



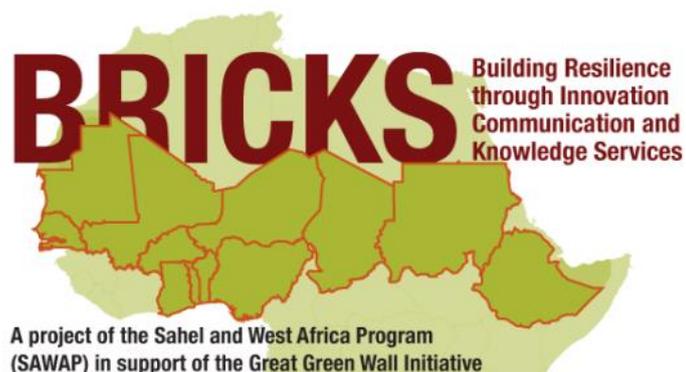
**SAHEL AND WEST AFRICA PROGRAM IN SUPPORT OF THE GREAT GREEN WALL
(SAWAP)**

BRICKS PROJECT

***BUILDING RESILIENCE THROUGH INNOVATION, COMMUNICATION AND
KNOWLEDGE SERVICES***

Establishing the Baseline of Carbon Sequestration Potential in the SAWAP region

TERMS OF REFERENCE



MARCH 2017

1. Context & justification

The Sahel and West Africa Program (SAWAP) is funded by the GEF in support of the Great Green Wall Initiative and represents a general investment framework approved in 2011 and comprising a regional project BRICKS (Building Resilience through Innovation, Communication and Knowledge Services) and 12 national investment projects implemented by 12 countries (Benin, Burkina Faso, Chad, Ethiopia, Ghana, Mali, Mauritania, Niger, Nigeria, Senegal, Sudan and Togo).

The SAWAP program focuses on sustainable land and water resources management (SLWM) and climate challenges and aims to extend SLWM practices to targeted and vulnerable areas in the Sahel and West Africa. SAWAP is the main support tool of the World Bank to the Sahelian and West African countries to improve their livelihoods and protect their natural wealth while taking into account climate variation and change.

The SAWAP program contributes also to the TerrAfrica initiative, funded and implemented by the World Bank and NEPAD-AU. TerrAfrica partners such as the World Bank, IFAD, FAO, UNDP and NEPAD are supporting countries in the region with a view to preparing multi-sectoral investment plans for sustainable land management (SLM) actions.

The **BRICKS** Project « Building Resilience through Innovation, Communication and Knowledge Services », 13th project of the SAWAP program, is designed to play the role of a regional platform to stimulate exchanges of best practices and successful experiences among the SAWAP national projects (knowledge management) for the implementation of common actions and for the documentation of the SAWAP portfolio performance through a performing monitoring-evaluation system.

The BRICKS project is structured around two main technical components:

Component 1: Knowledge management

This component aims to ensure a regular exchange of technical and operational knowledge through a regional information center which establishes a kind of network between the institutions and individuals involved in the 12 national investment projects. This component is coordinated by CILSS.

Component 2: Monitoring & Evaluation

This component focuses on strengthening capacities on new monitoring tools of the projects procedures and impacts at the national and regional level and on monitoring of the SAWAP program through a series of thematic and process indicators. This component is coordinated by OSS.

The indicator which measures the "carbon accumulation volume in biomass and soil and its change in compared to baseline (t C/ha/y, t C/ha/y between Y1 and Y2)" is one of the four key performance indicators retained by the SAWAP program. In fact, the areas to be restored through SLWM practices are part of a wider ongoing undertaking implemented by all of the SAWAP projects in order to reduce soil degradation, increase carbon sequestration, protect the environment and therefore reduce greenhouse gas emissions (GHG). It should be recalled that degraded land rehabilitation is one of the Strategic Objectives set by the SAWAP Program. For the estimation of the carbon storage and its changes over time and space, a diachronic analysis will be performed using the years 2012 (reference year / baseline) and 2017. The years between (baseline year and end year), will be used to calculate the changes in the quantity of carbon sequestered annually. This exercise will continue to be performed after year 2017 till end of the BRICKS project.

On the other hand, Target 15.3 on Land Degradation Neutrality (LDN) is also a part of the sustainable development goals (SDGs), recognized and adopted by the United Nations as an important response to the adverse impacts of climate change (September 2015). One of the three sub-indicators recommended for tracking progress towards LDN compared to baseline is measuring the above- and below-ground biomass and carbon stocks, which fits perfectly with the SAWAP Program main indicator. The same is true for the Intended Nationally Determined Contributions (INDCs) of the UNFCCC which

represent commitments undertaken by countries to limit global warming and risks resulting from rising temperatures.

The monitoring of this indicator has a twofold objective. It will at the same time contribute to tracking the progress made towards the achievement of target 15.3 of the SDGs and respond to the M&E needs of the SAWAP Program.

It is within this respect that these terms of reference have been elaborated for the recruitment of a consultant in charge of the elaboration of the baseline of Carbon Sequestration Potential in the SAWAP region.

2. Job/ tasks description

The main objective of the study is to provide qualitative and quantitative information of the above- and below-ground biomass and carbon stocks at the regional level (in the twelve SAWAP countries). and to analyze the impact of financing mechanisms on SLM in terms of mitigation. A focus will be made on the project sites for more detail and accuracy using high resolution spatial data as primary input data in addition to other input data described in the methodology.

