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INSTITUTIONAL MODELS FOR CARBON FINANCE TO MOBILIZE SUSTAINABLE AGRICULTURAL DEVELOPMENT IN AFRICA

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EcoAgriculture Partners

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TABLE OF CONTENTS

TABLES AND FIGURES

ACRONYMS

AFOLU	Agriculture Forestry and Other Land Uses
AGRA	Alliance for a Green Revolution in Africa
ASB	Partnership for Tropical Forest Margins
CAADP	Comprehensive Africa Agriculture Development Programme
CCI	Cocoa Carbon Initiative
CDM	Clean Development Mechanism
COMACO	Community Markets for Conservation
COP	Conference of the Parties
DRC	Democratic Republic of Congo
EU ETS E	European Union Emission Trading Scheme (EU ETS)
GBM	Green Belt Movement
GEF	Global Environmental Facility
GHG	greenhouse gas
ICRAF	World Agroforestry Center
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFPRI	International Food Policy Research Institute
MCLT	Mozambique Carbon Livelihoods Trust
MRV	Monitoring, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Action
NGO	Non-governmental Organizations
PES	Payments for Ecosystem Services
REDD	Reduced Emissions from Deforestation and Degradation
SALM	Sustainable Agriculture Land Management
SLM	Sustainable Land Management
TIST	The International Small Group Tree Planting Program
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
VCS	Voluntary Carbon Standard

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CARBON FINANCE FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT IN AFRICA VII

EXECUTIVE SUMMARY

If there is a silver lining to the storm cloud of climate change for Africa's small farmers, it is the potential for them to participate in international climate change mitigation markets that have emerged in recent years. With supportive policies and skillful project development, these markets have the potential to catalyze climate-friendly and resilient smallholder agricultural development in Africa. This project aimed to examine the ways that agricultural greenhouse gas (GHG) markets are developing in Africa to support livelihoods of small farmers and the agroecosystems that they manage and to suggest ways to strengthen the institutions upon which these projects will be built in the future. Our definition of agriculture projects includes those in which farmers benefit from GHG mitigation markets. So, in addition to sequestration and emission reduction projects on working farm and pasture land, we have included forestry projects in which farmers are the primary "sellers" of credits.

The project had three primary objectives. The first was to develop an inventory of agricultural GHG mitigation projects in sub-Saharan Africa. The analysis of the inventory includes a basic characterization of the elements of project design, with special attention to their institutional arrangements. Eighty-one projects in 24 countries were identified. A roughly equal number of projects were in the initial planning phases (33%) as those in which money was exchanged (36%). Developers had reached the stage of completed project plans in 14%, and in 10% sequestration or emission reduction practices have been put in place but no money has been exchanged. In 8% of the projects, where practices were in place, we were unable to establish, based on our information, whether money had actually been exchanged.

On mitigation practices, a roughly equal number of off-farm rehabilitation projects and on-farm farm sequestration projects were found. Some 30% included off-farm rehabilitation practices within agroecosystems as the sole means of sequestration. However, when included with multi-intervention projects, this rises to 53%. About 29% are on-farm sequestration projects, rising to 51% when combination projects are included. Some 7% were solo Reduced Emissions from Deforestation and Degradation (REDD) projects, 16% when including combinations. About 8% projects fell into a miscellaneous category – 9% when including combinations – that included emission reduction projects such as nitrogen fertilizer reduction and methane capture.

The survey included institutional questions on developers/investors, field program managers, sellers, buyers, land tenure status. and support services from other intermediaries. Details on institutional arrangements were often difficult to come by, but we collected sufficient information for a quantitative analysis on developer/investor type and field program manager type. Filling the developer/investor role, there were 11 different kinds of organizations represented. Roughly a third of them featured developer/investor arrangements in which multiple types of organizations collaborated to fill the role. The leaders in this group were multilateral/bilateral donors and carbon developers. In 19% of the cases, the multilateral/bilateral donors filled the role on their own; this share rose to 41% when the combination cases were included. Carbon developers filled the role 20% of the time on their own and 29% with combinations included.

For field program managers, there were 10 types of actors, mostly overlapping with those of the developer/investor types. The types were broadly distributed mostly between carbon developers (23%), private non-carbon businesses (21%), local/national NGOs (21%), and international environmental NGOs (19%). The report includes qualitative findings on farmer's organizations, Technical service providers for carbon projects and Sustainable Land Management (SLM) technical service and advice providers.

The second objective of the report is to synthesize lessons from the inventory to identify institutional gaps that are hampering the success of these projects and possible interventions to overcome them. These needs include low transaction costs, risk management for farmers, secure land tenure and carbon rights, sufficient incentives for farmers to participate, access to financing for farmers and project developers, project management and implementation capacity, and sufficient demand for agricultural credits.

Finally, based on the inventory and the institutional needs analysis, recommendations are offered regarding roles for various sectors and organizations, including USAID, to fill these gaps. Roles for national governments, community organizations, local and national non-governmental organizaitons (NGOs), research institutions, international donors, and the private sector are considered.

AGRICULTURAL CARBON MARKETS IN AFRICA

CLIMATE CHANGE AND AGRICULTURE IN AFRICA

African farmers will face severe pressure from climate change. Rising temperatures and shifting and unreliable precipitation patterns will exacerbate existing vulnerabilities to land degradation, floods, and drought in Africa and will challenge farmers to make major changes in farming systems. A third of the people in Africa already live in areas prone to droughts facing severe risks of food insecurity and famines.[1] Droughts will become more frequent in drylands, and rainfall higher in some rainforest regions, making food production even more difficult. With temperature changes, the growing season for crops may shrink by more than 20% in several countries in the continent. Crop yields may decline by 50% in some countries by 2020.[2] Climate change will also put ecosystems at risk, with over 4,000 African plant species projected to lose critical habitat, undermining the livelihoods of many Africans who depend on wild species for food, fuel, fodder and medicines.[3]

If there is a silver lining to the storm cloud of climate change for Africa's small farmers, it is the potential for them to participate in international climate change mitigation markets that have emerged in recent years. Soil and vegetation on the Earth's land surface store three times the carbon present in the Earth's atmosphere.[4] Land-clearing and degradation turn this valuable carbon sink into a major source of greenhouse gas (GHG) emissions. 43% of Africa's total CO_2 emissions come from land-clearing for agricultural use, including croplands and shifting cultivation.[5] Five million hectares of forest will likely be lost annually in Africa from 2005-2015, releasing nearly 2 billion tons of CO_2eq each year,[6] or 13% of annual global emissions from forestry and agriculture combined.[7] African topsoils are storing 316 billion tons of CO_2eq.[8] But with two-thirds of sub-Saharan Africa's cropland, rangeland, and woodland already degraded,[9] this stored carbon is being returned to the atmosphere.

By selecting among and adopting these management practices, where appropriate, African croplands could potentially reduce GHG emissions by 2.0–3.5 million tons of CO_2eq per hectare per year[10] or a total of 52.3–91.5 million tons of CO_2eq,[11] equal to 5-9% of annual African fossil fuel emissions in

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1 Boko et al. 2007. Africa. In: Climate Change 2007 (IPCC, 4th Assessment Report)

2 ibid

3 ibid

4 Scherr and Sthapit. 2009. Farming and Land Use to Cool the Planet. In: State of the World 2009: Into a Warming World (Worldwatch Institute)

5 Canadell, Raupach and Houghton. 2009. Anthropogenic CO2 emissions in Africa. Biogeociences 6:463

6 Sohngen, Beach & Andrasko. 2008.Avoided deforestation as a greenhouse gas mitigation tool: economic issues. Journal of Environmental Quality 37:1368-1375

7 IPCC. 2007. Climate Change 2007: Synthesis (IPCC, 4th Assesment Report)

8 Henry, Valentini and Bernoux. 2009. Soil carbon stocks in ecoregions of Africa. Biogeosciences Discussions 6:797-823

9 Pender et al. 2009. The Role of SLM for Climate Change Adaptation and Mitigation in sub-Saharan Africa

10 Smith and Martino. 2007. Agriculture. In: Climate Change 2007 (IPCC, 4th Assesment Report)

11 www.faostat.fao.org

2005.[12] Even in semi-arid lands, agroforestry systems like intercropping or silvopasture, with 50 trees per hectare, can store 110 to 147 tons of CO_2eq per hectare in the soil alone.[13]

Clearly, there are ample opportunities to sequester carbon in land and to reduce GHG emissions. With supportive policies and skillful project development, carbon markets have the potential to catalyze climate-friendly and resilient smallholder agricultural development in Africa.

EcoAgriculture Partners has identified five key strategies for reducing and sequestering land-based greenhouse gas emissions:

- *Enriching soil carbon.* Agricultural soils can be managed to reduce emissions by minimizing tillage, reducing use of nitrogen fertilizers, and preventing erosion. Soils can store the carbon captured by plants from the atmosphere by building up soil organic matter, which also has benefits for crop production. Adding biochar (biomass burned in a low-oxygen environment) can further enhance carbon storage in soil.

- *Farming with perennials.* Perennial crops, grasses, palms, and trees constantly maintain and develop their root and woody biomass and associated carbon, while providing vegetative cover for soils. There is large potential to substitute annual tilled crops with perennials, particularly for animal feed and vegetable oils, as well as to incorporate woody perennials into annual cropping systems in agroforestry systems.

- *Climate-friendly livestock production.* Rapid growth in demand for livestock products has triggered a huge rise in the number of animals, the concentration of wastes in feedlots and dairies, and the clearing of natural grasslands and forests for grazing. A reduction in livestock numbers may be needed but production innovations can help, including rotational grazing systems, manure management, methane capture for biogas production, and improved feeds and feed additives.

- *Protecting natural habitat.* The planet's 4 billion hectares of forests and 5 billion hectares of natural grasslands are a massive reservoir of carbon – both in vegetation above ground and in root systems below ground. As forests and grasslands grow, they remove carbon from the atmosphere. Deforestation, land clearing, and forest and grassland fires are major sources of GHG emissions, in long-settled agricultural landscapes, as well as in the agricultural frontier. Incentives are needed to encourage farmers and land users to maintain natural vegetation through product certification, payments for climate services, securing tenure rights, and community fire control. The conservation of natural habitat will benefit biodiversity in the face of climate change.

- *Restoring degraded watersheds and rangelands.* Extensive areas of the world have been denuded of vegetation through land clearing for crops or grazing and from overuse and poor management. Degradation has not only generated a huge amount of GHG emissions, but local people have lost a valuable livelihood asset as well as essential watershed functions. Restoring vegetative cover on carbon at field scales for many diverse practices and components of the landscape (soils, grasses, trees, animal wastes, etc.), and methods for integrated landscape-wide carbon assessment will soon be available.

For farmers, the value of moving towards more of these climate-friendly practices can also include livelihood and agroecosystems co-benefits. For example, an International Food Policy Research Institute

[12] Canadell, Raupach and Houghton. 2009. Anthropogenic CO2 emissions in Africa. Biogeociences 6:463-468

[13] Nair et al. 2009.Soil Carbon Sequestration in Tropical Agroforestry Systems: a Feasibility Appraisal. Environmental Science and Policy (in press)

(IFPRI) study analyzed 41 sustainable land management interventions and, nearly all of them demonstrated significant yield increase, with 24 interventions showing a yield increase greater than 100%.[14] Another 45 sustainable land management interventions examined in sub-Saharan Africa found that cereal yields increased between 50% and 100% in almost all of the cases. Almost all of these land use practices also showed significant profitability for farmers. [15]

STATUS OF AGRICULTURAL CARBON MARKETS IN AFRICA

This growing body of research on the potential of these climate-friendly land management practices to simultaneously mitigate climate change and improve agricultural production in Africa has sparked interest among African policy makers, NGOs, farmers groups, and developers and buyers within the international carbon market to explore the potential to leverage carbon markets to support sustainable agricultural development.

Measured by volume, carbon markets are the largest type of environmental market in the world. In 2009, the value of global carbon market reached US$144 billion, up from US$135 billion in 2008 and US$63 billion in 2007.[16] Most of these transactions are taking place in regulatory markets, linked to cap-and-trade mechanisms imposed by governments. Unfortunately for Africa's farmers, regulatory carbon markets have historically focused on industrial and energy sectors. The European Union Emission Trading Scheme (EU ETS) – the world's leading regulatory scheme – excludes any type of land use carbon. The Kyoto Protocol limits the eligible Clean Development Mechanism (CDM) project classes in the land-use area to afforestation and reforestation, specifically excluding any crediting for agricultural or forest management, avoided deforestation or degradation, and soil carbon storage in developing countries. Further hampering growth of these project types, the CDM awards afforestation / reforestation activities only temporary carbon credits that have limited fungibility with other traded carbon credits. The effect of these rules is that land use projects generally are very rare in the CDM and agricultural projects have been limited to those that reduce methane and other emissions from agricultural wastes and those that decrease energy emissions in processing.

Consequently, most of the action in the carbon markets for farmers has taken place in the much smaller voluntary markets, in which companies and individuals operate without government-mandated obligations. Voluntary transactions can apply private standards or simply be based on the agreement between the transacting parties. These markets were valued at US$705 million in 2008, an 87% increase over 2007.[17] Current estimates of developing country land-based carbon projects are ~US$5 to US$10 million worldwide, mostly through the World Bank's BioCarbon Fund.[18] Voluntary markets have been supportive of land-based projects generally, and agricultural projects in particular, due to the proliferation of multiple certification standards that provide space for projects to serve as laboratories for agricultural project development and MRV (monitoring, reporting and verification). Most notably, within the Voluntary Carbon Standard (VCS), a new methodology – The Sustainable Agricultural Landscape Methodology (SALM) – is close to completing the VCS's double certification process. The World Bank BioCarbon Fund is aggressively seeking out projects to apply this new methodology, particularly in Africa. For agribusinesses working through their supply chains, the Rainforest Alliance is

[14] Pender, J. December 2008. The World Food Crisis, Land Degradation and Sustainable Land Management: Linkages, Opportunities and Constraints. International Food Policy Research Institute.

[15] Pretty, J.N., A.D. Noble, D. Bassio, J. Nixon, R.E. Hine, F.W.T. Penning de Vries, and J.I.L. Morison. 2006. Resource conserving agriculture increases yields in developing countries. Environmental Science and Technology 40(4): 1114-1119.

[16] World Bank. State and trends of the carbon market 2010. Washington, DC: Carbon Finance at the World Bank.

[17] Hamilton, K., M. Sjardin, A. Shapiro, T. Marcello. 2009 State of the Voluntary Carbon Markets: Fortifying the Foundation. Ecosystem

[18] Newcombe, K. Soil and Agro-ecosystem Carbon: Markets and Opportunities. Rural Week, World Bank. March 3, 2009.

developing a Climate Module which can be added to the monitoring of other products already receiving their certification.

Although land-based projects are growing within the voluntary markets, Africa has lagged behind. As of February 2010, only 19 CDM projects had been registered in Africa through the CDM. In voluntary markets, Africa represents only 11% of total forest carbon transactions.[19] Far fewer of these have been agricultural projects, employing sustainable agricultural land management.

Despite the low number of land use projects, momentum has been building around the REDD agenda. A May 2010 agreement, concluded in Oslo, Norway, has promised $4.5 billion of support to developing countries to build capacity in their REDD programs. While there are certainly cases in which farmers can benefit from REDD, few African countries stand to benefit from climate finance that focuses exclusively on forests. Far more African land is characterized by heterogeneous agricultural landscape mosaics. Africa needs opportunities to develop projects that utilize climate-friendly, sustainable land management systems that will improve agro-ecosystem quality over time, and thus farmers' livelihoods. There are some signs that this is beginning to happen.

Within international climate policy discussions the profile of agriculture has been rising. In Copenhagen in December 2009, at COP-15, an Agriculture and Rural Development Day was organized alongside a United Nations Framework Convention on Climate Change (UNFCCC) meeting to highlight agriculture and climate change connections. In another substantial step forward, 21 countries pledged US$150 billion to a Global Research Alliance on Agricultural Greenhouse Gases. COP-15 also drew the forest and agriculture carbon work more closely together. A joint side event was held to report on the outcomes of Forest Day and Agriculture and Rural Development Day and make a joint statement about a common vision for future land use and climate change work.[20] Although the forestry and REDD agenda remains more advanced than agriculture, particularly the conclusion of the Oslo agreement, there is evidence that agriculture is rising on the agenda and that forestry/REDD frames may soon broaden to include agriculture.

The growing interest in agricultural carbon heard at the UNFCCC meetings is also being voiced by African governments, NGOs, and donors as they move to support an agricultural GHG agenda. In Africa, some national governments are establishing carbon policy positions and in some cases creating new governmental initiatives to develop and oversee them. Conservation and development NGOs have been stepping into the carbon project domain.

At the same time, there has been an increase in the level of support for sustainable agricultural land management activities in sub-Saharan Africa in recent years. Though most of these new investments were not originally designed for carbon mitigation projects, they have the potential to be leveraged to create a sizeable pipeline of potential projects. For example, US$1 billion has been earmarked by the Global Environment Facility's (GEF) for Sustainable Land Management in sub-Saharan Africa under the Comprehensive Africa Agriculture Development Programme (CAADP). The TerrAfrica Platform's Country Flagship Program for Climate Change, Land and Water is building on these resources and channeling grants directly to land-based climate change mitigation and adaptation activities.

Outside of the multilateral entities, USAID has been making substantial investments in African agricultural development and climate change and other bilaterals – such as the Norwegian Government's support of conservation tillage and agroforestry in Zambia – are following similar trends. In the private

[19] http://moderncms.ecosystemmarketplace.com/repository/moderncms_documents/SFCM.pdf

[20] The side event was titled: "Beyond Copenhagen: Agriculture and Forestry Are Part of the Solution." For further information, please see: http://www.donorplatform.org/content/view/348/210

foundation realm, the Alliance for a Green Revolution in Africa is investing throughout the agricultural value chain on seeds, soil health, market development, agricultural education, and policy and is committed to increasing this amount over the coming years. Concurrent with growing sustainable agriculture efforts, African governments have been investing a greater portion of national budgets into agriculture following on a commitment made in 2003 that at least 10% of total budgets would go to agriculture over the next five years, which has been partially realized.

