United Nations Environment Programme

Terminal Evaluation of the Project

"Carbon Benefits Project: Modelling, Measurement and Monitoring (CBP: MMM)"

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Disclaimer:

The views expressed in this report are those of the evaluators alone and do not necessarily reflect the views or policies of UNEP, or of any individual or organization consulted.

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List of Acronyms

AFOLU	Agriculture Forestry and Other Land Use
ALU	Agricultural Land Use
CDM	Clean Development Mechanism
CENA	Centro de Energia Nuclear na Agricultura
CIAT	International Centre for Tropical Agriculture
CIFOR	Center for International Forestry Research
COMET VR	Voluntary Reporting Carbon Management Tool
CSU	Colorado State University
M&E	Monitoring and Evaluation
GEB	Global Environmental Benefit
GEF	Global Environment Facility
GEFSEC	Global Environment Facility Secretariat
GEFSOC	Global Environment Facility Soil Organic Carbon
GHG	Greenhouse Gas
GIS	Geographic Information System
GOES	Global Observatory for Ecosystem Services
GPS	Global Positioning System
ICRAF	World Agroforestry Centre
ICRISAT	The International Council for Science
IPCC	Intergovernmental Panel on Climate Change
ISRIC	International Soil Reference and Information Centre
KARI	Kenya Agricultural Research Institute
LADA	Land Degradation Assessment in Drylands
LULUCF	Land Use, Land-Use Change and Forestry
MI	The Macaulay Institute
MSU	Michigan State University
NAP	National Action Plan
NREL	Natural Resource Ecology Laboratory
NGO	Non-governmental organization
NPP	Net Primary Production
NRCS	Natural Resources Conservation Service (of the USDA)
ODG	Overseas Development Group

OGC	Open GIS Consortium
OP	Operational Program
OVI	objectively verifiable indicators
PIR	Project Implementation Review
REDD	Reduced Emissions from Deforestation and Degradation
RS	Remote Sensing
SLM	Sustainable Land Management
SOC	Soil Organic Carbon
SOM	Soil Organic Matter
SSC	Scientific Steering Committee
STAP	Scientific and Technical Advisory Panel
UEA	University of East Anglia
UN	United Nations
UNDP	UN Development Programme
UNEP	UN Environment Programme
UNFCCC	UN Framework Convention on Climate Change
USDA	United States Department of Agriculture
WCMC	World Conservation and Monitoring Center
WWF	World Wildlife Fund for Nature
WKIEMP	Western Kenya Integrated Environmental Management Project

Executive Summary

1. The "Carbon Benefits Project: Modelling, Measurement and Monitoring" (CBP) project was a GEF-funded project in the amount of $5,526,265. It took place over the period from 2009 to 2013 and received co-financing support from a number of institutions.

2. The project was designed as a response to the situation at the time of project inception of a lack of any standardized, readily accessible, and cost-effective analytical tool to quantify global environmental benefits from sustainable land management (SLM) interventions. This prevented direct comparisons across SLM projects, and also posed difficult issues associated with accounting for carbon benefits in particular, notably issues of permanence, leakage, additionality of carbon gains, and uncertainty.

3. Hence, the project aimed was to develop a standardized, readily accessible and cost-effective tool that would be applicable, on either an *ex-ante* or *ex-post* basis, for the quantification of the full range of carbon benefits that can be derived from SLM project activities. The overarching aim for such a tool is a credible and comprehensive system capable of codifying sampling / measurement protocols, compiling /managing/ storing data, modeling of sustainable land use interventions/scenarios, and documenting / reporting of results.

4. The project was executed through a partnership between UNEP, Colorado State University (CSU), and the World Wildlife Fund for Nature (WWF). A number of other institutions were involved, among them Michigan State University (MSU), the World Agroforestry Centre (ICRAF), and the International Soil Reference and Information Centre (ISRIC). In addition, SLM project sites in China, Brazil, Kenya, and Niger/Nigeria were involved to provide ground-truthing user experience in the application of the tool under real-world conditions.

5. This terminal evaluation was undertaken under the aegis of the UNEP Office of Evaluation, based on a comprehensive set of criteria, indicators and sub-indicators as can be found in Annex F (Terms of Reference for the evaluation). Methods for the evaluation included a comprehensive review of available documentation (project reports, meeting minutes, project outputs and financial reports) (see Annexes A through E for a list); a set of interviews with key stakeholders (see Annexes A through E for a list); and several evaluation missions to each country test case sites and partner offices.

6. Overall, the evaluation found the following notable features:

   - The project's objectives were fully consistent with the national and international priorities at the time of project inception, as well as with the national priorities, action plans and environmental agendas at the country test case level.
   - the project has produced a web-accessible system to quantify carbon benefits with guidelines, data formatting, as well as capability for calculations, modeling and reporting.

- The likelihood of the project achieving its ultimate aim of universal application in GEF SLM projects going forward is realistic, assuming that follow-on activities take place, notably ongoing system maintenance to keep pace with evolving user experience and follow-on training activities.
- The project's implementation approach showed deviations from the design envisioned in the Project Document as well as incorporating important modifications not anticipated at the time of project design, reflecting a flexible response to an evolving understanding of user needs and emerging conditions/opportunities.
- On the whole, the quality and efficiency of financial planning in this project respected the standards in force at the time of implementation. Budgets were developed according to the required templates and procedures, with acceptable

Summary of terminal evaluation ratings

Criterion		Sub-criterion	Sub-criterion rating	Overall criterion rating
A	Strategic relevance	Relevance	HS	HS
B	Achievement of outputs	Achievement of outputs and activities	HS	HS
C	Effectiveness: Attainment of project objectives and results	Direct outcomes from reconstructed TOC	HS	HS
		Likelihood of impact using RoTI and based on reconstructed TOC	HS	
		Achievement of project goal and planned objectives	HS	
D	Sustainability and replication	Socio-political sustainability	HL	ML
		Financial resources	ML	
		Institutional framework	ML	
		Environmental sustainability	L	
		Catalytic role and replication	HL	
E	Efficiency	Efficiency	HS	HS
F	Factors affecting performance	Preparation and readiness	S	S
		Implementation approach and adaptive management	S	
		Stakeholder participation and public awareness	MS	
		Country ownership and driven-ness	MS	
		Financial planning and management	S	
		UNEP supervision and backstopping	S	
		Monitoring and evaluation - Design	S	
		Monitoring and evaluation - implementation	S	
			Overall project:	S

levels of detail, and the controls implemented under UNEP financial procedures were adequately delivered.

7. The evaluation concludes that the overall average rating for this project, compiled from ratings across the many criteria and sub-criteria, is Satisfactory. The table below provides the summary ratings for the project.

8. Based on the evaluation's finding, the following recommendations are made:

- **Recommendation 1:** From a substantive point of view, the future and systematic quantification of carbon benefits at the local level can only be achieved if there is a mandate for addressing carbon benefits from SLM interventions within GEF's operational programming. Carbon benefits should not be left to *ad hoc* project design decisions that can vary according to context and other factors. It is

essential that support for the rigorous and systematic quantification of carbon benefits be appropriately translated into high-level guidance.

- **Recommendation 2:** The proof of the ultimate success of the project is the degree that a relevant version of the CBP is integrated in future SLM project designs. For this to happen, it is essential that the CBP system be viewed as a dynamic tool that is allowed to evolve commensurate with the substantive and programming feedback from an increasing number of users in an increasingly number of challenging land use settings. This will require subsequent support for CBP system maintenance and improvement in the context of expanding applications in developing countries.
- **Recommendation 3:** At present, knowledge about the capabilities is not widespread among the community of prospective users. It will be important that a subsequent phase devoted to capacity building and awareness-raising be implemented. This is a necessary complement to any mandate to develop an estimate of carbon benefits in future SLM project activities.
- **Recommendation 4:** Continued development of the tool is necessary in order to account for important findings from using the CBP system at SLM projects. For example, users would benefit from a module that isolates the key factors associated with differences between results from the Simple and Detailed Assessments.
- **Recommendation 5:** It will be important to develop a workable institutional framework by which to link the emerging body of results from application of the CBP system in SLM settings to the work of the IPCC regarding GHG inventory methodology and database development.

Part I - Evaluation Background

A. Context

9. Human induced global climate change is occurring at a greater speed and intensity than previously anticipated. Necessary greenhouse gas (GHG) reduction goals will be difficult to achieve even under the most optimistic scenarios unless every environmentally and socially sound avenue of mitigation is used. Anthropogenic emissions of greenhouse gases such as CO_2, N_2O and CH_4 are acknowledged to be a serious threat to the global environment (IPCC, 2007), with annual emissions of CO_2-equivalent in 2010 equal to about 50.1 billion tonnes (UNEP, 2012), with net emissions associated with land use change and forestry typically accounting for about 20% of total anthropogenic GHG emissions throughout the 1990's (WRI, 2005).

10. Much of the attention for reducing anthropogenic GHG emissions has been focused on efforts to transition energy supply and use toward greater use of renewables and efficiency. Sustainable land management (SLM) projects and policies, while typically not primarily oriented to produce GHG reduction benefits, can also reduce net GHG emissions through carbon sequestration in terrestrial ecosystems. Depending on the nature and extent of alternative land management practices implemented, the levels of carbon sequestered can be substantial, thereby countering the build-up of CO_2 concentrations in the atmosphere and leading to Global Environmental Benefits (GEB).

11. SLM projects comprise a range of actions including afforestation, re-forestation, forest conservation, wetland restoration, and improved cropland/rangeland management. Unlike other types of GHG mitigation projects, SLM projects do not enjoy a standardized, cost effective protocol for the quantification of carbon sequestration benefits. When such benefits are measured, a variety of project-specific criteria and procedures have been used, rendering direct comparisons between SLM projects difficult. Moreover, the focus is usually on aboveground biomass, thereby neglecting carbon sequestration benefits associated with belowground soil organic carbon (SOC).

12. That is, at the time of project inception, there was no standardized, readily accessible, and cost-effective analytical tool that project managers could access and apply in support of *ex-ante* or *ex-post* claims of global environmental benefits from SLM interventions. Methods that were in use depended on land use, the phase of a project cycle, and the vagaries of the expertise and resources available. As a result, there was no consistent way to undertake comparisons across SLM projects, nor of dealing with some of the difficult issues associated with accounting for carbon benefits such as permanence, leakage, additionality of carbon gains, and uncertainty.

13. Hence, the underlying motivation for the project was the widely perceived need for a standardized, readily accessible and cost-effective tool that would be applicable, on either an *ex-ante* or *ex-post* basis, for the quantification of the full range of carbon benefits that can be derived from GEF's SLM project activities. The

overarching aim for such a tool is a credible and comprehensive system capable of codifying sampling/measurement protocols, compiling/managing/storing data, modeling of sustainable land use interventions/scenarios, and documenting/reporting of results.

14. Programmatically, the project was situated within the SFM-SP3 (Sustainable Forest Management) and LD (Forest Conservation) frameworks of the GEF IV Strategic Programme. Projects under these frameworks are intended to achieve the dual objectives of protecting or generating GEBs while demonstrating innovative approaches to sustainable land management at the local level. The project was developed by the United Nations Environment Programme (UNEP) in collaboration with a number of research institutions, international NGOs and other participating country entities. UNEP acted as both the Implementing Agency (IA) and Executing Agency (i.e., through its Division of Early Warning and Assessment (DEWA) for the GEF.

B. The CBP

CBP goals and objectives

15. For ease of reference, the following terminology has been used in the rest of this terminal evaluation:

- ***CBP*** refers to Project GFL/3349 as formulated by UNEP and financed by the GEF to develop a system to quantify carbon benefits from SLM project interventions.
- ***Country test case*** refers to the countries in which field testing activities for the CBP have been implemented.
- ***Test case site*** refers to specific physical locations within the country test cases where past or ongoing SLM interventions have been assessed using the tools, protocols and guidance materials developed by the CBP.
- ***Project*** refers to the past or ongoing SLM interventions that served as host for CBP activities.

16. The CBP was designed as a 3-year science-oriented and capacity-building initiative intended to develop a new and comprehensive tool to quantify global carbon benefits from SLM projects. Its design emphasized the coupling of university research institutions, where development of the tool was undertaken, together with country-based ongoing SLM projects where the tool was tested and applied on a case study basis. Tool development activities were undertaken at Colorado State University (CSU) and Michigan State University (MSU). Case study sites were chosen at ongoing SLM-related projects already underway in China, Brazil, Kenya, and the transboundary watershed region along the Niger/Nigerian border.

17. The CBP's overall development goal was to help the GEF promote and justify carbon sequestration as a global environmental benefit in SLM interventions. Its main objective was to provide a cost effective, user-friendly, yet scientifically rigorous software-based approach and web-based tool for measuring and modeling carbon stocks and GHG mitigation benefits in GEF projects dealing with natural resources in all climate zones and land use systems. The key aims in the design of the carbon

benefits system are to develop a practical protocol that allows users to (a) estimate and model C stocks and flows of other GHG emissions (b) to measure, monitor and manage above- and below-ground carbon in future GEF SLM projects, as well as similar non-GEF projects, across a broadly inclusive range of land use systems around the world, and (c) provide the resulting suite of tools with full instructions on how to use them from a single website beyond the life of the project.

18. There are four main areas of CBP activities, namely methodology development, field-based protocol/tool testing, capacity strengthening, and monitoring/evaluation. Two major and distinct components underlie these activities. Component A, led by Colorado State University (CSU), focuses on modeling aspects of the carbon benefits approach and system (hereafter: "CBP system") with an emphasis on croplands and pastoral grazing lands. Methodology development revolves around forecasting, monitoring, verifying, and projecting carbon stocks over a longer-term period. It uses the Intergovernmental Panel on Climate Change's (IPCC) 2006 GHG inventory guidelines for Agriculture, Forestry and other Land Use (AFOLU) as a foundation, incorporates above- and below-ground carbon stocks, and integrates scenario modeling with ground-based measurement.

Table 1: Project component and objectives

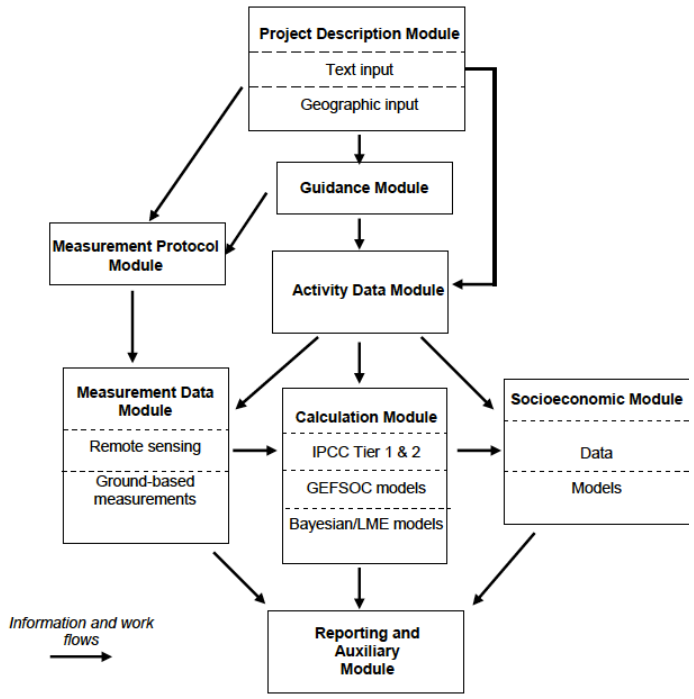
Comp	Objectives
A	To build on approaches used by Colorado State University (CSU) in its responsibility for estimating soil greenhouse gas emissions for the US national inventory
	To build on experience of development of a national-scale greenhouse gas inventory assessment tool encompassing the entire Agriculture, Forestry and Land Use sector, which is being implemented in several Central American and East Asian countries
	To build on CSU's extensive experience in ground-based measurement of ecosystem C stocks and in designing long-term monitoring systems
B	To develop a unified protocol to account for C sequestration at the community level using Remote Sensing (RS) measurements, C models and geographic information systems;
	To develop an accounting system that can be readily used by rural communities and local support organizations;
	To develop the needed technologies to support C accounting, management, measurement, and monitoring, using earth observation satellites, internet-based GIS and databases and ground based sensors and sensor webs.

19. Component B, led by the World Wildlife Fund (WWF) focuses on measurement aspects of the CBP tool. Michigan State University (MSU) has taken the technical lead in building upon earth-observation and field-based technologies; again linking above-ground and below-ground carbon measurements to support carbon accounting, management, measurement, and monitoring. The emphasis of Component B is on agro-forestry and forestry. The specific objectives within each of these two major Components are summarized in Table 1.

20. The conceptual framework for the CBP tool at the time of initial design is illustrated in Figure 1. The motivation underlying the initial design was to integrate the several distinct but related modules/elements under a single, fully self-contained framework. Hence, the system was designed to include an underlying GIS-based mapping system, comprehensive guidance materials, field measurement and remote sensing protocols, user-friendly activity data entry and database management capability, carbon stock calculation modules, socioeconomic analysis, and a simplified and consistent reporting format that can be applied across land use systems and types of SLM project interventions.

21. Notably, the carbon stock calculation modules are designed to be flexible and applicable to a wide range of potential users, depending on their background, technical capacity and resources. The modeling of soil and biomass carbon stock change ranges from a Simple Assessment approach that uses the default factors in the IPCC 2006 GHG Inventory Guidelines; to a Detailed Assessment approach where the user may opt to replace default factors with user-specific factors generated from local studies; to a Dynamic Modeling assessment approach which codifies a well-vetted model (i.e., the Century Model) as a basis to conduct more sophisticated assessments of soil and biomass carbon stock changes.

Figure 1: CBP system conceptual overview at project design



22. Table 2 shows the overall project budget approved by GEF at the time of CEO endorsement. The split between GEF trust funds and co-financing sources is 52% and 48%, respectively. There have been no changes to the total GEF contribution over the duration of the project. A one-year, no-cost extension through the end of May 2013 to accommodate additional time needed for model development and testing was granted.

23. A key feature of the project was collaboration with partners located in five (5) country test cases. The core aim of these collaborations was the provision of feedback on the emerging beta versions of the CBP tool, as well as its application in real-world SLM project and soil/biomass measurement activities. Four of the test cases were associated with Component A; one was associated with Component B. Each of the country test cases for local-level testing activities was developed to address a key aspect related to methodological development or establishing protocols guidelines. An overview of the test cases, including their respective key objectives, is provided in the paragraphs below.

24. *Niger/Nigeria:* This test case site falls within the objectives of Component A. Activities were undertaken within the context of an ongoing 2-phase, 8-year GEF-funded SLM project entitled: "Integrated Ecosystem Management in the Transboundary Areas between Nigeria and Niger" (GEF/GFL/2328-2770-4889). The main objective of the test case is to evaluate the potential and capabilities of carbon sequestration of natural ecosystems through Phase II activities that focused on the rehabilitation of agricultural and pastoral lands across two (2) test case sites covering roughly 26,000 hectares in western transboundary watershed areas between Niger and Nigeria.

25. *China:* This test case site falls within the objectives of Component A. Activities were undertaken mostly within the context of an ongoing Country Programme Framework funded through GEF's Operational Programme 12 (OP-12) around the core concept of Integrated Ecosystem Management (IEM). The main objective of the test case is to evaluate the net annual and cumulative change in carbon associated with ecosystem management, afforestation, and biodiversity conservation activities across four (4) sites covering nearly 400,000 hectares in the Gansu and Ningxia regions of north-central China.

26. *Brazil:* This test case site falls within the objectives of Component A. Activities were undertaken within the framework of an ongoing non-GEF project funded by the Fundacao de Amparo a Pesquisa do Estado de Sao Paulo (FAPESP). The project started in 1950 with the aim of developing an understanding of the impacts on soil composition from extensive land use change from deforestation underway in southwest Amazonia. The main objective of the test case is to evaluate the greenhouse gas (CO2, CH4 and N2O) emission impacts due to land use and land use change over nearly 91 million hectares at one (1) test case site in the state of Matto Grosso, as well to evaluate soil organic matter degradation, a key source of long-term GHG emissions.

27. *Kenya(A):* This is the first of two test cases in Kenya. This test case site falls within the objectives of Component A. Activities were undertaken within the context of an ongoing 6-year GEF-funded SLM project entitled: "Kenya Agricultural Productivity and Sustainable Land Management" (GEF Agency ID: P088600). The main objective of the test case is to evaluate the net change in carbon associated with the modernization of agricultural production practices at one (1) test case site covering 830 thousand hectares in the Cherrangani Hills region in western Kenya.

28. *Kenya(B):* This is the second of two test cases in Kenya. This test case site falls within the objectives of Component B. Activities were undertaken within the context of an ongoing 5-year GEF-funded SLM project entitled: "Western Kenya

Table 2: Financing plan at CEO endorsement

FINANCING PLAN (US$)	
GEF Project/Component	
• Project	5,526,265
• PDF and PPG	552,627
Subtotal GEF (52% of total)	6,078,892
Cash co-Financing	
• ISRIC	2,000,000
Cash subtotal	2,000,000
In-kind co-Financing (NGO/University)	
• CSU	594,289
• WWF	1,043,793
NGO/University subtotal:	1,638,082
In-kind co-Financing (other)	
• Governments	1,200,000
• UNEP/DEWA	350,000
Other subtotal:	1,550,000
Subtotal co-financing (48% of total)	5,188,082
Total Project Financing	**11,266,974**

Integrated Environmental Management" (GEF Project ID: P072981). The main objective of the test case is to implement carbon sampling and measurement protocols by building upon a set of agroforestry and forestry management interventions underway in the Nyando, Yala, and Nzoia watersheds of Western Kenya. A total of nine, 100 square kilometer blocks were selected throughout the 3-watershed region, with each block further divided into sixteen, 625 hectare survey units within which 10 plots were surveyed and monitored.

Key milestones and Implementation Summary

29. For the purposes of this terminal evaluation, the nature of the project can be characterized as primarily scientific- and research-oriented. That is, project implementation was focused on undertaking a coordinated sequence of activities leading to a scientifically rigorous protocol/tool that can be used to justify global environmental benefit claims made by SLM project interventions, either *ex-ante* or *ex-post*. This distinguishes the project from most other GEF-funded SLM projects, which typically focus at the country or regional level for developing legal/institutional frameworks, supporting natural resource management/conservation strategies, implementing community level technologies, measures, and/or strategies. Due to the unique nature of the CBP, its implementation displayed advantages and disadvantages, while offering some specific lessons for similar future projects, as discussed throughout this terminal evaluation report.

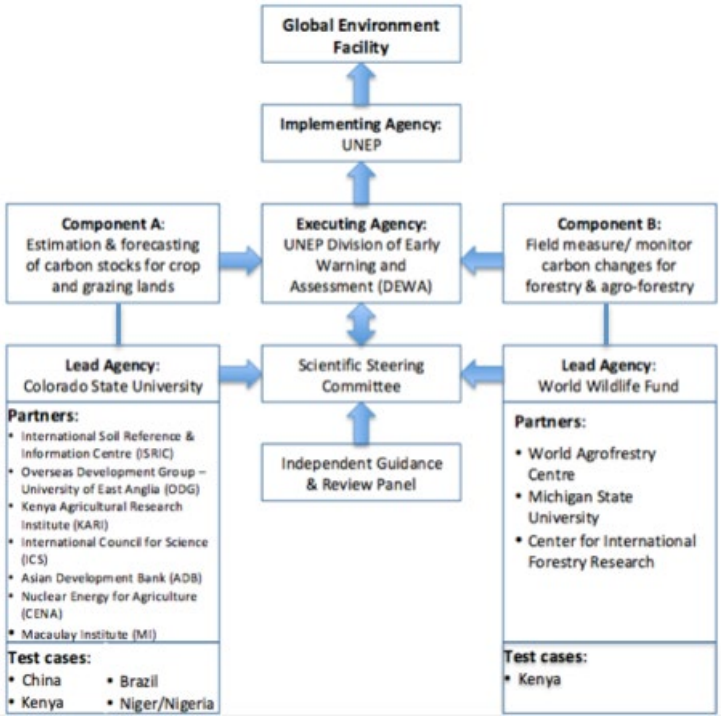
30. Design activities for the project were first undertaken in October 2007, with the submission and approval of the Project Identification Form (PIF). The project concept built on previous work such as the GEF's soil organic carbon (GEFSOC) modeling system for quantifying land use change impacts on soil carbon stocks; CSU's Agriculture and Land Use (ALU) national GHG inventory software; the USDA's Comet carbon management and accounting tool for farm-ranch-orchard operations; and the set of measurement/monitoring guidelines developed by UNDP/GEF in 2005 entitled: "Integrating Carbon Benefit Estimates into GEF Projects".

31. GEF approved the Project Document on 11 February 2009 and UNEP then gave its own approval shortly thereafter on 30 March 2009. The intended launch of the CBP was originally intended to take place in April 2009 with a scheduled duration of three (3) years and a projected completion date of March 2012. However, actual project start-up occurred in June 2009 and to account for the lag in start-up, the completion date for the project was adjusted to 31 May 2012.

32. The inception workshop was held over 11-14 May 2009 in Nairobi, with participation from all partnering institutions and test case sites, except for the ones in China and Niger/Nigeria which had yet to be identified. A subsequent mission to prospective Niger/Nigeria test case sites took place during 8-18 September 2009, confirming two sites on the Niger side of the border and two sites on the Nigerian side of the border as viable test case sites. Only the two sites on the Niger side of the border were incorporated into the test case due to security issues in Nigeria. As a result, the Niger/Nigeria test case consisted of two (2) individual test case sites evaluated as part of the CBP.

33. Similarly, a mission to prospective China test case sites took place over 1-11 November 2009, confirming two sites as viable; one in Gansu Province and the other in the Ningxia Autonomous region. At the suggestion of the Ningxia project management office, two additional sites were incorporated into the test case, another GEF-funded SLM project and a non-GEF project focusing on integrated forest/pulp production activities. In total, the China test case consisted of four (4) individual test case sites evaluated as part of the CBP.

Figure 2: Implementation arrangements at the time of project design (adapted from Project Document)



34. A first meeting of the Scientific Steering Committee took place over 30 August to 1 September 2010 in Washington DC. A total of eighteen (18) participants spanning the range of partnering and other interested organizations attended the meeting. The outcome of discussions confirmed that none of the technical issues and challenges that had been identified in the early stages of the project had been deemed to be overly serious or insurmountable.

35. Implementation arrangements are described in Figure 2. The integration of Components A & B was designed to be achieved through collaboration across multiple institutions and test sites, moderated by a technical oversight committee to promote the tool's scientific rigor, and managed by UNEP's Division of Early Warning (DEWA) to ensure financial accountability and compliance with project goals, objectives, and timelines. In practice, some of the partnering institutions noted in Figure 2 were not engaged over the course of the project (e.g., Macaulay Institute) while other institutions, largely unanticipated at the time of project inception, took on important roles as CBP field-based activities unfolded (e.g., Kenyan Forest Service). By the time the no-cost extension was over on 31 May 2013, project activities will have spanned a period of about 49 months, from April 2009 to May 2013, inclusive.

Basic Project information

Project Title:	Carbon Benefits Project (CBP): Modelling, Measurement and Monitoring
Executing Agency:	UNEP-DEWA in collaboration with Colorado State University and WWF
Project partners:	Modelling Component is led by Colorado State University (CSU) with the following partners: World Soils Information Centre (ISRIC), International

	Development (UEA), The University of Leicester, Centro de Energia Nuclear na Agricultura, Kenya Agricultural Research Institute, Nigeria-Niger Joint Commission for Cooperation, Foreign Debt Management Office Ningxia Hui Autonomous Region, and the GEF/OP12 Gansu Project Management Office in China. Measurement Component is led by the World Wildlife Fund (WWF) with the following partners: Michigan State University, World Agroforestry Centre, and the Centre for International Forestry Research.		
Geographical Scope:	Global		
Participating Countries:	Brazil, China, Kenya, Nigeria, Niger		
GEF project ID:	3449	**IMIS number*:**	GFL/2648-2713-4A47
Focal Area(s):	Land Degradation with relevance to Climate Change and Biodiversity	**GEF OP #:**	
GEF Strategic Priority/Objective:	SFM-SP3 Sustainable Forest Management (SFM)-SP-3, LD: Forest Conservation as a means to Protect Carbon Stocks and avoid CO^2 Emissions. Resource efficiency-sust. Consumption / production	**GEF approval date*:**	11 February 2009
UNEP approval date:	30 March 2009	**Date of first disbursement*:**	27 April 2009
Actual start date:	April 2009	**Planned duration:**	36 months
Intended completion date*:	March 2012 – extended to May 2013	**Actual completion date:**	31 May 2013
Project Type:	Full Size Project (FSP)	**GEF Allocation*:**	US$ 5,526,265
PPG GEF cost*:	Nil	**PPG co-financing*:**	Nil
Expected MSP/FSP Co-financing*:	US$ 3,638,082	**Total Cost*:**	US$ 9,164,347
Mid-term review/eval. (planned date):	12-16 September 2012	**Terminal Evaluation (actual date):**	Completed Sept 2013
Mid-term review/eval. (actual date):	12-16 September 2012	**No. of revisions*:**	1
Date of last Steering Committee meeting:	12-13 October 2011	**Date of last Revision*:**	13 April 2009
Disbursement as of 30 June 2012*:	US$ 4,238,903	**Date of financial closure*:**	N/A
Date of Completion*:	August 2012	**Actual expenditures reported as of 30 June 2012:**	US$ 4,181,599
Total co-financing realized as of 30 June 2012	US$2,310,777	**Actual expenditures entered in IMIS as of 30 June 2012*:**	US$ 3,550,033

C. Evaluation Objectives, Scope & Methodology

36. This terminal evaluation has been undertaken consistent with UNEP Evaluation Policy[1], the UNEP Evaluation Manual[2], and Guidelines for GEF Agencies in Conducting Terminal Evaluations[3]. The evaluation assesses project performance in terms of required criteria (e.g., relevance, effectiveness, efficiency) and determines outcomes and impacts (actual and potential) stemming from the project, including its sustainability.

37. Two main objectives underlie the terminal evaluation, namely a) to provide evidence of results relative to accountability requirements, and b) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP, the project co-executing partners (CSU and WWF), the GEF and their national partners. In pursuing these objectives, the evaluation seeks to provide answers to the following underlying four key questions:

- How successful was the project in developing a standardized, accessible and user-friendly system that reflects user needs in developing countries and which can be used to measure, monitor, model, and report carbon benefits in SLM projects?
- How successful was the project in applying the tool to quantify carbon benefits associated with GEF and non-GEF SLM projects in the test case countries (i.e., Niger/Niger, China, Brazil, and Kenya)?
- How successful was the project in increasing the capacity of the key stakeholder target groups to use the CBP system to justify the magnitude of carbon benefits in SLM projects?
- To what extent did project outputs increase global awareness of the linkages between carbon benefits and SLM projects, including the availability of the CBP system to quantify those linkages and the credibility to influence policymakers and other key audiences?

38. The terminal evaluation was conducted by a team of three (3) consultants under the supervision and with the support of the UNEP Evaluation Office. The evaluation timeline was roughly from January through May 2013. This period coincided with the last five months of project activity. Hence, a limitation of the terminal evaluation is the fact that final reporting had not yet been completed for the CBP.

39. The terminal evaluation methodology consisted of three (3) main elements. First, desk-based research was carried out. This involved the identification, acquisition, and review of a comprehensive set of project-related documents, including project reports, outputs, studies, meeting minutes, implementation reports, financial reports, and other related documentation.

40. Second, site visits were undertaken to meet with test case site staff and key project partners in order to discuss questions/issues that had emerged from the desk-based

[1] http://www.unep.org/eou/StandardsPolicyandPractices/UNEPEvaluationPolicy/tabid/3050/language/en-US/Default.aspx

[2] http://www.unep.org/eou/StandardsPolicyandPractices/UNEPEvaluationManual/tabid/2314/language/en-US/Default.aspx

[3] http://www.thegef.org/gef/sites/thegef.org/files/documents/TE_guidelines7-31.pdf

literature review and to assess test case performance relative to the activities specified in the respective subcontracting agreements. The division of labor among the evaluation team is outlined in the bullets below.

Table 3: Supporting administrative and logistical information found in this terminal evaluation report

Item	Sub-item	Section
Terms of Reference	Terminal Evaluation - overall project	Annex F
	Terminal Evaluation - test case sites	Annex G
Curricula vitae	Frank Murthuri	Annex A-4
	Yexu Wang	Annex B-4
	William Dougherty	Annex C-4
Site itinerary and contacts	Niger/Nigeria	Annex A-1
	China	Annex B-1
	Brazil	Annex C-1
	Kenya (Component A)	Annex D-1
	Kenya (Component B)	Annex E-1
Documents reviewed in preparation for test case site visits	Niger/Nigeria	Annex A-2
	China	Annex B-2
	Brazil	Annex C-2
	Kenya (Component A bibliography	Annex D-2
	Kenya (Component B	Annex E-2

- The US-based lead evaluator (William Dougherty) visited CSU (Ft Collins), MSU (East Lansing), ICRAF (Nairobi), and CENA offices (Piracicaba). Due to budget constraints, it was not possible to visit the test case site in Mato Grosso. In addition, telephone consultations were held with WWF personnel (Washington, DC). Due to schedule conflicts, it was not possible to arrange for in-person interviews with WWF personnel.
- The Kenya-based evaluator (Frank Murthuri) visited the Kenya-based entities, namely KARI, ICRAF, Cherangany Hills (test case site for Component A), and Yala (test case site for Component B). For logistical reasons, it was not possible to visit the other test sites in the Nyando and Nzoia watershed. He also travelled to Niger to undertake consultations at the project office in Niamey and visit the test case site in Birnin Konni. Due to logistical difficulties, it was not possible to visit the test case site near the town Maradi in Niger. Due to security issues, it was not possible to visit the two (2) test case site within Nigerian territory.
- The China-based evaluator visited the four (4) China-based test case sites, namely the test case site located in Gansu Province (i.e., Hongyue Village in Jingtai County) and the three (3) test case sites located in Ningxia Autonomous Region (i.e., Shapotou District in Zhongwei Municipality; Habahu National Nature Reserve in Yanchi County; and Xixia District in Yinchuan City).

41. Third, the overall project performance, as well as individual test case site performance, was evaluated based on the results of desk-based and site visits using UNEP's standardized evaluation methodology as indicated previously. Administrative and logistical details regarding the terminal evaluation process, together with the results of the test case site evaluations can be found in this report in the sections indicated in Table 3.

Part II - Evaluation Findings: Project Performance and Impact

42. This section provides a summary of the evaluation of the CBP as a whole, together with each of its test cases, relative to its overall performance and impact. Evaluation criteria are discussed and scored relative to a simple rating system (see Table 4). The sustainability and catalytic role criterion uses a rating system from unlikely to highly likely; all other criteria use a rating system from 'Highly Unsatisfactory' to 'Highly Satisfactory'.

43. The format for reporting the results of the evaluation is to first provide the ratings in a simple table, for easy reference. Both criteria and sub-criteria ratings are provided.

A. Strategic Relevance

44. The project's objectives were fully consistent with the national and international priorities at the time of project inception. The quantification of carbon benefits associated with SLM projects using a scientifically rigorous while user-friendly computation system had become a significant technical issue within the GEF when the project was first designed, and there was substantial interest on the part of countries, multilateral agencies and the GEF to demonstrate concrete progress in addressing this gap, considered a straightforward technical challenge without any controversial political or policy overtones.

45. The project's objectives and implementation strategies are consistent with the national priorities, action plans and environmental agendas at the country test case level. Each of the countries are signatories to relevant environmental conventions including CBD, Kyoto Protocol and UNFCCC. In addition the countries are all involved in the implementation of Integrated Environmental Management strategies that promote sustainable land management. Given that loss of vegetation and accompanying carbon stocks leading to desertification is a common problem facing the countries, the CBP system is a highly relevant intervention that is consistent with respective National Action Programmes regarding desertification control, natural resources management, and other national environmental strategies.

Table 4: Rating system used in this terminal evaluation report

Criterion	Rating	
Sustainability and catalytic role	Highly Likely	HL
	Likely	L
	Moderately Likely	ML
	Moderately Unlikely	MU
	Unlikely	U
	Highly Unlikely	HU
All other criteria	Highly Satisfactory	HS
	Satisfactory	S
	Moderately Satisfactory	MS
	Moderately Unsatisfactory	MU
	Unsatisfactory	U
	Highly Unsatisfactory	HU

46. Finally, the outputs of the country test cases produced a concrete estimate of the net carbon uptake from the range of SLM interventions undertaken. This specific output provides a substantive basis for claims that the various project interventions are delivering global, and not simply local, environmental benefits (see Part II in Annexes A, B, C, and D). This emphasizes the CBP's relevance to one of the key questions in the international climate change debate. Overall, '*Strategic relevance*' is rated 'Highly Satisfactory'.

B. Achievement of outputs

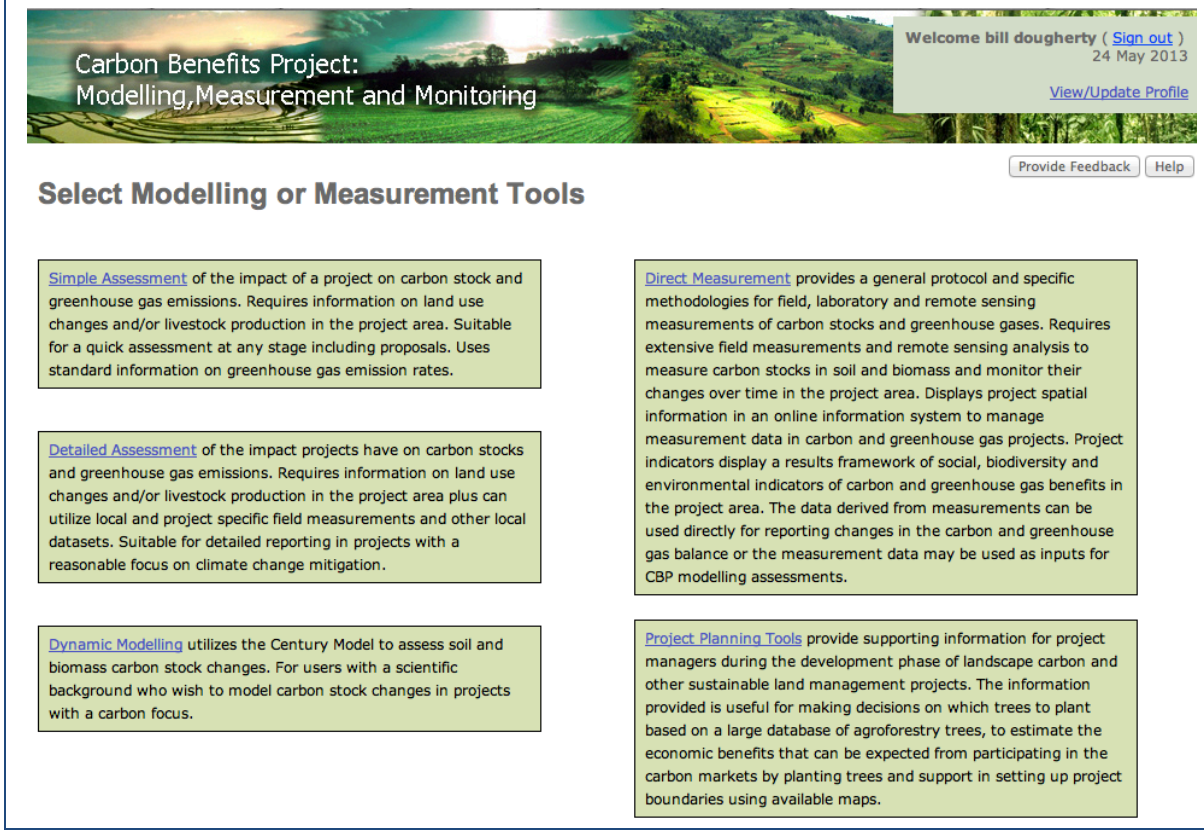
47. As embodied in the Results Framework of the 2009 UNEP Project Document, the CBP was divided into components, with outputs, and outcomes, and objectively verifiable indicators (OVI) for each component. The paragraphs below describe the achievement of outputs and activities relative to each of five (5) major OVIs.

48. OVI #1 focuses on the development of a standardized methodology for measuring monitoring, projecting and reporting C benefits in SLM projects including guidance. At the time of evaluation the CBP has produced a web-accessible system with guidelines, data formatting, as well as capability for calculations, modeling and reporting. A screenshot of the web-based system is shown in Figure 3. Modules for Component A (modeling) are shown on the left of the screenshot; modules corresponding to Component B (measuring, monitoring) are shown on the right.

49. Prospective users can gain ready online access to the tool by going to http://www.unep.org/ClimateChange/carbon-benefits/cbp_pim and completing a quick registration process. Among other features, the tool has built-in help screens and video resources, search query capability, technical databases with default factors, and detailed guidance materials/user guides for tracking carbon benefits, measuring and monitoring, and use of the analysis tools. The interface for the CBP system is available in five of the UN languages (i.e., English, Spanish, French, Russian, and Mandarin Chinese). All guidance materials are available in English only. As of this writing there are no plans, to our knowledge, to translate the documents. As per the terms of the Project Document, the CBP system is only accessible through its web-based portal (i.e., not available for download to personal computers).

50. As of the time of this writing, most of the key features of Component A (modeling) and B (measurement, monitoring) are operational. The Component A portion of the CBP system can be applied at any stage of an SLM project, can account for differing amounts of project-specific data available, can provide spatially explicit outputs through its internal shapefile database, and offers reports in a standard format for ease of comparison. The Component B portion of the CBP system is a comprehensive set of online measurement and monitoring tools that guide users involved in field, laboratory, and remote sensing measurements of carbon stock changes and emissions. Among other things, Component B provides an online guidance and analytical tools for the measurement/monitoring guidelines in the UNDP/GEF report entitled: "Integrating Carbon Benefit Estimates into GEF Projects", developed in 2005. The technical evaluation of the CBP system, its internal databases, guidance documents, analysis protocols, etc. is the subject of a separate evaluation conducted by the GEF STAP.

Figure 3: Screenshot of the web-based CBP tool



51. OVI #2 focuses on the development of comparable SLM data on project benefits. As the time of this evaluation, the CBP tool contains a consistent and standardized reporting format that can be applied across the foreseeable range of SLM projects implemented by GEF or other agencies. For Component A, which is the portion of the tool that quantifies the magnitude of carbon benefits, a 3-section report of about 15 pages is produced upon the completion of all scenario characterization and associated data entry. Such a format makes possible the direct comparison of C benefits across different SLM projects.

52. OVI #3 focuses on improving the understanding of personnel in the country test cases concerning data input and other capabilities/requirements of the CBP tool as well as its applicability relative to country-specific SLM project circumstances. At the time of evaluation all country test cases have provided regular feedback on beta versions of the CBP tool and most have applied the tool to one or more of their respective test case sites. A detailed summary of the evaluation of country test case activities and results is provided in Part II, Section A of Annexes A through E.

53. OVI #4 focuses on strengthening the capability of country test case project personnel for using the CBP system to measure, monitor, project, and report C benefits. Much of the training in the use of the CBP system seems to have occurred through numerous face-to-face and long-distance telephone "consultation workshops" with country test case personnel for which no formal records or presentations were kept. The audience for training and awareness-raising activities on the CBP system's methods and protocols extended beyond country test case personnel and focused

on the broader SLM community among GEF and other networks. A summary of training and awareness-raising workshops appears in Table 5.

54. OVI #5 focuses on the implementation of the work programme relative to its objectives, outputs, budget constraints, together with fund disbursements to project partners in a timely manner. Overall, the Project has a rate of activity completion of

Table 5: Summary of training and awareness-raising workshops during the duration of the CBP

Location	Month & Year	Duration (days)	Number trained	Details
Leicester, UK	October 2009	3	NA	Initial orientation and training meeting specifically for project personnel from the country test cases
Bonn, Germany	June 2011	NA	NA	UNFCCC-related Side Event at the meeting of the Subsidiary Body for Scientific and Technological Advice
Yinchuan City, China	July 2011	3	15	People from GEF projects in eight (8) provinces (Xinjiang, Inner Mongolia, Qinghai, Gansu, Ningxia, Shaanxi, Beijing, Jiangxi)
Voi Wildlife Lodge, Kenya	September 2012	1	20	Overview of CBP Measurement Tools for GEF STAP and Review Personnel
Changwon, Korea	October 2011	NA	NA	Side Event at the Convention to Combat Desertification Conference of Parties
Agua se Sao Pedro, Brazil	February 2012	3	19	Personnel from GEF projects in six (6) counties (Argentina, Brazil, Bolivia, Cost Rica, India, Paraguay)
Sabah, Malaysia	July 2012	4	24	Regional UNDP biodiversity and ecosystem technical teams in Southeast Asia
Nairobi, Kenya	December 2012	3	NA	not available

91%, based on the averaged rate of achievement of the list of intended outputs. This estimate is a judgment based on a review of documents such as the Project Implementation Reports (PIRs), steering committee minutes, and, wherever possible, confirmed during the evaluation mission to Nairobi, interviews with project partners, and consultations with project staff at the country test case sites.

55. At the time of this evaluation, Sub-component 1 (Methodology development) is essentially complete although some programming aspects are still being addressed through the end of the no-cost extension. The project achieved Output 2.1 only partially since the country test cases were designed as part of the Component A subcontracting agreements to test and apply all the calculation modules, implementation at three of the country test cases was essentially limited to a focus on the Simple Assessment portion of the CBP system due to the unavailability of the completed system (See further discussion Annexes A, B, and D). Also, some of the guidance materials for Component B uploaded to the web-based platform are still indicated as first drafts (e.g., Field and Laboratory Measurement Protocols for Non-CO2 GHGs, Inorganic-N, and Soil water content). Output 3.1 is fully complete, consistent with the training and awareness-raising milestones designated in the Project Document.

56. For Sub-component 4, there were no issues in project management, monitoring/evaluation, information dissemination, and timeliness that threatened the delivery of the outputs identified in the Project document, or the quality of those outputs. Disbursements to partnering organizations took place consistent with acceptable practice, including disbursements by partners to subcontracting entities in the country test cases. Outside of the 3-month delay at CBP outset, due to not

unexpected administrative and logistical hurdles, and the 1-year no-cost extension, due to the unfolding complexity encountered with the various methodological developments, programming, and country test case integration, there were no serious lapses in the timely delivery of outputs. However, there was no mid-term evaluation conducted which limited the amount of independent review material available for the terminal evaluation. A completion rate summary by sub-component, output, and the project as a whole is provided in Table 6. Overall the '*Achievment of project outputs and activities*' is rated 'Highly Satisfactory'.

Table 6: Summary of training and awareness-raising workshops during the duration of the CBP

Sub-components for CBP system	Outputs	Achievement rate
1. Methodology development	1.1 A cost-effective methodology for proving C benefits in GEF projects, comprised of a protocol for proving C as a GEB in GEF and other SLM projects	95%
	1.2 A web portal allowing easy access and implementation of this protocol.	100%
	Sub-component average	98%
2. Test Cases	2.1 A C benefits protocol that meets the specific requirements of GEF SLM projects and other SLM projects in developing countries.	75%
3. Capacity building	3.1 Increased capacity to prove C benefits in SLM projects.	95%
4. Project Management, Monitoring and Evaluation & Information Dissemination	4.1 A workable project management structure	100%
	4.2 Effective M&E of the project	80%
	4.3 Wide dissemination of the project tools	100%
	Sub-component average	93%
Overall project average		91%

C. Effectiveness: Attainment of project objectives and results

57. This element of the evaluation concerns the extent to which the project achieved its main objective: "to help the GEF prove carbon as a global environment benefit in SLM interventions by providing a cost-effectives, user-friendly but scientifically rigorous methodology for measuring carbon (C) benefits in GEF projects dealing with natural resources in all climate zones and land use systems". One objectively verifiable indicator was specified, namely "GEF and other SLM projects moving over to using a standardized system to prove C as a GEB" and represents the basis for an evaluation of effectiveness.

58. There are two major factors that support a conclusion that GEF and other SLM projects are moving over to using a standardized system to prove C as a GEB. First, there is growing interest on the part of other multilateral organizations (i.e., UNDP) and SLM project managers in developing countries to obtain training on the CBP system. Some of training and awareness-raising workshops noted previously in Table 6 have been in direct response to this emerging interest, which continues at the time of this evaluation (e.g., CBP training workshop in Swaziland held in May 2013). Second, GEF includes a reference to the ongoing CBP system development process on its website (http://www.thegef.org/gef/node/2263), with explicit urging for its

use by project managers. Presumably, once the project is complete, the GEF will push for its explicit inclusion in future SLM Project Document formulation, as well as provide a link to the CBP system similar to links to other carbon accounting tools (e.g., GHG Benefits Calculator & Manual for Transportation Projects).

Direct outcomes from reconstructed TOC

59. The CBP's logical chain of results, as embodied in the 2009 Project document, can be summarized as follows: First, using GEF and co-financing resources as the main ***input***, two major ***Components*** were established, one for modeling aspects and the other for measurement/monitoring aspects. Three key ***objectives*** were established under each Component that are pursued within the framework of four major ***activities***. Together, these activities contribute to the realization of four distinct ***outputs*** and four distinct ***outcomes***. All of these project elements combined are expected to contribute to achieving the project's main ***objective***.

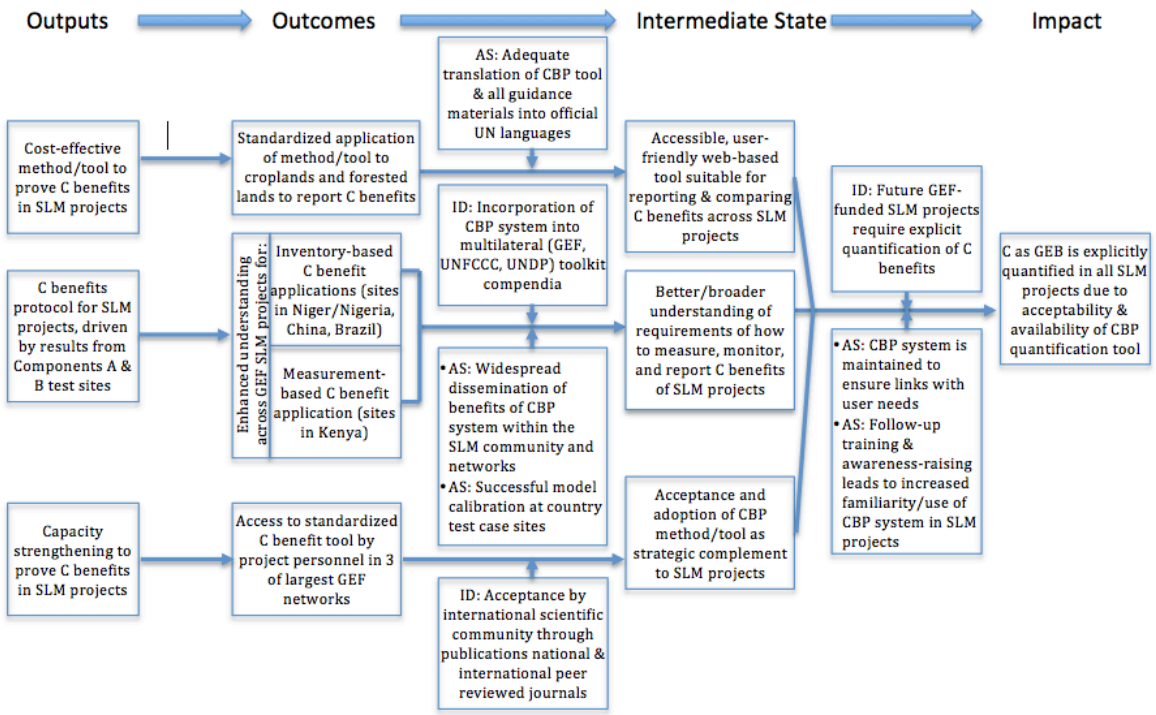
60. The project's intended ***impact*** (though not formulated as such) can be derived from the following statement of objective: "to help the GEF ***prove carbon as a global environmental benefit in SLM interventions*** by providing a cost-effective user-friendly but scientifically rigorous methodology for measuring Carbon (C) benefits in GEF projects dealing with natural resources in all climate zone and land use systems". Therefore, it is argued that the project's desired impact was '***the explicit quantification of carbon in all future SLM projects***' subject to the acceptability & availability of the new quantification tool.

61. The CBP design appears to assume that achieving the project's objective "*prove carbon as a global environmental benefit in SLM interventions*" will lead to the desired impact of "*the explicit quantification of carbon in all future SLM projects*". However, there are several intermediate states and intervening assumptions and impact variables between the availability of an accessible quantification system and the future application of that system in all SLM projects. While the availability of such a quantification system is a necessary element of a strategy to quantify carbon benefits of SLM projects, it is not necessarily sufficient of itself.

62. Figure 4 provides an overview of this logical chain of results, as initially inferred from the 2009 Project Document, and incorporating a set of additional impact drivers (ID) and key assumptions (AS) that this terminal evaluation considers essential to achieve the desired impact. The relevance these additional factors are briefly summarized in the bullets below.

- *Translation (AS):* As currently designed, the interface of the CBP system is available in five (5) languages. All of the underlying guidance materials for both Components are only available in English.
- *Toolkit compendia (ID):* The inclusion of the CBP system within the toolkit framework maintained by multilateral organizations is essential to establish its credibility and institutional acceptance.
- *Networks (AS):* Advantage should be taken of international technical and policy meetings to increase the awareness of professional networks of the availability

Figure 4: Outcomes to impacts pathways for the CBP



and potential of the CBP system for use in a wide range of SLM applications, not only GEF-funded projects.

- *Country test case success (AS):* Key postulates in project design were that the country test cases were representative and that local capacity was built sufficiently to apply CBP system outside of the test case situation. This also means that it was assumed that test case implementation would be successful.
- *Publications (ID):* The emergence of publications that focus on both methodological development and local applications of the methodology are essential to establish the credibility of the CBP as scientifically rigorous as well as cost-effective and practical in its local application.
- *Explicit requirement (ID):* The confirmation of the above key assumptions and support for the impact drivers represent the basis upon which to introduce the requirement that carbon benefits are tallied in future SLM projects, and that the CBP system is an ideal approach for the quantification.
- *System maintenance (AS):* The CBP system is not understood as a static piece of programmed technical guidance but rather a dynamic system that is ideally responsive to evolving user needs and requires maintenance to ensure/expand functionality and keep pace with emerging land use policy developments.
- *Follow-on activities (AS):* The end of the CBP phase should be understood as the beginning of the follow-on stage. Follow-on activities refer to capacity building, awareness-raising, and additional test case activities.

Likelihood of impact using RoTI and based on reconstructed TOC

63. The likelihood of a positive impact from the incorporation, going forward, of the additional impact drivers (ID) and key assumptions (AS) is high in the collective view of the evaluation team. In particular, the system maintenance and follow-on activities assumptions are the highest priority issues. With such commitments in place, the introduction of a requirement that carbon benefits are tallied in future SLM projects using the CBP system for quantification is realistic.

Achievement of project goal and planned objectives

64. The Project Document defines the project goal and objective to "help GEF promote and prove carbon as a global environmental benefit in SLM interventions by providing a cost effective, user-friendly, yet scientifically rigorous methodology for measuring carbon and GHG mitigation benefits in GEF projects dealing with natural resources in all climate zones and land use systems." There is sufficient evidence to warrant the conclusions the project goal and objective have been achieved. The CBP system in place at the time of the terminal evaluation provides a tool/protocol allowing users to estimate and model carbon stocks/flows and GHG emissions, as well a system to measure, monitor and manage carbon. This has been demonstrated through field-testing in a number of different land use systems. The demand for training from a range of potential users is further evidence of the timely arrival of the CBP system. Overall, 'Effectiveness: Attainment of project objectives and results' wat rated as 'Highly Satisfactory'.

D. Sustainability and replication

65. This section considers the extent to which the results achieved by the project are likely to continue to deliver long-term impacts. Because this terminal evaluation was completed during the implementation of activities, it offers only a projection of sustainability potential. An assessment with reference to longer-term sustainability would have been possible were the terminal evaluation completed well after the completion of all activities (say 1 to 2 years afterward). The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table 9 and described in the subsections that follow.

Socio-political sustainability

66. At least two key factors underlie the long-term sustainability of the overall project. The first factor is the credibility of the institutions responsible for the methodological development of the CBP system. CSU, WWF, MSU, and ICRAF are well-respected institutions that brought proven scientific credentials and experience for land use change GHG inventory development, carbon soil/biomass measurement/monitoring procedures, remote sensing techniques, and soil testing and classification. The ability to incorporate wide-ranging technical guidance - from soil/biomass sampling/analysis to scenario-based net carbon uptake projections to long-term monitoring protocols - within a single software platform designed for ready use by specialists and non-specialists alike reflects well on the essential role of such institutions in securing long-term sustainability. Moreover, at the time of the evaluation, CSU and MSU were continuing with efforts to enhance and improve the

functionality of the CBP system even though CBP project funding for such efforts had already been expended.

67. Another key socio-political aspect was the degree to which CBP system development was embedded within ongoing programmes and projects at the country test case level. For both Component A and B, the CBP activities in China, Niger, Nigeria, Brazil and Kenya were each hosted by ongoing SLM initiatives with roots in, and links to, the national land use planning and policymaking context. This supported not only the immediate objective of obtaining substantive technical feedback on CBP system design/application but also the integration of national land use management practitioners, and by extension their professional networks, within future policymaking processes in the respective countries. Despite the variation in the achievement of outputs and outcomes across the country test cases, the level of ownership was high with good prospects for leveraging the experience gained.

Financial Resources

68. A major factor underlying the financial sustainability of the CBP is the availability of ongoing financial resources to ensure that the CBP system keeps pace with evolving user needs. That is, the project was originally designed with the tacit assumption that upon project completion, the CBP system would then be directly suitable for use at SLM projects to quantify carbon benefits with no subsequent phase for system maintenance, awareness-raising, or capacity strengthening. While this may be true in the near-term (i.e., the next 1-2 years), the longer-term financial sustainability (i.e., beyond the next 2 years) depends on two factors, namely system maintenance and capacity building. At the time of this evaluation, there was no subsequent phase being planned. The evaluation team believes such a subsequent phase is essential to ensure long-term term sustainability.

