WHITE, & POULSEN, J.R. Deadwood stocks increase with selective logging and large tree frequency in Gabon. *Global Change Biology* 23(4), 2017. 1648-1660.

<sup>71</sup> Cf. [www.rainfor.org](http://www.rainfor.org)

Gabon<sup>72</sup>. During the first year, we will further test methodologies to measure populations of threatened large mammals, with elephants and great apes as a priority. These species are key to Gabon's aspirations for ecotourism and their numbers have decreased due to poaching, disease and fragmentation of their habitat.

To obtain statistically robust data on the distribution and density of elephant and great ape populations, a rigorous sampling and inventory protocol based on standard linear transects has been developed. For each one hectare biomass inventory plot, three linear transects of two km will be established (see Figure below) to collect: (a) observations of elephant dung, elephant trails, ape nests and dung, dung of other large mammals, (b) age of dung of elephants and ape nests, (c) signs of human activity, (d) forest type, and (f) perpendicular distance between the center of the transect and the center of the sign.



**FIGURE 19 - PLAN OF INVENTORY PLOT AND FOLLOW-UP TRACKS FOR LARGE MAMMALS FOR IRN (AUTHORS, 2016)**

Once the NRI has been fully established, plots will be reassessed every five years to determine changes in forest cover, biomass and diversity that may result from climate change or land-use change. This will provide direct information on forest dynamics and GHG emissions / removals.

**Analysis of changes in the structure and diversity of forest carbon stocks with due regard to data for new plots**

The data gathered in the field will be integrated into the secure online NRI database, which stores the field data, maps the plots, and calculates statistics, including plot biomass, carbon density, and tree height. The NRI database and website will be updated with the latest allometric equations<sup>73,74</sup>, using the freely available statistical software R<sup>75</sup>.

<sup>72</sup> POULSEN, J.R., S.E. KOERNER, S. MOORE, V.P. MEDJIBE, S. BLAKE, C.J. CLARK, M.E. AKOU, M. FAY, A. MEIER, J. OKOUYI, C. ROSIN, L.J.T. WHITE. 2017. Conservation 'nightmare': Poaching empties a Central African wilderness of forest elephants. *Current Biology* 27: R134-R135.

<sup>73</sup> CHAVE J., RÉJOU-MÉCHAIN M., BÚRQUEZ A., CHIDUMAYO E., COLGAN M.S., DELITTI W.B.C., DUQUE A. et al. Improved allometric models to estimate the aboveground biomass of tropical trees. *Glob Change Biology*, octobre 2014. 14p

<sup>74</sup> NGOMANDA A., ENGONE OBIANG N.L., LEBAMBA J., MOUNDOUNGA MAVOUROULOU Q., GOMAT H., MANKOU G.S., LOUMETO J., MIDOKO IPONGA D., KOSSI DITSOUGA F. & ZINGA KOU MBA R. Site-specific versus pantropical allometric equations: Which option to estimate the biomass of a moist central African forest? *Forest Ecology and Management*, January 2014. 9p

<sup>75</sup> <https://www.r-project.org/>

### ***Map carbon stocks and flows***

NRI field data will be used to calibrate remote sensing models to establish spatially explicit estimates of forest biomass and carbon (and changes in these parameters) in Gabon. This activity will produce thematic maps representing carbon balances in the UTCF sector, and is essential for monitoring and measuring the effects of reducing emissions from deforestation and land degradation.

### ***Capacity building for Gabon in land-use planning to ensure sustainability***

The NRI will include an important capacity building component in forest measurement methodologies. Although an experienced team of Gabonese NPA technicians is ready to undertake the field work, this project will include an annual retraining exercise to reinforce acquired knowledge. This training will highlight important concepts, ensure the maintenance of data quality, and improve capabilities in measurement techniques, survival techniques and first aid.

To meet its present and future technical needs for monitoring forest resources, Gabon seeks to train a body of scientists and technicians in the years to come. Thus, the activity will involve the recruitment of a post-doctoral researcher to support the AGEOS teams for three years. It will also support a PhD student with expertise in remote sensing for a period of three years. Two Master's students will undertake a professional training course within the AGEOS.

### ***Surveys to identify lands with high conservation value***

The NLUP decision-making process must be supported by concerted and spatialized environmental data to minimize the adverse impacts of certain types of land use (agriculture, mining, etc.). This activity will benefit from the data collected by the NNRFOS, which will be used for several purposes:

- Identify potential HVC and HSC forests areas outside existing protected areas;
- Streamlining the granting of logging permits to meet timber production targets;
- Facilitate the follow-up and evaluation of the implementation of the NLUP, once it has been implemented.

The concept of HVC is recognized internationally and is supported by the HCV network<sup>76</sup>. It is a generic framework for identifying important areas to be protected based on their ecological, biological, social and cultural values, particularly in the context of industrial development. There are six types of HCV.

The HSC approach is recognized internationally<sup>77</sup>. It aims to identify important areas to be protected or restored based on their ability to conserve carbon stocks, thus preventing greenhouse gas emissions.

The NPA already implemented an approach to evaluate HVC concept and the HSC approach have already been implemented by NPA to manage the environmental and social impacts of palm oil production in Gabon<sup>78</sup>. The project identified and mapped four types of areas with higher or lower environmental risks in view of the potential impacts of the development of palm plantations on HVC and HSC zones<sup>79</sup>:

- Green Zone: Development acceptable
- Yellow Zone: Development with precaution
- Orange Zone: Development with great care
- Red Zone: Development forbidden

This activity, therefore, aims to use the data collected by the NNRFOS (notably within the framework of the NRI) to apply this methodology to the whole territory and to all the sectoral activities that could have negative impacts on natural environments and forests.

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<sup>76</sup> Cf. <https://www.hcvnetwork.org>

<sup>77</sup> Cf. <http://highcarbonstock.org/>

<sup>78</sup> Agence nationale des Parcs nationaux. Gestion des impacts environnementaux et sociaux de la production d'huile de palme au Gabon. Politique de sélection des sites, de surveillance et de suivi, et de gestion de l'environnement pour des développements dans les zones périphériques des parcs nationaux. Libreville – NPA, juillet 2015. 46p

<sup>79</sup> see section 4b for more information and example maps

## 4b. Designing an Information System for Multiple Benefits, Other Impacts, Governance, and Safeguards

### Box 4-3: The Cancun COP Decision 1/CP.16: Reporting on Safeguards

Par. 71 calls for: “(d) A system for providing information on how the safeguards referred to in appendix I to this decision are being addressed and respected throughout the implementation of the activities referred to in paragraph 70...”

Appendix I Guidance and safeguards...:

... “2. When undertaking the activities referred to in paragraph 70 of this decision, the following safeguards should be promoted and supported: ...

(a) That actions complement or are consistent with the objectives of national forest programs and relevant international conventions and agreements;

(b) Transparent and effective national forest governance structures, taking into account national legislation and sovereignty;

(c) Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples;

(d) The full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities, in the actions referred to in paragraphs 70 and 72 of this decision;

(e) That actions are consistent with the conservation of natural forests and biological diversity, ensuring that the actions referred to in paragraph 70 of this decision are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits;

(f) Actions to address the risks of reversals;

(g) Actions to reduce displacement of emissions.

Source: <http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf>

### Standard 4b the R-PP text needs to meet for this component: Designing an Information System for Multiple Benefits, Other Impacts, Governance, and Safeguards:

The R-PP provides a proposal for the initial design and a workplan, including early ideas on capability (either within an integrated system, or in coordinated activities) for an integrated monitoring system that includes addressing other multiple benefits, impacts, and governance. Such benefits may include, rural livelihoods enhancement, conservation of biodiversity, and/or key governance factors directly pertinent to REDD-plus implementation in the country.

(The FCPF and UN-REDD recognize that key international policy decisions may affect this component, so a staged approach may be useful. The R-PP states what early activities are proposed.)



## Environmental and Social Co-Benefits Monitoring Program

Gabon views humans as an integral component of forest ecosystems. Forests constitute an important natural resource that provide ecosystem services to support humans and maintain the environment, including biodiversity, timber, fuel, wildlife habitat, erosion control, water cycling, weather regulation, and climate stabilization. The health of forest ecosystems, thus, depends on the maintenance of the entire system, including non-carbon related ecosystem functions. Thus, the methodologies described in section 4a extend beyond carbon monitoring to include indicators of: (1) forest ecosystem health; (2) floral and faunal diversity; and, (3) provision of ecosystem services (carbon sequestration, biodiversity, and food security). Indicators of non-carbon ecosystem functions are outlined in Table 11. Examples of data related to social and developmental co-benefits are presented in table y, Component 2c).

Through its NRI, Gabon is collecting massive amounts of data on both carbon and non-carbon characteristics of the forest (see Component 4a). A central database has been created to manage data and ensure quality control and timely analysis as new data is collected. In addition, technical research institutes collaborating with Gabon on this initiative are in the process of creating an analytical interface that produces updated statistics, graphs and maps as new data is added.

**Table 11. Non-Carbon Co-benefit Variables Collected as Part of the National Natural Resource and Forest Observation System (NNRFOS)**

Non-Carbon, co-benefit variables	
Co benefit	
Biodiversity	Full botanical survey including species ID in forest plots
	Additional botanical surveys in areas believed to have high endemism
	Intensified sampling, using standard protocols described in 4a, in high priority areas
	Wildlife surveys
	Methodology being developed: subsampling for other sensitive or threatened species as defined in Table 12.
Timber availability	Full forest inventory and demographic structure data collected for a suite of valuable timber species
Fuel	Necromass data collected to describe contribution of dead, woody debris to carbon pool calculations also valuable indicator of forest fuel wood production rates near rural, forest dependent communities
Wildlife Habitat	Habitat classification data are collected in both forest plots and along wildlife census transects as part of the NRI field protocol
	National scale, habitat maps are being created from the NRI data, coupled with parallel programs orchestrated as part of the national HCV process (see Figure 20 for example)
	NRI field teams serve as ground truthing mechanism for the remote sensing sector of the NNRFOS, and as such will eventually lead to real-time monitoring capacity of finer scale habitat variables from AGEOS.
Food security	Wildlife surveys will also serve to monitor availability of legally harvested protein sources important to forest dependent people.
Soil Fertility	Soil samples are collected to a 2m depth as part of the NRI protocol which will feed into both monitoring the agricultural suitability maps and serve as a general indicator of micro-ecosystem forest health
Water cycling and micro-scale weather regulation	Micro-scale weather monitoring towers constructed as part of the NIF (Component 2c), will provide the data and information necessary to monitor and report on shifts in micro-scale weather patterns, water regulation, and other ecosystem level indicators of ecosystem health and function.

## **Gabon's HCV approach**

The High Conservation Value (HCV) concept is an internationally-recognized, generic framework to identify areas that are important to protect at national, regional or global levels, based on the significant ecological, biological, social or cultural resources they hold or maintain. These areas need to be managed to preserve or improve the quality of their resources. Translating the HCV generic framework into practice requires that countries conduct a National Interpretation to define the values to protect in each national context. Gabon's first draft HCV National Interpretation<sup>80</sup> was done with the logging sector in mind, and is pending update, particularly to address impacts related to other types of development.

To start to address this, we identified HCV resources in need of protection to minimize impacts on the environment: biodiversity, landscapes, ecosystems and ecosystem services. These resources were then mapped at the national-scale to create a preliminary desktop assessment of their distributions and environmental vulnerability across the country, with the intention that the map would be refined at the site-level if development activities are pursued.