Agribusiness with African supply chains are also likely to explore the potential of engaging with African carbon projects. These businesses could gain a "triple win" by investing in agricultural carbon projects that would "decarbonize" supply chains, introduce greater adaptability to climate change, and enhance the brand among key in-region suppliers. The opportunity is not only one of engaging with agribusiness as prospective buyers of credits or offsets, but also potentially establishing themselves as an incentive mechanism for farmers if agribusiness adds carbon-friendly sustainable land management protocols to lists of recommended grower practices. Companies also offer a technical assistance delivery mechanism for farmers, giving regular corporate trainings of farmers in recommended agricultural practices. These possibilities are most likely with companies engaged in other sustainable agriculture initiatives, such as Sustainable Agriculture Initiative Platform, which includes Nestle, Unilever, Group Danone, McDonald's, Coca Cola, Kellogg's, General Mills, and others.

INSTITUTIONAL CHALLENGES FOR AGRICULTURAL CARBON MARKET DEVELOPMENT

But even as rules change, donors invest and potential buyers emerge, the nature of agricultural GHG projects, and the involvement of vulnerable small farmers, who are often politically marginalized, presents challenges for project design and implementation. Projects need streamlined approaches to reduce transactions costs, they need protection against exploitation by other actors in the carbon supply chain, and when these conditions are met, they need the technical and organizational capacity to implement and manage these projects. This is particularly true in Africa which has relatively weak agricultural development and environmental institutions.

This project aimed to examine the ways that agricultural GHG markets are developing in Africa to support livelihoods of small farmers and the agroecosystems that they manage and to suggest ways to strengthen the institutions upon which these projects will be built in the future. It had three primary objectives. The first was to develop an inventory of agricultural GHG mitigation projects in sub-Saharan Africa. The projects in the inventory include a basic characterization of the elements of project design, with special attention to their institutional arrangements. The second objective was to synthesize lessons from the inventory to identify institutional gaps that are hampering the success of these projects and possible interventions to overcome them. Finally, based on the inventory and the institutional needs analysis, recommendations have been made regarding roles for various sectors and organizations, including USAID, to fill these gaps.

INVENTORY FINDINGS: AGRICULTURAL CARBON PROJECTS, IMPLEMENTATION STATUS AND SEQUESTRATION PRACTICES

INVENTORY METHODOLOGY

The goal in developing this inventory of agricultural GHG projects in sub-Saharan Africa was to ascertain a sense of the number of projects ongoing, those under development, the scale of these projects, the practices that they are employing, and who is playing the key institutional roles. First, we worked to define the boundaries of the inventory.

We began by studying previous inventory work on closely related topics and documents from organizations that have been on the forefront of agricultural GHG project development.Key sources in this group included a Winrock International and FAO survey on "Carbon market opportunities for the forestry sector in Africa."[21] In this document, *forestry* refers to the widely used carbon market framing of AFOLU (agriculture, forestry and other land use) The World Agroforestry Centre (ICRAF) produced an inventory in 2009[22] of *biocarbon* projects – essentially the same framing as AFOLU – as part of their African Biocarbon Initiative. This inventory was a desk study and cited the Winrock report in many of its entries. The group also produced a policy brief that synthesized lessons from the unpublished inventory.[23] The Katoomba Group has also compiled a series of country specific inventories for Malawi, Kenya, Madagascar, Tanzania, Uganda, and South Africa, respectively – most recently updated in 2008 – but these were focused broadly on payments for ecosystem services (PES),[24] including the full range of carbon projects as well as watershed and biodiversity initiatives. These inventories were an important input for the previously noted inventories as well as this one.

The AFOLU framing used in the Katoomba report, very close to the meanings of the words *terrestrial* and *biocarbon,* are useful when viewing these projects primarily from a sequestration perspective. These terms refer to projects where carbon is being sequestered in, above or below ground biomass, anywhere

[21] Walker, S, T. Pearson, P. Munishib, and S. Petrova. 2008. Carbon market opportunities for the forestry sector of Africa Winrock International, and FAO between Winrock International and FAO in support of the 16th Session of the African Forestry and Wildlife Commission, Khartoum, Sudan.

[22] Chomba, S. and P.A. Minang. 2009 unpublished. Inventory in support of the African Biocarbon Initiative.

[23] Chomba S, P.A. Minang PA. 2009. Africa's biocarbon experience: Lessons for improving performance in the African carbon markets. World Agroforestry Centre Policy Brief 06. World Agroforestry Centre, Nairobi, Kenya. http://www.worldagroforestry.org/downloads/publications/PDFs/africa-biocarbon-experience.pdf

[24] Links To These Studies Can Be Found At Http://Www.Katoombagroup.Org/Regions/Africa/Assessments.Php

in any landscape. This project, however, was interested in *agricultural* GHG projects. This category covers a subset of AFOLU projects in which GHGs are sequestered within agricultural production systems, as well as GHG emission reduction projects on farms through mechanisms including biogas digesters and nitrogen fertilizer reduction schemes. Within the *agricultural* grouping, we were most interested in projects in which farmers were implementing climate-friendly agricultural practices that also provide livelihood and ecosystem service co-benefits. We hypothesized that the institutional issues faced in agricultural projects may be distinct from many reforestation/afforestation and avoided deforestation projects, although lessons from these experiences would certainly be applicable in agricultural contexts.

After our initial round of scanning the literature, however, we found that there were very few projects in Africa taking place entirely on working farmland. Consequently, we decided to expand our definition of *agriculture* projects to those in which farmers benefit from GHG mitigation markets. So we have also included forestry projects in which farmers are primary the "sellers" of credits.

With this revised definition, and the results of our initial desk study, we worked with our three consultants, to help us dig deeper into the inventory by filling informational gaps in previously identified projects and by tracking down additional projects. Each consultant was also tasked with developing short case studies that allowed us to more closely examine successful institutional elements within certain projects. These cases were integrated into the analysis in this report and they are also attached as separate documents as Annexes 1 through 5.

The inventory survey included questions designed to characterize the projects generally, and also to delve particularly into the institutional arrangements for these projects. The full inventory is attached as Annex 6. For the analysis in this report, the projects have been characterize based on carbon-generating activity, implementation status, types of project developers, and types of field program managers. We also use the collected information to diagram the institutional roles in a carbon project from a farmer's perspective, to focus thinking on how farmers might perceive a GHG project and which institutional actors are critical in order for these projects to work for farmers.

IMPLEMENTATION STATUS

In total, we identified 81 projects in 24 countries for the inventory. These entries came with varying levels of information, and we left out a number of probable projects in cases where we were unable to ascertain basic pieces of information. We were able to identify the implementation status of 73 of the projects (See Table 1.) We found a roughly equal number of projects that were in the initial planning phases (24 projects or 33%) as those in which money was exchanged (26 projects or 36%). Most of the projects that we left out of the inventory because a lack of information would have fallen into the initial scoping category. We found 10 projects (14%) in which developers had completed project plans, seven (10%) where sequestration or emission reduction practices have been put in place and no money has been exchanged, and six cases (8%) where practices were in place, but, based on our information, we were unable to establish whether money had actually been exchanged.

Table 1. Project implementation status (n=73)

Implementation stage	Total number	% of total with information
Still in scoping/planning	24	33
Project plan developed	10	14
Practices in place, but no money exchanged	7	10
Money exchanged	26	36
Could be either practices in place or or money exchanged, but information was insufficient to determine	6	8

SEQUESTRATION PRACTICES

These projects include the full spectrum of land based carbon sequestration and agricultural emission reduction practices. (See Table 2) We grouped them into four general categories: 1) off-farm rehabilitation; 2) on-farm tree-planting, agroforestry agricultural soil management; 3) REDD; and 4) miscellaneous emission reduction. In 20 of the 74 projects in which we are able to identify the sequestration practice or emission reduction practice, more than one of these categories was represented. Of the 74 projects there were roughly equal numbers of off-farm rehabilitation projects and on-farm sequestration projects. 22 projects (30%) included off-farm rehabilitation practices within agroecosystems as the sole means of sequestration. But when included with multi-intervention projects, this number rises to 39 projects (53%). There are 21 on-farm sequestration projects (29%) and 38 (51%) when combination projects are included. The inventory also included five solo REDD projects (7%) and 12 (16%) when including combinations. 6 (8%) of projects fell into a miscellaneous category – seven (9%) when including combinations – that included emission reduction projects such as nitrogen fertilizer reduction and methane capture.

Table 2. GHG mitigation activities (n=74)

Mitigation activity	% of projects implementing activity alone	% of projects implementing activity alone and in combination with others
Off-farm land rehabilitation with benefits to farmers	30	53
On-farm practices-tree planting, agroforestry agricultural soil management	28	51
REDD with benefits to farmers	7	16
Miscellaneous emission reductions (biodigesters, green charcoal, reducing N20 emissions from fertilizers)	8	9

Of the land rehabilitation projects within agro-ecosystems, the incentive for farmers to participate in these projects is, in some cases, a direct payment to plant trees or to protect certain areas for rehabilitation. Communities may also benefit from these projects if they have collective rights to the land that is generating carbon credits. In these cases individual farmers may get a small direct carbon credit payment. The primary benefit of these projects to communities in the long-term, however, will be the agricultural improvements in soil quality and water availability from the rehabilitated agro-ecosystem.

These regeneration projects also have the potential to be registered as CDM projects. The first project in this class (afforestation/reforestation) in Africa to be registered under the CDM is the Humbo Assisted Regeneration project in Ethiopia. In this case, local community groups will be receiving carbon payments

directly, and they will also benefit from agro-ecosystem restoration, particularly from improved water quality and quantity from nearby springs and streams. Another example is the PRESAL (Restoration of lands in the Senegal groundnut basin) in which the primary objective is to reclaim for productive agriculture 15000 ha of badlands affected by salinization.

For on-farm activities, so far, tree planting projects have been the most popular. Farmers plant the trees on their farms, either in woodlots or as elements of an agroforestry system, and usually get paid based on the number of trees planted. Some of these projects are linked with broader conservation initiatives in which the planting of indigenous trees is linked to either ecosystem conservation or land rehabilitation. The Greenbelt Movement project in Kenya is an example of this. In other cases, such as the International Small Group Tree Planting Program (TIST) projects, ecological context is less important as non-native species tend to be planted along the edges of farms regardless of the location of the farm.

With the development of new agricultural methodologies within the VCS, particularly the SALM, projects are beginning to emerge that build above and below ground carbon within production systems by utilizing agroforestry and reduced tillage techniques. The Western Kenya Smallholder Agricultural Carbon Finance project is the most advanced example of this kind of project, with others in the pipeline, particularly in Kenya and Zambia.

REDD projects were included in this inventory when farmers were found to be direct beneficiaries. An example of an agricultural livelihood/REDD project is the Nyamkamba Escarpment project in Ghana. The Nyankamba Community Resource Management Area is a proposed 240,000 hectare community protected area, proposed in the Ghanaian savannah/woodland transition zone, with approximately 4,000 inhabitants in eight communities. Although this is essentially a REDD project, a core goal is to promote sustainable alternative land uses for the local communities, including sustainable farming and charcoal production, forest management, sustainable harvesting of the non-timber forest products (mostly shea nuts), environmental education, social and health programs, and ecotourism.

Agricultural emission reduction projects in the inventory consist of bio-digester, nitrogen reduction, and renewal energy projects. The Senegal Green Charcoal Project is an example of these emissions reductions projects. It pays farmers to replace the wood charcoal and fuelwood used for domestic fuel with green charcoal, an alternative household fuel obtained from the clean carbonization of renewable biomass, such as agricultural residues or invasive weeds.

Twenty of these projects fell into multiple categories. The Ibi Bateke Carbon Sink Plantation in the Democratic Republic of Congo (DRC) is a sequestration and GHG reduction project. It will convert natural grassy savanna, disturbed by human-initiated fires, into an abundant and sustainable fuelwood supply for charcoal production. Carbon sequestration from the atmosphere is combined with a reduction in GHG emissions, resulting from the disappearance of savanna fires and the energy switch to non-fossil fuel.

As time goes on, it seems that agriculture GHG projects are becoming more able to include multiple interventions within a landscape. Early projects often highlighted simple tree planting, but as agricultural methodologies continue to develop and MRV systems become more sophisticated, carbon projects can be more easily integrated into agriculture landscape planning processes and larger conservation and rural development initiatives.

FINDINGS AND ANALYSIS ON INSTITUTIONAL ARRANGEMENTS

The goals of this inventory were to document the institutional arrangements of agricultural GHG projects, to use these findings to analyze projects' current strengths and weaknesses, and to identify future points for intervention that will help them succeed. To learn how these projects are organized, the inventory survey included questions on developer/investor type, field program managers, sellers, buyers, land tenure status, and support services from other intermediaries. With the information gathered in these categories, we have created a diagram of the institutions involved in an agricultural GHG project and offered examples of groups that play each role. (See Figures 1 and 2.) The diagram is not intended as an exhaustive map of all institutional actors with carbon projects, but rather aims to capture the perspective and interests of farmers within a complicated network of actors. It is designed to represent the central position of farmers within this system and show how a farmer might see and interact with other actors within a GHG project. This section will describe each of the roles represented in the diagram and, based on findings of the inventory, how they are being filled.

Figure 1. A farmer's view of agricultural GHG project institutions: Key actors & their functions

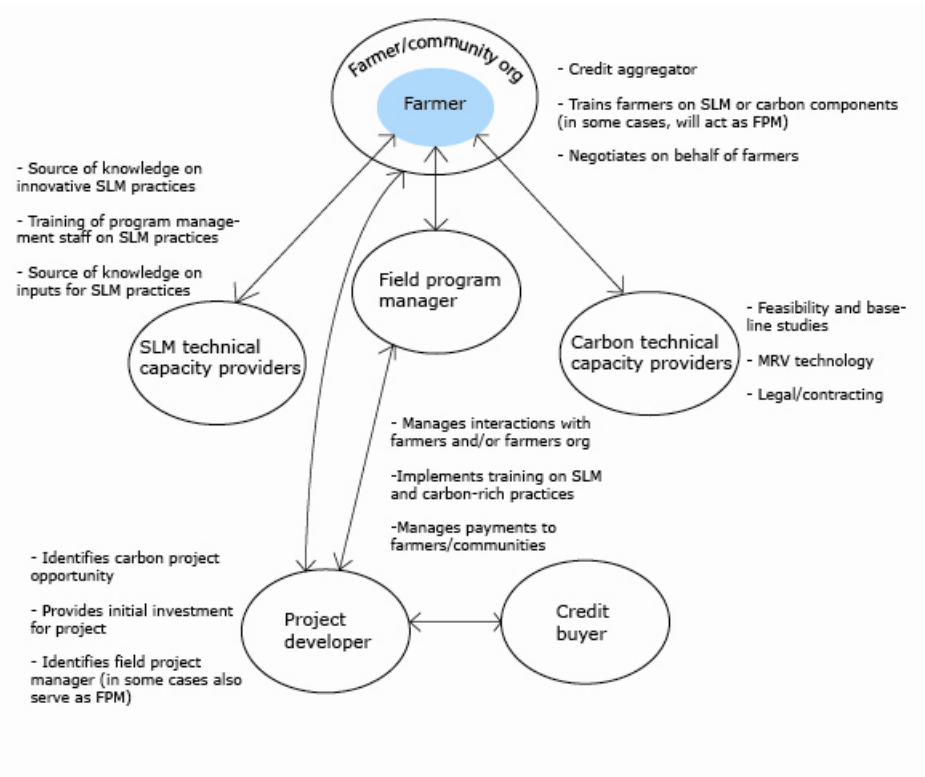
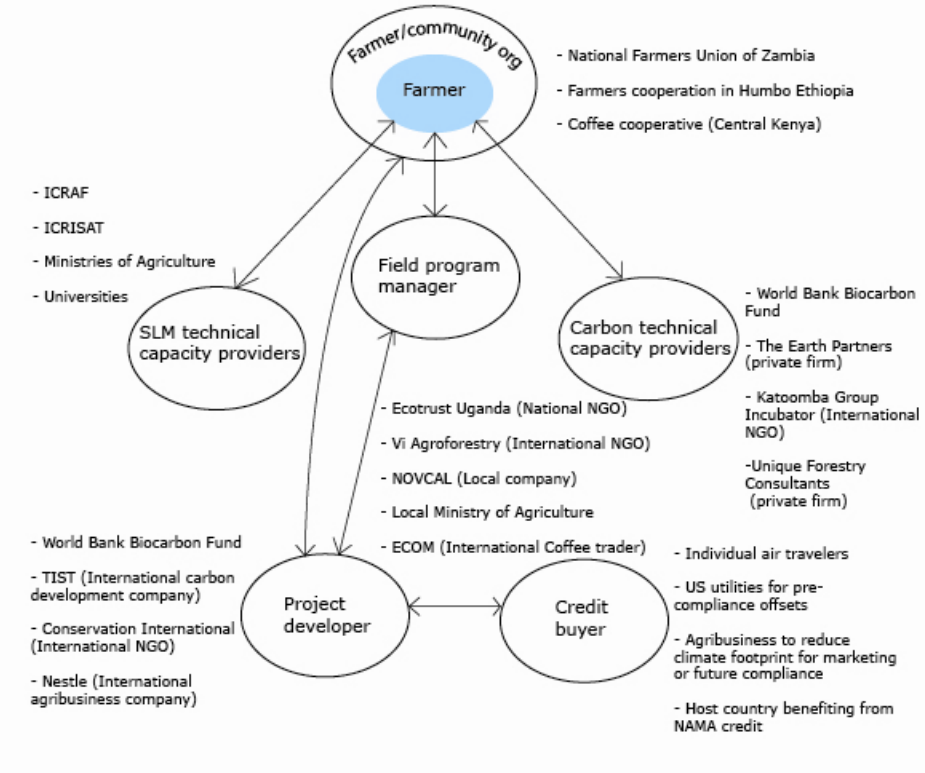


Figure 2. A farmer's view of agricultural GHG project institutions: Examples of key actors



Details on institutional arrangements were often difficult to come by for the inventory. However, we collected sufficient information for a quantitative analysis on two institutional elements: developer/investor type and field program manager type.

DEVELOPER/INVESTOR

The developer/investor is the party that initiates the project and provides the upfront capital to get it off the ground. For agricultural projects in Africa, this role is played by a highly diverse set of actors across sectors. Filling the developer/investor role, there were 11 different kinds of organizations represented among the 59 projects for which we had sufficient information. Roughly a third of them featured developer/investor arrangements in which multiple types of organizations collaborated to fill the role. The leaders in this group were multilateral/bilateral donors and carbon developers. In 19% of the cases the multilateral/bilateral donors filled the role on their own; this share rose to 41% when the combination cases were included. Carbon developers filled the role 20% of the time on their own and 29% with combinations included. (See Table 3.)