69. First, the degree to which the CBP system remains useful and relevant is directly related to how well it is maintained. That is, while the CBP is complete, ample experience with computer model building suggests that the future of the CBP system is just beginning, with the certain expectation that the system will require fixes, improvements, and better modular designs proportional to the number of future users. These ongoing activities can only occur within the context of a suitable institutional home, duly empowered and financed over time to oversee such developments. Several good examples exist of the need for, and merits of, such maintenance programmes. For example, the Long-range Energy Alternatives Planning System (LEAP), a tool widely used by non-Annex 1 countries to assess the GHG reduction benefits of energy efficiency and renewable energy measures is hosted by the US Center of the Stockholm Environment Institute and was launched with bilateral donor assistance. The website for the tool is also the home of a web-based user community called COMMEND where energy analysts can share perspectives ranging from LEAP technical problems/fixes to broader sustainable energy issues.

70. Second, the effective future use of the CBP system is directly related to the development of the technical capacity within future SLM project teams. This is particularly important because many future users of the CBP system are likely to be non-specialists in the quantification of carbon benefits. It is the opinion of the

evaluation team that the prospects for financial sustainability are better with a programmatic approach to capacity building rather than based on ad hoc project-driven approaches.

Institutional Framework

71. Because of the way CBP impact is defined in the outcomes to impact theory of change (i.e., C benefits quantified in future SLM ***projects***), it is possible to affirm that the sustenance of results and onward progress towards impacts is independent of the establishment of conducive institutional frameworks at the national level. Since GEF is positioned to require that such benefits be tabulated in future SLM projects that it funds, a key aspect of institutional sustainability is the continued recognition of the importance of accounting for the carbon benefits of SLM interventions in future GEF focal area programmes and replenishments.

72. Another aspect of institutional sustainability is the degree to which the country case studies have managed to introduce CBP activities and/or results into national institutional processes. This challenge was made difficult by design in the sense that CBP activities unfolded mostly within the context of field project offices, rather than government institutions, rendering a few steps removed from institutional decision making. The exception is the China test case where activities were implemented within a national OP-12 programmatic context (see Annex B). Aside from the Brazil test case, which is in a different position than the other country test cases, there are no initiatives underway to incorporate CBP lessons, results, or potential into regional/national institutional processes, policies, coordination mechanisms, or legal/accountability frameworks. Such initiatives will be needed in order to sustain project results and to lead to progress on regional/national impacts.

Environmental sustainability

73. No direct environmental factors, positive or negative, impact the future flow of CBP benefits (i.e., methodological development, calculations of carbon benefits at the country test cases, and capacity strengthening). However, environmental factors can indirectly affect future uses of the CBP system inasmuch as events such as extreme heat, high winds, or flash flooding can contribute to interruptions in electric power supply. Since the terms of reference for the CBP system called for the development of a web-based system, electric power is a prerequisite to the calculation of carbon benefits. The availability of an accompanying downloadable software program would offer the user the added flexibility of use battery power at times when the internet is not available due to power outages or lack of connectivity.

Catalytic role and replication

74. At the level of the individual aspects that comprise the nature of catalytic role and replication potential, it is difficult to pinpoint specific advances tied to the project. That is, as of the time of this writing, the evaluation team is unaware of any broad-based changes in national strategic programmes/plans, SLM management systems, or measurement/monitoring methods that can be attributed to activities at the test case sites on the methodological development of the CBP system. Nor as of the time of this evaluation, is there any evidence of any follow-on funding from any sources

or the emergence of any 'champion' prepared to catalyze the mainstreaming of the CBP system within national planning and policymaking institutions.

75. However, at an overall level, it seems clear that the development of the CBP system is an important step forward that has the potential to galvanize action in important new directions. For example, the protocols set forth in the tools for measuring and monitoring carbon stock in soils and biomass can serve as a catalyst to drive demand for CBP system enhancements to validate carbon benefits to the level necessary for use within carbon markets. Also, the CBP system is at a level of scientific rigor that offers opportunities for applications well beyond the project level, such as the characterization of the costs and carbon uptake benefits of alternative agriculture and forestry investment strategies for use in the development of climate change action plans.

76. Overall, the rating awarded for '*Sustainability and replication*' is 'Moderately Likely'.

E Efficiency

77. The efficiency criterion is understood relative to the timeliness and cost effectiveness of project execution. Regarding timeliness, contracting arrangements were finalized between UNEP/CSU and between UNEP/WWF, shortly after the actual project start-up that occurred in June 2009. For CSU (lead institution for component A) contracting arrangement were finalized on 10 July 2009; WWF (lead institution for Component B), contracting arrangements were finalized on 22 May 2009. The first disbursement of GEF funds was made one month later, in August 2009. For several months afterward, project management activity was focused on developing subcontracting agreements between the lead agencies and the partnering institutions. For CSU and its six (6) partners, all arrangements were finalized over the period October - December 2009, except for CENA, which were finalized in November of 2010. For WWF and its three (3) partners, all prime contractual arrangements were finalized with UNEP/DEWA in May 2009.

78. Regarding cost-effectiveness, the project remains active as of the time of this evaluation. Currently, the share of expenditures relative to the total GEF budget is about 89%, with approximately $626,030 remaining unspent, as shown in Table 8. UNEP accounts for the largest amount and share of the unspent budget, about 65% and $370,000, respectively. Most of this unspent UNEP amount corresponds to the project personnel sub-category, which suggests that the task management role ended up not being as substantial as originally planned. For CSU, an additional amount of nearly $540 thousand was spent on consultants in excess of the amount originally budgeted. This level is similar to the amount underspent on the country test cases (i.e., $591 thousand). Given the focus on methodological development and limitations of field-based activities in the absence of a fully functional beta version of the CBP system, this seems like a reasonable reallocation of internal budget items.

79. For WWF, the miscellaneous budget sub-category as well as some project personnel funds were subsequently reallocated to institutional subcontracts and travel, which likely contributed added value to Component B relative to methodological development and training. Full financial closure is pending submission of all final

documentation as well as the finalization of this terminal evaluation. Overall, 'Efficiency' was rated as 'Highly Satisfactory'.

F. Factors affecting performance

80. This section examines the various factors that influenced the attainment of results, from the project's design, which was partially explored in the section on Outcomes to Impact, to the mechanisms and effectiveness of implementation. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table 10 and described in the subsections that follow.

Preparation and Readiness

81. On the one hand, the CBP was developed along the lines of a fairly conventional process, benefitting from pre-preparation resources in funds and time. On the other hand, the project is rather unique and unlike many GEF projects in its emphasis on methodical and tool development. Moreover, prior to the development of the Project Document, the core substance of Components A and B were actually separate scientific initiatives that had been developing along independent proposal tracks, led by CSU and MSU, respectively. Given the growing recognition within GEF of the need for a scientifically defensible method to measure, monitor, model and report carbon stock changes, the leaders of the proposal efforts were prevailed upon to join forces under a single integrated project umbrella.

82. The rationale for this approach, understood as potentially risky at the time, was that bringing the two components would yield valuable synergies and efficiencies in the preparation and execution of the project. This feature underscores the preparation of the Project Document itself, which shows clearly the dividing lines between the two Components, as opposed to a more unified approach with separate but overlapping elements. Nevertheless, CBP preparation activities ultimately proceeded effectively, leading to the preparation of a coherent project document that was effective in providing the necessary results framework to guide subsequent activities. '*Preparation and readiness'* was rated as 'Satisfactory'.

Implementation Approach and Adaptive Management

83. The implementation of the CBP showed rapid early progress after some initial lag time. Final project approval was obtained on 12 January 2009, with the Inception Workshop in Nairobi coming four months later in May. For the seven-month period that followed, i.e., June through December 2009, activities focused in setting up the Component A and B project teams, assigning roles and responsibilities, establishing coordination arrangements with partners and test case sites, fleshing out the activity workplan, and starting development on the toolkit itself (for Component A) and measurement/monitoring protocols (for Component B).

84. The initial year of CBP implementation also showed progress on advancing the overall design of the CBP protocol, acquisition/development of datasets, and development of the software design process. Activities of partners were also launched during this period. For component A, this involved a methodology development meeting (in mid-July 2009), a team workshop (in October 2009), and

consultation visits (to Gansu and Nignxia test case sites in China). It also involved communications with technical partners, namely ISRIC, ODG, and IRD to contribute to protocol design and recruitment of project personnel. For Component B, this involved WWF interactions with its partners MSU and ICRAF regarding workplan development of protocol design. It also involved a coordination meeting at MSU with between members of the respective software design teams for Components A and B.

85. The second and third year of year of the CBP witnessed the launch of the range of field-based activities. For Component B, this involved field work in Kenya in collaboration with ICRAF staff in March 2010, June 2010, and November 2010. By June of 2011, this work had been synthesized into the development of field measurement protocols, laboratory measurement protocols, training manuals for extension workers, and the development/enhancement of tools to support tree selection in a landscape carbon context. For Component A, this involved the start of the test cases in China, Niger/Nigeria, Kenya, and Brazil starting the initial use of the available version of the CBP system for carbon tracking on their projects. Web portal software design was completed during this period for the Simple Assessment, with additional time needed for the Detailed Assessment and Dynamic Modelling option.

86. As is to be expected in a project with the scope and complexity of the CBP, the implementation approach showed deviations from the design envisioned in the Project Document as well as incorporating important modifications not anticipated at the time of project design. To a large extent, this reflected a flexible response to an evolving understanding of user needs and emerging conditions/opportunities. As a result, the implementation approach proved to be adaptable while adhering to the core elements of CBP design.

87. Early on in the project, a key CBP system design issue emerged around the need to balance carbon assessment as a global environmental good against other essential project objectives that teams undertaking SLM interventions are seeking to achieve. This was understood to be an issue somewhat unique to land use, land use change and forestry projects given past experience of the potentially prohibitive costs associated with the quantification of carbon stock changes. Hence, it was understood that the CBP system would need to navigate the potential tradeoffs between a cost-effective carbon stock quantification system, competing priorities of project implementers, and the 'bottom line' need for an accurate assessment about carbon as a global environmental benefit.

88. Two characteristics of the CBP system illustrate the project implementation approach in navigating these types of tradeoffs. For Component A, a key decision fork was understood to be the potential disparity in user access to data. This key premise was reflected in the structure of the tool, which provides the user with structured interview approach to make an initial choice to whether to undertake either a Simple Assessment (i.e., using basic project information that project implementers are likely to have on hand, such as the extent of the project, the land use types within the project area, land use changes that the project plans to implement, plus default data from the IPCC on soil/biomass properties) or a more sophisticated Detailed Assessment (i.e., using local data on cropping systems, fertilizer application, tillage and other factors), or an even more sophisticated Dynamic Modeling assessment (i.e., using detailed site specific conditions defined by

direct observation and measurement, either as part of a project specific measurement program or if this information is available from another source such as national meteorological or agronomic yield data). This basic structure was not called for in the Project Document but emerged in the process of adapting to unfolding conditions. Discussions at the project team level, with country case study collaborators, and at the Steering Committee level were all essential factors.

89. For Component B, a key premise for ensuring the scope and quality of field data measurements was understood to be local institutional participation. To this end, important partnerships with the Kenyan Forest Service and Kenyan Forestry Research Institute were developed on an opportunistic basis in the course of sampling and measurement fieldwork. These were important institutional links, unanticipated at the time of the initial CBP design that proved to be foundational for the development of a carbon map for all of Kenya. Moreover, it allowed MSU to add hundreds of biomass field data plots managed by partner agencies to the limited biomass plots that had been established as part of planned activities.

90. Regarding overall performance of project management, most of the CBP deliverables have been achieved, though some at varying levels of success (i.e., country test case applications) as per the terms of the contractual and sub-contractual arrangements. Those outputs that have not been delivered (e.g., implement the CBP protocol in the selected test case sites, with a view to implementation across the whole project area in the third year of the CBP) are due to a combination of the time and budget constraints, together with the unavailability of the calculation modules of the CBP tool within the duration of activities at the test case sites.

91. The Steering Committee meetings organized by WWF at its headquarters in Washington DC in September 2010 and October 2011 were instrumental in the development of an integrated design of the web-based portal for the CBP system. That is, the approach to implementation, for the most part, had allowed for both Components to proceed at a pace consistent with their technical and activity-driven mandates, leading to the gradual recognition that the CBP system should be careful to avoid being perceived by prospective users in the same way (i.e., as Component A and B, distinct from each other). Discussion around this issue helped promote and build consensus around the notion of the CBP system into a unified user interface framework. Overall, '*Implementation approach and adaptive management*' was rated as 'Satisfactory'.

Stakeholder Participation and Public Awareness

92. Relative to the Project Document, stakeholders are defined as members of the country test case project teams. For Component A, this involved stakeholders in China, Brazil, Niger, Nigeria, and Kenya. For Component B, this involved a single test case in Kenya.

93. The Project's overall approach to stakeholder participation was to conduct regular long-distance telephone "consultation workshops". The purpose of these engagements was to obtain feedback on the emerging design of the CBP system, identify problems or errors in the calculation sequence, and troubleshoot how to overcome problems. Interviews held at most of the test case project offices

confirmed that this approach was adequate although there was clear support for more than just the one project-wide meeting at the University of Leicester in the UK. This would have been a better approach to maintaining stakeholder engagement, time and resources permitting.

94. Increasing public awareness of the CBP system proceeded along a different track. First of all, outside of the Niger/Nigeria test case where local villagers were invited to participate in selected activities, there was no community-level awareness-raising concerning the ancillary benefits of sustainable land management which seems to be a lost opportunity. Nevertheless, this is acceptable given the scientific nature of the CBP and its emphasis on methodological and database development. Awareness-raising activities were focused on deploying project staff at regional and international meetings where updates on the CBP were provided (e.g., side events at climate and combating desertification meetings). Overall, 'Stakeholder Engagement' was rated as 'Moderately Satisfactory".

Country Ownership and Driven-ness

95. This project was designed as global scientific research effort to synthesize current best practices for carbon modeling, measurement, and monitoring into a cost-effective tool that could be readily used by SLM project implementers in the future. Hence, the CBP did not include in its design a mandate to create awareness and a sense of country ownership of the CBP system beyond the experience of the country test cases for which there was a high degree of consistency between the national priorities and CBP objectives. As a result of the experience in the country test cases, interest has intensified in carbon stock quantification issues. However, the sense of national ownership remains underdeveloped relative to what it could be. To a large extent, this is due to the unsatisfactory experience in some of the logistical aspects in using the tool such as slow internet connectivity which led to frustration and the consistent delays in tool development which limited progress in field testing. Overall, 'Stakeholder Engagement' was rated as 'Moderately Satisfactory".

Financial Planning and Management

96. On the whole, the quality and efficiency of financial planning in this project respected the standards in force at the time of implementation. Budgets were developed according to the required templates and procedures, with acceptable levels of detail, and the controls implemented under UNEP financial procedures were adequately delivered. As regards procurement of goods and services, in most instances the evaluation was able to retrace the subcontracting arrangements that defined original terms of reference.

97. The proper standards were met in the submission of the various project implementation reports submitted over the course of the CBP. These reports were completed satisfactorily and show adherence to standards of clarity and transparency.

98. A large component of financial planning was associated with the recruitment of staff and the setting up of arrangements with consultants, the latter involving the negotiation of agreements and the establishment of sub-contractual arrangements

with the project sites of the test cases. The arrangements were spelled clearly and transparently relative to activities and deliverables. There were no adverse issues raised in this area.

99. Total project expenditures against the GEF budget were less than the project budget as of the time of this evaluation. A total of $4.9 million or just under 90% of the GEF budget has been spent (see Table 7) The expenditure ratio shows that the technical assistance component accounted for a greater share of budget than originally anticipated. This is consistent with the evolving understanding of the challenge associated with the development of scientifically rigorous web-based tool that could be applied in a variety of land use contexts.

100. Co-financing did not materialize to the extent envisioned during project design. A total of $5,188,082 was identified as confirmed co-financing in the Project Document. Of this amount, $2 million was to be in the form of a cash grant from ISRIC/University of Wageningen (Netherlands) and the remaining $3,188,082 were in-kind contributions from CSU, WWF, MSU, ICRAF, and UNEP/DEWA. The cash grant did not materialize right at the start of the CBP due to a significant institutional change at ISRIC. Nevertheless, the decision was made to proceed anyway and ISRIC ended up providing a substantial amount of in-kind support, though not equivalent to the original amount. A summary of planned and actual co-financing is provided in the Table 8.

Table 7: Project costs summary

Component	Estimated cost at design (US$)	Actual Cost (US$)	Expenditure ratio (actual/planned)
Project management	1,023,209	106,958	0.10
Technical assistance	3,174,910	3,895,791	1.23
Other (e.g., training, country test cases)	1,328,146	897,485	0.68
Total	5,526,265	4,900,234	0.89

101. The project was able to leverage additional resources the implementation of the project. These additional resources were in-kind in nature and totaled $2,309,673.44. For Component A activities, they included an additional $72,315 from CSU (i.e., in excess of their original contribution level), $287,000 from ISRIC (i.e., there was no in-kind contribution level specified during project design, only a cash grant), and $231,000 from CENA (i.e., there were no in-kind contributions foreseen from CENA during project design). For Component B activities, they included an additional $776273.75 from ICRAF (all of it cash), $676,209 from MSU (of which $374,784 was cash), and $266,875.25 from WWF (all of it cash). Overall, '*Financial planning and management*' was rated as 'Satisfactory'.

Table 8: Co-financing summary

Co financing	IA own Financing (mill US$)		Government (mill US$)		University/Other (mill US$)		Total (mill US$)		Total Disbursed (mill US$)
(Type/Source)	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	
Grants (ISRIC/University of Wageningen)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2.00	$0.00	$0.00
Loans	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Credits	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Equity investments	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Other	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
In-kind support	$0.00	$0.00	$0.00	$0.00	$0.59	$2.90	$0.59	$2.90	$2.90
ISRIC	$0.00	$0.00	$0.00	$0.00	$0.00	$0.29	$0.00	$0.29	$0.29
CSU	$0.00	$0.00	$0.00	$0.00	$0.59	$0.67	$0.59	$0.67	$0.67
CENA	$0.00	$0.00	$0.00	$0.00	$0.00	$0.23	$0.00	$0.23	$0.23
WWF	$0.00	$0.00	$0.00	$0.00	$0.00	$0.27	$0.00	$0.27	$0.27
MSU	$0.00	$0.00	$0.00	$0.00	$0.00	$0.68	$0.00	$0.68	$0.68
ICRAF	$0.00	$0.00	$0.00	$0.00	$0.00	$0.78	$0.00	$0.78	$0.78

UNEP Supervision and Backstopping

102. UNEP's supervision tasks were determined early on by GEF and UNEP procedures. These included the consideration of quarterly financial reports, semi- annual narrative reports, and annual Project Implementation Review (PIR). The processes was in accordance with procedures in force at the time and were executed according to plan, although not without some delays. The cause of the initial delay was associated with setting up the contract between UNEP and CSU, which was not executed until July 2009. This had a ripple effect in establishing the test case subcontracts in Brazil, China, Niger/Nigeria, and Kenya. At the operation level, however, this situation did not prevent five members of Component A institutions (i.e., CSU, ISRIC, and CENA) from traveling from this institutions and participating in the inception workshop from 11-14 May 2009 in Nairobi. Nor did it seem to hinder planning for the Component A Methodology Development Meeting, which took place from 10-15 July 2009 and included pre-meeting interactions with ISRIC and CENA. During the course of implementation there were also delays associated with CBP system development, with some essential guidance documentation being unavailable during the testing period at the Component A test case sites. The project was granted a no-cost extension of one year, till 31 May 2013, to cope with the emerging complexities of CBP system development, particularly as it related to the development of the Detailed Assessment and Dynamic Modeling portions of the CBP system.

103. The evaluation found that all PIRs and quarterly reports were submitted and duly completed. An examination of the various ratings and comments in the PIRs lead one to conclude that, for the most part, the ratings were realistic and plausible. Overall, '*UNEP Supervision and backstopping*' was rated as 'Satisfactory'.

Monitoring and evaluation

104. The Monitoring and Evaluation system design that was established at the start of the project included a set of indicators for each output and outcome, as well as a supervision plan. The Project Implementation Review template also provided for a number of specific monitoring and evaluation tasks, risk management and assessment to be undertaken at regular intervals. In its architecture, the M&E system appears comprehensive and well designed to allow the monitoring of results and tracking of progress toward achieving project objectives. '*M&E – Design*' was rated as 'Satisfactory'. The following observations are offered:

- The quality of the project logframe as a planning and monitoring instrument was adequate. This was provided in the form of a Results Framework in the Project Document and consisted of objectively verifiable indicators, sources/means of verification, milestones toward progress, and key assumptions.
- There were specific indicators in the Results Framework for each of the project components, namely methodology development, test cases, capacity building, and project management. The indicators were measurable, realistic and relevant to the objectives. The indicators were not time-bound as this was addressed in the milestones portion.
- Baseline information on performance indicators had been presented in a clear manner in the main body of the Project Document, with sources for baseline information being well referenced.
- The responsibilities for M&E activities were clearly defined to follow standard UNEP monitoring, reporting and evaluation processes and procedures. This called for periodic reports on progress for review by the Steering Committee, which enabled recommendations for adjustments in project activities, as summarized in meetings notes. The frequency of monitoring activities was adequate, with PIRs submitted on an annual basis by project members.
- Specific targets have been specified for desired project outputs (e.g., fully tested CBP protocol after 18 months), with a desired level of achievement specified for all objectively verifiable indicators of outputs and outcomes. The legal instruments binding project partners to fully collaborate in evaluations were satisfactory.
- The budgeting and funding for M&E activities appears to be inadequate for a project of the CBP complexity. A total of $40,000 was indicatively allocated for the mid-term evaluation; a total of $50,000 was indicatively allocated for the terminal evaluation. Given the involvement of test case project sites and the distribution of project activities across North America, a doubling of these amounts would have been more realistic

105. The Monitoring and Evaluation plan implementation closely followed the design, including the explicit report formats for describing progress for each output and outcome. '*M&E – Implementation*' was also rated as 'Satisfactory'. The following observations are offered:

- The M&E system was implemented effectively and providing a way to track results and identify potential bottlenecks or issues related to the achievement of outputs.
- The annual project reports and Progress Implementation Review (PIR) reports were completely in a satisfactory way. There aligned well with the ratings provided.

- The information provided by the M&E system was used during the project to improve project performance and to adapt to changing needs. For example, Component B used a Version numbering system to account for unfolding methodological developments (e.g., Version 2.0 at 40%).
- There was an M&E system in place for monitoring progress. Given the adequate completion of the report forms, there was adequate familiarity for the project personnel responsible for M&E reporting.
- One gap in M&E activities was the mid-term evaluation/review. While it was originally foreseen to be part of the plan, and budget allocated accordingly, it was never carried out.

G. Complementarities with UNEP Strategies and Programmes

106. This final section provides an analysis of the extent to which the Project was consistent with UNEP's policies, strategies and programme of work. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table 11 and described in the subsections that follow.

Linkage to UNEP's Expected Accomplishments and Programme of Work 2010 – 2011

107. The UNEP Medium – term strategy (MTS) specifies desired results in the following six thematic focal areas:

- Climatic change;
- Disasters and conflicts;
- Ecosystem management;
- Environmental governance;
- Harmful substances and hazardous waste; and
- Resource efficiency – sustainable consumption and production.

108. As stated above, the objective of the CBP is to help the GEF demonstrate the GEBs of sustainable land management (SLM) interventions in terms of protected or enhanced C stocks and reduced greenhouse-gas (GHG) emissions by providing a cost-effective, user-friendly but scientifically rigorous methodology to monitor and forecast (C) benefits in GEF SLM projects. This objective is consistent with the UNEP objective under the climate change focal area – to strengthen the ability of countries to integrate climatic change responses into national development processes. Under this thematic area (climate change), CBP has made some contribution to the following UNEP expected accomplishments (EA):

- That increased carbon sequestration occurs through improved land use, reduced deforestation and reduced land degradation; and
- That country policy makers and negotiators, civil society and private sector have access to relevant climatic change science and information for decision making.

109. The CBP output (A carbon benefits protocol that meets the specific requirements of GEF SLM projects in developing countries) and the outcomes (parameterized and tested carbon accounting tools, enhanced understanding of the carbon measurements, monitoring, projecting and reporting needs of GEF SLM and other projects, and use of standardized carbon benefits protocol in SLM projects in five countries in three continents) constitute relevant climatic change science and information necessary to enhance carbon sequestration processes and empower the country policy makers and negotiators, civil society and private sector in decision making in climate change and other UNEP focal areas such as environmental management.

Alignment with the Bali Strategic Plan

110. The Bali Strategic Plan (BSP) provides a framework for UNEP to strengthen the capacity for governments in developing and transitional economy countries to achieve environmentally sustainable outcomes consistent with the programmatic goals of the UNEP Governing Council. The outcomes and achievements of the CBP are in alignment with the following UNEP BSP objectives:

- To strengthen the capacity of Governments of developing countries as well as of countries with economies in transitions, especially "To develop national research, monitoring and assessment capacity to support national institutions in data collection, analysis and monitoring of environmental trends and in establishing infrastructure for scientific development and environmental management, in order to ensure sustainability of capacity-building efforts"; and
- To promote, facilitate and finance, as appropriate, access to and support of environmentally sound technologies and corresponding know how, especially for developing countries as well as countries with economies in transition.

111. In line with UNEP BSP, the CBP has built capacity of individual scientists and institutions in the developing countries of Brazil, China, Kenya, Niger and Nigeria especially the following areas:

- Cost effective methodology for proving carbon benefits in GEF and other SLM projects;
- Measuring, monitoring, projecting and reporting carbon benefits in a standardized way; and
- Modelling tools for the assessment of the aboveground and below ground C stocks, among other capacity building efforts.

Gender

112. There were no issues associated with gender that arose over the course of the CBP or the terminal evaluation.

South-South Cooperation

113. The UNEP BSP underscores the importance of the South-South cooperation and the need to intensify efforts directed towards institutional capacity building especially through the exchange of expertise, experiences, information and documentation between the institutions of the South. The plan also places emphasis on the

Table 9: Summary of terminal evaluation ratings

		Sub-criterion	Sub-criterion rating	Overall criterion rating
A	Strategic relevance	Relevance	HS	HS
B	Achievement of outputs	Achievement of outputs and activities	HS	HS
C	Effectiveness: Attainment of project objectives and results	Direct outcomes from reconstructed TOC	HS	HS
		Likelihood of impact using RoTI and based on reconstructed TOC	HS	
		Achievement of project goal and planned objectives	HS	
D	Sustainability and replication	Socio-political sustainability	HL	ML
		Financial resources	ML	
		Institutional framework	ML	
		Environmental sustainability	L	
		Catalytic role and replication	HL	
E	Efficiency	Efficiency	HS	HS
F	Factors affecting performance	Preparation and readiness	S	S
		Implementation approach and adaptive management	S	
		Stakeholder participation and public awareness	MS	
		Country ownership and driven-ness	MS	
		Financial planning and management	S	
		UNEP supervision and backstopping	S	
		Monitoring and evaluation - Design	S	
		Monitoring and evaluation - implementation	S	

important role scientific knowledge and technology play in promoting economic and social development. The developing countries involved in the implementation of the BCP including Brazil, China, Kenya, Niger and Nigeria exchanged scientific information as an example of South – South cooperation. In this case Brazil provided C data to CSU partners while the other countries were used as test cases in the development of the model. The individual scientists from the participating countries exchanged scientific data and information through the documentation (summary reports and detailed reports) submitted to the CSU partners and during their participation in the conferences, training workshops and project meetings.

Part III - Conclusions and Recommendations

A. Conclusions

114. Based upon the information discussed in the previous paragraphs, the summary of evaluation ratings appears in Table 9.

115. In conclusion, this evaluation found that this project was successful in delivering its intended outputs and its anticipated outcomes. Among the main concrete positive results achieved by this project, the evaluation found that the CBP:

- Sustained the engagement and active participation of host countries in securing their feedback on the design of the CBP system and on the development of soil, biomass and other internal databases. In the process, local stakeholder capacity was strengthened.
- Integrated Component A (modeling) and Component B (measurement, monitoring) under a single web-based platform that guides users to apply the CBP system in a manner consistent with their local data access and availability constraints.
- Managed a large team of experts and field-based project teams tasked with simplifying a complex set of analytical procedures and sampling/measurement/monitoring guidelines to render them operationally relevant for the needs of non-experts in carbon uptake methods and tools.
- Completed the tasks called for in the Project Document, including training and unplanned awareness-raising activities, below the total budget allocated to the CBP while maintaining the quality standards required (i.e., well within the total budget).
- Delivered some lessons, both substantive and process oriented, that can be relevant to other projects and initiatives.
- Showed high relevance to GEF and UNEP policies, both in its design and implementation.
- Produced an estimate of the net carbon benefits of each of the country test cases for Component A using at least the Simple Assessment portion of the tool.

116. Among the main concrete negative results achieved by this project, the evaluation found that:

- The CBP system is combination of the two components rather than integration of those components. Judging from interviews and questions at test case sites, this has caused confusion and some difficulty among users, particularly regarding data sharing among the two Components.
- It is potentially risky to set a fixed timeframe for solving a scientific and technical issue. From a global project such as this one, there are various needs and expectations for carbon accounting as evidenced by the structure of the project report. Given the complexity of the issues, it has proven quite challenging to develop a uniform methodology with global acceptance in a fixed and relatively short timeframe, particularly with user needs were not fully scoped prior to project start-up.
- The funding levels associated with the development of the CBP system appear to have been underestimated. This is based on the perspective that funds are largely spent yet there appears much left to do, admittedly beyond the original scope but nevertheless essential for ensuring the relevance of the tool in the settings intended, regarding tool maintenance, incorporating user input into subsequent enhancements, and awareness-raising/capacity strengthening activities.

B. Lessons Learned

117. This evaluation has revealed a few lessons that may be of relevance to future GEF or UNEP programming:

118. **Lesson 1:** Projects aiming at developing strategic international analytical tools that are well embedded within demand-driven, bottom-up, pilot-based, and well-resourced efforts have an advantage over academic-driven, top-down, laboratory-based, and funding-constrained efforts. While the design of the CBP was characterized by being demand-driven, bottom-up and pilot-based - as well as consistent with GEF programming goals and strategies - the programming status of the CBP system suggests that additional funding for a follow-up phase should have been considered at the outset to account for activities associated with iterative testing, programming documentation, deployment, and ongoing maintenance in response to user feedback. The pace and ultimate success of long-term uptake and integration of the CBP system in SLM projects will ultimately depend on how well these activities are addressed.

119. **Lesson 2:** For any science-oriented project relying heavily on a fixed strategy for knowledge dissemination in developing countries, it is crucial to assess whether the strategy is compatible with the particular local circumstances that prevail. In the case of the CBP system, some of the country test cases found it unusable due to the frequency of power outages and chronically slow internet connectivity. These were logistical circumstances beyond local control that could have been overcome with alternative means of information dissemination such as a downloadable system, or CD availability. While there are good reasons for keeping the system web-based (e.g., transparency, keeping current with version updates), it does not seem practical in all circumstances.

120. **Lesson 3:** Project execution arrangements, especially in the case of multi-country projects for a complex science-oriented project such as the CBP, should be streamlined and simplified to ensure accountability on a few critical tasks rather than a loose conformance with a large and ultimately not-well-defined or necessarily set of activities not on the critical path for country test cases. At the country test case level, there were numerous activities that were not performed that ended up being a distraction to the essential local activities of CBP system testing and implementation. This promotes simplified lines of accountability and reporting, reduced transaction costs, and more strategic risk management processes.

121. **Lesson 4:** The forced integration of what had been two separate initiatives (i.e., modeling and measurement/monitoring), while ultimately effective in an overarching sense, introduced challenging project management issues related to sequencing, design, and overlaps. Rather than viewing these as undesirable aspects of collaboration across technical disciplines, it should be viewed as positive manifestations of substantive engagement that can lead to new and innovative approaches. The overall outcome of the project would likely have been diminished if the two initiatives were undertaken independently and subsequently integrated.

C. Recommendations

122. Bearing in mind the above findings and lessons, the evaluation makes the following recommendations:

123. **Recommendation 1:** From a substantive point of view, the future and systematic quantification of carbon benefits at the local level can only be achieved if there is a mandate for addressing carbon benefits from SLM interventions within GEF's operational programming. Carbon benefits should not be left to *ad hoc* project design decisions that can vary according to context and other factors. It is essential that support for the rigorous and systematic quantification of carbon benefits be appropriately translated into high-level guidance.

124. **Recommendation 2:** The proof of the ultimate success of the project is the degree that a relevant version of the CBP is integrated in future SLM project designs. For this to happen, it is essential that the CBP system be viewed as a dynamic tool that is allowed to evolve commensurate with the substantive and programming feedback from an increasing number of users in an increasingly number of challenging land use settings. This will require subsequent support for CBP system maintenance and improvement in the context of expanding applications in developing countries.

125. **Recommendation 3:** At present, knowledge about the capabilities is not widespread among the community of prospective users. It will be important that a subsequent phase devoted to capacity building and awareness-raising be implemented. This is a necessary complement to any mandate to develop an estimate of carbon benefits in future SLM project activities.

126. **Recommendation 4:** Continued development of the tool is necessary in order to account for important findings from using the CBP system at SLM projects. For example, users would benefit from a module that isolates the key factors associated with differences between results from the Simple and Detailed Assessments.

127. **Recommendation 5:** It will be important to develop a workable institutional framework by which to link the emerging body of results from application of the CBP system in SLM settings to the work of the IPCC regarding GHG inventory methodology and database development.

Annex A: Niger/Nigeria Test Case

Part I - Evaluation Background

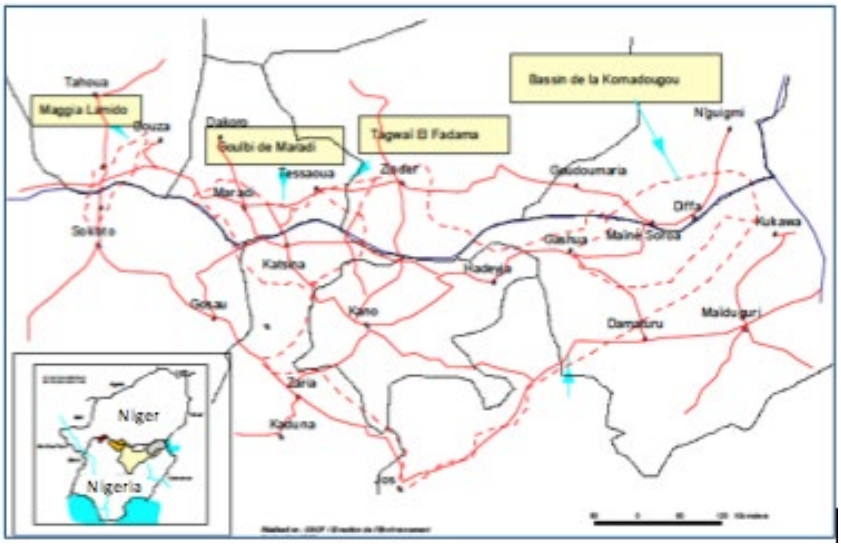
A. Context

1. Serious land degradation is evident in many Sub-Saharan African countries. Unsustainable resource management practices coupled with the mounting adverse impacts of climate change has contributed to the loss of soil nutrients and organic matter, reduction of natural woodland, reduction of surface water resources, lowering of groundwater tables, and the reduction of biodiversity. Inevitably, these outcomes weaken local economies, thereby increasing livelihood vulnerability, leading to increased out-migration, and sadly, often resulting in the exacerbation of resource-based conflicts among users of degraded natural resources.

2. Land degradation processes in many Sub-Saharan African countries have become increasingly understood as being deeply rooted in the mismanagement of transboundary watersheds. Coherent strategies and policies to confront land degradation have been largely lacking, particularly for shared resources across national borders. Low institutional capacity, poor coordination among government agencies, absent/inadequate transboundary legal provisions, and lack of access to better land management technologies/practices characterize the current situation. Sub-regional, cross-border mechanisms for exchanging information, resolving legal/institutional issues, and increasing cooperative frameworks among local populations are some of the key initiatives underway to confront the pace of land degradation. Integrating poverty alleviation and the development of sustainable land management is an overarching framework to these initiatives.

3. For Niger and Niger, transboundary watersheds characterize a large portion of their border. There are four shared water basins, the boundaries of which are indicated by dashed red lines in Figure A-1. From west to east, they include the Maggia-Lamido basin, the Gada-Gulbin Maradi basin, the Tagwai-El Fadama basin and the Komadugu Yobe basin. Together, these watersheds account for over 170,000 square kilometers of land.

Figure A- 1: Location of transboundary watersheds in Niger and Nigeria



4. Overall land area characteristics for each of the four basins are described in Table A-1. The Komadugu Yobe basin located to the farthest east is the largest basin by far, with a total area of

Table A- 1: Characteristics of transboundary watersheds in Niger and Nigeria

Basin	Area (square kilometers)			Share of total (%)
	within Niger	within Nigeria	Total	
Maggia-Lamido	2,119	2,019	4,138	2%
Gada-Gulbin Maradi	5,984	3803	9,787	6%
Tagwai-El Fadama	2,816	5,889	8,705	5%
Komadugu Yobe	7,400	140,600	148,000	87%
Total	18,319	152,311	170,630	100%

about 148,000 km^2, 95% of which is located within Nigeria. The other three watersheds comprise only about 13% of the total watershed area, with a roughly 50-50 split between Niger and Nigeria averaged across the three watersheds.

B. The Project

6. The Niger-Nigeria test case was integrated within the GEF-funded project entitled: "Integrated Ecosystem Management in the Transboundary Areas between Nigeria and Niger". CBP-related activities were undertaken on the Niger side of the border within the Maggia Lamido and Gada-Gulbin Maradi watersheds along the western stretch of the border. The project is part of the GEF focal area: International Waters and Biodiversity with relevance to the Cross cutting issue of Land Degradation. It is part of OP-12 (Integrated Ecosystem Management) with relevance to OP-1 (Arid and Semi-Arid Ecosystems), OP-9 (Integrated Land and Water Management) and OP-15 (Sustainable Land Management). Project management was carried out by the Niger–Nigeria Joint Commission for Cooperation (NNJCC), a sub-regional organization established in 1971.

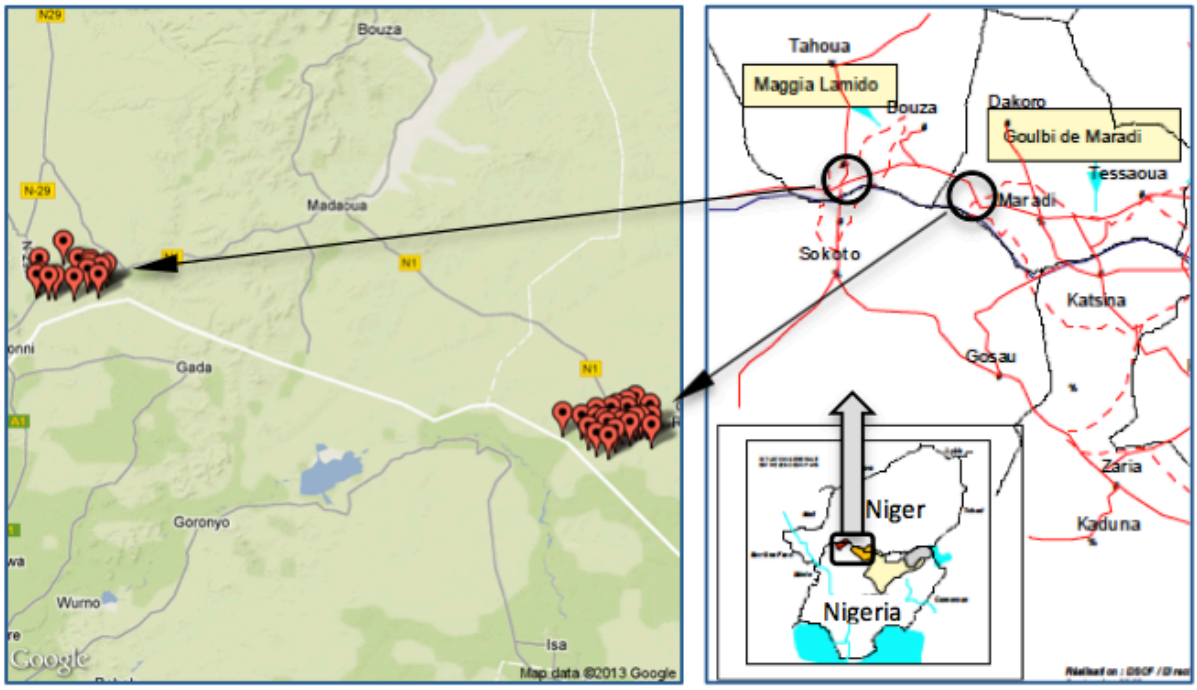
7. Prior to CBP-related activities, the project was in the process of creating conditions for sustainable integrated ecosystem management in locations covered by the Maiduguri Agreement, signed by Niger and Nigeria in 1990, to address development, conservation, and utilization of the water resources of their transboundary catchments. Project activities include (1) developing an integrated legal and institutional framework for collaboration and coordinated financing; (2) harnessing and improving on research-based and indigenous knowledge, and cultural values, to support natural resource management, conservation and productivity; and (3) developing and implementing sub-regional, catchment and community level ecosystem management plans through participatory and inclusive processes.

8. When implemented, these activities are expected to consolidate regional cooperation, conserve habitats and biodiversity, manage water resources, promote sustainable land use practices, control degradation trends, build institutional capacity, improve equity and reduce the vulnerability of local communities to environmental change. The project was launched in 2005 and consists of two 4-year phases. Phase I was completed in 2009; Phase II has not yet started.

C. Evaluation objectives, scope and methodology

9. The Niger-Nigeria test case focused on Component A of the CBP (Modeling: greater focus on cropland and grazing land) and Sub-component A-2 (Test cases). Project activities that were considered in the CBP test case were undertaken near the town of Birnin Konni in the Maggia Lamido watershed and near the town of Maradi in the Gada-Gulbin Maradi watershed (see general location of these areas on Figure A-2).

Figure A- 2: Test case site locations in Niger-Nigeria



These activities were undertaken in an area covering about 31,751 hectares, or about 2% of the total area of the two watersheds. A brief description of project initiatives relevant to carbon benefit quantification is provided in the paragraphs that follow.

10. *Initiative #1 - Restored Grassland/Agroforestry/Forest:* Up to 26,000 ha of the watersheds were restored through a variety of interventions, some of which led to an increase in carbon sequestration above- and below-ground while some which directly led to increased GHG emissions. Activities that led to carbon sequestration include the planting of over 500,000 trees aged 5 years and younger (40,000 *Acacia siyal* trees, 40,000 *Acacia nilotica* trees, and 424,000 other *Acacia* species trees); restoring about 3,226 hectares of subtropical dry forest natural vegetation over 20 years of age; and introducing alternative tillage practices (i.e., no tillage on severely degraded land) in 17,226 hectares which had the effect of improving soil carbon stocks. Activities that led to carbon-equivalent emissions were the introduction of 4,420 additional livestock, 76% of which were sheep and goats. The baseline land use scenario was assumed to have no tree planting, no restoration of natural vegetation, tillage on degraded land, and the introduction of only 120 animals, even divided among non-dairy beef cattle, goats, camels, horses, mules and donkeys, and sheep.

11. *Initiative #2 - Souloulou Restored Grasslands and Forest:* Up to 2,252 ha of the watersheds were restored through the same interventions as described in *Restored Grassland/Agroforestry/Forest* activities described above. Sequestration activities included the planting of 477,424 *Acacia* trees aged 5 years and younger; restoring about 644 hectares of subtropical dry forest natural vegetation over 20 years of age; and introducing alternative tillage practices (i.e., no tillage on severely degraded land) in 2,896 hectares. Activities that led to carbon-equivalent emissions were the introduction of 2,312 additional livestock, 49% of which were sheep and goats. The baseline land use and livestock scenario is the same.

12. *Initiative #3 - Restored Grassland/Dunes/Cropland:* Up to 2,200 ha of the watersheds were restored through some of the same interventions as described in *Restored Grassland/Agroforestry/Forest* activities described above. Sequestration activities included the planting of 466,400 Acacia trees aged 5 years and younger and introducing alternative tillage practices (i.e., no tillage on severely degraded land) in 4,900 hectares. Activities that led to carbon-equivalent emissions were the introduction of 2,113 additional livestock, 69% of which were sheep and goats. The baseline land use scenario is the same. The livestock scenario assumes the introduction of only 100 animals, evenly divided among non-dairy beef cattle, goats, horses, mules and donkeys, and sheep.

13. *Initiative #4 - Tsernawa Restored Grassland and Forest:* Up to 1,299 ha of the watersheds were restored through the same interventions as described in *Restored Grassland/Agroforestry/Forest* activities described above. Sequestration activities included the planting of 275,388 *Acacia* trees aged 5 years and younger; restoring about 1,300 hectares of subtropical dry forest natural vegetation over 20 years of age; and introducing alternative tillage practices (i.e., no tillage on severely degraded land) in 2,999 hectares. Activities that led to carbon-equivalent emissions were the introduction of 1,167 additional livestock, 68% of which were sheep and goats. The baseline land use scenario is the same. The livestock scenario assumes the introduction of only 100 animals, evenly divided among non-dairy beef cattle, goats, horses, mules and donkeys, and sheep.

14. The rationale for the selection of these four major initiatives was based on the fact that ongoing site-specific project activities were expected to lead to global environmental benefits in the form of carbon sequestration. However, the design of the projects had not explicitly account for the quantification of these benefits. As such, the activities provide a good opportunity to explore the magnitude of expected carbon benefits associated with a range of IEM interventions in a transboundary context.

Table A- 2: Scope of activities and outputs for each site in the Niger-Nigeria test case

1. Develop and test the Activity Data Module and the Calculation Modules of the CBP tool.
2. Work with ISRIC to help them collate and analyze soil samples in areas covered by the selected project.
3. Assess the beginning to end C and GHG monitoring, measuring and modeling needs to inform CSU as they develop the protocol; and provide feedback on the protocol as it is developed.
4. Take part in on-site training sessions in the CBP protocol for selected project personnel and arrange some of the logistics such as inviting relevant extension agencies and other outsiders etc.
5. Implement the CBP protocol in the selected project sites, with a view to implementation across the whole project area in the third year of the CBP.
6. Test aspects of CBP protocol (users guide, software) for the selected project and report to CSU.
7. Provide financial/scientific reports to project coordinator and UNEP.

15. The major objective for the evaluation of the Niger-Nigeria test case is to assess the performance of CBP-related activities relative to the scope of activities agreed to in the subcontracting arrangements established between CSU and the project management office in Niamey. Seven (7) key activities/outputs comprise the deliverables of the Niger-Nigeria test case, as summarized in Table A-2.

16. The methodology applied to evaluate the Niger-Nigeria test case was threefold. First, desk-based research was carried out. This involved the identification, acquisition, and review of a comprehensive set of project-related documents. Second, site visits were

undertaken to the project office in Niamey and one of the sites (Birnin Konni) in order to meet with project staff and discuss questions/issues emerging from the desk-based literature review. Third, project performance was evaluated based on the results of desk-based and site visits using UNEP's standardized evaluation criteria. Details regarding the site visit itinerary are provided in Annex A-1.

Part II - Project performance and impact

17. Project performance and impacts for the Niger-Nigeria test case has been evaluated relative to four (4) major criteria, namely attainment of objectives and planned results, sustainability and catalytic role, processes affecting attainment of results, and complementarity with UNEP programmes/strategies. The results of the terminal evaluation for each major criterion are described in the sections that follow.

Table A- 3: Summary of evaluation ratings for: "attainment of objectives and planned results"

Sub-criterion	Sub-criterion rating	Overall criterion rating
Achievement of outputs and activities	MS	MS
Relevance	S	
Effectiveness	MS	
Efficiency	MS	
Outcomes to impacts	MS	

Rating code: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

A. Attainment of objectives and planned results

18. The criterion "attainment of objectives and planned results" has been evaluated relative to five (5) distinct sub-criteria, namely achievement of outputs and activities, relevance, effectiveness, efficiency, and outcomes to impacts. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table A-3 and described in the subsections that follow.

Achievement of outputs and activities

19. The paragraphs below describe the achievement of outputs and activities for the Niger-Nigeria test case relative to each of the seven (7) activities that formed the scope of work under the subcontract with CSU.

20. Activity #1 focused on the development and testing of the Activity Data Module and the Calculation Modules (i.e., Simple Assessment, Detailed Assessment, Dynamic Modeling) of the CBP tool. Activities at both the Birnin Konni and Maradi areas were included in the development and testing of the Calculation Modules of the CBP Protocol. Testing involved regular interactions with CSU through email exchanges and skype conference calls related to the data set assembly, characterization of baseline conditions, and reporting requirements. The testing phase lasted through the end of 2012 and focused only on the Activity Data Module and the Simple Assessment Module, the only module sufficiently developed from CSU over the period. While testing uncovered several issues, there were no systematic technical reports prepared during the course of testing so it is impossible to assess the outputs of these activities (i.e., if/how these issues are reflected in the design of the Activity Data and Simple Assessment modules).

21. Activity #2 focused on working with ISRIC to help them collate and analyze soil samples. There were no soil sampling or laboratory analysis activities undertaken in either the Birnin Konni and Maradi areas. This was due to the lack of capacity for undertaking such activities. Moreover, there was no contact throughput the duration of activities with the ISRIC.

22. Activity #3 focused on a needs assessment for monitoring, measuring and modeling. While general feedback was provided to CSU shortly after test case start-up, the actual needs assessment was carried out in an informal fashion without a detailed report being delivered to CSU. That is, the format of the needs assessment was a set of informal email exchanges providing feedback on potential improvements to the CBP system relative to technical needs of the Niger-Nigeria project team for applying the Activity Data Module and Simple Assessment Module. By the end of 2010, monitoring needs had been adequately completed and communicated. By the end of 2011, measuring/modeling needs to account for carbon benefits had also been adequately completed and communicated.

23. Activity #4 focused on arranging/participating in on-site training sessions on the CBP protocol. Three (3) individuals from the Niger-Nigeria test case participated in a 3-day CBP training session held in Niamey over 12-14 April 2010. The goal of the training was to introduce the CBP system and try to resolve emerging questions/issues in real time. Feedback from participant evaluation of the training highlighted the wish for [indicate general feedback]. Some representatives from the Niger-Nigeria test case also attended additional training at the University of Leicester in the UK over the period 19-23 October 2009. While there was an unfortunate incident where some of the staff of the Niger–Nigeria test case could not be cleared to attend the UK workshop, this was beyond the control of the test case management. Despite the fact that no other training was received during the course of test case activities, the training received was sufficient to build the needed capacity among project staff to contribute to the development of the CBP tool.

24. Activity #5 focused on implementing the CBP protocol in the selected project sites with a view to implementation across the whole project area in the third year. The field-

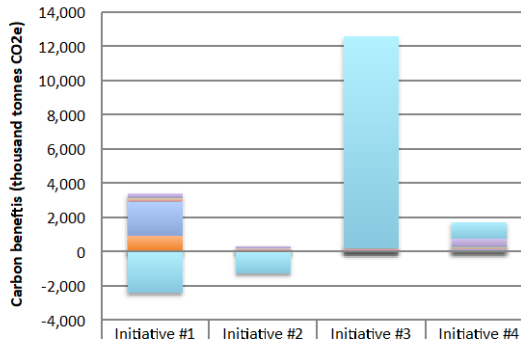
Table A- 4: Results of CBP tool testing for each major initiative for the Niger-Nigeria test case

Initiative		Area (hectares)		Carbon benefits (million tCO2-eq sequestered in 8-yr period)					
		Test case site	Maggia-Lamido & Gada-Gulbin Maradi basins	Simple Assessment		Detailed Assessment		Dynamic Modelling	
No.	Name			Test case	Overall project	Test case	Overall project	Test case	Overall project
1	Restored Grassland, Agroforestry, Forest	26,000	1,392,500	0.90	NA	NA	NA	NA	NA
2	Souloulou Restored Grasslands and Forest	2,252		-1.03	NA	NA	NA	NA	NA
3	Restored Grassland/Dunes/Cropland	2,200		12.54	NA	NA	NA	NA	NA
4	Tsernawa Restored Grassland and Forest	1,299		1.7	NA	NA	NA	NA	NA
Total		31,751		14.11	NA	NA	NA	NA	NA

testing occurred over a 2-year period in 2011 and 2012. While feedback was provided on the three calculation modules of the CBP tool (i.e., Simple, Detailed, Dynamic), only

the Simple Assessment module was sufficiently developed for practical application to quantify carbon benefits. That is, there were delays in tool development, with some essential guidance documentation being unavailable during the testing period. Nevertheless, the Simple Assessment module was adequately used to quantify carbon benefits for all four (4) initiatives in both the Birnin Konni and Maradi areas, as summarized in Table A-4. Further details are provided in Figure A-3 for the eleven (11) categories of carbon benefits quantified in the initiatives. The quantification of carbon benefits over the entire project areas was not attempted in the third year due to financial constraints.

Figure A- 3: Results of CBP tool testing for each major initiative for the Niger-Nigeria test case, 8-yr period



	Initiative #1	Initiative #2	Initiative #3	Initiative #4
Mineral soils	-2,455.27	-1,321.18	12,404.27	974.60
Fuelwood loss	267.94	140.67	0.00	526.50
Forest C growth	59.11	11.74	0.00	23.80
Agrofor C growth	143.41	135.84	132.70	78.36
N Fert Leach Runoff	2,000.00	0.00	0.00	64.00
N Fert Atmos Dep	888.00	0.00	0.00	32.00
Manure PRP Leach-Runoff N2O	-0.02	-0.03	-0.02	-0.02
Manure PRP Atmos Dep N2O	-0.59	-0.23	0.42	0.34
Maure PRP direct N2O	-0.16	-0.09	-0.07	-0.05
Manure CH4	0.00	-0.01	-0.01	0.00
Enteric CH4	-0.21	-0.15	-0.09	-0.06

25. Activity # 6 focused on testing aspects of CBP protocol such as the Users Guide and web-based software. The Users Guide was not evaluated due to the fact that it was not available during the period of testing activities. As indicated above, the web-based was tested in the course of efforts to quantify the magnitude of carbon benefits for each initiative. Tool testing was simplified due to poor internet connectivity and accessibility, leading to frequent periods where the CBP tool could be used in the field.

26. Activity # 7 focused on providing financial/scientific reports to the project coordinator and UNEP task manager. All financial reports have been provided to CSU and accepted. A draft technical report indicating the magnitude of carbon benefits has been submitted and was in the process of finalization at the time of this writing. No scientific papers have been prepared or are being planned related to the experience using the CBP tool in the Niger-Nigeria test case.

Relevance

27. The loss of vegetation leading to desertification is the major problem facing the two countries in the transboundary watershed region. The SLM initiatives undertaken are well aligned with the Niger National Action Programme for Desertification Control and Natural Resources Management (NAP/DC/NEM) and the Nigerian National Policy on the Environment, the National Environmental Action Plan (NEAP), the States Environmental Action Plans (SEAPs) and the Nigeria's National Action Plan to Combat Desertification (NAP), among other national environmental strategies.

28. Moreover, although the CBP is a global project, the Niger-Nigeria test case objectives and related capacity building are directly relevant to transboundary watershed

management priorities in the region. This can be seen clearly in light of the Maiduguri Agreement, which calls for cross-border cooperation in relevant research and capacity building to confront land degradation. CBP-related activities to quantify above- and below-ground carbon are highly relevant to the objectives of this key transboundary management agreement between the two countries.

29. Finally, both countries are in the process of implementing other GEF projects related to SLM. These projects have all claimed multiple global environmental benefits including carbon sequestration; yet have been largely lacking in the tools to justify those claims. Hence, the lack of a standardized methodology in Niger-Nigeria to quantify the carbon benefits of SLM projects infers the high relevance of the CBP tool in the Niger-Nigeria context.

Effectiveness

30. The effectiveness criterion is defined relative to the extent to which the test case achieved its main objectives. For the purpose of this terminal evaluation, "main objectives" have been interpreted as the stated output for Sub-Component A-2 (Test cases) as defined in the Project Results Framework in Annex A of the Project Document. The stated output of the test case is "a C benefits protocol that meets the specific requirements of GEF SLM projects and other SLM projects in developing countries". Three objectively verifiable indicators were specified in the Project Document and represent the basis for an evaluation of the effectiveness of the Niger-Nigeria test case, as summarized in the paragraphs that follow.

31. *Objectively verifiable indicator #1 - Spectrum of C benefit requirements of SLM test case projects understood:* The specific requirements for quantifying C benefits at SLM projects have been assessed through workshops and regular discussions between CSU and project staff. These exchanges have resulted in a clarification of the types and nature of data needed to quantify carbon benefits, leading to a gradual increase in user technical capacity and greater understanding of CBP tool functionality. Moreover, the testing and informal reporting has contributed to the adjustment to adapt the CBP system, both its carbon and socioeconomic aspects, to the specific circumstances of the Niger-Nigeria test case sites. However, the understanding of carbon benefit calculation requirements for SLM is at best limited, due to the focus of testing only on the Simple Assessment tool. There is no evidence of any exploratory testing using the Detailed Assessment or Dynamic Modeling.

32. *Objectively verifiable indicator #2 - Requirements of SLM projects outside of the test case situations understood:* The initiatives considered in the Niger-Nigeria test case represented a broad framework by which to develop a good understanding of how to quantify carbon benefits in a range of SLM projects. However, the application of the Simple Assessment is insufficient in itself to improve the understanding of those carbon benefits. What is needed is the application of all of the CBP system Calculation Modules (i.e., Simple, Detailed, Dynamic) within the test case for both the test case site and the larger project area in which the test case was located. The record of activities at the test case falls well short of this standard.

33. *Objectively verifiable indicator #3 - Capacity of test case projects for C measuring, monitoring and reporting understood:* One of the weakest aspects of activities at the

test case site was the measuring and monitoring of relevant data that affect the magnitude of carbon benefits (e.g., soil and plant CO2 emissions, yearly litters, lignin contents of wheat and maize, soil pH value, soil organic carbon content, biomass quantities at selected sites). There is no evidence of any measuring or monitoring activities of above- or below-ground carbon, and hence no reporting of such activities.

Efficiency

34. The efficiency criterion is defined relative to the timeliness and cost effectiveness of project execution. Regarding timeliness, the CBP was launched in April 2009 and was followed the next month by the Inception Workshop in Nairobi. In January 2010, the subcontract was signed with CSU. The period between the inception workshop and the signing of the contract was planned to be much shorter, on the order of a month or two. The delay in establishing the test case subcontract was due to the delay in establishing overall contractual arrangements between CSU and UNEP.

