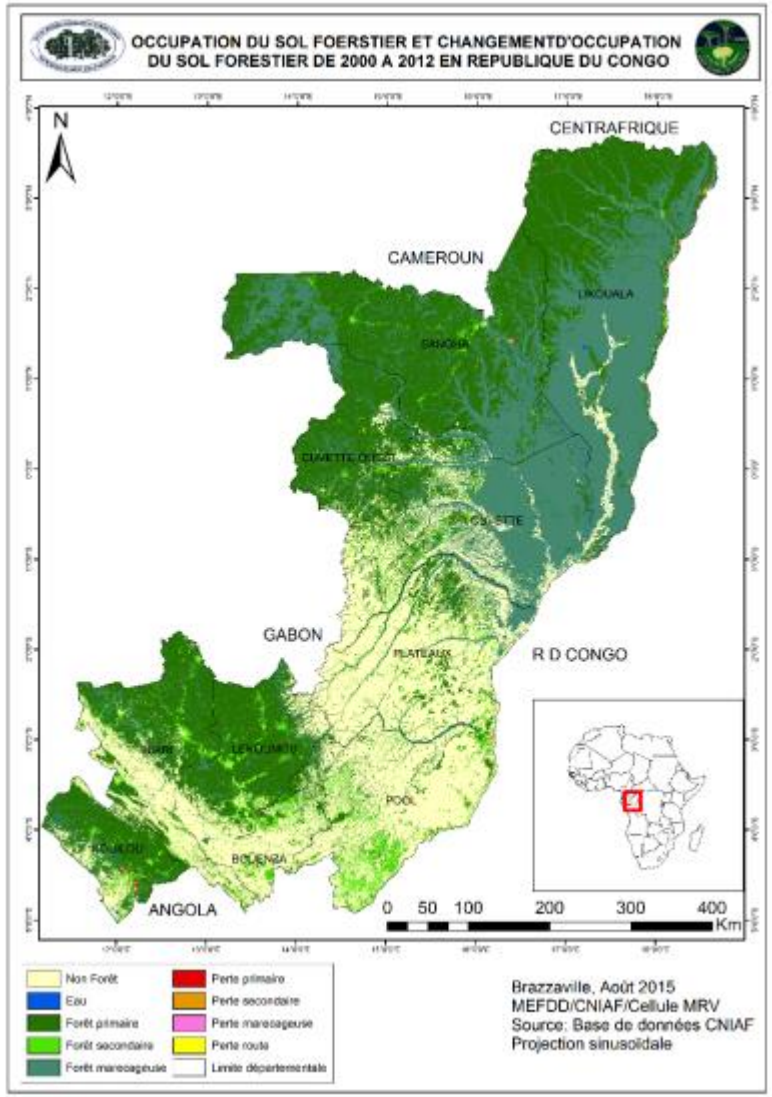
Setting up a National Forest Monitoring System and MRV for REDD+ activities *(The case of the Republic of Congo)*

MAMPOUYA WENINA Yeto Emmanuel

November 2022

Short presentation of the Republic of Congo

- 34.2 million hectares (342,000 km²);
- 23.5 million hectares of forest, or 69% of the national territory (CNIAF, 2015);
- low deforestation rate: 12.113 ha by year (CNIAF, 2015);
- REDD+ process start in February 2008.

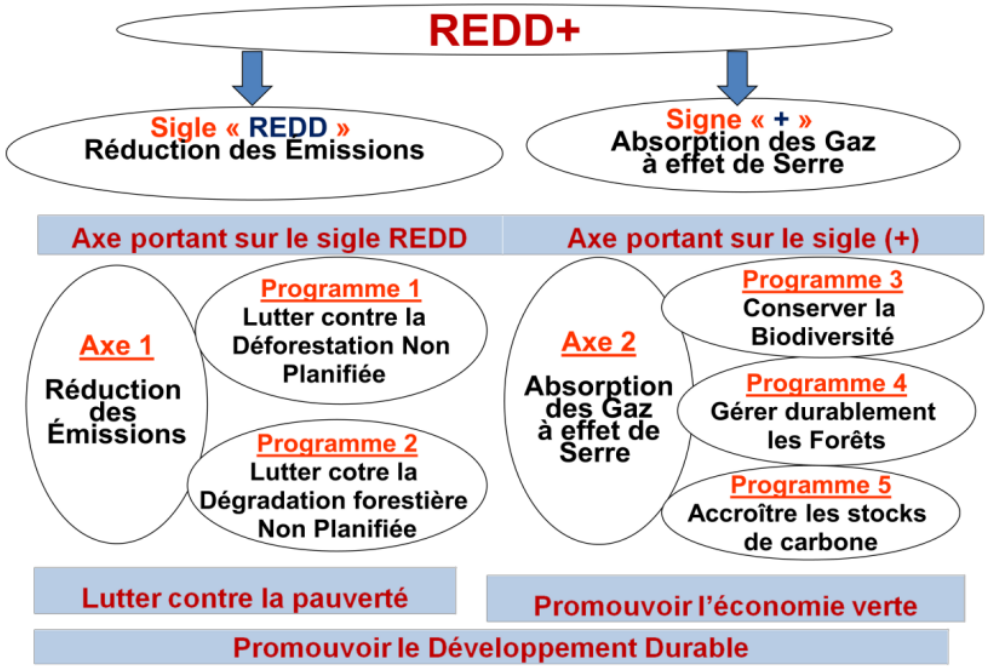


REDD+ in ROC (1)

In the framework of REDD+, the Republic of Congo aims to:

- Fight against unplanned deforestation and forest degradation, to reduce emissions from deforestation and forest degradation;

- Sustainable forest management, to reduce emissions from deforestation and forest degradation and reap the benefits of reduced impact logging;
- Biodiversity conservation to: conserve forest carbon stocks and reap the benefits;
- Increasing carbon stocks, to reap the benefits of afforestation, reforestation and agroforestry;
- Fight against poverty to reduce the pressure of the poorest populations on the forest;
- Promoting a green economy to foster low-carbon development.