Specifically, the study will aim at:

- Estimating the amounts of carbon sequestered (vegetation and woodlands areas) in the SAWAP zone and assessing specifically the carbon balance resulting from the project's activities on their zone of interest;
- Defining the baseline of carbon sequestration of vegetation and woodlands areas in the SAWAP zone;
- Modeling for the ecosystems of the project's site their possible carbon sequestration potential by 2019;
- Identifying good practices for sustainable land management (SLM) applied in the ecosystems of the project's sites that have the best impacts in terms of mitigation;
- Presenting the challenges of measuring, verifying and reporting on carbon sequestration of forest ecosystems and other wooded lands in the SAWAP areas of study;

3. Methodology

Multiple methodologies for estimating carbon sequestration exist or are being developed or evaluated by researchers and research institutes. Based on this knowledge, the consultant will propose the most detailed approach that he/she deems relevant to the realization of the mission and which will be discussed, refined and validated with the experts in charge of the BRICKS project. This methodological approach should be operational and adapted to the existing data.

This study on the calculation of this SAWAP indicator will be carried out based on an iterative process involving a number of stakeholders. The study will be developed according to a methodology that the consultant is required to propose in his technical offer and which will be accepted by mutual agreement between him/her and the BRICKS project experts. At each fundamental stage of the study development, the consultant shall present to OSS the progress of the work so that observations, additions and amendments could be made.

The study elaboration process will have three main steps as follows:

Step 1: Data collection and methodology proposal.

This first step will consist in understanding the required work, collecting the existing documentary data and finally proposing the most efficient methodology by the consultant. Particular attention will be given to methodologies using land cover/land use mapping.

Step 2: Mapping in support of carbon sequestration study

The mapping products used as part of this study will be provided by OSS experts who will be recruited for this purpose. High resolution images will be used to map the project sites. The consultant will provide methodological support to these experts and validate the products developed.

Step 3: Calculation and analysis

Based on the methodology adopted and the cartographic data, the consultant will generate statistics on the carbon sequestered by plants and in the soil. The results analysis will adopt a spatial approach in relation to the region's ecosystems, and take into consideration:

- LULC (Land Use / Land Cover) maps,
- Standard coefficients of FAO (which are already used in EX-ACT),
- Vegetation indices and derived products (NDVI, fAPAR, DMP, Net Primary Productivity, Leaf Area index ...)
- In-situ measurements and ancillary data provided by national partners
- Forest inventories for the national level if available.

Earth observation data and derived products will be provided by OSS, and the maps of carbon sequestration potential at the scale of 1: 1 000 000 for the regional level will be developed in collaboration with the OSS experts.

Available Carbon accounting models:

- Light Use Efficiency (LUE) models with integrating APAR time series data derived from NDVI (derived from Monteith model)
- Carbon accounting models (FAO): Ex-ante Appraisal carbon-balance tool (FAO): calculate the emissions and uptake of carbon by the project. www.fao.org/tc/rome2007initiative/ex-act-carbon-tool/en.
- Rapid Carbon Stock Appraisal (RaCSA) (ICRAF): to assess landscape carbon stocks. www.worldagroforestry.org/sea/projects/tulsea/inrmtools/RaCSA.
- [The General Ensemble Biogeochemical Modelling System using spatial databases for the simulation;](#)

4. Tasks and expected outputs

Under the supervision of the BRICKS Project Coordinator (OSS) and in close collaboration with the project's monitoring and evaluation expert, and the support of the experts in charge of developing maps, the consultant is required to:

- Conduct a comprehensive literature review of existing approaches and methodologies for carbon sequestration (estimation/evaluation);
- Propose a reliable methodology for achieving the expected results for carbon sequestration potential estimation;
- Propose statistical models to measure the evolution of carbon sequestration based on forecasting methods;
- Estimate the amounts of carbon sequestered and generate statistics on the direct and indirect economic and environmental impacts linked or not to the sequestered carbon;
- Analyze and interpret the carbon sequestration maps of the entire SAWAP zone;

- Prepare a preliminary report and a final report of the study;
- Develop PPT presentation outlining the main results.

The main expected outputs of the study are the following:

- Technical note on the carbon sequestration assessment methodology based on practical, and manageable processes and cartographic data;
- The cartographic supports used for the study development and the statistics generated based on the maps;
- The elaboration of a training manual on carbon sequestration estimation for the benefit of the SAWAP countries.

All of the above-mentioned deliverables must be provided in the two working languages of OSS: French and English.

NB: The consultant will be responsible for the translation of the final products.

5. Duration

Forty (40) days distributed over sixty (60) days.

6. Requested profile

Candidates must be:

Experts in Carbon Sequestration Potential Estimation: The consultant must possess a solid experience in estimating the carbon potential of ecosystems. In addition, s/he must fulfill the following requirements:

- Hold a diploma in natural resources management, geography, environmental science or similar field;
- Have perfect knowledge and mastery of methods and approaches for carbon sequestration potential estimations;
- Have a Good knowledge in the field of Sustainable Land and Water Management (SLWM);
- Be familiar with the UNFCCC instruments for carbon sequestration;
- Have a good Knowledge of the major environmental issues in the Great Green Wall zone the SAWAP area in particular;
- Have conducted at least three similar studies in the last five years
- Strong analytical, synthesis and good writing skills in the two working languages of OSS, English and French.

7. Technical and financial proposals

The application package must include:

1. A conceptual and methodological note for the study implementation;
2. A financial proposal
3. A detailed CV (standard template provided by OSS)
4. Any other relevant documents.