Table A- 5: Total budget - Niger-Nigeria test case

Budget item	Total (US$)
Senior Personnel	26,250
Other Personnel	52,500
In Country Travel	28,896
Materials & Supplies	32,789
Other Direct Costs	18,273
TOTAL	**158,708***

**Note: sum of individual budget items exceeds total subcontracted amount by $968*

35. At the operational level, the delay had little impact on the efficiency of early project execution because activities commenced at each of the project sites well in advance of finalization of sub-contractual arrangements. However, the overall timeliness of project execution is difficult to evaluate. At the time of the site visits in February 2013 associated with the terminal evaluation, final reports for each test case site were still unavailable. This was not unexpected given that the CBP was operating under a 1-year, no-cost extension through 31 May 2013. It is impossible to evaluate the overall timeliness of project execution until after the end of the extension period.

36. Regarding the cost-effectiveness of the Niger-Nigeria test case, activities were implemented for a total budget of nearly $157,740, covering all labor, travel, and materials (see Table A-5). Labor expenses were associated with conducting field-based activities, as well as project-based activities such as scenario analysis using the CBP tool, and reporting of results to CSU. Travel costs were associated with travel from the project management office in Niamey to the Birnin Konni and Maradi areas. International travel costs to participate in training workshops were covered out of either CSU or UNEP's budget. The remaining budget items represent about 11.5% of the total budget was covered miscellaneous items such as materials, supplies and other direct costs. The total budget is divided roughly evenly between the two areas of CBP-related activities. Project expenditures are cost-effective when compared to the other test cases, especially in light of the communication challenges due to internet availability.

Outcomes to impacts

37. The outcome to impacts criterion is defined relative to the extent to which outputs from the test case sites can contribute towards impacts. For the purposes of the terminal evaluation, the contribution of outcomes to impacts is defined relative to the

field-testing component of the CBP. The impact pathways, impact drivers (identified as "ID) and key assumptions (identified as "AS") are summarized in Figure A-4.

38. Based on the above figure, it can be concluded that the outcomes (i.e., results across the four initiatives) have not yet been fully delivered due to the lack of final reporting and the unavailability of a completed CBP tool (i.e., detailed assessment and dynamic modeling components) for the quantification of carbon benefits. These outcomes were designed to feed into an ongoing process to improve the understanding of the magnitude of carbon benefits associated with SLM projects specifically in Niger-Nigeria but also globally. This intermediate step has been partially achieved, primarily due to the progress in the two key assumptions. These findings have an adverse cascading effect through to the desired impact in Niger-Nigeria (i.e., carbon benefits to be quantified using the CBP tool in all future SLM projects in the country).

B. Sustainability and catalytic role

39. The criterion "sustainability and catalytic role" is actually comprised of two (2) separate criteria. The ***sustainability*** criterion is defined relative to the probability of continued long-term project-derived results and impacts after the external project funding and assistance ends. The ***catalytic role*** criterion is defined relative to the extent to which an enabling environment has been created to foster innovation. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table A-6 and described in the subsections that follow.

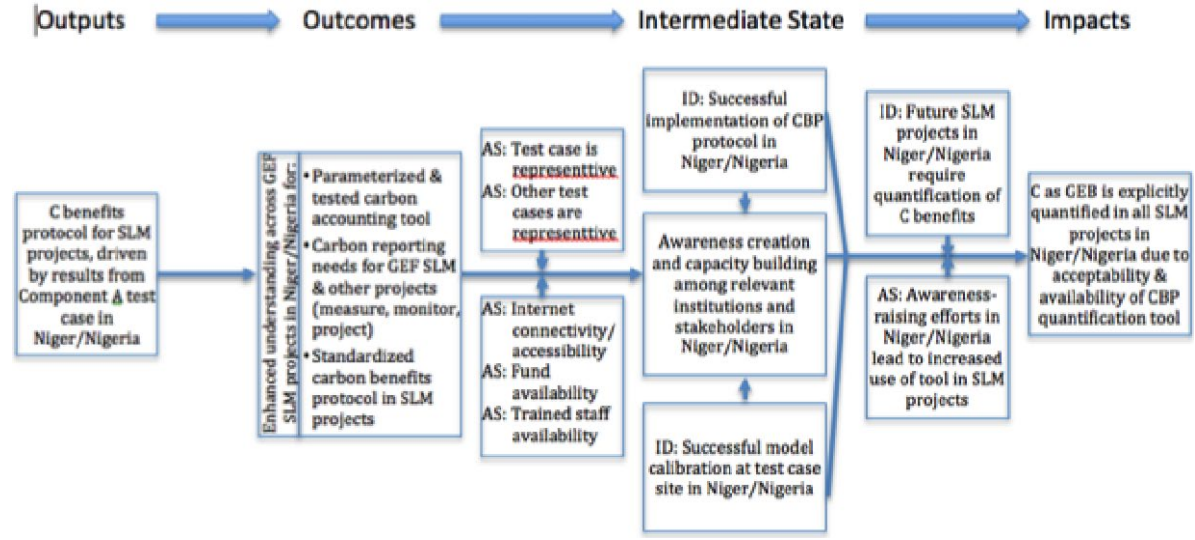
Table A- 6: Summary of evaluation ratings for: "sustainability and catalytic role"

Sub-criterion	Additional Sub-criterion	Sub-criterion rating	Overall criterion rating
Sustainability	Socio-political sustainability	L	ML
	Financial resources	ML	
	Institutional framework	ML	
	Environmental sustainability	L	
Catalytic role	Behavioral changes	ML	
	Incentives	ML	
	Institutional changes	ML	
	Policy changes	MU	
	Catalytic financing	ML	
	Champions	ML	

Rating code: Highly Likely (HL); Likely (L); Moderately Likely (ML); Moderately Unlikely (MU); Unlikely (U); Highly Unlikely (HU)

40. ***Sustainability.*** The sustainability criterion has been evaluated relative to four (4) distinct sub-criteria. These are socio-political sustainability, financial resources, institutional framework, and environmental sustainability. The results of the evaluation of each sub-criterion are described in the paragraphs below.

Figure A- 4: Outcomes to impacts pathways for the Niger-Nigeria test case



Socio-political sustainability

41. The socio-political sub-criterion is defined relative to any social or political factors that impact the sustainability of project results and progress towards impacts. Two additional socio-political sub-criteria were included in the evaluation, namely level of ownership and stakeholder engagement.

42. The level of ownership sub-criterion was considered from both the national level, where key institutions are located which will be responsible for incorporating and extending the lessons from the test case site, as well as the regional level, where test case initiatives were undertaken. At the national level, both Niger and Nigeria have the necessary institutional framework to make effective use of the CBP tool going forward. For example, Niger created the National Council for Sustainable Development, which contributed to the development of a national climate change strategy and action plan in 2004. The quantification of carbon benefits of future SLM activities is well within the mandate of this institution and suggests a good basis for socio-political sustainability. At the regional level, there was clearly a sufficient level of ownership to allow for the project results to be sustained. This is evident by, among other factors, the large number of initiatives and intervention sites that were incorporated into the Simple Assessment.

43. The stakeholder engagement sub-criterion was considered at the overall project level only. The range of meetings and discussions that were undertaken across all the Niger-Nigeria initiatives confirm that there was sufficient stakeholder awareness, interests, and commitment to execute the sub-contractual agreement established with CSU. There was a good understanding and awareness of the role the test case sites were expected to play in the development of CBP tool. However, at the local community level, stakeholders did not fully understand the intricacies and the details of the CBP tool. Nevertheless, they were positive about having the CBP test site in their locality and they reported being optimistic that they an benefit from SLM interventions, a factor that enhances the sustainability of examining CBP benefits at the grassroots

level. Finally, the commitment of project staff to project aims is evident by their continued contributions during the no-cost extension period.

Financial resources

44. The financial resources sub-criterion is defined relative to the dependence of eventual impact from the test case sites on continued financial support. It is clear from Table A-5 that project results, as currently available, are limited to the application of the Simple Assessment. Field-testing of the Detailed Assessment and Dynamic Modeling modules have not been attempted; nor have any applications of any calculation module of the tool been extended to the wider project watershed area. It is unlikely that such activities can be undertaken without continued financial support. Hence, there is a high dependence on continued financial support to achieve the results envisioned under the original sub-contractual agreement with CSU.

Institutional framework

45. The institutional framework sub-criterion is defined relative to institutional framework and governance issues that impact the sustainability of project results and progress towards impacts. As of the time of this writing, there are no project initiatives underway to incorporate project results/achievements into regional/national institutional processes, policies, coordination mechanisms, or legal/accountability frameworks. Such initiatives will be needed in order to sustain project results and to lead to progress on regional/national impacts. The NNJCC represents a key potential focus of such activities, given that it exhibits an institutional framework and governance structure that could help promote sustainability of the results and progress towards a systematic accounting of carbon benefits from future SLM initiatives in Niger and Nigeria. Therefore, the institutional framework for sustaining project activities remains currently undeveloped.

Environmental sustainability

46. The environmental sustainability sub-criterion is defined relative to any environmental factors that can impact the future flow of project benefits. There are no project outputs or higher-level results that are likely to affect the environment, or which might affect the sustainability of project benefits.

47. Moreover, the Niger – Nigeria test case is within the Sahel region, a marginal area where people's search for livelihoods involves activities that undermine ecological sustainability of the land. Presently, the whole of Niger and a great part of northern Nigeria are threatened by environmental degradation aggravated by human activities including overstocking, overgrazing and shifting cultivation and other unsustainable human activities. Application of the CBP tool in such circumstances will likely improve the capability of ecosystem managers to measure, monitor and manage carbon in the land-based systems. Coupled with the adoption of the SLM approaches should enhance environmental sustainability by increasing - and explicitly accounting for - carbon sequestration in the above and below ground carbon pools while reducing carbon emissions through avoiding deforestation and land degradation.

48. Indeed, there is evidence that SLM initiatives at the Niger–Nigeria test case site are beginning to show signs of environmental benefits. At the Birnin Konni test site, a 50

ha plot zoned off from grazing and other human activities in 2010 is now showing signs of recovery as re-colonization with grasses such as *Pennisetum* and *Cenchrus,* and trees such as *Acacia albida*, *Acacia seyal* and *Acacia nilotica* is underway, thereby increasing plant biodiversity and above- and below-ground carbon. These results improve the chances of the environmental sustainability of project initiatives.

49. ***Catalytic role.*** The catalytic role criterion has been evaluated relative to six (6) sub-criteria, namely behavioral changes, incentives, institutional changes, policy changes, catalytic financing, and champions. The results of the evaluation of each sub-criterion are described in the paragraphs below.

Behavioral changes

50. The behavioral changes sub-criterion is defined relative to any broad-based changes made by stakeholders in Niger-Nigeria that are a direct result of the application of the CBP at the test case sites. As of the time of this writing, there are no broad-based changes evident in strategic programmes/plans, SLM management systems, or measurement/monitoring methods that can be attributed to activities at the test case sites.

Incentives

51. The incentives sub-criterion is defined relative to any broad-based changes made by stakeholders in Niger-Nigeria that are a direct results of incentives embedded in the CBP application at the test case sites. As of the time of this writing, there are no broad-based changes evident that can be directly attributed to incentives embedded in the CBP application at the test case sites.

Institutional changes

52. The institutional changes sub-criterion is defined relative to any institutional uptake in Niger-Nigeria of lessons from the CBP application at the test case sites. As of the time of this writing, there is no evidence of mainstreaming of lessons from the test case sites into the wider institutional setting for SLM activities in Niger-Nigeria.

Policy changes

53. The policy changes sub-criterion is defined relative to the development of new policies in Niger-Nigeria based on the lessons from the CBP application at the test case sites. As of the time of this writing, there is no evidence of potential new policy directions based on the results and lessons of the test case sites.

Catalytic financing

54. The catalytic financing sub-criterion is defined relative to the emergence of any follow-on funding from government, bilateral donors, or the GEF to support continued activities at the test case sites. As of the time of this writing, there is no evidence of any follow-on funding from any sources.

Champions

55. The 'champions' sub-criterion is defined relative to the emergence of particular individuals or institutions in Niger-Nigeria willing to promote the lessons and results

from the test case sites into the broader transboundary planning context. As of the time of this writing, there is no evidence of any potential champion prepared to work to catalyze the mainstreaming of the CBP tool within planning and policymaking institutions in Niger-Nigeria.

C. Procedures affecting attainment of project results

56. The criterion "procedures affecting attainment of project results" has been evaluated relative to seven (7) distinct sub-criteria, namely preparation and readiness; implementation approach and adaptation management; stakeholder participation and public awareness; country ownership and driven-ness; financial planning and management; UNEP supervision and backstopping; and monitoring and evaluation. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table A-7 and described in the subsections that follow.

Preparation and readiness

57. The preparation and readiness sub-criterion is defined relative to the clarity, practicality, and feasibility of the test case objectives in the sub-contractual agreement between the NNJCC and CSU. The purpose and tasks were identified clearly in the subcontracts with sufficient flexibility due to the scientific nature of the project. The subcontracts were established with due consideration to the diversity of circumstances at the test case level. In this sense, the project's objectives were clear, practical, and feasible. However, activities at the test case site level were highly dependent on upstream activities associated with the development of the CBP system. Given the combination of timeline constraints and the delay in obtaining a functional version of all the calculation modules of the CBP tool and, it would have been desirable to build additional flexibility into the subcontracting arrangements. In this sense, the project's objectives, while clear, were impractical and not feasible.

Table A- 7: Summary of evaluation ratings for: "Procedures affecting attainment of project results"

Sub-criterion	Sub-criterion rating	Overall criterion rating
Preparation and readiness	MS	S
Implementation approach and adaptive management	S	
Stakeholder participation and public awareness	S	
Country ownership and driven-ness	S	
Financial planning and management	S	
UNEP supervision and backstopping	NA	
Monitoring and evaluation	NA	

Rating code: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

Implementation approach and adaptive management

58. The implementation approach and adaptive management sub-criterion is defined relative to the project's adaptation to changing conditions, the effectiveness of implementation arrangements, relevance of changes in project (or tool) design, and overall performance of project management. Regarding adaptation to changing conditions, project management at the test case were able to adjust to delays in the availability of the CBP tool by focusing on a limited set of outputs, namely technical feedback on, and application of, the Simple Assessment calculation module.

59. Regarding the effectiveness of implementation arrangements, the subcontract approach was used to establish the scope of work. Regular communications followed through email, skype calls, and telephone. However, there were typically long delays between the provision of detailed feedback on the CBP tool and the resolution of the feedback into a subsequent version. Moreover, the effectiveness of implementation arrangements would have been enhanced with more hands-on training built into the work plan (i.e., training sessions implemented at the Niamey management office).

60. Regarding the relevance of changes in tool design, this was a key factor in developing a useful tool for conditions in the transboundary watersheds. CSU largely incorporated feedback by the test case site staff on the user interfaces, data input and template, project description module, guidance module, the organizing of land use categories and related species, fertilizer and irrigation data, social-economic tools, and reporting module. Project management at the test case sites was fully able to adapt to the evolving architecture of the CBP tool. The codification of feedback into subsequent programming confirms the relevance of proposed changes in tool design.

61. Regarding overall performance of project management, most of the outputs of the test case sites have been delivered, as per the terms of the sub-contractual arrangements. Those outputs that have not been delivered (e.g., implement the CBP protocol in the selected project sites, with a view to implementation across the whole project area in the third year of the CBP) are due to a combination of the time and budget constraints, together with the unavailability of the calculation modules of the CBP tool within the duration of activities at the test case sites.

Stakeholder participation and public awareness

62. The stakeholder participation and public awareness sub-criterion is defined relative to the effectiveness of consultations and project decision-making among stakeholders. The key stakeholders in the Niger-Nigeria test case were the Governments of Nigeria and Niger as represented by the NNJCC and other relevant agencies, the staff of the NNJCC/IEM project, and the local community where test sites were located. Regarding the effectiveness of consultations among stakeholders, there was sufficient engagement to address test case objectives and to ensure buy-in from relevant government agencies by undertaking *ad hoc* seminars and presentations with decision-makers. At the community level, the various SLM initiatives themselves were well-received which created positive opportunities to engage community members on the issues of climate change and carbon benefits.

63. Regarding project decision-making among stakeholders, there was relatively good communications within the project management office in Niamey. The staff members that were involved in project activities displayed a high level of coordination in the execution of the range of tasks. This was particularly noteworthy for the scope of the carbon benefits assessment that extended to four (4) different types of SLM initiatives, resulting in the quantification of carbon benefits in eleven (11) categories.

Country ownership and driven-ness

64. The country ownership and driven-ness sub-criterion is defined relative to the degree to which government has assumed responsibility for the test case sites, offered institutional support, and been responsive to UNEP-DEWA guidance. For all of these

factors, there is strong evidence that the government has played a key role. First, the NNJCC project management office in Niamey for the OP-12 project was proposed as the key institution/agency for coordinating all activities. Second, institutional support was offered in terms of in-kind contributions of office space and official access/permission to visit the test case sites. Third, there was good cooperation between CSU, designated by UNEP-DEWA to manage the project and the project management office. Together, this evidence suggests a good sense of country ownership and driven-ness.

Financial planning and management

65. The sub-criterion is defined relative to the quality and effectiveness of financial planning and control of financial resources throughout the project's lifetime. There no irregularities found in the management of financial resources for the test case. Clear and transparent records were kept at the project management offices that show the distribution of funds commensurate with activities undertaken and deliverables submitted.

UNEP supervision and backstopping

66. The UNEP supervision and backstopping sub-criterion is defined relative to effectiveness of supervision and administrative/financial support provided by UNEP. This sub-criterion is not applicable at the test case level due to the lack of a direct line of accountability between UNEP and the test case sites.

Monitoring and evaluation

67. The monitoring and evaluation sub-criterion is defined relative to the effectiveness of project monitoring and evaluation (M&E) plans and tools. This sub-criterion is not applicable at the Niger-Nigeria test case due to the lack of M&E activities built into the sub-contractual arrangements with CSU.

D. Complementarity with UNEP programmes and strategies

68. The criterion "complementarity with UNEP programmes and strategies" has not been evaluated at the test case level. This is due to the fact that none of the four (4) sub-criteria (i.e., linkage to UNEP's EAs and POW 2010-2011; alignment with the Bali Strategic Plan; gender; and South-South Cooperation) are relevant to individual test case sites. The activities relative to the sub-criteria are relevant only at the overall project level.

Part III - Conclusions and recommendations

A. Conclusions

69. The final evaluation ratings for the Niger-Nigeria test case are summarized in Table A-8. The major positive achievements of the Niger-Nigeria test case are summarized in the bullets below.

Table A- 8: Summary of evaluation ratings for the Niger-Nigeria test case

Criterion	Sub-criterion	Additional Sub-criterion	Sub-criterion rating	Overall criterion rating
Attainment of objectives and planned results	Achievement of outputs and activities	NA	MS	MS
	Relevance		S	
	Effectiveness		MS	
	Efficiency		MS	
	Outcomes to impacts		MU	
Sustainability and catalytic role	Sustainability	Socio-political sustainability	L	ML
		Financial resources	ML	
		Institutional framework	ML	
		Environmental sustainability	L	
	Catalytic role	Behavioral changes	ML	
		Incentives	ML	
		Institutional changes	ML	
		Policy changes	MU	
		Catalytic financing	ML	
		Champions	ML	
Procedures affecting attainment of project results	Preparation and readiness	NA	MS	S
	Implementation approach/adaptive mngmnt		S	
	Stakeholder participation/public awareness		S	
	Country ownership and driven-ness		S	
	Financial planning and management		S	
	UNEP supervision and backstopping		NA	
	Monitoring and evaluation		NA	
Complementarity with UNEP programmes and strategies	Linkage to UNEP EAs & POW 2010-11	NA	NA	NA
	Alignment with the Bali Strategic Plan		NA	
	Gender		NA	
	South-South Cooperation		NA	

Rating code for all criteria except Sustainability and catalytic role: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

Rating code for Sustainability and catalytic role: Highly Likely (HL); Likely (L); Moderately Likely (ML); Moderately Unlikely (MU); Unlikely (U); Highly Unlikely (HU)

- The project has provided a good opportunity to explore the magnitude of expected carbon benefits associated with a range of IEM interventions in a trans-boundary context.
- CBP experiences at the Birnin Konni test site where a 50ha plot zoned off from grazing and other human activities in 2010 has demonstrated of recovery with subsequent re-colonization with grasses such as *Pennisetum* and *Cenchrus,* and trees such as *Acacia albida*, *Acacia seyal* and *Acacia nilotica.*
- Although, there is no evidence of any exploratory testing using the Detailed Assessment or Dynamic Modeling, the Simple Assessment module was adequately used to quantify carbon benefits for all four the four (4) initiatives in both the Birnin Konni and Maradi areas.
- The major portions of the sub-contractual agreement with CSU dealing with feedback, soil testing, and testing have been successfully implemented, thus

contributing to the development of the CBP system and increasing the understanding of local collaborators regarding carbon benefits of SLM projects.

70. The major negative aspects of the Niger-Nigeria test case are summarized in the bullets below, together with the underlying causes.

- The outcomes (i.e., results across the four initiatives) have not yet been fully delivered due to the lack of final reporting and the unavailability of a completed CBP tool (i.e., detailed assessment and dynamic modeling components) for the quantification of carbon benefits.
- One of the weakest aspects of activities at the test case site was the measuring and monitoring of relevant data that affect the magnitude of carbon benefits (e.g., soil and plant CO_2 emissions, yearly litters, lignin contents of wheat and maize, soil pH value, soil organic carbon content, biomass quantities at selected sites). There is no evidence of any measuring or monitoring activities of above- or below-ground carbon, and hence no reporting of such activities.
- Although the project sustainability is feasible with necessary institutional framework, sufficient level of ownership at national level and sufficient stakeholder awareness, interests, and commitment, it is unlikely to sustain the project results due to high dependence on continued financial support to achieve the results envisioned.
- Those outputs that have not been delivered (e.g., implement the CBP protocol in the selected project sites, with a view to implementation across the whole project area in the third year of the CBP project) are due to a combination of the time and budget constraints, together with the unavailability of the calculation modules of the CBP tool within the duration of activities at the test case sites.

71. In conclusion, the overall assessment of the Niger-Nigeria test case is Moderately Satisfactory (MS). The evidence provided in previous sections supports this summary conclusion.

B. Lessons learned

72. There are several key lessons that have emerged from the evaluation of the Niger-Nigeria test case. These lessons, summarized in the bullets below, are directly applicable to future projects that involve the implementation of country-based demonstration projects to support the development of quantitative tools and methods.

- Application of the CBP tool in SLM projects will enhance the capability of ecosystem managers to measure, monitor and manage carbon in the land-based systems.
- CBP experiences at the Birnin Konni test site where a 50ha plot zoned off from grazing and other human activities in 2010 and now showing signs of recovery with subsequent re-colonization with grasses such as *Pennisetum* and *Cenchrus,* and trees such as *Acacia albida*, *Acacia seyal* and *Acacia nilotica, is a* good lesson that can be replicated in other SLM projects.

C. Recommendations

128. There are several key recommendations that can serve as actionable proposals to resolve the concrete problems that have affected the execution of the Niger-Nigeria test case and the sustainability of its outputs. These lessons, summarized in the bullets below, are feasible to implement within the framework of the capacity that has been built.

- In a situation where project activities at the test case site level are highly dependent on upstream activities associated with the development of the CBP system, it is desirable to build additional flexibility into the subcontracting arrangements.
- Since the application of the Simple Assessment is insufficient in itself to improve the understanding of the carbon benefits, there is need for inclusive application of all of the CBP system Calculation Modules (i.e., Simple, Detailed and Dynamic) within the test case for both the test case site and the larger project area in which the test case was located.
- There is need to incorporate project results/achievements into regional/national institutional processes in order to enhance their sustainability necessary to lead to progress on regional/national impacts.
- In order to enhance the effectiveness of project implementation arrangements, there will be a need to provide additional training to local project team with more hands-on training built into the work plan (i.e., training sessions implemented at the Niamey management office).
- Due to lack of awareness of the GEF CBP tool beyond the staff of NNJCC, there is need to engage scientific and policy-making community in Niger and Nigeria to promote awareness of the tool and mainstreaming it into project formulation.

Annex A-1: Evaluation itinerary and meetings

a) Site visit itinerary

Date	Location	Activities
Monday, 25 February 2013	Nairobi - Niamey	Travel from Nairobi to Niamey, Niger
Tuesday, 26 February	Niamey	• Meeting at Niger-Nigeria Joint Commission for Cooperation (NNJCC) Offices • Interviews with project personnel • Document review
Wednesday, 27 February	Niamey - Konin	• Travelled from Niamey to visit the Konnin test site • Interviews with project personnel • Document review
Thursday, 28 February	Konin - Niamey	• Travelled from Konin back to Niamey. • Interviews with project personnel on way to Niamey • Document review
Friday, 1 March	Niamey - Nairobi	Travel from Niamey to Nairobi

b) Site visit contact list

Name	Title	Organization/unit	Type
Ali Abdou Bonguere	National Coordinator	Climate and Development Network, Niger	1-on-1 meeting
Emmanuel	Project staff	Integrated Ecosystem Management Project,	1-on-1 meeting

Name	Title	Organization/unit	Type
Olukayode Oladipo		Nigeria – Niger Joint Commission for Cooperation	
Ibrahim Abdou Malik	Project staff	Ministere de l'Hydraulique et l'Environnement, Republique du Niger	1-on-1 meeting
Issa Ada	Project staff	Integrated Ecosystem Management Project, Nigeria – Niger Joint Commission for Cooperation	1-on-1 meeting

Annex A-2: Bibliography

a) Project management documents/reports collected and reviewed

- CBP, 2009. Project General Information. UNEP GEF PIR Fiscal Year 1 July 2009 to 30 June 2010.
- CBP, 2009. The Carbon Benefits Project: Modelling, Measurement and Monitoring. Half Yearly Report Component A: Project General Information (01/04/09 – 31/12/09).
- CBP, 2009. The Carbon Benefits Project: Modelling, Measurement and Monitoring. Half Yearly Report Component B: Project General Information (July 1 to December, 31, 2009).
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- CBP, 2010. CBP Annex 8 Progress Report Template (Half Yearly Progress Report:
- CBP, 2010. CBP Half Yearly Progress Report, Component A: Project General Information (01/07 to 30/12/2010).
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- CBP, 2011. Project General Information. UNEP GEF PIR Fiscal Year 10 (1 July 2011 to 30 June 2012.
- CBP, 2013. Field Data Collection for Landscape Carbon Inventories: Landscape Carbon Measurement Guidelines, Document 1of 4, Version 1.2.
- CBP, 2013. Guideline for Developing Project Assessment Indicators: Landscape Carbon Measurement Guidelines, Document 4of 4, Version 1.4.
- CBP, 2013. Guidelines for Measuring Carbon in Agroforestry Biomass: Landscape Carbon Measurement Guidelines, Document 2of 4, Version 1.4.
- CBP, 2013. Guidelines for Measuring Carbon in Forest Change: Landscape Carbon Measurement Guidelines, Document 3of 4, Version 1.4.
- CSU, 2009. The Carbon Benefits Project: Modelling, Measurement and Monitoring (Component A). Colorado State University.
- Dougherty, B., 2013. Terminal Evaluation of the Carbon Benefits Project: Terms of Reference for the Technical Working Papers to be prepared by the Supporting Consultants.
- Milne, E., (undated). The Carbon Benefits project: Modelling, Measurements and Monitoring, Colorado State University.

- UNEP, 2009. Project Document, United Nations Environment Programme (UNEP).
- UNEP, 2011. Terminal Evaluation of the UNEP GEF Project, "Integrated Ecosystem Management (IEM) of Trans-boundary Areas between Nigeria and Niger (Phase1 – Strengthening of Legal and Institutional Frameworks for Collaboration and Pilot Demonstrations of IEM.
- UNEP, 2012. Terms of Reference for the Terminal Evaluation of the "Carbon Benefits Project: Modelling, Measurement and Monitoring (CBP:MMM)"

b) Additional documents collected and reviewed

- ICRAF. Soil – Plant Spectral Diagnostics Laboratory. World Agroforestry Center, Nairobi.

Annex A-3: Finances

Detailed information on co-financing arrangements was not available. A statement of project expenditures by activity was also not available.

Annex A-4: Supporting consultant info

Mr. Frank Muthuri undertook the terminal evaluation of the Niger-Nigeria test case sites. His Curriculum Vitae appears below.

Family Name: MUTHURI

Other Names: Francis; Mbijiwe

Nationality: Kenyan

Date of Birth: 12th June 1952

Marital Status: Married with Four Children

Address: P.O. BOX 1285 – 00606 Sarit Centre, Nairobi (Kenya)

Telephone: 0725 768 758

Email: muthuuri@gmail.com

Professional Experience:

Over twenty years experience in consulting on environmental management, project evaluations and development of natural resources with over sixty assignments successfully completed.

Carried out a wide range of consultancies in feasibility studies and reviews, project evaluations, project formulation, appraisals, project monitoring and baseline studies on diverse projects.

Extensive consultancy involvement in conducting environmental impact assessments of various development projects including conservation initiatives, water development projects, road construction projects, energy projects (hydropower, wind power, geothermal and biofuel development), irrigation and drainage schemes, fencing, construction and development of National Parks and Reserves, export processing zones development, power transmission projects, agricultural development schemes and sewerage systems planning among other related projects.

Accredited as an environmental impact assessment expert / environmental auditor since January 2002, by the National Environment Management Authority (NEMA).

Carried out consultancy work covering a wide range of environmental issues in several counties including Kenya, Tanzania, Somalia, Uganda, Ghana, Ethiopia, Rwanda, Burundi and Niger.

Acquired great teaching and capacity building experience in East African Universities and research involvement on various aspects of ecology and environment with subsequent publication of over twenty scientific papers in reputable international journals and attendance of numerous national and international conferences and workshops.

Education:

1985	Ph.D. in Ecology, University of Nairobi
1981	M.Sc. in Ecology, University of Nairobi
1979	International Certificate on Limnology, Austria Academy of Sciences
1977	B.Sc. (Hons) in Biological Sciences and Chemistry, University of Nairobi
1974	Dip. Ed. (S1), Kenya Science Teacher's College

Computer Proficiency: Ms-Word; Ms-Excel, PowerPoint

Languages: English and Swahili

Employment Record:

2007 - Present *Freelance Consultant*
Wide range of clients on assignments related to biodiversity, sustainable development, environmental impact assessments and others.

10/2004 - 10/2006 *Consultant, Lower Kihansi Environmental Management, Tanzania*
Capacity Building in environment and conservation at the University of Dar es Salaam and the Lower Kihansi Environmental Management Project, Tanzania, a World Bank funded project.

04/2001 – 10/2004 *Consultant with ETC East Africa Ltd*.
In charge of environmental desk at ETC East Africa. Involved in executing consultancy assignments, writing proposals, editing reports and training in environment and natural resources management and other related fields.

1995 - 1999 *Chairman, Botany Department, Kenyatta University*
Conducted administrative duties as the head of the Department of Botany, Kenyatta University with 54 academic and support staff and both undergraduate and postgraduate student population of over 200 students taking botany courses.

1994 - 2001 *Associate Professor, Kenyatta University*
Involved in teaching and supervision of both undergraduate and postgraduate students in the areas of ecology including aspects of

biology of conservation and environment. Research involvement in wetlands ecology and subsequent publication of scientific papers and attendance of conferences and workshops

1988 - 1994 *Senior Lecturer in Ecology, Kenyatta University*
Teaching both undergraduate and postgraduate students in the areas of ecology and environment. Supervision of postgraduate students at M.Sc. and PhD levels and involvement in research in ecology, environment and other related fields.

1985 - 1988 *Lecturer in Ecology, University of Nairobi*
Teaching and supervision of both undergraduate and postgraduate students in ecology. In charge of ecology field trips and Moana Botany Department Marine Field Station at the Kenyan Coast.

1981 - 1985 *Tutorial Fellow, University of Nairobi*
Studying for a Ph.D. degree in Botany Department in the area of ecology. Conducting tutorials, demonstrations and practicals for undergraduate students. Assisting senior members of staff teaching and assessment of undergraduate students.

1980 - 1981 *Limnologist, Ministry of Water Development*
Involved in pollution control activities including sampling and analysis of water in various parts of Kenya with particular duties for river systems in Western Kenya.

Annex B: China Test Case

Part I - Evaluation Background

A. Context

1. As the largest developing country in the world, China has been facing great pressure to promote environmental quality and comply with multilateral environmental agreements, particularly on the reduction of GHGs. China has committed to reduce carbon emissions per unit of GDP by 40%-45% by 2020 relative to 2005 levels. Notably it has also committed to land use change and forestry targets, with the intention to increase forested area by 40 million hectares and forest growing stock by 1.3 billion cubic meters.

2. In 2007, China established the National Programme for Addressing Climate Change. This programme defined the broad principles, objectives, policy orientation and measures of China's response to climate change. Increasing carbon sequestration in forests, grasslands and other land types has been identified as a key response measure in the programme. The links between carbon sequestration and sustainable land management are becoming increasingly understood in China.

3. In an effort to promote sustainable land management, China has initiated a partnership with the GEF around Operational Programme 12 (OP12), with the core concept of Integrated Ecosystem Management (IEM). The partnership was supported by a ten-year (2003-2012) Country Programme Framework (CPF) to build capacity and implement a number of demonstration projects. As of 2012, Partnership projects either underway or completed are listed in Table B-1.

Table B- 1: Sustainable land management projects in China

Project	Location
Capacity Building to Combat Land Degradation	Gansu, Inner Mongolia, Ningxia Hui, Qinghai, Shaanxi, Xinjiang Uygur
An IEM Approach to the Conservation of Biodiversity in Dryland Ecosystem	Gansu, Shanxi, Ningxia
Integrated Ecosystem and Agricultural Development Project	Ningxia
PRC-GEF Partnership-Capacity and Management Support for Combating Land Degradation in Dryland Ecosystems	Inner Mongolia, Shaanxi, Qinghai, Gansu, Ningxia, Xinjiang
Forestry and Ecological Restoration in Three Northwest Provinces	Gansu, Shaanxi, Xinjiang
Pastoral Development	Gansu, Xinjiang
Sustainable Development in Poor Rural Area Project – Sustainable Land Management and Adaptation	Henan, Shaanxi, Chongqing Municipality
Mainstreaming Biodiversity Protection within Production Landscapes and the Protected Areas of the Lake Aibi Basin	Xinjiang
Sustainable and Climate Resilient Land Management in Western PRC	Inner Mongolia, Shaanxi, Gansu, Qinghai, Guizhou, Sichuan

B. The Project

4. The China test case consisted of CBP-related activities in four (4) separate projects located in north-central China. Three of the projects are part of the partnership with the GEF around OP12 (see the first three projects of Table B-1). The fourth project is an independent enterprise loan project.

5. Prior to CBP-related activities, each of these projects was in the process of implementing some combination of integrated ecosystem management (IEM) and sustainable land management activities in an effort to combat biodiversity loss and reduce poverty. The two selected/participated province/autonomous region are shown on Figure B-1. Salient details regarding the projects are provided in the paragraphs below.

Figure B- 1: Selected provinces in China

6. *Capacity building to combat land degradation:* This was a GEF project in collaboration with the ADB. It was the first capacity building project under GEF's OP12 Programme and was implemented in six provinces/autonomous regions in western China, i.e. Gansu, Qinghai, and Shaanxi Provinces, and Ningxia, Inner Mongolia, and Xinjiang Autonomous Regions. The goal of the project was to help China establish an effective system of integrated ecosystem management to generate global benefits and reduce poverty. The project started in July 2004 and ended in December 2009. An OP12 Provincial Project Management Office (GEF-OP12 PMO) was established and remains staffed in each of the six provinces/autonomous regions. Each of the provinces/autonomous regions has established an IEM Information Center, providing the foundation for information analysis and sharing for land degradation control and capacity building for land degradation monitoring and evaluation. Best practice studies have been carried out on cultivated land, grassland and forests, run-off control, water-harvesting control, and grasslands management.

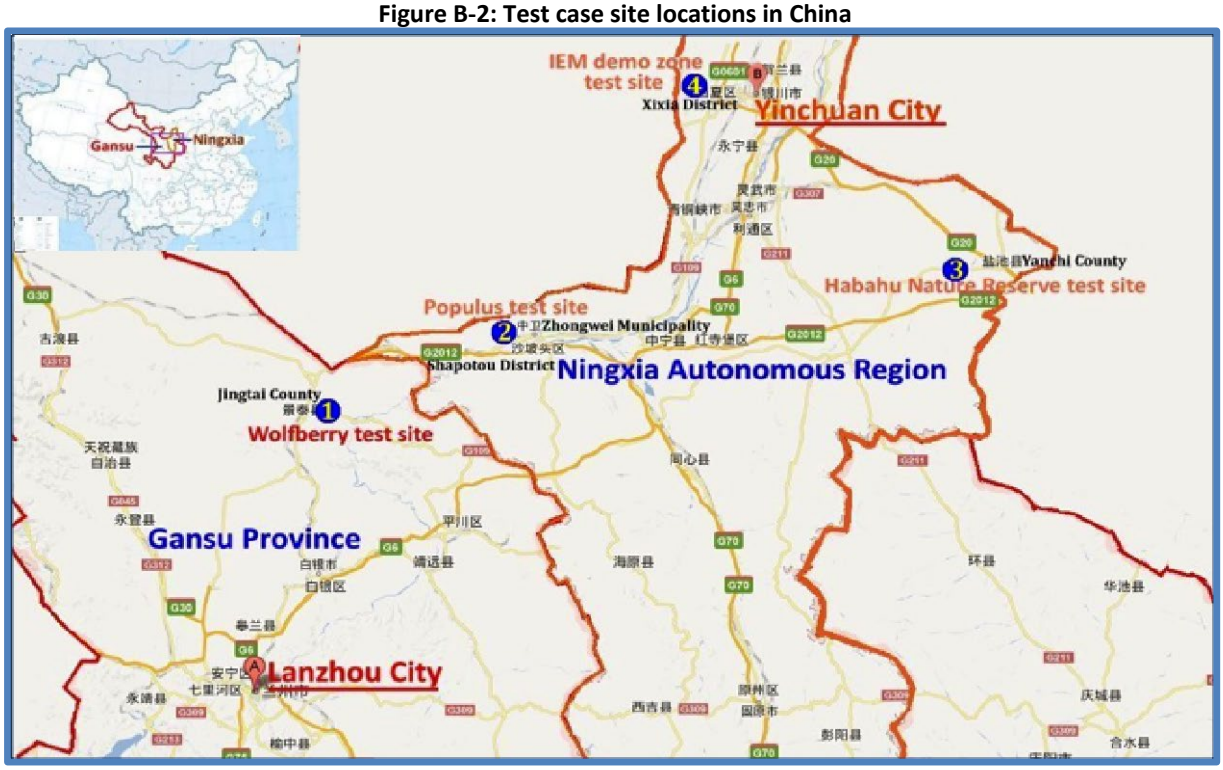
7. *An IEM Approach to the Conservation of Biodiversity in Dryland Ecosystem.* This is an ongoing GEF project in collaboration with IFAD. It was implemented in three provinces in China's Western Region, namely Gansu, Shanxi, and Ningxia. The goal of the project is to achieve significant reductions in loss of biodiversity in selected dryland ecosystems affected by land degradation. The project was started in April 2009 and is due to be completed in 2014. Activities include the implementation of pilot integrated ecosystem approaches designed to protect and rehabilitate existing protected areas that are threatened by non-sustainable land use practices which have led to land degradation, deforestation, over-grazing and illegal hunting. Inherent to the proposed objective and approach is the need to address the underlying issue of poverty and its reduction, a key causal factor contributing to the land degradation and loss of biodiversity.

8. *Ningxia Integrated Ecosystem and Agricultural Development Project:* This is an ongoing GEF project in collaboration with the ADB. The Project area covers 3,665 square kilometers of the oasis of the Yinchuan Plain extending into the piedmont zone and the Helan Mountains to the west of the Yellow River in Ningxia Hui Autonomous Region of China, involving three districts (Xingqing, Jinfeng, and Xixia) and 2 counties (Yongning and Helan). The goal of the project is to introduce integrated ecosystem management (IEM) approach to provide sustainable livelihoods based on better land management, biodiversity conservation and ecotourism. The project started in August 2008 is due to be completed in July 2014. Approximately one third of the Project area will be managed to enhance biodiversity

linkages between the Helanshan Nature Reserve, the Piedmont area and the Yinchuan plain. In addition, almost 11,500 ha of wetlands will use management approaches to protect biodiversity and enhance recreation and tourism.

9. *Integrated Forest Plantation and Pulp Production Project:* This was a enterprise loan project implemented outside of GEF activities. It was funded by a National Development Bank loan to the Meili Paper Industry Company, LTD, a subsidiary of the Metallurgical Corporation of China. The project is located in the Zhongwei Municipality of Zhongning County in the Ningxia Hui Autonomous Region. The goal of this project was to establish an afforested area to produce pulp. The project started in 2005 and ended in 2010. The total area of afforestation is about 33.300 ha, including 21,000 ha in Zhongwei Municipality and 12.300 ha in Zongning County. The major tree species for plantation are varieties of *Populus*, with planned 5-6 year rotation period of cutting, and the plantations were built on abandoned low productive sandy land, uncultivated land, and river mudflats.

Figure B-2: Test case site locations in China



C. Evaluation objectives, scope and methodology

10. The China test case focused on Component A of the CBP (Modeling: greater focus on cropland and grazing land) and Sub-component A-2 (Test cases). A total of four (4) test case sites were established, one for each of the projects described above. The test case sites are located in the Gansu Province and Ningxia Autonomous Region, as shown in Figure B-2. A brief description of the project activities relevant to carbon benefit quantification is provided in the paragraphs that follow.

11. Site #1 (*Wolfberry test case site*) corresponds to the project entitled: *Capacity building to combat land degradation,* and is located in Gansu Province. A total of

2,010 ha of wolfberry forest had been planted in Jingtai County, of which the project supported 40 ha as demonstration to control land degradation in Hongyue Village. For CBP tool testing, the total wolfberry plantation area of 2,010 ha was considered. These plantations were at various ages and were the basis for testing the Simple Assessment and Socio-economic modules, including DPSIR and CBA analyses. The baseline land use scenario was assumed to be barren saline land.

12. Site #2 (*Populus test case site*) corresponds to the project entitled: *Integrated Forest Plantation and Pulp Production Project,* and is located in the Shapotou District within the western part of the Ningxia Autonomous Region. A total area of 14,667 ha had been planted with the *Populus* tree species. Trees ranged in age from 5 to 8 years. These plantations were the basis for testing the Simple Assessment and Socio-economic modules, including DPSIR and CBA analyses. The baseline land use scenario was assumed to be desert land.

13. Site #3 (*Habahu Nature test case site*) corresponds to the project entitled: *An IEM Approach to the Conservation of Biodiversity in Dryland Ecosystem,* and is located in the north part of Yanchi County within the eastern part of the Ningxia Autonomous Region. The site covers 840 square kilometers, including a core area of 307 km2, a buffer zone of 223 km2, and an experimental zone of 310 km2. The Nature Reserve (NR) belongs to the type of wetland system with conservation targets of typical desert-wetland natural ecosystems. The land use patterns in the NR including forestland, grassland, wetlands, annual crops, and settlements. Some afforestation and land converting were carried out in the experimental zone of the NR. These areas were the basis for testing the Simple Assessment and Socio-economic modules, including DPSIR and CBA analyses. The baseline land use scenarios were assumed to be forest land (39,769 ha), grassland (29,188.3 ha), human settlements (452.3 ha), wetland (9,367.3 ha), annual crops (5,223.1 ha).

14. Site #4 (*IEM demo zone test case site*) corresponds to the project entitled: *Ningxia Integrated Ecosystem and Agricultural Development Project*, and is located in the Xixia District of Yinchuan City within the northern part of the Ningxia Autonomous Region. The test site covers a total area of 1,261 ha. Various land use patterns are present, including commercial forest plantations, natural forested land, and grape plantations. Each of these land uses were considered for testing the Simple Assessment and Socio-economic modules, including DPSIR and CBA analyses. The baseline land use scenario was assumed to be desert land.

15. The rationale for the selection of these four test case sites was based on the fact that ongoing site-specific

Table B- 2: Scope of activities and outputs for each site in the China test case

1. Develop and test the Activity Data Module and the Calculation Modules of the CBP tool.
2. Work with ISRIC to help them collate and analyze soil samples in areas covered by the selected project.
3. Assess the beginning to end C and GHG monitoring, measuring and modeling needs to inform CSU as they develop the protocol; and provide feedback on the protocol as it is developed.
4. Take part in on-site training sessions in the CBP protocol for selected project personnel and arrange some of the logistics such as inviting relevant extension agencies and other outsiders etc.
5. Implement the CBP protocol in the selected project sites, with a view to implementation across the whole project area in the third year of the CBP.
6. Test aspects of CBP protocol (users guide, software) for the selected project and report to CSU.
7. Provide financial/scientific reports to project coordinator and UNEP.

project activities were expected to lead to global environmental benefits in the form of carbon sequestration. However, the design of the projects had not explicitly account for the quantification of these benefits. As such, the four test case sites provide a good opportunity to explore the magnitude of expected carbon benefits associated with a range of IEM interventions.

16. The major objective for the evaluation of the China test case is to assess the performance of CBP-related activities relative to the scope of activities agreed to in the subcontracting arrangements established between CSU and the project management offices in Gansu and Ningxia. Seven (7) key activities/outputs comprise the deliverables of the China test case, as summarized in Table B-2.

17. The methodology applied to evaluate the China test case was threefold. First, desk-based research was carried out. This involved the identification, acquisition, and review of a comprehensive set of project-related documents. Second, site visits were undertaken to all four test case sites in order to meet with project staff and discuss questions/issues emerging from the desk-based literature review. Third, project performance was evaluated based on the results of desk-based and site visits using UNEP's standardized evaluation criteria. Details regarding the site visit itinerary are provided in Annex B-1.

Part II - Project performance and impact

Table B- 3: Summary of evaluation ratings for: "attainment of objectives and planned results"

Sub-criterion	Sub-criterion rating	Overall criterion rating
Achievement of outputs and activities	MS	MS
Relevance	S	
Effectiveness	MU	
Efficiency	MS	
Outcomes to impacts	MS	

Rating code: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

18. Project performance and impacts for the China test case has been evaluated relative to four (4) major criteria, namely attainment of objectives and planned results, sustainability and catalytic role, processes affecting attainment of results, and complementarity with UNEP programmes/strategies. The results of the terminal evaluation for each major criterion are described in the sections that follow.

A. Attainment of objectives and planned results

19. The criterion "*Attainment of objectives and planned results*" has been evaluated relative to five (5) distinct sub-criteria, namely achievement of outputs and activities, relevance, effectiveness, efficiency, and outcomes to impacts. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table B-3 and described in the subsections that follow.

20. Although China test case were evaluated and rated as a whole, the evaluator has noticed the different levels of achievement between the two sub-cases (i.e. Gansu and Ningxia), which were run by different teams. As observed during the evaluator's field visit, more detailed measurements and analyses had been conducted in Gansu in terms of carbon components and fluxes in both soil and vegetation pools, which

contributed to the module test and publication of 2 papers in peer reviewed journals and several other papers as planned for this project.

Achievement of outputs and activities

21. The paragraphs below describe the achievement of outputs and activities for the China test case relative to each of the seven (7) activities that formed the scope of work under the contract with CSU.

22. Activity #1 focused on the development and testing of the Activity Data Module and the Calculation Modules (i.e., Simple Assessment, Detailed Assessment, Dynamic Modeling) of the CBP tool. All four test case sites participated in the development and testing of the Calculation Modules of the CBP Protocol. The testing has lasted through the end of 2012. Testing uncovered several defects/bugs in the Simple Assessment Module that were communicated to CSU through email exchanges, skype conferences, and telephone discussions. No systematic technical reports were developed during the course of testing the tool. All four test case sites also participated in the development and testing of the Activity Data Module. For Site #1 (*Wolfberry test case site*), a socioeconomic survey was conducted during July to December of 2010 to obtain activity data for the cost-benefit analysis of wolfberry plantation. For the case study sites in Ningxia, activity data investigations focused on a) building a soil database using results from soil sampling/testing efforts from August to September 2012, b) collection of basic socioeconomic information through household surveys during July 2009 through June 2010, and c) review of the suitability of the global default databases used in the CBP system.

Table B- 4: Soil testing details at each test case site in China

Test case site	Period	Activity
#1 (Wolfberry test case site) in Gansu	from 11/2010 to 11/2011	• Soil and plant CO2 emissions in 5- and 8-year wolfberry plantations; also on barren saline land for control. • Measurements carried out from 08:00 to 18:00 once a month on 5- and 8-year wolfberry plantations; measurements once per month on barren saline land for control • Measurements over 24-hour period during August (hottest month) and February (coldest). • Measurements of yearly litters and pruning in the wolfberry plantations.
	During 2012	• Analysis of collected plant and soil samples
All test case sites in Ningxia	from 3/2010 to 6/2010	• Soil samples collected • Analysis of soil PH value and soil organic carbon • Biomass measurements conducted in selected test sites
	During 2012	• 650 soil samples collected and analyzed

23. Activity #2 focused on working with ISRIC to help them collate and analyze soil samples. All four test case sites conducted soil sampling and analyses, with 800 samples (including 650 samples in Ningxia test case and 150 samples in Gansu test case) collected/analyzed. From November 2010 to November 2011, soil organic carbon (SOC) was analyzed for wolfberry plantations aged 5, 8, and 11 years at Site #1 (*Wolfberry test case site*), with sampling also done in barren saline land and

surrounding crop fields as a control. From November 2010 to November 2011, SOC was tested on forestland, grassland, wetland, annual crops and perennial crops at the three Ningxia test case sites. However, no guidance was provided on ISRIC standards for sampling, testing, collating and analyzing soil samples. Moreover, there has been no direct contact with ISRIC, and no data has yet been submitted to ISRIC or CSU. Additional details on soil testing activities are provided in Table B-4.

24. Activity #3 focused on a needs assessment for monitoring, measuring and modeling. While general results were provided to CSU shortly after test case start-up, the actual needs assessment was carried out in an informal fashion without a formal report being delivered. Nevertheless, there has been regular/informal email feedback on potential improvements to the CBP system relative to technical needs at the China tests case sites for applying the Activity Data Module, Simple Assessment Module and Social-economic tools.

25. Activity #4 focused on arranging/participating in on-site training sessions on the CBP protocol. Personnel from all four test case sites participated in a 3-day CBP training session held in Yinchuan City in July 2011. In addition, representatives from all the six provinces/autonomous regions in which OP-12 activities are underway were alerted in advance to the availability of training and participated in the Yinchuan City

Table B- 5: Results of CBP tool testing at each test case site in China

Test case site		Area (hectares)		Carbon benefits (tCO2-eq sequestered)					
				Simple Assessment		Detailed Assessment		Dynamic Modelling	
No.	Name	Test case site	Overall project	Test case	Overall project	Test case	Overall project	Test case	Overall project
1	Wolfberry	2,010	NA[4]	85,437[5]	NA	NA	NA	NA	NA
2	Populus	14,667	33,333	NA	NA	NA	NA	NA	NA
3	Habahu Nature	84,000	-NA[6]	NA	NA	NA	NA	NA	NA
4	IEM demo zone	1,261	366,500	24,194[7]	NA	NA	NA	NA	NA

workshop (a complete participant list was unavailable at the time of the evaluation). The goal of the training was to introduce the CBP system and try to resolve emerging questions/issues in real time. Feedback from participant evaluation of the training highlighted the wish for a) more training materials than simply slide presentation, b) additional technical guidance in the form of a CBP system manual, and c) greater access to programming to avoid undue reliance on developers to solve future problems encountered. Representatives from the China test case also attended additional training at the University of Leicester.

26. Activity #5 focused on implementing the CBP protocol in the selected project sites with a view to implementation across the whole project area in the third year. All four test case sites implemented the simple assessment protocol and the social-economic assessment tools of the CBP system. The field-testing occurred over a 2-

[4] The host project covered six provinces/autonomous regions in western part of China dealing with various land degradation situation.
[5] The report period is 10 years from 2004-2014.
[6] The host project covered three particular eco-regions in three provinces/autonomous region (Ningxi, Gansu and Shanxi) in China's Western Region, and one established nature reserved was selected for the project in each of the three eco-regions.
[7] The report period was 6 years from 2009 to 2015.

year period in 2011 and 2012. However, only the Simple Assessment module was sufficiently developed for practical application at the test case sites to quantify carbon benefits. That is, there were delays in tool development, with some essential guidance documentation unavailable during the testing period. Nevertheless, the Simple Assessment module was used to quantify carbon benefits at each test case site, as summarized in Table B-5. For test case site #1 (*Wolfberry test case site)*, the CBP system was tested with data collected from the wolfberry plantations assuming barren saline land as the baseline scenario and a 10-year for quantifying carbon benefits. For the three test case sites in Ningxia, collected data were used to test the Simple Assessment tool and the socioeconomic analysis tools. The quantification of carbon benefits over the entire project areas was not attempted in the third year due to financial constraints.

27. Activity # 6 focused on testing aspects of CBP protocol such as the Users Guide and web-based software. The Users Guide was not evaluated due to the fact that it was not available during the period of testing activities. All four test case sites evaluated the web-based software in the course of efforts to quantify the magnitude of carbon benefits at each site. Tool testing was simplified due to difficulties with constructing the baseline scenarios for each test case site, leading to high levels of uncertainty regarding the actual magnitude of carbon benefits at each site. Only test case site #1 (*Wolfberry test case site)* has completed and submitted the final technical report of results (see Table B-5). There is no evidence that any of the test case sites evaluated the Detailed Assessment or Dynamic Modeling component of the CBP system.

28. Activity # 7 focused on providing financial/scientific reports to the project coordinator and UNEP task manager. For Site #1 (*Wolfberry test case site*), all financial and technical reports have been provided to CSU and accepted. Notably, ten (10) scientific papers are being planned related to the use of the CBP tool. Of these, one (1) has been published in a domestic peer-reviewed journal, one (1) has been submitted to an international peer-reviewed journal, and the remaining eight (8) are at various stages of preparation. For the three Ningxia test case sites, only the financial report has been sent to CSU, with reimbursement pending the submission of the technical reports. There are scientific papers being planned for these test case sites.

Relevance

29. Although this project is a global project, the project objective and the related capacity building are directly relevant to the priorities in the Chinese national environment conservation agenda. This can be seen clearly in its National Programme for Addressing Climate Change, in which the methodology development and related capacity building have been identified as national needs in international cooperation.

30. Further and more recently, the *Outline of 12th Five-Year Plan for National Economic and Social Development* includes efforts to control GHG emissions, largely through efforts to decrease CO2 emission GDP intensity, establishing and improving GHG accounting and auditing systems, and enhancing institutional capacity in climate change adaptation.

31. Within the scientific community, the Chinese Academy of Sciences established the China Ecosystem Research Network (CERN) in the 1990s, and in 2005, the Ministry of Science and Technology initiated the construction of National Network of Scientific Field Observation Station on Ecology and Environment. Moreover, there are many scientific programs planned or implemented regarding carbon, nitrogen and hydrological cycling of ecosystems, adaptation to climate change, integrated assessments and modeling approaches.

32. At the provincial level, there are several GEF and non-GEF SLM projects. These include some afforestation projects supported by the China Green Carbon Foundation that have been implemented specifically for the purpose of carbon sequestration. The OP-12 CPF and its componential projects have all claimed multiple global environmental benefits including carbon sequestration; yet have been largely lacking in the tools to justify those claims. Hence, the lack of a standardized methodology in China to quantify the carbon benefits of SLM projects infers the high relevance of the CBP tool to the China context.

Effectiveness

33. The effectiveness criterion is defined relative to the extent to which the test case achieved its main objectives. For the purpose of this terminal evaluation, "main objectives" have been interpreted as the stated output for Sub-Component A-2 (Test cases) as defined in the Project Results Framework in Annex A of the Project Document. The stated output of the test case is "a C benefits protocol that meets the specific requirements of GEF SLM projects and other SLM projects in developing countries". Three objectively verifiable indicators were specified in the Project Document and represent the basis for an evaluation of the effectiveness of the China test case, as summarized in the paragraphs that follow.

34. *Objectively verifiable indicator #1 - Spectrum of C benefit requirements of SLM test case projects understood:* The specific requirements for quantifying C benefits at SLM projects have been assessed through workshops and regular discussions between CSU and Chinese project staff. These exchanges have resulted in a clarification of the types and nature of data needed to quantify carbon benefits, leading to a gradual increase in user technical capacity and greater understanding of essential data collection. Moreover, the testing and informal reporting has contributed to the adjustment to adapt the CBP system, both its carbon and socioeconomic aspects, to the specific circumstances of the China test case sites. However, the understanding of carbon benefit calculation requirements for SLM is at best limited, due to the focus of testing only on the Simple Assessment tool. There is no evidence of any exploratory testing using the Detailed Assessment or Dynamic Modeling.

35. *Objectively verifiable indicator #2 - Requirements of SLM projects outside of the test case situations understood:* The China test case included 4 projects covering both GEF and a non-GEF project. This set was expanded from 2 GEF projects originally planned. One of the test case sites was a private sector project that was motivated by profitability concerns, thus enhancing the range/scope of relevant projects. This broad test case framework, while a good basis on which to develop a good understanding of how to quantify carbon benefits in a range of SLM projects, is

insufficient in itself to improve the understanding of those carbon benefits. What is needed is the application of all of the CBP system Calculation Modules (i.e., Simple, Detailed, Dynamic) within this broad test case (i.e., for each of the four test case sites; for each of the project areas in which the test case sites are located). The record of activities at the test case sites falls well short of this standard.

36. *Objectively verifiable indicator #3 - Capacity of test case projects for C measuring, monitoring and reporting understood:* One of the strongest aspects of activities at the test case sites was the measuring and monitoring of relevant data (e.g., soil and plant CO2 emissions, yearly litters, lignin contents of wheat and maize, soil PH value, soil organic carbon content, biomass quantities at selected sites). In all, 800 samples have been collected and key properties measured. However, there has been no direct contact with ISRIC (hence no guidance on measurement/monitoring standards) and the results have not been technically reviewed. The effectiveness of an otherwise impressive set of activities is thus inconclusive.

Efficiency

37. The efficiency criterion is defined relative to the timeliness and cost effectiveness of project execution. Regarding timeliness, the CBP was launched in April 2009 and was followed the next month by the Inception Workshop in Nairobi. Six months later, in November 2009, two subcontracts, one with the Gansu project management office, and the other with the Ningxia project management office, were signed with CSU. The period between the inception workshop and the signings of the contracts was planned to be much shorter, on the order of a month or two. The delay in establishing these test case subcontracts was due to the delay in establishing overall contractual arrangements between CSU and UNEP.