Among NGOs, conservation groups seem to have been the early actors, although lately, development organizations have become more interested. In the private sector, carbon developers have been key actors since the beginning, and their experience, along with the growing sophistication of other actors, has improved their opportunities for collaboration and allowed them to consider the ways that they can maximize the co-benefits of carbon projects. Non-carbon private companies, most notably agribusiness, forestry, and energy companies have begun to play a larger role recently. As governments observed the early projects, and participated in the international climate change discourse, they have also begun to appreciate the opportunities of agricultural carbon. Donors continue their strong support. The most important among these has been the World Bank BioCarbon Fund, which has spearheaded the

development of the SALM methodology within the VCS and has offered to buy the credits from these early agricultural projects and provide technical support.

Table 3. Project developer/investor types (n=59)

Institutional types	% when acting alone	% when working alone and in combination
Private carbon developer	20	28
Multilaterial/bilaterlal donor	19	41
Private business, not primarily carbon	10	15
International environmental NGO	8	24
International development NGO	8	10
Private foundation	0	3
Research institution	0	8
Local/national government	0	2
Local/national company	0	2

FIELD PROGRAM MANAGERS

The field program manager is the entity that runs the day-to-day operations of a project. This must be a strong, on-the-ground organization with a fairly long time horizon, able to engage with farmers and farmer organizations, negotiate contracts, manage transactions of carbon payments to farmers (where this is done), and aggregate the carbon credits generated, provide technical assistance to farmers on sustainable land management practices that produce carbon offsets and co-benefits, facilitate landscape- and farm-scale greenhouse gas monitoring, and implement field measurements of carbon with farmers. A wide range of actors now plays this role in agricultural GHG projects in Africa.

The inventory found 10 types of actors, mostly overlapping with those of the developer/investor types. In only two cases were there projects with multiple field program managers. The types were also more broadly distributed within the 52 projects in which we had sufficient information, mostly between carbon developers (23%), private non-carbon businesses (21%), local/national NGOs (21%), and international environmental NGOs (19%). There were only two cases where combination field program manager arrangements were found. They both involved government agencies. (See Table 4.)

Table 4. Field program manager types (n=52)

Field program manager types	% of total
Carbon developer	23
Private non-carbon business	21
Local/national NGO	21
International environmental NGO	19
International development NGO	10
National government agency	4
School	2

An illustrative example of how a carbon developer plays the field program manager role is the case of the Sofala Community Carbon project in Mozambique. Associação Envirotrade Carbon Livelihoods is the field program manager. It is technically a Mozambique NGO, but is essentially a local subsidiary of Envirotrade Group, and international carbon developer based in Mauritius. The organization is in charge

of managing the project's day-to-day operations, running the technical components, employing local staff, and managing relations with the local communities. In this case, Envirotrade Group has the responsibility to market the carbon offsets generated by the projects, negotiate the sale of the carbon offsets, raise additional finance where necessary, pay taxes on carbon offset sales, carry out research, and administer and develop new projects. In return, Envirotrade Group receives up to one-third of the proceeds of any carbon offset sales. Mozambique Carbon Livelihoods Trust (MCLT) is a trust fund established to manage the proceeds of the carbon sales. This vehicle protects the interests of the farmers and the local communities. Its board members include independent NGOs, the Community Association, Contabil (an auditing firm), and Associação Envirotrade Carbon Livelihoods.

When NGOs act as program managers, they are often already established within a community and take on additional responsibilities on top of the core functions they already perform. In many cases, they are also experts in implementing the very same sustainable land management practices that can be leveraged to develop carbon projects.

The Green Belt Movement (GBM), a national Kenyan NGO, has been working with farmers to plant trees in the Aberdare mountains since 1977. With carbon finance, they can simply expand their activities. This group already has the benefits of credibility among the community and ecological knowledge of the area. The carbon project will be able to leverage a well-established network of tree nurseries and community groups in the region.

The Mali Acacia Senegal plantation project is a case in which a large private landowner acts as field program manager and project developer. The project will reforest 6,000 ha. Of this, 3,000 ha is private land owned by the Déguessi Groupe, a Malian private producer and importer/exporter of agricultural products. The other 3,000 ha will be developed by local communities on communal land under a partnership agreement with the Déguessi Groupe. The company has signed sub-project agreements with the communities to commercialize the carbon credits on their land. It will develop and manage nurseries, contribute to farmers' training and assistance for planting trees, maintain plantations, and harvest Arabic gum. The project will also re-introduce agricultural activities through intercropping with groundnuts and cowpeas.

In the Kenya Smallholder Coffee Carbon Project, ECOM, an international coffee trading company, is overlaying a carbon component on its existing supply chain. A similar model is envisaged by the creators of the Cocoa Carbon Initiative (CCI), a venture of the international NGO Katoomba Group and the Nature Conservation Research Center (NCRC) to identify promising Cocoa projects and then to provide incubator support to develop them.

FARMER ORGANIZATIONS

Farmers and their organizations need the capacities to operate competently and, when appropriate, shrewdly as sellers. They need the capacity to plan and negotiate their own commitments for a carbon project, to implement sustainable land management practices at farm and landscape-scale, and to participate in the monitoring of carbon sequestration and emissions reductions. There are a variety of ways that the inventory found in which they are organizing to fill these needs.

In some cases agricultural carbon sellers were members of cooperatives or producers organizations that pre-dated the carbon project. In others, new farmers groups were created by the field program managers. In the Cocoa Carbon Initiative, the operative farmers' organizations are cooperatives of small cocoa growers, including the Kaupa Kkoo and the Cocoa Abrabapa cooperatives that represent a total of 1.2 million farmers. These farmers already have experience with Fair Trade certification and meeting buyers' standards. They have a strong social network and are able to disseminate information and train farmers

in new methods. The carbon benefit sharing plan for these projects would be that 50% of carbon payments would go to farmers and 50% would go to a community trust.

In the TIST projects, operating in Kenya, Tanzania and Uganda, farmer groups of 10-12 are created specifically for the purpose of contracting and interacting with the carbon project developer and field program manager, TIST. The payments go directly to the group based on the total number of trees planted by their members, and the benefits are then distributed among members of the group as they see fit.

TECHNICAL SERVICE PROVIDERS FOR CARBON PROJECTS

Field program staff may need support from technical experts for training and/or back-stopping on carbon program feasibility studies; determining the most appropriate carbon friendly interventions; and carbon measurement, reporting, and verification. In addition, managers require legal advice and contractual expertise to ensure a fair deal between buyers and sellers to package offsets to buyers and to manage these transactions. They may also need help in identifying qualified consultants to provide these services. The inventory found that these services are being provided by a combination of outside private experts, international NGOs and donors, agribusiness, research institutions, and government agencies. Carbon technical capacity is still relatively limited in Africa and most of these services are still coming from the outside, often through actors interested not only in particular projects but in the broader goal of building African agricultural carbon markets. The World Bank BioCarbon Fund has played the leading role in building and providing technical carbon capacity in Africa. Other groups with an interest beyond individual projects, such as the Cocoa Carbon Initiative, are also beginning to enter this space.

SLM TECHNICAL SERVICE AND ADVICE PROVIDERS

In addition to the technical carbon components of project development and implementation, managers may need support specifically on SLM practices. Fortunately, Africa already has a number of strong institutions which are able to play this role, although more support is certainly needed.

For the Acacia rehabilitation projects in Senegal and Niger, the agricultural research centers – the International Crops Research Institute in the Semi-arid Tropics (ICRISAT) and the World Agroforestry Centre (ICRAF) – have been developing the Acacia planting techniques being implemented and are leading providers of technical support for the project. Development and Conservation NGOs operating in Africa also have deep expertise in SLM project and implementation. In areas with strong public agricultural extension services, government can also play a key role.

Many of these agricultural GHG projects identified in the inventory are in their early stages, but they provide enough information for a sense of how these projects operate and what kinds of organizations currently have the capacity to play various institutional roles. Studying these projects also provides insights into the major challenges for agricultural GHG projects in Africa. Based on the lessons from this inventory and other experiences working on agricultural GHG projects in Africa, the next section synthesizes insights on key institutional needs for success.

REQUIREMENTS FOR SMALLHOLDER SUCCESS IN CARBON DEALS

This analysis is oriented to the needs of small farmers in agricultural GHG projects. Of course, these projects need to be functional for all parties if they are to succeed for any of them, but there are certain challenges posed by these projects that are particular to farmers. These are barriers that, if overcome, can make the difference between significant livelihood benefits and exploitation. These needs include low transaction costs, risk management for farmers, secure land tenure and carbon rights, sufficient incentives for farmers to participate, access to financing for farmers and project developers, project management and implementation capacity, and sufficient demand for agricultural credits.

A description of each of these challenges is presented here along with examples of success in overcoming them and recommendations for interventions.

LOW TRANSACTIONS COSTS

Agricultural carbon supply chains are long, complex, and require expensive MRV systems. As in agricultural products supply chains where there is often very little money left over for the commodity farmers – who are among the first to be squeezed when sales prices drop – carbon farmers also face low margins. This problem is exacerbated for farmers in carbon projects because weak institutions and lack of competition increase overall transactions costs. Furthermore, carbon prices are currently low and individual farmers produce relatively small volumes of offsets.

This inventory was not designed to quantify the transaction costs of the projects, but the Partnership for Tropical Forest Margins (ASB) has estimated that in CDM afforestation/reforestation projects in Africa transactions costs can total as much as $200,000 and that 30-60% of the financial value involved in these projects is spent on transaction costs, even in situations with much less stringent requirements than the CDM.[25] One could assume that transaction costs in agriculture projects are as much, if not more, than those in the forest sector. It should be noted that it is very difficult to measure the total costs of project development. The start-up costs, including baseline measurements and community engagement, up to the point where credits are being generated, are often covered, in part, by outside donors. Even TIST, which is ostensibly a private carbon developer, has received substantial support in Africa from USAID. Agricultural landscapes in Africa are often agro-ecologically and socially heterogeneous, and, therefore, credit aggregation is a key challenge. Scale and simplicity, however, can be keys to achieving cheap aggregation.

The early African agricultural projects for voluntary buyers have tended to be charismatic but small. To achieve significant impact on communities and climate, however, will require the involvement of hundreds of villages or communities, which requires additional coordination, monitoring, and strong on-

[25] van Noordwijk, M., F Chandler and T Tomich. 2004. Introduction to the Conceptual Basis of RUPES. RUPES Working Paper No. 2004_2.

the-ground capacity. For these large-scale, complex projects to succeed they need to include local stakeholders in the design and implementation of the project, rely on strong aggregators and intermediaries, and ensure that the project generates direct benefits for local communities so that these communities have a real incentive to implement and maintain the project over the long term. While this large scale of operation could entail significant complexity in transaction structures and monitoring actions, there are opportunities to work with existing institutional structures to reduce transactions costs.

The Conservation Agriculture with the *Faidherbia albida* Intercropping project in Zambia is a promising case of an agricultural GHG project utilizing pre-existing organizational structures to reduce transaction costs. The project is being managed by Community markets for Conservation (COMACO), a community-owned and run organization with a market-based approach to rural livelihoods, food security, and biodiversity conservation in the Luangwa Valley of Zambia. COMACO works with 50,000 farmers and has established the infrastructure and network of extension services along with payment mechanisms necessary to bring markets to remote rural communities, and value-added agricultural commodities into regional centers. Based on initial estimates, the carbon project is anticipated to have the potential to generate over 148,000 Voluntary Emission Reductions per year at maturity. The decentralized nature of this project and its large number of project participants has made it possible to layer all carbon project activities onto existing infrastructure and systems that are already in place.

Another way that agricultural projects could reduce transactions costs in the future is to employ the programmatic approach to CDM, which allows bundling of small projects using the same methodology into one large project. This is not currently possible for agricultural projects under the CDM, but is being discussed in policy circles.

An allure of the programmatic approach is that it would reduce MRV expenses. As previously discussed, land-use methodologies within the CDM are rare and complicated to implement. Agricultural methodologies are now available within the voluntary markets, primarily under VCS and Plan Vivo, but are still very complex. However, monitoring and measuring technologies for agriculture GHG are improving rapidly with developments in remote sensing, sampling techniques for field measurements, and modeling tools. Remote sensing has been used to record land use and land cover change for several decades and can also be efficiently used to track changes in the relative distribution of land use classes over time. It can be used with sampling techniques as inputs into conversion equations and models. The accuracy of these indirect tools varies, depending on available data and local ecology. Typical inputs for models include information related to carbon stock estimates and activity data such as current and historic natural disturbance, management, land use change, climate, soil properties, growth rates, decomposition rates, biomass pools (above and below ground estimates), and estimates of variability and error. Despite these improvements, however, in Africa, reliable input data for models remains a major obstacle. Additional investment in these measurement techniques, along with promising innovations in participatory data collection – including the use of handheld GPS devices and cell phones, should significantly reduce costs over time.[26]

RISK MANAGEMENT FOR FARMERS

Small farmers have a limited asset base to absorb carbon project risk, periods of lower returns or higher labor requirements. When farmers are asked to make commitments to avoid land or forest clearing for long periods of time, their opportunities for new economic activities will likely be reduced, and these opportunity costs may grow over time as productive land becomes scarcer with population growth or development. Poor selection of tree species, spacing or management in agroforestry systems may

[26] Shames, S. (ed.) December 2009 (draft). Advances in Agricultural GHG Measurement and Monitoring: Implications for Policy Makers. Ecoagriculture Policy Focus, Issue 4.

suppress, rather than increase, yields of associated crops. Projects must identify ways in which project risk can be primarily absorbed by outside actors. The principle way that this can happen is to ensure that any climate-friendly agricultural or SLM intervention implemented by a farmer will improve his or her livelihood over time regardless of whether or not he or she receives a carbon payment. This is certainly possible with various agroforestry and conservation tillage techniques that have been documented to significantly increase yields over time. (See discussion of climate-friendly practices with co-benefits in Section 1.)

Another key strategy to reduce risk for farmers is to involve them in decision-making processes regarding where project sites should be placed. Farmers will have critical knowledge of which places within an agroecosystem may have the greatest benefits for land-based livelihoods. For example, acacia projects in Senegal and Niger are designed to regenerate land for communities so that they might be available for productive activities, even if on a relatively limited basis, in the future.

The contracting and negotiation processes should also be pro-farmer. Symmetry in negotiations is a key challenge as carbon deals are often driven by experienced buyers with the support of highly specialized legal and technical advisors driving hard bargains to buy credits as cheaply as possible for as long as they can, and developers – in the form of an NGO or company partner – may have limited experience in carbon markets and insufficient capacity or incentive to represent farmers' interests effectively. As a result of this imbalance, most carbon finance deals – particularly first time deals with new project developers – result in disadvantageous contractual conditions for the farmer. Farmers may not fully understand commitments under the contracts developed, or may be pressured to undertake activities on the farm that make little economic sense in the whole-farm context. Yet, it is essential to ensure secure benefits for farmers as only this approach will increase community commitment to support these projects, which will in turn increase the likelihood of their success. Greater symmetry in information and access to expert advice and support is essential if agricultural carbon finance is to actually generate meaningful benefits for farmers and returns for investors and buyers. This is important as the contract is negotiated but also as it is enforced and any disputes require mediation throughout the course of the contract.

Communities also need ample opportunity to have meaningful input into the design of a carbon deal and some level of oversight over its implementation. They should be able to devise their own least-cost solutions to deliver ecosystem services, and enhance sustainability. When possible, these planning processes can build on prior local self-assessment of ecosystem service needs and issues, so that communities understand their own priorities, opportunities, and limitations before initiating negotiations with buyers.

Ideally, communities engaging in these contracts should begin the process with pre-existing and robust farming and/or community organization(s) that support social cohesion, have broad member input, and are recognized within the community as a forum for legitimate decision-making. Before communities enter into contracts, these organizations should evaluate their objectives for their local economy and agroecosystem and consider how a carbon project can help achieve them.

Risk can also be mitigated if contracts include some element of flexibility so that the project can adapt to changing circumstances in local economics and climate and can incorporate lessons from local and relevant outside experiences. These agreements should be revisited periodically and given the room to improve.

LAND TENURE AND CARBON RIGHTS

In areas where smallholder land tenure is not secure, there is a risk that more powerful interests will claim land that becomes more valuable as a result of the financial potential generated by the carbon

markets. Once communities restore degraded lands, largeholders or government agencies may come to claim them. In this way, the rights to carbon are closely associated to those for land. Unless rights for both are secured before a carbon deal is made by farmers, it will be very risky for farmers to move forward.

INCENTIVES FOR FARMERS: DIRECT PAYMENT TO FARMERS VS. PRODUCTION AND LIVELIHOOD BENEFITS

There is considerable disagreement among people with experience working with farmers, as to whether projects should pay individual farmers directly, pay farmer or community organizations, or consider non-financial project benefits to be sufficient. Given high transactions costs, in most cases the amount of money received by an individual farmer is insufficient on its own to provide an incentive to continue a particular land-use practice if it is not producing some other livelihood benefit. The level of potential carbon revenue should be clearly communicated at the farm level to avoid false expectations. For farmers, a carbon payment could be a catalyst for the adoption and maintenance of improved agricultural practices and technologies, but, in any case, it is the co-benefits of improved crop yields and improved livelihood-supporting ecosystem services that provide the bulk of the incentive.

If farmers do receive payments, there is a variety of ways that they can be distributed, including arrangements with local banks, electronic cards, cell phones or supplements to commodity payments. For example, a project in Kenya utilizes text messaging to allow farmers to claim cash from the carbon offsets they produce by using efficient cooking methods, such as a modern charcoal stove or solar cooker, instead of an inefficient open-pit fire burning biomass. TIST gives out vouchers to farmers based on the number of trees they plant that can be reimbursed at local banks.

Another approach to distributing agricultural GHG credits, given the relatively small amount of cash per farmer involved, is to use the payments to support the infrastructure to maintain and expand carbon-rich land use systems. Carbon payments could support a revolving fund to pay for technical carbon expertise or for agricultural and forestry extension activities, which offer farmers improved livelihoods. In Malawi's Trees of Hope project, the finance derived from the sale of carbon credits will help to provide farmers with training and extension services, seedlings, and financial incentives to plant and maintain trees.

