

**Report submitted to the
United States Agency for International Development
Cooperative Agreement No. EEM-A-00-06-00024-00**



USAID
FROM THE AMERICAN PEOPLE

**Global Climate Change:
Carbon Reporting Initiative**

January 2011

Submitted by:

Sandra Brown, Project Coordinator

wi Winrock International

Ecosystem Services Unit

1621 N. Kent St, Suite 1200

Arlington, VA 22209

Email: sbrown@winrock.org



Deliverable 12: Progress Report 4

January 2011



WINROCK
INTERNATIONAL

Putting Ideas to Work

1. Background

The main objective of the proposed work is to expand the ability of USAID to report global climate change impacts for forest-based activities by developing and implementing a set of innovative tools with high scientific integrity. Calculation tools will be developed to capture quantifiably the climate impact of a greater sphere of USAID project types and to include the full geographic extent of USAID investment. USAID-sponsored land use and land management activities worldwide have direct, significant, and positive impacts on the climate. Although the impact of these activities is real, projects have not had the ability or tools to translate this impact into reportable, quantifiable measures of avoided emissions or sequestered carbon.

Under this proposal, we seek to build tools that will be based on a set of simple yet scientifically-based and quantifiable indicators to be used as input data. Output from the tool will be an estimate of the carbon benefits of the activities over a given time period. The tools will be simple and easy to use, and will allow the GCC Team and local missions and other stakeholders around the world to increase confidence in the integrity of results.

2. Progress on Tasks outlined in Workplan for year 4 until October

Task 1: Development of detailed workplan for year 4

The workplan was submitted on January 13, 2010.

Task 2: Addition of an agricultural soil component using IPCC default values

To successfully complete this task, Winrock needs access to the USAID project portfolio. This would help us to determine which projects might be eligible under the agriculture and grazing land management calculator and to design the databases to be compatible with existing projects. The steps foreseen in this task and described in the “*Proposed Workplan for Year 4*” depend on the access of USAID project portfolio. Nonetheless, the methodology for calculating changes in soil carbon – as well as relevant default databases – in the IPCC Guidelines for Agriculture, Forestry and Other Land Use (2006) have been reviewed and calculations relating the changes in soil organic carbon have been made accordingly. Depending upon receiving additional information on the general goal of the USAID agricultural projects, few ideas on how to address possible benefits were brainstormed during several of our weekly group meetings to check on the development of the project, and include:

- Estimation of benefit from conventional agricultural practices to carbon conservative practices that avoid tillage
- Impacts of application of fertilizer on soil carbon stocks
 - Organic (manure)
 - Conventional (fertilizers based purely on macro- and micro-nutrients)

Task 3: Expansion of forest protection, forest management, A/R and agroforestry tools

Improvements to the tools mentioned above have begun and are summarized below. A common improvement made in the forest protection and forest management tools is the possibility for users to insert notes in every Level B box that will be printed in along with project summary in the end of calculations. This improvement is expected to be applied to all tools under the calculator, as Winrock understands the importance of carbon

footprint reporting of USAID project on multiple consecutive years. Thus, allowing project managers to keep track of information and their sources added in previous report.

Forest Protection tool: Significant improvements have been made in year 4 in the forest protection tool. The most significant was the update of the carbon stock estimates in the database based on the estimates of Saatchi et al. (in review.)¹. Updated deforestation rates based on data released recently in Hansen et al. (2010)² are also being incorporated into the tool. Additionally, several other updates were made to the level B calculations in this tool. Briefly, these improvements were:

- Users are prompted to select the threat to their forested area: Users can choose one or more of the identified threats of: Deforestation, Illegal logging, and Fire. After choosing the threat, users are required to fill the equivalent boxes of the chosen threats with known numbers. Defaults are available and will be used for whichever box users don't fill.
- Addition avoided of soil carbon emission due to avoided deforestation: User may choose to estimate avoided soil carbon emissions separately from avoided emissions from live biomass. Estimations of soil carbon emissions were made by applying in the IPCC AFOLU (2006) methodology and using their default values present in this same report.
- Addition of burning of Peat forests: If project developer has threatened peat forests in their project area, the potential emissions of these forests may be assessed if threat to forest protection is chosen to be "fire". Otherwise, peat burning emissions are not calculated.
- Modification of database and equations for carbon benefits estimation: Changes and improvements required updating and alterations in the database and modifications of the equations used to calculate carbon benefits.