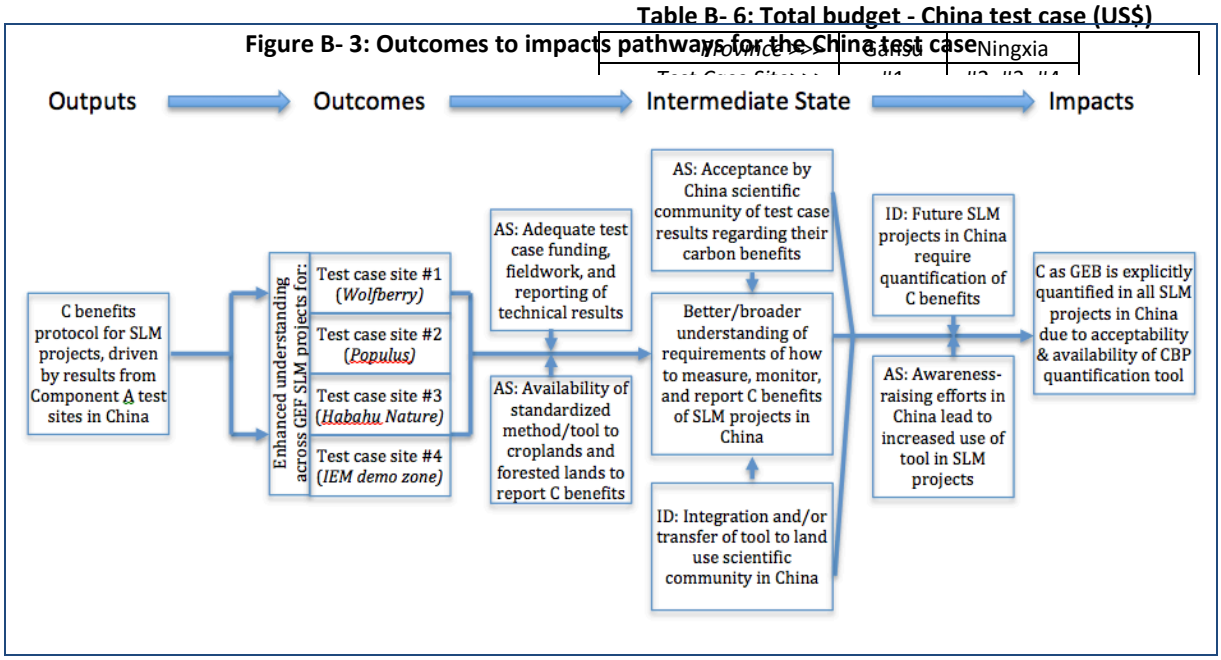
38. At the operational level, the delay had little impact on the efficiency of early project execution because activities commenced at each of the project sites well in advance of finalization of sub-contractual arrangements. However, the overall timeliness of project execution is difficult to evaluate. At the time of the site visits in March 2013 associated with the terminal evaluation, completed final reports for each test case site were still unavailable. This was not unexpected given that the CBP was operating under a 1-year, no-cost extension through 31 May 2013. It is impossible to evaluate the overall timeliness of project execution until after the end of the extension period.

39. Regarding the cost-effectiveness of the China test case, activities were implemented for a total budget of nearly $200,000, covering all labor, travel, and materials (see Table B-6). Labor expenses were associated with conducting field-based activities, as well as project-based activities such as scenario analysis using the CBP tool, and reporting of results to CSU. Travel costs were associated with in-country travel from the project management offices to the test case sites. International travel costs to participate in training workshops were covered out of either CSU or UNEP's budget. The remaining budget items represent about 22% of the total budget was covered miscellaneous items such as materials, supplies and other direct costs.

Table B- 6: Total budget - China test case (US$)

Province =>	Gansu	Ningxia

Figure B- 3: Outcomes to impacts pathways for the China test case



40. The total budget is divided roughly evenly between Gansu and Ningxia project management offices. As planned in the project document, each test case in China contained 1 test project. However, the Ningxia Foreign Debt Management Office extended Ningxia test case to covering 3 test sites in 3 test projects after the sub-contract signed with the willingness to cover the additional cost by their own resources. Comparing to the actual activities conducted, the evaluator believes that China test case was cost effective.

Outcomes to impacts

41. The outcome to impacts criterion is defined relative to the extent to which outputs from the test case sites can contribute towards impacts. For the purposes of the terminal evaluation, the contribution of outcomes to impacts is defined relative to the field-testing component of the CBP. The impact pathways, impact drivers (identified as "ID) and key assumptions (identified as "AS") are summarized in Figure B-3.

42. Based on the above figure, it can be concluded that the outcomes (i.e., results the four test case sites) have not yet been fully delivered due to the lack of final reporting for all test case sites and the applications of the anticipated CBP tools for the quantification of carbon benefits. Only the Simple Assessment Tool was tested in selected areas of the projects in China test case. These outcomes were designed to feed into an ongoing process to improve the understanding of the magnitude of carbon benefits associated with SLM projects specifically in China but also globally. The discussion and publications of the project results were very limited up till now. This will hinder the effective achievement of intermediate steps in the future. These findings have an adverse cascading effect through to the desired impact in China (i.e., carbon benefits to be quantified using the CBP tool in all future SLM projects in the country).

B. Sustainability and catalytic role

43. The criterion "sustainability and catalytic role" is actually comprised of two (2) separate criteria. The ***sustainability*** criterion is defined relative to the probability of continued long-term project-derived results and impacts after the external project funding and assistance ends. The ***catalytic role*** criterion is defined relative to the extent to which an enabling environment has been created to foster innovation. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table B-7 and described in the subsections that follow.

44. ***Sustainability.*** The sustainability criterion has been evaluated relative to four (4) distinct sub-criteria. These are socio-political sustainability, financial resources, institutional framework, and environmental sustainability. The results of the evaluation of each sub-criterion are described in the paragraphs below.

Socio-political sustainability

45. The socio-political sub-criterion is defined relative to any social or political factors that impact the sustainability of project results and progress towards impacts. Two additional socio-political sub-criteria were included in the evaluation, namely level of ownership and stakeholder engagement. The level of ownership sub-criterion was considered from both the -local level, where test case site activities were undertaken, as well as the national level, where key institutions are located which will be responsible for incorporating and extending the lessons from the test case sites. At the local level, there was clearly a sufficient level of ownership to allow for the project results to be sustained. This is evident by, among other factors, the initiative taken by Chinese collaborators to extend the number of test case sites from the two (2) that were originally planned to the four (4) that were actually implemented. At the national level, it is premature to evaluate the level of ownership. This is primarily due to the fact that the technical results have not yet been completed at the test case sites. Hence, the key basis by which to engage national institutions to incorporate the CBP tool in future SLM planning and projects is not yet in place.

Table B- 7: Summary of evaluation ratings for: "sustainability and catalytic role"

Sub-criterion	Additional Sub-criterion	Sub-criterion rating	Overall criterion rating
Sustainability	Socio-political sustainability	ML	ML
	Financial resources	ML	
	Institutional framework	ML	
	Environmental sustainability	ML	
Catalytic role	Behavioral changes	ML	
	Incentives	ML	
	Institutional changes	ML	
	Policy changes	ML	
	Catalytic financing	ML	
	Champions	ML	

Rating code: Highly Likely (HL); Likely (L); Moderately Likely (ML); Moderately Unlikely (MU); Unlikely (U); Highly Unlikely (HU)

46. The stakeholder engagement sub-criterion was considered at the project level only. The range of meetings and discussions that were undertaken across all the China test case sites confirm that there was sufficient stakeholder awareness, interests, and commitment to execute the sub-contractual agreement established with CSU. There was a good understanding and awareness of the role the test case sites were

expected to play in the development of CBP tool. There was a good level of interest in the substantive aspects of field-based activities, notably sampling, measurement, and monitoring activities. The commitment of project staff to project aims is evident by their continued contributions during the non-cost extension period.

Financial resources

47. The financial resources sub-criterion is defined relative to the dependence of eventual impact from the test case sites on continued financial support. It is clear from Table B-4 that project results, as currently available, are limited to the application of the Simple Assessment to only one of the four test case sites. Field-testing of the Detailed Assessment and Dynamic Modeling modules have not been attempted; nor have any applications of any calculation module of the tool been extended to the wider project area of the test case sites. It is unlikely that such activities can be undertaken without continued financial support. Hence, there is a high dependence on continued financial support to achieve the results envisioned under the original sub-contractual agreement with CSU.

Institutional framework

48. The institutional framework sub-criterion is defined relative to institutional framework and governance issues that impact the sustainability of project results and progress towards impacts. As of the time of this writing, there are no project initiatives underway to incorporate project results/achievements into regional/national institutional processes, policies, coordination mechanisms, or legal/accountability frameworks. Such initiatives will be needed in order to sustain project results and to lead to progress on regional/national impacts. Hence, the institutional framework for sustaining project activities remains undeveloped.

Environmental sustainability

49. The environmental sustainability sub-criterion is defined relative to any environmental factors that can impact the future flow of project benefits. There are no project outputs or higher-level results that are likely to affect the environment, or which might affect the sustainability of project benefits.

50. ***Catalytic role.*** The catalytic role criterion has been evaluated relative to six (6) sub-criteria, namely behavioral changes, incentives, institutional changes, policy changes, catalytic financing, and champions. The results of the evaluation of each sub-criterion are described in the paragraphs below.

Behavioral changes

51. The behavioral changes sub-criterion is defined relative to any broad-based changes made by stakeholders in China that are a direct result of the application of the CBP at the test case sites. As of the time of this writing, there are no broad-based changes evident in strategic programmes/plans, SLM management systems, or measurement/monitoring methods that can be attributed to activities at the test case sites.

Incentives

52. The incentives sub-criterion is defined relative to any broad-based changes made by stakeholders in China that are a direct results of incentives embedded in the CBP application at the test case sites. As of the time of this writing, there are no broad-based changes evident that can be directly attributed to incentives embedded in the CBP application at the test case sites.

Institutional changes

53. The institutional changes sub-criterion is defined relative to any institutional uptake in China of lessons from the CBP application at the test case sites. As of the time of this writing, there is no evidence of mainstreaming of lessons from the test case sites into the wider institutional setting for SLM activities in China.

Policy changes

54. The policy changes sub-criterion is defined relative to the development of new policies in China based on the lessons from the CBP application at the test case sites. As of the time of this writing, there is no evidence of potential new policy directions based on the results and lessons of the test case sites.

Catalytic financing

55. The catalytic financing sub-criterion is defined relative to the emergence of any follow-on funding from government, bilateral donors, or the GEF to support continued activities at the test case sites. As of the time of this writing, there is no evidence of any follow-on funding from any sources.

Champions

56. The champions sub-criterion is defined relative to the emergence of particular individuals or institutions in China willing to promote the lessons and results from the test case sites into the broader Chinese planning context. As of the time of this writing, the sub-contract implements have tried to promote the application of CBP tools in other projects under their jurisdiction. However, there is no evidence of any potential champion prepared to work to catalyze the mainstreaming of the CBP tool within planning and policymaking institutions in China.

C. Procedures affecting attainment of project results

57. The criterion "procedures affecting attainment of project results" has been evaluated relative to seven (7) distinct sub-criteria, namely preparation and readiness; implementation approach and adaptation management; stakeholder participation and public awareness; country ownership and driven-ness; financial planning and management; UNEP supervision and backstopping; and monitoring and evaluation. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table B-8 and described in the subsections that follow.

Preparation and readiness

Table B- 8: Summary of evaluation ratings for: "Procedures affecting attainment of project results"

Sub-criterion	Sub-criterion rating	Overall criterion rating
Preparation and readiness	MU	MS
Implementation approach and adaptive management	MS	
Stakeholder participation and public awareness	NA	
Country ownership and driven-ness	S	
Financial planning and management	S	
UNEP supervision and backstopping	NA	
Monitoring and evaluation	NA	

Rating code: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

58. The preparation and readiness sub-criterion is defined relative to the clarity, practicality, and feasibility of the test case objectives in the sub-contractual agreement with CSU. The purpose and tasks were identified clearly in the subcontracts with sufficient flexibility due to the scientific nature of the project. The subcontracts were established with due consideration to the diversity of circumstances at the test case site level. In this sense, the project's objectives were clear, practical, and feasible. However, activities at the test case site level were highly dependent on upstream activities associated with the development of the CBP system. Given the combination of timeline constraints and the delay in obtaining a functional version of all the calculation modules of the CBP tool and, it would have been desirable to build additional flexibility into the subcontracting arrangements. In this sense, the project's objectives, while clear, were impractical and not feasible.

Implementation approach and adaptive management

59. The implementation approach and adaptive management sub-criterion is defined relative to the project's adaptation to changing conditions, the effectiveness of implementation arrangements, relevance of changes in project (or tool) design, and overall performance of project management. Regarding adaptation to changing conditions, project management at the test case were able to adjust to delays in the availability of the CBP tool by focusing on a limited set of outputs, namely technical feedback on, and application of, the Simple Assessment calculation module.

60. Regarding the effectiveness of implementation arrangements, the subcontract approach was used to establish a common scope of work across all the test case sites. A work plan was then developed by local counterparts and finalized after discussions and iteration with CSU. Regular communications followed through email, skype calls, and telephone. However, there were typically long delays between the provision of detailed feedback on the CBP tool and the resolution of the feedback into a subsequent version. Moreover, the effectiveness of implementation arrangements would have been enhanced with more hands-on training built into the work plan (i.e., more training sessions along the lines of the Yinchuan workshop).

61. Regarding the relevance of changes in tool design, this was a key factor in developing a useful tool for Chinese conditions. CSU largely incorporated feedback by the test case site staff on the user interfaces, data input and template, project description module, guidance module, the organizing of land use categories and related species, fertilizer and irrigation data, social-economic tools, and reporting module. Project management at the test case sites was fully able to adapt to the evolving

architecture of the CBP tool. The codification of feedback into subsequent programming confirms the relevance of proposed changes in tool design.

62. Regarding overall performance of project management, most of the outputs of the test case sites have been delivered, as per the terms of the sub-contractual arrangements. Those outputs that have not been delivered (e.g., implement the CBP protocol in the selected project sites, with a view to implementation across the whole project area in the third year of the CBP) are due to a combination of the time and budget constraints, together with the unavailability of the calculation modules of the CBP tool within the duration of activities at the test case sites.

Stakeholder participation and public awareness

63. The stakeholder participation and public awareness sub-criterion is defined relative to the effectiveness of consultations and project decision-making among stakeholders. Regarding the effectiveness of consultations among stakeholders, there was involvement by personnel at outside research institutes and universities for data collection or sample analysis. This had the effect of raising the awareness among a key constituency of the potential of the CBP tool to quantify the potential benefits associated with carbon stored in soils.

64. Regarding project decision-making among stakeholders, there was relatively good communications within the project management offices in Gansu and Ningxia. The staff members that were involved in project activities displayed a high level of coordination in the execution of the range of tasks. This was particularly noteworthy for the extensive soil sampling and measurement activities that were undertaken. it was also evident in the decision-making regarding priority feedback that should be offered to the CSU for subsequent changes to the CBP tool.

65. In the test case level, although Activity #4 in the sub-contract for on-site training organized by CSU contributed to stakeholder participation and public awareness, there was no activities in China test case designed for the purpose of stakeholder participation and public awareness.

Country ownership and driven-ness

66. The country ownership and driven-ness sub-criterion is defined relative to the degree to which government has assumed responsibility for the test case sites, offered institutional support, and been responsive to UNEP-DEWA guidance. For all of these factors, there is strong evidence that the government has played a key role. First, the project management offices in Gansu and Ningxia for the OP-12 project were proposed as the key institution/agency for coordinating all activities. Second, institutional support was offered in terms of in-kind contributions of office space and official access/permission to test case sites. Third, there was good cooperation between CSU, designated by UNEP-DEWA to manage the project and both project management offices. Together, this evidence suggests a good sense of country ownership and driven-ness.

Financial planning and management

67. The sub-criterion is defined relative to the quality and effectiveness of financial planning and control of financial resources throughout the project's lifetime. There

no irregularities found in the management of financial resources for the test case sites. Clear and transparent records were kept at the project management offices that show the distribution of funds commensurate with activities undertaken and deliverables submitted.

UNEP supervision and backstopping

68. The UNEP supervision and backstopping sub-criterion is defined relative to effectiveness of supervision and administrative/financial support provided by UNEP. This sub-criterion is not applicable at the test case level due to the lack of a direct line of accountability between UNEP and the test case sites.

Monitoring and evaluation

69. The monitoring and evaluation sub-criterion is defined relative to the effectiveness of project monitoring and evaluation (M&E) plans and tools. This sub-criterion is not applicable at the China test case due to the lack of M&E activities built into the sub-contractual arrangements with CSU.

D. Complementarity with UNEP programmes and strategies

70. The criterion "complementarity with UNEP programmes and strategies" has not been evaluated at the test case level. This is due to the fact that none of the four (4) sub-criteria (i.e., linkage to UNEP's EAs and POW 2010-2011; alignment with the Bali Strategic Plan; gender; and South-South Cooperation) are relevant to individual test case sites. The activities relative to the sub-criteria are relevant only at the overall project level.

Part III - Conclusions and recommendations

A. Conclusions

71. The final evaluation ratings for the China test case are summarized in Table B-9. The major findings of the terminal evaluation are described in the paragraphs that follow.

72. The major positive achievements of the China test case are summarized in the bullets below.

- Major portions of the sub-contractual agreement with CSU dealing with feedback, soil testing, and testing have been successfully implemented. This has contributed to the development of the CBP system and increasing the understanding of Chinese collaborators regarding carbon benefits of SLM projects.
- Another major positive achievement was the capacities of participated subcontractors being built during the process of the system development, which has laid the basis for the replication of developed system tools in other related projects by the subcontractors. Several related scientific papers were either published or planned to publish in the near future in China test case. Finally, the China test case achieved partially the planned results and contributed even limited to the development of the CBP system. With additional efforts as expected, the choice of cooperation with PRC-GEF Partnership on Land Degradation Programme

Table B- 9: Summary of evaluation ratings for the China test case

Criterion	Sub-criterion	Additional Sub-criterion	Sub-criterion rating	Overall criterion rating
Attainment of objectives and planned results	Achievement of outputs and activities	NA	MS	MS
	Relevance		S	
	Effectiveness		MU	
	Efficiency		MS	
	Outcomes to impacts		MS	
Sustainability and catalytic role	Sustainability	Socio-political sustainability	ML	ML
		Financial resources	ML	
		Institutional framework	ML	
		Environmental sustainability	ML	
	Catalytic role	Behavioral changes	ML	
		Incentives	ML	
		Institutional changes	ML	
		Policy changes	ML	
		Catalytic financing	ML	
		Champions	ML	
Procedures affecting attainment of project results	Preparation and readiness	NA	MU	MS
	Implementation approach/adaptive mgmnt		MS	
	Stakeholder participation/public awareness		NA	
	Country ownership and driven-ness		S	
	Financial planning and management		S	
	UNEP supervision and backstopping		NA	
	Monitoring and evaluation		NA	
Complementarity with UNEP programmes and strategies	Linkage to UNEP EAs & POW 2010-11	NA	NA	NA
	Alignment with the Bali Strategic Plan		NA	
	Gender		NA	
	South-South Cooperation		NA	

Rating code for all criteria except Sustainability and catalytic role: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

Rating code for Sustainability and catalytic role: Highly Likely (HL); Likely (L); Moderately Likely (ML); Moderately Unlikely (MU); Unlikely (U); Highly Unlikely (HU)

(OP12 Programme) potentially enables it promisingly to disseminate and replicate the project results in a wide range of SLM projects by taking advantage of the network already built by the programme.

73. The major negative aspects of the China test case are summarized in the bullets below, together with the underlying causes.

- First, all the test sites in China only dealt with Simple Assessment Tool in the CBP system, and no test site has applied the tools across the whole project as expected., which mainly due to the uncertainties of the system in terms of user needs and required data in the beginning and delayed availability of functional version of the system for testing
- Secondly, no measures were implemented in testing C accounting tools to collate the system outputs in China test case. It was reported that IPCC Tier 1 methods was used in the Simple Assessment tool. However, the spatial and temporal scales applied were quite different between the IPCC Guidance for national inventories and CBP system for project level assessment.
- Finally, the sub-contract has not been fully implemented as of the time of this writing and the weak documentation in the process of the system development as

observed in this evaluation may risk the further improvement and maintenance of the system in the future.

74. In conclusion, the overall assessment of the China test case is Moderately Satisfactory due to the obvious shortcomings of the sub-contract implementation in China test case as stated above.

B. Lessons learned

75. There are some key lessons that have emerged from the evaluation of the China test case. These lessons, summarized in the bullets below, are directly applicable to future projects that involve the implementation of country-based demonstration projects to support the development of quantitative tools and methods.

- First, the complex science and technology oriented nature of the project determined inherently the uncertainties in fully achievement of the project objectives. The timeframe set for the project underestimated the difficulties of coordination, adaptation, and integration of the system among various situations in country-based test cases in terms of temporal and spatial scales of application and local absorption capacities.
- Second, the activities at the test case level were utterly dependent on upstream results and achievements in the development of the CBP system. Given the combination of timeline constraints and the delay in obtaining a functional version of all the calculation modules of the CBP tool and, it would have been desirable to build additional flexibility in the project designing.

C. Recommendations

76. Given the limited resources available in the project and possible application of the system tools in the future, it is strongly recommended in China test case to concentrate only on the improvement of the Simple Assessment Tool in late stage. Further, the additional training to local project team should be considered for dissemination and replication of achieved project results in other projects in China. In the process, more scientific papers should be prepared in collaboration and published in peer reviewed journals to promote public awareness of the tools and mainstreaming into project formulation.

Annex B-1: Evaluation itinerary and meetings

a) Site visit itinerary

Date	Time	Activities
Sunday, 24 March 2013	AM	Preparations for site visits
	PM	Travel from Beijing to Lanzhou
Monday, 25 March	AM	Group meeting with Gansu Project Team and Gansu Forestry Department
	PM	One to one interviews with personnel and participating organizations in Gansu
Tuesday, 26 March	AM	• Travel from Lanzhou City to Jingtai County; • Visit Test Site #1 (Wolfberry plantation) in Hongyue Village, Jingtai County • Interviews with project personnel
	PM	• Travel from Jingtai County to Zhongwei Municipality; • Visit Test Site #2 (Populus Plantation) in Shapotou District, Zhongwei Municipality; • Interviews with project personnel • Travel from Zhongwei Municipality to Yinchuan City.

Date	Time	Activities
Wednesday, 27 March	AM	• Travel from Yinchuan City to Yanchi County; • Visit Test Site #3 (Habahu National Nature Reserve) in Yanchi County; • Interviews with project personnel
	PM	• Travel from Yanchi County to Xixia District of Yinchuan City; • Visit Test Site #4 (IEM demonstration zone) in Xixia District; • Interviews with project personnel
Thursday, 28 March	AM	Document review
	PM	Document review
Friday, 29 March	AM	Travel from Yinchuan to Beijing (CA1214: 1335-1520)

b) Site visit contact list

Name	Title	Site #	Organization/unit	Type
Shi Wanqiong	Deputy Chief	1	Scientific Division of Gansu Forestry Department	Group meeting
Wang Yaolin	Team Leader/OP12 Manager	1	Gansu Provincial GEF-OP12 PMO	1-on-1 meeting
Ma Quanlin	Professor	1	Gansu Desert Control Research Institute	1-on-1 meeting
Li Yinke	Associated Professor	1	Gansu Desert Control Research Institute	Group meeting
Jin Hujia	Associated Professor	1	Gansu Desert Control Research Institute	Group meeting
Li Xiaobing	Director	1	Gansu Provincial IEM Information Center	1-on-1 meeting
Liu Yuehua	Project Officer	1	GEF-OP12 Gansu Provincial PMO	Group meeting
Li Yanxia	Project Officer	1	GEF-OP13 Gansu Provincial PMO	Group meeting
Li Shimei	Project Officer	1	GEF-OP14 Gansu Provincial PMO	Group meeting
Xu Xiaodong	Project Officer	1	GEF-OP15 Gansu Provincial PMO	Group meeting
Song Hanguo	Engineer	1	Forestry Bureau of Jintai County	1-on-1 meeting
Liu Jinshen	Deputy Director	2	Financial Bureau of Zhongwei Municipality	Conversation
Liu Dongju	Officer	2	Financial Bureau of Zhongwei Municipality	Conversation
Wang Ting	Director	2	Third Forest Center of Shapotou District	Conversation
Zhou Mei	Researcher	2	Research Institute of Zhongye Meili Forestry Development Company	Conversation
Zhang Xinhua	Chief	2	Land Management Division of Ningxia Agricultural Comprehensive Development Office	1-on-1 meeting
Zhang Weijun	Deputy Director	3	Habahu National Nature Reserve Administration	Conversation
Yu Dian	Staff	3	Habahu National Nature Reserve Administration	Conversation
Yang Lijin	Staff	3	Habahu National Nature Reserve Administration	Conversation
Li Yufei	Staff	3	Habahu National Nature Reserve Administration	-Conversation
Ma Minxia	Team Leader/Deputy Director General	4	Ningxia Provincial Financial Department	1-on-1 meeting
Yuan Hui	Manager	4	IEM demonstration zone of Ningxia	Conversation

Annex B-2: Bibliography

a) Project management documents/reports collected and reviewed

- Project Document of Carbon Benefits Project (CBP): Modeling, Measurement and Monitoring
- Inception Workshop Report
- Steering Committee Report in Sept. 2010
- Project Implementation Report FY2010
- Project Implementation Report FY2011
- Project Implementation Report FY2012
- Component A: Half Yearly Report Apr-Dec 2009

- Component A: Half Yearly Report Jun-Dec. 2010
- Component B: Half Yearly Report Jul-Dec. 2009
- Component B: Half Yearly Report Jul-Dec. 2010
- Quarterly expenditure Statement as of Sept. 2010
- CBP Budget for CSU Sub-contract with Foreign Debt Management Office of Ningxia
- CBP Budget for CSU Sub-contract with GEF OP 12 Gansu Project Management Office
- Sub-contract Summary Report of Gansu test case
- Sub-contract Summary Report of Ningxia test case
- TECHNICAL OUTPUTS (downloaded from the CBP website)
- Component A: General Tutorial for Using the Carbon Benefits Project Modelling System Pages
- Component A: Project Description Module Tutorial
- Component A: Guidance Module Tutorial
- Component A: Linking Measurement and Monitoring with GHG Inventories
- Component A: Simple Assessment Tutorial
- Component A: Detailed Assessment Tutorial
- Component A: User Manual GEFSOC Soil Carbon Modeling System
- Component A: Using the Carbon Benefits Project Social-economic Tools
- Component A: Driver, Pressure, Status, Impact and Response (DPSIR) Tutorial
- Component B: Useful Tree Species for Africa
- Component B: A Protocol for Defining Project Boundary in Carbon Benefit Project
- Component B: Field Data Collection for Landscape Carbon Inventories
- Component B: Landscape Carbon: A Community Participatory Manual
- Component B: Output 4: Supporting Data Management System (DMS)
- Component B: Draft Species Selection Tool for Carbon Benefits Project
- Component B: MRV User Guide
- Component B: Interfacing the Carbon Benefits Project with Existing Carbon Standards
- Component B: A Protocol for Stratification of Land use Over Times Series Using Satellite Remote Sensing Imageries
- Component B: Landscape Carbon Measurements for Extension Agents and Communities

b) Additional documents collected and reviewed

- The People's Republic of China Initial National Communication on Climate Change, Beijing, 2004 China Planning Press.
- The People's Republic of China 2nd National Communication on Climate Change, Beijing, 2004 China Planning Press.
- China's Policies and Actions for Addressing Climate Change, white book 2012, NDRC, PRC
- China's National Programme to Address Climate Change, white book, 2007

- Completion Report of PRC-GEF Partnership: Capacity Building to Combat Land Degradation Project, December 2010, ADB
- Capacity Building to Combat Land Degradation Project Completion Report, ADB, 2010
- Management and Policy Support for Combating Land Degradation in Dryland Ecosystem, 2008, ADB/GEF Project Identification Form
- An IEM Approach to the Conservation of Biodiversity in Dryland Ecosystems, 2007, IFAD/GEF Project Identification Form.
- Ningxia Integrated Ecosystem and Agricultural Development, 2008, ADB/GEF Project Document
- 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 1, General Guidance and Reporting, 2006, IPCC National Greenhouse Gas Inventories Programme
- 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Agriculture, Forestry and Other Land Use, 2006, IPCC National Greenhouse Gas Inventories Programme

Annex B-3: Finances

Detailed information on co-financing arrangements was not available. A statement of project expenditures by activity was also not available.

Annex B-4: Supporting consultant info

Mr. Yexu Wang undertook the terminal evaluation of the China test case sites. His Curriculum Vitae appears below.

PROFESSION:	Conservation Consultant
DATE OF BIRTH:	August 22, 1966
NATIONALITY:	China
SPECIALIZATION:	Conservation Project Development, Project Evaluation, Biodiversity and Sustainable Land Management
CAREER PROFILE:	Specialist in international conservation project planning, and evaluation, particularly working with the type of project funded by Global Environment Facility (GEF). Adequate academic background and knowledge preparation on nature resources management and sustainable development; A skilled project management staff with ten year involvement of international programs/projects in which taking various roles of either project assistance, technical support or project manager; Strengths include knowledge on China biodiversity policy and institutions, participatory assessment tools, and project cycle management.
EDUCATION:	*Ph.D. of Ecology* in former Commission for Integrated Survey of Natural Resources, Chinese Academy of Sciences (CAS), 1996-1999

M.Sc of Silviculture, Nanjing Forestry University, China, 1990-1993

B. Sc of Forestry, Xinjiang Agricultural University, China, 1984-1988

KEY EXPERIENCE

- **Project officer/manager,** July 1999 - February 2007, Foreign Economic Cooperation Office, Ministry of Environment Protection Project development strategist and project manager.
- **National Consultant**, April-May, 2012: Mid-term evaluation of FAO/GEF Conservation and Adaptive Management of Globally Important Agricultural Heritage Systems (GIAHS).
- **National Consultant**, March – April, 2012: Mid-term evaluation of UNDP/GEF Conservation and Sustainable Use of Biodiversity in the Headwaters of the Huaihe River Basin.
- **Consultant,** June-September, 2011**:** Development of wrap-up report of EU-China Biodiversity Programme which comprised a central component and 18 field demo projects
- **National Consultant,** July 2009**:** UNDP-Assessment of Development Results (ADR 2010 China), Contributing to the part of lessons learned in UNDP-China biodiversity portfolio.
- **National consultant,** November-December, 2008: Mid-term evaluation of UNDP/GEF Biodiversity Management in the Coastal Area of China's South Sea Project.
- **Consultant,** Sept. 2008: Help in proposal development of WWF Partnership for a Living Yangtze (Phase IV).
- **Consultant**, June-July, 2008: Participated in Development of the logic framework of WWF/HSBC Programme II: Integrated River Basin Management Module.
- **Consultant**, Jan.-April, 2008: Participated in the development of Strategic Planning of Chinese Ecosystem Research Network (2008-2020), Chinese Academy of Science.
- **Consultant,** Sept.-Nov., 2007: Participated in strategy development of WWF Amur/Heilong Eco-region Freshwater and Wetland Conservation Strategy (China Part).

SHORT TRAININGS

Participated in several short period technical and managerial trainings. The major ones include Remote Sensing, GIS and Ecological Modeling organized by the International Geosphere-Biosphere Programme (IGBP); Economics, Ecology and GAP Analysis in Brigham Yang University, USA; Procurement Procedure of World Bank and its Management in Tshinghua University; and China Bidding and Tendering Law and China Government Procurement organized by China National Reform and Development Commission.

Annex C: Brazil Test Case

Part I - Evaluation Background

A. Context

1. Brazil is arguably the most crucial country in the world from the vantage point of the impact from land use change and forestry on greenhouse gas emissions. Vast tracts of forested areas in the Brazilian Amazonia have been cleared for cattle pasture and agricultural production. FAO's 2010 Forest Resources Assessment estimates the forest cover for Brazil in 2010 at 520 million hectares.[8] This represents a 23 million hectare decrease from year 2000 levels which were estimated by the FAO at 543 million hectares.[9] Notably, this loss of forested land corresponds to a rate of forest cover change of 4.3 million ha/year between 2000-2010, or roughly double the 1990-2000 rate of 4.3 million ha/year. This has posed significant impacts on greenhouse gas emissions. About one-fifth of its forest area has been designated for protection; however this is related to the need to protect these resources for the benefit of the culture and way of life of forest-dependent peoples, rather than to constrain greenhouse emissions associated with land clearing.

B. The Project

2. Unlike the test cases in Niger/Niger and China, CBP activities were undertaken at a non-GEF project site. CBP activities were undertaken within the context of a field experimental station for soil research activities that had been set up decades ago in the state of Mato Grosso in Amazonia at the initiative of CENA. Over the years, extensive data has been collected and used for ongoing national research purposes, resulting in numerous peer-reviewed publications.

C. Evaluation objectives, scope and methodology

3. The Brazil test case focused on Component A of the CBP project (Modeling: greater focus on cropland and grazing land) and Sub-component A-2 (Test cases). The test case site is located in the in the state of Mato Grosso in southwestern Amazonia, as shown in Figure C-1. The value of the test case site was understood as mainly for the parameterization and testing of modeling tools being considered for inclusion in the CBP Component A suite of tools.

Figure C- 1: Mato Grosso test case site location in Brazil for Component A

4. The major objective for the terminal evaluation of the Brazil test case is to assess the performance of CBP-related activities relative to the scope of activities agreed to in the subcontracting arrangements established between CSU and the project management

[8] Available at http://www.fao.org/docrep/013/i1757e/i1757e.pdf
[9] Available at ftp://ftp.fao.org/docrep/fao/003/y1997E/frA%202000%20Main%20report.pdf

office in Piracicaba. Seven (7) key activities/outputs comprise the deliverables of the Brazil test case, as summarized in Table C-1.

Table C- 1: Scope of activities and outputs for the Brazil test case

1. Work with CSU to use the Nova Vida data to help develop and test the Activity Data Module and Calculation Modules.
2. Work with ISRIC to help them collate and analyze soil samples in areas covered by the selected project.
3. Assess the beginning to end C and GHG monitoring, measuring and modeling needs to inform CSU as they develop the protocol; and provide feedback on the protocol as it is developed.
4. Take part in on-site training sessions in the CBP protocol for selected project personnel and arrange some of the logistics such as inviting relevant extension agencies and other outsiders etc.
5. Implement the CBP protocol in the SW Amazonia project, with a view to implementation across the whole project area in the third year of the CBP project.
6. Test aspects of CBP protocol (users guide, software) for the selected project and report to CSU.
7. Provide financial/scientific reports to project coordinator and UNEP.

5. The methodology applied to evaluate the Brazil test case was threefold. First, desk-based research was carried out. This involved the identification, acquisition, and review of a comprehensive set of project-related documents.

6. Second, a visit was undertaken to the project office in Piracicaba to meet with individuals who had been directly involved with the project. The original plan was to visit the project site in Mato Grosso and another site in Rondonia. However, as these sites were located far from Piracicaba and involved relatively expensive travel costs to cope with the rugged terrain, the UNEP budget for the terminal evaluation was not able to support the field site visits. Therefore, the visit was limited to a short 2-day visit with project personnel within CENA offices in Piracicaba.

7. Third, project performance was evaluated based on the results of desk-based and site visit using UNEP's standardized evaluation criteria. Details regarding the site visit itinerary are provided in Annex C-1.

Part II - Project performance and impact

8. Project performance and impacts for the Brazil test case has been evaluated relative to four (4) major criteria, namely attainment of objectives and planned results, sustainability and catalytic role, processes affecting attainment of results, and complementarity with UNEP programmes/strategies. The results of the terminal evaluation for each major criterion are described in the sections that follow.

A. Attainment of objectives and planned results

9. The criterion "attainment of objectives and planned results" has been evaluated relative to five (5) distinct sub-criteria, namely achievement of outputs and activities, relevance, effectiveness, efficiency, and outcomes to impacts. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table C-2 and

Table C- 2: Summary of evaluation ratings for: "attainment of objectives and planned results"

Sub-criterion	Sub-criterion rating	Overall criterion rating
Achievement of outputs and activities	HS	S
Relevance	S	
Effectiveness	S	
Efficiency	S	
Outcomes to impacts	S	

Rating code: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

described in the subsections that follow.

Achievement of outputs and activities

10. The main objective of the Brazil test case was to evaluate the environmental impact due to land use and land use change in the southwest Amazonia in terms of greenhouse gas (CO2, CH4 and N2O) emissions, providing an estimate of the relative regional contribution to climate change over the past 30 years. An important parallel objective was to evaluate the degradation of soil organic matter degradation, a natural source of GHG emissions.

11. In general, CBP activities in Brazil involved the calculation of GHG emissions, expressed in CO2 equivalents, emitted by land use change or land use as pasture and/or agriculture during the last 30 years in the state of Mato Grosso (907.035 km2).[10] The calculation equations used locally derived emission rates, measured under both in field and laboratory conditions, due to the conversion of different types of native vegetation (forest, dense cerrado and cerrado)[11] in other uses like pasture and agriculture.

12. CBP activities also included GHG emissions that were sampled at different land use classifications. This included different land use and cultivation types such as pasture, rice, soybean, maize, cotton, and respective succession cultures. It also included different land management practices such as conservative and conventional land use management.

13. Regarding the determination of the degradation of soil organic matter (SOM), CBP project activities evaluated impacts on both the quantitative and qualitative levels. For quantitative determinations, the difference in C and N stocks before and after human interference was determined. For qualitative estimations, the origin of the C introduced into the soil system, biological activity and soil structural stability was described. To develop estimates of the C and N stocks and the SOM quality, CBP activities were undertaken to collect soil samples at several representative locations, each of which was characterized by distinct natural vegetation types, pastures, crops and manage systems.

14. One last key activity was associated with database development. That is, CBP activities also include the development of a database on GHG emissions, SOM, as well as several pieces of pertinent social and economic information, obtained directly by through CBP activities or mined from the peer-reviewed or available reliable grey literature. Given the location of these activities within a national research institution, the results of the research effort are intended to be made available with public institutions that are charged with promoting environmental quality in Brazil. Courses and special lectures have also been developed in order to promote knowledge dissemination.

15. The results of the Brazil test site are shown in Table C-3 for a 55-year period. The baseline situation is defined as deforested land without any subsequent land use changes or interventions. The results highlight the importance of the use of locally derived emission factors and other factors. Using the Simple Assessment (i.e., essentially

[10] Activities were also undertaken in the state of Rondonia (239.349 km2). For the purposes of this terminal evaluation, the focus is on activities in the state of Mato Grosso as this is the state for which Simple and Detailed Assessment reports have been completed.

[11] "Cerrado" is a Portuguese term meaning "closed" denoting tropical savanna areas. It includes forest, wooded, and park savanna types.

Tier 1 of the IPCC inventory guidelines), a carbon benefit of 17.6 million tonnes CO2e is calculated. Using the Detailed Assessment (i.e., essentially Tier 2 methods), net carbon

Table C- 3: Results of CBP tool testing at Brazil test case

Test case site		Area (hectares)[12]		Carbon benefits (million tCO2-eq sequestered in 55-yr period)					
				Simple Assessment		Detailed Assessment		Dynamic Modelling	
No.	Name	Test case site	Overall project	Test case	Overall project	Test case	Overall project	Test case	Overall project
1	Mato Grosso	90,703,500	90,797,554	17.6	17.6	-26.7	-26.7	NA	NA

emissions in the amount of 26.7 million tonnes of CO2e are estimated from land use changes introduced to the Baseline situation. This represents a 44.3 million tonnes CO2e uncertainty in the estimate of carbon benefits, an important issue that the CBP has been able to quantify.

16. CBP activities in the Brazil test case have been achieved. The project used an existing non-GEF project in southwestern Amazonia to parameterize, test and implement the CBP system, in close collaboration with CSU. The Brazil test case partners fully participated in the activities leading to the production of the tool and displayed extensive intellectual curiosity in the types of experiments conducted and range of issues explored. Attainment of project objectives and activities is rated 'Highly Satisfactory'.

Relevance

17. CBP objectives and implementation strategies are highly aligned with pressing environmental issues and needs in Brazil and the rest of Amazonia region. The CBP is relevant the UNEP mandate and policies at the time of design and implementation and GEF focal areas, strategic priorities and operational programmes. The CBP implementation in Brazil is consistent with the UNEP's mandate and strategy for environmental observation and assessment particularly in the analysis of the state of the global environment, assessment of global and regional environmental trends, and the provision of early warning on environmental threats, based on the best scientific and technical capabilities available.

Effectiveness

18. The effectiveness criterion is defined relative to the extent to which the test case achieved its main objectives. For the purpose of this terminal evaluation, "main objectives" have been interpreted as the stated output for Sub-Component A-2 (Test cases) as defined in the Project Results Framework in Annex A of the Project Document. The stated output of the test case is "a C benefits protocol that meets the specific requirements of GEF SLM projects and other SLM projects in developing countries". Three objectively verifiable indicators were specified in the Project Document and represent the basis for an evaluation of the effectiveness of the Brazil test case, as summarized in the paragraphs that follow.

19. *Objectively verifiable indicator #1 - Spectrum of C benefit requirements of SLM test case projects understood:* The spectrum of C benefit requirements of SLM test case projects

[12] For the purposes of this terminal evaluation, the test case site and the project area assumed to be coincident.

was fully understood. In fact, Brazil test personnel were active in some of the technical issues associated with tool development and south-south transfer of knowledge.

20. *Objectively verifiable indicator #2 - Requirements of SLM projects outside of the test case situations understood:* The Brazil test case is in a different position in the sense it was counted upon for parameterization activities that by definition extend beyond the test case situation.

21. *Objectively verifiable indicator #3 - Capacity of test case projects for C measuring, monitoring and reporting understood:* The was already a high capacity for C measuring and monitoring before the introduction of CBP activities. In essence, the incorporation of Brazil as a test case served to tap its capacity for the benefit of the overall project team, rather than other way around.

Efficiency

22. The efficiency criterion is defined relative to the timeliness and cost effectiveness of project execution. The implantation of the subcontract with CENA was delayed relative to the other subcontracts though this did not lead to adverse impacts on the delivery of outputs.

Table C- 4: Total budget - Brazil test case (US$)

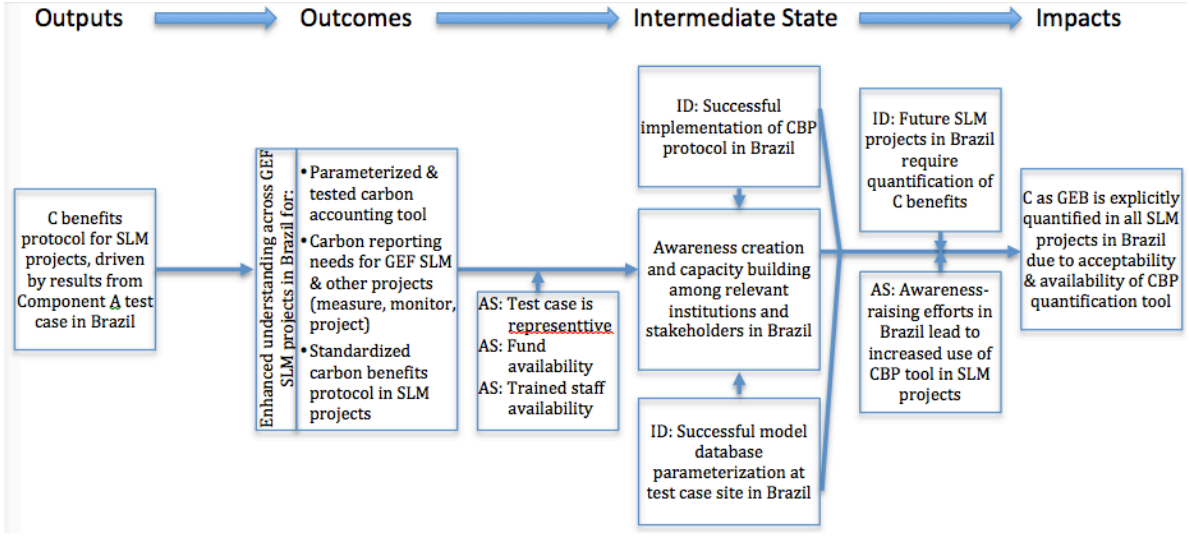
Budget item	Total
Senior Personnel	48,243
Other Personnel	44,181
In Country Travel	50,338
Materials & Supplies	13,611
Other Direct Costs	20,488
TOTAL	**176,860**

23. Regarding the cost-effectiveness of the Brazil test case, activities were implemented for a total budget of $176,860, covering all labor, travel, and materials (see Table C-4). Insert other information as appropriate. Overall, the project efficiency is rated Satisfactory.

Outcomes to impacts

24. The outcome to impacts criterion is defined relative to the extent to which outputs from the test case sites can contribute towards impacts. For the purposes of the terminal

Figure C- 2: Outcomes to impacts pathways for the Brazil test case



evaluation, the contribution of outcomes to impacts is defined relative to the fielC-

testing component of the CBP. The impact pathways, impact drivers (identified as "ID) and key assumptions (identified as "AS") are summarized in Figure C-2.

25. The review of outcomes to impacts (ROtI) for the Brazil test case was carried out using the methodology presented in the GEF Evaluation Office's ROtI Practitioner's Handbook. This procedure involved the reconstruction of the logical pathways from project outputs over achieved outcomes, towards impacts and taking into account impact drivers and assumptions.

Table C- 5: Summary of evaluation ratings for: "sustainability and catalytic role"

Sub-criterion	Additional Sub-criterion	Sub-criterion rating	Overall criterion rating
Sustainability	Socio-political sustainability	HL	L
	Financial resources	L	
	Institutional framework	L	
	Environmental sustainability	L	
Catalytic role	Behavioral changes	L	
	Incentives	L	
	Institutional changes	L	
	Policy changes	L	
	Catalytic financing	L	
	Champions	L	

Rating code: Highly Likely (HL); Likely (L); Moderately Likely (ML); Moderately Unlikely (MU); Unlikely (U); Highly Unlikely (HU)

B. Sustainability and catalytic role

26. The criterion "sustainability and catalytic role" is actually comprised of two (2) separate criteria. The ***sustainability*** criterion is defined relative to the probability of continued long-term project-derived results and impacts after the external project funding and assistance ends. The ***catalytic role*** criterion is defined relative to the extent to which an enabling environment has been created to foster innovation. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table C-5 and described in the subsections that follow.

27. ***Sustainability.*** The sustainability criterion has been evaluated relative to four (4) distinct sub-criteria. These are socio-political sustainability, financial resources, institutional framework, and environmental sustainability. The results of the evaluation of each sub-criterion are described in the paragraphs below.

Socio-political sustainability

28. The socio-political sub-criterion is defined relative to any social or political factors that impact the sustainability of project results and progress towards impacts. Generally, the socio-political situation in Brazil is such that it will positively influence the sustenance of project results and progress towards impacts. This is primarily due to the fact that CBP activities were introduced into a project context that exhibited a long history and substantive institutional engagement on the very issues around which the CBP system is built. The socio-political sustainability is built in and assured, so to speak.

Financial resources

29. The financial resources sub-criterion is defined relative to the dependence of eventual impact from the test case sites on continued financial support. The continuation of project results and the eventual impact of the project in the Brazil test case are

independent of continued financial support from the CBP project. As indicated earlier the Mato Grosso site is an area where CENA has undertaken and continues to undertake research activities related to soil carbon.

Institutional framework

30. The institutional framework sub-criterion is defined relative to institutional framework and governance issues that impact the sustainability of project results and progress towards impacts. The Brazil test case was implemented by the scientists from CENA and the University of Sao Paulo, leading agricultural research organizations with an excellent institutional framework and governance landscape both in Brazil and in the Latin America Region.

Environmental sustainability

31. The environmental sustainability sub-criterion is defined relative to any environmental factors that can impact the future flow of project benefits. There were no significant environmental factors likely to negatively influence the future flow of project benefits.

32. ***Catalytic role.*** The catalytic role criterion has been evaluated relative to six (6) sub-criteria, namely behavioral changes, incentives, institutional changes, policy changes, catalytic financing, and champions. The results of the evaluation of each sub-criterion are described in the paragraphs below.

Behavioral changes

33. The behavioral changes sub-criterion is defined relative to any broad-based changes made by stakeholders in Brazil that are a direct result of the application of the CBP at the test case sites. To a large extent, this is not applicable to the Brazil test case context in that behavioral change had already been effected prior to the introduction of CBP activities. Indeed, the track record of the institutions involved was the driving factor for their inclusion in the project for parameterization contributions.

Incentives

34. The incentives sub-criterion is defined relative to any broad-based changes made by stakeholders in Brazil that are a direct results of incentives embedded in the CBP application at the test case sites. Participation in CBP activities represented a way to leverage the knowledge gained through the parameterization and testing activities into course material for undergraduate and graduate students, as well as technical presentations to professional audiences at conferences and seminars.

Institutional changes

35. The institutional changes sub-criterion is defined relative to any institutional uptake in Brazil of lessons from the CBP application at the test case sites. As of the time of this writing, there is evidence of mainstreaming of lessons from the test case sites into research and teaching framework, which, given the local prominence of the institutions involved (i.e., CENA and University of Sao Paul) is likely to eventually and effectively translate to the wider institutional setting for SLM activities in Brazil.

Policy changes

36. The policy changes sub-criterion is defined relative to the development of new policies in Brazil based on the lessons from the CBP application at the test case sites. Although the project has not contributed to policy changes or provided tangible incentives to contribute to catalyzing changes in stakeholder behavior, it has to some extent contributed to institutional changes and created opportunities for individual scientists to catalyze change through exposure of findings in international peer-reviewed publications.

Catalytic financing

37. The catalytic financing sub-criterion is defined relative to the emergence of any follow-on funding from government, bilateral donors, or the GEF to support continued activities at the test case sites. As of the time of this writing, there is no evidence of any follow-on funding from any sources.

Champions

38. The champions sub-criterion is defined relative to the emergence of particular individuals or institutions in Brazil willing to promote the lessons and results from the test case sites into the broader Chinese planning context. This may not be a particularly relevant sub-criterion in the sense that at the time of CBP activities, some personnel were already considered national champions around the issue of understanding the carbon and other benefits/impacts of land use change.

Table C- 6: Summary of evaluation ratings for: "Procedures affecting attainment of project results"

Sub-criterion	Sub-criterion rating	Overall criterion rating
Preparation and readiness	S	S
Implementation approach and adaptive management	S	
Stakeholder participation and public awareness	S	
Country ownership and driven-ness	S	
Financial planning and management	S	
UNEP supervision and backstopping	NA	
Monitoring and evaluation	NA	

Rating code: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

C. Procedures affecting attainment of project results

39. The criterion "procedures affecting attainment of project results" has been evaluated relative to seven (7) distinct sub-criteria, namely preparation and readiness; implementation approach and adaptation management; stakeholder participation and public awareness; country ownership and driven-ness; financial planning and management; UNEP supervision and backstopping; and monitoring and evaluation. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table C-6 and described in the subsections that follow.

Preparation and readiness

40. The preparation and readiness sub-criterion is defined relative to the clarity, practicality, and feasibility of the test case objectives in the sub-contractual agreement with CSU. CBP activities in Brazil achieved its main objective of testing the tool in a local context. At a broader level, CBP activities in Brazil contributed to the development of a cost

effective, user-friendly, yet scientifically rigorous methodology for measuring carbon and GHG mitigation benefits in GEF projects dealing with natural resources.

Implementation approach and adaptive management

41. The implementation approach and adaptive management sub-criterion is defined relative to the project's adaptation to changing conditions, the effectiveness of implementation arrangements, relevance of changes in project (or tool) design, and overall performance of project management. The Brazil test case personnel collaborated closely with CSU staff and were able to cope with and adapt to schedule changes associated with beta versions of the CBP system.

Stakeholder participation and public awareness

42. The stakeholder participation and public awareness sub-criterion is defined relative to the effectiveness of consultations and project decision-making among stakeholders. There was good stakeholder engagement as evidence by the engagement of property owners in making land available for field testing activities.

Country ownership and driven-ness

43. The country ownership and driven-ness sub-criterion is defined relative to the degree to which government has assumed responsibility for the test case sites, offered institutional support, and been responsive to UNEP-DEWA guidance. There was a great deal of country ownership associated with the Brazil test case. This is primarily associated with the fact that the project site itself was identified and maintained over the years by national institutions, independent of external direction/assistance.

Financial planning and management

44. The sub-criterion is defined relative to the quality and effectiveness of financial planning and control of financial resources throughout the project's lifetime. The Brazil test case funds agreed in the project budget were US$ 176,860.00. At the time of evaluation final invoicing is in process on the basis of the receipt by CSU of all contracted deliverables. The Brazil test case did not experience any irregularities in the financial management and reporting. In general, financial reporting and management was timely and no delays were encountered in the Brazil test case.

UNEP supervision and backstopping

45. The UNEP supervision and backstopping sub-criterion is defined relative to effectiveness of supervision and administrative/financial support provided by UNEP. This sub-criterion is not applicable at the test case level due to the lack of a direct line of accountability between UNEP and the test case sites.

Monitoring and evaluation

46. The monitoring and evaluation sub-criterion is defined relative to the effectiveness of project monitoring and evaluation (M&E) plans and tools. This sub-criterion is not applicable at the Brazil test case due to the lack of M&E activities built into the sub-contractual arrangements with CSU.

Table C- 7: Summary of evaluation ratings for the Brazil test case

Criterion	Sub-criterion	Additional Sub-criterion	Sub-criterion rating	Overall criterion rating
Attainment of objectives and planned results	Achievement of outputs and activities	NA	HS	S
	Relevance		S	
	Effectiveness		S	
	Efficiency		S	
	Outcomes to impacts		S	
Sustainability and catalytic role	Sustainability	Socio-political sustainability	HL	L
		Financial resources	L	
		Institutional framework	L	
		Environmental sustainability	L	
	Catalytic role	Behavioral changes	L	
		Incentives	L	
		Institutional changes	L	
		Policy changes	L	
		Catalytic financing	L	
		Champions	L	
Procedures affecting attainment of project results	Preparation and readiness	NA	S	S
	Implementation approach/adaptive mngmnt		S	
	Stakeholder participation/public awareness		S	
	Country ownership and driven-ness		S	
	Financial planning and management		S	
	UNEP supervision and backstopping		NA	
	Monitoring and evaluation		NA	
Complementarity with UNEP programmes and strategies	Linkage to UNEP EAs & POW 2010-11	NA	NA	NA
	Alignment with the Bali Strategic Plan		NA	
	Gender		NA	
	South-South Cooperation		NA	

Rating code for all criteria except Sustainability and catalytic role: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

Rating code for Sustainability and catalytic role: Highly Likely (HL); Likely (L); Moderately Likely (ML); Moderately Unlikely (MU); Unlikely (U); Highly Unlikely (HU)

D. Complementarity with UNEP programmes and strategies

47. The criterion "complementarity with UNEP programmes and strategies" has not been evaluated at the test case level. This is due to the fact that none of the four (4) sub-criteria (i.e., linkage to UNEP's EAs and POW 2010-2011; alignment with the Bali Strategic Plan; gender; and South-South Cooperation) are relevant to individual test case sites. The activities relative to the sub-criteria are relevant only at the overall project level.

Part III - Conclusions and recommendations

A. Conclusions

48. The final evaluation ratings for the Brazil test case are summarized in Table C-7. The major findings of the terminal evaluation are described in the paragraphs that follow.

49. The major positive achievements of the Brazil test case are summarized in the bullets below.

- The main positive achievement is assistance provided to CSU for parameterization activities. The development of internal databases in the tool making use of Brazilian data provides important value added to the overall project

- Another major positive achievement was the testing using both the Simple and Detailed Assessment of the CBP system. Brazil was the only country test case able to achieve this output.
- Finally, the Brazil test case was able to leverage its already significant research activities for supporting a tool that can benefit the global community of practitioners.

50. In conclusion, the overall assessment of the Brazil test case is satisfactory. The evidence provided in previous sections supports this summary conclusion. There was clearly a sustained engagement by project personnel on CBP activities. This is evident by participation at steering committee meetings, involvement with training, and incorporation of numerous students in project activities.

B. Lessons learned

51. The key lesson from the Brazil test case is the importance of engaging leading local institutions in tool development. The background, experience, and number of individuals involved with or expose to the CBP are highly noteworthy. Picking the right institution, as was done in the Brazil test case, has salutary ripple effects in both the near- and the long-term.

C. Recommendations

52. There are several key recommendations that can serve as actionable proposals to resolve the concrete problems that have affected the execution of the Brazil test case and the sustainability of its outputs. These lessons, summarized in the bullets below, are feasible to implement within the framework of the capacity that has been built.

- First, follow-on activities should aim to test other portions of CBP system. The outputs of dynamic modeling under Brazilian conditions could be highly instructive.
- Second, further work on the CBP system would benefit from including a module that assists user in establishing the major factors associated with differences between the outputs of the Simple and Detailed. Such a module could be useful in helping to identify key research needs.
- Finally, it would be good to promote the integration of the Brazil test case findings within the broader work of the IPCC on GHG inventories. Expanding the default factor database used in Tier 1 estimates to account for the Brazil Detailed Assessment experience would be helpful.

Annex C-1: Evaluation itinerary and meetings

a) Site visit itinerary

Date	Time	Activities
12 March 2013	AM	Arrival in Sao Paulo; travel to Piracicaba
	PM	meetings at CENA/College of Agriculture
13 March	AM & PM	meetings at CENA/College of Agriculture
14 March	AM & PM	meetings at CENA/College of Agriculture
15 March	AM	travel to Sao Paulo; departure to Boston

b) Site visit contact list

Name	Title	Type
Professor Cerri	Director	one-to-one
Carlos Eduardo Cerri	Associate Professor	group presentation/discussion
Various	postdoc researchers, graduate students	group presentation/discussion

Annex C-2: Bibliography

a) Project management documents/reports collected and reviewed

- assorted project document materials

b) Additional documents collected and reviewed

- not applicable

Annex C-3: Finances

Detailed information on co-financing arrangements and project expenditures by activity was not available.