Source : CN-REDD 2012

REDD+ in ROC (2)

Now, the country has:

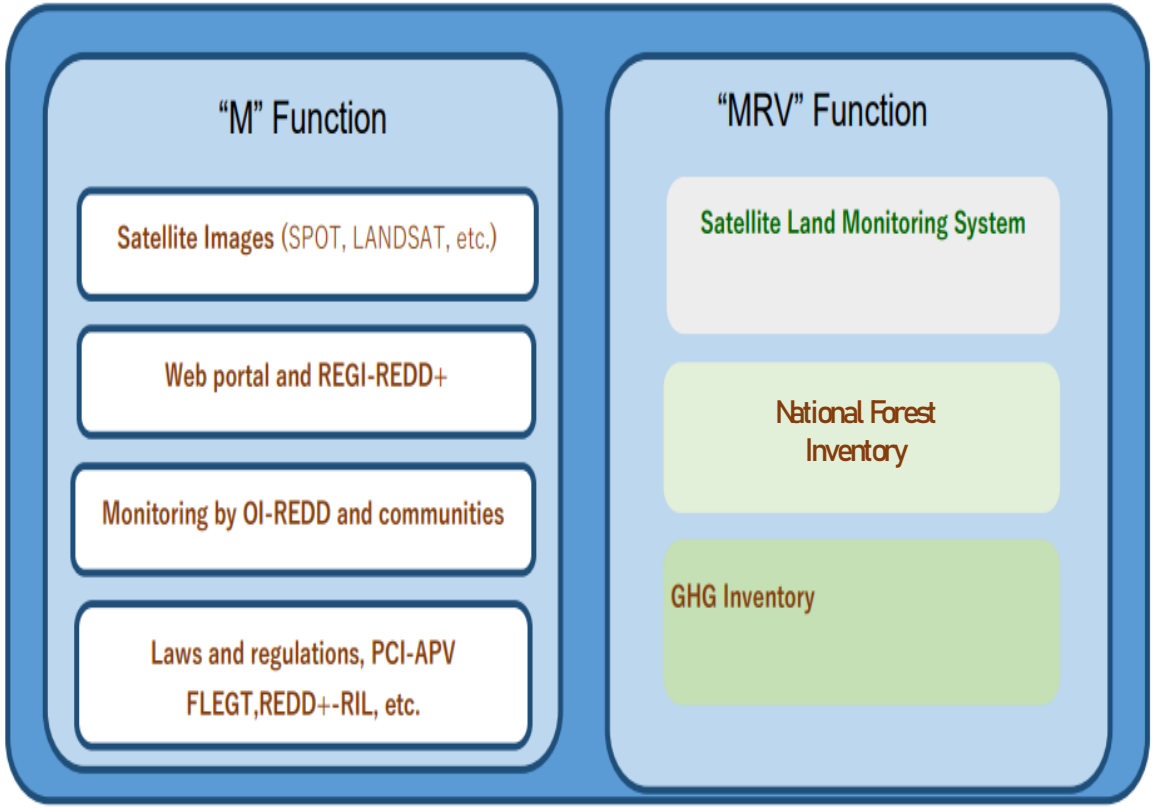
- A National REDD Strategy approved by the Congolese Ministers Council.
- A national definition of forest, validated in 2013.
- The UNFCCC Reference Emission Level;
- The Reference Level of the Sangha Likouala emission reduction programme;
- A Forestry Investment Plan,
- A MRV UNIT,
- The National System-MRV (SYNA-MRV) document, to make the SYNA-MNV truly operational in the Republic of Congo.

SYNA-MRV in ROC

Based on the National Forest Reference Emission Level for, assess national performance in:

- Reduction of emissions from deforestation,

- and forest degradation across the country.