An ideal might be a hybrid model in which a portion of the carbon proceeds go directly to farmers, some is utilized by community groups for collective initiatives, and the rest to a larger agroecosystem-wide conservation effort. A scheme along these lines is run in Madagascar's Makira Forest project, which distributes 50% of the carbon revenue to communities, 25% toward management of the protected area and 25% towards monitoring and marketing of the carbon project. The appropriate balance of distribution among stakeholders will be context specific it may differ for every project.

SECURING ACCESS TO PRE-FINANCING AND FINANCIAL INTERMEDIATION FOR FARMERS AND PROJECTS

A large share of the cost of producing agricultural offsets comes in a project's planning and establishment phase. Projects may take a number of years before they begin sequestering carbon and generating carbon credits. The interventions will need to be financed before these payments begin to flow. The cash flow of payments on the VCS, for instance, is "on issuance only," which means that payments increase as time goes on for agricultural projects. Therefore, it will be essential to raise upfront finance. Unfortunately for farmers, upfront finance linked to carbon credits is typically provided by buyers interested in getting a hefty discount on credits. Mechanisms are needed by which finance is available for project design and development of carbon baselines and technical assistance at reasonable terms.

Ideally, projects would find a buyer for the future stream of credits at a sufficient price to develop the project. This has proven to be difficult in the current market. However, some projects are finding funds. In addition to some buyers hungry for risk, projects have found support from impact investors; philanthropic or government institutions; field program management organizations interested primarily in the project's co-benefits; independent micro-finance institutions willing to operate on a multi-year basis; and in some cases, farmers' self-financing.

For Africa, the World Bank BioCarbon Fund has often played a catalytic role in raising these funds. For the Ibi Bateke Carbon Sink Plantation project in the DRC, the BioCarbon Fund has played a pivotal role in enabling NOVACEL, the local NGO which acts as the field program manager, to obtain loans from private firms (Suez and Umicore) to finance upfront investments. It has also attracted the participation of other carbon buyers – Orbeo, a subsidiary of the French conglomerate Société Generale, and Rhodia.

With such an acute need for pre-finance, sellers, buyers, and certifiers must also be careful not to overreach. The Sofala project in Mozambique certified by Plan Vivo allows for the issuance and sale of 100 years of credits within the first seven years of the project. This policy is based on the assumption that the adopted project activities become self-financing after seven years through the livelihood co-benefits they provide. This practice, however, has called into question the rigor of the Plan Vivo methodology and has devalued its credits in some circles.[27]

IMPLEMENTATION/MANAGEMENT CAPACITY

Even when the previously discussed institutional elements are in place, project actors still need the capacity to implement these programs. Many of the project developers, field program managers, and community organizations identified in the inventory are encountering carbon projects for the first time. Most smallholders and communities have worked through NGO, private sector intermediaries, or government outreach staff, not directly with buyers. These projects have been of highly variable management quality and there is still limited capacity in African institutions – NGOs, government agencies, private sector and research institutions – to support the technical elements of carbon projects. The outside expertise that has been employed so far is very expensive, and unless local capacity improves, agricultural GHG projects will not thrive in Africa.

Community groups, in particular, need to play a more proactive role in project development and implementation. A key element of their participation will be additional expertise in project design. The World Bank BioCarbon Fund and the CCI are both examples of groups in this space working to build carbon project capacity among small farmers in Africa. The BioCarbon Fund holds trainings for project developers on monitoring methodologies for carbon projects aimed at project developers. One such training was organized for Francophone Africa at the Ibi Bateke station in the DRC in November 2009. The CCI, funded by a consortium of private foundations and chocolate companies, and implemented by NGOs, has organized trainings in Ghana on project development.

DEMAND FOR CREDITS

The buyer market for agricultural carbon is currently quite small due the complexities of the rules for these projects discussed in the first section. But buyers can still be found. This group is led by impact investors such as the World Bank BioCarbon Fund, but other buyers and investors are exploring ways to utilize the new VCS methodologies and are closely tracking potential changes in CDM rules and the possibility of a cap-and-trade system within the United States that would include agricultural offsets.

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27 See Case Study – Sofala Community Carbon Project, Mozambique

Agribusinesses with African supply chains are also exploring the potential of engaging with African carbon projects. They can engage as developers, managers, sellers, and buyers of credits. These companies can work directly through the medium of carbon credits or they may also link the mitigation values to their agricultural products and sell them jointly as eco-certified products. The Rainforest Alliance is a leading eco-certifier working on methodologies to make this easier.

The key message from the discussion of challenges in this section is that these projects will need a spurt of institutional support to get them off the ground, but will also need to develop the capacity to maintain and grow these initiatives for the long-term. Many sustainable land management programs and projects in Africa have relatively short time-horizons, although there are some notable exceptions of long-term investments. For agricultural GHG projects to succeed, it will be essential to identify and establish partnerships with these long-term investments and Africa's strongest institutions to ensure that full carbon offset benefits are produced, monitored, and delivered to buyers, and that they support the livelihood development of the sellers and the health of their agroecosystems. The following section discusses the roles that various sectors can play in the long-term prospects of agricultural carbon projects in Africa that support sustainable agricultural development.

ADVANCING CARBON MITIGATION IN AGRICULTURE: ROLES FOR VARIOUS SECTORS

For agricultural GHG mitigation projects to play a major role in African rural developments and conservation, all sectors will need to play their appropriate role. These groups includes national governments, community organizations, local and national NGOs, research institutions, international donors, and the private sector.

NATIONAL GOVERNMENTS

The work of supporting agricultural carbon projects starts with national governments. They will need to establish national policy frameworks for investment, financing and development of agricultural GHG projects. Ministries of environment, agriculture and others will have to coordinate their efforts so that policy in this area can be designed and enforced in a coherent and reliable way. They could also identify priority strategies locally where carbon finance can contribute to pre-existing landscape initiatives and support livelihood and ecosystem co-benefits. Government agricultural extension services should be supported and utilized to link with carbon projects.

African governments might also expand their role in the international negotiations that govern carbon markets within the UNFCCC. This would consist of a louder and clearer voice on CDM reform to include agriculture and other AFOLU projects, and advocacy for the inclusion of land use Nationally Appropriate Mitigation Action (NAMAs), which are still only vaguely defined within the UNFCCC negotiations.

FARMERS AND COMMUNITY ORGANIZATIONS

Farmer and community groups should continue to explore low-cost models for selling their agricultural carbon credits. There is also scope for them to expand their role in practically all areas of the carbon supply chain, including project identification, management, and technical capacity support to members. Farmers should also organize to play a more substantial role in the international and national rule setting around climate change, generally, and agricultural GHG projects in particular.

LOCAL AND NATIONAL CONSERVATION AND DEVELOPMENT NGOS

Like farmer and community organizations, these groups have enormous potential to contribute throughout the agricultural carbon supply chain. So far, they have primarily played the role of field program managers, but they can build beyond this. Over time, as they become more familiar with how these markets work, they can take the lead in identifying and developing potential projects. They can

also build internal technical capacity to serve as extension agents for SLM practices as well as experts on MRV.

INTERNATIONAL NGOS

International NGOs can play a key role in advancing agricultural GHG markets by innovating ways to leverage their pre-existing activities in sustainable agriculture and conservation to link to carbon markets. These groups are well-placed, with the necessary relationships and expertise, to develop large-scale projects and provide technical SLM support in areas where government extension services are weak. Where carbon project support services are expensive or inaccessible, they can also build capacity so that they can provide "full service" agricultural project support. This role will serve the interests of small farmers as these groups' primary objective is usually to support them along with the ecosystem services critical to their livelihoods.

RESEARCH INSTITUTIONS

For agricultural carbon markets to function over the long term there must be trust in the quality of the credits. Research institutions, and to some extent private carbon measurement firms, will need to provide accurate and cheap measurement tools for climate mitigation as well as the related livelihood and ecosystem for benefits in which many buyers will be interested. These methodologies should be available to function on a large scale and be able to measure all carbon sinks and emissions reductions throughout an agricultural landscape. In addition to carbon MRV, researchers should continue to develop the climate-friendly sustainable land management technologies on which these agricultural carbon projects will be based.

PRIVATE SECTOR

The private sector, as the group with the potential to capture most of the financial gains, has a heavy responsibility in the development of these markets. Carbon project investors and credit buyers will need to recognize that these markets are still emerging and that they should support a "learning by doing" approach even if it is uncomfortably risky at times. The private sector carbon professionals will have to innovate models for pre-financing, such as microfinance, to get projects started and to mitigate risk for farmers. The international carbon professional roles will continue to be essential; however, ideally more of this capacity will reside in African institutions over time.

The other critical private sector group is the agribusiness and food industry, which has the potential to drastically reduce transactions costs by implementing these projects within their existing supply chains and corporate infrastructure. Their experience is beginning to build, and will only grow with increasing pressure from consumers – and possibly regulation in the future – to provide products with a lower climate impact.

INTERNATIONAL DONORS

There has been an increase in the level of support for sustainable agricultural land management activities in sub-Saharan Africa in recent years, and although most of these investments were not originally designed for carbon mitigation projects, donors are now considering ways to link carbon finance to SLM objectives. As markets develop, most elements of the agricultural carbon supply chain will need support in some form or another.

At this moment, a particularly critical need is support for capacity-building among farmer and community organizations to participate in these projects. Investments might include trainings for farmer and community organizations on project development and management, and the development of low-cost, pro-farmer MRV methods.

Donors could also collaborate with sellers and buyers to improve opportunities for upfront finance for projects. As discussed in the previous section, private buyers require a deep discount from sellers in order to buy these early agricultural credits. For sellers, the need for upfront finance erodes much of their profit margin. Donors could support an institution that can bridge this gap as a buyer of future streams of agricultural credits at a fair price for sellers. A revolving fund could be established in which the pre-credits could be sold to fund the development of future projects.

USAID

The recommendations for international donors also apply to USAID. However, USAID is in a unique position as it is simultaneously considering its climate investments and implementation of the Feed the Future strategy. Investments in pro-farmer infrastructure for agricultural GHG projects have the potential to meet the objectives of both of these strategies. By supporting agricultural production systems, and associated technical assistance programs, that increase carbon sequestration, USAID can lay the foundation for future large-scale sequestration payments.

Another critical role for the U.S. Government is leadership on international climate policy. Although USAID may not be the lead agency for the U.S. Government in these discussions, it might communicate the ways in which agricultural carbon finance has the potential to support multiple agendas. This paper has focused primarily on the anatomy and development of carbon projects, but there is a broader discussion to be had regarding specific policy initiatives that could support the flow of carbon finance – in the form of mitigation and adaptation funds – to smallholders in Africa.

ANNEX 1 SOFALA COMMUNITY CARBON PROJECT CASE STUDY

CARBON CREDITS FROM SUSTAINABLE LAND USE AND RURAL DEVELOPMENT

PROVIDED BY THE SOFALA COMMUNITY CARBON PROJECT IN MOZAMBIQUE

PREPARED BY: JOHN FAY

MARCH 2010

BACKGROUND

The Sofala Community Carbon Project is the continuation and scaling up of the Nhambita Pilot Project. Initiated as a research trial phase in 2002 with a group of 53 farmers, this project serves as one of the pioneering agriculture land management projects in Africa and globally. The project was funded by the European Union (additional support provided by Envirotrade, University of Edinburgh, and DFID) to assess the potential of rural development land use practices to generate verifiable carbon emission reductions. The project ran until August 2008 and is a flagship Plan Vivo project. It has operated under the voluntary standard since the research trial started in 2002.

Since September 2009, the Sofala Community Carbon Project continues the work of the Nhambita pilot to facilitate sustainable land use and rural development activities in communities within the Gorongosa National Park buffer zone in Sofala State, central Mozambique. The project financing now depends on carbon sales to guarantee its maintenance, payment to cover operations, and compensation to project participants is dependent on the sale of project generated VERs (verified emission reductions). The objective is to move from a joint donor/investment phase to become dependent on sales of carbon offsets. Projected CO2e offsets from the project exceed one million tonnes and is expected to provide income for the project to continue its activities. Local knowledge transfer has also increased the communities' capacity for overseeing all aspects of the project. The expansion of the project into adjoining areas will be determined by the availability of markets and the sale of the VER offsets.

APPROACH

The projects work with a large number of rural smallholders to promote the adoption of sustainable land use management and generate VERs. The individual smallholders can choose to adopt mitigation activities from a selection of different land use systems (seven agroforestry and one forestry system – See Annex A). For each of these systems, technical specifications summarize all relevant information (i.e. establishment, management, site requirements, carbon sequestration potential, etc.). For each system that a producer decides to adopt, a contract is established with Envirotrade – the project developer. Guidance is then provided to the rural farmer on how to adopt the system that must then be monitored and verified as the basis for carbon payments.

As of August 2009, the agroforestry systems have been widely adopted. Each farmer may have several contracts (currently there are some farmers who already have six systems in place), the total crediting period per farmer can be layered using multiple systems with a new one each year. This means that actual carbon revenues are paid out over an extended period – for example, a farmer with four systems implemented over four years will get payments for 11 years. There are 1,023 producers in Chicare community who have signed 2,858 contracts with the project developer. For each adopted system, an individual contract is signed; thus, one producer might have more than one contract. In Matenga (Mucombeze) community there were 496 producers who have signed about 1180 contracts. In the Zambezi Delta there are producers who have signed 410 contracts. In total, 1,755 producers have signed 4,448 contracts. In addition, the forestry system was adopted on 9,405 ha in Chicare community and 366 ha in Matenga community. The total area amounts to 9,771 ha.

From 2002-2009, the project has produced a total of 476,210 tCO2e VER to be sold ex ante. Of these, a total of 168,740 tCO2e have already been sold. The balance of 307,469 tCO2e, which are held on stock by the project developer, and all new VERs generated after the baseline was established in January 2007, are subject to the Climate, Community and Biodiversity Alliance (CCBA) validation by auditor/certifier Rainforest Alliance. In 2009, Envirotrade submitted a project design document to the project design CCBS to further prove the projects' additional community and biodiversity benefits and increase salability of the corresponding VERs.

Agroforestry is calculated as an average carbon benefit per hectare modeled over 100 years. Individual projects are limited to selling a tenth of the total carbon benefits from the forestry systems per year under Plan Vivo. Total VERs produced for sale are 476,210 tCO2, 355,352 from agroforestry (total benefits calculated ex ante), and 120,857 tCO2 from forestry. A further 686,823 from forestry will be available for sale in the future.

The marketability of Plan Vivo credits has the potential to negatively affect future revenue streams. Plan Vivo is often regarded as not rigorous for potential buyers and other standards, including the VCS, have competing, more stringent agriculture land management methodologies in development. One commonly noted problem with the approach taken by Sofala is the crediting period.

For agroforestry-related mitigation measures, the crediting period is 100 years; however, farmers who have signed contracts adopting these systems are paid during the first seven project years for the entire offset stream of 100 years. This is based on the assumption that the adopted project activities after seven years are self-financing and provide sufficient incentives to continue with the adopted management activities. As a result, long-term viability and permanence of the Plan Vivo VERs can be questioned.

IMPLEMENTING ORGANIZATIONS[1]

The project is implemented by *Associação Envirotrade Carbon Livelihoods*, a Mozambique not-for-profit Association. The organization is in charge of managing the project's day-to-day operations, running the technical operations, employing local staff, and managing relations with the local communities involved. All operational costs relating to project delivery by Associação Envirotrade Carbon Livelihoods are to be covered by one-third share of any carbon offset sale, provided after the sale of the VERs. Any unused funds are contributed to Mozambique Carbon Livelihoods Trust (MCLT) for benefit of the community.

Envirotrade Group, based in Mauritius, has the responsibility to market the carbon offsets generated by the projects, negotiate the sale of the carbon offsets, raise additional finance where necessary, pay taxes on carbon offset sales, carry out research and administer and develop new projects. In return, Envirotrade Group receives up to one-third of the proceeds of any carbon offset sales.

Mozambique Carbon Livelihoods Trust is a Mozambique trust fund established to manage the proceeds of the carbon sales. This vehicle protects the interests of the farmers and the local communities. Its board members include independent NGOs, the Community Association, Contabil (an auditing firm), and Associação Envirotrade Carbon Livelihoods.

The Mozambique Carbon Livelihoods Trust was launched in 2007 to ensure the community and individual farmer proceeds from the carbon offset sales were safeguarded. Approximately one-third of the proceeds of any carbon offset sale is allocated directly to this fund and is paid out to individual farmers over seven years. A portion of the income will go to farmers directly, and another portion will be distributed according to the needs of the community as a whole at the discretion of the trust in consultation with the local community. Of the portion distributed to the farmer, the schedule of payments is as follows: 30% of payment immediately after planting, followed by 12% per year for five years, then a final payment of 10% in the seventh year.

[1] All information provide on implementing organizations and carbon revenue allocations is sourced in publicly available documents written by Envirotrade.

MENU OF AGROFORESTRY INTERVENTIONS

The agroforestry systems options within the program and monitoring targets as defined per the August 2009 CCBS PDD provided by Envirotrade.

Boundary planting: Monitoring targets for the first four years are based on establishment; the whole plot must be established by the third year with at least 85% survival rate of seedlings. Thereafter, monitoring targets are based on DBH. The expected DBH at the time of monitoring is based on a predicted mean annual diameter increment on which carbon sequestration estimates are based.

Dispersed Interplanting Gliricidia: Monitoring targets for the first four years are based on establishment. The whole plot must be established by the third year with at least 85% survival of seedlings. Thereafter, monitoring targets are based on DBH. The expected DBH at the time of monitoring is based on a predicted mean annual diameter increment on which carbon sequestration estimates are based.

Dispersed Interplanting Faidherbia: Monitoring targets for the first years are based on establishment. The whole plot must be established in the third year with a survival rate of at least 85%. Thereafter, monitoring targets are based on DBH. The expected DBH at the time of monitoring is based on a predicted mean annual diameter increment on which carbon sequestration estimates are based.

Fruit Orchard Cashew: Monitoring targets for the first four years are based on establishment. The whole plot must be established by the third year with at least 85% survival of seedlings. The targets are based on DBH, with the expected DBH at the time of monitoring based on a predicted mean annual diameter increment on which carbon sequestration estimates are based.

Fruit Orchard Mango: Monitoring targets for the first four years are based on establishment; the whole plot must be established by the third year with at least 85% survival of seedlings. Thereafter, monitoring targets are based on DBH: the expected DBH at the time of monitoring is based on a predicted mean annual diameter increment on which carbon sequestration estimates are based.