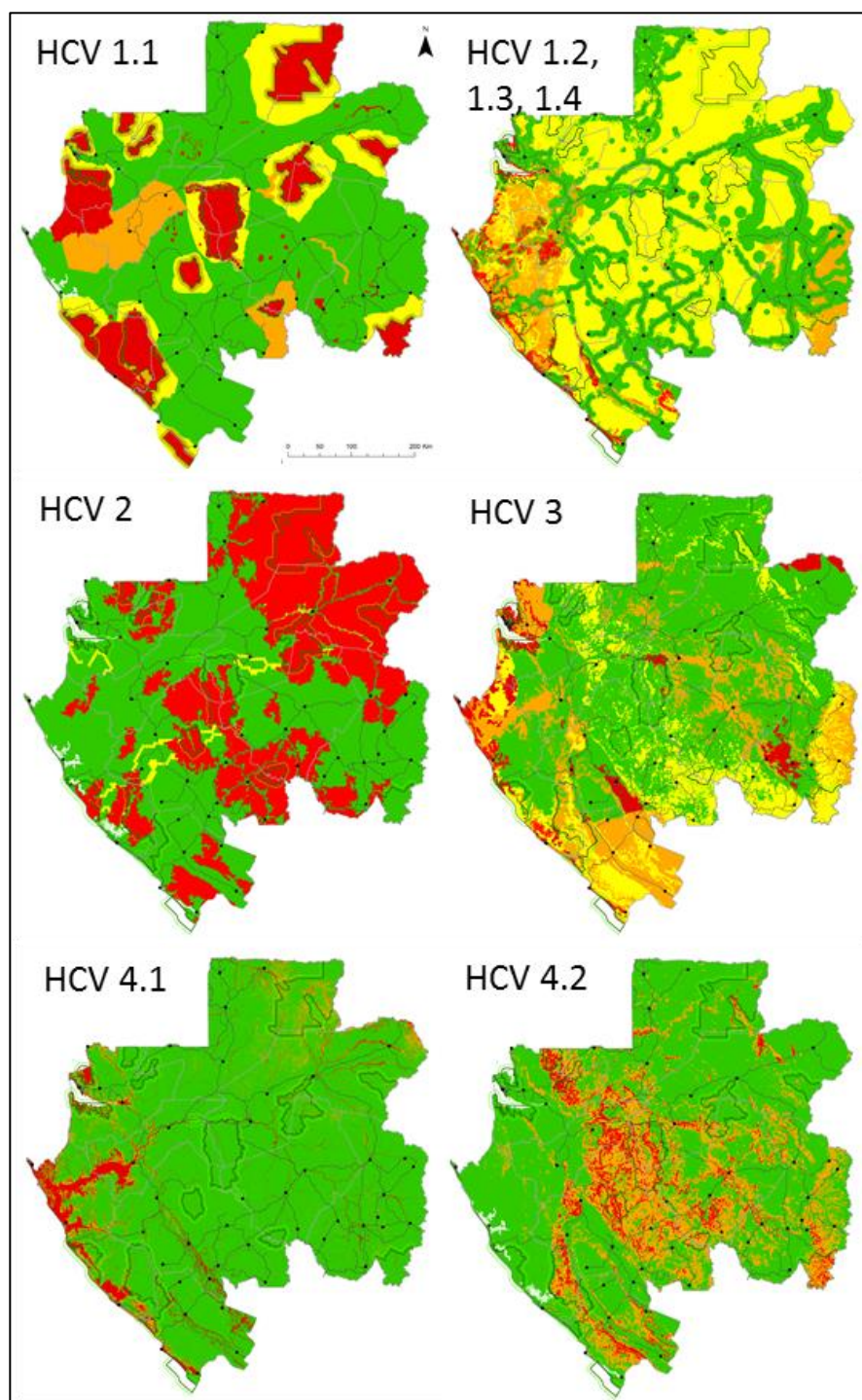
We then proposed four management categories for HCV resources – a 'green' zone where industrial operations are least likely to negatively impact the resource, subject to standard management protocols including an EIA; a 'yellow' or 'orange' zone where resources are vulnerable and development activities should only be considered with medium or high-level management; and a 'red' zone in which development should be prohibited to conserve its High Conservation Value.

Both the mapping and management categories are in the testing-phase and are only used to highlight potentially sensitive areas for development, with the intention to improve their applicability in the coming year.

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<sup>80</sup> Stewart, C. and Rayden, T. 2008. Une interprétation nationale des forêts à haute valeur pour la conservation pour le Gabon. Proforest, U.K.





**FIGURE 20: INDICATIVE HCV MANAGEMENT ZONES FOR 1.1. PROTECTED AREAS, 1.2 THREATENED AND ENDANGERED SPECIES, 1.3 ENDEMIC SPECIES, 1.4 AREAS OF CRITICAL SEASONAL USE, HCV 2 GLOBALLY, REGIONALLY OR NATIONALLY SIGNIFICANT LARGE LANDSCAPE AREAS, HCV 3 RARE, THREATENED OR ENDANGERED ECOSYSTEMS, HCV 4.1 FORESTS CRITICAL TO WATER CATCHMENTS, HCV 4.2 FOREST CRITICAL TO EROSIONS CONTROL. THESE DATA ARE BEING COLLECTED BOTH AS PART OF AND IN COMPLIMENT TO THE EXISTING NRI MONITORING PROGRAM<sup>81</sup>.**

<sup>81</sup> Non-validated maps that synthesis of biodiversity, protected area, regions with sensitive species distributions, and other HCV categories being considered for inclusion in the NRI methodologies.

**Table 12. Priority Species with Mapped Distributions Used in HCV Identification to be Included in the NRI Surveys as Appropriate** (e.g. when distribution overlap with plots). Criteria include: 1) globally threatened or endangered, IUCN Red List (CR = critically endangered; EN = endangered; VU = threatened); 2) protected by CITES Appendix 1; CMS Appendix 1; AEWA Annex 1, Table 3, Column A; Algiers' Convention; 3) likely nationally threatened, evaluated by taxonomic experts in Gabon, IUCN national Red List criteria; 4) endemic or near-endemic (occurs in  $\leq 3$  countries, including Gabon) and threatened; 5) important proportion of global population in Gabon; 6) rare or special distribution or habitat specialist that should be taken into account to safeguard them. Gabon is currently in the process of adding sensitive plants species to this list.

	Nom Scientifique	Nom en Français	Nom en Anglais	UICN Liste Rouge CR, EN, VU	CITES CMS Alger	Menacee au niveau nationale	Endémique Presque-end	Population importante	Rare et/ou spécialiste d'habitat
Reptile	<i>Pelusios carinatus</i>	Péluse carénée	Keeled hinged terrapin						
	<i>Pelusios marani</i>	Péluse de Maran	Maran's hinged terrapin						
	<i>Crocodylus niloticus</i>	Crocodile du Nil	Nile crocodile		CITES I Alger B				
	<i>Cynisca bifrontalis</i>	Amphisbène d'Omboué	Omboue worm lizard						
	<i>Leptotyphlops perreti</i>	Serpent-ver de Perret	Perret's worm snake						
	<i>Letheobia pauwelsi</i>	Serpent aveugle de Pauwels	Pauwels' blind snake						
	<i>Hydraethiops laevis</i>	Couleuvre aquatique ocellée	Ocellate water snake						
	<i>Pelecanus rufescens</i>	Pélican gris	Pink-backed Pelican		Alger A				
	<i>Mycteria ibis</i>	Tantale ibis	Yellow-billed Stork		Alger A				
	<i>Ephippiorhynchus senegalensis</i>	Jabiru d'Afrique	Saddle-billed Stork		Alger A				
Oiseau	<i>Threskiornis aethiopicus</i>	Ibis sacré	Sacred Ibis		Alger A				
	<i>Platalea alba</i>	Spatule d'Afrique	African spoonbill		Alger A				
	<i>Falco peregrinus</i>	Faucon pèlerin	Peregrine Falcon		CITES I Alger B				
	<i>Pseudochelidon eurystomina</i>	Pseudolangrayen d'Afrique	African river martin	DD NT					
	<i>Bradypterus grandis</i>	Bouscarle géante	Dja River Warbler						
	<i>Picathartes oreas</i>	Picatharte à cou gris	Grey-necked Picathartes	VU C2a(i) VU C2a(i)	CITES I				
	<i>Ploceus subpersonatus</i>	Tisserin à bec grêle	Loango Weaver						
	<i>Gorilla gorilla</i>	Gorille de l'ouest	Western lowland gorilla	CR	CITES I CMS I Alger A				
	<i>Pan troglodytes</i>	Chimpanzé	Chimpanzee	EN	CITES I Alger A				
	<i>Colobus satanas</i>	Colobe noir	Black colobus	VU					
Mammifère	<i>Mandrillus sphinx</i>	Mandrill	Mandrill	VU	CITES I Alger B				
	<i>Cercocebus torquatus</i>	Cercocèbe à collier blanc	Red-capped mangabey	VU					
	<i>Cercopithecus solatus</i>	Cercopithèque à queue de soleil	Sun-tailed guenon	VU					
	<i>Leptailurus serval</i>	Serval	Serval		Alger B				
	<i>Caracal aurata</i>	Chat doré	Golden cat		Alger A CITES I				
	<i>Panthera pardus</i>	Panthère	Leopard		Alger B				
	<i>Trichechus senegalensis</i>	Lamantin	Manatee	VU	CITES I CMS I/II Alger A				
	<i>Loxodonta africana</i>	Éléphant	Elephant	VU	CITES I CMS II Alger B				
	<i>Hippopotamus amphibius</i>	Hippopotame	Hippopotamus	VU	Alger B				
	<i>Hylochoerus meinertzhageni</i>	Hylochère	Giant forest hog		Alger B				
	<i>Kobus ellipsiprymnus</i>	Cobe defassa	Waterbuck		Alger B				
	<i>Redunca arundinum</i>	Cobe des roseaux	Southern reedbuck		Alger B				
	<i>Sylvicapra grimmia</i>	Grimm	Grimm's duiker						
	<i>Tragelaphus eurycerus</i>	Bongo	Bongo		Alger B				

## Social and Environmental Safeguards

Gabon has defined several social and environmental standards to develop a regulatory framework that integrates both social and environmental considerations in the implementation of its sustainable development policies. The standards are in full compliance with the Cancun Agreements and related international regulatory frameworks (Table 13). Indicators to monitor compliance with international regulatory mechanisms are in development.

**Table 13. Social and Environmental Standards and Regulatory Framework as Related to Cancun Safeguards**

Cancun Safeguard	Indicators relevant for the NIF and RPP process	Results indicators that will provide data	Existing Legal Framework	Expected frequency of data	Baseline for 2016 (when available)
(a) Actions complement or are consistent with the objectives of national forest programs and relevant international conventions and agreements	Percentage of Environmental Impact Assessment (EIA) done before agricultural concessions are granted, per target area	Product 5. Sustainable development impact assessment approved.	Environmental Code, Sectoral Codes, Sustainable development Law	Annual	?
	Hectares and % of forests with forest management plans	Product 7. Satellite images analyzed and forest cover statistics produced	Agricultural Code	Annual	36 permits
	Number of forestry permits granted following existing regulations		Forest Code	Annual	
	Accessibility of information on permits, harvesting allowances, concessions, forest managements plans:		Forest Code	Annual	
	Percentage of forested surface area in which Environmental and Social Impact Assessment (ESIA) have been completed		Environmental Code and Mining Code	Annual	100%
	· before new mining concessions are granted				
	· before new roads are built				
	Ha of forest registered conditioned upon EIA and in compliance with environmental management plans – in target areas	Product 5. Sustainable development impact assessment approved.		Annual	
(b) Transparent and effective national forest governance structures, taking into account national legislation and sovereignty	Degree of anchoring of the NIF and RPP in the national development policy and institutional fabric				The NIF and RPP are profoundly anchored.
	Number of updated land use laws/policies that take into account the contribution of forests and land use sector to climate change mitigation and other social and environmental benefits	Product 3. Analysis of adaptation for use, compatibility and diagnosis of land			

		Product 6. LUP technical planning capacities strengthened			
		Product 7. Satellite images analyzed and forest cover statistics produced			
(c) Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples	Existence of instruments a) developed b) enacted c) implemented to promote the rights of communities to access and sustainably use forest resources, with due regard given to gender, vulnerable people, local communities and indigenous peoples.	Product 2. Communication, consultation and consensus strategy defined and implemented	Law No. 002/2014 on Sustainable Development in the Republic of Gabon and its implementing provisions	Bi Annual	
		Product 8. Georeferenced participatory rural maps produced	Forestry, Agriculture and Mining Codes		
		Product 11. Technical capacity established to monitor LULUCF			
(d) The full and effective participation of relevant stakeholders, particularly indigenous peoples and local communities	Ha of land for which consensus on how to use the land is reached among different sectors and stakeholders in target areas	Product 8. Georeferenced participatory rural maps produced		Annual	
	A functional, recognized multi-stakeholder mechanism (e.g. civil society platform, representative on a Steering Committee, participatory monitoring mechanism) to accompany the National Investment Framework cycle :			Twice a year	Steering Committee
	a. Exists				
	b. Exists but lacks quality, recognition and regularity				
	c. Exist and is recognized and systematic				
	Accessibility by public, media and civil society to NIF and their M&E plans, data and results				Web site
(e) Actions are consistent with the conservation of natural forests and biological diversity, ensuring that actions are not used for the conversion of	Area (ha) of new agriculture lands resulting from forests conversion in target areas:	Product 7. Satellite images analyzed and forest cover statistics produced		Annual	14 925 ha for industrial agriculture. Other data can be supplied by

natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits	- Excluding plantations				participative mapping.
	- Including plantations				
	Existence of policies and legal frameworks limiting conversion of natural ecosystems (forest) to agricultural concessions	Product 5. Sustainable development impact assessment approved.		Annual	
	Existence of policies and legal frameworks limiting conversion of	Product 4. Preliminary version of LNUP completed			
	natural ecosystems (forest) to	Product 5. Sustainable development impact assessment approved.			
	mining and / or oil concessions				
	National land cover and land use regular comparable maps	Product 11. Technical capacity established to monitor LULUCF	Decree establishing the national land allocation commission	Annual	
	a) produced	Product 8. Georeferenced participatory rural maps produced			
	b) Actively maintained	Product 7. Satellite images analyzed and forest cover statistics produced			
	c) used to coordinate with other sectoral ministries				
	d) officially released				

## Component 5: Schedule and Budget

### Standard 5 the R-PP text needs to meet for this component: Completeness of information and resource requirements

The R-PP proposes a full suite of activities to achieve REDD-plus readiness, and identifies capacity building and financial resources needed to accomplish these activities. A budget and schedule for funding and technical support requested from the FCPF and/or UN-REDD, as well as from other international sources (e.g., bilateral assistance), are summarized by year and by potential donor. The information presented reflects the priorities in the R-PP, and is sufficient to meet the costs associated with REDD-plus readiness activities identified in the R-PP. Any gaps in funding, or sources of funding, are clearly noted.