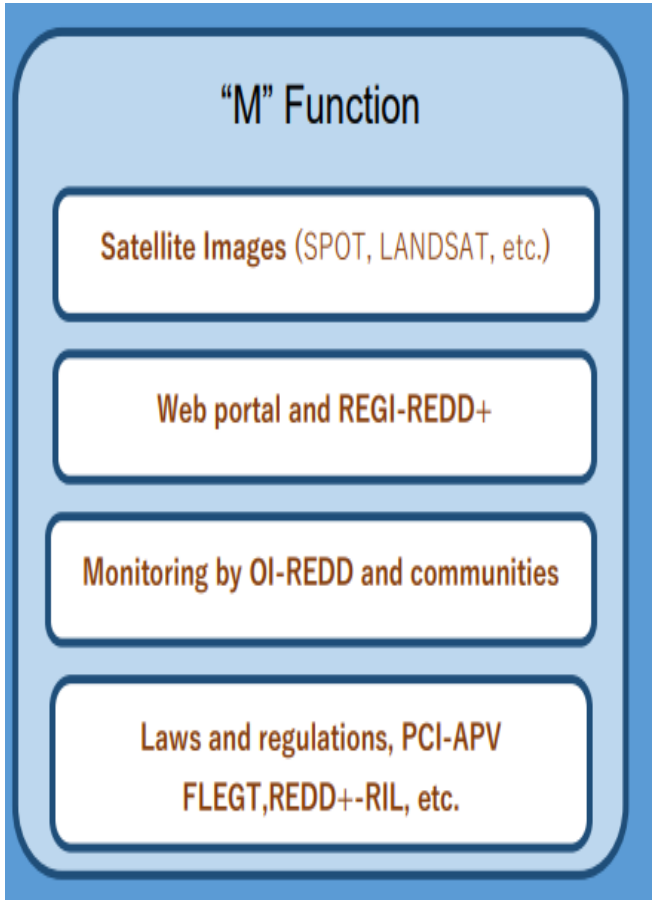


The monitoring function

The monitoring function

- policy implementation and monitoring,

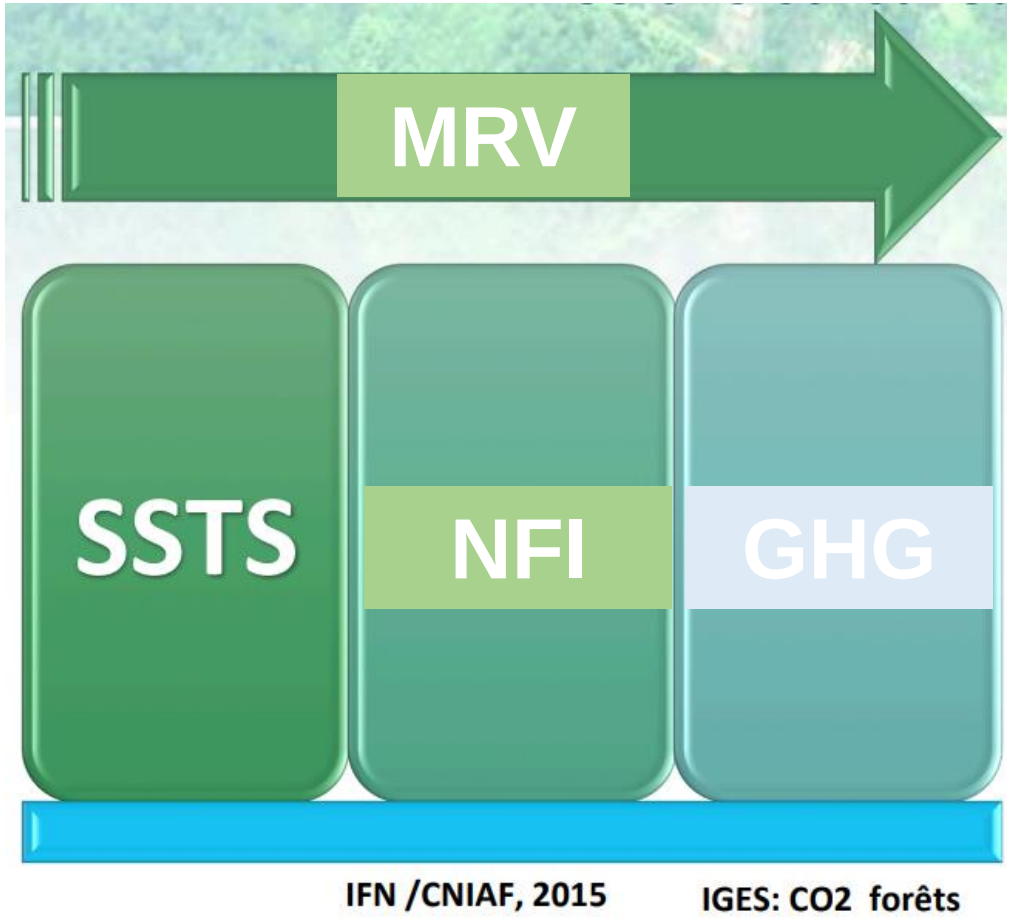
- conservation measures and sustainable forest management (laws, decrees, orders and guidelines)



The MRV function

The MRV function (Measurement, Reporting and Verification) aims to :

- Measuring: changes in forest land area and changes in carbon stocks related to REDD+ activities;
- Estimating: anthropogenic greenhouse gas emissions and CO2 sequestered by forests;
- Notify GHG mitigation performance to the relevant offices of the United Nations Framework Convention on Climate Change;
- Monitor and evaluate the potential for other benefits;
- Store data and make it available for any audit contingency.



MRV Institutionalization

- Formalization and revitalization of the MRV Unit at the National Centre for Inventories and Management of Forest and Wildlife Resources,

- Establishment of a team for the operationalisation of the MRV system by ministerial note.

MINISTERE DE L'ECONOMIE FORESTIERE
CABINET

REPUBLIQUE DU CONGO
Unité*Travail*Progrès

N° 0130 /MEF/CAB/CNIAF

NOTE DE SERVICE

Pour l'opérationnalisation du système Mesurage, Notification et Vérification (MNV) au Centre National d'Inventaire et d'Aménagement des Ressources Forestières et Fauniques (CNIAF), une équipe est mise en place et composée ainsi qu'il suit :

- **Chef de la cellule MNV**
  Carine saturnine MILANDOU
- **ASSISTANT de la cellule MNV**
  Brice Chérubins OUISSIKA
- **Pilier Système de Surveillance des Terres par Satellite (SSTS)**
  - Dabney MATOKO KOUEDIATOUKA ;
  - Jean blaise Samuel MPONGUI ;
  - Bertrand ONKA-TSIBA.
- **Pilier Inventaire des Gaz à Effet de Serre (IGES)**
  - Emmanuel MAMPOUYA WENINA YETO ;
  - Arsovh Kenovh OMBOUHO.
- **Pilier Gestion de Base de Données (GBD)**
  - Karel MENGUE ZOLA ;
  - Destin Loge LOKENGNA.

La présente note de service prend effet à compter de la date de signature.