Homestead Planting: Monitoring targets for the first four years are based on establishment; the whole plot must be established by the third year with at least 85% survival of seedlings. Thereafter, monitoring targets are based on DBH: the expected DBH at the time of monitoring is based on a predicted mean annual diameter increment on which carbon sequestration estimates are based.

Woodlot: Monitoring targets for the first four years are based on establishment; the whole plot must be established by the third year with at least 85% survival of seedlings. Thereafter, monitoring targets are based on DBH: the expected DBH at the time of monitoring is based on a predicted mean annual diameter increment on which carbon sequestration estimates are based.

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ANNEX 2: COMACO CASE STUDY

CARBON OFFSETS THROUGH CONSERVATION AGRICULTURE APPROACH OF INTERCROPPING "FAIDHERBIA ALBIDA" AT COMACO IN ZAMBIA

PREPARED BY: JOHN FAY

MARCH 2010

BACKGROUND

Food insecurity and poverty are persistent problems for many households in Zambia, and often lead rural households to rely heavily on their natural resources to survive. Forests are cleared to make way for new agricultural land, wildlife is hunted to provide additional protein or to be bartered for staples such as maize, and soils are gradually degraded by unsustainable farming practices and inadequate fallow periods as pressure on arable land increases. Zambia is not alone in being burdened by these issues, but they are proving to be particularly pernicious here, and could grow more widespread as rainfall becomes more variable and temperatures change due to increasing greenhouse gases (GHG) in the atmosphere.

Rural farmers, as the largest natural resource managers in the world, can have significant collective impact on GHG concentrations in the atmosphere. But these need not be a burden. One of the most fundamental means of carbon sequestration available – trees – can also improve smallholder farmers food security and enhance household incomes.

Known as agroforestry, intercropping with trees, such as *Faidherbia Albida* or *Msangu,* can significantly improve yields, and has the additional benefit of shifting land management strategies away from slash-and-burn agriculture, thus reducing emissions from agricultural practices that accelerate deforestation and degradation of forests. However, agroforestry is a long-term investment. Trees require additional labor inputs for their establishment and maintenance, and it can take several years to see the benefits of increased crop yields. This delayed return on investment has been a major challenge in promoting the adoption of agroforestry in Zambia. Carbon markets have the potential to incentivize such adoption by smallholder farmers, helping them to benefit from increased food security and resilience to climate change.

The voluntary carbon markets provide a mechanism through which GHG emission sequestration can be a valuable asset, one that farmers can create with the resources already available to them – land, labor, and seeds. Farmers can then realize the financial value of these carbon assets through carbon markets, providing returns to cover their initial investment.

APPROACH: CONSERVATION AGRICULTURE WITH FAIDHERBIA ALBIDA INTERCROPPING

The *Faidherbia Albida*[1] *(FA)* tree is unusual in that it displays reverse phenology. The tree leafs up in the dry season and defoliates in the rains, thus reducing competition for sunlight with crops. At the recommended planting density of 100 *FA* trees/hectare, mature *FA* trees supply the equivalent of 300kg of complete fertiliser and 250kg of lime, which result in an estimated 250-400% yield increase in maize under the tree canopy (Conservation Farming Unit, Zambia). FA also improves soil fertility, protects against soil erosion and reduces the need to clear forest for new cropland. This can create a legitimate financial asset that can be monitored, verified and registered.

No known reliable data exists for the carbon dynamics of *FA*. In response to this information gap, a study led by Sam Bell of Cornell University has been commissioned with financial support and technical assistance provided by the Cornell Center for Sustainable Futures and the USAID PROFIT project. The study will also estimate the impact of *FA* on soil carbon. This will require soil sampling and analysis from the project area in question, along with modeling of soil dynamics (using RothC, Century or similar). To further verify the impact of *FA* on soil carbon, the total carbon of cropland soils under standing mature *FA* will be compared with the total carbon of cropland soils without the influence of *FA*. Although other emissions sources and gases will need to be monitored, assessed and included, the carbon sequestered in soils and trees will form the two main components of the emission offsets.

[1] The FA tree is known by many different names including Acacia Albida, Winter Thorn and Msangu.

Initial assessments (subject to final confirmation), based on a predicted VER price range of USD$3-11, estimate the carbon asset per hectare per year of USD$22.20 – USD $81.40.

IMPLEMENTING ORGANIZATION: COMMUNITY MARKETS FOR CONSERVATION (COMACO)

COMACO (www.itswild.org) is a community-owned and run organization with a market-based approach to rural livelihoods, food security, and biodiversity conservation in the Luangwa Valley of Zambia. COMACO has established the infrastructure, network of extension services, along with payment mechanisms necessary to bring markets to remote rural communities, and value-added agricultural commodities into regional centers.

As a result, COMACO is perfectly positioned to leverage their existing infrastructure to implement projects that offset GHG emissions throughout the entire Luangwa Valley ecosystem. COMACO can also ensure that those who create emission reductions – smallholder farmers – will receive the financial benefits from carbon finance. Opportunities with the potential to leverage the voluntary carbon markets include: agroforestry and conservation farming – growing the native tree Faidherbia albida (FA), and Gliricidia sepium (GS) in croplands to improve yields; and avoided deforestation by reducing threats such as slash-and-burn (chitemene), charcoal-making, and the creation of community parks (REDD).

Implementation of Agricultural Land Management (ALM) in the form of agroforestry is underway on the eastern side of the Luangwa River in the valley and on the plateau, where the soils are most conducive to growing FA trees. The project has completed the Project Idea Note (PIN) for the Voluntary Carbon Standard (VCS). Currently there are no Agricultural Land Management Methodologies approved on any rigorous voluntary standards,. With support from the World Bank's BioCarbon Fund, the Sustainable Agriculture Land Management (SALM) methodology is at the first validation of the dual validation approval process. COMACO intends to leverage the pending SALM methodology upon its approval, therefore COMACO has already commenced work on the Project Design Document (PDD). There are currently over 27,000 farmers working with COMACO on the Eastern part of the Luangwa Valley who represent the participants in the initial phases of this agroforestry initiative. Each farmer is planting on average one lima of land with FA trees. Another 24,000 farmers will be added to the program by the end of 2011 for a total of 51,000 farmers, each planting an average of 38 FA trees. Based on initial estimates, the project is anticipated to have the potential to generate over 148,000 Voluntary Emission Reductions per year at maturity.

The decentralized nature of this project and its large number of project participants has made it possible to layer all carbon project activities onto existing infrastructure and systems that are already in place. Additionally, the finance each farmer will gain from the carbon credits is intended to help adaption and implementation of the project, the real benefit lies in the longer term substantial increase in yields provided by FA trees – thus making this carbon project a means to an end of better food and income security.

ANNEX 3: THE COCOA CARBON INITIATIVE

PREPARED BY: MATTEO BIGNONI

MARCH 2010

BACKGROUND

Ghana is experiencing one of the highest deforestation rates in Africa at nearly 2% per year and it has lost 85% of its original forest cover in the last 100 years. The World Bank estimates that the main cause of deforestation in Ghana is agricultural activities, which account for six times more loss of forest cover that logging. In particular, cocoa farming represents the main deforestation factor.

Indeed, Ghana is the second world's largest cocoa producer – after Cote D'Ivore and before Brazil, with an annual yield in 2007 of 680,000 tonnes. Cocoa is a key driver of the Ghanaian economy and it accounts for 40 % of the total exports of the country and, more that 30% of local farmers depend on cocoa plantations for their livelihoods. Nevertheless, cocoa production in Ghana has considerably increased in recent years, mainly due to the consistent expansion of the total land devoted to cocoa production rather than to an actual increase in farm productivity.

Farming techniques vary quite considerably within the country so that, for example, in the Western Region of Ghana nearly 80% of cocoa planting is conducted with no shade or low-shade cover and less than 20% of canopy cover, while in the Eastern Region half of the cocoa planting is carried out with a high-shade method, that is with a 30-40% canopy cover.

Over the last few decades, the conversion of Ghana's forests into cocoa plantations has rapidly increased, mainly because of two factors – namely, the introduction of chainsaws and of genetically-modified cocoa varieties that are more tolerant to sunlight. Those improved varieties have allowed the adoption of low or no-shade cocoa farming techniques at the expense of more traditional and more sustainable cocoa landscapes.

Moreover, the continuous expansion of new cocoa farms into forests has also been supported by the high fertility of forest soils, also known as forest rent, and by the farmers' choice not to use fertilizers in already cultivated areas. At the same time, the degradation of soil in relatively old farms is producing very low yields, which, in turn, has instigated a perverted cycle. Indeed, low yields caused by ecosystem degradation promote further expansion into new forest land and the establishment of large farms in order to obtain a sufficient harvest while older farms are abandoned.

Furthermore, a recent study from the University of Reading has shown that there exists a trade-off between short-term cocoa trees productivity and the well-being of the ecosystem they depend upon. The study has demonstrated that soil fertility will decrease very rapidly in those farms characterized by short-term high yields achieved through minimal shade or no shade techniques. Low soil fertility will cause not only a very rapid degradation of the ecosystem, but also unsuitability for further cocoa farming or other agricultural activities. In addition, while at the national level the constant degradation of forest cover could be detrimental for Ghana's cocoa economy; at the international level, it is one of the main causes of climate change, being responsible for 20% of global CO_2 emissions.

THE COCOA CARBON INITIATIVE (CCI)

In this context, the Cocoa Carbon Initiative has been established by the Katoomba Incubator and the Nature Conservation Resource Centre (NCRC) as an effort to provide Ghanian cocoa farmers with the opportunity to benefit from carbon finance though Reducing Emissions from Deforestation and Forest Degradation (REDD or REDD+). In short, cocoa farmers could collectively decide to stop the expansion of farms into unprotected forest land and to halt the agricultural encroachment into Forest Reserves (FRs), so as to be eligible for REDD. Alternatively, farmers could decide to maintain a high level of in-farm carbon stock and to enhance carbon sequestration though the intensification of shade tree (canopy) at a level that is higher than business per usual, that is a REDD+ activity.

These improved farm management systems could provide economic and ecological benefit not only to the cocoa sector, but also to the larger landscape. The CCI is seeking to implement two pilot projects over the 2009-2011 periods in order to test the viability and long-term sustainability of REDD/REDD+ scheme in cocoa sector in Ghana. For this purpose, the incubator has developed a feasibility study based on stakeholder consultations to identify the project areas. The consultations involved three key activities:

Potential Site Selection Workshop (November 24, 2010)

The threats posed by climate change to the cocoa sector as well as the potential for finance through REDD were explained to the workshop participants. Also, the workshop discussion was centered on the development of assessment criteria for site selection and the identification of 15 potential sites.

Site Assessment Field Trips (January 18-24 and February 8-14, 2010)

The field trips were aimed at evaluating all the potential sites against the criteria identified during the previous workshop. The sites included the five cocoa growing regions and five sites were eventually selected: Amansie West, Assin North, Asunafo North/Asutifi, Juabeso, and Wassa Amenfi West.

Site Selection Workshop (February 26, 2010)

This second workshop included a final review of the Cocoa Carbon Initiative, an introduction to REDD+, and a further discussion of the site selection criteria. Participants discussed the outcome of the field trips and selected the strongest sites for the development of the two pilot projects based on which site possessed the strongest potential.

The final three selected sites are:

- Juabeso (Western Region)
- Asunafo North Municipal/ Asuti (Brona Ahafo Region)
- Assin North

The following table describes the three sites selected for the pilot projects:

Selected site	Ecosystem	Plantation	Carbon Financing option	Potential partners
Juabeso (Western Region)	Bia National Park and many high biodiversity value reserves threatened by logging and cocoa farm encroachment	Farms are normally large and with little to no shade. Also, many abandoned farms	Three options: REDD to reduce farm expansion into forest reserves; REDD to protect off-farm forests; REDD+ to increase on-farm shade trees	Sustainable Tree Crops Programme (STCP), Kuapa Kokoo, Coca Abrabopa, Wildlife Division
Assin North (Assin Fosu)	Kakum National Park and adjacent Dedicated Forest (DF), less than 150 ha.	Cocoa farming is the main land-use activity. Also, many abandoned farms.	REDD+ to increase shade intensity; REDD to protect off-farms reserves	CREMA approach

Asunafo North Municipality (Goaso) and Asutifi	Eight Forest Reserves with a high biodiversity value (rare birds) and many off-reserves forests and secondary forests threatened by cocoa farms expansion	Very little shade	Three options On-reserve REDD to reduce cocoa expansion into Forest Reserves; Off-reserve REDD to reduce deforestation caused by cocoa farms; REDD+ to enhance shade cover through natural regeneration and tree planting	Cocoa Abrabopa, Kuopa Kokoo, STCP, Cadbury Cocoa Partnership (CCP), Government institutions and possibly CREMA model

CHALLENGES FOR THE IMPLEMENTATION OF REDD/REDD+

Monitoring and verification

Cocoa plantations in Ghana are mainly owned by smallholders and, indeed, most farms are between 1 and 5 hectares. While carbon financing undoubtedly is storing a vast potential for poverty reduction, smallholder ownership of cocoa farms can raise critical challenges to a cost-effective monitoring and verification of carbon schemes.

First of all, monitoring methodologies will need to be modified to adapt to a plethora of small farms. Indeed, so far REDD methodologies deal with large and relatively homogeneous landscapes such as national parks. In contrast, because the CCI will cover an aggregation of small patches of land distributed across the national territory, monitoring and verification methodologies will have to deal with a variety of ecosystems and their diverse ability to store carbon.

Secondly, at the national level, investment will have to be provided for the use of appropriate satellite technology to assemble data relative to all of the small farms. Finally, the CCI will have to be supported by a coordinating organization to encompass all the different smallholders into a national programme that can reach the critical size to become attractive to carbon investors. In relation to this last point, the CCI intends to work closely with organized cocoa producers at the national level such as The Kuapa Kokoo and Cocoa Abrabopa. Those cooperatives could easily provide a very solid foundation for the envisioned aggregation system.

Similarly, the CCI is intends to establish so-called "Community Resource Management Areas (CREMA)" in the sites selected for REDD/REDD+. Indeed, CREMAs are legally recognized community-based organizations aimed at enforcing traditional laws on natural resource management. For instance, CREMAs can increase farmers control and involvement in the management of natural resources, typically wildlife, better tenure rights over trees or the power to regulate land tenure issues.

While CREMAs have so far been limited to wildlife, ecotourism, and biodiversity activities, the new Wildlife Bill currently examined by the Ghanaian Government could include new regulatory framework for the objectives of REDD/REDD+. Hence, the ICC would rely on the establishment of a network of CREMAs in order to interconnect the different sites and to offer an interface between the local communities and institutional actors.

Trees Tenure Rights

As in many other West African countries, tree tenure rights could represent one of the main constraints to the full implementation of REDD or REDD+ schemes. In Ghana, the State owns all naturally-growing trees while planted trees belong to the individual who actually planted them. At the same time, farmers are allowed to cut naturally-grown trees for agricultural or household purposes but they are also forbidden to sell timber for commercial use.

Since many cocoa farms are located in off-reserves that the Government leased out as timber concession zones, loggers are legally allowed to enter the farms and to fell naturally-occurring trees. In theory, the law in Ghana requires the loggers to compensate the farmers for any damage caused to the cocoa plantation but, unfortunately, this legislation is rarely enforced.

As a consequence, in order to avoid any possible damage to their plantation, farmers will select non-timber shade trees or eliminate all naturally-growing trees in their farms. Furthermore, another option that farmers might choose is to sell the timber from their plantation to chainsaw workers and share the revenue from the sale of the timber with them. Thus, the development of future REDD or REDD+ operations may be dependent on whether or not farmers may obtain more rights over trees as part of a potential tenure rights reform decided by the Government. Increased trees tenure rights will incentivise farmers to preserve their in-farm trees and, thus, to increase carbon stock.

Opportunity Cost of REDD/REDD+ mechanisms

The current market price of carbon is not sufficient to induce cocoa farmers to engage in large-scale in-farm tree intensification or to stop farms' encroachment into protected forest reserves. While one of the main future tasks of the CCI is to identify a clear break-even price for carbon that will allow REDD/REDD+ schemes to become attractive to both investors and farmers, business per usual cocoa farming is currently more profitable and less risky than farm management systems qualifying for carbon financing.

Indeed, high level of risk associated with REDD/REDD+, uncertainty about land and trees tenure rights, and the need to produce increasingly higher levels of yields per hectare are some of the factors that have justified the use of high interest rates (opportunity cost) employed in all financial models that have so far proposed carbon financing in cocoa farms in Ghana. Clearly, REDD/REDD+ would need to compensate farmers for all the relative losses and risks in a scenario of improved farm management systems.

However, if farmers could obtain the right to sell specifically selected timber deriving from their farms, one of the solutions envisioned by the ICC is to combine the revenue from timber with the revenue generated from REDD credits. This would certainly make the adoption of improved management systems more profitable and attractive.

CONCLUSIONS

In Ghana, the expansion of cocoa farms is the main driver of deforestation and land degradation. The Cocoa Carbon Initiative seeks to encourage improved farm management systems that could lead to the full implementation of REDD/REDD+ schemes. The CCI has started the development of two pilot projects in three selected sites in Ghana: Juabeso (Western Region), Asunafo North Municipal/ Asuti (Brona Ahafo Region), and Assin North.

The sites were selected through consultations with local communities and field trips specifically designed to assess the suitability of the three locations. More specifically, REDD activities will be focused on preserving protected forests from cocoa farms encroachment while REDD+ activities will be centered

on enhancing carbon stock through improved farm management systems, typically the intensification of shade trees.

The CCI seems to possess a very sound approach to the implementation of valid REDD/REDD+ schemes. Its bottom-up methodology to the selection of appropriate sites for the pilot projects is a good indicator of the long-term sustainability of the projects, which admirably seeks to integrate the protection of extremely valuable forests with an effort to reduce poverty though the increase in agricultural yields in cocoa plantations as a function of improved farm management systems.

This study has however identified three main challenges to the full implementation of REDD/REDD+ mechanisms for cocoa farms in Ghana. First of all, this study described the difficulty to adapt current carbon monitoring and verification methodologies to a collection of small farms. Secondly, it explained how tree tenure rights might hinder the preservation of in-farm carbon stock and, finally, it discussed the high opportunity cost associated to the switching to more sustainable improved farm management systems.