**Table 14. Activities Calendar for Activities Planned within the NIF and R-PP Framework**

Activities/ years	Y1	Y2	Y3	Y4	Y5
<b>Outcome 1. Key Land-Use Planning Activities being conducted in partnership with CAFI</b>					
Finalize, print and distribute the NLUP V0					
Implement the CRRNATs and the CPRRNATs					
Resolve Land Use Conflicts and validate the NLUP V1					
Establish a Mapping and Data Management Unit within AGEOS					
Communicate and consult at the provincial and departmental levels					
Provide key information for NLUP V2					
Support decision-making for the development of the NLUP V2					
Evaluate the impact of the sustainable development of the NLUP V2					
Communicate and consult with local and national stakeholders to finalization and validate the NLUP VF					
Capacity building for the establishment and strengthening of the Spatial Data Management Unit within AGEOS and the CRRNATs					
<b>Outcome 2. Key Forest Observation and Monitoring Activities being conducted in partnership with CAFI</b>					
Formulate and apply a methodology for analyzing satellite images and update maps and statistics related to changes in forest cover					
Satellite monitoring for the spatial coverage of villages					
Satellite monitoring for activities relating to the development of forests, industrial and food-producing agriculture, and mining development					
Establishing NNRFOS on the ground					
Mapping of stocks and carbon flows of the biomass					
Capacity building for Gabon to ensure sustainability					
<b>Outcome 3. Key activities to reduce emissions from the forestry sector proposed to the FCPF</b>					
<b>Activities / Years</b>	<b>Y1</b>	<b>Y2</b>	<b>Y3</b>	<b>Y4</b>	<b>Y5</b>
Develop improved methodology for calculating emissions from degradation					
Design national study and train inventory team to conduct work					
Implement methodology on a national scale to calculate emissions from forestry sector					
Design and implement a strategy to Reduce Emissions from logging					
Evaluate the potential of reforestation, stock enhancement, and plantation programs					
Design strategy for certifying forestry concessions with the "Green Gabon" Label					

**Table 15. Budget Summary for Activities defined within the NIF and R-PP Framework.** All costs are presented in K\$.

<b>Outcome 1. National Land Use Plan</b>	<b>Total cost over 5 years</b>	<b>Y1</b>	<b>Y2</b>	<b>Y3</b>	<b>Y4</b>	<b>Y5</b>
<b>Output 1. Current state of land use documented and validated</b>	950,3	271,7	169,7	169,7	169,7	169,7
Finalize and print the NLUP V0 and distribute it to stakeholders	.0.0	0.00	0.00	0.00	0.00	0.00
Set up the CRRNATs and the CPRRNATs	88.20	29.40	14.70	14.70	14.70	14.70
Set up the CRRNATs and the CPRRNATs	37.10	37.10	0.00	0.00	0.00	0.00
Set up the CRRNATs and the CPRRNATs	825.00	205.20	155.00	155.00	155.00	155.00
<b>Output 2. Strategy for Communication, Consultation and Consensus Defined and Implemented</b>	4 492,6	1 110,3	859,9	859,9	859,9	802,6
Communications and consultations at the provincial and departmental level	4 355.2	1 110.3	859.90	859.90	859.90	665.20
Local and national consultations for the finalization and validation of the NLUP VF	137.40	0.00	0.00	0.00	0.00	137.40
<b>Output 3. Analysis of key elements for adapting to final use, compatibility and diagnosis of the land</b>	5 330,8	1 980,3	1 296,3	1 202,3	834,4	17,5
Providing key information to NLUP V2	5 330.8	1 980.3	1 296.3	1 202.3	834.40	17.50
<b>Output 4. Completion of the draft National Land Use Plan</b>	133,1	0,0	0,0	56,6	76,6	0,0
Support for analysis and decision-making for the development of the NLUP V2	133.10	0.00	0.00	56.60	76.60	0.00
<b>Output 5. Evaluation and impact of sustainable development finalized and approved</b>	98,0	0,0	0,0	26,0	36,0	36,0
Evaluation of the impact of sustainable development	98.00	0.00	0.00	26.00	36.00	36.00
<b>Output 6. Technical planning capacities for land use strengthened</b>	75,0	15,0	15,0	15,0	15,0	15,0
Bolstering the capacities of NLUP data within AGEOS	75.00	15.00	15.00	15.00	15.00	15.00
<b>TOTAL GENERAL Outcome 1 – NLUP</b>	<b>11079.70</b>	<b>3377.20</b>	<b>2340.90</b>	<b>2329.40</b>	<b>1991.50</b>	<b>1040.80</b>
<b>Outcome 2. NNRFOS</b>	<b>Total cost over 5 years</b>	<b>Y1</b>	<b>Y2</b>	<b>Y3</b>	<b>Y4</b>	<b>Y5</b>
<b>Output 7. Satellite images analyzed and statistics relating to forest cover and changes in forest cover produced</b>	769,0	403,6	91,4	91,4	91,4	91,4
Development and application of a methodology for analyzing satellite imagery and updating maps and statistics relating to forest cover change	769.00	403.60	91.40	91.40	91.40	91.40
<b>Output 8. Georeferenced Participatory Rural Maps Produced</b>	150,0	30,0	30,0	30,0	30,0	30,0
Monitoring satellite mapping of the spatial influence of the villages	150.00	30.00	30.00	30.00	30.00	30.00
<b>Output 9. Permanent forest plots and transects and biodiversity established</b>	2 433,3	917,2	758,0	758,0	0,0	0,0
Implementation of a NNRFOS at the field level	2 433.3	917.20	758.00	758.00	0.00	0.00

<b>Output 10. Biomass maps updated periodically</b>	190,0	0,0	95,0	95,0	0,0	0,0
Mapping of stocks and carbon flows of biomass	190.00	0.00	95.00	95.00	0,0	0,0
<b>Output 11. Technical capacity for monitoring UTCF established</b>	2 304,0	484,0	489,0	489,0	421,0	421,0
Satellite tracking of logging, industrial and subsistence agriculture, mining and urban and rural sprawl	2 030.0	406.00	406.00	406.00	406.00	406.00
Strengthening the monitoring capacity of the UTCF	274.00	78.00	83.00	83.00	15.00	15.00
<b>TOTAL GENERAL – Outcome 2 - NNRFOS</b>	<b>5846.30</b>	<b>1834.80</b>	<b>1463.40</b>	<b>1463.40</b>	<b>542.40</b>	<b>542.40</b>
<b>Outcome 3. Reduced Emissions from Forestry</b>	<b>Total cost over 2 years</b>	<b>Y1</b>	<b>Y2</b>	<b>Y3</b>	<b>Y4</b>	<b>Y5</b>
<b>Output 12. Improved baseline emissions calculations from the forestry sector</b>	<b>932.34</b>	<b>586.57</b>	<b>345.78</b>			
Activity 1.1. Develop and compare improved methodologies for calculating emissions from degradation.	145.54	145.54	0.00			
Activity 1.2. Design national scale sampling program and train inventory team to conduct work at a national scale	95.25	95.25	0.00			
Activity 1.3. Implement improved degradation methodology in forestry concessions at national scale to calculate emissions from forestry sector	691.55	345.78	345.78			
<b>Output 13. A national emissions reduction strategy for the forestry sector exists and is implemented</b>	<b>921.11</b>	<b>921.11</b>	<b>0.00</b>			
Activity 2.1. Design and implement a strategy to Reduce Emissions from logging operations (building on and expanding data from Activity 1.1)	486.43	486.43	0.00			
Activity 2.2. Evaluate the potential of reforestation and or wood plantation programs, particularly in highly degraded forests as an additional means of reducing emissions from the forestry sector	100.68	100.68	0.00			
Activity 2.3. Design and implement a strategy for certifying forestry concessions engaged in the Gabon emissions reduction program with the "Green Gabon" Label	334.00	334.00	0.00			
<b>Overhead @ 5%</b>	<b>92.67</b>	<b>75.38</b>	<b>17.29</b>			
<b>TOTAL GENERAL Outcome 3 - Reduced Emissions from Forestry Sector</b>	<b>1946.12</b>	<b>1583.06</b>	<b>363.06</b>			
<b>TOTAL OUTCOME 1, 2 AND 3</b>	<b>18872.12</b>	<b>6795.06</b>	<b>4167.36</b>	<b>3792.80</b>	<b>2533.90</b>	<b>1583.20</b>

More detailed budgets are provided in Annex 3. Management and coordination costs associated with program implementation are presented in Annex 3, Table 21.



## Component 6: Design a Program Monitoring and Evaluation Framework

### Standard 6 the R-PP text needs to meet for this component: Design a Program Monitoring and Evaluation Framework

The R-PP adequately describes the indicators that will be used to monitor program performance of the Readiness process and R-PP activities, and to identify in a timely manner any shortfalls in performance timing or quality. The R-PP demonstrates that the framework will assist in transparent management of financial and other resources, to meet the activity schedule.

### Project summary

The specific aim of Gabon's RPP is to compliment efforts addressed by the Gabon-CAFI to **minimize and avoid emissions from the anticipated drivers of future deforestation** and degradation, which will go hand in hand with the economic diversification and development activities. The R-PP aims to extend upon these initiatives to **reduce emissions from the forestry sector** by providing improved knowledge, identifying advanced methodological and technological solutions, and evaluating innovative incentives to improve forestry management and monitoring at a national scale.

Gabon submitted its Intended Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC) in April of 2015. Because a high percentage of Gabon's estimated emissions are from the forest sector, the NDC is founded to a large extent on sustainable management of forests and sound land use planning. In this respect, the PNAT will serve secondarily as a mechanism of regulation that will ensure that Gabon respects its NDC. The completion of the Natural Resource and Forest Monitoring System (Component 4) will serve as a transparent means for evaluating, monitoring and reporting implementation of the PNAT as well as Gabon's compliance with the NDC target actions. Completion of both the PNAT and Natural Resource and Forest Monitoring System are of primary importance for Gabon to reach its goals of *minimizing and avoiding emissions* from new development initiatives – an effort supported in a partnership developed between Gabon and the Central Africa Forest Initiative (CAFI). But, given the relatively high percentage of emissions estimated to come from the forestry sector (see component 3), Gabon is also committed to reducing emissions from forestry operations by (1) improving knowledge of current emission levels from forest degradation in logging concessions; (2) defining and implementing necessary guidelines for improved forestry management with increased and specific emphasis on carbon (RIL-C); and (3) examining the potential for reforestation and national "label" programs to serve as additional means by which emissions from the forestry sector may be further reduced.

**Budget Summary** No funds are requested or required to develop the M&E strategy for the NIF and R-PP Framework. A consolidated monitoring and evaluation plan, including an implementation schedule is provided in Annex D (Table 22). Detailed budgets and timelines for the integrated program implementation are provided in Component 5. Summarized budgets are provided in Component 2c and 5.

## Results framework for the Gabon NIF and R-PP

**Table 16. Indicators and outputs of Gabon's NIF and RPP framework.** For each of the three expected major outcomes, a list of the planned activities is provided (see component 2c and component 5 for further detail). For each activity, the pre-implementation reference situation and the post-implementation situation are defined. Anticipated result indicators are provided. Additional outputs monitoring and evaluation details for this project are provided in section 2c (logical framework high level outcome indicators) and 4b (safeguard indicators associated with program implementation).