Fait à Brazzaville, le 11 JAN. 2019

La Ministre de l'Economie Forestière,

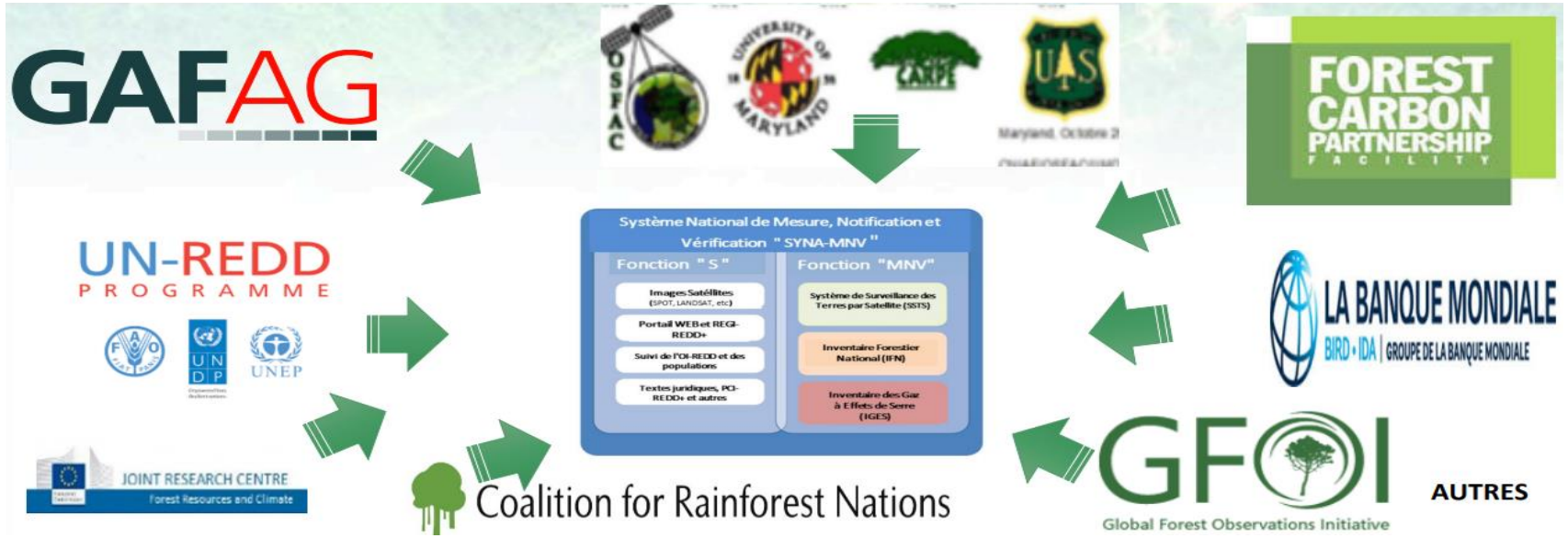
Rosalie MATONDO

AMPLIATIONS :

MEF/CAB	2
Dtions rattachées	5
TGSIEF	1
DGEF/SAO	2
DAF/SAP	2
DGB	1
DGPP	1
Intéressés	9
Archives	1/24.-

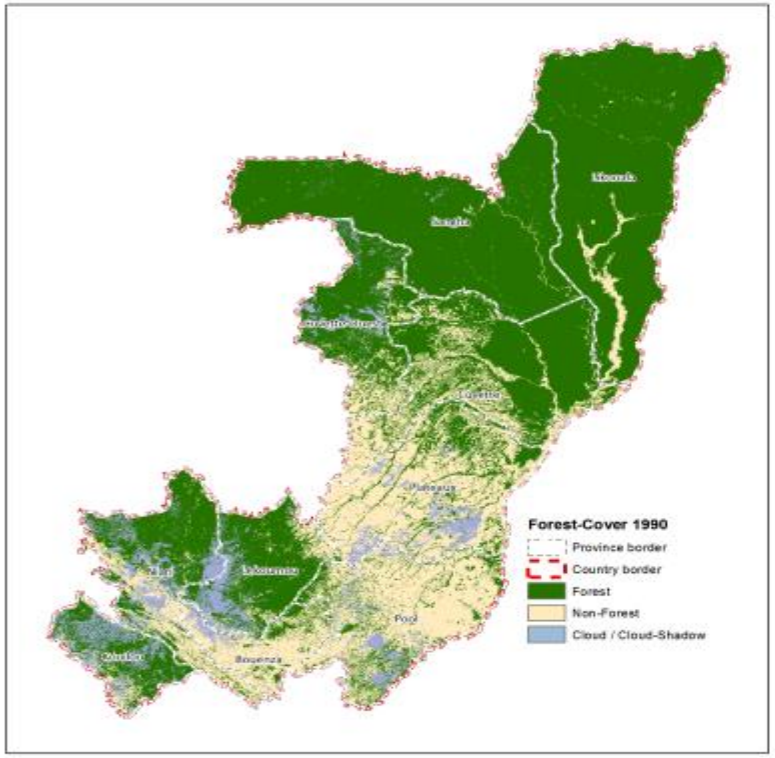
Partners and support

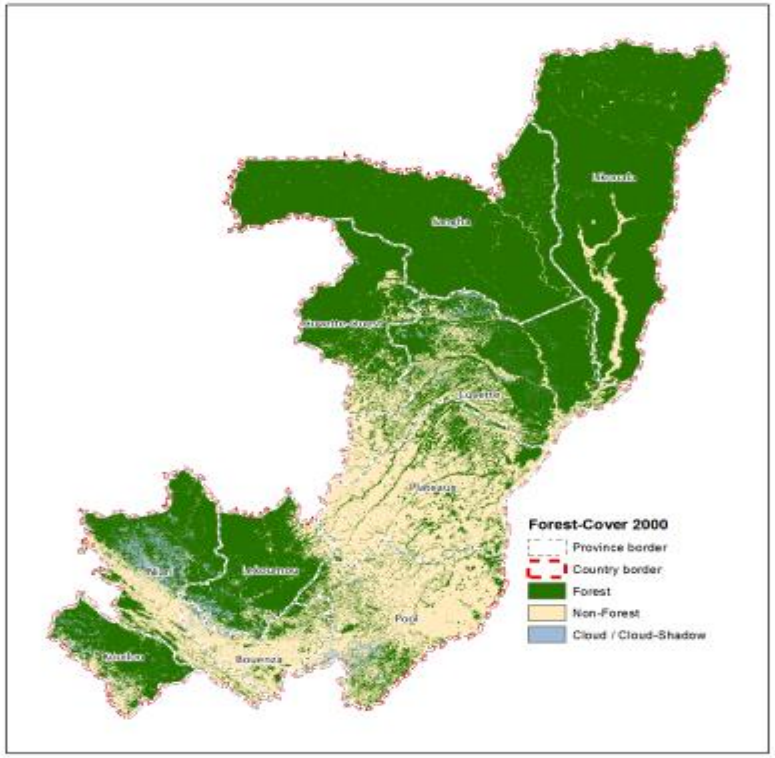
Since 2010, the MRV unit has received technical support from partners to the process.