Forest Management tool: Significant improvements were also made to this tool. The main modification consist on the change of the name of the tool to "Commercial Forest Management", which after much discussion, was agreed to be the nomenclature that best represent the tool itself. Other important improvements follow:

- Insertion of total harvest area in Level A: In Level A calculations users are prompted to insert the area of the project as well as the total harvest area. The inclusion of the harvest area was made to avoid confusion in cases where project areas are far greater than area where forest is actually managed.
- Additional information about timber harvest area in Level B: In Level B, users may enter annual harvest area (in ha), rotation length (in years), and type of project (ex: reduced impact logging). Each choice will have different implications in calculating the benefits.
- Modification of database and equations for carbon benefits estimation.

A/R tool: New documents, such as the "Redimiento y Aspectos Silviculturales de Plantaciones Madereras en America Latina" prepared by Lugo (1997), have been reviewed for the purpose of finding additional information about species specific and age dictated growth curves, such that default values could be developed for more specific Level B parameters (such as tree diameter, which could be used to predict biomass accumulation). However, growth curves in the A/R calculator have not been modified at this time due to insufficient data. In addition to the literature review, we are in the process of revising a document that explains the data and equations underlying the A/R tool that will be sent out for peer review by selected experts. Based on the comments received in the peer review process, the document (as well as the methodology and data where applicable) will be revised and posted as an update to the website once all edits are finalized.

¹ Saatchi, SS, NL Harris, S Brown, B Zutta, W Buermann, M Lefsky, W Salas, S Hagen and S Petrova. Benchmark distribution of biomass carbon stocks across three continental regions. In review, *Nature Geoscience*

² Hansen MC, SV Stehman and PV Potapov. 2010. Quantification of global gross forest cover loss. PNAS, www.pnas.org/cgi/doi/10.1073/pnas.0912668107

Agroforestry tool: A document detailing the data and equations underlying the Agroforestry tool was written and sent for review by the following agroforestry specialists:

1. Rodel Lasco, World Agroforestry Centre (ICRAF), Philippines
2. Ciro Righi, Department of Forestry Sciences, University of Sao Paulo (USP), Brazil
3. Jim Roshetko, World Agroforestry Centre (ICRAF) and Winrock International, Indonesia

Comments from all three peer reviewers were received and addressed appropriately.

Task 4: Develop project planning tool and add target setting to existing tool –WORKSHOP OUTCOMES

Winrock aims at developing a robust planning tool to allow Mission staff to evaluate which project types are most beneficial from a carbon perspective on both short and long timeframes. The planning tool will produce projections over many years, rather than limiting estimates to annual benefits, so that users can make strategic decisions about which regions, and which activities within those regions, might have the potential to generate the largest carbon benefits. Thus, Winrock has held several internal discussions (as well as discussions with DRG) on the development of the planning tool. In addition, Winrock also promoted a participatory workshop on December 14th, 2010 to discuss the development of the planning tool with relevant stakeholders. The list of attendees can be seen in Table 1.

Table 1: List of attendees of Forest Carbon Calculator's Planning Tool Workshop

Attendee	Affiliation	Email
Patrick Smith	USAID	pasmith@usaid.gov
Nancy Harris	WI	nharris@winrock.org
Sandra Brown	WI	sbrown@winrock.org
Felipe Casarim	WI	fcasarim@winrock.org
Gustavo Fonseca	GEF	gfonseca1@thegef.org
Linda Heath	GEF	lheath@thegef.org
Tom Wirth	EPA	Wirth.Tom@epamail.epa.gov
Ken Andrasko	WB FCPF	kandrasko@worldbank.org
Doug Pool	IRG	Dpool@irglt.com
Todd Johnson	IRG	tjohnson@irglt.com
Tyler Chapman	DAI	tyler_chapman@dai.com
Thomas Erdmann	DAI	Tom_Erdmann@dai.com
Matthew Edwardsen	USFS IP Rainforest	mpedwardsen@fs.fed.us
David Hughell	Alliance	dhughell@ra.org
Robert Rose	WCS	rrose@wcs.org
John Morrison	WWF	john.morrison@wwfus.org
Paya deMarcken	WWF	

Amongst many outcomes the participatory process helped addressing some of the initial questions Winrock had in regards to the planning tool. The most important decisions agreed upon during the workshop are outlined below:

- Estimate benefits for a period of 30 years
- Planning tool should be multisectoral, encompassing other topics (at least qualitatively) such as: food security, human health, etc.