Activities	Reference situation (2016)	Post-NIF/RPP situation	Outcome	Output indicators and means of verification
<b>Completion of an NLUP - Effect 1. Optimum planning of land allocations</b> <b>Outcome indicators:</b> <ul style="list-style-type: none"> <li>The NLUP is finalized (baseline: NLUP V0)</li> <li>The majority of stakeholders express their satisfaction regarding i) the process and ii) the result (baseline: N/A; MOV: stakeholder survey)</li> <li>The NLUP is integrated into policy documents of different ministries (MOV: technical and policy documents of Ministries)</li> </ul>				
Finalize and print the NLUP Version 0 and distribute it to stakeholders	NLUP Version 0 being distributed	NLUP Version 0 distributed to stakeholders	Outcome 1. Current state of land allocation documented and validated	Existence and validation of the land use planning document  (MOV: minutes of the validation meetings)
Set up the CRRNAT and the CPRRNATs	Land allocation without inter-ministry coordination or involvement of the provincial authorities and stakeholders	Effective inter-ministry coordination and involvement of the authorities and stakeholders at provincial level		
Resolve land allocation conflicts and endorse NLUP Version 1	Cases of land allocation overlaps which are juridically incompatible	Land allocations optimized and conflict-free		
Establish a Mapping and Data Management Unit within the AGEOS	Lack of a data management unit specific to the NLUP within the AGEOS	Data management unit of the NLUP within the AGEOS operational and tested		
Communications and consultations at provincial and departmental level	No consultation of the stakeholders or populations at provincial and departmental level concerning the allocation of land	Process of preparing the NLUP open and participatory, involving wider consultations at local and national level	Outcome 2. Strategies for communication, consultation and consensus-finding defined and implemented	Number of communication products
Consultations in preparation for finalization and validation of the NLUP Final Version				Number of consultations, disaggregated by provinces and departments 8 MOV: consultation reports)
Supply key information to NLUP Version 2	Information on the allocations of land insufficient and not centralized	Process of preparing the NLUP including the collection, centralization and analysis of key information	Outcome 3. Analysis of the fitness for purpose, the compatibility and the analysis of the land	Existence of the analyses
Analysis and support to the decision	Lack of a trans-sectoral vision of a method to support decision-making on land allocations	Decision-making on policy facilitated by a multi-criterion decision-making support method	Outcome 4. Preliminary version of the NLUP completed	Existence of the preliminary version of the NLUP

<b>Evaluation of impact of sustainable development</b>	Lack of consideration of the objectives of sustainable development in land allocations	NLUP compatible with the objectives of sustainable development, compensatory measures implemented	Outcome 5. Impact assessment of sustainable development approved	Existence of the evaluation  Validation of the evaluation (MOV : validation meeting minutes)
<b>Capacity-building for the Data Management Unit of the NLUP within the AGEOS</b>	Insufficient technical capacity within AGEOS	Technical capacity of the Data Management Unit of the NLUP enhanced	Outcome 6. Technical capacity for land use planning enhanced	Number of trained personnel (disaggregated by sex)
<b>Completion of an NNRFOS - Effect 2. Monitoring of the LULUCF sector</b> <b>Outcome indicators:</b> <ul style="list-style-type: none"> <li>• Availability of updated data</li> <li>• Accessibility of updated data</li> <li>• Frequency of updates</li> </ul>				
<b>Preparation and implementation of a methodology for analysis of the satellite images and annual updating of the maps and statistics</b>	Methodology for mapping of the forest cover not automated	Use of an automated image-processing setup for mapping the forest cover and changes	Outcome 7. Satellite images analyzed and forest cover statistics and maps produced	Existence of the image analysis reports  Existence and availability of forest cover statistics
<b>Satellite tracking (mapping) of the spatial extent of the villages</b>	Lack of participatory georeferencial maps of rural areas	Spatial extent of the villages georeferenced and tracked	Outcome 8. Participatory georeferencial maps of rural areas produced	Existence of georeferenced rural maps  Satisfaction of stakeholders who have participated on 1) the process ii) the result
<b>Establishment of an NNRFOS on the ground</b>	Network of 200 IRN plots established	Network of 500 IRN plots and 300 biodiversity transects established	Outcome 9. Permanent plots and transects of forests and biodiversity established	Existence of plots and transects
<b>Mapping of the stocks and flows of carbon in the biomass</b>	Map of the carbon stocks in the biomass based on an insufficient number of IRN plots	Map of carbon stocks in the biomass consolidated on the basis of the data from 500 IRN plots	Outcome 10. Biomass maps periodically updated	Existence and availability of updated biomass maps
<b>Satellite tracking of forestry and agro-industrial activities, foodstuff production and rural and urban spread</b>	Lack of satellite tracking of sectoral activities potentially acting as drivers of deforestation and forest degradation	Regular satellite tracking of the LULUCF sector and deforestation alert system operational	Outcome 11. Technical capacity for tracking the LULUCF sector established	Number of trained personnel (disaggregated by sex)
<b>Strengthening of the capacities for tracking the LULUCF sector</b>	Insufficient capacity	Capacity of the teams enhanced		

Emissions from the forestry sector are reduced - Effect 1. Improved forest management and enhanced production is practiced in forestry concessions at a national scale				
<b>Outcome indicators:</b> <ul style="list-style-type: none"> <li>Improved emissions calculations exist. Data available in NNRFOS data base.</li> <li>National Strategy for improved forest management (e.g. RIL-C) is validated by appropriate Ministries.</li> <li>Private Sector Operators implement methodologies. Emissions reduced without negatively impacting production. Annual field evaluations and reports.</li> </ul>				
Develop a improved methodologies for calculating emissions from degradation	Methodology for calculating emissions retains high degree of estimate error and low confidence.	Field data collection and statistical approaches employed result in greater confidence and improved precisions of emissions estimates from degradation.	Output 12. Improved emissions calculations from the forestry sector are available.	Existence of methodological protocols.
Design national scale study and train inventory team to conduct work at a national scale	Insufficient capacity			Study design and protocols available. Training manuals and reports. Number of trained personnel.
Implement selected methodology on a national scale to calculate emissions from forestry sector	Lack of data			Data available in the NNRFOS. Number of forestry concessions completed.
Design and implement a strategy to Reduce Emissions from logging operations	Carbon dimensions to current forestry guidelines are absent from current practice.	Improved forestry practices that specifically consider emissions from each step in the production cycle are practiced nationally.	Output 13. A national emissions reduction strategy for the forestry sector is defined and implemented.	Annual impact assessments and reports.
Evaluate the potential of reforestation and or stock enhancement programs	A preliminary assessment of plantation potential for Gabon savanna habitats has been conducted by ONF. Additional information and analysis required for degraded forests.	Gabon has evaluated reforestation, stock enhancement, and plantation programs for economic, carbon, and biodiversity costs and benefits. The analysis is included in the National Emissions Reduction Strategy.		Technical report
Design strategy for certifying forestry concessions with the "Green Gabon" Label	Incentives for forestry operators to implement RIL-C techniques remains inadequate	An (inter)-nationally recognized forestry "best practices" label - that include specific carbon impacts - creates potential for (future) improved market value for forestry operators.		Technical report

Annex A.

### **A.2.1 Sub-regional and national satellite observation programs**

Central Africa has the second largest tropical forest in the world. Faced with the problems of deforestation, forest degradation and new challenges posed by climate change, various programs using satellite observation technologies have been set up by the Central African States and their institutional, technical and financial partners.

In Gabon, AGEOS has been involved in many of these programs. Created by Ordinance No. 002 / PR / 2010 (PR, 2010a)<sup>82</sup>, ratified by Law n ° 025/2010 (PR, 2010b)<sup>83</sup>, its powers, organization and functioning have been established by Decree No. 0205 / PR / MENP / 2015 (PR, 2015)<sup>84</sup>.

AGEOS is a public scientific, technological and environmental institution whose mission is to contribute to the implementation of the policy of the GoG in collecting, analyzing and making available remote sensing data on the national territory for the sustainable management of the environment, natural resources, land use, land-use planning and research and innovation. It was inaugurated in August 2015 and is currently receiving satellite data over a wide area, including Sierra Leone in the north, Rwanda in the east, and Angola in the south.

Below is a summary of the various often interconnected regional and national projects and programs that contributed to the creation and consolidation of AGEOS and the development of Gabon's UTCF mappings:

- Tropical Forest Spatial Observation Project (OSFT): Initiated at the 2009 Climate Summit in Copenhagen, it was finally launched in 2011 by AFD, with funding of € 8.5 million. Implemented by a consortium led by the Institut Géographique National-France / International (IGN-FI), this project made it possible to make SPOT 4 and SPOT 5 satellite images available to the countries of Central Africa as well as images of very high resolution, SPOT 6 and SPOT 7.

With a resolution of 1.5 m to 6 m, SPOT 6 or SPOT 7 images can detect objects of the same size in the field. These satellites perform a revolution around the earth in 101 minutes, and thus permanently take photos of the forests. Images acquired must have a cloud cover of less than 20 percent to be usable, which is often difficult in Gabon. These images were systematically ortho-rectified by spatio-triangulation before they were made available.

In Gabon, AGEOS was designated a national authority and signed a license to use images in January 2013, enabling it to use, share and copy SPOT products in the framework of national projects to preserve forest cover.

- GSE-FM REDD Extension Project: Created by the GSE-FM project (see **Part 2.1.1 above**), the REDD Extension sub-project was launched at the international level in 2009 to address forest cover monitoring needs. In this context, Gabon received the support of a consortium led by the company SIRS<sup>85</sup> between January 2010 and March 2014.

AGEOS has thus benefitted from close collaboration with the SIRS teams as well as with various organizations of expert consultants from the Research Institute for Development (IRD), the Centre for International Cooperation in Agricultural Research for Development (CIRAD), the National Centre for Agricultural Machinery Engineering, Water and Forestry (CEMAGREF), etc.

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<sup>82</sup> Presidency of the Republic, Ordinance No. 002 / PR / 2010 on the establishment, attributions and organization of the Gabonese Agency for Space Studies and Observations. Libreville - Gabonese Republic, February 2010.

<sup>83</sup> Presidency of the Republic, Law No. 025/2010 concerning the ratification of the ordinance relating to the creation and organization of a Gabonese Agency for Space Studies and Observations. Libreville-Gabonese Republic

<sup>84</sup> Présidence de la République – Ministère de l'économie numérique et de la poste. Décret n°0205/PR/MENP/2015 fixant les attributions, l'organisation et le fonctionnement de l'Agence gabonaise d'études et d'observations spatiales. Libreville – République gabonaise, février 2010.

<sup>85</sup> Cf. <http://www.sirs-fr.com/en>

The project was carried out in three phases between January 2010 and March 2014, and resulted in a forest cover monitoring system ("*wall to wall*") at the national level that led to the mapping of forest cover in 1990, 2000 (whole country) and 2010 (partial coverage: 102,000 km<sup>2</sup>). The project also analyzed the needs of AGEOS; developed a sustainability plan; put in place a robust validation method for satellite treatments; and helped build local capacity to monitor GHG emissions from the UTCF.

- Assisted Environmental Satellite Monitoring Project (SEAS) Gabon: The project was based on a strategic partnership between Gabon (AGEOS), France (AFD, IRD) and Brazil (Instituto Nacional de Pesquisas Espaciais - INPE), with a total budget of € 12 million, € 9 million of which was released by the agreement to convert France-Gabon debts for the preservation of Gabonese forest ecosystems.

In this context, the IRD signed a contract for scientific and technical assistance with AGEOS in March 2011. Extensions were signed in 2013 and 2014 to continue activities. The SEAS Gabon project had two main objectives:

- Creation of a technology platform for the direct reception of satellite imagery. It should be noted that (i) AGEOS signed an agreement with the National Aeronautics and Space Administration (NASA) and the United States Geological Survey (USGS) in February 2013 for the direct reception of LANDSAT 8 data in Gabon; (ii) AGEOS and the Gabonese Strategic Investment Fund (FGIS) signed a partnership agreement ("*Earthlab Gabon*") with TPZ-France in December 2013, including the direct reception of data from the COSMO constellation –SkyMed<sup>86</sup> in Gabon;
- Creation of a Remote Sensing Competence Centre for the Sustainable Management of Forest Ecosystems in Gabon and Central Africa. This Centre, located at the AGEOS, includes a complementary set of elements including a geomatics technical platform, geomatics and multimedia training rooms, and offices and meeting rooms equipped with the appropriate equipment.
- IFN Project: Launched in 2012 by the Ministry of Water and Forests and the Japan International Cooperation Agency (JICA), this project provided equipment for Gabon's National Forest Inventory (NFI) (3, 8 GFCFA, i.e. € 5.8 million) and to train Gabonese trainees for three months in the use of satellite image analysis software;
- GEOFORAFRI project: Funded by the French Global Environment Facility (FFEM) between 2012 and 2016, with a budget of € 3.5 million, it has been implemented in several countries in Central Africa by the IRD. This project promoted the adoption and methodological and technical control of satellite earth observation data, enabling the target country to carry out forest cover monitoring in accordance with the international requirements proposed under the REDD+ mechanism. This project made it possible to finalize the UTCF mapping of Gabon in 2010 (initiated by GSE-FM);
- Central and West African Forest Spatial Observation Project (OSFACO): Launched by AFD in 2016 as a follow-up to the OSFT project, this project has a budget of € 5 million and will run from 2016 to 2018. As with OSFT, oversight is exercised by a consortium led by IGN-FI. The OSFACO project plans to provide SPOT 6 and SPOT 7 images to countries and support the production of UTCF maps. It also plans to organize awareness-raising workshops on the use of satellite imagery and training sessions. In Gabon, the focal point of the project is AGEOS, which thus benefits from satellite imagery, mapping support, specific equipment and capacity building.