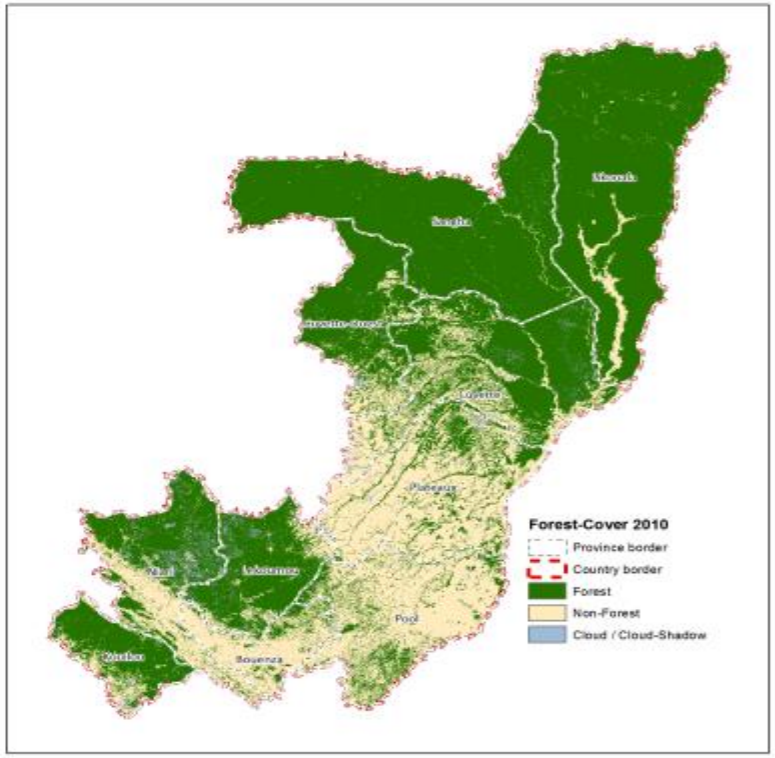


Product of the Operationalization of the Satellite Land Monitoring System “SSTS” (1)

- Forest cover and change maps 1990, 2000, 2010 (GAF)
- Forest cover change maps 2000-2012 / 2014 (CNIAF/FAO/UMD)
- Forest cover change maps 2014-2016 (CNIAF/FAO/JRC)





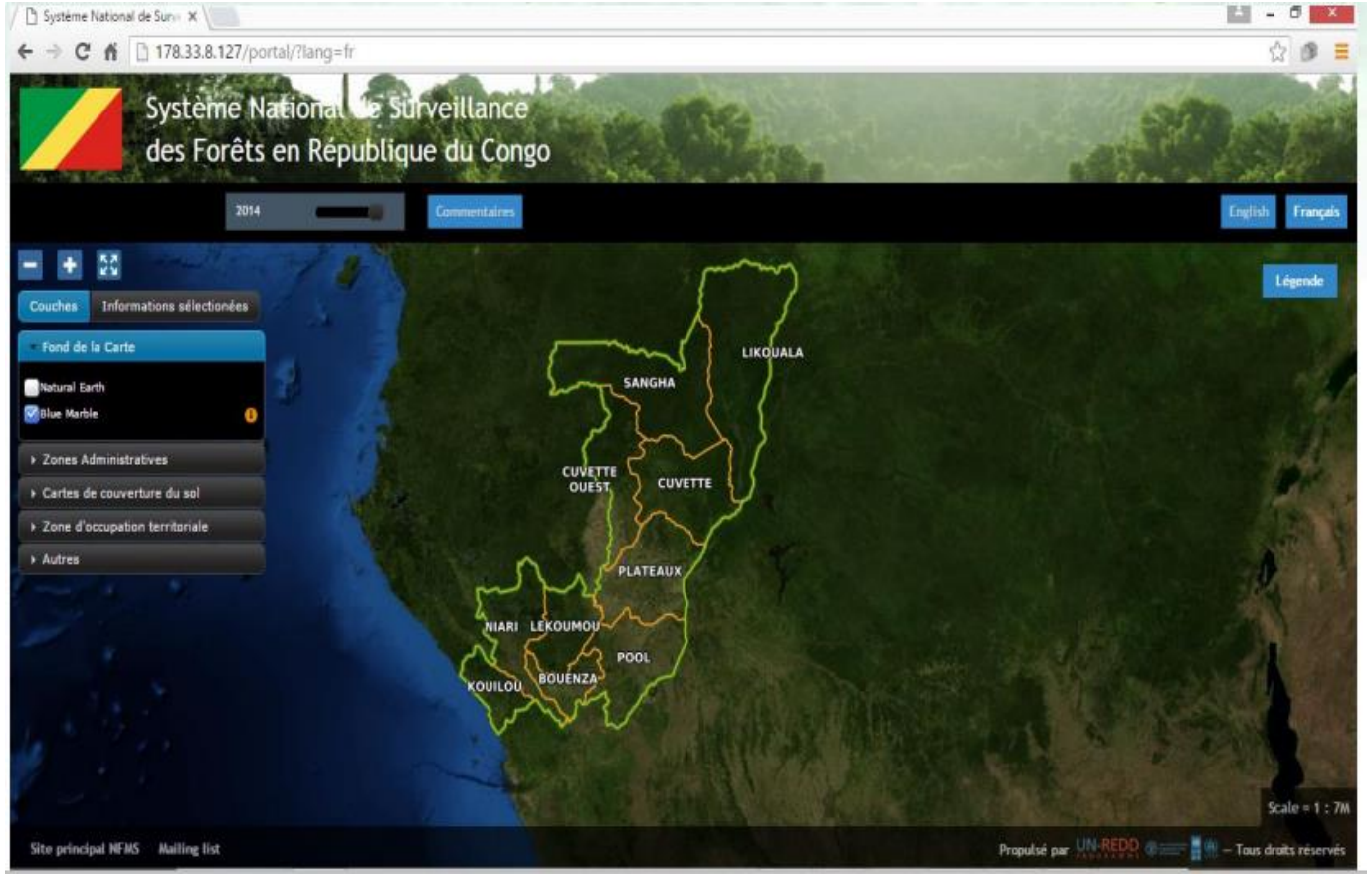


Product of the Operationalization of the Satellite Land Monitoring System “SSTS” (2)

Web portal: http://www.roc-snsf.org

The primary purpose of the Satellite Forest Monitoring System portal is to regularly inform stakeholders, the public and national and international partners about activities related to forest monitoring.

