The Carbon Map and Model Project (CO$_2$M&M)
In the Democratic Republic of Congo

WWF

Introduction

With the support of the International Climate Initiative **(ICI)** of the Federal Ministry of the Environment, Conservation, and Nuclear Security, the implementation of the German Development Bank **KfW**, the « **Carbon Map and Model (CO₂M&M)** » project, the World Wide Fund for Nature (**WWF**) Germany and local partners will produce a national scale biomass map for the entire forest coverage of the Democratic Republic of Congo (DRC) along with feasibility assessments of different forest protection measures within a framework of a REDD+ model project.

The Carbon Map Component:
A national biomass map for the DRC will enable quantitative assessments of carbon stocks and emissions in the largest forest of the Congo Basin to support the national REDD (Reducing Emissions from Deforestation and Degradation) program in DRC, which plays a major role in sustainable development and poverty alleviation. This map will be developed from field data, complemented by airborne LiDAR (Light Detection and Ranging) and up-scaled to satellite images to accurately estimate carbon content in all forested areas.

The Carbon Model Component:
The carbon model component will assist the jurisdictional stakeholders to go 'full circle' with REDD+, by:
- developing a REDD+ mitigation strategy following feasibility studies for conservation concessions, improved forest management and reduced impact logging, reduction of unsustainable shifting cultivation and improved grazing management;
- developing a benefit sharing and distribution scheme for compensation;
- providing technical support to the development of a jurisdictional REDD+ programme in Mai Ndombe districts and province;
- lessons learned to feed into to the national and international REDD+ strategies.

Capacity Building

This collaborative project will support the Forest Inventory and Management Department (**DIAF**) along with the Department of Sustainable Development **(DDD)** under the supervision of the Ministry of Environment, Conservation and Tourism (**MECNT**), and the Satellite Observatory for the Forests of Central Africa **(OSFAC)** to build and reinforce technical capacity in technical aspects of REDD+. This program will also offer fellowships to Congolese scholars for advanced studies in REDD, forestry, and remote sensing.

Local capacities in emissions reductions will also be ensured through the development of a REDD+ mitigation strategy. The local staff of WWF in DRC, along with local stakeholders will be closely involved in the activities related to the development of a Jurisdictional and Nested REDD+ (**JNR**) approach for DRC. This will be achieved through the elaboration and provision of criteria concerning the development of procedures for monitoring of 'safeguards' for avoiding negative project impacts in order to ensure positive social and ecologic benefits, transparency and stakeholder involvement. Furthermore, regular trainings and workshops will be conducted to support local stakeholders (including WWF, district and regional managers) for the dissemination of innovative project results.

Justification

In order to evaluate and calculate national carbon emissions from deforestation and degradation, a national baseline carbon assessment is required. A spatially explicit forest biomass map allows an accurate carbon assessment to account for spatial variability of forests, due to influences from geo-physical factors such as climate, elevation, soil and ecology. This map will complement the existing forest monitoring efforts, which locate areas of deforestation and degradation, to help identify areas contributing significantly to carbon emissions, and support the international REDD+ reporting process.

In the DRC, little or no credible information is available related to measures of deforestation emissions, and the feasibility, impact and efficiency of implementation of emissions reducing interventions. The information acquired from the REDD+ model project in the Lac Tumba Landscape shall be used as a reference for future REDD+ projects in DRC. If the feasibility of the pilot projects can be substantially proven, those projects can be upscaled to the jurisdiction, for effective forest conservation in DRC.

Innovation

National forest carbon estimation using integrated LiDAR sampling has until now, never been achieved in DRC, or neighboring countries, though a similar effort is underway in Gabon, where wall-to-wall LiDAR is being employed. A national map created with these innovative technologies is envisioned to cover a large forest area, while reducing the error and cost per unit hectare. In addition, this effort will help build local capacity for fundamentals in LiDAR data processing and manipulation, and principles of biomass estimation. This approach will serve as an example for other countries in the region to establish baseline carbon assessments and reinforce their national REDD MRV systems (Monitoring, Reporting and Verification), which will help conserve forests and promote sustainable development, and socio-economic benefits to local communities.