All these projects contributed to the establishment and strengthening of AGEOS as well as to the development of Gabon's NNRFOS.

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<sup>86</sup> Cf. <http://www.e-geos.it/cosmo-skymed.html>

## Annex B. Estimates of biomass and forest carbon

### ***Preliminary results***

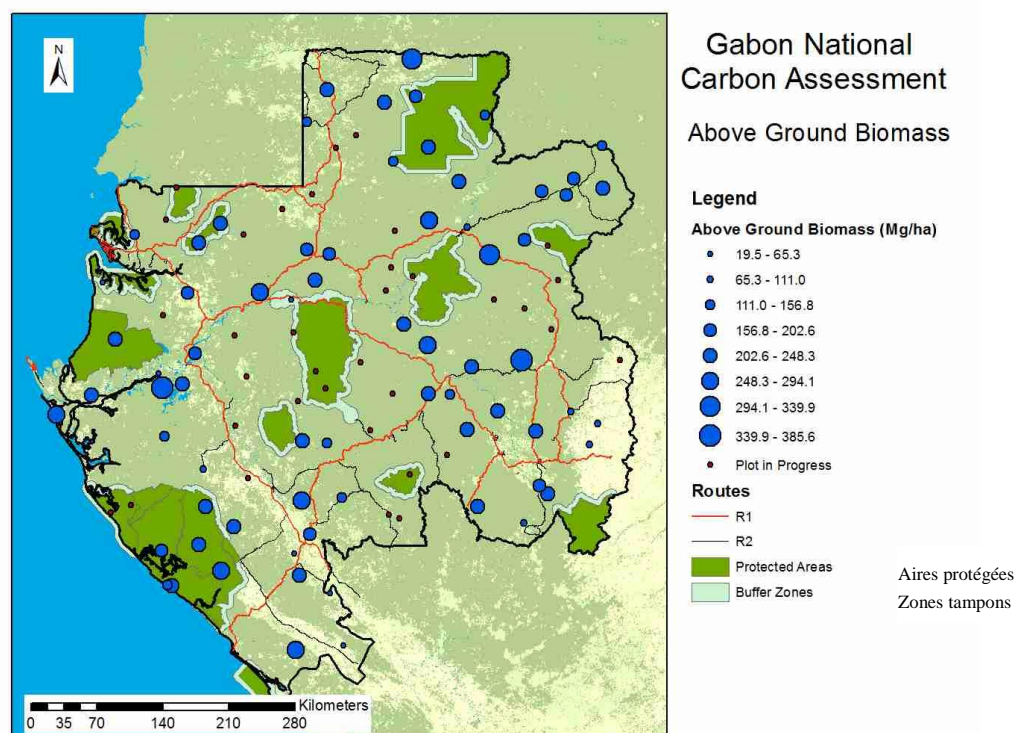
The creation of a forest plot network began in March 2012, with 200 plots established to date. We present an initial analysis of 73 plots. With measurements of the diameter of each trunk, estimates of wood density, and measurements of tree heights, the tree biomass was estimated using the allometric equation of CHAVE et al. (2014) for wet forests (Figure 40).

An initial analysis of 73 plots showed an average biomass of 187.5 Mg / ha (95 percent CI = [169.7, 206.0], approximate bootstrap normal CI), constituting an average carbon stock of 93.8 Mg / ha for Gabon. This biomass value is significantly lower than previously reported values from “research plots” established for scientific studies (Lewis et al., 2009). Researchers often tend to choose pristine sites with large trees, which biases the biomass and carbon estimates upwards. The average biomass of the national parks in Gabon is 192.6 Mg / ha (95 percent CI = [153.7, 233.1]), compared with an average biomass of 186.6 Mg / ha (95 percent CI = [166.3, 206.2]) outside national parks.

**Table 17. Statistical Descriptive Values for 74 Plots of Land Sampled in the First Phase of the NRI (Authors, 2016). Values Are the Mean and 95% Confidence Intervals.**

	<b>Gabon</b>	<b>Outside national parks</b>	<b>Inside national parks</b>
Number of plots	74	63	11
Average aerial biomass (Mg/ha)	187.5 [169.7, 206.0]	186.6 [166.3, 206.2]	192.6 [153.7, 233.1]
Average land surface area (cm <sup>2</sup> )	643.8 [594.5, 691.9]	634,0 [167.7, 206.0]	699.1 [151.3, 232.7]
Average dhh (cm)	23.6 [22.71, 24.21]	23.4 [22.43, 24.29]	24.1 [23.19, 24.91]





**FIGURE 21- MAP OF 73 PLOTS OF ESTABLISHED LAND (AUTHORS, 2016). SIZE OF BLUE CIRCLES INDICATES THE RELATIVE BIOMASS OF EACH PLOT.**

### ***Power analysis: number of plots needed***

Given the investment required to undertake a national carbon inventory, it is important that the size of the inventory (number of plots) responds to the goals of the monitoring program, but at the lowest cost possible. We evaluated the statistical power required to detect changes in forest carbon using the 73 forest plots mentioned above.

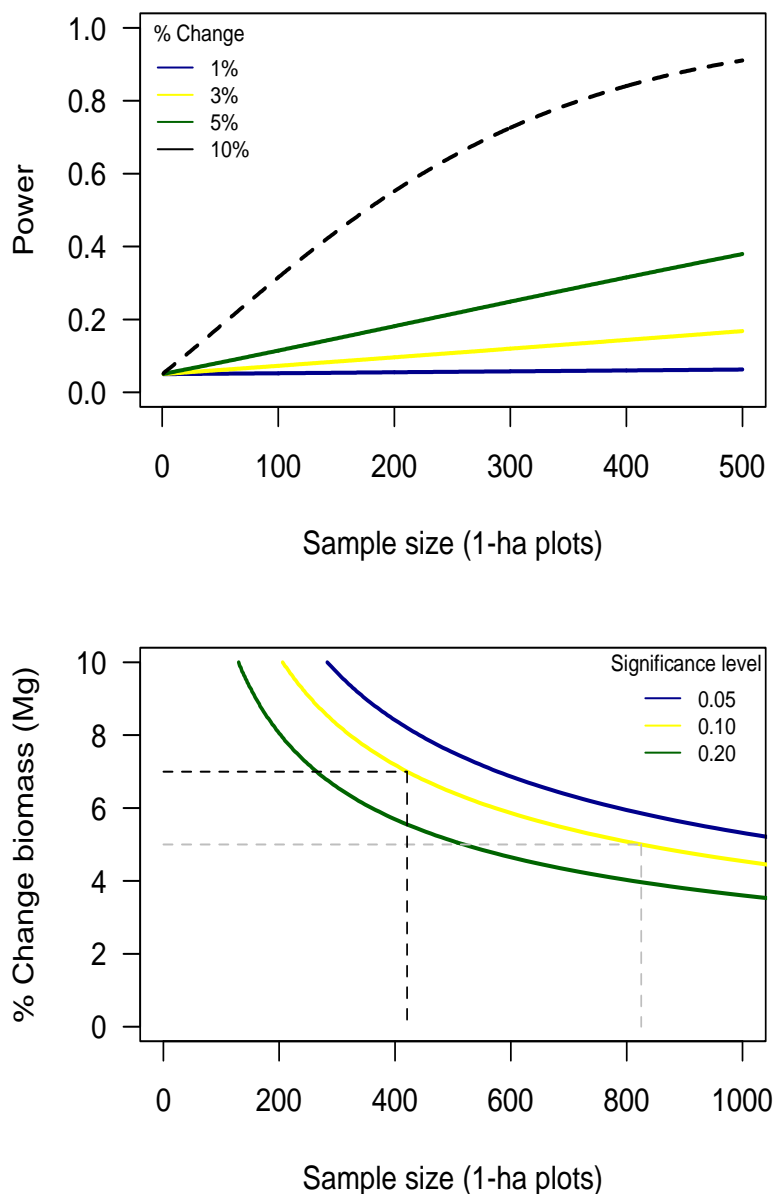
To estimate the statistical power of the NRI to detect change in forest carbon stocks, we adapted the statistical error methods of Westfall et al. (2013). These methods account for dependent observations because the same plots are measured repeatedly, and include a covariance parameter in the variance of the change estimates. We performed power analyses for several Type I error rates ( $\alpha = 0.05, 0.10$  and  $0.20$ ) to examine the relationship between sample size, statistical power, and rate of change in biomass



With a sample of 100 forest plots, the power required to detect a biomass change of 1 to 10 percent is between 5 and 32 percent. The set of 73 plots would be too small to reliably detect changes in biomass or carbon over time. The figures show the statistical power available to detect changes in biomass in various sample sizes, assuming a Type I error rate of 5 percent. The power increases with the increase in the rate of change of the biomass and the size of the sample. The power to detect a change of at least 5 percent is very low except at extremely high sample sizes (> 1000 plots).

This raises the question of what percentage change a monitoring system should be able to detect. Data from 30 plots of one hectare in the rainforest of the Republic of Congo (POULSEN and CLARK, unpublished data) indicate that plot biomass increased by 3.7 percent over five years. This may be an appropriate first approximation for the rate of change in biomass for Gabon, given that one third of the plots are located in a national park and two-thirds of the plots are randomly distributed in an active forest concession.

It may not be feasible to detect a 4 percent change in biomass since the required sample size would be 810 one-hectare plots at a 10 per cent I-type error rate. Otherwise, detection of a 7 percent change in biomass would require 421 plots ( $\alpha = 0.10$ , dotted black line on the 2nd plot) or 577 plots ( $\alpha = 0.05$ ). This analysis indicates that it will take 400 to 600 plots to detect a biomass change of 7 per cent over five years. This estimate may be further refined by means of additional sampling.



**FIGURE 22 - TOP: STATISTICAL POWER GAIN BASED ON NUMBER OF INVENTORY PLOTS; BOTTOM: CHANGE IN AGB VERSUS THE NUMBER OF 1 HA PLOTS (AUTHORS, 2016). BOTTOM GRAPH: THE BLACK DOTTED LINE INDICATES THE SIZE OF THE SAMPLE NEEDED TO DETECT A CHANGE IN BIOMASS OF 7 PER CENT WITH A TYPE I ERROR RATE OF 10 PERCENT. THE GRAY DOTTED LINE INDICATES THE NUMBER OF PLOTS NEEDED TO DETECT A CHANGE IN BIOMASS OF 5 PER CENT.**

# Annex C. Budget Details

**Table 18. Budget Details for Outcome 1: Completion and implementation of a National Land Use Plan will result in minimized emissions from new development activities.**