Publication of forest cover monitoring data and other useful information



NFI and GHGI products

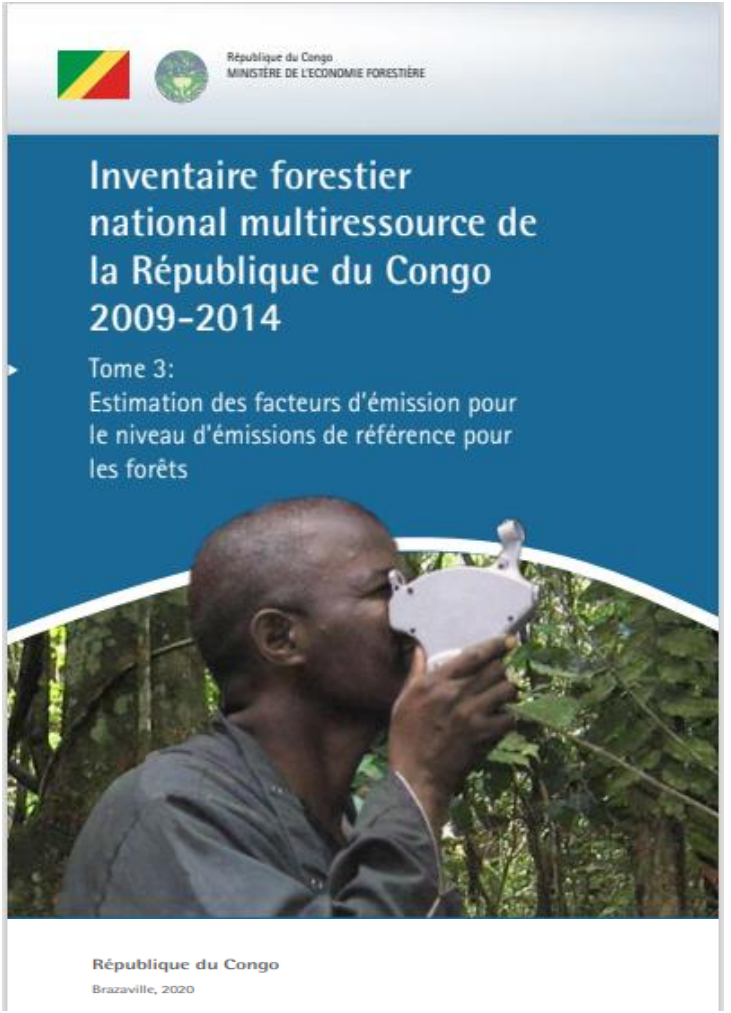
- Realization of the Multi-resource National Forest Inventory of the Republic of Congo
- Realization of the GHG measurement in Agriculture Forestry Other land use inventory for the third national communication to the UNFCCC
- Installation of the database management system.

NFI (1)

- The estimation of emission factors for the Congo NFEL was developed based on NFI field data.

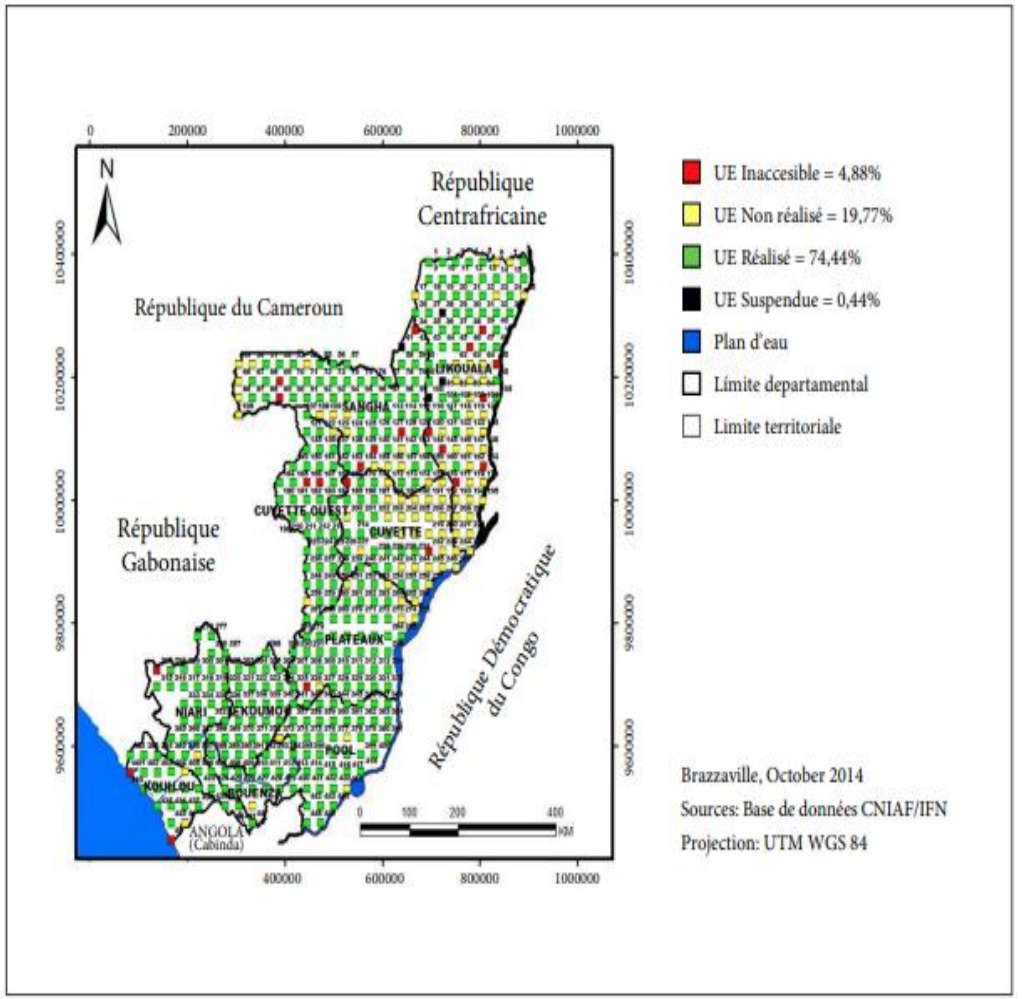
- This was based on the collection of field data from 1,800 permanent plots throughout the country and on a classification of land use and forest types.