Annex C-4: Supporting consultant info

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Climate Change Research Group, LLC
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EXPERIENCE SUMMARY

Dr Dougherty has worked over the past 18 years on a wide variety of climate change related issues, with an emphasis on mitigation and adaptation. He has assisted governments in the development of national GHG mitigation and adaptation strategies, led vulnerability assessments, formulated project documents, analyzed energy efficiency and renewable energy options for achieving emission reductions, and contributed to the development of methodological approaches, training programs and software tools that are used throughout the world. Dr Dougherty has been invited as a speaker or expert participant in meetings of the World Bank, United Nations Department of Economic and Social Affairs, the United Nations Development Programme, the African Development Bank, and the United Nations Environment Programme. He has worked throughout North Africa, Sub-Saharan Africa, and the Middle East in support of national government agencies, multi-lateral organizations, and development banks. He has authored or co-authored over 100 technical reports.

EDUCATION

Ph.D. University of Pennsylvania, City and Regional Planning, 1991

M.S.	Drexel University, Philadelphia, Civil Engineering (Geotechnical), 1980
B.S.	Drexel University, Philadelphia, Civil Engineering, 1978

EXPERIENCE

2009-present	Climate Change Research Group, LLC; Owner Stockholm Environment Institute – US Center; Research Associate
2006-2009	Stockholm Environment Institute – US Center, Energy Group; Senior Scientist Tellus Institute, Energy & Environment Group; Senior Scientist
1985-1994	Independent Consultant in Energy and the Environment
1980-1985	Stone & Webster Engineering Corporation; Engineer
1978-1980	Drexel University; Research and Teaching Assistant
1979	United States Indian Health Service, Engineering Costep
1977	VME Nitro Consult Incorporated; Cooperative Engineering Intern
1975	Watermation, Inc; Cooperative Engineering Intern
1974-1975	City of Philadelphia Water Department; Cooperative Engineering Intern

Annex D: Kenya(A) Test Case

Part I - Evaluation Background

A. Context

1. Land degradation is a widespread problem in Kenya and is the major constraint to increased agricultural productivity. About 70 percent of Kenya's population lives in 12 percent of total land area (581,679 km^2) which is classified as being of medium to high potential for agriculture and livestock production. The rest of the population lives in ecologically-fragile Arid and Semi-Arid Lands (ASALs) that constitutes 70% of the total land area. One consequence of this is that land size and its distribution varies widely as does the population density which ranges from as low as 2 persons per km^2 in the ASALs to high population densities of over 2,000 persons per km^2 in high potential areas. Currently, the growing population and the resulting increase in demand for land, energy and water is putting tremendous pressure on the natural resources in the country. Land degradation manifests itself in multiple ways including over-exploitation and poor use of the natural resource base, excessive soil erosion, continued loss and degradation of forest areas and increased vulnerability of and gradual reduction in incomes of rural families.

2. There are multiple issues that underpin the trend of increasing land degradation in Kenya. The major factors that facilitate land degradation or constrain sustainable land management are related to (i) lack of community awareness, (ii) lack of incentives for SLM, and (iii) low investment and institutional attributes such as lack of coordination among development activities and institutions. The persistent diminishing land productivity and the absence of significant investment to raise agricultural productivity have generated recent land policy debate and highlighted the need to address land degradation and improve natural resources management through interventions at the macro as well as at the farm and community levels.

3. The Government of Kenya (GoK) recognizes the need to increase land productivity in order to raise rural incomes and improve the sustainability of land use. The Government main development strategies are articulated in the Economic Recovery Strategy for Wealth and Employment Creation (ERS) (2003-2007) and the "Vision 2030". Both of these strategies identify agriculture as a prime driver of the recovery and growth programme and places particular emphasis on sustainable agricultural growth as a critical element in poverty reduction. The Government adopted the Strategy for Revitalizing Agriculture (SRA), 2004-2014 which recognizes the lack of a coherent land policy as one of the impediments to sound land use leading to environmental degradation.

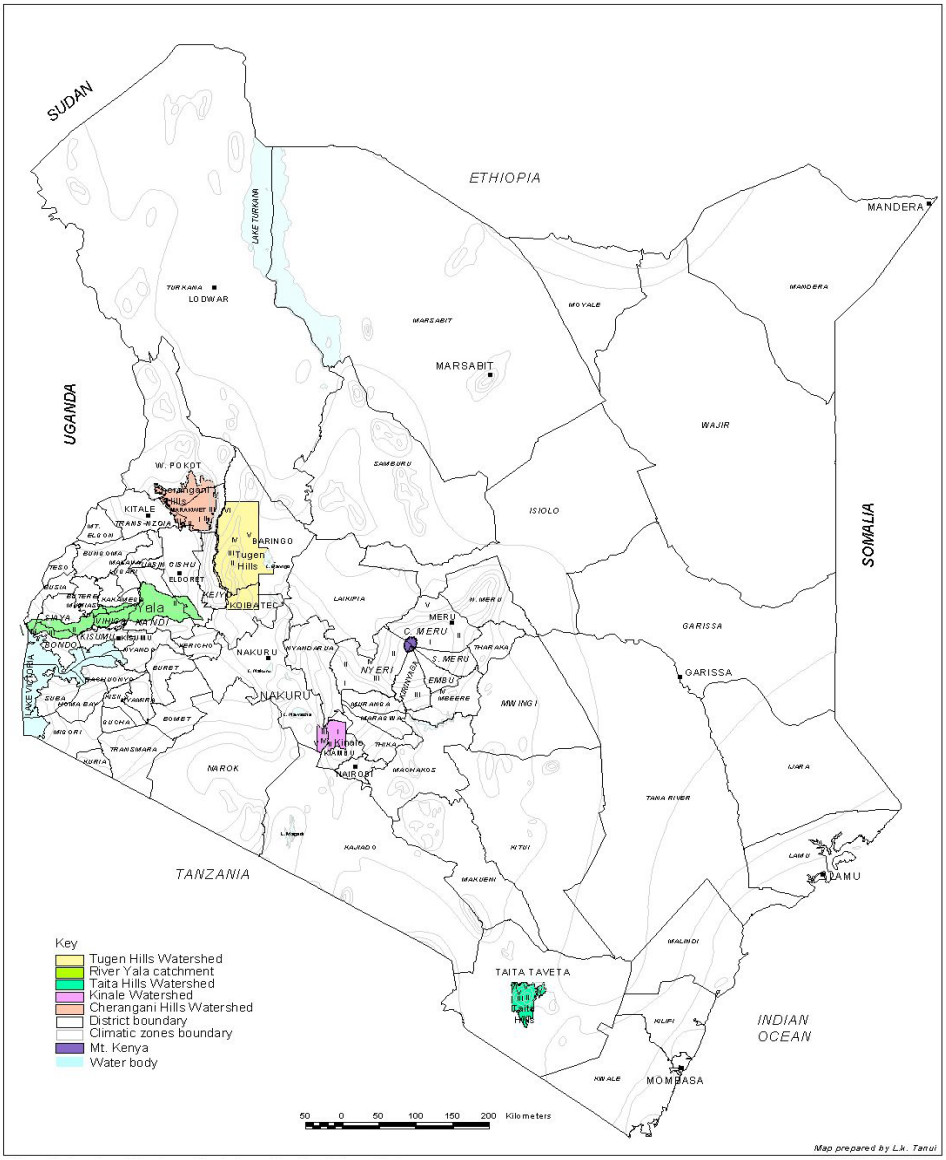
4. The Kenya Agricultural Productivity and Sustainable Land Management Project (KAP SLM), is a Government attempt to arrest land degradation, promote sustainable use of natural resources for higher productivity and better incomes for the rural farmers of Kenya and maintain the critical ecosystem functions in degraded and environmentally sensitive areas.

B. The Project

5. The KAP SLM project was formulated to complement other Government of Kenya (GoK) programmes aimed at addressing constraints hindering the exploitation of land enormous agricultural potential by focusing on issues of sustainable land use in order to achieve the set national policy goals of food security, poverty reduction, and employment creation without compromising sustainability of its natural resources. The KAP SLM project delayed in starting but is now in full operation since beginning of 2012. The project is being implemented in three (3) catchment areas including Kikuyu/Kinale, Taita Hills and Cherangany Hills that are distributed all over the country (see Figure D-1). The selection of the catchments was based on the assessment of several factors such as population density, poverty indices, biophysical parameters, socio cultural differences and technologies available. The selected catchments are of high ecological and bio-physical importance in Kenya since they currently face high erosion and land degradation hazards that are closely linked to high poverty prevalence. Salient features of the three catchments which are also the KAP SLM project operational areas are summarized in the paragraphs described below.

6. **Cherangani Hills:** Cherangani catchment lies in or in parts of the following districts of Kenya: Nandi North and South, Trans Nzoia, West Pokot, Uasin Gishu, Marakwet and Keiyo. In Cherangani Hills watershed, land and environmental degradation occur in form of deforestation of both indigenous and exotic trees and consequent loss of biodiversity, soil nutrient depletion due to inadequate application of soil nutrients, destruction of water catchment areas, encroachment of wetlands, and cultivation on sloping land without adequate Soil and Water Conservation (SWC) measures.
7. **Kinale – Kikuyu:** The Kinale-Kikuyu catchment is located in the Athi river drainage system mainly in the Kiambu District, and parts of the neighboring districts. The catchment is characterized by high population density. It is also a source of many rivers

Figure D- 1: Test case site location in Kenya for Component A



that supply water to the lowlands and urban centers like Nairobi. The dams for water supply, fisheries and irrigation located in the Kinale – Kikuyu catchment are: Sasumua, Olarimutia, Gathanyi, and Ya Kiongozi.

8. The major forms of land degradation in the Kinale – Kikuyu catchment are deforestation and consequent destruction of water catchment areas. Other types of land degradation processes include encroachment of wetlands and soil nutrient depletion due to continuous cultivation and limited soil fertility management practices to replenish depleted nutrients. In addition the catchment experiences overgrazing and cultivation on fragile steep slopes without adequate SWC measures, which trigger severe soil erosion. It is estimated that about 60% of the natural forests in Kinale-Kikuyu catchment have varying degrees of degradation due to excessive charcoal burning, and harvesting of timber, fuel wood, and other forest products. Due to poor land management practices and deforestation upstream, sediment yields of some rivers have increased 5 to 15 times over the levels of 1970s. For example, the water storage capacity of the Sasumua water treatment plant (near Kijabe township), which supplies 20% of Nairobi potable water, has been reduced considerably due to siltation of its reservoirs and channels. The Sasumua water treatment plant draws water from Chania River and Kiburu River. The diversion dam on the Chania and one of the intakes on Kiburu River has now been completely silted up, reducing the inflow and gross storage of the reservoirs.
9. **Taita/Taveta Hills:** The Taita/Taveta hills catchment is a high potential area found in the hill masses of the Taita, Saghala and Kasighau Hills that rise to an elevation above 1,500 m with peaks of up to 2,600 m above sea level. The catchment, which accounts for only 2.5% of the Taita/Taveta County, has mean annual rainfall above 1,250mm per year. These hills are completely surrounded by the Savannah vegetation in the semi-arid areas that lie below 640 m above sea level and receive rainfall ranging from 250-700mm per year. The main land use in the lowlands surrounding the Taita/Taveta Hills is wildlife conservation as practiced in the Tsavo National Park, crop production and extensive ranching. The Taita/Taveta Hills catchment suffers from the typical highland problem of severe erosion, and high population density, both of which have forced farmers to expand agricultural activities into more fragile areas with steep slopes above the legal limit of 35% slope set by the Kenyan statutes. This has triggered even more severe erosion and landslides in the highlands and flooding in the semi-arid lowlands.
10. The proposed Kenya Agricultural Productivity and Sustainable Land Management Project (KAP SLM) has four main components including:

    - Building capacity for SLM;
    - Investments in community SLM micro-projects;
    - Strengthening the enabling policy and institutional environment for SLM;
    - Piloting and capacity building for application of Payment for Environmental Services (PES); and
    - Coordination, monitoring and evaluation of project activities.

11. **Building Capacity for Sustainable Land Management:** This component recognizes the critical need for capacity at multiple levels for the implementation of the objectives of the project and seeks to address the identified gaps. It aimed to target communities and service providers for training and capacity enhancement as well as help build a broader awareness of the potential and impact of sustainable land management (SLM).
12. **Investments in community SLM micro-projects:** This component aimed to support community micro-projects. The micro-projects identified within the micro-catchment

plans developed by communities aimed to address land degradation using a Community Driven Development (CDD) approach.

13. **Strengthening the enabling environment for SLM:** This component aimed to strengthen the enabling environment necessary for mainstreaming sustainable land management approaches through the policy and institutional landscape. It aimed to address gaps in the policy framework, provide support for institutional capacity for cross-sectoral integrated planning of and monitoring SLM interventions. It also aimed to support improved coordination between agencies, and importantly, and facilitate the evolution towards a national SLM program by developing a programmatic approach in the short term.

14. **Payments for Environmental Services Pilot:** This component aimed to pilot the implementation of Payments for Environmental Services (PES) mechanism in watershed of the rivers that supply water to the Sasumua Water Treatment Plant operated by the Nairobi Water and Sewerage Company (NWSC). PES is an innovative market-driven approach to addressing watershed environmental problems based on the principles that, those who benefit from environmental services should pay for them, and that, those who contribute to generating environmental services should be compensated for providing them. The PES approach is attractive in that (i) it generates new financing, which would not otherwise be available for conservation; (ii) it is likely to be sustainable, as it depends on the mutual self-interest of service users and providers and not on the whims of government or donor funding; (iii) it is likely to be efficient, in that it conserves services whose benefits exceed the cost of providing them, and does not conserve services when the opposite is true. Where it is feasible and working, PES concept can therefore play a key role in SLM and other environmental conservation measures within a more sustainable market based arrangement.

15. **Project coordination and monitoring:** This component aimed to support project coordination and implementation at the national, district and grassroots level through accepted institutional structures. The project coordination organ included competitively selected personnel with the required skill-mix (SLM/NRM), community and social development, environmental management, etc). At the catchment level, the plan was for three (3) Catchment Area Coordinators (CACs) to be recruited to spearhead and coordinate project implementation at the three operational areas (Cherangani Hills, Kinale-Kikuyu and Taita – Taveta Hills).

16. The CBP Kenya (A) test case was integrated within the GEF-funded KAP SLM project whose objective was to promote sustainable use of natural resources for higher productivity and incomes for the rural farmers of Kenya by improving the livelihoods of rural communities through improved agricultural production practices and mitigation of land degradation through the promotion of SLM. The Ministry of the Environment is the executing agency and Kenya Agricultural Research Institute (KARI) was initially responsible for the CBP Kenyan case study, having been instrumental in the development of the CBP project.

17. The CBP-related activities were undertaken on the Cherangani Hills situated to the north west of Kenya. The project is part of the GEF focal area: International Waters and Biodiversity with relevance to the Cross cutting issue of Land Degradation. It is part of OP-12 (Integrated Ecosystem Management) with relevance to OP-1 (Arid and Semi-Arid

Ecosystems), OP-9 (Integrated Land and Water Management) and OP-15 (Sustainable Land Management).

18. The CBP has concentrated its activities in the humid to sub-humid Cherangani Hills catchment area (see Figures, D-1, D-2 and D-3). The present land use in the Cherangani catchment area is intensive cropping by smallholders with maize as a cash crop. Land management problems to be addressed are soil erosion due to cultivation, encroachment and destruction of forests, and encroachment and destruction of wetlands. The CBP aimed to work closely with farmers, community scientists and policy makers in this project to develop a workable protocol for measuring C benefits. Development of the web portal and user guides was intended to be tailored to the needs of similar groups, producing a system that can be used without training sessions. Activities in the project which may have a positive effect on C sequestration are presented in Table D-1.

C. Evaluation objectives, scope and methodology

Table D- 1: KAP SLM Project activities in Cherangani Hills

1. Arrest the uncontrolled deforestation and excision of land and protect the rare, threatened and endangered species of trees and animals.
2. Streamline the policy, legal and institutional framework for forestry.
3. Rehabilitation of degraded forest areas through participatory partnership with local farmers.
4. Encourage farmers to grow trees in woodlots as an additional source of income while contributing to conserving the environment at farm level.
5. Provide seeds (from Forest Department) for quick-maturing tree species at affordable prices to community-based tree nursery owners, people operating on roadsides, and individual farmers.
6. Train farmers on appropriate nursery management and tree management. This will contribute to rapid reforestation on private land by easing shortages of plant seedlings.
7. Promote SOM build up through introduction and promotion of appropriate conservation tillage and alternative agriculture technologies.
8. Study the viability of efficient utilization of locally available quality organic resources for recycling nutrients and improvement of SOM and promote appropriate options.
9. Test cultural practices that encourages vegetation cover for most part of the year and promote for instance, reseeding degraded pastures, practice afforestation and agroforesty (agroforestry targeted at the farm level will involve testing, domestication and introduction and promotion of multi-purpose trees to exploit specific niches within the farms); community tree germplasm collection and maintenance and tree nurseries establishment and management will be encouraged; trees grown for other purposes such as, fruit medicinal and aromatic trees will be tested and promoted.
10. Involve the Forest Department, Kenya Forest Research Institute (KEFRI) and Kenya Wildlife Service (KWS) in the establishment and maintenance of the forests.
11. Promote the use of bio-digesters to provide alternative energy for cooking
12. Introduce and promote the use of the solar energy for lighting, drying and cooking; Start exploitation of wind energy to generate electricity or to drive traditional and improved mills.
13. Conserve biodiversity of plant genetic resources as a major activity in the project including conservation of existing tree species, and encourage identification, introduction and promotion of growing of endangered species.
14. Continue to empower farmers, community based organizations, non-government organisations, extension providers including local administration and the implementers both in knowledge and resources to better implement natural resource programs.
15. Train District and Division level extension staff to enable them to transfer appropriate technology and practices to the local communities.

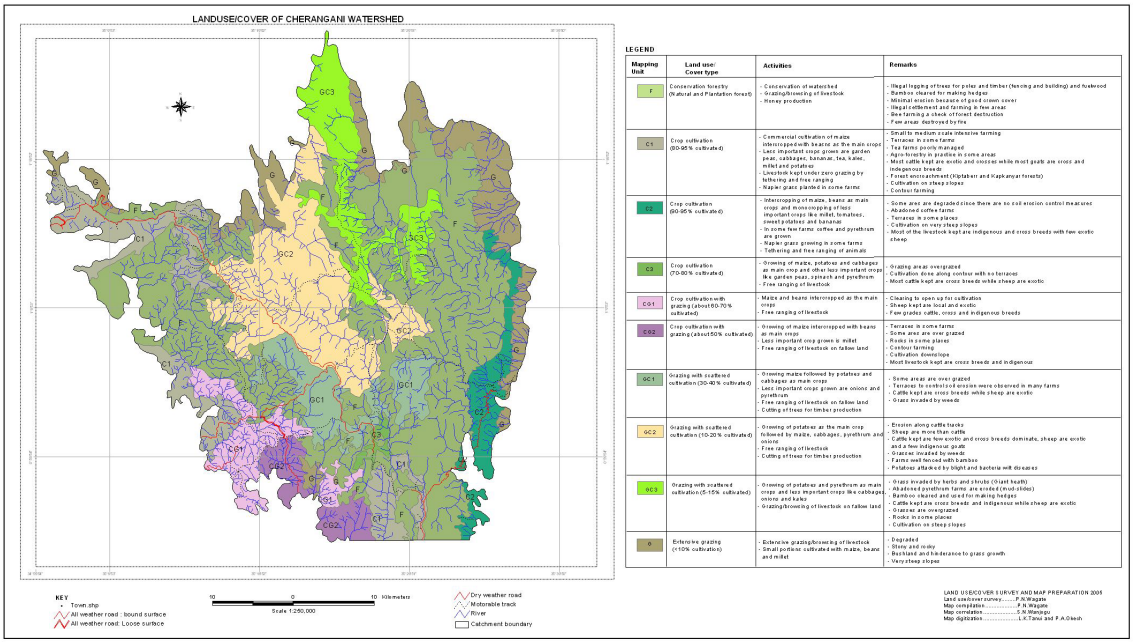
19. The methodology applied to evaluate the Kenya (A) test case was threefold. Firstly, desk-based research was carried out which involved the identification, acquisition, and review of a comprehensive set of project-related documents. Secondly, site visit was undertaken to the Cherangani Hills and the surrounding areas in order to meet with project staff and discuss questions/issues emerging from the desk-based literature

review. Thirdly, project performance was evaluated based on the results of desk-based and site visit using UNEP's standardized evaluation criteria. Details regarding the site visit itinerary are provided in Annex A-1.

20. The Kenya (A) test case focused on Component A of the CBP project (Modeling: with greater focus on cropland and grazing land) and Sub-component A-2 (Test cases). The test case site is located in the Cherangani Hills region in north-western Kenya, as shown in Figures D-1 (see above), as well as Figures D-2 and D-3 below. Project activities for CBP are being undertaken in Cherangani Hills catchment which covers approximately 204,536 ha. The Cherangani Hills are situated in altitude range of 2060 to 3280 meters above sea level (m asl) and the catchment lies between Latitudes 0054'N and 1°26'N and Longitudes 35°00'E and 35°49'E. A brief description of project initiatives relevant to carbon benefit quantification is provided in the paragraphs that follow.

21. Only simple assessment was done since the other calculation modules were not ready

Figure D- 2: Land Use Cover of Cherangani Watershed



when the project started. Since the project in Cherangani Hills did not start as planned project scenario (Table D-2), the development and testing of the Activity Data Module and the Calculation Modules of the CBP tool for Cherangani Hills test case were based on existing information and planned activities that the KAP SLM project expected to achieve. The existing information included baseline reports on land use/cover, land degradation, KAP SLM Project Implementation Plan Final report (Karanja et al, 2006), and land management data gathered in the field by project team.

22. Land use groups (Lugroups) were used as activities (see Table D-2 and Figure D-2). The coordinates of each landuse group and the areas were entered in the project description module resulting in an automatic generation of the location points (activity areas) by the map module (Figure D-3) This was followed by definition of the land use areas which involved description of land use areas (activity areas).

Figure D- 3: Location of activity areas for Cherangani Hills Test Case

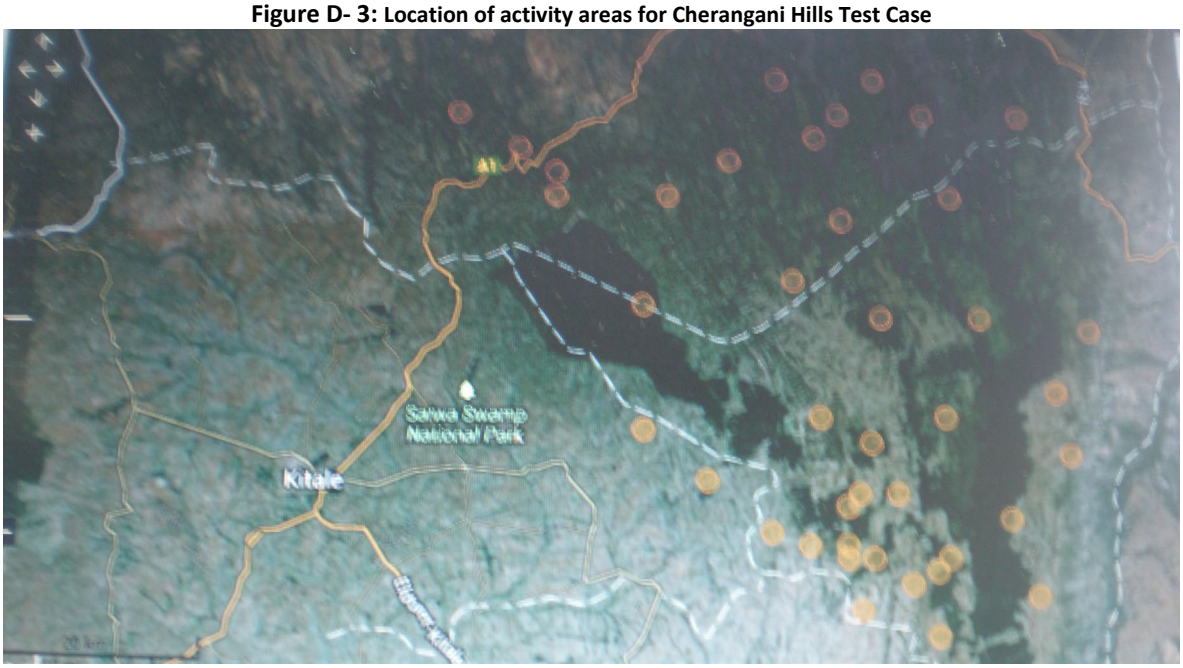


Table D- 2: Land management activities and baseline information for the Cherangani Hills Catchment

Land cover	Total area (ha)	Initial land use, 2005*	Land management activities Project Scenario, 2010	Baseline ***
F	81,450	Natural & plantation Forest. About 5% deforested	Reforestation, tree cover increased by 15%.	Natural & plantation Forest. About 10 % deforested
C1	18,086	- 80% annual cropland, - cultivated with maize. - 10 % grassland (wire grass) - 10 % trees/shrubs	- Planted grass strips along the contour in 20% of the cropland area. - Planted 15 % woodlots in cropland - Reseeded the whole grassland with improved indigenous perennial grass (*Eragrostis superba* – Masai Love grass).	- 90% annual cropland, - cultivated with maize. - 5 % grassland (wire grass) - 5 % trees/shrubs
C2	8,221	- 90% annual cropping (maize % beans). - 3 % grassland - 7 % trees	- **Fanya Juu terraces installed in 40 % of the annual cropland area. - Grass strips planted on the Fanya juu. - Agroforestry – woodlots planted in 10 % cropland.	- 92 % annual cropping (maize % beans). - 3 % grassland - 5 % trees
C3	1,048	- 72 % annual cropping (Maize & potatoes). - 23 % grassland. - Livestock- free ranging Cattle and Merino sheep. - 5 % tree/shrubs	- Fanya Juu in 20% of annual cropland. - Grass strips planted on the Fanya juu. - Reseeded the whole of grassland with improved indigenous grass (*E. superba*). Agroforestry- woodlots planted in 5 % of cropland.	- 80 % annual cropping (Maize & potatoes). - 17 % grassland. - Livestock- free ranging Cattle and Merino sheep. - 3 % tree/shrubs
CG1	9,629	65 % annual cropland 25 % unimproved grassland (wire grass). 10 % trees	- Fanya Juu terraces installed in 20 % of the cropland. - Grass strips planted on the Fanya juu. - Woodlots planted along the contour in 5 % of the grassland. - Reseeded the whole grassland with improved indigenous grass (*E.superba*).	80 % annual cropland 15 % unimproved grassland (wire grass). 5 % trees
CG2 (slopes 5-16 %)	6,024	50 % annual cropland (Maize). 35 % unimproved grassland (wire grass). 15 % trees	- Grass strips planted along the contour in 20 % of cropland. - Increase tree cover by 5 % . - Reseeded 15 % of the grassland with improved grass.	70 % annual cropland (Maize). 25 % unimproved grassland (wire grass). 5 % trees

Source: Ngugi et al, (2005), Land use/Cover map and report of Cherangani Watershed; *Terraces in which the excavated soil is thrown on the upslope; ***Data collected in the area in April 2011

23. The major objective for the evaluation of the Kenya (A) test case is to assess the performance of CBP-related activities relative to the scope of activities agreed to in the subcontracting arrangements established between CSU and KARI/ the project management in Cherangani Hills. Six (6) key activities/outputs comprise the deliverables of the Kenya (A) test case as summarized in Table D-3.

Part II - Project performance and impact

24. Project performance and impacts for the Kenya(A) test case has been evaluated relative to four (4) major criteria, namely attainment of objectives and planned results, sustainability and catalytic role, processes affecting attainment of results, and complementarity with UNEP programmes/strategies. The results of the terminal evaluation for each major criterion are described in the sections that follow.

A. Attainment of objectives and planned results

25. The criterion "attainment of objectives and planned results" has been evaluated relative to five (5) distinct sub-criteria, namely achievement of outputs and activities, relevance, effectiveness, efficiency, and outcomes to impacts. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table D-3 and described in the subsections that follow.

Table D- 3: Summary of evaluation ratings for: "attainment of objectives and planned results"

Sub-criterion	Sub-criterion rating	Overall criterion rating
Achievement of outputs and activities	MU	MS
Relevance	S	
Effectiveness	MS	
Efficiency	S	
Outcomes to impacts	MS	

Rating code: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

Achievement of outputs and activities

26. The paragraphs below describe the achievement of outputs and activities for the Kenya(A) test case relative to each of the seven (7) activities that formed the scope of work under the subcontract with CSU (see Table D-4).

27. Activity #1 focused on the development and testing of the Activity Data Module and the Calculation Modules (i.e., Simple Assessment, Detailed Assessment, Dynamic Modeling) of the CBP tool. With regard to the Cherangani Hills test case, the simple assessment analysis involved inserting initial, baseline and project scenario data into the CBP model and then running the model when all data were accepted by the model. This proved

Table D- 4: Scope of activities and outputs for each site in the Kenya(A) test case

1. Develop and test the Activity Data Module and the Calculation Modules of the CBP tool.
2. Work with ISRIC to help them collate and analyze soil samples in areas covered by the selected project.
3. Assess the beginning to end C and GHG monitoring, measuring and modeling needs to inform CSU as they develop the protocol; and provide feedback on the protocol as it is developed.
4. Take part in on-site training sessions in the CBP protocol for selected project personnel and arrange some of the logistics such as inviting relevant extension agencies and other outsiders etc.
5. Implement the CBP protocol in the selected project sites, with a view to implementation across the whole project area in the third year of the CBP project.
6. Test aspects of CBP protocol (users guide, software) for the selected project and report to CSU.
7. Provide financial/scientific reports to project coordinator and UNEP.

quite challenging because there were instances when the CBP model refused to accept the entries and thus could not run. This necessitated constant communication with CSU by email and through Skype. Due to the large number of activity areas involved in the whole project area and the fact that the training on the model was conducted in December 2012 (when the KAP SLM had just commenced), it was not possible to produce results for the simple assessment before the CBP ended. One challenge that was encountered and not yet solved was that the CBP model could not handle reseeding, introduction of grass strips and construction of terraces which are essential attributes for erosion control. However, the socioeconomic analysis was done and completed using the Yala Basin data (from WKIEMP) and results submitted to CSU.

28. Activity #2 focused on working with ISRIC to help them collate and analyze soil samples. There was no soil sampling or laboratory analysis activities undertaken in Cherangani Hills. The Kenya Soil Survey (KSS), a division of NARL (KARI) had already described the soils of Cherangani Hills and therefore the services of ISRIC were not required in this case. Consequently, there was no contact made with ISRIC throughput the duration of project activities.

29. Activity #3 focused on a needs assessment for monitoring, measuring and modeling. While general feedback was provided to CSU shortly after test case start-up, the actual needs assessment was carried out in an informal manner without a detailed report being delivered to CSU. That is, the format of the needs assessment was a set of informal email exchanges providing feedback on potential improvements to the CBP system relative to technical needs of the Kenya (A) project team with regard to applying the Activity Data Module and Simple Assessment Module. By the end of 2010, monitoring needs had been adequately completed and communicated. By the end of 2011, measuring/modeling needs to account for carbon benefits had also been adequately completed and communicated.

30. Activity #4 focused on arranging/participating in on-site training sessions on the CBP protocol. With regard to this activity, two KARI team officers (Dr. P. Gicheru and Dr. P. Kamoni) attended the Leicester CBP training in UK in 2009. Between 6th and 8th April, 2010, a CBP consultation workshop was held at the Jacaranda Hotel, Nairobi, Kenya. Workshop participants included three KARI staff, one staff from KAPAP (Kenya Agricultural Productivity and Agribusiness Project formerly KAPP), two staff from UNEP, and three staff from CSU (Colorado State University) who were the resource persons. The goal of the training was to introduce the CBP system and try to resolve emerging questions/issues. The topics covered included:- 1) Introductions and aims of the meeting, 2) The Project Information Module (PIM), 3) The Project Description Module (PDM), 4) The Guidance Module, 5) Uncertainty analysis 6) Introduction to the Simple Assessment option, 7) The Cost Benefit Analysis, 8) The DPSIR and 9) Introduction to the Detailed Assessment (IDA).

31. Following the completion of the above workshop on 8th April, 20210, the project partners (CSU and KARI) left for a field trip to the Cherangani Hills. On 9th April 2010 the project partners held discussions in a group session in Kitale with KAPP field staff and representatives from the Ministry of Agriculture (extension staff), representatives of the Forestry Department, Vi Agroforestry (an NGO working on sustainable land management in western Kenya), and NEMA (National Environment Management Authority) staff based at Cherangani Hills. The discussions centered on land use and its

management in the Cherangani Hills. During the meeting the staff from Vi Agroforestry informed the meeting that they are working on a project funded by the World Bank which is involved in carbon credits and payment. The staff of Vi Agroforestry further said that they were in the process of developing a methodology on carbon credits and the tools developed by the CBP were useful to them. Later the team visited the Cherangani Hills, the test case site for the CBP.

32. Further to the above training, Dr Kamoni (KARI) participated in the CBP workshop on assessing total system carbon held at Tsavo, Wildlife Lodge from 12th to 16th September, 2012. The aim of the workshop was to review the GEF tools developed by the Carbon Benefits Project (CBP). In addition, Dr Kamoni and Dr Gicheru (KARI) participated in the CBP training workshop held at Jacaranda hotel from 4th to 6th December 2012.

33. Activity #5 focused on implementing the CBP protocol in the selected project sites with a view to implementation across the whole project area in the third year. This activity has not yet started in earnest. Although the KARI staff including Dr. Gicheru and Dr. Kamoni participated in the training sessions on the CBP protocol, none of the KAP SLM project staff (the MOA staff currently implementing KAP SLM in Cherangani Hills) has been trained in the use of the CBP tool. This is attributed to the fact that the CBP came to an end before the commencement of KAP SLM. In addition the CBP was implemented by KARI while KAP SLM (host project) is now being implemented by Ministry of Agriculture (MOA) staff. Based on the implementation schedule of the project activities (Table D-3) on the Cherangani Hills, the CBP Activity data is expected to be generated for the initial, baseline and project scenarios. The data gathered in the Cherangani Hills test case will thereafter be entered into the CBP model in order to predict C stocks and GHG for the baseline and project scenarios. To realize this achievement, it will be necessary to train the MOA staff on the CBP tool.

34. Activity # 6 Activity # 6 focused on testing aspects of CBP protocol such as the Users Guide and web-based software. The Users' Guide was not evaluated due to the fact that it was not available during the period of testing activities.

35. Activity # 7 focused on providing financial/scientific reports to the project coordinator and UNEP task manager. All financial reports have been provided to CSU and accepted. Recently (2013) the KARI team has written a chapter entitled “Managing soil organic carbon for multiple benefits - the case of Africa” as a contribution to a book that will be produced by CSU. This chapter has already been sent to the CBP team leader Ms. Eleanor Milne. CBP activities in the Kenya(A)test case have been achieved. The project used existing GEF projects in Kenya to develop, test and implement the CBP protocol. The Kenya(A) test case partners fully participated in the activities leading to the production of the tool. In this case, the scientists at Kenya Agricultural Research Institute (KARI) delivered the requested information to Colorado State University (CSU), trained in the model programme and participated in the testing of the model.

36. Attainment of project objectives and activities is rated Moderately Unsatisfactory (MU). This rating is based on the following considerations:

    - The model took a much longer time to develop. CSU had a problem with programming the model which caused a delay in project implementation;

- The project was extended by one year or so but the extension was still not adequate since the project was expected to test the model with stakeholders an activity that has not been carried out yet;
- CBP virtually came to an end (December 2012) when KAP SLM, the GEF "host project" was commencing its activities in the Cherangani Hills. The KAP SLM should have provided data for the testing of the CBP model, and
- A major constraint in implementing the project has been internet connectivity. There were times when internet connectivity was very slow, other times the internet connectivity was absent altogether and at other times it was very unreliable.

Relevance

37. CBP objectives and implementation strategies are consistent with environmental issues and needs in Kenya and the rest of East Africa region. Kenya participated in the United Nations Conference on Environment and Development (UNICED) in Rio de Janeiro, Brazil in 1992. After Rio, the country embarked on translation of Agenda 21 into a national development agenda. In 1994, the country developed the National Environment Action Plan (NEAP) with the aim of enhancing integration of environment concerns into national planning and development process. Kenya is a signatory to all the relevant environmental conventions including Convention on Biological Diversity (CBD), Kyoto Protocol and United Nations Framework on Convention on Climate Change (UNFCCC). It ratified the UNFCCC) in 1994 and acceded to Kyoto Protocol in 2005 thus demonstrating its commitment in combating the problems of climate change. In 2009, East African Community member states (Burundi, Kenya, Rwanda, Tanzania and Uganda) developed the East African Community Climate Change Policy (EACCCP) with emphasis on the preparation and implementation of collective measures to address climate change in the region with emphasis on priorities such as afforestation, reforestation, efficient crop and livestock production while capturing opportunities in emission reduction provided for under the Clean Development Mechanism (CDM) of the Kyoto Protocol.

38. Kenya ratified the UNCCD in 1997 and developed its National Action Program (NAP) in 2002. The activities proposed in KAP-SLM are consistent with UNCCD's call for implementation of activities aimed at preventing and/or reducing land degradation, rehabilitating partly degraded lands and reclaiming the degraded lands through National Action Programs. The KAP SLM project will support implementation of the Government's National Action Program (NAP) priorities including strengthening the enabling environment, capacity building, knowledge sharing and awareness-raising – by helping to address some of the barriers preventing the widespread uptake of, and improving the incentives for sustainable land management activities, supporting land use and tenure policy reform, strengthening involvement of local communities in decision making and management processes, knowledge sharing and awareness creation, and capacity building.

39. Kenya, through the Ministry of Agriculture, is currently implementing the GEF funded Kenya Agricultural Productivity and Sustainable Land Management Project (KAP SLM) with the main objective of improving the livelihoods of rural communities through improved agricultural production practices and mitigation of land degradation through the promotion of SLM. The Kenya Agricultural Research Institute (KARI) was responsible for the CBP Kenya (A) case study, having been instrumental in the development of this

project. CBP is relevant to the UNEP mandate and policies at the time of design and implementation and GEF focal areas, strategic priorities and operational programmes. It is also consistent with the UNEP's mandate and strategy for environmental observation and assessment particularly in the analysis of the state of the global environment, assessment of global and regional environmental trends, and the provision of early warning on environmental threats, based on the best scientific and technical capabilities available. The *CBP:MMM* addresses the Action Plan strategic objective of "promoting multi-country co-operation directed to achieving global environmental benefits. The GEF has identified the need for a consistent methodology to determine the global C benefits of natural resource interventions. The test-case GEF projects all claim C as a GEB and therefore need a standardized method to substantiate and document this. The project fits with the Land Degradation (SLM) focal area strategy and the Sustainable Forest Management (SFM) Framework of GEF-4 and in particular forest conservation as a means to protect carbon stocks and avoid CO_2 emission. The relevance of the project is rated Satisfactory (S).

Effectiveness

40. The effectiveness criterion is defined relative to the extent to which the test case achieved its main objectives. For the purpose of this terminal evaluation, "main objectives" have been interpreted as the stated output for Sub-Component A-2 (Test cases) as defined in the Project Results Framework in Annex A of the Project Document. The stated output of the test case is "a C benefits protocol that meets the specific requirements of GEF SLM projects and other SLM projects in developing countries". Three objectively verifiable indicators were specified in the Project Document and represent the basis for an evaluation of the effectiveness of the Kenya (A) test case, as summarized in the paragraphs that follow.

41. *Objectively verifiable indicator #1 - Spectrum of C benefit requirements of SLM test case projects understood:* The spectrum of C benefit requirements of SLM test case projects were fully understood.

42. *Objectively verifiable indicator #2 - Requirements of SLM projects outside of the test case situations understood:* The tests outside case situations were not done since finalized tool was only recently released in Sept. 2012. The MOA has expressed a desire to test the model outside KARI. In addition the KARI is soliciting for funds to train and disseminate the benefits of the model to a wider range of stakeholders.

43. *Objectively verifiable indicator #3 - Capacity of test case projects for C measuring, monitoring and reporting understood:* The capacity of each test case project was availed to Colorado State University (CSU) during 1st year of project implementation.

44. The participation of the KARI scientists in both GEF Soil Organic Carbon (GEF SOC) and CBP projects has enhanced their capacity in modeling. Previously only ICRAF could understand the modeling of SLM and Carbon benefits in Kenya. The KARI staff has been trained in the CBP modeling and can measure, predict and monitor carbon stocks and fluxes and GHG mitigation in SLM projects. As a result of CBP training, some NGOs are now contacting KARI for training on monitoring, measurements and predicting of C stocks and fluxes.

45. Effectiveness of the project especially in the Kenya (A) test case is rated Moderately Satisfactory. In rating the project it is put into consideration that some of the factors that influenced achievement of project outputs and activities come into play in this case. One of the key factors that affect the effectiveness of the project is the fact that the model is internet based. This presents a main constraint in implementing the project in developing countries like Kenya where internet connectivity is low and at times absent or very unreliable.

Efficiency

46. The efficiency criterion is defined relative to the timeliness and cost effectiveness of project execution. Regarding timeliness, as stated above, the CBP suffered a delay of a period of one year. This was attributed to challenges in the development of the model. The delay precipitated a six month extension in order to complete tool development. However, this did not cause any extra funding. The delay also does not seem to have affected the costs and effectiveness of the project implementation. According to the KARI scientists (Dr. Gicheru and Dr. Kamoni), CBP funds were received on time and were put into good use according to the project plan. This was corroborated by Dr. Eleanor Milne (CBP project coordinator) of CSU. Hence for all intents and purposes the project was cost effective. The project's efficiency was also built upon the pre-achievements in GEFSOC project (2002 to 2005) where the two KARI scientists derived a lot of knowledge and experienced from this earlier work.

Table D-5. Total budget – Kenya (A) test case (US$)

Budget item	Total
Senior Personnel	34,377
Other Personnel	29,614
In Country Travel	32,250
Materials & Supplies	11,559
Other Direct Costs	16,400
TOTAL	**124,200**

47. Regarding the cost-effectiveness of the Kenya (A) test case, activities were implemented for a total budget of US$ 12,400 covering all labor, travel, and materials (see Table D-5). KARI carried out accounting of the funds received to the satisfaction of CSU. Overall, the project efficiency is rated Satisfactory.

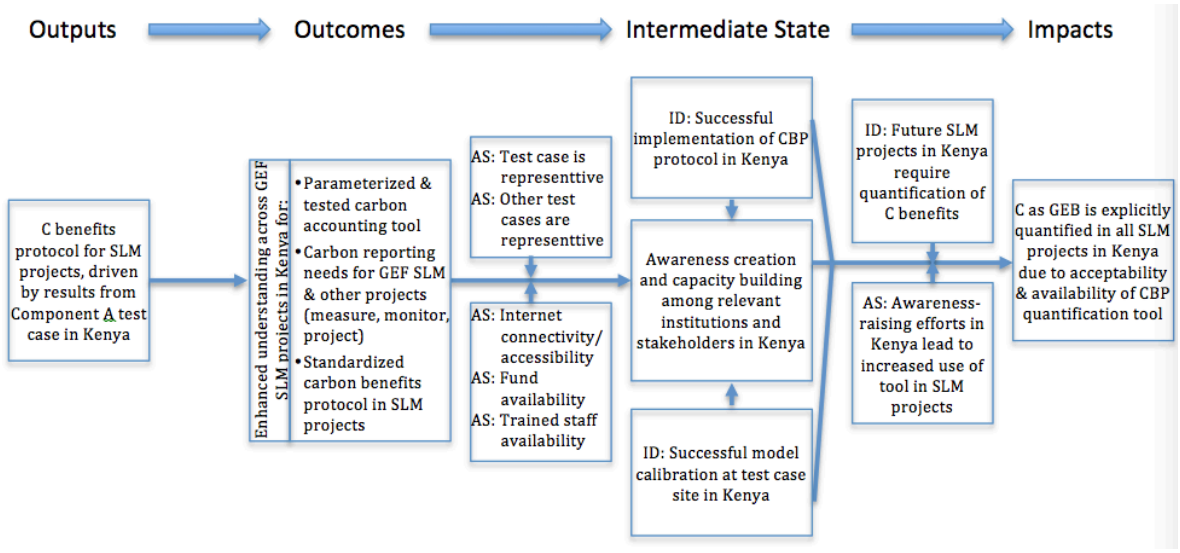
Outcomes to impacts

48. The outcome to impacts criterion is defined relative to the extent to which outputs from the test case sites can contribute towards impacts. For the purposes of the terminal evaluation, the contribution of outcomes to impacts is defined relative to the field-testing component of the CBP. The impact pathways, impact drivers (identified as "ID) and key assumptions (identified as "AS") are summarized in Figure D-5.

49. The review of outcomes to impacts (ROtI) for the Kenya(A) test case was carried out using the methodology presented in the GEF Evaluation Office's ROtI Practitioner's Handbook. This procedure involved the reconstruction of the logical pathways from project outputs over achieved outcomes, towards impacts and taking into account impact drivers and assumptions.

50. The CBP has delivered the intended outputs and outcomes and the developed protocol is now available online. Several scientists from KARI including Dr. Patrick Gicheru and Dr. Peter Kamoni have received training in the model operation. The extent to which the project is likely to contribute to changes in stakeholder behavior in using the

Table D- 5: Outcomes to impacts pathways for the Kenya(A) test case



methodology for measuring carbon and GHG mitigation in Kenya will depend on the following factors:

- Improvement in internet connectivity and accessibility;
- Availability of funds to continue CBP capacity building activities;
- Raising awareness on the benefits of the model; and
- Availability of trained staff to reach out to more institutions and individual stakeholders.

51. Based on the current activities at KARI, the Kenya (A) test case is likely to contribute to changes in stakeholder behavior in the implementation of the CBP system. In this endeavor, the Kenya (A) test case has made some notable progress likely to lead to towards intermediate states. For example, the KARI scientists who received CBP training continue to implement the model through limited application by analyzing total carbon and GHG balance for baseline and project scenarios and incremental difference. Since only a few stakeholders have received adequate training on the model, the KARI scientists are writing a proposal to solicit funds from MOA in order to raise awareness and train more stakeholders in the CBP model implementation. Towards this objective, KARI is now training a PhD student (Mr. Njeru Mugambi) from the University of Nairobi on the use of the model in predicting the carbon stocks and fluxes. It is likely there will be more scope towards the intermediate states if KARI gets some of the remaining CBP funds (US$ 450,000) earmarked for capacity building (Gemma Shepherd Pers Comm). Based on the above efforts, CBP impact in Kenya (A) test case is rated as Moderately Likely.

B. Sustainability and catalytic role

52. The criterion "sustainability and catalytic role" is actually comprised of two (2) separate criteria. The ***sustainability*** criterion is defined relative to the probability of continued long-term project-derived results and impacts after the external project funding and assistance ends. The ***catalytic role*** criterion is defined relative to the extent to which an enabling environment has been created to foster innovation. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table D-6 and described in the subsections that follow.

53. ***Sustainability.*** The sustainability criterion has been evaluated relative to four (4) distinct sub-criteria. These are socio-political sustainability, financial resources, institutional framework, and environmental sustainability. The results of the evaluation of each sub-criterion are described in the paragraphs below after some opening observations.

54. The KARI scientist who participated in the CBP project implementation felt that CBP project is sustainable. On the whole future projects can use the web portal to access the tools and do their analysis. Furthermore developers of the tools would get feedback and do improvements to the tools. However, the key factors that are likely to contribute to the persistence of the project benefits on the Kenya(A) test case are:

    - Availability of project donor funds and funds from other sources;
    - Awareness raising on benefits of the CBP tool
    - Acceptability of the tool for use in carbon trading;
    - Economic benefits the farmers are likely to get by practicing these SLM practices; and
    - Continuity of carbon trading.

55. Two key factors that are likely to undermine the sustainability of the project benefits in the Kenya(A)test case are availability of funds and the fact that the CBP tool only works online. Currently, the Kenya(A) test case does not have any funding to implement the CBP tool. However, the KARI scientists have written a proposal to solicit funds from Ministry of Agriculture (MOA) to carry out capacity building among stakeholders and other relevant project activities including raising awareness on the benefits of the CBP tool. It is also likely that some of the remaining US$ 450,000 in CBP funds (Gemma Shepherd Pers Comm) will be used for capacity building in the Kenya(A) test case. Since the KARI scientists have the drive to implement the CBP tool, any success in getting the

Table D- 6: Summary of evaluation ratings for: "sustainability and catalytic role"

Sub-criterion	Additional Sub-criterion	Sub-criterion rating	Overall criterion rating
Sustainability	Socio-political sustainability	ML	ML
	Financial resources	ML	
	Institutional framework	L	
	Environmental sustainability	ML	
Catalytic role	Behavioral changes	ML	
	Incentives	ML	
	Institutional changes	ML	
	Policy changes	ML	
	Catalytic financing	ML	
	Champions	ML	

Rating code: Highly Likely (HL); Likely (L); Moderately Likely (ML); Moderately Unlikely (MU); Unlikely (U); Highly Unlikely (HU)

funding will significantly enhance the sustainability of the CBP results.

56. Many developing countries like Kenya have serious problems with internet connectivity and accessibility. Since the CBP model only works online, the poor internet connectivity and accessibility prevailing in Kenya are significant factors that can reduce sustainability of the CBP results. Diversification of the CBP model to a version that does not use the internet would significantly increase the number of model users and enhance the sustainability of the project benefits in Kenya. Other factors that will enhance the sustainability of the CBP results in Kenya will include:

- Capacity building among various potential users of the CBP tool; and
- Raising awareness on the benefits of the model among institutions and individual stakeholders.

Socio-political sustainability

57. The socio-political sub-criterion is defined relative to any social or political factors that impact the sustainability of project results and progress towards impacts. Generally the socio-political situation in Kenya will positively influence the sustenance of project results and progress towards impacts. As discussed above, CBP objectives and implementation strategies are consistent with environmental agenda in Kenya. The country developed the National Environment Action Plan (NEAP) in 1994 with the aim of enhancing integration of environment concerns into national planning and development process. Kenya is a signatory to all the relevant environmental conventions including Convention on Biological Diversity (CBD), Kyoto Protocol and United Nation Framework on Convention on Climate Change (UNFCCC), thus demonstrating her commitment in combating the problems of environment and climate change. Despite the above national commitment, it is likely that at the community level sustainability of the project results may be influenced by the social factors prevailing in the areas implementing the project including the test sites. In these areas, farmers' socio-economic status is likely to make them prefer short term benefits including planting crops such as maize, beans and bananas that are quick yielding rather planting trees for carbon sequestration with the aim of attracting carbon credits and other long-term benefits.

58. As to whether there is sufficient government and stakeholder awareness and interest on the benefits of the CBP tool, it should be realized that the CBP model was completed and available online only recently (December 2012). Consequently, the level of ownership by the main national and regional stakeholders is not sufficient enough to allow for the project results to be sustained. Although several stakeholders were trained on the working of the model in December, 2012, it is unlikely that all the stakeholders who underwent the CBP training are confident enough to disseminate the information on the model and build capacity on new stakeholders. The exception to the above reservation is the staff of ICRAF and the KARI scientists who participated in the CBP implementation from inception. The KARI scientists also participated in the development of GEFSOC model, which was a precursor to the CBP model. Currently, there is no actual follow up work on capacity building including the raising of awareness of the model among individual stakeholders and institutions. However, the KARI scientists have now written a proposal to solicit funds from MOA in order to carry out capacity building among stakeholders and other relevant project activities including raising awareness on

the benefits of the CBP tool. It is also likely that the above effort will be supported by the GEF through the remaining US$ 450,000 in CBP funds (Gemma Shepherd Pers Comm). The project's socio-political sustainability is rated as Moderately Likely.

Financial resources

59. The financial resources sub-criterion is defined relative to the dependence of eventual impact from the test case sites on continued financial support. The continuation of project results and the eventual impact of the project in the Kenya(A)test case are dependent on continued financial support. Continued funding will enhance the sustainability of project results with regard to the following activities:

- Awareness creation on the CBP tool,
- Capacity building including the training of other stakeholders;
- CBP model calibration and validation in the field; and
- Introduction of other parameters including carbon trade.

60. Presently the CBP finance vote at KARI is exhausted and without extended financial resources from GEF or any other sources, there no remaining funds to continue with project activities. According to the KARI scientists, sustainability of the project will to a large extent depend on whether there are financial resources to at least to raise awareness and disseminate the model results to stakeholders. Towards this objective KARI has already written a proposal to solicit funds from MOA in order to carry out implementation of the CBP activities including capacity building among stakeholders and other relevant project activities. It is also likely that KARI may get some funding from GEF through the remaining US$ 450,000 in CBP funds (Gemma Shepherd Pers Comm). The project's financial sustainability is rated as Moderately Likely.

Institutional framework

61. The institutional framework sub-criterion is defined relative to institutional framework and governance issues that impact the sustainability of project results and progress towards impacts. The Kenya(A) test case was implemented by the scientists from KARI, a leading agricultural research organization with an excellent institutional framework and governance landscape both in Kenya and in the East African Region. Through the GEFSOC project, KARI collated extensive data sets and developed expertise in soil carbon modelling and use of the GEFSOC modelling system for estimating SOC stocks and changes. This experience was brought to play in the implementation of the CBP project. KARI has the infrastructural capacity, necessary policies, institutional and governance framework required to sustain the CBP results with potential to lead to impacts on human behavior and environmental resources. During the implementation of the CBP (2009 – 2012), KARI provided the required physical facilities, personnel, necessary data and information for the model development and other support and inputs to the CBP tool development and satisfactorily accounted for the project funds received from CSU. More recently, KARI expanded its institutional framework to accommodate global changes among its mandate. In an effort to respond to effects of climate change, KARI recently launched the KARI Climatic Change Unit (KCCU). The main aim KCCU is to develop capacity and adaptation technologies to help stakeholders to adequately respond to the effects of climate change.

62. Beyond KARI, the policy and governance structures of the Government of Kenya (GoK) are consistent with the objectives of CBP. As stated in many sections of this report, the GoK has demonstrated commitment to combat problems of environment and climate change. Among the notable commitments, the GoK signed the Convention on Biological Diversity (CBD) in 1992 and ratified the same in 1994. In 2002, the GoK developed a National Action Plan (NAP) to address land degradation in the context of the United Nations Convention to combat Desertification (UNCCD). In August 1994, Kenya ratified the UNFCCC and acceded to the Kyoto Protocol in February 2005. All the above in initiatives demonstrate that the Government has relevant policies, institutional structure and governance environment necessary to enhance the sustainability of project results which are likely to lead to impacts on human behavior and environmental resources. Institutional sustainability is rated Likely (L).

Environmental sustainability

63. The environmental sustainability sub-criterion is defined relative to any environmental factors that can impact the future flow of project benefits. Discussion with the KARI partners involved in the implementation of the CBP, did not point to any significant environmental factors that are likely to negatively influence the future flow of project benefits. It should, however, be appreciated that the CBP implementation was taking place in the background of the host project, the GEF funded Kenya Agricultural Productivity – Sustainable Land Management (KAP SLM) project. The KAP SLM main aim is to address soil erosion and land degradation hazards in the Cherangani Hills, Kinale and Taita-Taveta catchments of Kenya. Although KAP SLM is only one year into implementation, and probably too early to gauge its impacts on the environment and local community, the project implementers (some of them also participated in the implementation of CBP), have noted a positive change in the attitudes of the local people with regard to land management and protection of environment. The above statement is based on the following observations in the project area:

- Some NGOs in the project area including Vi Agroforestry have made attempts at inducing the local community into sustainable land management and carbon trade activities;
- There is no more encroachment into the forests of Cherangani Hills;
- There is increased establishment of tree nurseries; and
- Farmers are now proactive in planting their woodlots in order to be self-sufficient in firewood, timber and building material supply.

64. All the above community initiatives are likely to improve the environment and reverse land degradation in the project area, which in turn will affect the sustainability of the project benefits. Environmental sustainability was rated Likely.

65. ***Catalytic role.*** The catalytic role criterion has been evaluated relative to six (6) sub-criteria, namely behavioral changes, incentives, institutional changes, policy changes, catalytic financing, and champions (Table D-6). The results of the evaluation of each sub-criterion are described in the paragraphs below. Overall, The catalytic role of the project is rated as Moderately Satisfactory.

Behavioral changes

66. The behavioral changes sub-criterion is defined relative to any broad-based changes made by stakeholders in Kenya that are a direct result of the application of the CBP at the test case sites. The extent to which the project has catalyzed behavioral changes by the relevant stakeholders in terms of use and application of CBP tool can only be described as moderate. The above moderate rating is attributed to the fact that the CBP model was completed and available online only recently (December 2012) and therefore not many stakeholders have come to know and apply the tool. It is also likely that a large percentage of stakeholders who participated in the CBP training, except the staff of ICRAF and KARI (the two institutions participated in the model development and CBP implementation since inception) are not confident enough or do not have adequate resources to build capacity and recruit new stakeholders. It should also be appreciated that the model is still "in the classroom stage" and has not been validated or calibrated in the field.

67. Indeed, the KARI scientists are now making concerted efforts to catalyze behavioral changes among the relevant stakeholders in Kenya with a view to upscale the project activities. Realizing that only a few stakeholders have received adequate training on the CBP tool the KARI scientists have now written a proposal to the Ministry of Agriculture (MOA) to solicit for funds in order to raise awareness and train more stakeholders in the CBP model implementation. In addition, KARI is now training a PhD student (Mr. Njeru Mugambi) from the University of Nairobi on the use of the model in predicting the carbon stocks and fluxes and using the data from the field to calibrate and validate the CBP model. Behavioral changes is rated Moderately Satisfactory (MS).

Incentives

68. The incentives sub-criterion is defined relative to any broad-based changes made by stakeholders in Kenya that are a direct results of incentives embedded in the CBP application at the test case sites. The CBP does not seem to have adopted an approach to promote replication effects. However, KARI's identification of the need to increase the number of trained stakeholders on the model implementation and the initiative to solicit funds from MOA for capacity building of the relevant stakeholders may enhance prospects of project replication. However, the following factors are likely to influence replication and scaling up of project experiences in Kenya:

    - Resources availability and funding opportunities;
    - Level of capacity building among wide range of relevant stakeholders;
    - Awareness on the availability of CBP tool ; and
    - Internet connectivity and accessibility.

Institutional changes

69. The institutional changes sub-criterion is defined relative to any institutional uptake in Kenya of lessons from the CBP application at the test case sites. Although KARI is making efforts to solicit funds to embark on capacity building among the stakeholders, as of the time of this writing this report, there is no evidence of mainstreaming of lessons from

the test case sites into the wider institutional setting for SLM activities in Kenya. Rating on the Institutional changes is Moderately Satisfactory (MS).