- Tool should be incorporated into country's development plans, integrated with existing programs. Avoiding the perception that planning tool is yet another separate apparatus, but rather something that could/will enhance existing programs and aid in the decision making process.
- Help users define when to use default data built in the calculator and when collect own data. Describe importance of collecting high quality and accurate data, otherwise mind as well use calculator's robust default data.
- Add sensitivity analysis differentiating crucial from not so crucial data required for proper estimations.
- Provide a qualitative data quality assessment of input data based on obtained results
- Provide additional information on default data (i.e. illustrative information of forests with various C stocks)
- Incorporate data on with population density, population growth rate, and crop suitability databases and display this information in output. This will provide informed decision for project planners.
- Link planning tool to other tools and state clearly how it may relates to other tools
- Prepare documentation describing Planning tool

Winrock has developed wireframes (i.e., screen shots of how the tool will eventually look) and DRG is currently working on developing the planning tool.

Task 5: Incorporation of the latest carbon and deforestation maps

Updated carbon stocks and deforestation rates were uploaded to the Carbon Calculator in December 2009 according to draft estimates by Saatchi et al. (in review) as well as draft estimates of forest loss using the MODIS Vegetation Continuous Fields (VCF) dataset. Final estimates by Saatchi et al. (in review) and deforestation rates by Hansen et al. (2010) – which account for small-scale clearing by correcting MODIS rates of forest loss to rates derived using higher resolution Landsat imagery – are now being incorporated into the default database.

Task 6: Hosting of website for another year

Data Research Group (DRG), a partner Winrock has subcontracted for the development of this project, will host the USAID Forest Carbon Calculator website during year 4.

Task 7: Separation of carbon benefits from live biomass versus soil

The IPCC AFOLU (2006) methodology for calculating the change in carbon stocks in soils after a change in land use from forest to cropland is being used to develop default estimates of post-deforestation soil carbon losses in countries where the top three expanding crops (according to FAO statistics) are annual crops. (This situation represents the majority of countries). However, soil carbon losses are not calculated for countries where the primary expanding crop is perennial, which is assumed not to affect the soil carbon pool (e.g., Indonesia, Malaysia). See also progress on Task 2 above.

Task 8: Development of guidance documents on data collection and processing for Level B data and conduct training seminars

A guidance non-technical document designed to help users navigate through the Calculator and exemplifying hypothetical projects in each tool is under development. This document will be a "User's Manual" and will provide easy-to-understand description of how the calculator works, and if users need to use the calculator to report their projects (i.e. explains the types of projects that are covered by the calculator). In addition, a guidance technical document for the Agroforestry tool describing the underlying data, and calculations' rationale has been created and peer-reviewed. This document will be put available on the website for users that have

questions and concerns regarding the methodology and data used in the development of the tool. Similar documents for the other tools are being created and will undergo the same process. The ultimate goal is to have a non-technical user's manual document for the entire calculator describing uses of each tool, and a technical document per tool describing the underlying methodology and data.

Task 9: Allow import of shapefiles

After much internal discussion Winrock decided to drop this initiative due to design issues of the calculator. The forest carbon calculator was not designed to allow spatial specific analysis at the property level, rather its spatial analysis are done at the country's sub-administrative units' level.

Task 10: Creation of stand-alone version of tool and development reporting interface

Winrock has met with DRG to lay out plans for the stand alone tool. The basic wire frame of the tool was defined and the stand alone tool will look very similar to the existing USAID Carbon Calculator. However, no login will be necessary and therefore no information will be saved under user profile. The tool is available online for testing at: <http://winrock.stage.datarg.net/standalone/>

Task 11: Working with the National Inventory ALU tool developers to harmonize approaches

No progress has been done to date.

Task 14: Produce progress reports

This document reflects the progress report until January 2011.



For questions or comments contact:

Dr. Sandra Brown Director and Chief Scientist, Ecosystem Services Unit
office 703.302.6578 | cell 703.470.9430 | fax 703.302.6512 | sbrown@winrock.org
2121 Crystal Drive, Suite 500 | Arlington, VA 22202, USA | www.winrock.org/ecosystems/