- The field data were used to generate estimates of forest carbon densities in above-ground, below-ground and dead wood biomass, following the stratification adopted for the NFEL.



NFI (2)

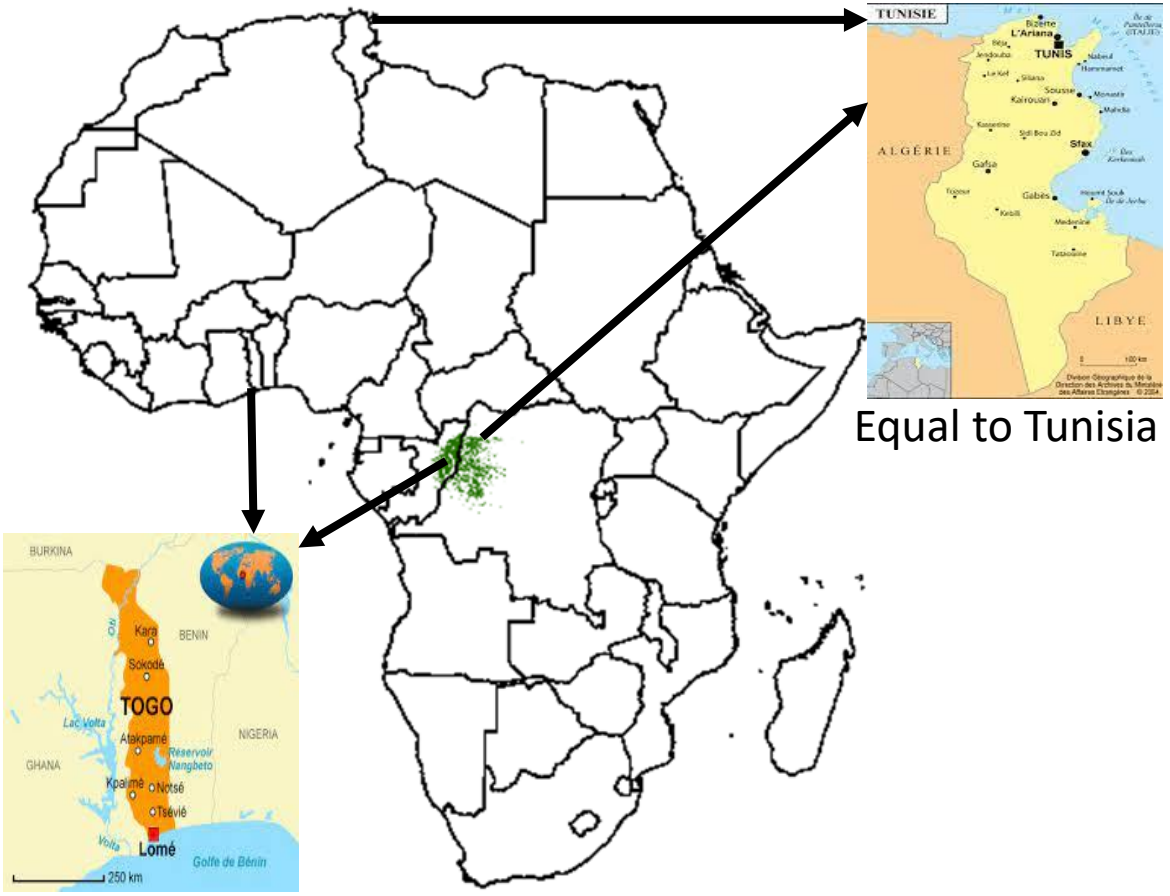
- The implementation of the NFI was not without difficulties.
- Its sampling plan included a total of 455 Sampling Units (UE).
- Almost 20% of the UE could not be surveyed,
- Inaccessibility, especially in swamp areas,
- Which are an important part of the tropical rainforests of the central Congo Basin.



C stock and CO2 emissions in swamp forests: data collection (1)

The tropical rainforests of the central Congo Basin,

- Largest tropical peatland complex in the world (Dargie et al. 2017 and Biddulph G. E., et al., 2022)
- Area of about 167,600 km² between the Republic of Congo and the Democratic Republic of Congo (Crezee et al. 2022).
- 30.6 Pg C in the subsoil,
- about 29% of total tropical peat carbon stock,
- 5% of global peatland carbon stock. (Dargie et al. 2017)



C stock and CO2 emissions in swamp forests: data collection (2)

- GEM methods
- 3x 1 hectare plots
- Terra firme
- Hardwood peat swamp
- Palm-dominated peat swamp
- 2 years of measurements
- March 2019-March 2021

C stock and CO2 emissions in swamp forests: data collection (3)

- AGB of trees >10 cm dbh
-AGB of trees 2-10 cm cm dbh
-AGB of *Raphia laurentii* palm
- coarse woody debris stocks and productions (dead wood)
- roots production
- fine litter fall production,
- ground litter stocks

CO2, N20 and CH4 emissions in swamp forests: data collection

- soil and stem CO2 efflux,
- soil and stem N20 efflux
- Soil and stem CH4 efflux.