In 2013 the national government of the DRC as well as the government of Bandundu province, have decided to develop a jurisdictional programme in what is to become Mai Ndombe Province. The main reason for this approach is to be able to participate in the Forest Partnership Facility (FCPF) Carbon Fund, which intends to purchase emission reductions from sub-national jurisdictions (or emission reduction programme areas). The government of the DRC has already submitted its first version of an Emission Reduction Programme Idea Note (ER-PIN) in June 2013 with the proposed programme area being the future province of Mai Ndombe. In support to this effort, the Verified Carbon Standard (VCS), with funds from the Norwegian Agency for Development Cooperation (NORAD), intends to pilot the implementation of the new VCS JNR requirements in Mai Ndombe province starting in 2013.

The REDD+ model projects comprise part of the jurisdictional efforts that are currently under development in the DRC. The formation of jurisdictions are at an early stage worldwide and informed experiences are practically non-existent. The Model Component of the project will focus exclusively on supporting the development and implementation of a jurisdictional REDD+ programme in the new Mai Ndombe province, and to assist jurisdictional proponents to go 'full circle' with REDD+.

Partners, Roles

This project unites several major actors for mapping biomass and reducing deforestation emissions:

Direction de Développement Durable (DDD), under the direction of the Ministry of Environment Conservation and Tourism (MECNT), coordinates the national REDD activities, as well as the execution of environmental protection strategies, sustainable land use planning and management of natural resources. This project will support efforts of the REDD National Coordination by providing an accurate biomass maps for MRV (monitoring, reporting and verification) activities, including emissions calcula-

tions, scenarios, low carbon development and the ER-PIN (emissions reduction program in Maï Ndombe).

Département des Inventaires et Aménagement Forestier (DIAF), under the direction of the Ministry of Environment Conservation and Tourism (MECNT), manages the national forest inventory and forest resource management. This project will support the TerraCongo system, and reinforce capacity in manipulation of LiDAR data, and biomass estimation.

Observatoire Satellital des Forêts d'Afrique Centrale (OSFAC) – A nonprofit organization supports national forest monitoring and remote sensing for REDD MRV. The project will build local capacity for LiDAR data processing and manipulation, and satellite and airborne database management for the national REDD program.

WWF-DRC will manage the project locally in Kinshasa, and will lead the independent plot establishment and coordinate the model REDD projects in the Mai Ndombe region.

GFA Envest Consutling group – has experience in implementing REDD carbon projects in developing countries. Jointly with WWF, GFA will be responsible for developing the carbon model component of the project including evaluation of options for the development of mitigation activities; supporting a JNR Approach as Model for a National REDD+; assessing different Reference Emission Level/Reference Level (REL/RL) approaches and contributing to the national REDD+ Strategy, Monitoring Reporting and Verification (MRV) procedures.

University of California, Los Angeles (UCLA) - Dr. Sassan Saatchi will lead the LiDAR data analysis and development of specific algorithms to estimate biomass from field data, LiDAR indices and various types of satellite data.

Southern Mapping Company (SMC) – based in South Africa has a long history of airborne LiDAR data collection in Africa, and specifically in DRC.

WWF-US – WWF in Washington, DC will provide support for the Education for Nature (EFN) fellowships for advanced studies in themes associated with the project.

For more information:

WWF Germany
Stefanie Grundner
Chef de Projet
Tel: +49 (30) 311 777−287
Email: stefanie.grundner@wwf.de

Aurélie Shapiro
Spécialiste en Télédétection
Tel: +49 (30) 311 777−243
Email: aurelie.shapiro@wwf.de

WWF DRC
Mina Lee
Chef de Projet
Tel : +243 (81) 975 9493
Email : mina.lee@wwfcarpo.org

Elvis Tshibasu
Expert SIG/Télététection
Tel : +243 (99) 919 5449
Email: etshibasu@wwfcarpo.org