All in all, the Cocoa Carbon Initiative could prove to be very successful and remunerative for farmers. Also, within the institutional context of West Africa, Ghana has so far been extremely proactive in providing a suitable regulatory environment for the development of conservation efforts such as REDD/REDD+. It is very possible and desirable that the Cocoa Carbon Initiative may provide a good example of project to replicate in other part of West Africa so as to challenge the status quo of institutional lethargy that permeates the region in relation to its enormous potential for agricultural and forestry carbon initiatives.

ANNEX 4: THE SHEA CARBON PROJECT

PREPARED BY: MATEO BIGNONI

MARCH 2010

BACKGROUND

Shea butter is a natural fat extracted from the seeds of African Shea trees. The butter is obtained by boiling or crushing the seeds and nowadays, it is very widely used in the production of cosmetics as a moisturizer and, because it also edible, as a substitute for cocoa butter in the food manufacturing industry.

Shea butter has become a relevant export product for West African countries and is playing a key role in the support of community-based economies, especially in countries such as Mali and Ghana. Indeed, Shea butter preparation still follows traditional methods, mostly conducted by locally organized cooperatives of women.

It is estimated that the value of the global Shea butter market for cosmetic products alone will approach $10 billion, with the United States and the European Union as the two largest importers. Remarkably, the global demand for Shea butter has increased by 600% in the last 10 years and, the total amount of Shea butter exported to EU countries rose from 2,500 tonnes in 1995 to 16,500 in 2007.

While Shea butter has become an important economic factor for West Africa, its preparation and extraction methods use great amounts of firewood that ultimately represent a large source of CO_2 emissions. At the same time, firewood collection for the preparation of Shea butter is also one of the main causes of deforestation in West Africa, especially in Ghana.

First of all, because of its long preparation and extraction techniques, it is estimated that 19.3 kg of CO_2 are emitted to prepare one kilo of Shea butter. It is also calculated that the total amount of CO_2 emitted to produce Shea butter for the European market in 2007 was equivalent to 298,417 tonnes in 2007.

Secondly, the firewood used in Shea butter production mostly comes from unsustainably-managed forests. This is particularly evident in Northern Ghana where, in combination with extensive slash-and-burn operations, indiscriminate logging and uncontrolled grazing, loss of forest cover due to firewood collection for Shea butter production has caused the serious depauperation of soil fertility and intense erosion superficial soil cover.

THE SHEA BUTTER CARBON PROJECT

The project plans to undertake the afforestaion and reforestation (A/F) of selected degraded lands in four Shea butter-producing zones across Ghana. A/F activities will also be combined with regeneration of native tree species to allow the natural regeneration of forest cover.

The project will support a participatory and collaborative effort within local communities to select appropriate sites. Local communities will also be highly involved in the setting up of workshops focused on the training of local farmers in order to accompany the introduction of improved woodland management techniques.

The aim of the project is also to integrate CO_2 sequestration operations into a broader institutional framework and to seek long-term carbon financing mechanisms that can be attractive to individuals as well as corporate and institutional clients.

PROJECT DESCRIPTION AND PROPOSED ACTIVITIES

The project is expected to conduct four main activities which can be subdivided in two main categories:

Protection and ecological restoration of native forest coverage

- Reforestation of degraded Shea woodlands and forest enrichment by planting in areas with low Shea tree density. The reforestation of existing degraded areas will be eventually passed on to

local communities who will be in charge of managing and protecting them from grazing to ensure the permanence of carbon storage in the foreseeable future.

- Afforestation of new areas as an additional source of carbon credit.

The establishment of forest plantations and agroforestry systems to guarantee forest products and the provision of key ecological services such as CO_2 sequestration.

- Management of existing Shea woodlands in order to allow carbon emission reductions though sustainably-managed Shea woodlands.
- Establishment of woodlots of other three species that local communities will be able to exploit as an alternative and sustainably-managed source of fuel wood. The project will establish 6,000 hectares of forest plantation and agroforestry fields of Shea trees on areas that have been degraded over the past years. Those interventions are expected to significantly increase carbon stocks in above-ground biomass, litter, and dead wood as well as below the ground biomass and soil organic matter.

More specifically, the implementation of forest restoration systems for carbon sequestration will be subdivided as follows:

Type of Activity	Size
Protective- productive plantations such as community woodlots	1,000 ha
Assisted Natural Regeneration	1,000 ha
Agroforestry Systems	6,000 ha

The potential for carbon sequestration and the generation of carbon credits from current Shea woodland is vast in Ghana. It is estimated that there exist about 9.4 million naturally growing Shea trees in the counttry, each with an average carbon biomass of 0.27 tonnes. By extrapolation, it is possible to state that the Shea tress alone have a CO_2 sequestration potential of approximately 2.5 million tonnes per year.

As a consequence, the project will seek to accreditation by the Clean Development Mechanism (CDM) through the implementation of Afforestation/Reforestation (A/R) methodologies.

Initially, the first screening for project locations has been based on the eligibility criteria for degraded savannah ecological areas elucidated by UNFCCC. The proposed A/R CDM project activities are planned to take place in four regions of Ghana, namely the Northern, Upper East, Upper West and the Brong-Ahafo region, which collectively include 11 districts. Those four regions represent the main Shea-growing zones of Ghana and have a total human population of over 5 million people, equivalent to 28. % of the country's population.

The administrative map of Ghana

The project aims to strengthen community organizations through the involvement of local people in the decision-making process through the early identification of owners who are eligible and will consent to take part in the activities. Developers believe that it is essential for the success of the project to allow land owners to consciously choose suitable areas for the implementation of the activities following their own needs.

Local communities are expected to benefit from the improved management and forest conservation systems, mainly through income diversification stemmed from a broader spectrum of forest products, such as timber, fruits, and nuts. Moreover, in more than 50% of the project area, communities will obtain exclusive user rights to rehabilitate and manage the forest so as to generate income from a combination of wood products and emission reductions.

In addition, community-based workshops will be conducted in order to train local farmers to adopt improved forest management systems, particularly involving the minimum use of heavy machinery. For instance, tractor use will be limited to the transport of seedlings from nursery sites to lands on which they are to be planted. Also, the use of light hand tools such as hoes, machetes, and pruning knives will be encouraged to minimize the impact on soil and natural vegetation belts. Finally, minimum or no chemical pesticides or fertilizers will be employed in the selected project locations.

BASELINE SCENARIO

Based on 2009 data gathered by the developers of this project, the area in consideration has an average carbon stock of 9.15 tonnes per hectare. The CDM activities are expected to double tree density from the current 57 trees per hectare to over 100 trees per hectare in order to produce an average of over 67 tonnes of sequestered CO_2 per hectare. In total, the CDM activities are projected to produce 537,280 tonnes of sequestered carbon dioxide over a crediting period of 20 years.

STAKEHOLDERS AND PROJECT PARTICIPANTS

- Professor John C. Lovett, Centre for Technology and Sustainable Development, University of Twente, Enshede, Netherlands.

- Department of Horticulture, Institute of Renewable Natural Resources, University for Development Studies, Tamale, Ghana
- Dr. Peter N, Lovett of West Africa Trade hub, Accra, Ghana.
- Local communities in Ghana
- Ministry of Environment, Science and Technology, Ghana
- Ministry of Lands, Forestry and Mines, Ghana.

Designated National Authority in Ghana: the Environment Protection Agency

CONCLUSIONS

The demand for Shea butter is projected to increase rapidly in the next few years mainly because of a shift towards more natural ingredients for cosmetic products in Europe and the United States. While this can prove to be very beneficial for local communities in West Africa, the carbon-heavy Shea butter production techniques will represent a large source of CO_2 emissions as well as one of the main drivers of deforestation.

For those reasons, the Shea Butter Carbon Project will seek to achieve a Clean Development Mechanism accreditation in four degraded Shea butter producing areas in Ghana. The project will essentially consist of improved farm management systems combined with the afforestation of degraded land with more shea trees and the allocation of land for the reforestation of indigenous tree species to allow biodiversity restoration.

In this context, farmers will benefit from both an increased variety of forest products such as fruits and timber, and from the sales of carbon credits derived from the CDM market. Specifically, Shea Butter Carbon Project is expected to abate 537,280 tonnes of carbon dioxide over a period of 20 years.

While the main stakeholders to be involved in the project have been identified both at the local and institutional level, the activities are still at the design stage and technical issues concerning the methodological approach of the putative CDM accreditation have not been discussed yet. Typically, those issues will include the project boundary and the additionality of the project. Finally, the baseline scenario will necessitate further research to establish a definite carbon sequestration potential that can sustain the verification of an independent third party as required by the CDM approval process.

As the project can certainly be very beneficial to both local communities and ecosystems, its success will depend on how closely the developers will manage to involve institutional stakeholders and the Designated National Authority (DNA) in the elaboration and approval of the CDM accreditation.

ANNEX 5: WESTERN KENYA SMALL HOLDER AGRICULTURAL CARBON FINANCE PROJECT

PREPARED BY: ALICE RUHWEZA

MARCH 2010

BACKGROUND

Project Overview

The overall goal of this project is carbon sequestration through the adoption of sustainable agricultural land management practices (SALM) in Western Kenya. The project is located in the Western Kenya Region (Bondo, Siaya, Kisumu, and Bungoma districts) ranging from Upper midlands (UM4) slopes of Mt. Elgon to Low Midlands (LM4) shores of Lake Victoria Agroecological zones. The area is densely populated with small-scale agriculture land use on two major river drainage area – watershed (R. Nzoia and R. Yala) draining into Lake Victoria. The project developer – the NGO Swedish Cooperative Center-Vi Agroforestry [SCC ViA] is promoting the adoption of SALM practices on approximately 45,000 ha.[1] It is expected that a wide range of SALM practices will be adopted, including practices related to cropland management (e.g. cover crops, crops rotation, mulching, improved fallows, compost management, green manure, agroforestry, organic fertilizer, residue management) and rehabilitation of degraded land. Expected outcomes include that smallholder farmers in Kenya will be able to access the carbon market and receive additional carbon revenue streams through the adoption of productivity enhancing practices and technologies. Hence, economic benefits will be based on (i) increased yields and productivity, and (ii) additional income sources due to payment for environmental services. An important co-benefit will be enhanced resilience to climate variability and change. As an outcome indicator it is estimated that the project will generate in average about 60,000 tons of $C0_2$ equivalents per year.

The project is targeting smallholder farmers and small-scale business entrepreneurs organized in common interest groups, primary level cooperatives, farmer groups and informal organizations. SCC-ViA applies a participatory extension approach focusing on community empowerment, using tools and methods such as participatory rural appraisals [PRA], farmer field schools, agricultural training centers and farmer-to-farmer study tours. SCC-ViA extension staff provide demand-driven advice and training on all issues related to sustainable agricultural production and marketing. The extension staff work closely with other institutions such as the Ministry of Agriculture and the Kenya Forestry Service. SCC-ViA advice is also focusing on farm enterprise development. Farmer groups and organizations are strengthened through capacity building and development of entrepreneurial skills. Extension staff works with smallholders to organize farming activities as a business, react on market demands and integrate them into the value chain. Smallholder farmers are targeted to be empowered for a period of 6 years in intensive and less intensive phases.

Project Duration:

The project started in January 2009 and will run until December 31, 2029 (i.e. 20 years crediting period)

Targeted Emission Reduction

1.2 m t CO2e over 20 years; an average of 60,000 tCO2e per year; and an average of 1.4 tCO2e per ha per year. By 2029 the project is expected to have sequestered 1,236,373 tCO2 eq. but 60 % will be held to act as a buffer in case of non delivery or non permanence.

Land Tenure System

The project area is comprised of privately owned farms by individuals (farmers have title deeds).

[1] The size of the project is 116,000 ha but only 45,000ha will be under SALM adoption area.

Institutional Arrangements

***Project Developer*:** Vi Agroforestry is the project proponent and administrator. They will also be in charge of administering carbon payments when they come in. Vi Agroforestry has employed field staff in 28 locations supervised by six zone coordinators. Field staff identify and facilitate formation of farmer groups, contract willing groups and train them. A farmer group ranges from 15-30 farmers committed to implementing SALM practices and reports to group leaders who in turn report to Vi Agroforestry annually. VI also provides advisory services, pays for technical capacity development of staff and farmers, and performs monitoring and project management and on behalf of farmers signs ERPA with the World Bank.

***Project Investor (also Carbon Buyer*):** The World Bank BioCarbon Fund (BioCF). The BioCF will sign Emission Reductions Purchase Agreements (ERPA) with Vi Agroforestry to purchase the carbon credits resulting from the project. The BioCF also offers Technical support in Development of methodologies and training together with *Unique Forestry Consultants* and *Johanneum Research Consulting Firm*. The World bank also facilitates meetings between Vi, BioCF investors, and carbon buyers. It disseminates information about the project globally in international forums.

Practices to Sequester Carbon

The project is promoting and implementing a package of sustainable agricultural land management (SALM) practices within smallholder farmer groups and creating reductions of emissions of greenhouse gases (GHGs) through carbon sequestration by trees and soil. Some specific practices include cropland management (cover crops, reduced tillage, manure, residue management, water conservation, agroforestry, multiple cropping) rehabilitation of degraded land (terracing etc.), livestock management (upgrading, fodder and forage management,) incorporating organic matter into the soils (crop residues, farm yard manure), sustainable agroforestry practices (using nitrogen fixing trees, more tree establishment within the farm, fodder trees for dairy animals, fruit trees for use by the family,reducing large less productive herds of cattle with fewer more yielding breeds of cattle, etc.

Methodology

The project, together with *the World Bank, Unique Forestry Consultants* and *Johanneum Research Consulting Firm* submitted an SALM methodology to the Voluntary Carbon Standard (VCS): www.v-c-s.org/methodology_salm.html (validation is on-going). The methodology focuses on encouraging six specific land management practices (tillage, manure additions and others) in three cropping systems (coffee, maize, and Napier grass) based on results of successful demonstration projects. The 28-page methodology relies on existing tools approved by the Clean Development Mechanism (CDM), as well as computer modeling and field-verified default values, to deliver a streamlined protocol that may open up soil carbon projects for other parts of Africa – where soils have deteriorated dramatically, threatening food security for millions of people. Other key methodology features include: activity-based monitoring using model based default values for C (e.g. production, residual use, livestock, fertilizer, manure, perennials, and cover crops). Crop yields shall be measured in local units per area unit annually and carbon monitoring is quantified by using Biomass and Soil carbon. Soil carbon is measured using an activity baseline monitoring survey done annually with default values and other models. Carbon is quantified annually at farmer groups levels and contracted groups will be paid at intervals of three to four years on delivery of carbon**.** The methodology is designed to be affordable enough for millions of impoverished farmers to restore degraded farmlands and boost yield (and "operationalize the concept of generating soil carbon financial assets in developing countries," according to the World Bank).

Farmer Organization

Farmers are sensitized to form small groups (membership of 15-30) and these groups are empowered through participatory needs assessment, training, and support to carry out record-keeping, monitoring, and reporting. Farmers sign a farmer commitment form to show their willingness to participate in carbon-smart activities within the group; the group keeps records, opens an account, and signs a contract with Vi Agroforestry. These groups become democratic entities with functioning administration and leadership. Some farmers are trained as farmer trainers. These are the groups that will be contracted by VI to sell carbon to the BioCF. Contracts are set until the 2029 crediting period. Payments are expected to be made within the first 10 years. Small groups that are not able to meet requirements such as production volumes, marketing, value addition, policy participation, lobbying, and advocacy can join together and form an umbrella farmer organisation.

Nature of Farmer Benefits

Small-scale farmers (with an average farm size of 0.70 ha) also gain from improved agriculture technology, increasing yields after improving soil fertility for food and income security, improving income from carbon payments, cash crops, and farm enterprise development. Farmers also gain new markets to sell timber, poles, fruits etc., improve soil and water quality in the area, and adaptat to climate change.

Support Services

Farmers' agricultural land management problems and training needs are identified and Vi Agroforestry field staff plan with farmers using community/group action plans or strategic plans and trainers to offer farmer friendly training. Demonstration plots, farmer learning centers, and trial and field schools are put directly in the community where farmers learn by doing and field staff constantly backstop farmers and follow up. Most training is offered by Vi field staff, but they also facilitate farmers to train one another. Farmers are in constant support by a field officer.

Key support activities include:

- Farmer enterprise development – more business-oriented kind of farming, which enables the smallholder farmers to earn an income from their farms. This is linked with training on marketing.
- Value addition
- Group approach and better organization of farmers through their own organizations as opposed to being alone and hence not being able to voice concerns
- Emphasis on soil health, rehabilitation of degraded farm lands
- Tree planting activities even in public places like schools and churches
- Sensitization of various farmer groups on the importance of SLM practices and support for farmers with various agroforestry tree seeds

Examples of training include: agroforestry, agronomic practices, livestock management, soil and water conservation options, land rehabilitation and restoration, group dynamics, village savings and loaning, farmer enterprise selection and development, organic farming, leadership and democracy (according to group needs), etc. Farmers are given tree starter seeds, some special seedlings and germplasms, and crop seeds only when demonstrating an activity. The group monitors farmers' SALM activities individually, including crop yields, biomass of trees, livestock management, farm enterprises, and household income.

A social survey is conducted annually to estimate community wealth status, socioeconomic or livelihoods (water access, energy, financial services or mobilisation, etc.)

Through strengthening of farmer groups and expansion of social networks, the farmers have a voice and can speak as one to local leaders and politicians, and link with other development agents/ NGOs/ government institutions.

Implementation Status

About 16,559 households have been sensitized and 8,128 committed. SALM practices have been implemented on about 7000 ha sequestering about 10,500 tCO2 as of 2009.

Challenges

High costs of MRV (see Annex 1); investment barriers (lack of enough money to cover all requirements), institutional barriers (lack of capacity in institutions), technological barriers; barriers related to local tradition/prevailing practice (some farmers still stuck in old ways), barriers due to local ecological conditions (densely populated with small scale agriculture land use on two major river drainage area – draining into Lake Victoria), and barriers due to social conditions (need to understand local cultures and work within them).

Key Lessons Learned

- A good aggregator that can advise on agricultural practices is essential.
- The MRV system must be simple, accessible, and transparent to the farmer. The farmer should be able to easily access a table and tell how much payment he expects to receive. This kind of transparency encourages participation.
- MRV system must adapt to existing farming systems: particularly small-scale agriculture (farm size), diversity of farming systems, and assist small-scale farmers to reach their objectives.
- MRV must be cost effective, minimize transaction costs along (carbon) value chain.
- There is need to promote demand-driven advisory services.
- Projects must work within limited resources and capacity; acknowledge realities of limited national research systems and limited data availability.