NB : all costs are in k \$	Unit	Quantity	Price per unit	Total cost over 5 years	Y1	Y2	Y3	Y4	Y5
Output 1. Current state of land use documented and validated				950,3	271,7	169,7	169,7	169,7	169,7
<b>Finalize and print the NLUP V0 and distribute it to stakeholders</b>				<b>.0.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<u>Revise and formalize the NLUP V0</u>				0	0	0	0	0	,0.0
<b>Set up the CRRNATs and the CPRRNATs</b>				<b>88.2</b>	<b>29.4</b>	<b>14.7</b>	<b>14.7</b>	<b>14.7</b>	<b>14.7</b>
Defining and formalizing the CRRNATs, CPRRNATs and local level participation	Flat rates			88.2	29.4	14.7	14.7	14.7	14.7
Room rental in Libreville 2 days in Year1, 1 day in Year 2	Meeting	6	3	18	.6.0	3	3	3	3
Meals and coffee breaks for 30 people for 2 days in Year 1, 1 day in Years 2-5	Hj	180	0.03	5.4	1.8	0.9	0.9	0.9	0.9
Perdiems 18 representatives of the Provinces 2 days in year 1, 1 day in years2-5 (transport, housing, food in Libreville)	Hj	108	0.6	64.8	21.6	10.8	10.8	10.8	10.8
<b>Resolve land allocation conflicts and validate NLUP V1</b>				<b>37.1</b>	<b>37.1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<u>Legal advice at the level of ministries and the Prime Minister to resolve disputes relating to land allocation</u>				20.3	20.3	0	0	0	0
Room hire in Libreville 5 days en Year 1	Meeting	5	3	15	15	0	0	0	0
Meal and coffee break for 35 persons 5 days in Year 1	Hj	175	0.03	5.3	5.3	0	0	0	0
<u>National Workshop for the Validation of Conflict Resolutions and NLUP V1</u>				16.8	16.8	0	0	0	0
Room rental in Libreville 1day in Year 1	Meeting	1	3	3	3	0	0	0	0
Meals and coffee break for 100 people in Year 1	Hj	100	0.03	3	3	0	0	0	0
Perdiems for 18 representatives of the Provinces 1j in Year 1 (transport, housing, food in Libreville)	Hj	18	0.6	10.8	108	0	0	0	0
<b>Establish a Mapping and Data Management Unit within AGEOS Activity</b>				<b>825</b>	<b>205.2</b>	<b>155</b>	<b>155</b>	<b>155</b>	<b>155</b>
Bonus for an AGEOS Engineer in Unit Supervision from years 1-5	Hm	60	0.5	30	6	6	6	6	6
Hiring of a database manager at national level from years 1.5	Hm	60	2	120	24	24	24	24	24
Hiring of two GIS technicians from Years 1-5.	Hm	120	1.5	180	36	36	36	36	36

<u>Identification of office space and purchase of equipment</u>				77	42.8	8.6	8.6	8.6	8.6
Purchase of computers, hard drives, and inverters in Year 1 for 4 agents	Material	4	3.2	12.8	12.8	0	0	0	0
Maintenance and renewal of equipment i Years 2-5 for 4 agents	Mainten ance	4	2.56	10.2	0	2.6	2.6	2.6	2.6
Purchase of 2 servers for data storage	Material	2	15	30	30	0	0	0	0
Maintenance and renewal of servers	Mainten ance	4	6	24	0	6	6	6	6
<u>Installing the database</u>				26	18	2	2	2	2
Acquisition of ArcGIS licenses for 4 posts in Year 1	Logistical	4	4.5	18	18	0	0	0	0
Renewal of ArcGIS licenses in Years 2-5	Logistical	16	0.5	8	0	2	2	2	2
<u>Hiring of National Land Use Planning Council</u>				196	39.2	39.2	39.2	39.2	39.2
Legal salary advisor from Years 1-5	Hm	60	3	180	36	36	36	36	36
Perdiems for 40 days of mission per year from Years 1-5	Hj	200	0.08	16	3.2	3.2	3.2	3.2	3.2
<u>Hiring of a national technical adviser in land use planning from Years 1-5</u>				196	39.2	39.2	39.2	39.2	39.2
Technical Advisor Salary from Years 1-5	Hm	60	3	180	36	36	36	36	36
Perdiems for 40 days of mission per year from Years 1-5	Hj	200	0.08	16	3.2	3.2	3.2	3.2	3.2
Output 2. Strategy for Communication, Consultation and Consensus Defined and Implemented				4 492,6	1 110,3	859,9	859,9	859,9	802,6
<b>Communications and consultations at the provincial and departmental level</b>				<b>4 355.2</b>	<b>1 110.3</b>	<b>859.9</b>	<b>859.9</b>	<b>859.9</b>	<b>665.2</b>
<u>Define the Consultation and Communication Plan for the 5-year project</u>				49.6	49.6	0	0	0	0
International Communication Consultant Fees in Year 1	Hm	2	10	20	20	0	0	0	0
Return airline tickets in Year 1	Aircraft	1	3	3	3	0	0	0	0
Perdiems for international consultant for 60 days in Gabon in Year 1	Hj	30	0.15	4.5	4.5	0	0	0	0
Room hire in Libreville 3 days en Year 1	Meeting	3	3	9	9	0	0	0	0
Meal and coffee breaks 25 people 3 days in Year 1	Hj	75	0.03	2.3	2.3	0	0	0	0
Perdiems for 18 representatives of the Provinces 1 day in Year 1 (transport, housing, food in Libreville)	Hj	18	0.6	10.8	10.8	0	0	0	0
<u>Communication equipment</u>				18	10	2	2	2	2

Acquisition of computers (x2), projectors and screens (x2), cameras (x2), video cameras (x2), smartphones (x2) and accessories	Material	2	5	10	10	0	0	0	0
Maintenance and replacement of equipment in Years 2-5	Maintenance	8	1	8	0	2	2	2	2
<u>Communications Products</u>				536	120	104	104	104	104
Products printed from Years 1-5	Annual	5	85	425	85	85	85	85	85
Television broadcasts from Years 1-5	Annual	5	15	75	15	15	15	15	15
Development of website in Year 1	Internet site	1	20	20	20	0	0	0	0
Website maintenance in Years 2-5	Annual	4	4	16	0	4	4	4	4
<u>Establishment of a consultation and information center on land-use planning within each Prefecture</u>				2 380.8	537.6	460.8	460.8	460.8	460.8
Hiring of 48 extension agents Years 2-5	Hm	2880	0.6	1 728.0	345.6	345.6	345.6	345.6	345.6
Purchase furniture and computers for 48 agents in Year 1	Material	48	2	96	96	0	0	0	0
Maintenance and replacement of computers Years 2-5	Annual	192	0.4	76.8	0	19.2	19.2	19.2	19.2
Internet fixed rates and prints for 48 agents from Years 1-5	Annual	240	2	480	96	96	96	96	96
Hiring of 2 drivers in Years 1-5	Hm	120	0.6	72	14.4	14.4	14.4	14.4	14.4
Hiring of 2 national communication experts in Years 1-5	Hm	120	2	240	48	48	48	48	48
<u>Meetings and workshops: annual national meetings from Years 1-4</u>				48	12	12	12	12	0
Room hire 1 day per year in Years 1-4	Meeting	4	3	12	3	3	3	3	0
Communication equipment	Material	4	6	24	6	6	6	6	0
Meal and coffee break for 100 people	Hj	400	0.03	12	3	3	3	3	0
Meetings and workshops: annual departmental meetings 0.5 day from Years 1-4 and additional meetings for 50 per cent of the departments	Meeting			456	114	114	114	114	0
Coffee break for 25 people	Hj	7200	0.01	72	18	18	18	18	0
Communication equipment	Communication	384	1	384	96	96	96	96	0
-				198	49.5	49.5	49.5	49.5	0
<u>Meetings and workshops: annual provincial meetings from Years 1-4</u>									
Room rental 1 day	Meeting	36	1	36	9	9	9	9	0
Communication equipment	Communication	36	3	108	27	27	27	27	0

Meal and coffee break for 50 people	Hj	1800	0.03	54	13.5	13.5	13.5	13.5	0
<u>Missions and daily allowances</u>				76.8	19.2	19.2	19.2	19.2	0
Per diems for 2 national experts and 2 drivers for 60 days of mission per year from Years1-4	Hj	960	0.08	76.8	19.2	19.2	19.2	19.2	0
<u>Purchase of vehicles, maintenance, fuel, insurance</u>				280	136	36	36	36	36
Purchase of 2 4x4 vehicles in Year 1	Vehicle	2	50	100	100	0	0	0	0
Maintenance, fuel and insurance of vehicles from Years 1-5	Annual	10	18	180	36	36	36	36	36
<b>Local and national consultations for the finalization and validation of the NLUP VF</b>				<b>137.4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>137.4</b>
<u>Validation meetings at the departmental level in Year 5</u>				72	0	0	0	0	72
Meal and coffee break for 50 people in 48 departments	Hj	2400	0.03	72	0	0	0	0	72
<u>Provincial validation meetings in Year 5</u>				45	0	0	0	0	45
<u>Rental of room for one day in Year 5</u>		9	2	18	0	0	0	0	18
Meal and coffee break for 100 people in 9 provinces	Hj	900	0.03	27	0	0	0	0	27
<u>Validation meetings at the national level in Year 5</u>				6	0	0	0	0	6
<u>Rental of a room for one day in Year 5</u>		1	3	3	0	0	0	0	3
Meal and coffee break for 100 people	Hj	100	0.03	3	0	0	0	0	3
<u>Missions and daily indemnities</u>				14.4	0	0	0	0	14.4
Per diems for 2 national experts and 2 drivers for 45 mission days in Year 5	Hj	180	0.08	14.4	0	0	0	0	14.4
Output 3. Analysis of key elements for adapting to final use, compatibility and diagnosis of the land				5 330,8	1 980,3	1 296,3	1 202,3	834,4	17,5
<b>Providing key information to NLUP V2</b>				<b>5 330.8</b>	<b>1 980.3</b>	<b>1 296.3</b>	<b>1 202.3</b>	<b>834.4</b>	<b>17.5</b>
<u>Mapping of the agricultural potential of the land</u>				110	110	0	0	0	0
Salary for an international consultant for 3 months in Year 1	Hm	5	10	50	50	0	0	0	0
2 return airline tickets	Air flow	2	3	6	6	0	0	0	0
Per diems for an international consultant for 60 days in Gabon	Hm	60	0,15	9,0	9,0	0,0	0,0	0,0	0,0
Field mission flat rate	Missions	2	10	20	20	0	0	0	0
Laboratory analyses	Analyses	1	25	25	25	0	0	0	0
<u>Modeling of the impacts of climate change on land use</u>				135	67.5	67.5	0	0	0

International consultant in modeling of impacts for 6 months for a year in Year 1 and Year 2	Hm	12	10	120	60	60	0	0	0
2 return airline tickets	Air flow	2	3	6	3	3	0	0	0
Per diems for an international consultant for 30 days in Gabon each year in year 1 and Year 2	Hj	60	0.15	9	4.5	4.5	0	0	0
<u>Village mapping for the use of land and rural land systems</u>				3 567.6	1 116.9	816.9	816.9	816.9	0
Hiring of 24 technical village mapping agents from Years 1- 4	Hm	1152	1.5	1 728.0	432	432	432	432	0
Hiring of 6 drivers from Years 1-4	Hm	288	0.6	172.8	43.2	43.2	43.2	43.2	0
Per diems field missions for 16 agents and 4 drivers 240 days per year from Years 1-4	Hj	28 800	0.02	576	144	144	144	144	0
Village Meetings and Accompanying Compensation	Meeting	2392	0.15	358.8	89.7	89.7	89.7	89.7	0
Purchase of 6 4x4 vehicles in Year 1	Vehicle	6	50	300	300	0	0	0	0
Maintenance, fuel and insurance of vehicles from Years 1-4	Annual	24	18	432	108	108	108	108	0
<u>Mapping of hydrocarbon and mineral deposits and potential for development</u>				121	121	0	0	0	0
International consultant fees 2x6 months in A1 (1 hydrocarbons and 1 mines)	Hm	10	10	100	1000	0	0	0	0
2 return airfares to Gabon	Air flow	4	3	12	12	0	0	0	0
Per diem for 30 days of mission in Gabon	Hj	60	0.15	9	9	0	0	0	0
<u>Economic analysis of the sustainable extraction of natural resources</u>				63	36.5	26.5	0	0	0
International consultant in econometrics for 3 months in Year 1 and 2 months in Year 2	Hm	5	10	50	30	20	0	0	0
Return airfare to Gabon once a year in Years 1 and 2	Air flow	2	2	4	2	2	0	0	0
Per diem for 60 days in Gabon, 30 days in Year 1 and 30 days in Year 2	Hj	60	0.15	9	4.5	4.5	0	0	0
<u>Botanical surveys by the National Herbarium to refine the analysis of land with high conservation value</u>				313.7	177.9	67.9	67.9	0	0
Support to infrastructure, storage and collection of the national herbarium in Year1	Material			75	75	0	0	0	0
Maintenance and replacement of equipment from Years 2-3	Mainten ance	2	15	30	0	15	15	0	0
Per diems for 120 days for field missions per year for 2 national botanists from Years 1-3	Hj	720	0.06	43.2	14.4	14.4	14.4	0	0
Support of two international botanists for 15 days a year in Years 1-3	Hm	3	10	30	10	10	10	0	0
Airline tickets for 2 experts, 1 ticket per year Years 1-3	Expert	6	3	18	6	6	6	0	0