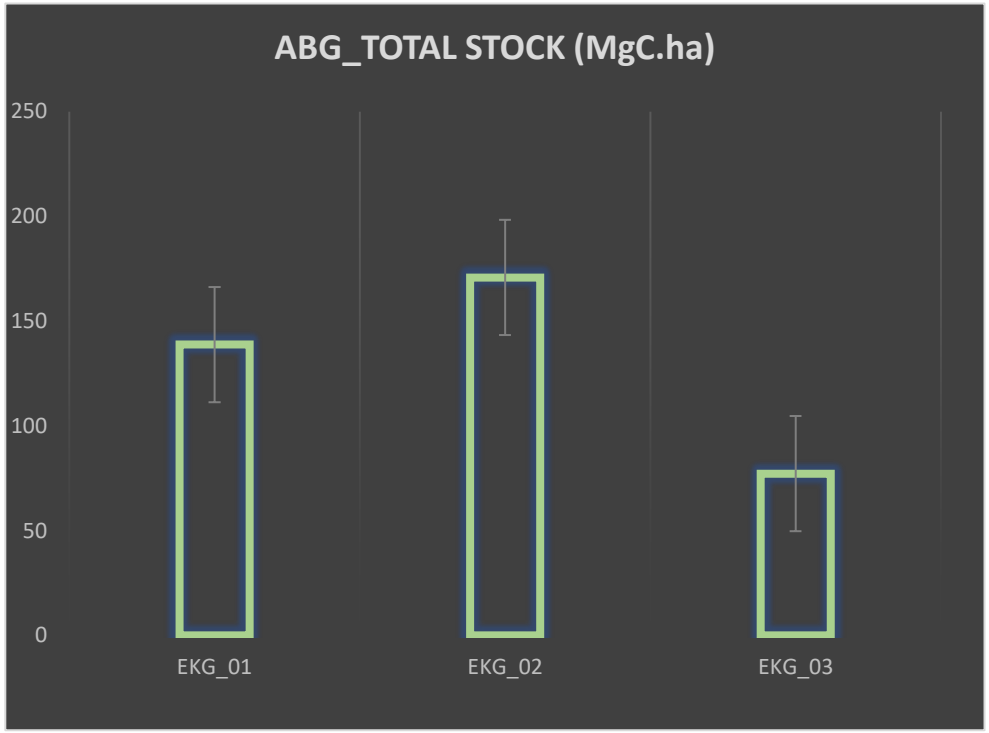
How look's the first trends overall (1)

The aboveground carbon stock is:

- 138.81± 7.47,
- 170.8± 7.65,
- and 77.18± 5.16 MgC.ha

respectively in the terra firme plot (EKG_01), the hardwood peat plot (EKG_02),

and the Raphia peat plot (EKG_03)



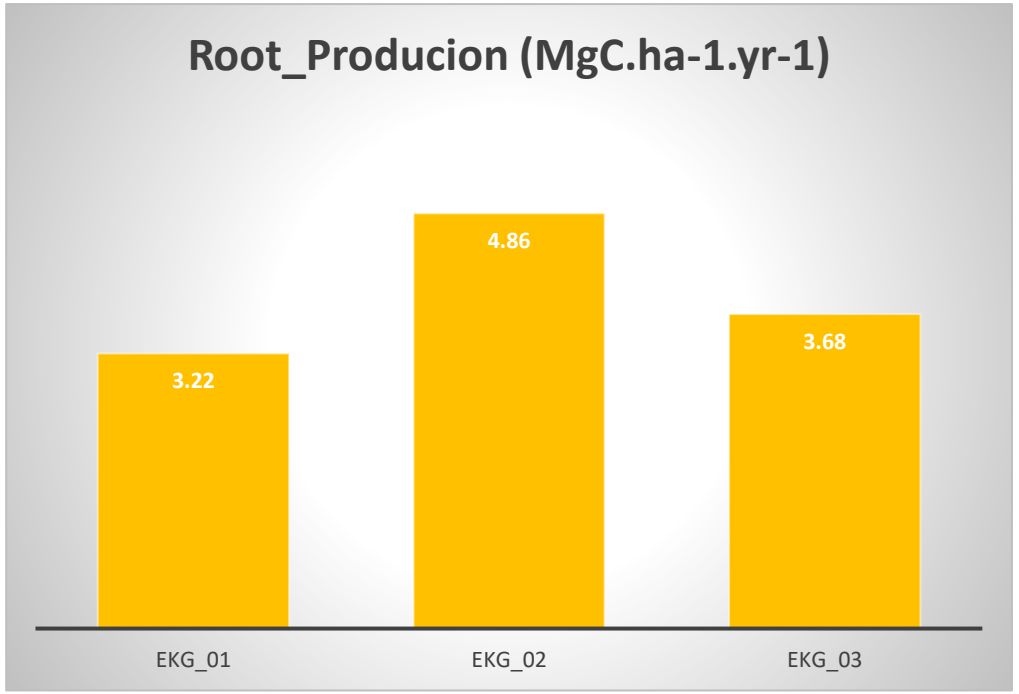
How look's the first trends overall (2)

But as far as below-ground biomass is concerned, the comparison of the three types of ecosystems shows a different trend.

We obtained an total root production averages of:

- 3,68 (± 0,37) Mg C ha-1 yr-1 in EKG_02,
- 4,86 (± 0,30) Mg C ha-1 yr-1 in EKG_03
- 3,22 (± 0,42) Mg C ha-1 yr-1 in EKG_01,

For depth intervals of 0-10, 10-20 et 20-100 cm.



Challenges encountered

- Accessibility
- fund to cover a larger area,
- Mapping peatlands by type of vegetation,
- conduct the same study in *Raphia hookeri* swamp forests,
- Social economic study (relationship between people and peatlands)

Expectations of data Collection (1)

Two Congolese thesis ingoing:

1. Carbon Inputs in Terra Firme and Peatland Tropical Forests of Central Congo Basin

2. NPP in Terra Firme and Peatland Tropical Forests of Central Congo Congo Basin

Expectations of data Collection (2)

In press :

- *First data of fine root production in tropical peat swamp and terra firme forests of the central Congo Basin.*
- *Allometric equation for the commonest palm in the Central Congo Peatlands, Raphia laurentii De Wild.*

Ready to be submitted:

- *Total carbon stock in tropical peat swamp and terra firme forests of the central Congo Basin*
- *Leaf NPP in tropical peat swamp and terra firme forests of the central Congo Basin*

What's left to do

- Data processing of CO2, N20 and CH4 efflux
- Publication of papers on soil, tree and coarse woody debris respiration in those plots
- With the MRV unit, capitalize on these scientific informations (Methodology) to:
- In the short term: Develop a new sampling plan to cover the entire swamp area
- In the medium term: Set up permanent plots over the entire peatland area of the ROC
- In the long term: Include them in the next NFI and GHG Measurement project.

WE THANK YOU
FOR YOUR ATTENTION