Policy changes

70. The policy changes sub-criterion is defined relative to the development of new policies in Kenya based on the lessons from the CBP application at the test case sites. Although the project has not contributed to policy changes or provided tangible incentives to contribute to catalyzing changes in stakeholder behavior, it has to some extent contributed to institutional changes and created opportunities for individual scientists to catalyze change. The KARI scientists participated in the development of GEFSOC model which was a precursor to the CBP model. Through the GEFSOC project, KARI collated extensive data sets and developed expertise in soil carbon modelling and use of the GEFSOC modelling system for estimating SOC stocks and changes. This experience was brought to play in the implementation of the CBP project, where KARI provided the required infrastructure and facilities for project implementation. The KARI scientists who received CBP training continue to implement the model through limited application by analyzing total carbon and GHG balance for baseline and project scenarios and incremental difference. Based on the above experiences, it is very likely that the project has created opportunities for KARI and its scientists to catalyze change.

Catalytic financing

71. The catalytic financing sub-criterion is defined relative to the emergence of any follow-on funding from government, bilateral donors, or the GEF to support continued activities at the test case sites. As of the time of this writing, there is no evidence of any follow-on funding from any sources.

Champions

72. The champions sub-criterion is defined relative to the emergence of particular individuals or institutions in Kenya willing to promote the lessons and results from the test case sites into the broader Kenya planning context. Although KARI is making an attempt at building capacity on the CBP model among stakeholders, as of the time of this writing, there is still no potential champion prepared to work to catalyze the mainstreaming of the CBP tool within planning and policymaking institutions in Kenya.

C. Procedures affecting attainment of project results

73. The criterion "procedures affecting attainment of project results" has been evaluated relative to seven (7) distinct sub-criteria, namely preparation and readiness; implementation approach and adaptation management; stakeholder participation and public awareness; country ownership and driven-ness; financial planning and management; UNEP supervision and backstopping; and monitoring and evaluation. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table D-7 and described in the subsections that follow.

Preparation and readiness

74. The preparation and readiness sub-criterion is defined relative to the clarity, practicality, and feasibility of the test case objectives in the sub-contractual agreement with CSU. The CBP achieved its main objective in providing a cost effective, user-friendly, yet scientifically rigorous methodology for measuring carbon and GHG mitigation benefits in GEF projects dealing with natural resources. The project, however, could not be completed within the two-year timeline allocated. This precipitated an extension of one year to complete the model development but the extension did not attract any cost implications on the project execution. The project document though quite technical, was clear and realistic and it enabled effective and efficient implementation of the project.

Table D- 7: Summary of evaluation ratings for: "Procedures affecting attainment of project results"

Sub-criterion	Sub-criterion rating	Overall criterion rating
Preparation and readiness	MS	MS
Implementation approach and adaptive management	MS	
Stakeholder participation and public awareness	MS	
Country ownership and driven-ness	S	
Financial planning and management	S	
UNEP supervision and backstopping	NA	
Monitoring and evaluation	NA	

Rating code: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

The lead agency, CSU role in methodology development including sub-contracting to the test-case partners in Kenya was exemplary. The partnership arrangements were properly identified and the roles and responsibilities negotiated with KARI partners prior to project implementation.

75. The CBP incorporated valuable lessons from other projects into the project's design. The project's design built on the approaches used by Colorado State University (CSU) in estimating soil greenhouse gas emissions and the CSU's extensive experience in ground-based measurement of ecosystem C stocks and in designing long-term monitoring systems and the experience of the project coordinator, Eleanor Milne in her work on greenhouse gas inventory. In addition, lessons from other relevant projects especially the GEFSOC were properly incorporated in the project design, while lessons learned and recommendations from Steering Committee meetings were adequately integrated in the project implementation. Furthermore, the KARI scientists who participated in the development of GEFSOC model used their expertise to design project at the test case level and in the implementation of the project.

76. However, the selection of KAP SLM as the CBP host project and Cherangani Hills as a test case site affected the implementation of the project especially the following activities:

- Activity 1 - Development and test the Activity Data Module and Calculation Modules of the CBP tool; and
- Activity 5 - Implement the CBP protocol in the selected sites, with a view to implementation across the whole project area in the third year of the CBP project

77. With regard to the implementation of the above project activities, the CBP Project came to an end (2012) when the KAP SLM was commencing and therefore it was not possible to adequately produce results for the Simple Assessment, Detailed Assessment and

Dynamic Modeling of the CBP tool. The preparation and readiness was rated Moderately Satisfactory (MS).

Implementation approach and adaptive management

78. The implementation approach and adaptive management sub-criterion is defined relative to the project's adaptation to changing conditions, the effectiveness of implementation arrangements, relevance of changes in project (or tool) design, and overall performance of project management. To a large extent the project implementation mechanism outlined in the project document was followed and was found to be effective in delivering project outputs and outcomes. With regard to the role and performance of the project execution arrangements, including the units and committees established, it should be noted that the project at the Kenya (A) test case level did not deal directly with the high levels of the CBP project structure and management at the GEF, UNEP, Steering Committee or the GEF STAP levels. The Kenya (A) test case project management received direction and guidance from the lead agency for Component A, the Colorado State University (CSU). The KARI partners felt the leadership provided by the CSU was exemplary and they did not experience any administrative, operational and/or technical problems and constraints that negatively influenced the project implementation.

79. The CBP as a whole suffered a delay in implementation due to the intricacies in the model development. This delay precipitated a project time extension of one year without any cost implications on the project execution. Although the CBP started when the KAP SLM was not ready as a "host project" to CBP, no adaptation seems to have been done accommodate the situation. The rating of the project implementation approach was Moderately Satisfactory (MS).

Stakeholder participation and public awareness

80. The stakeholder participation and public awareness sub-criterion is defined relative to the effectiveness of consultations and project decision-making among stakeholders. The key stakeholders in the Kenya (A) test case were the Ministry of Agriculture (MOA), the Government of Kenya (GoK) as represented by KARI, the staff (two scientists) of KARI, Colorado State University, and the local community where test sites were located. The stakeholders were fully engaged in effective collaboration and interactions during the course of implementation of the CBP. Before the commencement of the project Dr. Patrick Gicheru representing KARI wrote to Dr. Eleanor Milne to confirm the willingness of KARI in the participation of CBP implementation. The KARI scientist attended and participated in the project inception workshop (11-14th May 2009) and the Component A Team Workshop held between 19th and 23rd October at the University of Leicester. Between 6th and 8th April, 2010, both CSU and KARI partners participated in the CBP consultation workshop held at the Jacaranda Hotel, Nairobi, Kenya where the CBP system was introduced with the CSU team resolving emerging questions/issues. Thereafter, both CSU and KARI partners visited the test case site in Cherangani Hills. Since 2009, KARI partners liaised with the CSU through email and telephone correspondence on matters concerning the CBP implementation including assembling of existing data sets, collating information on baseline conditions and assessing C and GHG reporting requirements

81. The KARI scientists provided data on the usability of draft versions of the cost benefit analysis (CBA) and the social analysis (DPSIR), and worked with scientists of CSU to put the CBP toolkit into practice using the field measurement and national information to provide site specific data. The stakeholder interactions were also extended when the KARI scientists met project participants in the course of attending conferences, workshops and scientific forums and when they made presentations on the progress of the project and outcomes at the relevant fora. The process of information dissemination and consultation between the stakeholders effectively continued until the CBP tool was completed in December, 2012.

82. Although at the test site level, local communities have a high stake interest in the implementation of project as this was likely to directly affect their environment and economy; there was no stakeholder involvement initially at the CBP project test sites of Cherangani Hills, Kinale and Taita - Taveta catchments. This is because implementation of CBP ended before the host project (GEF funded KAP SLM) started. Stakeholder participation and public awareness was rated as Moderately Satisfactory (MS).

Country ownership and driven-ness

83. The country ownership and driven-ness sub-criterion is defined relative to the degree to which government has assumed responsibility for the test case sites, offered institutional support, and been responsive to UNEP-DEWA guidance. The Government of Kenya (GoK) through KARI, a parastatal organization in the Ministry of Agriculture (MOA) assumed responsibility for the CBP project and provided adequate support to project execution. The national focal point for the project, the National Environment Management Authority (NEMA) cleared the CBP for implementation. KARI provided the necessary institutional framework and governance structure essential for the implementation of the project. Although there were no counterpart funding (in cash) for the CBP activities, KARI provided in kind support to CBP. In the Memorandum of Understanding (MoU), between KARI and CSU, KARI provided the required two scientists to work in the CBP. Other support provided by KARI included material support (vehicles, computers, office facilities) and salaries for the staff involved in the project. The project also received high level cooperation from the various contact institutions including the Ministry of Agriculture, Kenya Forestry Service (KFS) and KEFRI, among other institutions in Kenya.

84. As stated in many sections of this report, the political and institutional framework prevailing in Kenya has offered conducive environment for the project implementation and performance. The country has demonstrated commitment to combat problems of environment and climate change. In addition, the GoK has relevant policies, institutional structure and governance environment necessary for the implementation of the CBP. The country ownership and driven-ness was rated Satisfactory (S).

Financial planning and management

85. The sub-criterion is defined relative to the quality and effectiveness of financial planning and control of financial resources throughout the project's lifetime. The Kenya (A) test case funds agreed in the project budget were US$ 124,200.00. So far the above test case has received all the total amount of funds (US$ 124,200.00) invoiced by 18th April, 2013 and there are no remaining funds. Funding from CSU was utilized for field trips, data

entry, communication, purchase of stationery, and payment of overtime for the staff (scientists and GIS expert). The control of financial resources throughout the project's lifetime was effective. Once sub-contracts were set up, Kenya (A) test case like all other test case partners implemented the CBP using their own funding sources and thereafter sent invoices to CSU with details of expenditure. Funds were reimbursed to the KARI partners once CSU was satisfied the invoice corresponded with work performed for the project. This system ensured that sufficient and timely financial resources were available to the project and its partners. The CBP did not get any co-financing from the Kenya (A) test case apart from material support (vehicles, computers, office facilities) and salaries for the staff involved in the project. Since inception CBP at the Kenya (A) test case level did not leverage any resources.

86. The Kenya (A) test case did not experience any irregularities in the financial management and reporting. As stated above, CSU operated an accounting system where invoices submitted were checked to verify whether reimbursements requested matched work performed before transfers were made. In general financial reporting and management was timely and no delays were encountered in the Kenya (A) test case. The financial management and reporting of the test case is rated Satisfactory (S).

UNEP supervision and backstopping

87. The UNEP supervision and backstopping sub-criterion is defined relative to effectiveness of supervision and administrative/financial support provided by UNEP. This sub-criterion is not applicable at the test case level due to the lack of a direct line of accountability between UNEP and the test case sites.

Monitoring and evaluation

88. The monitoring and evaluation sub-criterion is defined relative to the effectiveness of project monitoring and evaluation (M&E) plans and tools. This sub-criterion is not applicable at the Kenya(A)test case due to the lack of M&E activities built into the sub-contractual arrangements with CSU.

D. Complementarity with UNEP programmes and strategies

89. The criterion "complementarity with UNEP programmes and strategies" has not been evaluated at the test case level. This is due to the fact that none of the four (4) sub-criteria (i.e., linkage to UNEP's EAs and POW 2010-2011; alignment with the Bali Strategic Plan; gender; and South-South Cooperation) are relevant to individual test case sites. The activities relative to the sub-criteria are relevant only at the overall project level.

Part III - Conclusions and recommendations

A. Conclusions

90. The final evaluation ratings for the Kenya(A) test case are summarized in Table D-8. The major findings of the terminal evaluation are described in the paragraphs that follow.

91. The major positive achievements of the Kenya(A)test case are summarized in the bullets below.

Table D- 8: Summary of evaluation ratings for the Kenya(A)test case

Criterion	Sub-criterion	Additional Sub-criterion	Sub-criterion rating	Overall criterion rating
Attainment of objectives and planned results	Achievement of outputs and activities	NA	MU	MS
	Relevance		S	
	Effectiveness		MS	
	Efficiency		S	
	Outcomes to impacts		MS	
Sustainability and catalytic role	Sustainability	Socio-political sustainability	ML	ML
		Financial resources	ML	
		Institutional framework	L	
		Environmental sustainability	L	
	Catalytic role	Behavioral changes	ML	
		Incentives	ML	
		Institutional changes	ML	
		Policy changes	ML	
		Catalytic financing	ML	
		Champions	ML	
Procedures affecting attainment of project results	Preparation and readiness	NA	MS	MS
	Implementation approach/adaptive mngmnt		MS	
	Stakeholder participation/public awareness		MS	
	Country ownership and driven-ness		S	
	Financial planning and management		S	
	UNEP supervision and backstopping		NA	
	Monitoring and evaluation		NA	
Complementarity with UNEP programmes and strategies	Linkage to UNEP EAs & POW 2010-11	NA	NA	NA
	Alignment with the Bali Strategic Plan		NA	
	Gender		NA	
	South-South Cooperation		NA	

Rating code for all criteria except Sustainability and catalytic role: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

Rating code for Sustainability and catalytic role: Highly Likely (HL); Likely (L); Moderately Likely (ML); Moderately Unlikely (MU); Unlikely (U); Highly Unlikely (HU)

- The CBP achieved its main objective in providing a cost effective, user-friendly, yet scientifically rigorous methodology for measuring carbon and GHG mitigation benefits in GEF projects dealing with natural resources.
- The CBP has delivered the intended outputs and outcomes and the developed protocol which is now available online. However, the key factors that are likely to contribute to the persistence of the project benefits on the Kenya (A) test case are:
    - Availability of project donor funds;
    - Raising awareness on the CBP tool;
    - Acceptability of the tool for use in carbon trading;
    - Economic benefits the farmers are likely to get by practicing these SLM practices; and
    - Continuity of carbon trading.
- Several scientists from KARI received training in the CBP model operation. The participation of the KARI scientists in both GEF Soil Organic Carbon (GEFSOC) and CBP projects has enhanced their capacity in modeling and can now measure, predict and monitor carbon stocks and fluxes and mitigate GHG in SLM projects.

92. The major negative aspects of the Kenya(A)test case are summarized in the bullets below, together with the underlying causes.

- The CBP could not be completed within the two-year timeline allocated. This precipitated an extension of one year to complete the model development although the extension did not attract any cost implications on the project execution;
- One of the key factors that are likely to affect the effectiveness of the CBP tool is the fact that the model is internet based. This presents a main constraint in implementing the project in developing countries like Kenya where internet connectivity is low and at times absent or very unreliable;
- Although the KARI staff participated in the training sessions on the CBP protocol, none of the KAP SLM project staff (the MOA staff currently implementing KAP SLM in Cherangani Hills) has been trained in the use of the CBP tool.
- Testing of the Activity Data Module and the Calculation Modules (i.e., Simple Assessment, Detailed Assessment, Dynamic Modeling) of the CBP tool proved to be challenging for the Cherangani Hills test case as it was not possible to produce results even for the simple assessment before the project ended.
- The CBP model encountered a challenge that has not yet been resolved. It cannot handle reseeding, introduction of grass strips and construction of terraces, activities that are essential for soil erosion control in Charangani Hills.

93. In conclusion, the overall assessment of the Kenya(A)test case is Moderately Satisfactory. The evidence provided in previous sections supports this summary conclusion. The key factors that have contributed to this overall assessment are briefly described in the bullets below.

- The participation of the KARI scientists in both GEF Soil Organic Carbon (GEF SOC) and CBP projects enhanced their capacity in CBP modeling. The KARI staff can now effectively measure, predict and monitor and model carbon stocks and fluxes and GHG mitigation in SLM projects; and
- The delay in starting the KAP SLM project was the main cause for not adequately testing of the Activity Data Module and the Calculation Modules of the CBP tool in the Cherangani Hills test site during the lifespan of the CBP (2009 – 2012).

B. Lessons learned

94. There are two key lessons that have emerged from the evaluation of the Kenya(A)test case. These lessons, summarized in the bullets below, are directly applicable to future projects that involve the implementation of country-based demonstration projects to support the development of quantitative tools and methods.

- Training of the local staff in CBP and GEFSOC modeling as carried out among the KARI staff was a good lesson and practice that should be replicated in all the GEF projects. The trained local expertise will be instrumental in sustaining the project outputs among the relevant stakeholders in Kenya once the CBP project has come to an end.

- However, training on CBP tool alone, without support for capacity building including raising awareness on the CBP tool, is inadequate to sustain the CBP outputs in developing countries like Kenya.

C. Recommendations

95. There are several key recommendations that can serve as actionable proposals to resolve the concrete problems that have affected the execution of the Kenya(A)test case and the sustainability of its outputs. These lessons, summarized in the bullets below, are feasible to implement within the framework of the capacity that has been built.

- There is need for GEF to support KARI staff in training and dissemination of the CBP tool benefits to a wider range of stakeholders in Kenya. .
- Due to problems with internet connectivity and accessibility in Kenya and many developing countries, a diversification of the CBP model to a version that is not based on internet connectivity would significantly increase the number of model users and enhance the sustainability of the project benefits in Kenya.
- There is a dire need to provide additional training to the Ministry of Agriculture (MOA) team that is currently implementing KAP SLM in the Cherangani Hills test site, since they did not participate in the initial CBP training.
- Due to the delay in starting the KAP SLM project and the subsequent inadequate testing of the Activity Data Module and the Calculation Modules of the CBP tool during the lifespan of the CBP (2009 – 2012), there is need to support KARI and MOA team in testing of all the portions of CBP tool in the Cherangani Hills test site.
- KAP SLM team and KARI staff should continue their partnership with CSU in order to resolve the CBP model challenge of handling reseeding, introduction of grass strips and construction of terraces which are essential interventions for erosion control in the Cherangani Hills test site.

Annex D-1: Evaluation itinerary and meetings

a) Site visit itinerary

Date	Time	Activities
17/04/2013	Nairobi - Kitale	Travelled from Nairobi to Kitale on our way to Cherangani Test Site with Peter Kamoni from KARI.
18/04/2013	Kitale-Cherangani Hills	Carried out the following activities: • Met Mr. Robert Musikoyo, Deputy Project Manager, Vi Agroforesty. • Held discussions with Mr. Musikoyo based on the activities of Vi Agroforestry in the western Kenya. Travelled to the Cherangani Hills test site and viewed the salient features of the project test site.
19/04/2013	Kitale - Nairobi	Travelled from Kitale to Nairobi.

b) Site visit contact list

Date	Location	Organization/unit	Activities
11/03/2013	Nairobi	National Agricultural Laboratories (NARL), Kabete	Held a meeting with Dr. Patrick Gicheru and Dr. Kamoni to discuss the modalities of responding to the CBP Evaluation Questionnaire.
13/ 03/2013	Nairobi	National Agricultural	Held another meeting with Dr. Patrick Gicheru and Dr. Kamoni to

Date	Location	Organization/unit	Activities
		Laboratories (NARL), Kabete	discuss the responses to the Evaluation Questionnaire.
03/04/2013	Nairobi	Shanema Homes near UNEP	Both Consultants William Dougherty and Frank Muthuri reviewed the CBP evaluation progress and itinerary for 2-5 April visit to UNEP.
03/04/2013	Nairobi	UNEP, Gigiri	Met Ms Jessica Kamugira of the UNEP Evaluation Office for a brief introduction.
03/04/2013	Nairobi	UNEP, Gigiri	Held a meeting with Gemma Shepherd and Mohammed Sessay of UNEP, reviewed the CBP progress, and achievements, shared findings and discussed the way forward.
04/04/2013	Nairobi	UNEP, Gigiri	Met Martin Okun and Rodney Vorley and discussed CBP finance management.
05/04/2013	Nairobi	UNEP, Gigiri	The Consultants (William Dougharty and Frank Muthuri) prepared and gave an initial terminal evaluation presentation to the UNEP Evaluation Office represented by Jessica Kamugira and Michael Spilsbury.
18 /04/2013	Kitale	Vi Agroforestry	Met and held discussions with Mr. Robert Musikoyo, Deputy Project Manager, Vi Agroforesty based on the activities of Vi Agroforestry in the western Kenya.

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b) Additional documents collected and reviewed

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Annex D-3: Finances

Detailed information on co-financing arrangements was not available. A statement of project expenditures by activity was also not available.

Annex D-4: Supporting consultant info

See Annex A.

Annex E: Kenya(B) Test Case

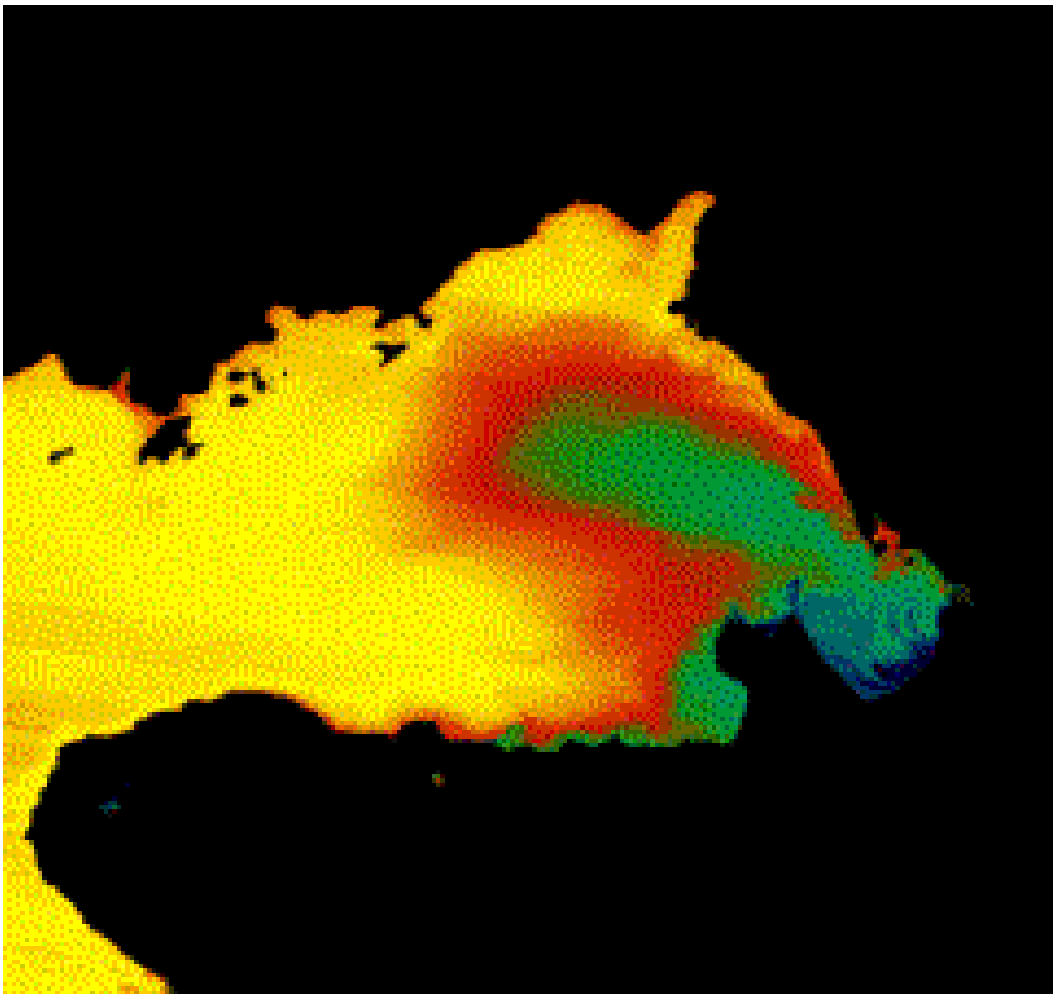
Part I - Evaluation Background

A. Context

1. Component B project builds on the existing work in western Kenya undertaken as part of the Western Kenya Integrated Environmental Management Project (WKIEMP), a GEF co-sponsored intervention in the Nzoia, Yala and Nyando catchments of the Lake Victoria basin. Western Kenya is part of Lake Victoria basin an expansive basin that covers 184,400 km^2 of Kenya, Uganda, Tanzania, Rwanda and Burundi. The basin is a home to an estimated 35 million people with an average population density of 135 persons km^{-2}. Lake Victoria basin comprises 11 major river basins such as River Nzoia, Yala, Nyando and Sonu-Miriu, among others and a large lake edge area that drains directly into the lake. The lake a covers a surface area of 68,000 km^2 and adding its catchment (covering 184,400 km^2) together gives an area of 252,400 km^2. Lake Victoria is the source of the Victoria Nile, and as such the hydrological lifeline for much of Uganda, the Sudan and Egypt.
2. The Kenyan portion of the Lake Victoria basin covers about 42,000 km^2 and is home to about 7.9 million people. This drainage area includes lands with high agricultural potential coupled with high rates of environmental deterioration. The Nyando, Sondu-Miriu and Yala river basins have all experienced high rates of deforestation and loss of topsoil (ISRIC, 1971). Among the 11 major rivers draining in Lake Victoria, four basins that are contained within Kenya all receive considerably higher average annual rainfall than any of the other river basins. The erosion risk, as measured by both percent and sediment transport capacity, is thus much higher in the Kenyan rivers.
3. The rapid increase in human population in the past half a century, has led to significant effect on the land and water quality in Lake Victoria basin. The effects of human population increase have serious environmental implications especially in the western Kenya. The high rural population coupled with stagnating urban job growth has accelerated the search for new agricultural land resulting in high rate of conversion of woodlands, forests and wetlands into agricultural production. Despite the existence of national laws and regulations that discourage human encroachment into fragile ecosystems, the search for livelihoods has resulted in the cultivation of steep slopes, wetlands, and forests in western Kenya resulting in high rates of land and water degradation and biodiversity loss in western Kenya.
4. Studies conducted in the context of Lake Victoria Integrated Project indicate occurrence of severely accelerated land degradation particularly in the Nyando River Basin. In this basin, large quantities of sediment (discernible in satellite images), as presented in Figure E-1, are being deposited at the outlet of the Nyando River Basin in the Winam Gulf of Lake Victoria. Indeed measurements conducted on the sediment cores collected in the Nyando estuary show that sedimentation rates have increased fourfold over the last 100 years. This level of degradation has led to an export of high sediment loads to the tune of 3.2 $X10^6$ Mg Yr^{-1} of sediment to Nyando River with subsequent compromise on water quality in the lake. Land degradation of the above magnitude has significant impacts on soil fertility, water quality including eutrophication of Lake Victoria which has

now led to rapid colonization of the lake by water hyacinth (*Eichhornia crassipes*) and subsequent decrease in fish and aquatic plant diversity.

Figure E- 1: Nyando sediment plume (~40 km2) in Winam Gulf, Lake Victoria



Source: Based on Landsat ETM data Feb. 2000

5. Indeed, western Kenya's rich stock of biodiversity has suffered as a result of land degradation. By the mid 1980's, some 400 endemic species of cichlid fish were approaching extinction due to encroachment from water hyacinth and increasing eutrophication of Lake Victoria. Deforestation and loss of vegetative cover has also resulted in a shortage of plant and tree resources. Over the last 150 years the most important land cover conversion pathways in the Nyando basin have been characterized by substitutions of vegetation dominated by trees (characterized by a C3 photosynthetic pathway) to vegetation dominated by grasses (characterized by a C4 photosynthetic pathway). Evidence from stable carbon isotope (i.e.; d13C) studies as shown by work in ICRAF suggest that historically, grass and cereal crop based land use types are strongly associated with elevated soil erosion risk in this environment.

B. The Project

6. Component B has focused on field measurements and monitoring of carbon changes across landscapes with an emphasis on agroforestry and forestry. It sought to assemble, demonstrate and refine the tools needed to reduce costs and expand opportunities for

bringing C sequestration through reforestation and agroforestry to practice and application. The component aimed at reducing the overall expense of C accounting by reducing the need for high cost, time consuming in situ measurements. Although the ground based measurements are not eliminated altogether, they are expanded in their scale and spatial extrapolation across many projects and landscapes. Component B focused on the following three main objectives:

a) To develop a unified protocol to account for C sequestration at the community level using RS measurements, C models and geographic information systems;

b) To develop an accounting system that can be readily used by rural communities and local support organizations; and

c) Develop the needed technologies to support C accounting, management, measurement, and monitoring, using earth observation satellites, internet-based GIS and databases and ground based sensors and sensor webs.

7. The component built on the existing work in western Kenya undertaken as part of the Western Kenya Integrated Environmental Management Project (WKIEMP), a GEF co-sponsored intervention in the Nzoia, Yala and Nyando catchments of the Lake Victoria basin. The project was implemented in two of the three initially identified basins of western Kenya, Nyando, Yala, and Nzoia River Basins, which together, support a population of nearly 7 million. Approximately 75% of the area within these basins is classified as an agro-ecosystem. The total area of the three basins is about 20,000 sq. km (Nyando 3,590 sq. km., Yala 3,250 sq. km., and Nzoia 13,250 sq. km). The project area will consist of approximately nine 100 sq. km focal areas (FA's), three for each river basin. Focal areas within basins will be stratified by elevation zones to include: Lowlands, 1134-1440 m, Midlands, 1440-1890 m and Highlands >1890 m a.s.l. slope.

8. The results of the project aimed to enable GEF, and its Implementing Agencies, to measure and monitor carbon stocks and flows in a very wide range of rural landscapes; b) utilize tools that help to maximize land use emission reductions, carbon sequestration and related ecosystem and socio-economic benefits; c) support capacity development for subsequent country and community use. Together the project's deliverables aimed to enable communities, project developers, and international and national authorities to assess, manage and report on project, portfolio, program and policy performance of projects with carbon goals and components.

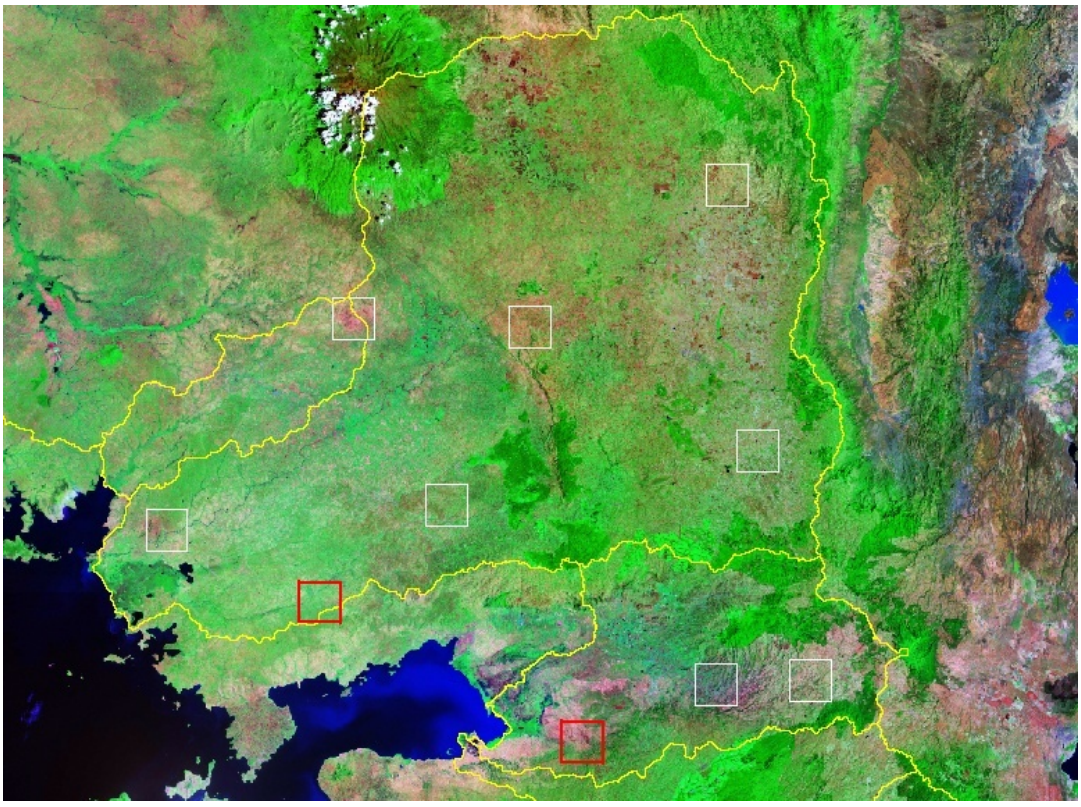
9. The project sought to improve the productivity and sustainability of land use systems in selected watersheds in the Nzoia, Yala and Nyando river basins through adoption of an integrated ecosystem management approach. In order to achieve this, the project planned to: (i) support on- and off-farm conservation strategies; and (ii) improve the capacity of local communities and institutions to identify, formulate and implement integrated ecosystem management activities (including both on-and off-farm land use planning) capturing local and global environmental benefits. The project objectives were planned to be achieved through a community driven development process whereby communities would decide on resources for infrastructure investments, technical assistance and implementation of ecosystem management activities.

10. Component B was built around a set of permanent plots and household locations that provide a sample of the populations of similar plots and households in each of nine, 100

km^2 (10 X 10 km) blocks which have been selected for project implementation. The blocks were located in three of the five major river basins that drain the Kenyan portion of the Lake Victoria Basin, namely the Nyando, Yala and Nzoia River Basins (see Figure E-2). Block locations were stratified by landscape position, and one block was placed within the upper, middle and lower elevation zones of each basin so as to focus on areas of the respective watersheds that appear to be severely degraded.

11. CBP was designed to take advantage of the trials and well characterized research sites in western Kenya to measure and model the dynamics of C, N and GHGs with improved agricultural practices. Quantification focused on soil N oxide emissions (N_2O and NO) and CH_4. Although the CBP did not have any development objectives *per se*, it aimed to develop tools to support development activities in landscapes in western Kenya and work with stakeholders to feedback information to relevant development actors. Like Component A of the project, Component B was part of the GEF focal area: International Waters and Biodiversity with relevance to the Cross cutting issue of Land Degradation. It was part of OP-12 (Integrated Ecosystem Management) with relevance to OP-1 (Arid and Semi-Arid Ecosystems), OP-9 (Integrated Land and Water Management) and OP-15 (Sustainable Land Management). Component B implementation was mainly carried out by the Michigan State University and World Agroforestry Center (ICRAF).

Figure E- 2: Project area - block locations in the Nyando, Yala and Nzoia river basins in western Kenya. Block locations marked in red had already been surveyed at the beginning the project, 2009.



C. Evaluation objectives, scope and methodology

12. The Component B focused on agroforestry and forestry themes. Project activities of the Component B test case were undertaken in western Kenya within Kenyan Lake Victoria basin in the catchments of the Rivers Yala, Nyando and Nzoia (see Figure above). Implementation of the Component B test case activities commenced in earnest in

August 2009, when three MSU team members travelled to Nairobi to meet ICRAF staff to discuss collaboration on field work and to exchange work plans. The project is based on the implementation of the following six activities:

- Field measurements protocols;
- Lab based measurement protocols;
- Satellite remote sensing protocols;
- Supporting data management system;
- Project level carbon monitoring and reporting; and
- Community participating manual

13. The major objective for the evaluation of the Component B test case is to assess the performance of the project relative to the scope of above activities as agreed in the subcontracting arrangements established between WWF and the project implementers at MSU and ICRAF. The Component B evaluation was carried out in line with the UNEP Evaluation Policy, the UNEP Evaluation Manual and the Guidelines for GEF Agencies in Conducting Terminal Evaluations.

14. The methodology applied to evaluate the Component B test case involved desk-based research including identification, acquisition, and review of a comprehensive set of project-related documents. The project performance was evaluated based on the results of desk-based analysis of evaluation questionnaire and through interviews with project implementers in ICRAF and KEFRI. Further interviews were held relevant staff of UNEP and GEF Secretariat.

Part II - Project performance and impact

15. Project performance and impacts for the Component B test case has been evaluated relative to four (4) major criteria, namely attainment of objectives and planned results, sustainability and catalytic role, processes affecting attainment of results, and complementarity with UNEP programmes/strategies. The results of the terminal evaluation for each major criterion are described in the sections that follow.

A. Attainment of objectives and planned results

16. The criterion "attainment of objectives and planned results" has been evaluated relative to five (5) distinct sub-criteria, namely achievement of outputs and activities, relevance, effectiveness, efficiency, and outcomes to impacts. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table E-1 and described in the subsections that follow.

Table E- 1: Summary of evaluation ratings for: "attainment of objectives and planned results"

Sub-criterion	Sub-criterion rating	Overall criterion rating
Achievement of outputs and activities	S	S
Relevance	S	
Effectiveness	S	
Efficiency	S	
Outcomes to impacts	S	

Rating code: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

Achievement of outputs and activities

17. Implementation of Component B commenced on 1st April 2009 with a completion date of April 2011. The component mainly focused on the field measurement and monitoring of carbon changes across landscapes with emphasis on agroforestry and forestry. Project activities in Component B mainly include gathering data and carbon stocks in western Kenya, acquisition and analysis of satellite imagery of relevant locations, creation of protocols for the field measurements of above and below ground carbon stocks, non CO_2 greenhouse gases and the analysis of remotely sensed satellite imagery, and development of allometric equations specific to the test bed through field sampling and the corresponding mathematic analysis.

18. The paragraphs below describe the achievement of outputs and activities for the Kenya Component B test case relative to each of the six (6) activities that formed the scope of work under the subcontract with WWF.

19. Activity #1 focused on field measurements and development of protocols. This included field sampling and development of database models, development of Non-GHG coefficients and development of allometric equations.

20. During the field sampling and development of database models, a hierarchical field sampling scheme for land resource characterization was re-evaluated in terms of ability to provide estimates of above ground carbon stocks at landscape level. Soil sampling was completed in 3 random plots per cluster in each of the five sentinel sites in Lower Nyando, Middle Nyando, Lower Yala and Lower Nzoia. Quick Bird images were commissioned for the five sentinel sites and soil infrared spectral and carbon measurements carried out as expected.

21. Development of non-GHG coefficients involved analysis of near infrared (NIR) spectroscopy and mid infrared (MIR) spectroscopy on soil samples from the GHG measurements sites.

22. Development of allometric equations involved several activities including literature review on species specific allometries developed for some common tree species in western Kenya, recruitment of a Kenya MSc student to assist with the development and testing of a protocol for tree coring for wood density estimates and a PhD student to conduct field measurements and data evaluation, field work involving identification of trees, destructive and non-destructive sampling of above ground and below ground biovolume, drying and weighing of samples. Other activities associated with development of allometric equations were analysis of C content and establishment of allometries and formulation of the sampling protocol and cross checking against other approaches. The main constraint encountered in the development of the allometric equation involved blunting and breaking of the corers. This forced the partners to adapt a successful protocol from the literature which deploys a carpenter's awl.

23. **Activity #2** focused on lab based measurement and development of relevant protocols. This included development of protocol for soil carbon from IR&X-ray spectroscopy, development of baseline and measurement of other greenhouse gases (nitrous oxide and methane) and development of baseline and measurement of other greenhouse gases (nitrous oxide and methane).

24. The development of protocol for soil carbon from IR&X-ray spectroscopy started by drafting standard operating procedures for soil sample preparation and sub sampling, near and mid –infrared analysis of soils, and carbon reference analysis using CN analyzer. Although a breakdown in X-ray equipment delayed the X-ray analysis, development of protocol for soil carbon from IR&X-ray spectroscopy was completed by 30th June 2011.

25. In the implementation of baseline and measurement of other greenhouse gases (nitrous oxide and methane), an additional equipment was required to extend the measurement capacity of ICRAF gas laboratory in Kisumu. This included a NOx analyzer, a NOx calibration unit and an infrared gas analyzer (IRGA). Initial experiences in working with the NOx analyzer were very challenging as the equipment had many measurement problems associated with pressure variations inside the chambers.

26. Protocol for wood density, moisture and C from IR spectroscopy mainly involved development and testing for the NIR prediction of wood density, moisture and carbon. A Kenyan MSc student was recruited to assist with the development and testing of a protocol for tree coring for wood density estimates. Although a protocol for milling of wood samples from wood cores for NIR and MIR spectral analysis was developed, the testing of the NIR and MIR measurement protocol proved to be problematic in the initial stages.

27. **Activity # 3** focused on development of satellite remote sensing protocols. In this activity all major baseline data of the selected areas were identified, documented and achieved in an accessible database. This included data from the WKIEMP project on 9 sites within Nyando, Yala and Nzoia basins. Other required data was identified and acquired including satellite imagery in ICRAF and from other sources, and all relevant data from WKIEMP.

28. **Activity # 4** focused on supporting data management system. This activity mainly involved compilation of a manual on how to set up a structural data management system with a rapid prototype for project carbon monitoring. This activity experienced a delay when two contributors left ICRAF but were replaced thereafter.

29. **Activity # 5** focused on project level carbon monitoring and reporting. Several voluntary carbon standards including Voluntary Carbon Standard (VCS), Climate Community and Biodiversity Standard (CCBS), Plan Vivo, Carbon Fix, California Action Registry (CCAR) and Chicago Climate Exchange (CCX), were reviewed to determine which of them were primary in the field of carbon project verification and crediting.

30. **Activity # 6** focused on development of community participating manual. The focus of this work was the creation of a set of manuals that describe how to perform the ground based measurements that are necessary to complement the remote sensing analysis as part of Carbon Benefits Project. This activity involved compilation of two manuals - a manual of training of trainers, and a handbook for community carbon measurement.

31. Although the project started with a three months delay which precipitated an adjustment in the timeline set in the contract, and other delays occasioned by equipment failure, and other hitches, it successfully completed measurements and monitoring of carbon stocks as presented in the Project Document and the agreement between WWF and MSU and ICRAF. In this regard, all project outputs and activities

pertaining measurement were achieved by 30th June 2012. The attainment of project objectives and activities is rated Satisfactory.

Relevance

32. The project is consistent with GEF Focal Areas especially a) Biodiversity, b) Land Degradation, c) Climate Change especially climate change mitigation which promotes conservation and enhancement of carbon stocks through sustainable management of land use, land use change and forestry (LULUF), and d) Sustainable Forest Management (SFM) and reducing emissions from deforestation and forest degradation (REDD+). The CBP is consistent with the UNEP's mandate and strategy for environmental observation and assessment particularly in the analysis of the state of the global environment, assessment of global and regional environmental trends, and the provision of early warning on environmental threats, based on the best scientific and technical capabilities available.

33. CBP objectives and implementation strategies are consistent with environmental issues and needs in Kenya and the rest of east Africa region. Kenya participated in the United Nations Conference on Environment and Development (UNICED) in Rio de Janeiro, Brazil in 1992. After Rio, Kenya embarked on translation of Agenda 21 into a national development agenda. In 1994, the country developed the National Environment Action Plan (NEAP) with the aim of enhancing integration of environment concerns into national planning and development process. Kenya is a signatory to all the relevant environmental conventions including Convention on Biological Diversity (CBD), Kyoto Protocol and United Nations Framework on Convention on Climate Change (UNFCCC). It ratified the UNFCCC) in 1994 and acceded to Kyoto Protocol in 2005 thus demonstrating her commitment in combating the problems of climate change.

34. Western Kenya, a test bed for the Component B activities, is an important part of the Lake Victoria basin which is shared by the five East African Community member states of Burundi, Kenya, Rwanda, Tanzania and Uganda. In 2009, East African Community member states developed the East African Community Climate Change Policy (EACCCP) with emphasis on the preparation and implementation of collective measures to address climate change in the region especially on priorities such as afforestation, reforestation, efficient crop and livestock production while capturing opportunities in emission reduction provided for under the Clean Development Mechanism (CDM) of the Kyoto Protocol. Component B is consistent with the national priorities of the host country, Kenya as evidenced by the project participation in the pre-existing GEF Western Kenya Integrated Environmental Management project (WKIEMP).

35. Western Kenya is currently experiencing high levels of erosion due to poor land management practices. Studies carried out in Nyando River Basin indicate occurrence of severely accelerated land degradation in the Nyando River Basin. Large quantities of sediment are being deposited at the outlet of the Nyando River basin in the Winam Gulf of Lake Victoria where sedimentation rates of the basin have increased 3 - 4 fold over the last 100 years. Land degradation of this magnitude has large negative impacts on soil fertility and soil physical properties leading to poor crop performance. Although CBP does not have development objectives *per se*, rather it has developed tools to support development activities in landscapes like western Kenya. In addition, CBP has worked with stakeholders especially those who have been working with the Western Kenya

Integrated Ecosystem Management Project (WKIEMP) to feed information back to relevant development actors. The rating of the project relevance is Satisfactory (S).

Effectiveness

36. The effectiveness criterion is defined relative to the extent to which the test case achieved its main objectives. The main objective of the Component B is the development of a landscape carbon measurement, monitoring and modelling system. The following indicators represent the basis for the evaluation of the effectiveness of the Kenya (B) test case.

37. ***Indicator #1 - Protocol for measurement of soil carbon developed:*** The protocol for the measurement of soil carbon is now complete.

38. ***Indicator #2 – Field measurement pprotocol manual developed:*** The field measurement protocol manual is complete.

39. ***Indicator #3 - Protocol for measurement of soil carbon developed:*** The protocol for the measurement of soil carbon is now complete.

40. ***Indicator #4 - Protocol for biomass field sampling and analysis developed:*** This protocol is complete and published.

41. ***Indicator #5 – Model for assessing biomass ground level based on non-destructive measurements developed:*** The model is complete, operational and accessible online.

42. ***Indicator #6 – Protocol for GHG field sampling and analysis complete:*** This protocol has been developed.

43. ***Indicator #7 - Protocol for soil carbon measurement using infrared and X-ray spectroscopy and protocol for wood density measurement using IR spectroscopy developed:*** The two protocols have been developed.

44. ***Indicator #8 – Laboratory manual for non-CO_2 GHG measurement developed:*** The manual has been developed.

45. ***Indicator #9 – Spatial data covering both overall area and project specific sites listed and documented:*** A complete spatial database was shared across the project components.

46. ***Indicator #10 – Time series Landstat and other images georeferenced, radiometrically corrected and finally interpreted into time series land use and cover maps showing changes with project areas:*** Time series mapping with status of landcover changes were completed.

47. **Indicator #11 – Data Management Protocol manual developed:** Final version of the manual ready

48. ***Indicator #12 – XML Schema for data acquisition support developed:*** Schema fully documented.

49. ***Indicator #13 – Review of carbon standards in relation to CBP information generated:*** Combined review of carbon standards and manual for use of CBP with carbon standards completed

50. ***Indicator #14 – Manual for use of CBP information with other carbon standards developed:*** Manual was completed.

51. ***Indicator #15 – How-to Manual for extension personnel and how-to manual for community members developed:*** The two manuals have been developed.

52. ***Indicator #16 – Landscape biomass stocks, carbon stocks, and other greenhouse gas emission or sequestration estimates in western Kenya:*** Soil carbon stock estimates completed.

53. ***Indicator #17 – Field sampling, laboratory analysis and data analysis for soil carbon in western Kenya landscapes:*** Field sampling, lab analysis and data analysis complete.

54. The synergy among the CBP partners and especially between MSU and ICRAF was a main factor in enhancing the success of the Component B in achieving the project objectives. Both MSU and ICRAF have tremendous experience in earth observing technologies which they have employed in the management of complex datasets required in the application of environmental markets. This has facilitated more accurate and rigorous measuring and monitoring for better understanding of land use, natural resource management and climate change. The CBP Component B gained substantially from the MSU experience and capability on remote sensing technologies and the multi-scale assessment framework developed by ICRAF under the GEF funded Western Kenya Integrated Ecosystem Management Project (WKIEMP). Effectiveness was rated Satisfactory.

Table E- 2: ICRAF budget – Kenya (B) test case (US$)

Budget item	Total
Senior Personnel	581,401
Other Personnel	297,355
Travel	62,648
Materials & Supplies	97,096
Other Direct Costs	166,603
TOTAL	1,205,103

Efficiency

55. The efficiency criterion is defined relative to the timeliness and cost effectiveness of project execution. In accordance to the WWF Grant Agreement for Component B, the starting date of the CBP Component was 1st of March, 2009 while the project ending date was 31st March 2010. Regarding timeliness, the CBP suffered a delay attributed to challenges in methodologies, equipment failure and other delays due to the intricacies of model development. The delay precipitated an extension of one year and three months, with a new expiration date being 1st march 2012, in order to complete the project tools. The, delay, however, did not cause any extra funding. The delay also did not seem to affect the costs and effectiveness of the project implementation.

56. The total funding for Component B amounted to US$ 2,265,936.00 of which ICRAF received US$ 1,270,925.00 while MSU received US$ 995,011.00. According to the ICRAF Programme's Manager, Josephine Njoroge, the funds were received on time and were utilized for the intended services. A breakdown of how ICRAF spent the funds received from WWF between 1st April 2009 and 30th November, 2012 is presented in Table E-2. The greatest percentage of funding (73%) was spent on personnel. This is mainly due to the fact that the senior personnel spent a lot of their time developing the project tools. Putting into consideration the number of activities carried out by the Component and

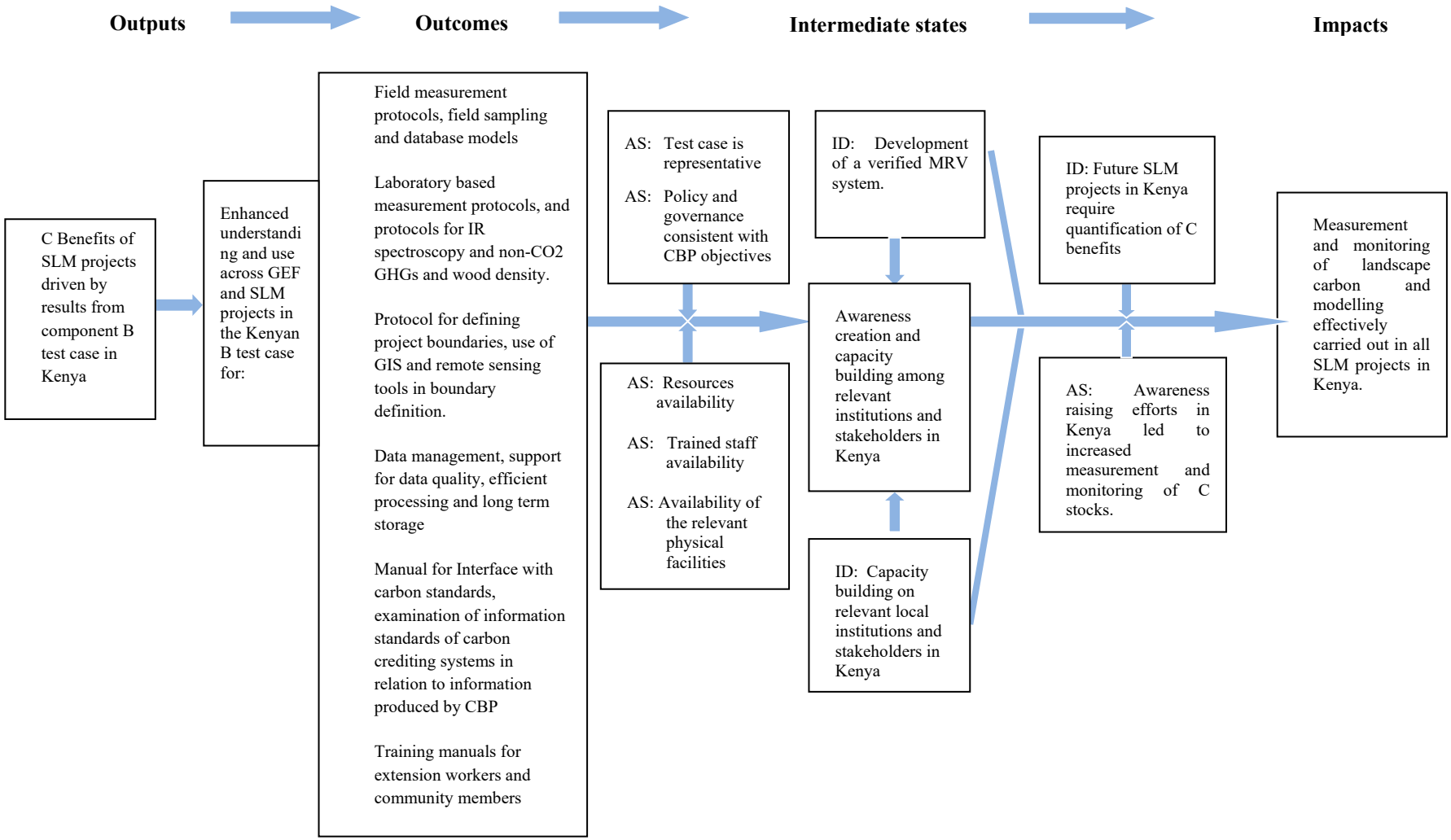
the number of tools developed within a span of three years, the implementation of the component was cost effective.

57. As stated above, the synergy among the CBP partners and especially between MSU and ICRAF helped to increase the project efficiency. The MSU experience and capability on remote sensing technologies and ICRAF experience in developing the multi-scale assessment framework under the GEF funded Western Kenya Integrated Ecosystem Management Project (WKIEMP) enhanced the efficiency in the implementation of Component B. The CBP benefited strongly from the African Soil Information Service (AfSIS), a project that builds on recent advances in digital soil mapping, infrared spectroscopy, remote sensing, statistics, and integrated soil fertility management, and other projects that supported the development of the ICRAF Land Health Surveillance Framework. Cost effectiveness was rated Satisfactory.

Outcomes to impacts

58. The outcome to impacts criterion is defined relative to the extent to which outputs from the test case sites can contribute towards impacts. For the purposes of the terminal evaluation, the contribution of outcomes to impacts is defined relative to the C measurements in Component B of the CBP. The impact pathways, impact drivers (identified as "ID) and key assumptions (identified as "AS") are summarized in Figure E-3. The review of outcomes to impacts (ROtI) for the Kenya (A) test case was carried out using the methodology presented in the GEF Evaluation Office's ROtI Practitioner's Handbook. This procedure involved the reconstruction of the logical pathways from project outputs over achieved outcomes, towards impacts and taking into account impact drivers and assumptions.

Figure E- 3: Outcomes to impacts pathways for the Kenyan B test case



59. The CBP has delivered the intended outputs and outcomes and a system has been developed for the measurement and monitoring of carbon stocks on agricultural and forested landscapes thus creating a vehicle to quantify carbon as a global environmental good. The project reports that soil carbon measurement methods and a land degradation surveillance framework have been taken up at Africa scale through the Africa Soil Information Service[13] (AfSIS) and at national level by the Ethiopia Soil Information System (EthioSIS)[14] and a number of sustainable land management projects in Africa (e.g. Cameroon, Cote d'Ivoire, Ethiopia, Kenya, Mali, Rwanda, Tanzania) . Ten laboratories in Africa are now using infrared spectroscopy for rapid soil carbon analysis and demand appears to be growing. Furthermore, the project reports that Kenya Agricultural Research Institute, have purchased an infrared spectrometer using their own funds and ICRAF has trained KARI staff in soil spectroscopy to the extent that KARI are using the technology independently. The commitment of national institutions to the vegetation and soil carbon measurement and monitoring methods promoted under CBP go beyond the Kenya test case and exceed the expectations for the case study.

Sustainability and catalytic role

60. The criterion "sustainability and catalytic role" is actually comprised of two (2) separate criteria. The ***sustainability*** criterion is defined relative to the probability of continued long-term project-derived results and impacts after the external project funding and assistance ends. The ***catalytic role*** criterion is defined relative to the extent to which an enabling environment has been created to foster innovation. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table E-3 and described in the subsections that follow.

Table E- 3: Summary of evaluation ratings for: "sustainability and catalytic role"

Sub-criterion	Additional Sub-criterion	Sub-criterion rating	Overall criterion rating
Sustainability	Socio-political sustainability	ML	ML
	Financial resources	MU	
	Institutional framework	ML	
	Environmental sustainability	L	
Catalytic role	Behavioral changes	ML	
	Incentives	ML	
	Institutional changes	ML	
	Policy changes	MU	
	Catalytic financing	MU	
	Champions	ML	

Rating code: Highly Likely (HL); Likely (L); Moderately Likely (ML); Moderately Unlikely (MU); Unlikely (U); Highly Unlikely (HU)

61. ***Sustainability.*** The sustainability criterion has been evaluated relative to four (4) distinct sub-criteria. These are socio-political sustainability, financial resources, institutional framework, and environmental sustainability. The results of the evaluation of each sub-criterion are described in the paragraphs below.

Socio-political sustainability

62. The socio-political sub-criterion is defined relative to any social or political factors that impact on the sustainability of project results and progress towards impacts. Two

[13] http://www.africasoils.net/
[14] http://www.ata.gov.et/projects/ethiopian-soil-information-system-ethiosis

additional socio-political sub-criteria were included in the evaluation, namely level of ownership and stakeholder engagement.

63. Kenya was among the early signatories of the Convention on Biological Diversity (CBD) and ratified the convention in 1994. It has actively participated in meetings of the Conference of the Parties (COP) to CBD, and hosted the most recent meeting (COP-5) with UNEP in May 2000. The country has strong links between the Government governance structures and the country's main research institutes. The Kenya Agricultural Research Institute (KARI) and Kenya Forestry Research Institute (KEFRI) have been restructured so that research activities are more clients focused and participatory. Both institutes are active in developing and disseminating improved technologies through regional research centers and have developed strong linkages with government and non-government extension agents. KARI and KEFRI have partnered with the Ministry of Agriculture (MoA) on a number of sustainable land management initiatives in Western Kenya such as the National Agriculture and Livestock Extension Program (NALEP), Soil Management Project (SMP), Legume Research Network (LRN), Agricultural Technology and Information Response Initiative (ATIRI), and Lake Victoria Improved Land Management Program (LVEMP).

64. The level of ownership sub-criterion was considered from both the national level, where key institutions (KEFRI and KFS) are located which will be responsible for incorporating and extending the lessons from the test case site, as well as the international level where test case initiatives were undertaken by ICRAF and MSU. Three institutions that are likely to be critical to the sustainability of the CBP tools especially the measurements are:

- World Agroforestry Centre (ICRAF) – Founded in 1978, ICRAF is an international institute based in Nairobi with involvement in research in Agroforesty with a view to developing more sustainable and productive land use;
- Kenya Forestry Research Institute (KEFRI) – Established in 1986 under the Science and Technology Act to carry out research in forestry and allied natural resources; and
- Kenya Forest Service (KFS) – A state corporation established in 2007 under the Forest Act 2005 to conserve, develop and sustainably manage forest resources for Kenya's socio-economic development.