Annex 1: Costs for Carbon Accounting

Direct measurement			Crop production & activity monitoring	
Project cost item	Total cost ($)	% of carbon revenues	Total cost ($)	% of carbon revenues
Carbon component	316,819	13%	316,819	13%
Carbon monitoring	872,740	35%	260,726	11%
Project implementation	1,293,600	52%	1,293,600	52%
Total costs	2,483,159	100%	1,871,145	76%

(Source: Tennigkeit and Woelkce)

Annex 2: Project proponents', including contact information

Role	Company	Contact
Project proponent	Vi Agroforestry Programme	Bo Lager, Programme Director P.O. Box 3160, 40100 Kisumu, Kenya Ph.: Tel +254 57 2020386; Email: bo.lager@viafp.org
Project developer	UNIQUE forestry Consultants Ltd. Schnewlinstrasse 10 D-79098 Freiburg Germany	Timm Tennigkeit, Matthias Seebauer Ph.: +49 (761) 208534-0 Email: timm.tennigkeit@unique-forst.de
Technical advisors	JOANNEUM RESEARCH Elisabethstrasse 5, A-8010, Graz, Austria	David Neil Bird Ph.: +43 316 876 1423 Email: neil.bird@joanneum.at Giuliana Zanchi Ph.: +43 316 876 1423 Email: giuliana.zanchi@joanneum.at
Funder	World Bank 1818 H Street, NW Washington, D.C. 20433 United States of America	Johannes Woelcke Ph.: +1 (202) 473-6054 Email: jwoelcke@worldbank.org

ANNEX 6: INVENTORY OF AFRICAN AGRICULTRAL CARBON PROJECTS

Prepared by Seth Shames with Matteo Bignoni, John Fay, Alice Ruhweza, and Courtney Wallace

March 2010

Angola, Lesotho, Mozambique

Project Name	Agricultural Development Soil Carbon Project	Natural Resource Management Project	No-till Farming System	Quirimbas Carbon Livelihoods Program	Zambezi Delta, Carbon Livelihoods Program	Nhambita Community Carbon Project (Sofola/ Gorongosa)	Lurio Forestry Plantation and Carbon Sequestration Project	Sofala Community Carbon Project in Mozambique
Start Date			**2007**	**2007 - 2017**	**May 2007**	**2001**		**2002-2009**
Country	**Angola**	**Angola**	**Lesotho**	**Mozambique**	**Mozambique**	**Mozambique**	**Mozambique**	**Mozambique**
Location/ Ecosystem		Okavango river	Maphutsing, Mohale's Hoek district. High plateau	Terrestrial and Marine. Targets agricultural communities in the Macomia, Quissanga and Meluca districts of the National Park	Zambezi Delta	N'hambita community in Gorongosa National Park, Miombo woodlands	Nampula and Cabo Delgado Provinces- grassland and heavily degraded forest land	Gorongosa National Park buffer zone in Sofala State, central Mozambique
Size (ha)			6 tons/ha	7506 km2 (both terrestrial and marine)	12,000 km2	8000 ha project area (35000 from alt source)	126,000 ha	1,023 producers; The total area amounts to 15,161 ha
Practices to Sequester Carbon			No tilling farming system with emphasis on maize	LULUCF; Agroforestry, forest & fire management. NTFPs	Establishing local nurseries, reforestation, agroforestry (LULUCF)	Agroforestry	Establish new forest, protect existing wetlands	Agroforestry, avoided deforestation and forest conservation
Categorization of Carbon Sequestering Activity[1]	2		2	1, 2	1, 2	2	1, 3	1, 2, 3
Implementation Status[2]	1	1	1	4, operational beginning June 2007	4, operational since 5/2007	4	2, framework agreement signed in March 2009, feasibility completed	4, 168,740 tCO2e have already been sold.
Emissions Reductions (Actual and/or Target)				Total 1,369,397 VERs current year; Yr. 5 projected 11,680,357; Yr 10 projected 25,722,707	123,633 VERs total current year, projected yr 5 520,000, Yr. 10 = 1,150,000	See Note D	30 million tCo2 over 15 years	2,132,715 tCO2 over its calculation period of 99 years

[1] 1. Off-farm rehabilitation 2. On-farm tree-planting, agroforestry, agricultural soil management 3. REDD 4. Other

[2] 1. Still in scoping/planning phase, 2. Project plan developed 3. Practices in place, but no money exchanged, 4. Money exchanged

Project Name	Agricultural Development Soil Carbon Project	Natural Resource Management Project	No-till Farming System	Quirimbas Carbon Livelihoods Program	Zambezi Delta, Carbon Livelihoods Program	Nhambita Community Carbon Project (Sofola/ Gorongosa)	Lurio Forestry Plantation and Carbon Sequestration Project	Sofala Community Carbon Project in Mozambique
Farmer's Benefits			See Note A	See Note C	Revenue from the offsets and NTFPs, community trust fund, and extension support	See Note E	Wood for building materials and energy	See Note G
Other Ecosystem Services Benefits (Biodiversity/ Watershed)			Minimizing disturbance of the topsoil helps to protect it from heavy rains and preserves organic matter.	Reforestation – part of planned elephant corridor	Conservation of adjacent forest and buffalo reserves	Land-use change in the buffer zone (See note F)		See Note H
Standard/MRV Methodology			N/A	Plan Vivo	Plan Vivo and Univ. Edinburgh audit	Plan Vivo, Carbon Livelihoods Trust; Univ. Edinburgh audit		Plan Vivo
Developer/ Investor & Type[3]	World Vision, 2		August Basson	WWF, Envirotrade (1, 5)	WWF, Mozambique government, NGOs (1, 10)	Envirotrade Ltd, European Union, DFID, the University of Edinburgh and the Edinburgh Centre for Carbon Management (4, 5, 9)		Envirotrade Ltd, European Union, DFID, the University of Edinburgh and the Edinburgh Centre for Carbon Management (4, 5, 9)
Field Program Manager & Type [4]	2							
Sellers/role of the Sellers/ Organization of the Sellers/Other			August Basson					

[3] 1. International environmental NGO 2. International development NGO 3. Local/national NGO 4. World Bank/multilaterial/bilaterlal donor 5. Carbon developer 6. Private business operating in non-carbon activities (agribusiness, forestry, energy) 7. Private foundation 8. Private bank 9. CGIAR/research institute, 10. Local/national government 11. Local/national company

[4] 1. Environmental NGO 2. Development NGO 3. Local/National NGO 4. World Bank/multilaterial donor 5. Carbon developer 6. Private, non-carbon agribusiness, timber 7. Local farmer/community org 9.National government agency 10. CGIAR/research institute 11. Local energy company 12. School

Project Name	Agricultural Development Soil Carbon Project	Natural Resource Management Project	No-till Farming System	Quirimbas Carbon Livelihoods Program	Zambezi Delta, Carbon Livelihoods Program	Nhambita Community Carbon Project (Sofola/ Gorongosa)	Lurio Forestry Plantation and Carbon Sequestration Project	Sofala Community Carbon Project in Mozambique
Info and Seller Type[5]								
Buyers/role of the Buyers/ Organization of the Buyers/Other Info and Type[6]								
Other Institutional Arrangement Info, Roles of the Project Participants			See Note B					
Land Tenure Status			Traditional and customary					
Support Services from other Intermediaries			Growing Nations Organization					
Additional Notes			http://www.barrymannphotography.com/GN-CA.html					
For More Info	Winrock International report	Winrock International report	http://growingnations.co.za/					

Note A: WFP buying local farmer's production. Intensive training for 30 'lead farmers' in Maphusteng, followed by farmer-to-farmer exchanges, monthly refresher courses and regular monitoring.
Note B: The government is supporting that effort, with a US$4 million budget to subsidize larger producers using CA techniques. National University of Lesotho is developing a hands-on science curriculum for secondary and tertiary levels, which includes CA and agroforestry.
Note C: Building institutional capacity in communities, establishing trust funds to channel funds from the sale of carbon offsets to individual farmers, communities.
Note D: Community traded over 100 000 tons of CO2–$900 000. $125 000 in Carbon Livelihoods Trust for future payments; sequester total 2,132,715 tCO2 over 99 years
Note E: Individuals earning over $130 per annum in addition to new crops and other co-benefits from the livelihoods program. The project will provide fruit, timber, fodder, and fuel wood to the local community and improve soil productivity. In addition, the community will benefit from improved organizational capacity and education and awareness about forest stewardship and conservation, and the introduction of novel income streams through bee-keeping, cane rat production, and craft making. There will also be community spending money on a school, clinic, wells etc.
Note F: Land use change in the buffer zone of the protected area takes pressure off threatened natural resources and assists the rehabilitation of the park.
Note G: For each system that a producer decides to adopt, a contract is established between him or her and the project developer. The latter provides guidance on how to adopt the system and is monitoring the implementation, which is the basis for carbon payments. There are currently 1,023 producers who have signed 2,858 contracts with the project developer.
Note H: Planting on watershed stabilizes river banks, biodiversity conservation is achieved by planting indigenous species, agroforestry reduces pressure to cut old trees, and soil quality improvement is achieved by planting nitrogen fixing trees.

[5] 1. Farmers/producer org 2. Newly formed groups 3, Large scale private

[6] 1. World Bank/donor, 2. Individuals, 3. Agribusiness, No Credits yet (NC) 4. Private philanthropy 5. Private intermediary/broker 6. Private business

Malawi

Project Name	Trees of Hope	Bio-Energy Resources Ltd. (BERL)	Mbawa Tree Planting Project	Management for Adaptation to Climate Change	Malawi Conservation Agriculture Project (no official name listed)	Araboku Sokoke Forest Management and Conservation Project	Malawi Ecobank Project	Kulera Biodiversity/ Livelihoods Project
Start Date		**2006**	**2009**	**08/2008**	**2009**	**May, 2009**	**12/2009**	**09/2009**
Country	**Malawi**	**Malawi**	**Malawi**	**Malawi**	**Malawi**	**Malawi**	**Malawi**	**Malawi**
Location/ Ecosystem	Neno and Dowa, Malawi	Most parts of Malawi from Nsanje to Ntchisi	Mbawa	District Assemblies of Salima, Nkhotakota, Ntchisi, Dowa and Nkhata-Bay	4 districts in the central region, i.e., Lilongwe, Kasungu, Dowa and Salima	Nyika National Park; 3,134 km2; Miombo woodland, grasslands and evergreen forest	Ntchisi District, central region of Malawi	Nyika-Vwaza , Mkuwazi Forest Reserve, Nkhotakota Wildlife Reserve, Ntchisi Forest Reserve
Size (ha)		15 million Jatropha trees planted to date		Agriculture: 3,750 hectares Forestry: 5,000 nurseries; 3,750 households planting improved fruit trees	At least 1000ha	37,677 ha	$2500 for three years	6102 km-2, which excludes the 10 km border zone around their perimeter
Practices to Sequester Carbon	See Note A	See Note D	Conservation Agriculture	See Note H	Based on agroforestry systems, especially nitrogen fixing trees	See Note K	Farmers are required to plant indigenous M'bawa trees	Forestry and agricultural land management
Categorization of Carbon Sequestering Activity[7]	1, 2	4	2	2	2	1, 3, 4	2	
Implementation Status[8]	2	4	1	1	1	4	4, Ongoing, first payment in 12/2009	1
Emissions Reductions (Actual and/or Target)	Projected 33,000 tCO_2 per year			TBD		1,510,729 tCO2 over 10 years	10,000 tons After 25 years, full compliance	TBD
Farmer's Benefits	See Note B	Farmers on contract growing with BERL	Increased Yield and carbon payment, food security	Sustainable increase in crop yields, reduced forest/soil	Increased Yield and carbon payment, food security	Continued supply of forest products. Alternative livelihood	Apart from cash, the trees will eventually serve as a source of	Increased food security and crop diversification

[7] 1. Off-farm rehabilitation 2. On-farm tree-planting, agroforestry, agricultural soil management 3. REDD 4. Other

[8] 1. Still in scoping/planning phase, 2. Project plan developed 3. Practices in place, but no money exchanged, 4. Money exchanged

Project Name	Trees of Hope	Bio-Energy Resources Ltd. (BERL)	Mbawa Tree Planting Project	Management for Adaptation to Climate Change	Malawi Conservation Agriculture Project (no official name listed)	Araboku Sokoke Forest Management and Conservation Project	Malawi Ecobank Project	Kulera Biodiversity/ Livelihoods Project
				degradation, reduction in nitrogen fertilizer		developments like bee keeping, fish farming and eco-tourism. Sustainable bio-energy from woodlots and using energy saving stoves.	fuelwood and timber for the rural families and reduce pressure from forests	
Other Ecosystem Services Benefits (Biodiversity/ Watershed)	Establishment of woodlots and reduced pressure on protected forests to reduce soil erosion and encourage diversity	See Note E	Decreased erosion and increase resilience to climate change	Groundwater recharge and maintenance, reduced siltation of lakes and dams, increased biodiversity	Decreased erosion and increase resilience to climate change	See Note L	Biodiversity conservation by planting indigenous M'bawa trees	Transform livelihoods from subsistence survival to thriving rural enterprises that are self sufficient
Standard/MRV Methodology	Plan Vivo	Uses internationally accepted standards for carbon credit certification		TBD	TBD	Plan Vivo		TBD
Developer/ Investor & Type[9]	The Hunter Foundation and Baugur Group (7, 5)	BERL, TNT (Transport For Good project)	ICRAF and Harvard University/ under the EU/Pro-Poor Reward for Ecosystems Services in Africa PRESA (4, 9)	Royal Norwegian Embassy - $5.8 Million, August 2008 - July 2013 (4)	ICRAF, DEA & FD, CARE, IRISH AID (2, 4, 9)	Malawi Environmental Endowment Trust (MEET)	Ecobank (8)	$7 Million Total, $5.4 Million USAID, $1.2 Million TLC, $750,000 GDA (1, 4)
Field Program Manager & Type [10]	Clinton Hunter Development Initiative (2)	Bio-energy resources limited (11)		Total Land Care (TLC), Dr. Trent Bunderson - tbunderson@yahoo.com (1)		Benson Chipezaani Program Director(3)	ICRAF Malawi and Ntchisi District Departments of Forestry and Agriculture Extension. (9, 10)	Total Land Care (TLC), Dr. Trent Bunderson - tbunderson@yahoo.com (1)

[9] 1. International environmental NGO 2. International development NGO 3. Local/national NGO 4. World Bank/multilaterial/bilaterlal donor 5. Carbon developer 6. Private business operating in non-carbon activities (agribusiness, forestry, energy) 7. Private foundation 8. Private bank 9. CGIAR/research institute, 10. Local/national government 11. Local/national company

[10] 1. Environmental NGO 2. Development NGO 3. Local/National NGO 4. World Bank/multilaterial donor 5. Carbon developer 6. Private, non-carbon agribusiness, timber 7. Local farmer/community org 9.National government agency 10. CGIAR/research institute 11. Local energy company 12. School

Project Name	Trees of Hope	Bio-Energy Resources Ltd. (BERL)	Mbawa Tree Planting Project	Management for Adaptation to Climate Change	Malawi Conservation Agriculture Project (no official name listed)	Araboku Sokoke Forest Management and Conservation Project	Malawi Ecobank Project	Kulera Biodiversity/ Livelihoods Project
Sellers/Role of the Sellers/ Organization of the Sellers/Other Info and Seller Type[11]		Numerous farmers across Malawi growing and selling Jatropha to BERL		Communities that create carbon asset and TLC	Farmers	Protection and restoration of standing forests within the Park and the Reserve	Farmers plant indigenous M'bawa trees on half an acre of their land and receive cash in exchange for investing land and labor	Communities that create carbon asset and TLC
Buyers/Role of the Buyers/ Organization of the Buyers/Other Info and Type[12]	The Hunter Foundation and Baugur Group has pledged $600,000 per year to Malawi to buy carbon credits and support PlanVivo projects (4)	See Note F		TBD	Open Trading available	See Note M	Contribute $2,500 a year for the first three years of the project	TBD
Other Institutional Arrangement info, Roles of Other Project Participants	See Note C	See Note G		See Note I			50 seedlings were distributed to every participating farmer	See Note N
Land Tenure Status		Small holder and commercial farms	Customary - allocated by local chief	See Note J	Customary - allocated by local chief	Guided by Puplic - private partnership between government and community through binding resource use agreements and co-management plans		Traditional / customary land tenure
Support Services from Other Intermediaries	Cooperation with government agricultural extension workers in rural areas, coordination with	Additional, sustainable support from TNT and WFP		Government, Project and NGO entities that are interested in collaboration and/or receiving				Currently under planning, however project infrastructure can provide MRV

[11] 1. Farmers/producer org, 2. Newly formed groups, 3 Large scale private

[12] 1. World Bank/donor, 2. Individuals, 3. Agribusiness, No Credits yet (NC) 4. Private philanthropy 5. Private intermediary/broker 6. Private business

Project Name	Trees of Hope	Bio-Energy Resources Ltd. (BERL)	Mbawa Tree Planting Project	Management for Adaptation to Climate Change	Malawi Conservation Agriculture Project (no official name listed)	Araboku Sokoke Forest Management and Conservation Project	Malawi Ecobank Project	Kulera Biodiversity/ Livelihoods Project
	national, district and local authorities in tree planting			technical/training support				
Additional Notes				See Note K				Note O
For More Info	http://www.planvivo.org/?page_id=87	http://www.berl.biz/index.html info@berl.biz Phone: +265 1 923438	PES document	http://www.totallandcare.org/Projects/MACC/tabid/72/Default.aspx	PES document	Malawi Environment Endowment Trust Phone: +265-620 303, 622 930, 622 829 email: meet@africa-online.net		http://www.care.org/careswork/projects/MWI048.asp