Per diems for 2 international botanists 15 days per year from Years 1-3		90	0.15	13.5	4.5	4.5	4.5	0	0
A 4x4 vehicle		1	50	50	50	0	0	0	0
Maintenance, fuel and insurance of vehicles from Years 1-3		3	18	54	18	18	18	0	0
Establishment of a network of national meteorological monitoring stations				1 020.5	350.5	317.5	317.5	17.5	17.5
International consultant in climatology / meteorology for 1 month per year from Years 1-5	Hm	5	10	50	10	10	10	10	10
International airline tickets from Years 1-5	Air flow	5	3	15	3	3	3	3	3
Per diems of consultant for 30 days a year in Gabon from Years 1-5	Hj	150	0.15	22.5	4.5	4.5	4.5	4.5	4.5
Purchase and transport in Gabon of 20 weather stations from Years 1-3	Material	20	16	320	120	100	100	0	0
Purchase and transport in Gabon of 2 scattering stations		2	7	13	13	0	0	0	0
Construction equipment for 20 weather stations from Years 1-3	Material	20	10	200	66.7	66.7	66.7	0	0
Local labour for the installation and maintenance of 20 weather stations from Years 1-3	Manpower	20	15	300	100	100	100	0	0
Rental of trucks for the transport of equipment from Years 1-3	Rental	20	5	100	33.3	33.3	33.3	0	0
Output 4. Completion of the draft National Land Use Plan				133,1	0,0	0,0	56,6	76,6	0,0
<b>Support for analysis and decision-making for the development of the NLUP V2</b>				<b>133.1</b>	<b>0</b>	<b>0</b>	<b>56.6</b>	<b>76.6</b>	<b>0</b>
Multi-departmental coordination measures				15.6	0	0	7.8	7.8	0
Hiring of room for 2 days a year in Years 3- 4	Meeting	4	3	12	0	0	6	6	0
Meal and coffee breaks 30 people 2 days in Year 3 and 2 days in Year 4	Hj	120	0.03	3.6	0	0	1.8	1.8	0
Hiring of an international consultant to facilitate optimization and decision-making modeling exercises				117.5	0	0	48.8	68.8	0
Fees for an international consultant for 4 months in Year 3 and 6 months in Year 4	Hm	10	10	100	0	0	40	60	
Airline tickets to Gabon in Years 3-4	Air flow	2	2	4	0	0	2	2	
Per diems consulting 45 days a year in Gabon in Years 3-4	Hj	90	0.15	13.5	0	0	6.8	6.8	
Output 5. Evaluation and impact of sustainable development finalized and approved				98,0	0,0	0,0	26,0	36,0	36,0
<b>Evaluation of the impact of sustainable development</b>				<b>98</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>36</b>	<b>36</b>
Development of a methodology and guidelines for conducting a Sustainable Development Impact Assessment				26	0	0	26	0	0



International consultant fees to develop a methodology and guidelines for impact assessment of sustainable development in Year 3	Hm	2	10	20	0	0	20	0	0
Airline tickets for the consultant to travel Gabon in Year 3	Air flow	1	3	3	0	0	3	0	0
Per diems for the consultant for 20 days a year in Gabon in Year 3	Hj	20	0.15	3	0	0	3	0	0
<u>Conducting the Sustainable Development Impact Assessment</u>				72	0	0	0	36	36
Hiring of an international consultant to conduct the Sustainable Development Impact Assessment for 6 months in Years 4-5	Hm	6	10	60	0	0	0	30	30
Gabon consultant's plane tickets	Air flow	2	3	6	0	0	0	3	3
Per diems of the consultant for 40 days / year in Gabon in Years 4-5	Hj	40	0.15	6	0	0	0	3	3
Output 6. Technical planning capacities for land use strengthened				75,0	15,0	15,0	15,0	15,0	15,0
<b>Bolstering the capacities of NLUP data within AGEOS</b>				<b>75</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>
Strengthening Gabon's Land Use Planning Capacity for Project Sustainability				75,0	15	15	15	15	15
Training, workshop, conferences for 5 AGEOS employees from Years 1- 5	Annual	25	3	75	15	15	15	15	15
<b>TOTAL GENERAL Outcome 1 – NLUP</b>				<b>11 079.7</b>	<b>3 377.2</b>	<b>2 340.9</b>	<b>2 329.4</b>	<b>1 991.5</b>	<b>1040.8</b>

**Table 19. Budget Details for Outcome 2: Completion of the National Natural Resources and Forestry Observation System will enable Gabon to both monitor the impacts of the NLUP and meet Tier 3 monitoring standards for GHG emissions/removals in the LULUCF sector.**

NB : all costs are in k\$	Unit	Quantity	Price per unit	Total cost over 5 years	Y1	Y2	Y3	Y4	Y5
Output 7. Satellite images analyzed and statistics relating to forest cover and changes in forest cover produced				769,0	403,6	91,4	91,4	91,4	91,4
<b>Development and application of a methodology for analyzing satellite imagery and updating maps and statistics relating to forest cover change</b>				<b>769</b>	<b>403.6</b>	<b>91.4</b>	<b>91.4</b>	<b>91.4</b>	<b>91.4</b>
<u>Carrying out verification missions according to needs</u>				184.8	77	27	27	27	27
Per diems for 28 days of field missions for one year for 3 agents and et 1 driver for Years 1-5	Hj	560	0.08	44.8	9	9	9	9	9
Purchase of 1 vehicle 4x4	Vehicle	1	50	50	50	0	0	0	0
Maintenance, fuel and vehicle insurance from Years 1-5	Annual	5	18	90	18	18	18	18	18
<u>Hiring of database managers and GIS technicians at the national level</u>				228	45.6	45.6	45.6	45.6	45.6
Bonus for two AGEOS Engineers	Hm	120	0.5	60	12	12	12	12	12
Bonus for an AGEOS Scientific Coordinator	Hm	60	0.8	48	9.6	9.6	9.6	9.6	9.6
Hiring of a Remote Sensing Engineer	Hm	60	2	120	24	24	24	24	24
<u>Identification of office space and purchase of hardware and software</u>				356.2	281	18.8	18.8	18.8	18.8
Purchase of computers for 6 AGEOS agents	Material	6	2	12	12	0	0	0	0
Amortization and replacement of equipment Years 2-5	Material	4	2.4	9.6	0	2.4	2.4	2.4	2.4
Purchase of 5 high-performance workstations	Material	5	10	50	50	0	0	0	0
Transportation of the 5 workstations from Maryland to Gabon	Material	5	2	10	10	0	0	0	0
University of Maryland Fees for Workstation Setup and Setup	Salaries	5	10	50	50	0	0	0	0
Purchase of equipment and field equipment (5 GPS, 1 radiometer, 1 infrared camera, 1 drone, other miscellaneous)	Material	1	57	57	57	0	0	0	0
<u>Performing ground verification mi Amortization and replacement of equipment Years 2-5</u>	Annual	4	11.4	45.6	0	11.4	11.4	11.4	11.4
Per diems for 28 days of field missions per year for 3 agents and 1 driver Years 1-5									
Logistical acquisitions for high performance posts	Licences	5	3	15	15	0	0	0	0

Acquisition of ArcGIS logistical licenses	Licences	6	4.5	27	27	0	0	0	0
Acquisition of 6 logistical ERDAS licenses	Licences	6	10	60	60	0	0	0	0
Logistical update of Years 2-5	Licences	4	5	20	0	5	5	5	5
<b>Output 8. Georeferenced Participatory Rural Maps Produced</b>				<b>150,0</b>	<b>30,0</b>	<b>30,0</b>	<b>30,0</b>	<b>30,0</b>	<b>30,0</b>
<b>Monitoring satellite mapping of the spatial influence of the villages</b>				<b>150</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>
<u>Hiring of national Remote Sensing technicians</u>				150	30	30	30	30	30
Bonus for an AGEOS Remote Sensing Engineer	Hm	60	0.5	30	6	6	6	6	6
Hiring of a Remote Sensing Engineer	Hm	60	2	120	24	24	24	24	24
<u>Satellite tracking (mapping) of the spatial right-of-way of villages</u>									
<b>Output 9. Permanent forest plots and transects and biodiversity established</b>				<b>2 433,3</b>	<b>917,2</b>	<b>758,0</b>	<b>758,0</b>	<b>0,0</b>	<b>0,0</b>
<b>Implementation of a NNRFOS at the field level</b>				<b>2 433.3</b>	<b>917.2</b>	<b>758</b>	<b>758</b>	<b>0</b>	<b>0</b>
<u>Analysis of changes in the structure and diversity of forests and evaluations of carbon stocks with due regard for data for new forest plots</u>				232.5	77.5	77.5	77.5	0	0
Hiring of an International Consultant 1 month a year in Years 1-3	Hm	3	10	30	10	10	10	0	0
Hiring of a post-doctoral researcher in Years 1-3	Hm	36	5	180	60	60	60	0	0
Return airline tickets for the Consultant Years 1-3	Air flow	3	3	9	3	3	3	0	0
Per diems for consultant for 30 days a year in Gabon Years 1-3	Hj	90	0.15	13.5	4.5	4.5	4.5	0	0
<u>Completion of the establishment of permanent forest plots</u>				2 200.8	839.7	680.5	680.5	0	0
Hiring of data administrator for 3 years from Years 1-3	Hm	36	1.5	54	18	18	18	0	0
Hiring of two data entry and verification officers for 3 years	Hm	72	1.1	79.2	26.4	26.4	26.4	0	0
Hiring of two drivers for 3 years from Years 1-3	Hm	72	0.6	43.2	14.4	14.4	14.4	0	0
Hiring of 30 field workers divided in 4 teams for 3 years from Years 1-3	Hm	1 080	0.72	777.6	259.2	259.2	259.2	0	0
Hiring of 2 national botanists for 3 years from Years 1-3	Hm	72	1,8	129.6	43.2	43.2	43.2	0	0
Purchase material for a field kit for each field worker	Material	32	1.05	33.6	33.6	0	0	0	0
Purchase of equipment for each of the 4 teams	Material	4	10.1	40.4	40.4	0	0	0	0
Amortization and replacement of equipment of field agents and teams in Years 2-3 (20 per cent per year)	Material	2	14.8	29.6	0	14.8	14.8	0	0
Feeding for field teams, 20 days per month, 11 months per year from Years 1-3	Hj	21 120	0.018	380.2	126.7	126.7	126.7	0	0

Hiring of 3 local team assistants	Hm	396	0.4	158.4	52.8	52.8	52.8	0	0
Herbarium Technical Services Fee	Hm	33	2	66	22	22	22	0	0
Laboratory Soil Testing	Annual	3	25	75	25	25	25	0	0
Delivery of material and transport of soil samples	Annual	3	30	90	30	30	30	0	0
<u>Analysis of changes in forest structure, diversity and carbon stock assessments using data from new forest plots</u>									
Fees international consultant 1 month per year in Years 1-3									
Purchase of 2 4x4 vehicles	Vehicle	2	50	100	100	0	0	0	0
Maintenance, fuel and insurance for vehicles	Annual	6	18	108	36	36	36	0	0
Communication expenses for publishing, translating, editing	Annual	3	12	36	12	12	12	0	0
Output 10. Biomass maps updated periodically				190,0	0,0	95,0	95,0	0,0	0,0
<b>Mapping of stocks and carbon flows of biomass</b>				<b>190</b>	<b>0</b>	<b>95</b>	<b>95</b>	<b>0,0</b>	<b>0,0</b>
<u>Provision of technical support to AGEOS for national biomass mapping</u>				55	0	27.5	27.5	0	0
UCLA / NASA consultancy fees 1 month per year in Years 2-3	Hm	2	20	40	0	20	20	0	0
Return airline ticket to Gabon in Years 2-3	A/r flow	2	3	6	0	3	3	0	0
Per diems for an international consultant for 30 days / year in Gabon in Years 2-3	Hj	60	0.15	9	0	4.5	4.5	0	0
				135	0	67.5	67.5	0	0
	Hm	24	5	120	0	60	60	0	0
	Air flow	2	3	6	0	3	3	0	0
Per diems for an international consultant for 30 days / year in Gabon in Years 2-3	Hj	60	0.15	9	0	4.5	4.5	0	0
Hiring of a post-doctoral researcher for 2 years Years 2-3									
Return airfare to Gabon in A2 and A3									
Post-doctoral per diems for 30 days / year in Gabon in Years 2-3									
Output 11. Technical capacity for monitoring UTCF established				2 304,0	484,0	489,0	489,0	421,0	421,0
<b>Satellite tracking of logging, industrial and subsistence agriculture, mining and urban and rural sprawl</b>				<b>2 030.0</b>	<b>406</b>	<b>406</b>	<b>406</b>	<b>406</b>	<b>406</b>
Bonus for an AGEOS Remote Sensing Engineer	Hm	60	0.5	30	6	6	6	6	6