65. Out of the above three institutions, ICRAF was extensively involved as one of the partners in Component B implementation, KEFRI was nominally involved especially with tree measurements while KFS was virtually not involved in Component B implementation. Generally the socio-political situation in Kenya favours the ownership of the project with positive influence in the sustenance of project results and progress towards impacts. This is due to the fact that CBP objectives are consistent with environmental agenda in Kenya. Kenya is a signatory to all the relevant environmental conventions including Convention on Biological Diversity (CBD), Kyoto Protocol and United Nation Framework on Convention on Climate Change (UNFCCC), thus demonstrating her commitment in combating the problems of environment and climate change.

66. Despite the national commitment to environmental agenda and the presence of two forestry institutions, it is unlikely that both KEFRI and KFS will sustain the CBP measurements due to lack of capacity. In order for the local institutions to sustain the CBP measurements, there is need to invest heavily on scientific equipment, remote sensing technologies, other relevant technological advancements and capacity building on the local staff. Although the socio-political environment in Kenya favored the implementation of the CBP, the project did not cultivate adequate awareness among the government and the local stakeholders necessary to allow for the project results to be sustained. This is evident from the fact that an important state institution like KFS was not involved in project activities and KEFRI was only incorporated into the project late into implementation (July 2010). Socio-political sustainability is rated Moderately Likely (ML).

Financial resources

67. The financial resources sub-criterion is defined relative to the dependence of eventual impact from the test case sites on continued financial support. The continuation of project results and the eventual impact of the project in the Kenya (B) test case are dependent on continued financial support. Activities associated with project measurements is an expensive undertaking and the likelihood that adequate financial resources will be available to continue with CBP measurements is very limited. In order to enhance the project sustainability, there will be need to acquire continued funding for the support of the following activities:

- Development of a verified MRV system;
- Capacity building on local institutions, especially in the acquisition of the relevant infrastructure including physical facilities and equipment for measurements.
- Need for more capacity building on the areas of GIS, RS, modeling, training on MRVs; and
- Awareness creation on the CBP measurement tools.

Institutional framework

68. The institutional framework sub-criterion is defined relative to institutional framework and governance issues that impact on the sustainability of project results and progress towards impacts. The success for the implementation of the Kenya (B) test case is attributed to the synergy between the two CBP partners, MSU and ICRAF. Both institutions have tremendous capability and experience in earth observing technologies which they employed in the Kenya test case B. Although the Government of Kenya has the policy and governance structures consistent with the objectives of CBP and necessary to enhance the sustainability of project results, the relevant national institutions including KFS and KEFRI currently do not have the capacity and resources required to sustain the CBP measurements.

69. Indeed KEFRI has realized that Kenya urgently requires additional human and physical capacity for building a national carbon accounting system for the forest sector that will support UNFCCC reporting requirements and other forest carbon activities. Towards meeting this objective, KEFRI formulated a proposal in 2010 with the main objective of strengthening the capacity for government agencies, academic institutions, and non-

government organizations in Kenya for forest carbon MRV systems. The proposal focuses on the following aspects:

- Develop the physical infrastructure within partner organizations to implement a MRV system for REDD+ and a national forest carbon accounting system in Kenya;
- Develop the human capacity within partner organizations to implement a MRV system for REDD+ and a national forest carbon accounting system in Kenya;
- Expand awareness to the general public on the role of forest carbon in climate change and develop linkages to private sector groups working to mitigate climate change in Kenya; and
- Position Kenya as a regional leader providing capacity building for MRV systems throughout East Africa.

Environmental sustainability

70. The environmental sustainability sub-criterion is defined relative to any environmental factors that can impact on the future flow of project benefits. Discussions with the ICRAF and KEFRI CBP partners involved in the implementation of the Kenya B test case, did not point to any significant environmental factors that are likely to negatively influence the future flow of project benefits. It should, however, be appreciated that the CBP implementation was taking place in the background of the host project, the GEF funded Western Kenya Integrated Environmental Management Project (WKIEMP), where rapid increase in human population in the past half a century has led to significant increase in land degradation resulting in increased soil erosion followed by a loss of soil fertility, decrease in water quality including increase in eutrophication of Lake Victoria leading to rapid colonization of the lake by water hyacinth (*Eichhornia crassipes*) with subsequent decrease in fish and aquatic plant diversity.

71. The WKIEMP objective was to improve the productivity and sustainability of land use systems in selected watersheds in the Nzoia, Yala and Nyando river basins through adoption of an integrated ecosystem management approach. In order to achieve this, the project: (i) supported on- and off-farm conservation strategies; and (ii) improved the capacity of local communities and institutions to identify, formulate and implement integrated ecosystem management activities (both on-and off-farm land use planning) while capturing local and global environmental benefits. The involvement of communities in the WKIEMP main environmental project activities such as conservation agriculture, water management, agroforestry, and biodiversity conservation, made it possible to effectively mitigate climate change through carbon sequestration, enhance biodiversity conservation on- and off-farm, and reduce sediment loading in critical waterways. The Component B project outputs are likely to empower the relevant stakeholders in western Kenya to employ better tools of measuring and monitoring carbon stocks to effectively mitigate climate change through carbon sequestration and reduction of GHG emissions, all leading to the enhancement of environmental sustainability in the project area. Environmental sustainability is rated Likely (L).

72. ***Catalytic role.*** The catalytic role criterion has been evaluated relative to six (6) sub-criteria, namely behavioral changes, incentives, institutional changes, policy changes, catalytic financing, and champions. The results of the evaluation of each sub-criterion

are described in the paragraphs below. Overall, the catalytic role of the project is rated as Moderately Likely (ML).

Behavioral changes

73. The behavioral changes sub-criterion is defined relative to any broad-based changes made by stakeholders in Kenya that are a direct result of the application of the CBP measurement tools. The extent to which the project has catalyzed behavioural changes by the relevant stakeholders in terms of use and application of CBP tool is very modest. This is attributed to the fact that the CBP measurement tools were completed and available online only recently (December 2012) and therefore not many stakeholders have come to know and apply them. However, there is potential for future changes especially from the stakeholders who have been trained through the CBP project. Such stakeholders include Dr. Vincent Oeba (KEFRI) who has acquired latest experiences on remote sensing (RS) technologies and the use of Geographic Information System (GIS) from the University of Maryland (UOM) and Michigan State University (MSU), and Mr. Njeru Mugambi, a PhD student (University of Nairobi) trained at ICRAF on the development and use of CBP tools in predicting the carbon stocks and fluxes. Since then, Dr. Oeba has taken the lead in the formulation of the KEFRI proposal to solicit funding for a training programme in order to build capacity for monitoring, reporting and verification (MRV) of forest in Kenya.

Incentives

74. The incentives sub-criterion is defined relative to any broad-based changes made by stakeholders in Kenya that are a direct results of incentives embedded in the CBP application at the test case sites. The CBP does not seem to have adopted an approach to promote replication effects. However, success in funding of the KEFFRI's proposal on the training programme for building capacity in monitoring, reporting and verification (MRV) of forest in Kenya may enhance prospects of project replication.

Institutional changes

75. The institutional changes sub-criterion is defined relative to any institutional uptake in Kenya of lessons from the CBP application at the test case sites. KEFRI, one of project stakeholders and a leading institution in forest research in Kenya has been exposed to the latest methodologies in tree measurements and has adopted some of the CBP tools in their day to day activities. For example, KEFRI has now adopted the novel ways of setting sampling plots by use of compass and GPS which is an improvement over what they used to do – "traditional way of setting plots with strings and pegs". In addition researchers in KEFRI have been exposed to tree trunk coring expertise, better procedures of taking tree measurements including use of Diameter at Breast Height (DBH) and crown diameter and are now developing their protocols tailored to the local conditions and needs.

Policy changes

76. The policy changes sub-criterion is defined relative to the development of new policies in Kenya based on the lessons from the CBP application at the test case sites. As of the time of this writing, there is no evidence of potential new policy directions based on the results and lessons of the test case sites.

Catalytic financing

77. The catalytic financing sub-criterion is defined relative to the emergence of any follow-on funding from government, bilateral donors, or the GEF to support continued activities at the test case sites. As of the time of this writing, there is no evidence of any follow-on funding from any sources.

Champions

78. The champions sub-criterion is defined relative to the emergence of particular individuals or institutions in Kenya willing to promote the lessons and results from Kenyan Component B test case into the broader planning context. Except for the above mentioned attempt by KEFFRI on the development of proposal for building capacity for monitoring, reporting and verification (MRV) of forest in Kenya, there are no other opportunities created to catalyze change and enhance prospects of project replication.

Table E- 4: Summary of evaluation ratings for: "Procedures affecting attainment of project results"

Sub-criterion	Sub-criterion rating	Overall criterion rating
Preparation and readiness	MS	S
Implementation approach and adaptive management	S	
Stakeholder participation and public awareness	MS	
Country ownership and driven-ness	MS	
Financial planning and management	HS	
UNEP supervision and backstopping	NA	
Monitoring and evaluation	NA	

Rating code: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

C. Procedures affecting attainment of project results

79. The criterion "procedures affecting attainment of project results" has been evaluated relative to seven (7) distinct sub-criteria, namely preparation and readiness; implementation approach and adaptation management; stakeholder participation and public awareness; country ownership and driven-ness; financial planning and management; UNEP supervision and backstopping; and monitoring and evaluation. The results of the terminal evaluation at the criterion and sub-criterion level are summarized in Table E-4 and described in the subsections that follow.

Preparation and readiness

80. The preparation and readiness sub-criterion is defined relative to the clarity, practicality, and feasibility of the test case objectives in the sub-contractual agreement between WWF and MSU and ICRAF. WWF entered into an agreement in May 2009 where the two institutions (MSU and ICRAF) agreed to undertake the implementation of Component B activities with an expiration date of 31st December 2010. This agreement was subsequently amended and the project expiration date of 31st December 2010 was extended to 1st March 2012. In the agreement MSU was to manage all remote sensing activities, while ICRAF was to conduct the ground measurements and best practices design activities and WWF was to develop the policy institutional framework guide and manage the project component. Subsequently, ICRAF and the Centre for International Forestry Research (CIFOR) entered into an agreement on 28th August 2009 in which CIFOR agreed to undertake the implementation of project activities in relation to

measurements of non CO_2 GHG component of CBP activities and other related activities, while KEFRI was incorporated into the project much later in July 2010 through an agreement with MSU.

81. The project document though quite technical, was clear and realistic and it enabled effective and efficient implementation of the project. At the international level, the project partnership arrangements were properly identified and the roles and responsibilities of MSU, ICRAF and CIFOR were well defined and negotiated prior to project implementation. However, project partnership with regard to the Kenyan institutions was not properly identified and their roles in the project were not well defined. KEFRI was identified much later (July 2010) in the process of project implementation while KFS did not participate in the project activities. Kenya being the host country to the project, its relevant institutions including KEFRI should have been identified early for inclusion in the project implementation process while KFS should have been considered for inclusion in the project implementation. Such an arrangement could give the local institutions the necessary exposure, promote project ownership and develop host country capacity to sustain the project outputs when the donor funding comes to an end.

82. The project (Component B) started with three months delay and the time set out in the contract was adjusted accordingly. The project could not be completed within the 18 months timeline allocated and the expiration date of 31st December 2010 was extended to 1st March 2012. Within the new allocated time span the project virtually completed all its planned activities and achieved its main objective in providing a cost effective, user-friendly, yet scientifically rigorous methodology for measuring carbon and GHG mitigation benefits in GEF projects dealing with natural resources.

83. The project was cost effective. However, cost effectiveness should be understood in the sense that the implementation of the project capitalized on the previous GEF projects and other existing tools available for assessment, measuring and modeling. Using existing GEF activities and facilities acquired with GEF funding, the project saved substantial costs that would have been required to set up and run new activities involving natural resource interventions. Never the less, the project outputs of the project (measuring and monitoring) will be very costly to apply, sustain or replicate in many developing countries like Kenya. The relevant institutions in many developing countries require capacity building in physical infrastructure and human personnel in order to effectively absorb the CBP project outputs.

84. The CBP Component B incorporated valuable lessons from other projects into the project's design and implementation. The project gained from the MSU experience and capability on remote sensing technologies and ICRAF experience in developing multi-scale assessment framework under the GEF funded Western Kenya Integrated Ecosystem Management Project (WKIEMP). The CBP benefited strongly from ICRAF thirty years of conducting research in agroforestry and especially the experience gained from the African Soil Information Service (AfSIS), a project that builds on recent advances in digital soil mapping, infrared spectroscopy, remote sensing, statistics, and integrated soil fertility management. In addition, the project benefited from the synergy between the two CBP partners, MSU and ICRAF since both institutions have tremendous capability and experience in earth observing technologies which they ably employed in the implementation of Component B Kenya test case.

Implementation approach and adaptive management

85. The implementation approach and adaptive management sub-criterion is defined relative to the project's adaptation to changing conditions, the effectiveness of implementation arrangements, relevance of changes in project (or tool) design, and overall performance of project management.

86. The implementation approach adopted in the implementation of CBP Component B was guided by the comparative strength of the various partners. In this regard WWF undertook to develop the policy institutional framework guide and manage the project component, MSU took the lead in carrying out activities dealing with remote sensing aspects, ICRAF was responsible for conducting ground measurements and best practices design activities while CIFOR carried out measurements on non CO_2 GHG. Each of the partners developed a work plan for delivering the project outputs against well set timelines. To a large extent the project implementation mechanism outlined in the project document was followed and was found to be effective in delivering project outputs and outcomes.

87. WWF entered into an agreement with partners in May 2009 where MSU and ICRAF agreed to undertake the implementation of Component B activities with an expiration date of 31st December 2010. CBP as a whole suffered a delay in implementation due to the intricacies in the model development. This delay precipitated a project time extension of over one year without any cost implications on the project execution. Other changes that affected the implementation are outlined as follows:

- ICRAF and the Centre for International Forestry Research (CIFOR) entered into an agreement on 28th August 2009 in which CIFOR agreed to undertake the implementation of project activities in relation to measurements of non CO_2 GHG;
- KEFRI was incorporated into the project during the implementation in July 2010 through an agreement with MSU;
- The project could not be completed within the 18 months timeline allocated and the expiration date of 31st December 2010 was extended to 1st March 2012.

88. The above changes were relevant since the extension of the expiration date was in response to the delay in the project implementation. By incorporation of CIFOR the project benefited from the expertise and wide experience of CIFOR in the measurement of non CO_2 GHG. The project gained on the KEFRI research experience in the local forests while at the same time cultivating ownership among the local institutions.

- The project did not experience any administrative or operational problems. However, there were technical issues and constraints emanating on the methodologies adopted and the equipment operation. Some of the key hitches experienced by the project and the procedures followed in resolving them are outlined below as follows:
- Although QuickBird images were commissioned for the five sentinel sites, they were not acquired on time due to unseasonal cloud cover;
- The original datasets for the characterization of the five sentinel sites were found to have a number of inconsistencies and errors. However, the original field sheets

were obtained, the data was checked and cleaned and data sets were made available;

- Testing of conventional tree corers resulted in difficulties with tropical hardwoods due to blunting and breaking of the corers, evened with hardened bits. A protocol was adapted from the literature that deploys a carpenter's awl and was found to be successful;
- The new total x-ray diffraction and laser diffraction particle size instrument developed a fault. Although a replacement of the instrument was carried out, this equipment failure delayed the implementation progress;
- Initial experiences with the NOx analyzer were problematic. The gas flux chambers were redesigned to improve the flow pattern within the chamber and produced laminar flow of the gases over the soil surface;
- NIR and MIR measurement protocols for wood analysis tested on the high-throughput MIR analyzer were getting saturation of absorbance peaks. Collaboration with the instrument manufacturers led to the development and use of Teflon discs which resulted in optimal MIR spectra on wood samples; and
- In the development of a prototype application of the data management protocols, two of the key contributors left ICRAF. Although the contributors were replaced, their departure slowed the process.

89. Despite the above hitches in project implementation, the partners put tremendous effort in meeting the new set expiration date of 1st March 2012. As a whole the project performed well and all the Component B outputs have been delivered as per the terms of contract. The implementation approach and adaptive management is rated Satisfactory.

Stakeholder participation and public awareness

90. The stakeholder participation and public awareness sub-criterion is defined relative to the effectiveness of consultations and project decision-making among stakeholders. The key stakeholders in the Kenya Component B test case were the project partners including WWF, ICRAF, MSU and CIFOR. Other stakeholders included local institutions such as KEFRI and KFS, local NGOs and the local communities within the project location in Western Kenya where the ground based measurements were carried out. The key project partners including WWF, MSU, ICRAF and CIFOR were fully engaged in effective collaboration and interactions during the course of implementation of the project. Collaboration and interaction between the key stakeholders and local institutions was rather weak. KEFRI was only incorporated into the project much later during project implementation in July 2010 and its role was nominal, only limited to tree measurements while KFS was virtually not involved in any project activities.

91. There were reasonable interactions among the key partners as exemplified in their participation in attending conferences, workshops and scientific forums and during presentations on the progress of the project and outcomes at the relevant fora. Examples of stakeholder's interactions are outlined below as follows:

- MSU hosted a meeting in July, 2009 with the University of Maryland to discuss collaboration on remote sensing analysis;

- Three MSU team members travelled to Nairobi, Kenya in August, 2009 to meet with ICRAF staff to discuss collaboration on field work and to exchange work plans;
- Both MSU and ICRAF staff conducted collaborative field work in Kenya in November 2009;
- The project held several partners consultative meetings (workshops at ICRAF to discuss issues on agro-forestry, community measurements and field work between August and November, 2009;
- MSU hosted a meeting with Colorado State University in December, 2009 to coordinate Component A and Component B efforts on the joint CBP website portal;
- Early in 2010, ICRAF and CARE conducted the field testing of the Training of Trainers Manual among the community in western Kenya;
- Towards the end of 2010, ICRAF and CARE conducted the field testing of the Handbook of Community Measurements, among other stakeholders' interactions; and
- In addition, the project partners attended and participated in the deliberations of the project inception workshop (11 – 14 May 2009) and the Steering Committee meeting 30 August – 1 September, 2010 among other relevant interactions.

Country ownership and driven-ness

92. The country ownership and driven-ness sub-criterion is defined relative to the degree to which government has assumed responsibility for the test case sites, offered institutional support, and been responsive to UNEP-DEWA guidance. The political and institutional framework prevailing in Kenya has offered conducive environment for the project implementation and performance. As stated in many sections of this report, the country has demonstrated commitment to combat problems of environment and climate change. In addition, the Government has relevant policies, institutional structure and governance environment necessary to for the implementation of the CBP Component B. This is demonstrated by the participation of KEFRI in the project and subsequent signing of MoU between KEFRI and MSU in 2010.

93. Although the socio-political environment in Kenya favoured the implementation of the CBP, the project itself did not cultivate adequate awareness among the government institutions necessary to enhance project performance. This is evident from the fact that an important state institution like KFS was not involved in project activities and KEFRI was only incorporated into the project half way during implementation in July 2010 and its role in project implementation was nominal. The country ownership and driven-ness is rated Moderately Satisfactory (MS)

Financial planning and management

94. This sub-criterion is defined relative to the quality and effectiveness of financial planning and control of financial resources throughout the project's lifetime. The grants received from WWF in support of Kenya (B) test case project activities were US$ 1,205,925 for ICRAF and US$ 995,011.00 for MSU. Funding from WWF was utilized for the support of project personnel which included senior scientists, technical and administrative staff,

travel and local transportation, purchase of and maintenance of equipment, premises and other miscellaneous expenditure. The control of financial resources throughout the project's lifetime was effective and there were no irregularities found in the management of financial resources for the Component B Kenya test case. Clear and transparent records were kept at the project management offices that show the distribution of funds commensurate with activities undertaken and deliverables submitted. The financial management and reporting of the test case is rated Highly Satisfactory (HS).

UNEP supervision and backstopping

95. The UNEP supervision and backstopping sub-criterion is defined relative to effectiveness of supervision and administrative/financial support provided by UNEP. This sub-criterion is not applicable at the test case level due to the lack of a direct line of accountability between UNEP and the test case sites.

Monitoring and evaluation

96. The monitoring and evaluation sub-criterion is defined relative to the effectiveness of project monitoring and evaluation (M&E) plans and tools. This sub-criterion is not applicable at the Kenya (B) test case due to the lack of M&E activities built into the sub-contractual arrangements with WWF.

D. Complementarity with UNEP programmes and strategies

97. The criterion "complementarity with UNEP programmes and strategies" has not been evaluated at the test case level. This is due to the fact that none of the four (4) sub-criteria (i.e., linkage to UNEP's EAs and POW 2010-2011; alignment with the Bali Strategic Plan; gender; and South-South Cooperation) are relevant to individual test case sites. The activities relative to the sub-criteria are relevant only at the overall project level.

Part III - Conclusions and recommendations

A. Conclusions

98. The project has made remarkable achievement towards the measurement and monitoring of carbon stocks on agricultural and forested landscapes in western Kenya. The final evaluation ratings for the Kenya (B) are summarized in Table E-5. The major findings of the terminal evaluation are described in the paragraphs that follow.

99. The major positive achievements of the Kenya (B) test case test case are summarized in the bullets below.

- Satellite imageries of the relevant locations were acquired and analyzed to determine land use and associate it with measured carbon levels;
- Protocols were developed for the field measurement of above and below ground carbon stocks, non-CO_2 greenhouse gases, and the analysis of remotely sensed satellite imageries;
- Allometric equations specific to the test bed locations were developed through field sampling and the corresponding mathematical analysis;
- An integrated web portal has been developed that will allow users to access the capabilities being developed by the Carbon Benefits Project; and
- The project has created a vehicle to quantify carbon on these landscapes as a global environmental good.

Table E- 5: Summary of evaluation ratings for the Kenya (B) test case

Criterion	Sub-criterion	Additional Sub-criterion		
Attainment of objectives and planned results	Achievement of outputs and activities	NA	S	S
	Relevance		S	
	Effectiveness		S	
	Efficiency		S	
	Outcomes to impacts		MU	
Sustainability and catalytic role	Sustainability	Socio-political	ML	ML
		Financial resources	MU	
		Institutional framework	ML	
		Environmental sustainability	L	
	Catalytic role	Behavioral changes	ML	
		Incentives	ML	
		Institutional changes	ML	
		Policy changes	MU	
		Catalytic financing	MU	
		Champions	ML	
Procedures affecting attainment of project results	Preparation and readiness	NA	MS	S
	Implementation approach/adaptive		S	
	Stakeholder participation/public		MS	
	Country ownership and driven-ness		MS	
	Financial planning and management		HS	
	UNEP supervision and backstopping		NA	
	Monitoring and evaluation		NA	
Complementarity with UNEP programmes and strategies	Linkage to UNEP EAs & POW 2010-11	NA	NA	NA
	Alignment with the Bali Strategic Plan		NA	
	Gender		NA	
	South-South Cooperation		NA	

Rating code for all criteria except Sustainability and catalytic role: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU)

Rating code for Sustainability and catalytic role: Highly Likely (HL); Likely (L); Moderately Likely (ML); Moderately Unlikely (MU); Unlikely (U); Highly Unlikely (HU)

100. The project outputs are likely to empower the relevant stakeholders in western Kenya to employ better tools of measuring and monitoring carbon stocks in order to effectively mitigate climate change through carbon sequestration and reduction of GHG emissions, all leading to the enhancement of environmental sustainability in the project area.

101. The major negative aspects of the Kenya (B) test case are summarized in the bullets below, together with the underlying causes.

- The project started with a three months delay which precipitated an adjustment in the timeline set in the contract, and other subsequent delays occasioned by equipment failure, and other hitches which precipitated an extension of project expiration date from 31st March to 1th March, 2012.
- Although the project has achieved its objectives and delivered on the planned outputs, the continuation of project results and the eventual impact of the project in the Kenya (B) test case are very slim since its sustainability is dependent on continued financial support which at present is not available.
- Project partnership with regard to the Kenyan institutions was not properly identified and their roles in the project were not well defined. KEFRI was identified much later (July 2010) in the process of project implementation while KFS did not participate in the project activities.
- Although the Government of Kenya has the policy and governance structures consistent with the objectives of CBP which is necessary to enhance the sustainability of project results, the relevant national institutions including KFS and KEFRI currently do not have the capacity and resources required to sustain the CBP measurements.

102. In conclusion, the overall assessment of the Kenya (B) test case is Satisfactory (S). The evidence provided in previous sections supports this summary conclusion. The key factors that have contributed to this overall assessment are briefly described in the bullets below.

- The success for the implementation of the Kenya (B) test case is attributed to the synergy between the two CBP partners, MSU and ICRAF. Both institutions have tremendous capability and experience in earth observing technologies which they have employed in the Kenya test case B.
- The CBP Component B gained substantially from the MSU experience and capability on remote sensing technologies and the multi-scale assessment framework developed by ICRAF under the GEF funded Western Kenya Integrated Ecosystem Management Project (WKIEMP).
- The CBP benefited strongly from the African Soil Information Service (AfSIS), a project that builds on recent advances in digital soil mapping, infrared spectroscopy, remote sensing, statistics, and integrated soil fertility management, and other projects that supported the development of the ICRAF Land Health Surveillance Framework; and

- Finally, the project success is attributed to the exemplary leadership provided WWF and the commitment of the MSU and ICRAF principal scientists and support staff involved in the project implementation.

B. Lessons learned

103. There are several key lessons that have emerged from the evaluation of the Kenya (B) test case. These lessons, summarized in the bullets below, are directly applicable to future projects that involve quantification of measurements and monitoring of carbon stocks on agricultural and forested landscapes:

- The synergy among the project implementation partners as shown by collaboration between MSU and ICRAF has proved to be effective in enhancing the success in measuring and monitoring of landscape carbon stocks and management of complex datasets in forestry and agroforestry systems;
- In situations where local institutions lack capacity, the sustainability of project results and the eventual impact of the project are dependent on continued donor support.
- Use of GEF projects as test cases and incorporation of lessons from other related projects such as WKIEMP and AfSIS into the project's design, enhanced the cost effectiveness of the project.

C. Recommendations

104. There are several key recommendations that can serve as actionable proposals to resolve the concrete problems that have affected the project implementation and sustainability of its outputs. These recommendations are summarized in the bullets below:

- The CBP projects need to identify relevant host country institutions for participation in the project early enough before the project commences. Such an arrangement will give the local institutions the necessary exposure, promote ownership and develop host country capacity to sustain the project outputs when donor funding is stopped.
- The continuation of project results and the eventual impact of the project in the Kenya (B) test case are dependent on continued financial support. There is therefore, a need to acquire continued funding for the local institutions for the support of the following activities:
    - Development of a verified MRV system;
    - Capacity building especially in the acquisition of the relevant infrastructure including physical facilities and equipment for measurements.
    - Need for more capacity building on the areas of GIS, RS, modeling, training on MRVs; and
    - Awareness creation on the CBP measurement tools.

Annex A-1: Evaluation itinerary and meetings

Visit itinerary and contacts

Date	Location	Activities
03/04/2013	Nairobi	The Consultants (William Dougherty) and (Frank Muthuri) conducted the following project activities: Reviewed the evaluation progress and itinerary for 2-5 April visit to UNEP at Shanema Homes;
03/04/2013	Nairobi	Met Jessica of the UNEP Evaluation Office for a brief introduction; and
03/04/2013	Nairobi	Held a meeting with Gemma Shepherd and Mohammed Sessay, reviewed the CBP progress, and achievements, shared findings and discussed the way forward.
04/04/2013	Nairobi	Met Martin Okun and Rodney Vorley and discussed CBP finance management.
04/04/2013	Nairobi	Visited the World Agroforestry Centre, Nairobi and held ICRAF participation in the implementation of CBP with Dr. Henry Neufeldt, Dr. Keith Shepherd and Dr. Ermias Betemariam.
05/04/2013	Nairobi	The Consultants (William Dougharty and Frank Muthuri) prepared and gave an initial terminal evaluation presentation to the UNEP Evaluation Office (represented by Jessica Kamugira and Michael Spilsbury).
22/05/2013	Nairobi	Visited ICRAF and held discussion with Josephine Njoroge with regard to CBP Financial Planning and Management
28/05/2013	Nairobi	Held a meeting with Dr. Oeba of KEFRI at Pizza Garden to discuss the involvement of KEFRI in CBP implantation and other project issues
03/06/ 2013	Nairobi	Visited UNEP collected several CBP documents from Anne Njuguna and Rodney Vorley office

Annex A-2: Bibliography

a) Project management documents/reports collected and reviewed

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- UNEP, 2012. Terms of Reference for the Terminal Evaluation of the "Carbon Benefits Project: Modelling, Measurement and Monitoring (CBP:MMM)"

b) Additional documents collected and reviewed

- ICRAF. Soil – Plant Spectral Diagnostics Laboratory. World Agroforestry Centre, Nairobi.
- ROtI, 2009. Review of Outcomes to Impacts – Practitioner's Handbook
- UNEP, 2006. UNEP Gender Plan of Action.
- UNEP, 2010. Medium-term Strategy 2010 – 2013.
- UNEP, 2010. UNEP Vision – Draft Programme of Work 2010 – 2011.

Annex A-3: Finances

Detailed information on co-financing arrangements was not available. A statement of project expenditures by activity was also not available.

Annex A-4: Supporting consultant info

Mr. Frank Muthuri undertook the terminal evaluation of the Niger-Nigeria test case sites. His Curriculum Vitae appears in Annex A.

Annex F: Terms of Reference - Overall Project

TERMS OF REFERENCE

Terminal Evaluation of the "Carbon Benefits Project: Modelling, Measurement and Monitoring (CBP: MMM)"

PROJECT BACKGROUND AND OVERVIEW

Project General Information[15]

Table 1. Project summary

GEF project ID:	3449	**IMIS number:**	GFL/2648-2713-4A47
Focal Area(s):	Land Degradation with relevance to Climate Change and Biodiversity; Sustainable Forest Management (SFM); Forest Conservation as a Means to Protect Carbon Stocks and Avoid CO_2 Emissions	**GEF OP #:**	
GEF Strategic Priority/Objective:	SFM-SP3 Sustainable Forest Management (SFM)-SP-3, LD: Forest Conservation as a means to Protect Carbon Stocks and avoid CO^2 Emissions. Resource efficiency-sust. Consumption/production.	**GEF approval date:**	11 February 2009
Approval date:	30 March 2009	**First Disbursement:**	27 April 2009
Actual start date:	April 2009	**Planned duration:**	36 months (2yrs Phase 1 + 1 year Phase II
Intended completion date:	March 2012	**Actual or Expected completion date:**	Dec 2012
Project Type:	Full Size Project (FSP)	**GEF Allocation:**	US$ 5,526,265
PPG GEF cost:	Nil	**PPG co-financing:**	Nil
Expected MSP/FSP Co-financing:	US$ 3,638,082	**Total Cost:**	US$ 9,164,347
Mid-term /STAP. (planned date):	Sept 2012	**Terminal Evaluation (actual date):**	December-April 2012
STAP (In place of MTR) (actual date):	12-16 September 2012	**No. of revisions:**	1
Date of last Steering Committee meeting:	12-13 October 2011	**Date of last Revision*:**	13 April 2009
Disbursement as of 30 June 2012:	US$ 4,238,903		
Total co-financing	US$2,310777	**Leveraged**	

[15] Source: UNEP GEF Project Implementation Report (PIR) Fiscal Year 2010

realized as of 30 June 2012:		**financing:**	

Project Rationale

Human induced global climate change is occurring at a greater speed and intensity than previously anticipated. Necessary greenhouse gas (GHG) reduction goals will be difficult to achieve even under the most optimistic scenarios unless every environmentally and socially sound avenue of mitigation is used. According to the project document of 9 September 2008, the human-induced increase in atmospheric greenhouse gases (GHGs particularly CO_2 but also N_2O and CH_4) is acknowledged to be a serious threat to the global environment, with current annual emission of CO_2-carbon to the atmosphere at 6.3 ± 1.3 Pg C yr^{-1} and with land use accounting for 25-30 per cent of total anthropogenic GHG emissions.

Sustainable land management (SLM) projects can cut these emissions and counter the increase in atmospheric CO_2 by increasing carbon sequestration.

Currently, the issue faced by the GEFSec and implementing agencies, is one of natural resource management projects (at inception and during operation) claiming carbon (C) benefits as global environmental benefits (GEBs) whilst the GEF has no standardized, cost effective protocol for the quantification and assessment of C benefits. A protocol is needed that is applicable to the full range of GEF activities (e.g. all climate and land use/management variations), is standardized, comprehensible and robust. Comparison of benefits between projects is difficult because benefits are measured, if at all, according to various criteria and procedures making comparison difficult.

Moreover, measurements are usually confined to changes in above ground biomass with C sequestration as soil organic carbon (SOC) being neglected. This is despite the fact that the benefits of increasing SOC go far beyond its value as a C sink. Soil organic matter (SOM) is the most important and dynamic attribute determining soil fertility, water processing capacity and resilience of soils. SOM depletion through poor land use and management is one of the most serious challenges to the sustainability of agriculture, particularly in the tropics (Sanchez 2000). Recognition that improved land use practices can create a net C sink (both in biomass and soils) means that SLM projects can generate additional economic benefit, as C-emission offsets, as part of emerging emissions trading systems and C markets that aim at GHG mitigation (e.g. World Bank Carbon Fund).

Mitigating and adapting to climatic change is a prime concern of the GEF's SLM focal area as fixation of excess atmospheric CO_2 (as biomass and SOC) and control of land use emissions of GHGs are key issues. SLM projects are not limited to afforestation and re-forestation but encompass forest conservation, restoration of wetlands, and improved management of cropland and rangeland (Pearson and others 2005).

Incorporating C sequestration and GHG mitigation as components of SLM projects, particularly if the objectives include tradable emission-offset credits, requires: 1) the ability to forecast the C benefits of different land use activities and, 2) a rigorous system for monitoring and verification. Quantifying C sequestration and GHG emissions in managed ecosystems is complex: it involves multiple land use activities, C pools and emission sources. A credible, comprehensive system is needed that can provide accurate and efficient protocols for sampling and measurement, data compilation and management, model computations, documentation and reporting.

Project objectives and components

The project's overall development goal is to help the GEF promote and prove carbon as a global environmental benefit in SLM interventions. Its main objective is to provide a cost effective, user-friendly, yet scientifically rigorous methodology for measuring carbon and GHG mitigation benefits in GEF projects dealing with natural resources in all climate zones and land use systems. The system will allow users to (i) estimate and model C stocks and flows and GHG emissions and (ii) to measure, monitor and manage carbon in GEF and similar projects across an inclusive range of land use systems.

The project has two components, each with its own component objective as presented in table 2.

Table 2. Project components and component objectives

Components	Component objectives
Component A-with a greater focus on cropland and grazing land	To build on approaches used by Colorado State University (CSU) in its responsibility for estimating soil greenhouse gas emissions for the US national inventory
	To build on experience of development of a national-scale greenhouse gas inventory assessment tool encompassing the entire Agriculture, Forestry and Land Use sector, which is being implemented in several Central American and East Asian countries
	To build on CSU's extensive experience in ground-based measurement of ecosystem C stocks and in designing long-term monitoring systems
Component B-with a greater focus on agro-forestry and forestry	To develop a unified protocol to account for C sequestration at the community level using Remote Sensing (RS) measurements, C models and geographic information systems;
	To develop an accounting system that can be readily used by rural communities and local support organizations;
	To develop the needed technologies to support C accounting, management, measurement, and monitoring, using earth observation satellites, internet-based GIS and databases and ground based sensors and sensor webs.

The planned outputs under each component, as per the Logical Framework Matrix are presented in Annex 1 of the TORs. Component A of the project focuses on estimation and forecasting of carbon stocks, flows and GHG emission with greater emphasis on cropland and grazing land and seeks to build on existing projects and national-scale C inventory tools developed over the past 13 years by Natural Resource Ecology Laboratory (NREL) and a group of partner institutions in developed and developing countries. In general, these assessment tools have a greater focus on agricultural and pasture land and will therefore complement activities of Component B.

Component B focuses on field measurements and monitoring of carbon changes across landscapes with an emphasis on agroforestry and forestry. It seeks to assemble, demonstrate and refine the tools needed to reduce costs and expand the opportunities for bringing C sequestration through reforestation and agro-forestry to practice and application. By replacing the need for high-cost, time-consuming *in situ* measurements the overall expense of accounting can be reduced. Ground based measurements are not eliminated, but rather expanded in their scale and spatial extrapolation across many projects and landscapes.

Executing Arrangements

UNEP is both Implementing Agency and Executing Agency of the project. The UNEP Task Manager in charge of overall supervision and implementation support to the project and the UNEP Fund Manager Officer in charge of financial oversight are located in the Division for Environmental Policy Implementation (DEPI). The Project Manager, in charge of day-to-day management of the project, is located in the Division for Early Warning and Assessment (DEWA). DEWA also coordinates other UNEP Divisions (WCMC, RISOE, and DTIE) to ensure that the project links up with UNEP Medium Term Strategy and its Work Programme as approved by the UNEP Governing Council. For Component A, the lead agency is the Colorado State University while other partners include ISRIC, ODA-University of East Anglia, NNJC, KARI, and CENA. The lead agency for Component B is World Wide Fund for Nature (WWF) with ICRAF, Michigan State University and CIFOR as partners.

There is a Scientific Steering Committee (SSC) and an Independent Guidance and Review Panel (IGRP). The SSC is the overall-policy setting body for the project and includes representatives of the partners and is co-chaired by UNEP-DEPI and GEF, and meets annually. The IGRP is expected to provide independent opinions and advice on planned activities, protocol, technical reports and products, and to offer advice on related activities and possible co-financing opportunities.

The project has field sites in Kenya, Niger/Nigeria, Brazil, China and Senegal which were all already existing GEF project sites differing in size, climate and land use, that the CBP:MMM hoped to capitalize on.

Project Cost and Financing

Table 3 presents a summary of expected financing sources for the project as presented in the Project Document. The GEF was to provide US$ 5,526,265 of external financing to the project. This put the project in the full-size Project category. The project was expected to mobilize another US$ 3,638,082 in co-financing, from The International Soil Reference and Information Centre (ISRIC) (US$ 2,000,000...), the Colorado State University (US$ 594,289 and The World Wide Fund for Nature (US$ 1,043,793.

The most recent Project Implementation Review (PIR) for fiscal year 2012 reports that by 30 June 2012 the project had effectively disbursed US$ 4,238,903 of the GEF grant – close to 77%. By then, the project had mobilized US$ 2,310,777 in co-financing.

Table 3. Estimated project costs per component and financing source

Component	Co-financing others	GEF	TOTAL	%
Comp I: …	1,070,714	2,366,566	3,437,280	38
Comp II: …	1,206,335	1,845,005	3,051,340	33
Comp III: …	592,029	884,698	1,476,727	16
Comp IV: …	769,004	429,996	1,199,000	13
Total Project Financing	3,638,082	5,526,265	9,164,347	100

Source: Project Document for CEO Approval –11 February 2009

Project Implementation Issues

According to the Project Implementation Reviews, there were no major implementation issues during the project, and those minor issues that came up were quickly addressed as explained below.

Scientific and technological issues- Right from the start it was noted that this was a large and complex science-technology project involving a number of international and national scientific institutions. This complex project with the "Modeling" and "Measurement and Monitoring" components being designed and executed by two different teams required significant project coordination to foster good integration between the two components. Coordination and linkage of web sites across two US universities and UNEP provided some technical challenges but these were overcome by good teamwork by technical staff from all institutions.

Capacity Building- It was noted in the first PIR that in the project design stage, the Measurement and Monitoring component of the project did not have a capacity building element to mirror that of the Modeling component. Proposals were however made to address this issue with support from GEF Secretariat.

A Scientific and Technical Advisory Panel review (STAP) of the project was conducted 12-16 September 2012. The report is expected in December 2012.

II. TERMS OF REFERENCE FOR THE EVALUATION

Objective and Scope of the Evaluation

In line with the UNEP Evaluation Policy[16], the UNEP Evaluation Manual[17] and the Guidelines for GEF Agencies in Conducting Terminal Evaluations[18], the terminal evaluation of the Project "Carbon Benefits Project: Modelling, Measurement and Monitoring (CBP:MMM)" is undertaken at the end of the project to assess project performance (in terms of relevance, effectiveness and efficiency), and determine outcomes and impacts (actual and potential) stemming from the project, including their sustainability. The evaluation has two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP, Colorado State University (CSU), World Wildlife Fund (WWF), the GEF and their partners. Therefore, the evaluation will identify lessons of operational relevance for future project formulation and implementation. It will focus on the following sets of **key questions**, based on the project's intended outcomes, which may be expanded by the consultants as deemed appropriate:

> To what extent does it appear that the project will enable GEF to prove carbon as a global environmental benefit in SLM interventions?
>
> How successful was the project in providing a cost effective, user-friendly, yet scientifically rigorous methodology for measuring carbon and GHG mitigation benefits?

16 http://www.unep.org/eou/StandardsPolicyandPractices/UNEPEvaluationPolicy/tabid/3050/language/en-US/Default.aspx

17 http://www.unep.org/eou/StandardsPolicyandPractices/UNEPEvaluationManual/tabid/2314/language/en-US/Default.aspx

18 http://www.thegef.org/gef/sites/thegef.org/files/documents/TE_guidelines7-31.pdf

How successful was the project in developing a C sequestration accounting system that is readily useable by stakeholders at the community level, by rural communities and local support organizations?

How successful was the project in developing the needed technologies to support C accounting, management, measurement, and monitoring?

Overall Approach and Methods

The terminal evaluation of the "Carbon Benefits Project: Modelling, Measurement and Monitoring (CBP:MMM)" will be conducted by three independent consultants under the overall responsibility and management of the UNEP Evaluation Office (Nairobi), in consultation with the UNEP GEF Coordination Office (Nairobi).

It will be an in-depth evaluation using a participatory approach whereby key stakeholders are kept informed and consulted throughout the evaluation process. Both quantitative and qualitative evaluation methods will be used to determine project achievements against the expected outputs, outcomes and impacts.

The findings of the evaluation will be based on the following:

A **desk review** of project documents[19] including, but not limited to:

Relevant background documentation, inter alia UNEP and GEF policies, strategies and programmes pertaining to Sustainable Land Management (SLM), Sustainable Forest Management (SFM), Carbon sequestration and GHG emissions.
Project design documents; Annual Work Plans and Budgets or equivalent, revisions to the logical framework and project financing;
Project reports such as progress and financial reports from countries to the EA and from the EA to UNEP; Steering Committee meeting minutes; annual Project Implementation Reviews and relevant correspondence;
The STAP report (in place of the Mid Term Review);
Documentation related to project outputs.

Interviews[20] with:

Project management and execution support;
UNEP Task Manager and Fund Management Officer (Nairobi);
Country lead execution partners and other relevant partners;
Relevant staff of GEF Secretariat;
Representatives of other multilateral agencies (e.g. IMO, FAO) and other relevant organisations.

Country visits. The lead evaluation consultant will visit Kenya, USA (Colorado, Michigan and Washington for DC WWF offices) and Brazil, the 1st supporting consultants will visit

19 Documents to be provided by the UNEP and UNDP are listed in Annex 7.
20 Face-to-face or through any other appropriate means of communication

Kenya and Nigeria while the 2nd supporting consultant will visit the two sites (Gansu and Ningxia) in China

Key Evaluation principles

Evaluation findings and judgements should be based on **sound evidence and analysis**, clearly documented in the evaluation report. Information will be triangulated (i.e. verified from different sources) to the extent possible, and when verification was not possible, the single source will be mentioned[21]. Analysis leading to evaluative judgements should always be clearly spelled out.

The evaluation will assess the project with respect to **a minimum set of evaluation criteria** grouped in four categories: (1) Attainment of objectives and planned results, which comprises the assessment of outputs achieved, relevance, effectiveness and efficiency and the review of outcomes towards impacts; (2) Sustainability and catalytic role, which focuses on financial, socio-political, institutional and ecological factors conditioning sustainability of project outcomes, and also assesses efforts and achievements in terms of replication and up-scaling of project lessons and good practices; (3) Processes affecting attainment of project results, which covers project preparation and readiness, implementation approach and management, stakeholder participation and public awareness, country ownership/driven-ness, project finance, UNEP supervision and backstopping, and project monitoring and evaluation systems; and (4) Complementarity with the UNEP strategies and programmes. The lead consultant can propose other evaluation criteria as deemed appropriate.

Ratings. All evaluation criteria will be rated on a six-point scale. However, complementarity of the project with the UNEP strategies and programmes is not rated. Annex 3 provides detailed guidance on how the different criteria should be rated and how ratings should be aggregated for the different evaluation criterion categories.

In attempting to attribute any outcomes and impacts to the project, the evaluators should consider the difference between **what has happened with** and **what would have happened without** the project. This implies that there should be consideration of the baseline conditions and trends in relation to the intended project outcomes and impacts. This also means that there should be plausible evidence to attribute such outcomes and impacts to the actions of the project. Sometimes, adequate information on baseline conditions and trends is lacking. In such cases this should be clearly highlighted by the evaluators, along with any simplifying assumptions that were taken to enable the evaluator to make informed judgements about project performance.

As this is a terminal evaluation, particular attention should be given to learning from the experience. Therefore, **the "why?" question** should be at front of the consultants' minds all through the evaluation exercise. This means that the consultants needs to go beyond the assessment of "what" the project performance was, and make a serious effort to provide a deeper understanding of "why" the performance was as it was, i.e. of processes affecting attainment of project results (criteria under category 3). This should provide the basis for the lessons that can be drawn from the project. In fact, the usefulness of the evaluation will be determined to a large extent by the capacity of the consultants to explain "why things happened" as they happened and are likely to evolve in this or that direction, which goes well beyond the mere assessment of "where things stand" today.

[21] Individuals should not be mentioned by name if anonymity needs to be preserved.

Evaluation criteria

Attainment of Objectives and Planned Results

The evaluation should assess the relevance of the project's objectives and the extent to which these were effectively and efficiently achieved or are expected to be achieved.

Achievement of Outputs and Activities: Assess, for each component, the project's success in producing the programmed outputs as presented in Table A1.1 (Annex 1), both in quantity and quality, as well as their usefulness and timeliness. Briefly explain the degree of success of the project in achieving its different outputs, cross-referencing as needed to more detailed explanations provided under Section 3 (which covers the processes affecting attainment of project objectives). The achievements under the regional and national demonstration projects will receive particular attention.

Relevance: Assess, in retrospect, whether the project's objectives and implementation strategies were consistent with: i) Sub-regional environmental issues and needs; ii) the UNEP mandate and policies at the time of design and implementation; and iii) the relevant GEF focal areas, strategic priorities and operational programme(s).

Effectiveness: Appreciate to what extent the project has achieved its main objective **provide a cost effective, user-friendly, yet scientifically rigorous methodology for measuring carbon and GHG mitigation benefits in GEF projects dealing with natural resources in all climate zones and land use systems** and its component objectives as presented in Table 2 above. To measure achievement, use as much as appropriate the indicators for achievement proposed in the Logical Framework Matrix (Logframe) of the project, adding other relevant indicators as appropriate. Briefly explain what factors affected the project's success in achieving its objectives, cross-referencing as needed to more detailed explanations provided under Section 3.

Efficiency: Assess the cost-effectiveness and timeliness of project execution. Describe any cost- or time-saving measures put in place in attempting to bring the project to a successful conclusion within its programmed budget and (extended) time. Analyse how delays, if any, have affected project execution, costs and effectiveness. Wherever possible, compare the cost and time over results ratios of the project with that of other similar projects. Give special attention to efforts by the project teams to make use of / build upon pre-existing institutions, agreements and partnerships, data sources, synergies and complementarities with other initiatives, programmes and projects etc. to increase project efficiency.

Review of Outcomes to Impacts (ROtI): Reconstruct the logical pathways from project outputs over achieved objectives towards impacts, taking into account performance and impact drivers, assumptions and the roles and capacities of key actors and stakeholders, using the methodology presented in the GEF Evaluation Office's ROtI Practitioner's Handbook[22] (summarized in Annex 8 of the TORs). Appreciate to what extent the project has to date contributed, and is likely in the future to further contribute to changes in stakeholder behaviour as regards: i) accounting for C sequestration at the community level ii) the management, measurement, and monitoring of C, using earth observation satellites, internet-based GIS and databases and ground based sensors and sensor webs,

[22] http://www.thegef.org/gef/sites/thegef.org/files/documents/Impact_Eval-Review_of_Outcomes_to_Impacts-RotI_handbook.pdf

and the likelihood of those leading to the promotion by GEF and acceptance by the Council and GEF donors of carbon as a global environmental benefit in SLM interventions.

Sustainability and catalytic role

Sustainability is understood as the probability of continued long-term project-derived results and impacts after the external project funding and assistance ends. The evaluation will identify and assess the key conditions or factors that are likely to undermine or contribute to the persistence of benefits. Some of these factors might be direct results of the project while others will include contextual circumstances or developments that are not under control of the project but that may condition sustainability of benefits. The evaluation should ascertain to what extent follow-up work has been initiated and how project results will be sustained and enhanced over time. Application of the ROtI method will assist in the evaluation of sustainability.

Four aspects of sustainability will be addressed:

Socio-political sustainability. Are there any social or political factors that may influence positively or negatively the sustenance of project results and progress towards impacts? Is the level of ownership by the main national and regional stakeholders sufficient to allow for the project results to be sustained? Are there sufficient government and stakeholder awareness, interests, commitment and incentives to execute, enforce and pursue the programmes, plans, agreements, monitoring systems etc. prepared and agreed upon under the project?

Financial resources. To what extent are the continuation of project results and the eventual impact of the project dependent on continued financial support? What is the likelihood that adequate financial resources[23] will be or will become available to implement the programmes, plans, agreements, monitoring systems etc. prepared and agreed upon under the project? Are there any financial risks that may jeopardize sustenance of project results and onward progress towards impact?

Institutional framework. To what extent is the sustenance of the results and onward progress towards impact dependent on issues relating to institutional frameworks and governance? How robust are the institutional achievements such as governance structures and processes, policies, sub-regional agreements, legal and accountability frameworks etc. required to sustaining project results and to lead those to impact on human behaviour and environmental resources?

Environmental sustainability. Are there any environmental factors, positive or negative, that can influence the future flow of project benefits? Are there any project outputs or higher level results that are likely to affect the environment, which, in turn, might affect sustainability of project benefits?

Catalytic Role and Replication. The *catalytic role* of GEF-funded interventions is embodied in their approach of supporting the creation of an enabling environment and of investing in pilot activities which are innovative and showing how new approaches can work. UNEP and the GEF also aim to support activities that upscale new approaches to a national, regional or global level, with a view to achieve sustainable global environmental benefits. The evaluation will assess the catalytic role played by this project, namely to what extent the project has:

[23] Those resources can be from multiple sources, such as the public and private sectors, income generating activities, other development projects etc.

catalyzed behavioural changes in terms of use and application by the relevant stakeholders of: i) technologies and approaches show-cased by the demonstration projects; ii) strategic programmes and plans developed; and iii) assessment, monitoring and management systems established at a national and sub-regional level;

provided *incentives* (social, economic, market based, competencies etc.) to contribute to catalyzing changes in stakeholder behaviour;

contributed to *institutional changes.* An important aspect of the catalytic role of the project is its contribution to institutional uptake or mainstreaming of project-piloted approaches in the regional and national demonstration projects;

contributed to *policy changes* (on paper and in implementation of policy);

contributed to sustained follow-on financing (*catalytic financing*) from Governments, the GEF or other donors;

created opportunities for particular individuals or institutions ("*champions*") to catalyze change (without which the project would not have achieved all of its results).

Replication, in the context of GEF projects, is defined as lessons and experiences coming out of the project that are replicated (experiences are repeated and lessons applied in different geographic areas) or scaled up (experiences are repeated and lessons applied in the same geographic area but on a much larger scale and funded by other sources). The evaluation will assess the approach adopted by the project to promote replication effects and appreciate to what extent actual replication has already occurred or is likely to occur in the near future. What are the factors that may influence replication and scaling up of project experiences and lessons?

Processes affecting attainment of project results

Preparation and Readiness. Were the project's objectives and components clear, practicable and feasible within its timeframe? Were the capacities of executing agencies properly considered when the project was designed? Was the project document clear and realistic to enable effective and efficient implementation? Were the partnership arrangements properly identified and the roles and responsibilities negotiated prior to project implementation? Were counterpart resources (funding, staff, and facilities) and enabling legislation assured? Were adequate project management arrangements in place? Were lessons from other relevant projects properly incorporated in the project design? Were lessons learned and recommendations from Steering Committee meetings adequately integrated in the project approach? What factors influenced the quality-at-entry of the project design, choice of partners, allocation of financial resources etc.?

Implementation Approach and Adaptive Management. This includes an analysis of approaches used by the project, its management framework, the project's adaptation to changing conditions (adaptive management), the performance of the implementation arrangements and partnerships, relevance of changes in project design, and overall performance of project management. The evaluation will:

Ascertain to what extent the project implementation mechanisms outlined in the project document have been followed and were effective in delivering project outputs and outcomes. Were pertinent adaptations made to the approaches originally proposed?

Assess the role and performance of the units and committees established and the project execution arrangements at all levels;

Evaluate the effectiveness and efficiency of project management by the EA and how well the management was able to adapt to changes during the life of the project;

Assess the extent to which project management responded to direction and guidance provided by the Steering Committee and IA supervision recommendations;

Identify administrative, operational and/or technical problems and constraints that influenced the effective implementation of the project, and how the project partners tried to overcome these problems;

Assess the extent to which STAP Review recommendations were followed in a timely manner.

Stakeholder[24] Participation and Public Awareness. The term stakeholder should be considered in the broadest sense, encompassing project partners, government institutions, private interest groups, local communities etc. The assessment will look at three related and often overlapping processes: (1) information dissemination between stakeholders, (2) consultation between stakeholders, and (3) active engagement of stakeholders in project decision making and activities. The evaluation will specifically assess:

the approach(es) used to identify and engage stakeholders in project design and implementation. What were the strengths and weaknesses of these approaches with respect to the project's objectives and the stakeholders' motivations and capacities? What was the achieved degree and effectiveness of collaboration and interactions between the various project partners and stakeholders during the course of implementation of the project?

the degree and effectiveness of any public awareness activities that were undertaken during the course of implementation of the project; or that are built into the assessment methods so that public awareness can be raised at the time the assessments will be conducted;

how the results of the project (standardized method of measuring, monitoring, projecting and reporting of C benefits in SLM projects) engaged rural communities, local support organisations and key stakeholders in promoting and proving C as a global environmental benefit in SLM interventions.

The ROtI analysis should assist the consultants in identifying the key stakeholders and their respective roles, capabilities and motivations in each step of the causal pathway from activities to achievement of outputs and objectives to impact.

Country Ownership and Driven-ness. The evaluation will assess the performance of the Governments of the countries involved in the project, namely:

in how the Governments have assumed responsibility for the project and provided adequate support to project execution, including the degree of cooperation received

[24] Stakeholders are the individuals, groups, institutions, or other bodies that have an interest or stake in the outcome of the project. The term also applies to those potentially adversely affected by the project.

from the various contact institutions in the countries involved in the project and the timeliness of provision of counter-part funding to project activities;

to what extent the political and institutional framework of the participating countries has been conducive to project performance. Look, in particular, at the extent of the political commitment to enforce (sub-) regional agreements promoted under the project;

to what extent the Governments have promoted the participation of communities and their non-governmental organisations in the project; and

how responsive the Governments were to UNEP-DEWA coordination and guidance, to UNEP supervision and the STAP recommendations.

Financial Planning and Management. Evaluation of financial planning requires assessment of the quality and effectiveness of financial planning and control of financial resources throughout the project's lifetime. The assessment will look at actual project costs by activities compared to budget (variances), financial management (including disbursement issues), and co-financing. The evaluation will:

Verify the application of proper standards (clarity, transparency, audit etc.) and timeliness of financial planning, management and reporting to ensure that sufficient and timely financial resources were available to the project and its partners;

Appreciate other administrative processes such as recruitment of staff, procurement of goods and services (including consultants), preparation and negotiation of cooperation agreements etc. to the extent that these might have influenced project performance;

Present to what extent co-financing has materialized as expected at project approval (see Table 1). Report country co-financing to the project overall, and to support project activities at the national level in particular. The evaluation will provide a breakdown of final actual costs and co-financing for the different project components (see tables in Annex 4).

Describe the resources the project has leveraged since inception and indicate how these resources are contributing to the project's ultimate objective. Leveraged resources are additional resources—beyond those committed to the project itself at the time of approval—that are mobilized later as a direct result of the project. Leveraged resources can be financial or in-kind and they may be from other donors, NGO's, foundations, governments, communities or the private sector.

Analyse the effects on project performance of any irregularities in procurement, use of financial resources and human resource management, and the measures taken by the EA or IA to prevent such irregularities in the future. Appreciate whether the measures taken were adequate.

UNEP Supervision and Backstopping. The purpose of supervision is to verify the quality and timeliness of project execution in terms of finances, administration and achievement of outputs and outcomes, in order to identify and recommend ways to deal with problems which arise during project execution. Such problems may be related to project management but may also involve technical/institutional substantive issues in which UNEP has a major contribution to make. The evaluators should assess the effectiveness of supervision and administrative and financial support provided by UNEP including:

The adequacy of project supervision plans, inputs and processes;

The emphasis given to outcome monitoring (results-based project management);

The realism and candour of project reporting and ratings (i.e. are PIR ratings an accurate reflection of the project realities and risks);

The quality of documentation of project supervision activities; and

Financial, administrative and other fiduciary aspects of project implementation supervision.

Monitoring and Evaluation. The evaluation will include an assessment of the quality, application and effectiveness of project monitoring and evaluation plans and tools, including an assessment of risk management based on the assumptions and risks identified in the project document. The evaluation will appreciate how information generated by the M&E system during project implementation was used to adapt and improve project execution, achievement of outcomes and ensuring sustainability. M&E is assessed on three levels:

M&E Design. Projects should have sound M&E plans to monitor results and track progress towards achieving project objectives. An M&E plan should include a baseline (including data, methodology, etc.), SMART indicators and data analysis systems, and evaluation studies at specific times to assess results. The time frame for various M&E activities and standards for outputs should have been specified. The evaluators should use the following questions to help assess the M&E design aspects:

Quality of the project logframe as a planning and monitoring instrument; analyse/compare logframe in Project Document, revised logframe (2008) and logframe used in Project Implementation Review reports to report progress towards achieving project objectives;

SMART-ness of indicators: Are there specific indicators in the logframe for each of the project objectives? Are the indicators measurable, attainable (realistic) and relevant to the objectives? Are the indicators time-bound?

Adequacy of baseline information: To what extent has baseline information on performance indicators been collected and presented in a clear manner? Was the methodology for the baseline data collection explicit and reliable?

Arrangements for monitoring: Have the responsibilities for M&E activities been clearly defined? Were the data sources and data collection instruments appropriate? Was the frequency of various monitoring activities specified and adequate? In how far were project users involved in monitoring?

Arrangements for evaluation: Have specific targets been specified for project outputs? Has the desired level of achievement been specified for all indicators of objectives and outcomes? Were there adequate provisions in the legal instruments binding project partners to fully collaborate in evaluations?

Budgeting and funding for M&E activities: Determine whether support for M&E was budgeted adequately and was funded in a timely fashion during implementation.

M&E Plan Implementation. The evaluation will verify that:

the M&E system was operational and facilitated timely tracking of results and progress towards projects objectives throughout the project implementation period;

annual project reports and Progress Implementation Review (PIR) reports were complete, accurate and with well justified ratings;

the information provided by the M&E system was used during the project to improve project performance and to adapt to changing needs;

projects had an M&E system in place with proper training, instruments and resources for parties responsible for M&E.

Complementarities with UNEP strategies and programmes

UNEP aims to undertake GEF funded projects that are aligned with its own strategies. The evaluation should present a brief narrative on the following issues:

Linkage to UNEP's Expected Accomplishments and POW 2010-2011. The UNEP MTS specifies desired results in six thematic focal areas. The desired results are termed Expected Accomplishments. Using the completed ROtI analysis, the evaluation should comment on whether the project makes a tangible contribution to any of the Expected Accomplishments specified in the UNEP MTS. The magnitude and extent of any contributions and the causal linkages should be fully described. Whilst it is recognised that UNEP GEF projects designed prior to the production of the UNEP Medium Term Strategy (MTS)[25]/ Programme of Work (POW) 2010/11 would not necessarily be aligned with the Expected Accomplishments articulated in those documents, complementarities may still exist.

Alignment with the Bali Strategic Plan (BSP)[26]. The outcomes and achievements of the project should be briefly discussed in relation to the objectives of the UNEP BSP.

Gender. Ascertain to what extent project design, implementation and monitoring have taken into consideration: (i) possible gender inequalities in access to and the control over natural resources; (ii) specific vulnerabilities of women and children to environmental degradation or disasters; and (iii) the role of women in mitigating or adapting to environmental changes and engaging in environmental protection and rehabilitation. Appreciate whether the intervention is likely to have any lasting differential impacts on gender equality and the relationship between women and the environment. To what extent do unresolved gender inequalities affect sustainability of project benefits?

South-South Cooperation. This is regarded as the exchange of resources, technology, and knowledge between developing countries. Briefly describe any aspects of the project that could be considered as examples of South-South Cooperation.

The Consultants' Team

For this evaluation, a team of 3 independent consultants will be hired. The evaluation team will combine the following expertise and experience:

[25] http://www.unep.org/PDF/FinalMTSGCSS-X-8.pdf
[26] http://www.unep.org/GC/GC23/documents/GC23-6-add-1.pdf

Evaluation of environmental projects

Expertise in Climate change, Greenhouse Gas emissions, Carbon Sequestration

Extensive knowledge of Soil Organic Carbon (SOC), Sustainable Land Management (SLM), Scientific Modelling techniques, and Forestry

Good knowledge of UNEP/GEF work

The **Team Leader** will be responsible for coordinating the data collection and analysis phase of the evaluation, and preparing the main report. (S)He will ensure that all evaluation criteria are adequately covered by the team. **Annex 6** provides a matrix which presents the distribution of responsibilities between evaluation team members (to be finalized in consultation with the Team Leader).

The **Supporting Consultants** will prepare relevant country reports that will be appended into the main report, the content of which will be agreed upon with the Team Leader. The Supporting Consultants are also expected to contribute to selected sections of the main report as agreed with the Team Leader, and provide constructive comments on the draft report prepared by the Team Leader.

By undersigning the service contract with UNEP/UNON, the consultants certify that they have not been associated with the design and implementation of the project in any way which may jeopardize their independence and impartiality towards project achievements and project partner performance. In addition, they will not have any future interests (within six months after completion of their contract) with the project's executing or implementing units.

Evaluation Deliverables and Review Procedures

The Team Leader will prepare an **inception report** containing a thorough review of the project design quality and the evaluation framework. The review of design quality will cover the following aspects:

Project relevance (see paragraph 28 (b));

A desk-based Theory of Change of the project (see Annex 8 - ROtI analysis);

Sustainability consideration (see paragraphs 29-30)) and measures planned to promote replication and upscaling (see paragraph 32);

Preparation and readiness (see paragraph 33);

Financial planning (see paragraph 38);

M&E design (see paragraph 41(a));

Complementarities with UNEP strategies and programmes (see paragraph 42);

Using the above, complete an assessment of the overall quality of the project design (see Annex 9);

The evaluation framework should summarize the information available from project documentation against each of the main evaluation parameters. Any gaps in information should be identified and methods for additional data collection, verification

and analysis should be specified. A draft schedule for the evaluation process should be presented.

The evaluation framework will present in further detail the evaluation questions under each criterion with their respective indicators and data sources. The inception report will be submitted for review by the Evaluation Office before the evaluation team conducts any field visits.

The main evaluation report should be brief (no longer than 35 pages – excluding the executive summary and annexes), to the point and written in plain English. The report will follow the annotated Table of Contents outlined in Annex 2. It must explain the purpose of the evaluation, exactly what was evaluated and the methods used (with their limitations). The report will present evidence-based and balanced findings, consequent conclusions, lessons and recommendations, which will be cross-referenced to each other. The report should be presented in a way that makes the information accessible and comprehensible. Any dissident views in response to evaluation findings will be appended in footnote or annex as appropriate.

Technical working paper. The format and contents of the working paper prepared by the Supporting Consultants should be agreed upon with the Team Leader and approved by the UNEP Evaluation Office before any data collection and analysis work is undertaken. It is recommended that the working papers follow the same structure as the main evaluation report, for easy reference by the Team Leader (Annex 2). The Team Leader will carry out a first review of the working papers and provide comments to the Supporting Consultants for improvement. Only a version acceptable to the Team Leader will be submitted to the EO as an appendix to the draft main report.

Report summary. The Team Leader will prepare a 15-slide presentation summarizing the key findings, lessons learned and recommendations of the evaluation. This presentation will be presented at a stakeholder's meeting (tentatively planned for mid March 2013). The purpose of this presentation is to engage the main project partners in a discussion on the evaluation results.

Review of the draft evaluation report. The Team Leader will submit the zero draft report latest by 31 January 2013 to the UNEP EO and revise the draft following the comments and suggestions made by the EO. The EO will then share the first draft report with the UNEP GEF Coordination Office (Nairobi) and the UNEP Division of Environmental Policy and Implementation (DEPI). The UNEP Task Manager will forward the first draft report to the other project stakeholders, in particular State University, World Wide Fund for Nature (WWF), ICRAF, Michigan State University and CIFOR for review and comments. Stakeholders may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions. Comments would be expected within two weeks after the draft report has been shared. Any comments or responses to the draft report will be sent to the UNEP EO for collation. The EO will provide the comments to the Team Leader for consideration in preparing the final draft report. The Team Leader will submit the final draft report no later than 2 weeks after reception of stakeholder comments. The Team Leader will prepare a **response to comments**, providing a list of the comments that are in contradiction with the findings of the evaluation team and could therefore not be accommodated in the final report, with a clear explanation why. This response will be shared by the EO with the interested stakeholders to ensure full transparency.

Consultations will be held between the consultants, EO staff, the UNEP/GEF, UNEP/DEWA, and key members of the project execution team. These consultations will seek feedback on the proposed recommendations and lessons.

Submission of the final Terminal Evaluation report. The final report shall be submitted by Email to:

Segbedzi Norgbey, Head

UNEP Evaluation Office

Email: segbedzi.norgbey@unep.org

The Head of Evaluation will share the report with the following persons:

Maryam Niamir-Fuller, Director

UNEP/GEF Coordination Office

Email: maryam.niamir-fuller@unep.org

Peter Gilruth, Director
UNEP/DEWA

Email : peter.gilruth@unep.org

Mohammed Sessay
Chief , GEF Biodiversity/Land Degradation/Biosafety Unit & Portfolio Manager
DEPI/GEF

Tel: +254 20 7624294
mohamed.sessay@unep.org

Gemma Shepherd
Programme Officer, Land/Soil
Scientific Assessment Branch
Project Manager, CBP:MMM
UNEP/DEWA
Phone: +254 20 7623282
Email: Gemma.Shepherd@unep.org

The final evaluation report will be published on the UNEP Evaluation Office web-site www.unep.org/eou and may be printed in hard copy. Subsequently, the report will be sent to the GEF Office of Evaluation for their review, appraisal and inclusion on the GEF website.

As per usual practice, the UNEP EO will prepare a **quality assessment** of the zero draft and final draft report, which is a tool for providing structured feedback to the evaluation consultants. The quality of the report will be assessed and rated against both GEF and UNEP criteria as presented in Annex 5.

The UNEP Evaluation Office will also prepare a **commentary** on the final evaluation report, which presents the EO ratings of the project based on a careful review of the evidence collated by the evaluation team and the internal consistency of the report. These ratings are the final ratings that the UNEP Evaluation Office will submit to the GEF Office of Evaluation.

Resources and Schedule of the Evaluation

This Terminal Evaluation will be undertaken by three independent evaluation consultants contracted by the UNEP Evaluation Office. The consultants will work under the overall responsibility of the UNEP Evaluation Office and they will consult with the EO on any procedural and methodological matters related to the evaluation. It is, however, the consultants' individual responsibility to arrange for their travel, obtain documentary evidence, meetings with stakeholders, field visits, and any other logistical matters related to their assignment. The UNEP Task Manager, UNDP Regional Technical Advisor, UNDP Country Offices and regional and national project staff will provide logistical support (introductions, meetings, transport, lodging etc.) for the country visits where necessary, allowing the consultants to conduct the evaluation as efficiently and independently as possible.

The **Team Leader** will be hired for 8.5 weeks to be carried out in between December 2012 and March 2013. He will travel to Kenya (Nairobi) and USA (Colorado, Michigan and Washington DC).

The 1st **Supporting Consultant** will be hired for 6 weeks of work to be carried out in between December 2012 and March 2013. He will travel within Kenya and Nigeria.

The 2nd consultant will be hired for 4.5 weeks of work to be carried out in between December 2012 and March 2013. He will travel only within China (Ganzu and Ningxia).

The tentative schedule is presented in the table below:

Table 4: Tentative Evaluation Timeline

Activity	Date
Start of contract	11 December 2012
Inception report to UNEP EO	7 January 2013
Consultative meetings: WWW in Washington DC, MSU, CSU*	14-18 January 2013
1 day site visit to Nigeria* (2 days travel)	14-18 January 2013
3 days site visits to Ganzu and Ninngxia, China*	14-18 January 2013
Consultative meetings: CENA Sao Paulo; Site visits in Brazil (Mato Grosso & Rondonia)* + 2 days travel	21-25 January 2013
3 days site visits in Kenya	21-25 January 2013
Consultative meetings: Task Manager, FMO at UNEP Nairobi-Bill (includes 2days travel from USA for Bill) Consultative meetings: CIFOR and ICRAF (and ICRISAT) Nairobi* -Frank with or w/out Bill	28-31 January 2013
Zero draft report to UNEP EO	18 February 2013
First draft report to UNEP EO	11 March 2013
Collated comments by UNEP EO sent to consultant	25 March 2013

Activity	Date
Final report and response to comments to UNEP EO	1 April 2013
End of contract	15 April 2013

Wherever possible, the Consultant should make an effort to visit the National Focal Points in the countries visited while on mission

Schedule of Payment

The consultants will be hired under an individual Special Service Agreement (SSA) covering the consultants' fees but which is NOT inclusive of all expenses such as airfares, in-country travel, accommodation, incidental and terminal expenses. Air tickets will be paid separately by UNEP and 75% of the DSA for each authorised travel mission will be paid up front. Local in-country travel and communication costs will be reimbursed on the production of acceptable receipts. Terminal expenses and residual DSA entitlements (25%) will be paid after mission completion.

The Team Leader will receive 20% of the honorarium portion of his fee upon submission of an acceptable inception report, 40% upon acceptance of a draft report deemed complete and of acceptable quality by the EO. The remainder will be paid upon satisfactory completion of the work.

The Supporting Consultants will be paid 40% of the honoraria upon submission of the draft report and the remaining 60% upon satisfactory completion of their work. The Team Leader will advise the EO whether the Supporting Consultants have provided satisfactory inputs in the evaluation.

In case the consultants are not able to provide the deliverables in accordance with these TORs, in line with the expected quality standards by the UNEP Evaluation Office, payment may be withheld at the discretion of the Head of the Evaluation Office until the consultants have improved the deliverables to meet UNEP's quality standards.

If the consultants fail to submit a satisfactory final product to UNEP in a timely manner, i.e. within one month after the end date of their contract, the Evaluation Office reserves the right to employ additional human resources to finalize the report, and to reduce the consultants' fees by an amount equal to the additional costs borne by the Evaluation Office to bring the report up to standard.

Annex 1. Project outputs

Table A1.1. Project components and outputs

Components	Sub-components for both A and B	Outputs
Component A-with a greater focus on cropland and grazing land	Methodology development	A cost-effective methodology for proving C benefits in GEF projects, comprised of a protocol for proving C as a GEB in GEF and other SLM projects A web portal allowing easy access and implementation of this protocol.
	Test Cases	A C benefits protocol that meets the specific requirements of GEF SLM projects and other SLM projects in developing countries.
Component B-with a greater focus on agro-forestry and forestry	Capacity building	Increased capacity to prove C benefits in SLM projects.
	Project Management, Monitoring and Evaluation and Information Dissemination	4.1 A workable project management structure 4.2 Effective M&E of the project 4.3 Wide dissemination of the project tools.

Annex 2(a): Annotated Table of Contents of the Inception Report

Section	**Notes**
1. Introduction	Brief note of documents consulted in preparing the inception report.
2. Review of Project Design	Complete the Template for assessment of the quality of project design given in Annex 7 of the Terms of Reference. **Data sources:** background information on context (UNEP or GEF programme etc.), first phase of project – if any, project document, logical framework.
3. Theory of Change Analysis	The section should start with a brief description of the project context. The 'theory of change' should be developed using the process described in Annex 6 (Introduction to Theory of Change/Impact pathways, the ROtI Method and the ROtI results score sheet) of the TORs. The final ToC diagram can be designed on the basis of figure 3 in Annex 6. Outputs do not necessarily occur at the beginning of the process, additional outputs may occur at different stages of the process (for example to move from one intermediate state to another). The diagram can be represented horizontally or vertically. **Data sources**: project document, logical framework and a review of other project documents.
4. Evaluation Process Plan	This section should include: Detailed evaluation questions (including new questions raised by review of project design and theory of change analysis). Data Sources and Indicators List of individuals to be consulted. Distribution of roles and responsibilities among evaluation consultants (in case of larger evaluation teams). Revised logistics (dates of travel and key evaluation milestones). The framework can be presented as a table for ease of use, showing which data sources will be used to answer which questions. **Data sources**: review of all project documents. Discussion with project team on logistics.

Annex 2(b): Annotated Table of Contents of the Main Report

Project Identification Table	An updated version of the table in Section I.A. of these TORs
Executive Summary	Overview of the main findings, conclusions and recommendations of the evaluation. It should encapsulate the essence of the information contained in the report to facilitate dissemination and distillation of lessons. The main points for each evaluation parameter should be presented here (with a summary ratings table), as well as the most important lessons and recommendations. Maximum 4 pages.
I. Evaluation Background	
A. Context	A. Overview of the broader institutional and country context, in relation to the project's objectives.
B. The Project	B. Presentation of the project: rationale, objectives, components, intervention areas and target groups, milestones in design, implementation and completion, implementation arrangements and main partners, financing (amounts and sources), modifications to design before or during implementation.
C. Evaluation objectives, scope and methodology	C. Presentation of the evaluation's purpose, evaluation criteria and key questions, evaluation timeframe, data collection and analysis instruments used, places visited, types of stakeholders interviewed, and limitations of the evaluation.
II. Project Performance and Impact A. Attainment of objectives and planned results B. Sustainability and catalytic role C. Processes affecting attainment of project results D. Complementarity with UNEP, UNDP and	This section is organized according to the 4 categories of evaluation criteria (see section D of these TORs) and provides factual evidence relevant to the questions asked and sound analysis and interpretations of such evidence. This is the main substantive section of the report. Ratings are provided at the end of the assessment of each evaluation criterion.

UNIDO programmes and strategies	
III. Conclusions and Recommendations	
A. Conclusions	This section should summarize the main findings of the evaluation, told in a logical sequence from cause to effect. It is suggested to start with the positive achievements and a short explanation why these could be achieved, and, then, to present the less successful aspects of the project with a short explanation why. The conclusions section should end with the overall assessment of the project. Findings should be cross-referenced to the main text of the report (using the paragraph numbering). The overall ratings table should be inserted here (see Annex 2).
B. Lessons Learned	Lessons learned should be anchored in the main findings of the evaluation. In fact, no lessons should appear which are not based upon a conclusion of the evaluation. The number of lessons learned should be limited. Lessons learned are rooted in real project experiences, i.e. based on good practices and successes which could be replicated or derived from problems encountered and mistakes made which should be avoided in the future. Lessons learned must have the potential for wider application and use. Lessons should briefly describe the context from which they are derived and specify the contexts in which they may be useful.
C. Recommendations	As for the lessons learned, all recommendations should be anchored in the conclusions of the report, with proper cross-referencing. Recommendations are actionable proposals on how to resolve concrete problems affecting the project or the sustainability of its results. They should be feasible to implement within the timeframe and resources available (including local capacities), specific in terms of who would do what and when, and set a measurable performance

	target. In some cases, it might be useful to propose options, and briefly analyze the pros and cons of each option.
Annexes	These may include additional material deemed relevant by the evaluator but must include: 1. Evaluation TORs 2. The evaluation framework (second part of the inception report) 3. Evaluation program, containing the names of locations visited and the names (or functions) of people met 4. Bibliography 5. Summary co-finance information and a statement of project expenditure by activity (See annex of these TORs) 6. The review of project design (first part of the inception report) 7. Technical working paper 8. Brief CVs of the consultants TE reports will also include any formal response/ comments from the project management team and/ or the country focal point regarding the evaluation findings or conclusions as an annex to the report, however, such will be appended to the report by UNEP Evaluation Office.

Examples of UNEP GEF Terminal Evaluation Reports are available at www.unep.org/eou.

Annex 3. Evaluation ratings

The evaluation will provide individual ratings for the evaluation criteria described in section II.D. of these TORs. Some criteria contain sub-criteria which require separate ratings (i.e. sustainability and M&E). Furthermore, an aggregated rating will be provided for Relevance, effectiveness and efficiency under the category "Attainment of project objectives and results".

Most criteria will be rated on a six-point scale as follows: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU). Sustainability is rated from Highly Likely (HL) down to Highly Unlikely (HU).

In the conclusions section of the report, ratings will be presented together in a table, with a brief justification cross-referenced to the findings in the main body of the report. Please note that the order of the evaluation criteria in the table will be slightly different from the order these are treated in the main report; this is to facilitate comparison and aggregation of ratings across GEF project evaluation reports.

Criterion	Summary Assessment	Rating
A. Attainment of project objectives and results		HS → HU
1. Effectiveness		HS → HU
2. Relevance		HS → HU
3. Efficiency		HS → HU
B. Sustainability of project outcomes		HL → HU
1. Financial		HL → HU
2. Socio-political		HL → HU
3. Institutional framework		HL → HU
4. Environmental		HL → HU
C. Catalytic role		HS → HU
D. Stakeholders involvement		HS → HU
E. Country ownership / driven-ness		HS → HU
F. Achievement of outputs and activities		HS → HU
G. Preparation and readiness		HS → HU
H. Implementation approach		HS → HU
I. Financial planning and management		HS → HU
J. Monitoring and Evaluation		HS → HU
1. M&E Design		HS → HU
2. M&E Plan Implementation		HS → HU
3. Budgeting and funding for M&E activities		HS → HU
K. UNEP and UNDP Supervision and backstopping		HS → HU
1. UNEP		HS → HU
2. UNDP		HS → HU

Rating of Attainment of project objectives and results. A compound rating is given to the category based on the assessment of relevance, effectiveness and efficiency. This aggregated rating is not a simple average of the separate ratings given to the evaluation criteria, but an overall judgement by the consultants. Relevance and effectiveness, however, will be considered as critical criteria. This means that the aggregated rating for Attainment of objectives and results may not be higher than the lowest rating on either of these two criteria.

Ratings on sustainability. According to the GEF Office of Evaluation, all the dimensions of sustainability are deemed critical. Therefore, the overall rating for sustainability will not be higher than the lowest rating on the separate dimensions.

Ratings of monitoring and evaluation. The M&E system will be rated on M&E design, M&E plan implementation, and budgeting and funding for M&E activities (the latter sub-criterion is covered in the main report under M&E design) as follows:

Highly Satisfactory (HS): There were no shortcomings in the project M&E system.

Satisfactory(S): There were minor shortcomings in the project M&E system.

Moderately Satisfactory (MS): There were moderate shortcomings in the project M&E system.

Moderately Unsatisfactory (MU): There were significant shortcomings in the project M&E system.

Unsatisfactory (U): There were major shortcomings in the project M&E system.

Highly Unsatisfactory (HU): The Project had no M&E system.

M&E plan implementation will be considered critical for the overall assessment of the M&E system. Thus, the overall rating for M&E will not be higher than the rating on M&E plan implementation.

Annex 4. Project costs and co-financing tables

Project Costs

Component/sub-component	Estimated cost at design	Actual Cost	Expenditure ratio (actual/planned)

Co-financing

Co financing (Type/Source)	IA own Financing (mill US$)		Government (mill US$)		Other* (mill US$)		Total (mill US$)		Total Disbursed (mill US$)
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	
Grants									
Loans									
Credits									
Equity investments									
In-kind support									
Other (*) - -									
Totals									

This refers to contributions mobilized for the project from other multilateral agencies, bilateral development cooperation agencies, NGOs, the private sector and beneficiaries.

Annex 5. Quality Assessment of the Evaluation Report

All UNEP evaluation reports are subject to a quality assessment by the Evaluation Office. The quality assessment is used as a tool for providing structured feedback to the evaluation consultants. The quality of the draft evaluation report is assessed and rated against the following criteria:

GEF Report Quality Criteria	UNEP EO Assessment	Rating
A. Did the report present an assessment of relevant outcomes and achievement of project objectives in the context of the focal area program indicators if applicable?		
B. Was the report consistent and the evidence complete and convincing and were the ratings substantiated when used?		
C. Did the report present a sound assessment of sustainability of outcomes?		
D. Were the lessons and recommendations supported by the evidence presented?		
E. Did the report include the actual project costs (total and per activity) and actual co-financing used?		
F. Did the report include an assessment of the quality of the project M&E system and its use for project management?		
UNEP additional Report Quality Criteria		
G. Quality of the lessons: Were lessons readily applicable in other contexts? Did they suggest prescriptive action?		
H. Quality of the recommendations: Did recommendations specify the actions necessary to correct existing conditions or improve operations ('who?' 'what?' 'where?' 'when?)'. Can they be implemented? Did the recommendations specify a goal and an associated performance indicator?		
I. Was the report well written? (clear English language and grammar)		
J. Did the report structure follow EOU guidelines, were all requested Annexes included?		
K. Were all evaluation aspects specified in the TORs adequately addressed?		
L. Was the report delivered in a timely manner		

Quality = (2*(0.3*(A + B) + 0.1*(C+D+E+F))+ 0.3*(G + H) + 0.1*(I+J+K+L))/3

The Totals are rounded and converted to the scale of HS to HU

Rating system for quality of Terminal Evaluation reports: A number rating between 1 and 6 is used for each criterion: Highly Satisfactory = 6, Satisfactory = 5, Moderately Satisfactory = 4, Moderately Unsatisfactory = 3, Unsatisfactory = 2, Highly Unsatisfactory = 1.

Annex 6 – Matrix for Distribution of responsibilities and tasks among evaluation consultants

L: Lead assessor

S: Support in data collection and analysis

Evaluation Criteria		Team Leader	Supporting Consultant 1	Supporting Consultant 2
Attainment of Objectives and Planned Results	Achievement of Outputs and Activities	See table below		
	Relevance	L		
	Effectiveness			
	Achievement of main objective	L		
	Achievement of component objectives:			
	Component I	L		
	Component II		L	
	Component III			L
	Component IV		L	
	Component V	L		
	Efficiency	L		
	Review of Outcomes to Impacts (ROtI)	L	S	S
Sustainability and catalytic role	Socio-political sustainability	L		
	Financial resources	L		
	Institutional framework	L		
	Environmental sustainability			L
	Catalytic Role and Replication	L		
Processes affecting attainment of project results	Preparation and Readiness	L		
	Implementation Approach and Adaptive Management	L		
	Stakeholder Participation and Public Awareness	L		
	Country Ownership and Driven-ness	L		
	Financial Planning and Management	L		
	UNEP and UNDP Supervision and Backstopping	L		
	Monitoring and Evaluation	L		
Complementarities with the UNEP Medium Term Strategy and Programme of Work	Linkage to UNEP's EAs and POW 2010-2011	L		
	Alignment with the Bali Strategic Plan (BSP)	L		
	South-South Cooperation	L		

	Achievement of Outputs and Activities	Team Leader	Supporting Consultant 1	Supporting Consultant 2
Component I	Output 1.1:.		L	
	Output 1.2:	L		
	Output 1.3:	L		
	Output 1.4:	L		
	Output 1.5:	L		
		L		

		L		
			L	
Component II	Output 2.1:		L	
	Output 2.2:		L	
			L	
			L	
			L	
			L	
			L	
Component III	Output 3.1:			L
	Output 3.2			L
				L
				L
				L
				L
				L
Component IV	Output 4.1:		L	
	Output 4.2:		L	
	Output 4.3:		L	
			L	
			L	
			L	
			L	
Component V	Output 5.1:	L		
	Output 5.2:	L		
	Output 5.3:	L		
		L		
				L
		L		
		L		
		L		

Annex 7. **Documentation list for the evaluation to be provided by the UNEP Task Manager**

Project design documents
Project supervision plan, with associated budget
Correspondence related to project
Supervision mission reports
Steering Committee meeting documents, including agendas, meeting minutes, and any summary reports
Project progress reports, including financial reports submitted
Cash advance requests documenting disbursements
Annual Project Implementation Reports (PIRs)
Management memos related to project
Other documentation of supervision feedback on project outputs and processes (e.g. comments on draft progress reports, etc.).
Extension documentation. Has a project extension occurred?
Project revision documentation.
Budget revision documentation.
Project Terminal Report (draft if final version not available)

Annex 8. Introduction to Theory of Change / Impact pathways, the ROtI Method and the ROtI Results Score sheet

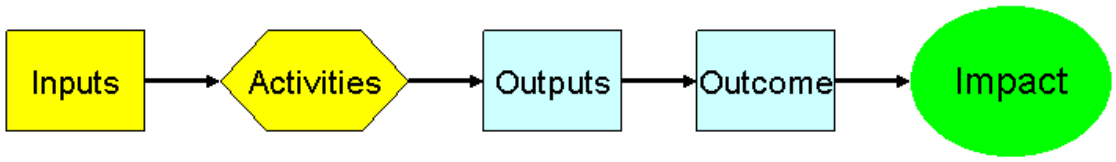
Terminal evaluations of projects are conducted at, or shortly after, project completion. At this stage it is normally possible to assess the achievement of the project's outputs. However, the possibilities for evaluation of the project's outcomes are often more limited and the feasibility of assessing project **impacts** at this time is usually severely constrained. Full impacts often accrue only after considerable time-lags, and it is common for there to be a lack of long-term baseline and monitoring information to aid their evaluation. Consequently, substantial resources are often needed to support the extensive primary field data collection required for assessing impact and there are concomitant practical difficulties because project resources are seldom available to support the assessment of such impacts when they have accrued – often several years after completion of activities and closure of the project.

Despite these difficulties, it is possible to enhance the scope and depth of information available from Terminal Evaluations on the achievement of results **through rigorous review of project progress along the pathways from outcome to impact**. Such reviews identify the sequence of conditions and factors deemed necessary for project outcomes to yield impact and assess the current status of and future prospects for results. In evaluation literature these relationships can be variously described as 'Theories of Change', Impact 'Pathways', 'Results Chains', 'Intervention logic', and 'Causal Pathways' (to name only some!).

Theory of Change (ToC) / impact pathways

Figure 1 shows a generic impact pathway which links the standard elements of project logical frameworks in a graphical representation of causal linkages. When specified with more detail, for example including the key users of outputs, the processes (the arrows) that lead to outcomes and with details of performance indicators, analysis of impact pathways can be invaluable as a tool for both project planning and evaluation.

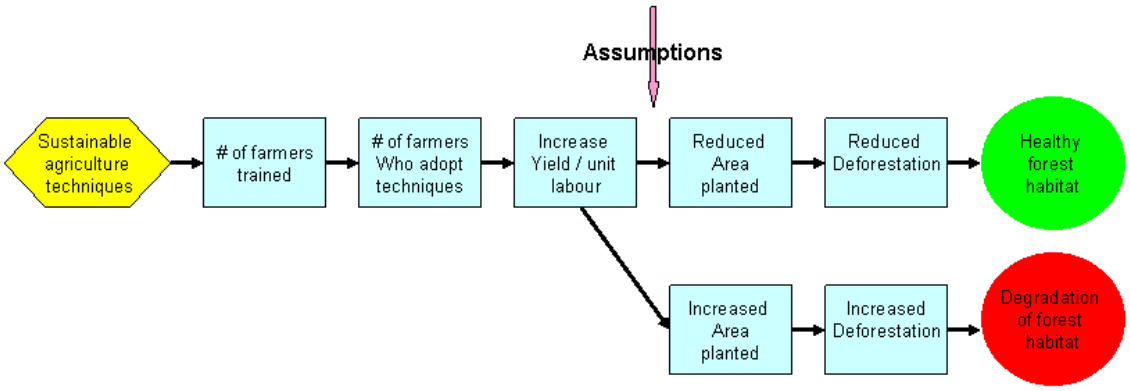
Figure 1. A generic results chain, which can also be termed an 'Impact Pathway' or Theory of Change.



The pathways summarise casual relationships and help identify or clarify the assumptions in the intervention logic of the project. For example, in the Figure 2 below the eventual impact depends upon the behaviour of the farmers in using the new agricultural techniques they have learnt from the training. The project design for the intervention might be based on the upper pathway assuming that the farmers can now meet their needs from more efficient management of a given area therefore reducing the need for an expansion of cultivated area and ultimately reducing pressure on nearby forest habitat, whereas the evidence gathered in the evaluation may in some locations follow the lower

of the two pathways; the improved faming methods offer the possibility for increased profits and create an incentive for farmers to cultivate more land resulting in clearance or degradation of the nearby forest habitat.

Figure 2. An impact pathway / TOC for a training intervention intended to aid forest conservation.



The GEF Evaluation Office has recently developed an approach that builds on the concepts of theory of change / causal chains / impact pathways. The method is known as Review of Outcomes to Impacts (ROtI)[27] and has three distinct stages:

Identifying the project's intended impacts

Review of the project's logical framework

Analysis and modelling of the project's outcomes-impact pathways

The **identification of the projects intended impacts** should be possible from the 'objectives' statements specified in the official project document. The next stage is to **review the project's logical framework** to assess whether the design of the project is consistent with, and appropriate for, the delivery of the intended impact. The method requires verification of the causal logic between the different hierarchical levels of the logical framework moving 'backwards' from impacts through outcomes to the outputs; the activities level is not formally considered in the ROtI method[28]. The aim of this stage is to develop an understanding of the causal logic of the project intervention and to identify the key 'impact pathways'. In reality such process are often complex; they often involve multiple actors and decision-processes and are subject to time-lags, meaning that project impact often accrue long after the completion of project activities.

The third stage involves analysis of the 'impact pathways' that link project outcomes to impacts. The pathways are analysed in terms of the **'assumptions'** and **'impact drivers'** that underpin the processes involved in the transformation of outcomes to impacts via **intermediate states** (see Figure 3). Project outcomes are the direct intended results stemming from the outputs, and they are likely to occur either towards the end of the project or in the short term following project completion. **Intermediate states** are the

[27] GEF Evaluation Office (2009). ROtI: Review of Outcomes to Impacts Practitioners Handbook. http://www.gefweb.org/uploadedFiles/Evaluation_Office/OPS4/Roti%20Practitioners%20Handbook%2015%20June%202009.pdf

[28] Evaluation of the efficiency and effectiveness in the use of resources to generate outputs is already a major focus within UNEP Terminal Evaluations.

transitional conditions between the project's immediate outcomes and the intended impact. They are necessary conditions for the achievement of the intended impacts and there may be more than one intermediate state between the immediate project outcome and the eventual impact.

Impact drivers are defined as the significant factors that if present are expected to contribute to the realization of the intended impacts and **can be influenced** by the project / project partners & stakeholders. **Assumptions** are the significant factors that if present are expected to contribute to the realization of the intended impacts but are largely **beyond the control of the project** / project partners & stakeholders. The impact drivers and assumptions are ordinarily considered in Terminal Evaluations when assessing the sustainability of the project.

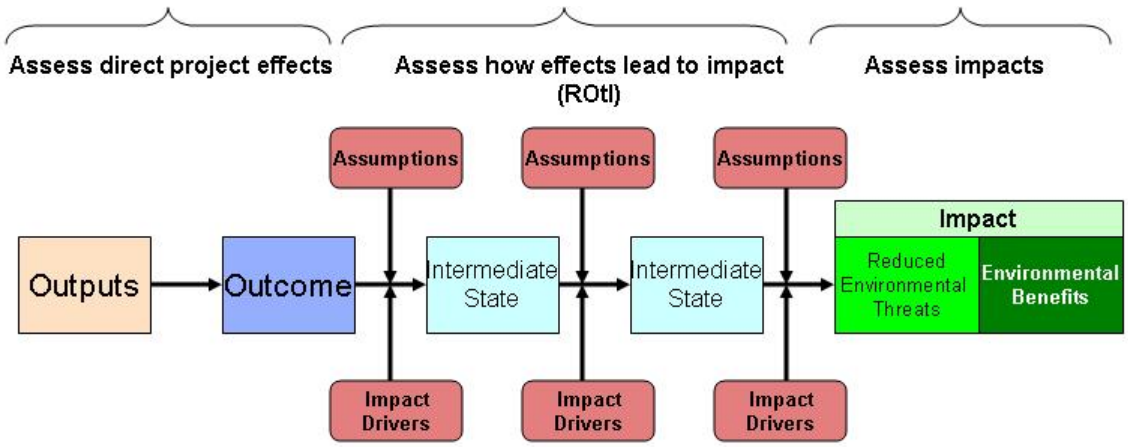
Since project logical frameworks do not often provide comprehensive information on the processes by which project outputs yield outcomes and eventually lead, via 'intermediate states' to impacts, the impact pathways need to be carefully examined and the following questions addressed:

Are there other causal pathways that would stem from the use of project outputs by other potential user groups?

Is (each) impact pathway complete? Are there any missing intermediate states between project outcomes and impacts?

Have the key impact drivers and assumptions been identified for each 'step' in the impact pathway.

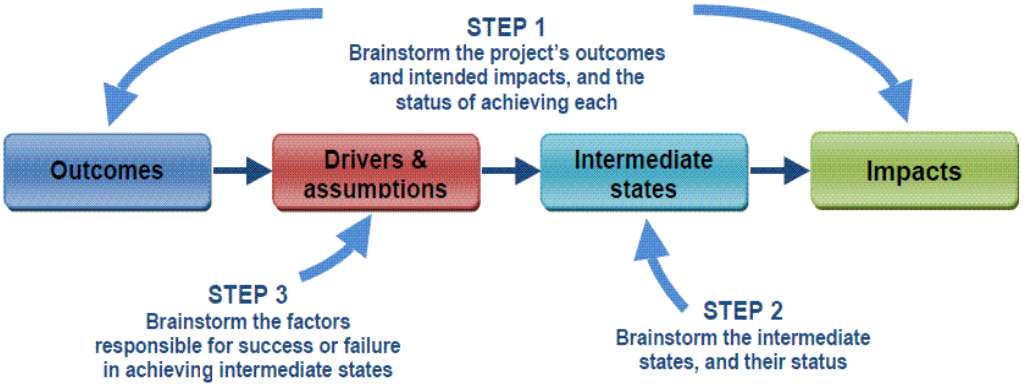
Figure 3. A schematic 'impact pathway' showing intermediate states, assumptions and impact drivers (adapted from GEF EO 2009).



The process of identifying the impact pathways and specifying the impact drivers and assumptions can be done as a desk exercise by the evaluator or, preferably, as a group exercise, led by the evaluator with a cross-section of project stakeholders as part of an evaluation field mission or both. Ideally, the evaluator would have done a desk-based assessment of the project's theory of change and then use this understanding to facilitate a group exercise. The group exercise is best done through collective discussions to develop a visual model of the impact pathways using a card exercise. The component elements (outputs, outcomes, impact drivers, assumptions intended impacts etc.) of the impact

pathways are written on individual cards and arranged and discussed as a group activity. Figure 4 below shows the suggested sequence of the group discussions needed to develop the ToC for the project.

Figure 4. Suggested sequencing of group discussions (from GEF EO 2009)



Once the theory of change model for the project is complete the evaluator can assess the design of the project intervention and collate evidence that will inform judgments on the extent and effectiveness of implementation, through the evaluation process. Performance judgments are made always noting that project contexts can change and that adaptive management is required during project implementation.

The ROtI method requires ratings for outcomes achieved by the project and the progress made towards the 'intermediate states' at the time of the evaluation. According the GEF guidance on the method; "*The rating system is intended to recognize project preparation and conceptualization that considers its own assumptions, and that seeks to remove barriers to future scaling up and out. Projects that are a part of a long-term process need not at all be "penalized" for not achieving impacts in the lifetime of the project: the system recognizes projects' forward thinking to eventual impacts, even if those impacts are eventually achieved by other partners and stakeholders, albeit with achievements based on present day, present project building blocks."* For example, a project receiving an "AA" rating appears likely to deliver impacts, while for a project receiving a "DD" this would seem unlikely, due to low achievement in outcomes and the limited likelihood of achieving the intermediate states needed for eventual impact (see Table 1).

Table 1. Rating scale for outcomes and progress towards 'intermediate states'

Outcome Rating	**Rating on progress toward Intermediate States**
D: The project's intended outcomes were not delivered	**D:** No measures taken to move towards intermediate states.
C: The project's intended outcomes were delivered, but were not designed to feed into a continuing process after project funding	C: The measures designed to move towards intermediate states have started, but have not produced results.
B: The project's intended outcomes were delivered, and were designed to feed into a continuing process, but with no prior allocation of responsibilities after project	B: The measures designed to move towards intermediate states have started and have produced results, which give no indication that they can progress towards the intended long term impact.

funding	
A: The project's intended outcomes were delivered, and were designed to feed into a continuing process, with specific allocation of responsibilities after project funding.	A: The measures designed to move towards intermediate states have started and have produced results, which clearly indicate that they can progress towards the intended long term impact.

Thus a project will end up with a two letter rating e.g. AB, CD, BB etc. In addition the rating is given a '+' notation if there is evidence of impacts accruing within the life of the project. The possible rating permutations are then translated onto the usual six point rating scale used in all UNEP project evaluations in the following way.

Table 2. Shows how the ratings for 'achievement of outcomes' and 'progress towards intermediate states translate to ratings for the 'Overall likelihood of impact achievement' on a six point scale.

Highly Likely	Likely	Moderately Likely	Moderately Unlikely	Unlikely	Highly Unlikely
AA AB BA CA BB+ CB+ DA+ DB+	BB CB DA DB AC+ BC+	AC BC CC+ DC+	CC DC AD+ BD+	AD BD CD+ DD+	CD DD

In addition, projects that achieve documented changes in environmental status during the project's lifetime receive a positive impact rating, indicated by a "+". The overall likelihood of achieving impacts is shown in Table 11 below (a + score above moves the double letter rating up one space in the 6-point scale).

The ROtI method provides a basis for comparisons across projects through application of a rating system that can indicate the expected impact. However it should be noted that whilst this will provide a relative scoring for all projects assessed, it does not imply that the results from projects can necessarily be aggregated. Nevertheless, since the approach yields greater clarity in the 'results metrics' for a project, opportunities where aggregation of project results might be possible can more readily be identified.

Results rating of project entitled:							
Outputs	**Outcomes**	**Rating (D – A)**	**Intermediary**	**Rating (D – A)**	**Impact (GEBs)**	**Rating (+)**	**Overall**
1.	1.		1.		1.		
2.	2.		2.		2.		

3.	3.		3.		3.		
	Rating justification :		**Rating justification:**		**Rating justification :**		

Scoring Guidelines

The achievement of **Outputs** is largely assumed. Outputs are such concrete things as training courses held, numbers of persons trained, studies conducted, networks established, websites developed, and many others. Outputs reflect where and for what project funds were used. These were not rated: projects generally succeed in spending their funding.

Outcomes, on the other hand, are the first level of intended results stemming from the outputs. Not so much the number of persons trained; but how many persons who then demonstrated that they have gained the intended knowledge or skills. Not a study conducted; but one that could change the evolution or development of the project. Not so much a network of NGOs established; but that the network showed potential for functioning as intended. A sound outcome might be genuinely improved strategic planning in SLM stemming from workshops, training courses, and networking.

Examples

Funds were spent, outputs were produced, but nothing in terms of outcomes was achieved. People attended training courses but there is no evidence of increased capacity. A website was developed, but no one used it. (Score – D)

Outcomes achieved but are dead ends; no forward linkages to intermediary stages in the future. People attended training courses, increased their capacities, but all left for other jobs shortly after; or were not given opportunities to apply their new skills. A website was developed and was used, but achieved little or nothing of what was intended because users had no resources or incentives to apply the tools and methods proposed on the website in their job. (Score – C)

Outcomes plus implicit linkages forward. Outcomes achieved and have *implicit forward linkages* to intermediary stages and impacts. Collaboration as evidenced by meetings and decisions made among a loose network is documented that should lead to better planning. Improved capacity is in place and should lead to desired intermediate outcomes. Providing implicit linkages to intermediary stages is probably the most common case when outcomes have been achieved. (Score - B)

Outcomes plus explicit linkages forward. Outcomes have *definite and explicit forward linkages* to intermediary stages and impacts. An alternative energy project may result in solar panels installed that reduced reliance on local wood fuels, with the outcome quantified in terms of reduced C emissions. Explicit forward linkages are easy to recognize in being concrete, but are relatively uncommon. (Score A)

Intermediary stages:

The **intermediate stage** indicates achievements that lead to Global Environmental Benefits, especially if the potential for scaling up is established.

"Outcomes" scored C or D. If the outcomes above scored C or D, there is no need to continue forward to score intermediate stages given that achievement of such is then not possible.

In spite of outcomes and implicit linkages, and follow-up actions, the project dead-ends. Although outcomes achieved have *implicit forward linkages* to intermediary stages and impacts, the project dead-ends. Outcomes turn out to be insufficient to move the project towards intermediate stages and to the eventual achievement of GEBs. Collaboration as evidenced by meetings and among participants in a network never progresses further. The implicit linkage based on follow-up never materializes. Although outcomes involve, for example, further participation and discussion, such actions do not take the project forward towards intended intermediate impacts. People have fun getting together and talking more, but nothing, based on the implicit forwards linkages, actually eventuates. **(Score = D)**

The measures designed to move towards intermediate states have started, but have not produced result, barriers and/or unmet assumptions may still exist. In spite of sound outputs and in spite of explicit forward linkages, there is limited possibility of intermediary stage achievement due to barriers not removed or unmet assumptions. This may be the fate of several policy related, capacity building, and networking projects: people work together, but fail to develop a way forward towards concrete results, or fail to successfully address inherent barriers. The project may increase ground cover and or carbon stocks, may reduce grazing or GHG emissions; and may have project level recommendations regarding scaling up; but barrier removal or the addressing of fatal assumptions means that scaling up remains limited and unlikely to be achieved at larger scales. Barriers can be policy and institutional limitations; (mis-) assumptions may have to do with markets or public – private sector relationships. **(Score = C)**

Barriers and assumptions are successfully addressed. Intermediary stage(s) planned or conceived have feasible direct and explicit forward linkages to impact achievement; barriers and assumptions are successfully addressed. The project achieves measurable intermediate impacts, and works to scale up and out, but falls well short of scaling up to global levels such that achievement of GEBs still lies in doubt. **(Score = B)**

Scaling up and out over time is possible. Measurable intermediary stage impacts achieved, scaling up to global levels and the achievement of GEBs appears to be well in reach over time. **(Score = A)**

Impact: Actual changes in environmental status

"Intermediary stages" scored B to A.

Measurable impacts achieved at a globally significant level within the project life-span. . **(Score = '+')**

Template for the assessment of the Quality of Project Design – UNEP Evaluation Office September 2011

Relevance		Evaluation Comments	Prodoc reference
Are the intended results likely to contribute to UNEPs Expected Accomplishments and programmatic objectives?			
Does the project form a coherent part of a UNEP-approved programme framework?			
Is there complementarity with other UNEP projects, planned and ongoing, including those implemented under the GEF?			
Are the project's objectives and implementation strategies consistent with:	i) Sub-regional environmental issues and needs?		
	ii) the UNEP mandate and policies at the time of design and implementation?		
	iii) the relevant GEF focal areas, strategic priorities and operational programme(s)? (if appropriate)		
	iv) Stakeholder priorities and needs?		
Overall rating for Relevance			
Intended Results and Causality			
Are the objectives realistic?			
Are the causal pathways from project outputs [goods and services] through outcomes [changes in stakeholder behaviour] towards impacts clearly and convincingly described? Is there a clearly presented Theory of Change or intervention logic for the project?			
Is the timeframe realistic? What is the likelihood that the anticipated project outcomes can be achieved within the stated duration of the project?			
Are the activities designed within the project likely to produce their intended results			
Are activities appropriate to produce outputs?			
Are activities appropriate to drive change along the intended causal pathway(s)			
Are impact drivers, assumptions and the roles and capacities of key actors and stakeholders clearly described for each key causal pathway?			
Overall rating for Intended Results and causality			

Efficiency			
Are any cost- or time-saving measures proposed to bring the project to a successful conclusion within its programmed budget and timeframe?			
Does the project intend to make use of / build upon pre-existing institutions, agreements and partnerships, data sources, synergies and complementarities with other initiatives, programmes and projects etc. to increase project efficiency?			
Overall rating for Efficiency			
Sustainability / Replication and Catalytic effects			
Does the project design present a strategy / approach to sustaining outcomes / benefits?			
Does the design identify the social or political factors that may influence positively or negatively the sustenance of project results and progress towards impacts? Does the design foresee sufficient activities to promote government and stakeholder awareness, interests, commitment and incentives to execute, enforce and pursue the programmes, plans, agreements, monitoring systems etc. prepared and agreed upon under the project?			
If funding is required to sustain project outcomes and benefits, does the design propose adequate measures / mechanisms to secure this funding?			
Are there any financial risks that may jeopardize sustenance of project results and onward progress towards impact?			
Does the project design adequately describe the institutional frameworks, governance structures and processes, policies, sub-regional agreements, legal and accountability frameworks etc. required to sustain project results?			
Does the project design identify environmental factors, positive or negative, that can influence the future flow of project benefits? Are there any project outputs or higher level results that are likely to affect the environment, which, in turn, might affect sustainability of project benefits?			
Does the project design foresee adequate measures to catalyze behavioural changes in terms of use and application by the relevant stakeholders of (e.g.):	i) technologies and approaches show-cased by the demonstration projects;		
	ii) strategic programmes and plans developed		
	iii) assessment,		

	monitoring and management systems established at a national and sub-regional level		
Does the project design foresee adequate measures to contribute to institutional changes? [An important aspect of the catalytic role of the project is its contribution to institutional uptake or mainstreaming of project-piloted approaches in any regional or national demonstration projects]			
Does the project design foresee adequate measures to contribute to policy changes (on paper and in implementation of policy)?			
Does the project design foresee adequate measures to contribute to sustain follow-on financing (catalytic financing) from Governments, the GEF or other donors?			
Does the project design foresee adequate measures to create opportunities for particular individuals or institutions ("champions") to catalyze change (without which the project would not achieve all of its results)?			
Are the planned activities likely to generate the level of ownership by the main national and regional stakeholders necessary to allow for the project results to be sustained?			
Overall rating for Sustainability / Replication and Catalytic effects			
Risk identification and Social Safeguards			
Are critical risks appropriately addressed?			
Are assumptions properly specified as factors affecting achievement of project results that are beyond the control of the project?			
Are potentially negative environmental, economic and social impacts of projects identified			
Overall rating for Risk identification and Social Safeguards			
Governance and Supervision Arrangements			
Is the project governance model comprehensive, clear and appropriate?			
Are roles and responsibilities clearly defined?			
Are supervision / oversight arrangements clear and appropriate?			
Overall rating for Governance and Supervision Arrangements			
Management, Execution and Partnership Arrangements			
Have the capacities of partner been adequately			

assessed?		
Are the execution arrangements clear?		
Are the roles and responsibilities of internal and external partners properly specified?		
Overall rating for Management, Execution and Partnership Arrangements		
Financial Planning / budgeting		
Are there any obvious deficiencies in the budgets / financial planning		
Cost effectiveness of proposed resource utilization as described in project budgets and viability in respect of resource mobilization potential		
Financial and administrative arrangements including flows of funds are clearly described		
Overall rating for Financial Planning / budgeting		
Monitoring		
Does the logical framework: capture the key elements in the Theory of Change for the project? have 'SMART' indicators for outcomes and objectives? have appropriate 'means of verification' adequately identify assumptions		
Are the milestones and performance indicators appropriate and sufficient to foster management towards outcomes and higher level objectives?		
Is there baseline information in relation to key performance indicators?		
Has the method for the baseline data collection been explained?		
Has the desired level of achievement (targets) been specified for indicators of Outcomes and are targets based on a reasoned estimate of baseline??		
Has the time frame for monitoring activities been specified?		
Are the organisational arrangements for project level progress monitoring clearly specified		
Has a budget been allocated for monitoring project progress in implementation against outputs and outcomes?		
Overall, is the approach to monitoring progress and performance within the project adequate?		
Overall rating for Monitoring		
Evaluation		
Is there an adequate plan for evaluation?		

Has the time frame for Evaluation activities been specified?		
Is there an explicit budget provision for mid term review and terminal evaluation?		
Is the budget sufficient?		
Overall rating for Evaluation		

Annex G: Terms of Reference - Country Test Cases

Terminal Evaluation of the Carbon Benefits Project:

Terms of Reference for the Technical Working Papers to be prepared by the Supporting Consultants

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28 January 2013

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Introduction

The purpose of this document is to propose a clear evaluation and reporting Terms of Reference (TOR) for the Supporting Consultants who will be undertaking an evaluation of case study sites in China, Nigeria, and Kenya in reference to the Carbon Benefits Project.This case study TOR is needed in order to be consistent with UNEP expectations regarding the substance and format of the individual case study evaluations, and their compatibility with the overall terminal evaluation report.

Starting Premises

The overall terminal evaluation report consists of three main components, as briefly described in the bullets below. This information is based on the overall Terms of Reference for the terminal evaluation.[29]

Main evaluation report: The Team Leader will prepare this report. It will follow the report structure established in the overall terminal evaluation TOR.[30]

Technical working papers: The Supporting Consultants will prepare these reports, which will be included as annexes to the main evaluation report. The report structure for each Technical Working Paper is described in the subsections below.[31]

Report summary: The Team Leader will prepare this document. It is a 15-slide presentation without a specified format.

Technical Working Paper overall report structure

The Technical Working Papers represent the terminal evaluation at the case study level. One (1) Technical Working Paper is expected from each Supporting Consultant, regardless of how many case study sites are evaluated in a country.

The overall structure of the Technical Working Paper is summarized in the annotated table of contents shown in Table 1. This report structure is adapted from Annex 2 of the overall terminal evaluation TOR. It is important to note that some sections are needed at the country level only, while others dealing with the substantive portions of the evaluation are needed at the case study level.

1. [29]Based on the document entitled: "TERMS OF REFERENCE - Terminal Evaluation of the “Carbon Benefits Project: Modelling, Measurement and Monitoring (CBP: MMM), sent to the author on 29 November 2012 in an email from Jessica Kamugira. This is referred to hereafter as the "overall terminal evaluation TOR".

[30]See Annex 2

[31]The Technical Working Papers are expected to adhere to the same format as the main evaluation report (source: paragraph 49 of the overall terminal evaluation TOR).

Table 1: Annotated table of context for the Technical Working Paper

Main	Subsection	Overview of contents	Applicability
Executive Summary	NA	Overview of the main findings, conclusions and recommendations of the evaluation. It should encapsulate the essence of the information contained in the report to facilitate dissemination and distillation of lessons. The main points for each evaluation parameter should be presented here (with a summary ratings table), as well as the most important lessons and recommendations. Maximum 4 pages.	Country level only
I. Evaluation Background	A. Context	Overview of the broader institutional and country context, in relation to the project's objectives.	
	B. The Project	Presentation of the project: rationale, objectives, components, intervention areas and target groups, milestones in design, implementation and completion, implementation arrangements and main partners, financing (amounts and sources), modifications to design before or during implementation.	
	C. Evaluation objectives, scope and methodology	Presentation of evaluation's purpose, evaluation criteria and key questions, evaluation timeframe, data collection and analysis instruments used, places visited, types of stakeholders interviewed, and limitations.	
II. Project Performance and Impact	A. Attainment of objectives and planned results	This section provides factual evidence relevant to the questions asked and sound analysis and interpretations of such evidence as per the categories indicated in Annex 6 of the overall terminal evaluation TOR. This is the main substantive section of the report. Ratings are provided at the end of the assessment of each evaluation criterion.	Each case study site
	B. Sustainability and catalytic role		
	C. Processes affecting attainment of project results		
	D. Complementarity with UNEP and the Division for Environmental Policy Implementation (DEPI) programmes and strategies		
III. Conclusions and Recommendations	A. Conclusions	This section should summarize the main findings of the evaluation, told in a logical sequence from cause to effect. It is suggested to start with the positive achievements and a short explanation why these could be achieved, and, then, to present the less successful aspects of the project with a short explanation why. The conclusions section should end with the overall assessment of the project. Findings should be cross-referenced to the main text of the report (using the paragraph numbering). The overall ratings table should be inserted here (see Annex 3 of the overall terminal evaluation TOR).	Country level only
	B. Lessons Learned	Lessons learned should be anchored in the main findings of the evaluation. In fact, no lessons should appear which are not based upon a conclusion of the evaluation. The number of lessons learned should be limited. Lessons learned are rooted in real project experiences, i.e. based on good practices and successes which could be replicated or derived from problems encountered and mistakes made which should be avoided in the future. Lessons learned must have potential for wider application and use. Lessons should briefly describe context from which they are derived and specify the contexts in which they may be useful.	
	C. Recommendations	As for the lessons learned, all recommendations should be anchored in the conclusions of the report, with proper cross-referencing. Recommendations are actionable proposals on how to resolve concrete problems affecting the project or the sustainability of its results. They should be feasible to implement within the timeframe and resources available (including local capacities), specific in terms of who would do what and when, and set a measurable performance target. In some cases, it might be useful to propose options, and briefly analyze the pros and cons of each option.	
Annexes	1. Evaluation	Detailed description of evaluation programme including names of locations visited the names (or functions) of people met, as well as the dates visited	Each case study site

Evaluation criteria

Section II of the Technical Working Papers should provide a detailed evaluation at the case study level. There are 4 major evaluation criteria, as outlined below.[32]

Criterion #1: Attainment of Objectives and Planned Results

Criterion #2: Sustainability and catalytic role

Criterion #3: Processes affecting attainment of project results

Criterion #4: Complementarities with UNEP strategies and programmes

The above criteria represent the core evaluation framework that should be applied to Output 2.1 of both Components A and B of the Carbon Benefits Project. Output 2.1 corresponds to the test cases for cropland and grazing land (Component A) and agro-forestry and forestry (Component B).

It is important to note that the other Outputs of the Project (i.e., 1.1, 1.2, 3.1, 4.1, 4.2, and 4.3)[33] are being evaluated as part of the main evaluation report and are not to be addressed in the Technical Working Papers.

Within each of the main evaluation criteria are a number of sub-criteria. Table 2 provides an overall matrix for the hierarchy of evaluation criteria. Each of these should be investigated and scored as part of the case study terminal evaluation.

Submission schedule

To the extent possible, the following schedule for submission of the Technical Working Paper should be observed.

Initial draft: Within 10 days of the completion of the field visit.

Final draft: Within 10 of the receipt of comments from the Team Leader.

[32]Based on Section D of the overall terminal evaluation TOR.
[33]See Annex 1 of the overall terminal evaluation TOR

Table 2: Evaluation criteria for case study site project performance

Main criteria	Sub-criteria	Additional sub-criteria
Attainment of Objectives and Planned Results	Achievement of Outputs and Activities	NA
	Relevance	NA
	Effectiveness	NA
	Efficiency	NA
	Review of Outcomes to Impacts (ROtI)	NA
Sustainability and catalytic role	Socio-political sustainability	NA
	Financial resources	NA
	Institutional framework	NA
	Environmental sustainability	NA
	Catalytic Role and Replication	Behavioral change
		Incentivizing actions
		Institutional change
		Policy change
		Follow-up financing
		Individual/institutional championing
Processes affecting attainment of project results	Preparation and Readiness	NA
	Implementation Approach and Adaptive Management	Project Document followed
		Performance of units/committees
		Project management efficiency
		Responsiveness
		Problems/constraints
		STAP Review recommendations followed
	Stakeholder Participation and Public Awareness	Stakeholder engagement effectiveness
		Public awareness effectiveness
		Link of project results with global benefits
	Country Ownership and Driven-ness	Government support/responsibility
		Adequacy of political/institutional framework
		Government promotion of project
		Government responsiveness
	Financial Planning and Management	Application of proper standard
		Administrative processes
		Co-financing availability
		Resources leveraging
	UNEP and UNDP Supervision and Backstopping	Adequacy of supervision plans
		Emphasis on monitoring
		Project reporting effectiveness
		Documentation quality
		Adequacy of financial/administrative supervision
	Monitoring and Evaluation	Design adequacy
		Implementation adequacy
Complementarities with UNEP Medium Term Strategy and Work Programme	Linkage to UNEP's EAs and POW 2010-2011	NA
	Alignment with the Bali Strategic Plan (BSP)	NA
	Gender	NA
	South-South Cooperation	NA

Annex H: Other information