Purchase of 100 satellite images COSMO-SKYMED Spotlight-2 10x10km per year in Years 1-5 (indicative prices <a href="http://www.e-geos.it">http://www.e-geos.it</a> )	Images	500	2.9	1 450.0	290	290	290	290	290
Purchase of 100 satellite imagery COSMO-SKYMED Stripmap HIMAGE 40x40km per year in Years 1-5 (indicative prices <a href="http://www.e-geos.it">http://www.e-geos.it</a> )	Images	500	1.1	550	110	110	110	110	110
<b>Strengthening the monitoring capacity of the UTCF</b>				<b>274</b>	<b>78</b>	<b>83</b>	<b>83</b>	<b>15</b>	<b>15</b>
2.6.a. Support for the development and application of a methodology for the analysis of satellite imagery and annual updating of maps and statistics on changes in forest cover	Hm			144	48	48	48	0	0
Hiring of a national post-doctoral student for 3 years in Years 1-3	Hm	36	4	144	48	48	48	0	0
<u>Strengthening the capacity of the AGEOS teams for optimal implementation of the NNRFOS</u>				130	30	35	35	15	15
Budget formations et déplacements pour 5 agents de l'AGEOS en A1-A5Budget training and travel for 5 AGEOS agents in Years 1-5	Annual	25	3	75	15	15	15	15,0	15
Support to a national student undertaking thesis for 3 years in Years 1-3	Annual	3	15	45	15	15	15	0	0
Hiring for professional training of two Masters students in Years 2-3	Annual	2	5	10	0	5	5	0	0
<b>GENERAL TOTAL – NNRFOS</b>				<b>5846.3</b>	<b>1834.8</b>	<b>1463.4</b>	<b>1463.4</b>	<b>542.4</b>	<b>542.4</b>

**Table 20. Budget Details for Outcome 3: Completion of activities to improve estimates of emissions estimates from degradation and upgrade forestry practices at a national scale will result in reduced emissions from the forestry sector.**

<i>NB : all costs are in K\$</i>	Unit	Quantity	Price per unit	Total cost over 2 years	Y1	Y2
<b>Reduced Emissions from Forestry Sector</b>				<b>1946.12</b>	<b>1583.06</b>	<b>363.06</b>
Output 12. Improved baseline emissions calculations from the forestry sector				<b>932.34</b>	<b>586.57</b>	<b>345.78</b>
Activity 1.1. Develop and compare improved methodologies for calculating emissions from degradation.				145.54	145.54	0.00
1 Technical Expert	Hm	6	10.00	60.00	60.00	0.00
Per diems consulting 60 days in Gabon	Hj	60	0.15	9.00	9.00	0.00
4 Field Assistants - salary @\$1000/month per person	Hm	24	1.00	24.00	24.00	0.00
Field Assistant per diem (\$10/d x 21d/mo x 6 mo)	Hj	504	0.01	5.04	5.04	0.00
Field Equipment (field kit @ \$1000/person)	Material	5	1.00	5.00	5.00	0.00
1 Data Entry technicians	Hm	6	1.00	6.00	6.00	0.00
Local transport (2000l/mo x \$1.5/l = \$3,000/mo)	Missions	6	3.00	18.00	18.00	0.00
International Transport	Aircraft	1	3.00	3.00	3.00	0.00
Phone and internet credit @ \$300/person	Communi cation	5	0.30	1.50	1.50	0.00
Meetings and Collaboration building	Meeting	2	2.00	4.00	4.00	0.00
Printing, communication, outreach	Flat rates	2	5.00	10.00	10.00	0.00
Activity 1.2. Design national scale sampling program and train inventory team to conduct work at a national scale			0.00	95.25	95.25	0.00
1 Technical Expert	Hm	2	10.00	20.00	20.00	0.00
Technical training	Hj	1500	0.03	37.50	37.50	0.00
Per diems consulting 45 days in Gabon	Hj	45	0.15	6.75	6.75	0.00
25 National Field researchers - training stipend	Hm	50	0.30	15.00	15.00	0.00
Local transport (2000l/mo x \$1.5/l = \$3,000/mo)	Missions	2	3.00	6.00	6.00	0.00
International Transport	Aircraft	1	3.00	3.00	3.00	0.00
Meetings and Collaboration building	Meeting	1	2.00	2.00	2.00	0.00
Printing, communication and outreach	Flat rates	1	5.00	5.00	5.00	0.00
Activity 1.3. Implement improved degradation methodology in forestry concessions at national scale to calculate emissions from forestry sector			0.00	691.55	345.78	345.78
1 Technical Expert	Hm	4	10.00	40.00	20.00	20.00
Per diems consulting 30 days in Gabon annually	Hj	45	0.15	6.75	3.38	3.38
1 post doc salary	Hy	1.5	60.00	90.00	45.00	45.00
Per diems post doc in Gabon @120d/yr	Hj	180	0.08	13.50	6.75	6.75
1 National Data Quality Experts/Controller	Hm	18	2.00	36.00	18.00	18.00
15 National Field researchers - salary	Hm	360	0.60	216.00	108.00	108.00
15 National Field researchers – per diem (21d/mo x 24 m per person)	Hj	7560	0.01	75.60	37.80	37.80

Phone and internet credit @ \$300/person	Communi cation	54	0.30	16.20	8.10	8.10
Phone and internet credit @ \$50/person	Communi cation	360	0.05	18.00	9.00	9.00
Field Equipment (field kit @ \$1000/person)	<i>Material</i>	20	1.00	20.00	10.00	10.00
<i>Local transport (2000l/mo x \$1.5/l = \$3,000/mo)</i>	Missions	18	3.00	54.00	27.00	27.00
1 Data Entry technicians	Hm	18	1.00	18.00	9.00	9.00
1 vehicle	Equipmen t	1	50.00	50.00	25.00	25.00
Computers and software	<i>Material</i>	2	3.00	6.00	3.00	3.00
Communication and outreach	Flat rates	1.5	5.00	7.50	3.75	3.75
Collaboration building (local, district, national)	Meeting	1.5	10.00	15.00	7.50	7.50
International Travel	Aircraft	3	3.00	9.00	4.50	4.50
Output 13. A national emissions reduction strategy for the forestry sector exists and is implemented			0.00	921.11	921.11	0.00
Activity 2.1. Design and implement a strategy to Reduce Emissions from logging operations (building on and expanding data from Activity 1.1)			0.00	486.43	486.43	0.00
1 Technical Expert	Hm	6	10.00	60.00	60.00	0.00
<i>Per diems consulting 45 days in Gabon</i>	Hj	45	0.15	6.75	6.75	0.00
2 National Assistants - salary	Hm	4	2.00	8.00	8.00	0.00
Field Assistant per diem	Hj	168	0.01	1.68	1.68	0.00
Field Equipment	<i>Material</i>	3	1.00	3.00	3.00	0.00
RIL (light machines) for trial and comparison with conventional equipment	Equipmen t	1	200.00	200.00	200.00	0.00
Vehicle	Equipmen t	1	50.00	50.00	50.00	
<i>Local transport (2000l/mo x \$1.5/l = \$3,000/mo)</i>	Missions	4	3.00	12.00	12.00	0.00
International Transport	Aircraft	2	3.00	6.00	6.00	0.00
Meetings and Collaboration building	Meeting	3	3.00	9.00	9.00	0.00
Printing, communication, outreach to government	Flat rates	1	10.00	10.00	10.00	0.00
Training in forestry sector (both government and private sector actors)	Flat rates	4	30.00	120.00	120.00	
Activity 2.2. Evaluate the potential of reforestation and or wood plantation programs, particularly in highly degraded forests as an additional means of reducing emissions from the forestry sector			0.00	100.68	100.68	0.00
1 Technical Expert	Hm	4	10.00	40.00	40.00	0.00
<i>Per diems consulting 60 days in Gabon</i>	Hj	60	0.15	9.00	9.00	0.00
2 National Assistants - salary	Hm	8	2.00	16.00	16.00	0.00
Field Assistant per diem	Hj	168	0.01	1.68	1.68	0.00
Field Equipment	<i>Material</i>	3	1.00	3.00	3.00	0.00
<i>Local transport (2000l/mo x \$1.5/l = \$3,000/mo)</i>	Missions	4	3.00	12.00	12.00	0.00
International Travel	Aircraft	1	3.00	3.00	3.00	0.00
Meetings and Collaboration building	Meeting	2	3.00	6.00	6.00	0.00



Printing, communication, outreach	Flat rates	1	10.00	10.00	10.00	0.00
Activity 2.3. Design and implement a strategy for certifying forestry concessions engaged in the Gabon emissions reduction program with the "Green Gabon" Label			0.00	334.00	334.00	0.00
2 Technical Expert	Hm	12	10.00	120.00	120.00	0.00
<i>Per diems consulting 90 days in Gabon x 2 experts</i>	Hj	180	0.30	54.00	54.00	0.00
2 National Assistants - salary	Hm	12	2.00	24.00	24.00	0.00
Office supplies and consumable equipment	Flat rates	4	5.00			
<i>Local lodging and transport x 2</i>	Hm	12	2.00	24.00	24.00	0.00
International Travel	Aircraft	4	3.00	12.00	12.00	0.00
Meetings and Collaboration building	Meeting	5	10.00	50.00	50.00	0.00
Printing, communication, outreach	Flat rates	2	10.00	20.00	20.00	0.00
<i>Local transport</i>	Missions	10	3.00	30.00	30.00	0.00
<b>Overhead @ 5%</b>			0.00	92.67	75.38	17.29

**Table 21. Budget Details for Project Coordination:**

<i>NB : all costs are in k\$</i>	Unit	Quantity	Price per unit	Total cost over 5 years	Y1	Y2	Y3	A4	Y5
NIF programs and activities coordinated and managed in an efficient and transparent manner					227,8	161,8	161,8	161,8	161,8
<b>Efficient and transparent coordination and management of NIF and R-PP</b>				<b>875</b>	<b>227.8</b>	<b>161.8</b>	<b>161.8</b>	<b>161.8</b>	<b>161.8</b>
Hiring of National Coordinator Years 1-5	Hm	60	4	240	48	48	48	48	48
<i>Hiring of a deputy to the national coordinator from Years 1-4</i>	Hm	60	3	180	36	36	36	36	36
<i>Hiring of an administrative and financial officer</i>	Hm	60	2	120	24	24	24	24	24
<i>Hiring of secretaries</i>	Hm	60	1	60	12	12	12	12	12
Hiring of a driver	Hm	60	0.4	24	4.8	4.8	4.8	4.8	4.8
<i>Computer equipment for 4 people</i>	Material	4	5	20	20	0	0	0	0
<i>Amortization and material replacement 20 per cent per year in Years 2-4</i>	Material	4	4	16	0	4	4	4	4
<i>Operating budget for coordination</i>	Annual	5	15	75	15	15	15	15	15
Purchase a 4x4 vehicle	Vehicle	50	1	50	50	0	0	0	0
Vehicle maintenance, fuel and insurance	Annual	5	18	90	18	18	18	18	18
<b>GENERAL TOTAL NIF Management Unit</b>				<b>875</b>	<b>227.8</b>	<b>161.8</b>	<b>161.8</b>	<b>161.8</b>	<b>161.8</b>

Annex D. Consolidated M&E Plan

**Table 22. Consolidated M&E Plan with an Implementation Schedule**

Activities (\$1946.12)	Responsible	Year 1 (\$1583.06 )				Year 2 (\$363.06 )	Means of verification (Indicators)
Improved emissions calculations from the forestry sector are available.							
Activity 1.1. Develop and compare improved methodologies for calculating emissions from degradation.	AGEOS and NPA	Q1	Q2	Q3	Q4		Existence of methodological protocols.
Activity 1.2. Design national scale sampling program and train inventory team to conduct work at a national scale	AGEOS						Study design and protocols available. Training manuals and reports.
							Number of trained personnel.
Activity 1.3. Implement improved degradation methodology in forestry concessions at national scale to calculate emissions from forestry sector	AGEOS						Data available in the NNRFOS.
							Number of forestry concessions completed
A national emissions reduction strategy for the forestry sector is defined and implemented							
Activity 2.1. Design and implement a strategy to Reduce Emissions from logging operations (building on and expanding data from Activity 1.1)	DGF						Annual impact assessments and reports.
Activity 2.2. Evaluate the potential of reforestation and or wood plantation programs, particularly in highly degraded forests as an additional means of reducing emissions from the forestry sector	DGF and NPA						Technical report
Activity 2.3. Design and implement a strategy for certifying forestry concessions engaged in the Gabon emissions reduction program with the “Green Gabon” Label	NPA and DGF						Technical report