Note A: fruit orchards, boundary plantings, dispersed inter-planting, homestead planting, woodlots, shade coffee, water course protection
Note B: The revenue derived from the sale of carbon services will help to provide farmers with training and extension services, seedlings and financial incentives to plant and maintain trees in accordance with technical specifications
Note C: The Government of Malawi has recently initiated a national forestry offset program, with the primary objective of incentivizing tree planting to address the problems faced in the country as a result of deforestation. Meeting fuel-wood needs is a key priority for this program. Thus far, two farmers per district have been identified to participate. Annual payments are made to farmers for 3 years after planting (the precise details of the payments have yet to be clearly defined to ECCM).
Note D: 1. Substitution of biofuel for petrol-diesel; use of processed seed cake as briquettes or charcoal to substitute fuel-wood or wood charcoal; carbon sequestration in the plantations of trees whose seeds are used for biofuel production
Note E: Jatropha is non-edible and uses non-productive land to produce it in Malawi. Production of Jatropha requires low labor input and therefore less competition with the labor requirements of other crops such as tobacco. It also requires very little water to grow and prevents soil erosion. Oil from Jatropha seed can be used for other many other purposes.
Note F: Initiate an extensive tree planting program through existing extension agents, smallholder farmers and commercial in the next ten years, purchase seed through contracts with smallholder growers and commercial farmers, expel and clean crude oil for the use of biofuel, develop and offer to the market various by-products to add value to the production process, including organic fertilizer, bulk compost and palletized fuel, offer technical services to interested parties who would like to promote an additional, secure cash crop to the rural communities at grass root level. (3, 6)
Note G: The biofuel Association has been founded to create one voice for government and to combine the interests of all stakeholders in the biofuel production chain. The focus is to learn from each other, sharing research and development and to develop sustainability standards.
Note H: Agroforestry/soil fertility management with a focus on simple, low input practices, conservation agriculture/reduced tillage, soil & water conservation measures, reforestation, evaluation of crop/plant/soil carbon sequestration, provision of Efficient Cook Stoves.
Note I: Field coordinators and village extension agents in liaison with local leaders and District Executive Committee (DEC) staff will facilitate selection of beneficiaries which will be demand-driven, tailored to suit the needs and capabilities of the different groups.
Note J: Traditional / Liaison with Government Agencies will be conducted on the need to revise /strengthen policies and related enforcement on land tenure issues that promote shifting cultivation and related impacts on deforestation.
Note K: Based on Chia Lagoon Watershed Management Project funded by USAID from 2004-2007 and by the Royal Norwegian Embassy in 2008
Note L: Ensure continuous forest cover for carbon conservation, protection of biodiversity and watersheds; prevention of soil erosion, increased and continued supply of forest products, provision of sustainable bio-energy from woodlots, and promotion of energy saving stoves.
Note M: Continuous forest cover for carbon conservation, protection of biodiversity and watershed and prevention of soil and water conservation, increased protection of forests through joint government and community patrolling, and sustainable harvest of forest products.
Note N: Establish, develop and manage an endowment fund to provide sustainable financing for environmental activities in Malawi, provide support for the empowerment of communities towards achieving sustainable management of their local environment and natural resources, provide support to institutions involved in appropriate management, research and educational activities addressing key environmental and natural resource issues, and foster partnerships amongst the different stakeholders.
Note O: Project will work to improve governance through a participatory, decentralized structure that provides economic incentives to support sustainable natural resource management
Note P: Project documentation highlights accessing carbon markets: Important cross-cutting initiatives will be incorporated under this framework with emphasis on development of carbon markets and related revenue streams

Namibia, Tanzania

Project Name	Ondangwa Namibia Reforestation	Planting in Schools in Northern Namibia	Kavango Biodiesel Plantation	TIST in Tanzania	Emiti Nibwo Bulora	Bagamoyo Afforestation Project	Same and Mwanga CDM Forest Plantation Project	Uchindile and Mapanda Forest Project
Start Date	**2002 - 2052**	**2007**	**2006-2012**	**1999**	**PIN in 2009**		**2009**	**2002**
Country	**Namibia**	**Namibia**	**Namibia**	**Tanzania**	**Tanzania**	**Tanzania**	**Tanzania**	**Tanzania**
Location/ Ecosystem	Ondangwa, (north of Windhoek)	Okangororosa. Omuthiya and Omboto school Etosha National Park	Kavango region (North-Eastern Namibia)	Morogoro,Tanga, Kigoma andDodoma	Kagera Basin	Kwang'andu, Kimange, and Rupungwi	Mwanga District	Southern Highlands
Size (ha)	60.000 ha		72,000 ha	169,682 trees planted by 222farmer groups	The project aims to bring 1300 ha under plan vivo management by 2012	9,842 sq kilometers	100,000 ha	reforest 10,814ha and put 7,565 ha into conservation
Practices to Sequester Carbon	Afforestation with native tree species such as marula, acacia erioloba or wild fig	Forestation	Reforestation: Jatropha curcas plantations on degraded lands in north-eastern Namibia	See Note B	See Note J	Establishing natural and exotic forests on degraded agricultural lands with biodiversity and climate change mitigation considerations	Establishing plantations in grasslands where there are no trees and the land is neither suitable for settlements nor agriculture	Tree planting
Categorization of Carbon Sequestering Activity[13]	1	1	1	2	2, 3	1	1	1
Implementation Status[14]	3	3	4, operational since 2007	4	2	2, PIN forwarded to DNA for Letter of Non-Objection	2, PIN forwarded to DNA for Letter of Non-Objection	4
Emissions Reductions (Actual and/or Target)	42 tonnes CO2e per year	TBD	Temporary CERs equivalent to ca. 8 Mt CO2e until 2012		90,000 Plan Vivo credits by 2012	150,000 tCo2 per year	90,000 tCo2 per year	611,418 tCO2 already and from 2008 to 2020 2,873,417 tCO2 planned

[13] 1. Off-farm rehabilitation 2. On-farm tree-planting, agroforestry, agricultural soil management 3. REDD 4. Other

[14] 1. Still in scoping/planning phase, 2. Project plan developed 3. Practices in place, but no money exchanged, 4. Money exchanged

Project Name	Ondangwa Namibia Reforestation	Planting in Schools in Northern Namibia	Kavango Biodiesel Plantation	TIST in Tanzania	Emiti Nibwo Bulora	Bagamoyo Afforestation Project	Same and Mwanga CDM Forest Plantation Project	Uchindile and Mapanda Forest Project
Farmer's Benefits	Farmer's income generated carbon offset sales by Envirotrade	Income from carbon offset will support schools	Sustainable income to 3,500 families	See Note C	See Note K	See Note L	See Note M	See Note N
Other Ecosystem Services Benefits (biodiversity/ watershed)	Reversing the clearing of forests for grazing land and firewood		Plantations on degraded lands			Conserve the habitats of protected animals Re-establishment of native species		
Standard/MRV Methodology			CDM	See Note D	Plan Vivo			See Note O
Developer/ Investor & Type[15]	PrimaKlima-Weltweit (Germany) (1)	Flying Forest Ltd. (UK)	EcoSecurities (5)	See Note E	Vi Agroforestry Swedish International Development Agency (Sida)	Community Development Corporation, the National Tree Seed Programme and Tanzania Forestry Research Institute (TAFORI) (6, 9, 11)	Safarijet Services Limited (8)	Green Resources (6)
Field Program Manager & Type [16]	Bäume für Menschen (Trees for the World) (1)	Okangororosa Combined School, Omuthiya and Omboto Primary School (12)	EcoSecurities (5)	Institute for Environmental Innovation (I4EI) and Clean Air Action Corporation (CAAC) (5)	Vi Agroforestry (1)	Community Development Corporation Limited (6)		Green Resources (6)
Sellers/Role of the Sellers/ Organization of the Sellers/Other Info and Seller Type[17]	2800 trees planted with community support and input		Plantation of biodeisel - Jatropha carcus and reuse of biodiesel	See Note F	small holder farmers, associations or co - operatives	Reforestation of degraded land or arid lands through planting trees manually under existing land use	Reforestation of degraded or arid lands	

[15] 1. International environmental NGO 2. International development NGO 3. Local/national NGO 4. World Bank/multilaterial/bilaterlal donor 5. Carbon developer 6. Private business operating in non-carbon activities (agribusiness, forestry, energy) 7. Private foundation 8. Private bank 9. CGIAR/research institute, 10. Local/national government 11. Local/national company

[16] 1. Environmental NGO 2. Development NGO 3. Local/National NGO 4. World Bank/multilaterial donor 5. Carbon developer 6. Private, non-carbon agribusiness, timber 7. Local farmer/community org 9.National government agency 10. CGIAR/research institute 11. Local energy company 12. School

[17] 1. Farmers/producer org 2. Newly formed groups 3. Large scale private

Project Name	Ondangwa Namibia Reforestation	Planting in Schools in Northern Namibia	Kavango Biodiesel Plantation	TIST in Tanzania	Emiti Nibwo Bulora	Bagamoyo Afforestation Project	Same and Mwanga CDM Forest Plantation Project	Uchindile and Mapanda Forest Project
Buyers/Role of the Buyers/ Organization of the Buyers/Other Info and Type[18]	Locals	Offset carbon by aviation and shipping industry (2)	Support of sustainable, local income stream	For TIST: Dow – US$1.2 million, WB – US$45,000 (1, 6)	U&W (You&We) http://www.uwab.se/ (5)			
Other Institutional Arrangement Info, Roles of Other Project Participants	Government support of the project.	Tree planting in partnership with Etosha Park		See Note G				
Land Tenure Status	Forest/woodlotsCommunal and government land	State owned land (schools)	Communal land		Farmers in the process of getting title deeds	Protected areas		
Support Services From Other Intermediaries	Cooperation with other Namibian projects, nurseries and other forestry activities	Support from Flying Forest and trasnportation of trees from Safar Drive (www.safaridrive.com)		Note H		The Center for Energy Environment Science and Technology		
Additional Notes		See Note A		Note I				
For More Info	http://www.baeume.de/indexe.htm http://www.prima-klima-weltweit.de/englisch_neu/aufforstung/realisierte-projekte.php http://www.carboncatalog.org/projects/ondangwa-namibia-reforestation/	http://www.carboncatalog.org/projects/planting-in-schools-in-northern-namibia/	chinese.ecosecurities.com/GetAsset.ashx?AssetId=12365 - United Kingdom	www.tist.org; Scurrah-Ehrhart (2006)	http://planvivo.org.34spreview.com/wp-content/uploads/VI-Agroforestry-Plan-Vivo-PIN-Tanzania.pdf	Community Development Corporation Limited, City Depot Road, Dar Es Salaam P.O Box 70278 email: cfptanzania@yahoo.co.uk	Safarijet Services Ltd P.O Box 2758 Dar es Salaam, Tanzania	http://www.forestcarbonportal.com/inventory_project.php?item=282; http://www.greenresources.no/

Note A: The schools have planted a mix of trees including marula, acacia, wild plum, lemon and guava.
The saplings are each surrounded by a 'wigwam' of branches to protect them from the sun and animals. The branches will be used for new saplings when these trees become established.
Note B: The conservation management practices required are tree planting around farmers' homes, gardens, fields and villages and adoption of improved soil-management techniques. The top three species of tree planted are Luciner, Mijohoro and Mjlonge (www.tist.org/tist/Tanz ania2.php accessed April 7 2006).
Note C: The World Bank payment was a one-off open trading deal. The total amount paid was US$ 45,000.00 at $4 per ton of carbon, between 2000 and 2005* (Ben Henneke, Clean Air Action Corporation). Farmers were paid 20 Tsh/USD .02 per year per tree. Note: the TIST contract with farmers states this to be the fee payable for the first 20 years, after which farmers will receive 70% of the market price for every tree planted (see Annex 6 under 'TIST Agreement with Farmers'). At this '20 year anniversary,' UMET is slated to receive 30% of market prices to cover program running costs. Additional (nonmonetary) benefits to farmers include access to small loans, HIV/AIDs

[18] 1. World Bank/donor 2. Individuals 3. Agribusiness, no credits yet (NC) 4. Private philanthropy 5. Private intermediary/broker 6. Private business

information and training on improved soil management techniques *There is some discrepancy with the sales figure. Thus, according to another CAAC representative, total carbon sales from Tanzania to date amount to no more than USD 27,840.00 Other than a USAID progress report mentioned by UMET (not made available) there have been no formal analyses of local benefits from the project (Clean Air Action Corporation representative, personal communication) Note: TIST has earned a bad reputation in Tanzania because its payments to farmers are regarded as unreasonably low and not economically competitive - in terms of labor and time - compared to alternative economic options available. For example, an article in the July-Sept 2005 edition of Kakakuona, the international edition of the Tanzania Wildlife Quarterly, reports that payments to farmers – as reported by the latter - amount to 200 Tsh (USD 0.16) per tree per ten year period. Meanwhile, a farmer can get more than Tsh 2,000 (USD 1.6) for selling that same tree for timber, poles or fuel wood (Kilahama, 2005)

Note D: TIST has been blocked from CDM activities by GoT's VPODOE office. The program is hoping to get a 'nonobjection' from VPO-DOE, allowing it to sell CO2 as a LULUCF/CDM project.The DNA appears to have grown more dubious of the projects' good standing because the CDM Executive Board has not yet accredited these forestry projects. While this is more a result of the slow methodology approval process of the CDM, and less of the credibility of the project itself, the DNAs misapprehension and doubt have slowed the projects' growth. Consequently, CAAC has learned a valuable lesson of maintaining strong relations with the host country's DNA in order to foster project growth. By involving the DNA at the inception of the Project Design Documents, CAAC can ensure the openness of their intentions and plans for development. Furthermore, by increasing the capacity of DNAs and thereby reducing the risk of projects coming to halt, corporations like CAAC may be more willing to invest in sequestration projects in these least developed countries. It can be said that a strong, transparent alliance between the host country's DNA and the MNC is vital to the growth and success of small-scale forestry projects, as well as to maximize the resulting environmental and economic benefits for all project participants. In the meantime, TIST collects a small portion of revenues from the carbon credits traded on voluntary markets. It carries out its own monitoring through UMET 'quantifiers' financed and their internal 'auditors', financed and trained by the corporation. 'Quantifiers 'count the number of trees planted, record the species, estimate the age of trees and enter the position of each grove into portable GPS units, from which data is then synchronized into a larger database. Auditors check the quantifiers' work, visit farmers and count their trees to monitor compliance.

Note E: Clean Air Action Corporation has invested approximately USD 4 million globally on TIST. In addition, the corporation has received approximately USD 3 million in from USAID and Dow Chemicals, representing at total global investment of USD 7 million (C. Williams, CAAC representative, pers. Comm.). The Corporation has used these funds to finance the TIST program in Tanzania. This included registering UMET (the national counterpart), designing their Project Document, setting up an office in Morogoro, training office staff (including training officers, auditors and quantifiers), training farmers, creating a website, and providing equipment including conference call capabilities, Palm Computers, Computers, GPS units and other miscellaneous equipment. In addition, CAAP says it has paid 'thousands' of dollars in forgiven loans to armors (CAAP representative, personal communication (5)

Note F: TIST, through its Tanzanian registered partner UMET (Ukuzaju Maendeleo Endelevu Tanzania) and affiliated farmers' groups. The TIST program operates in India, Kenya, Uganda and Tanzania. It is a joint venture of the Institute for Environmental Innovation (I4EI) and Clean Air Action Corporation UMET; TIST (Tanzania) has reduced transaction costs by organizing local farmers into small groups of 10–12 people. The two project partners have registered a local subsidiary called UMET Ltd. (Ukuzaji Maendeleo Endelevu Tanzania), which manages the project. Farmer groups transfer all carbon offsets to UMET Ltd. in return for quarterly payments. Finally, all activities including monitoring and supervision are performed by UMET's staff drawn from the local population, which further helps to reduce costs.

Note G: Institutions involved: World Bank Bio, Carbon Fund; Clean Air Action Corporation as TIST founder; UMET as the Tanzanianregistered branch of TIST; Farmers' Groups from four Tanzanian regions; CDRB Bank local branches (some of which are operating through SACCOS); Winrock and WB auditors sent to assess and verify the TISTWB carbon deal. TIST-UMET is encouraging mall farmers' groups (which currently have 6-12 members each) to form CBOs These CBOs are a very recent idea, those that have formed have been in existence not more than a year C. TIST-UMET CBOs are involved in carbon PES through TIST by planting trees. However, they are independent entities in their own right. Two elected representatives from each of 10-50 Farmers' Groups (numbering 6-12 farmers each group) are required to gather at monthly "Node Meetings" where they are met by an UMET staff member. At such Meetings, the UMET staff member provides Farmer Group representatives with a monthly newsletter and with payment vouchers. In turn, the representatives, bring a 'monthly report form' based on which the UMET staff member enters information into his/her palm pilot. The World Bank sends money to the UMET bank account (at CDRB Bank-Tanzania). UMET issues vouchers which it gives to farmers' groups that have planted trees. Farmers groups take the vouchers to the CDRB Branch where they have an account and cash the vouchers. Note that CDRB Bank has begun operating through SACCOS (local savings and credit organizations) in some remote rural areas of Tanzania, thus facilitating farmers' access to the bank;

Note H: Farmers receive a direct quarterly cash stipend from CAAC based on the trees' future sequestration. This stipend acts as an incentive to sustain tree growth, thus
reducing the risk of non-permanence in the CO2 reduction credits generated. In addition to this cash stipend, increased crop yields resulting from conservation farming techniques introduced through TIST programs may generate USD $450 per year for local farmers. These monetary rewards for maintaining a healthy forest can spur economic and social development at the village level, as a typical small group of farmers planting and maintaining 2,000 trees earn around USD $40 per year from the stipend alone. Within each site there are several community group centers usually located in key local villages. These group centers act as focal points for the numerous small community groups, and are to submit monthly reports on their tree planting achievements to TIST. TIST auditors then make visits to the small groups to share information as well as to survey the group's project sites. By providing regular accounting of the location, size, and species of trees being planted, as well as assessing the impact of the program on food supply, health, and other social factors, TIST auditors continually identify opportunities for improving the program's operations. For instance as the program grows, TIST is building local monitoring capacity by training increasing numbers of farmers to use GPS and 3-Com's Palm-Pilot technology to monitor sequestration projects. Therefore, by organizing participation and sharing expertise at the Small Group level, TIST encourages the sustainability of these projects funded by the Clean Air Action Corporation.

Note I: TIST is blocked from CDM activities by the government of Tanzania. The World Bank sends money to the UMET bank account (at CDRB Bank-Tanzania). UMET issues vouchers which it gives to farmers' groups that have planted trees. Farmers groups take the vouchers to the CDRB Branch where they have an account and cash the vouchers. Note that CDRB Bank has begun operating through SACCOS (local savings and credit organizations) in some remote rural areas of Tanzania, thus facilitating farmers' access to the bank.

Note J: Fruit trees are either planted as an orchard or planted between crops as shadetrees, soil improvement (and hence increasing of soil carbon stocks) through shading and mulching material, composting material is left in a pit for a while and due to internal degradation the material is turned into soil carbon, reduced soil erosion through protection of degraded areas, reducing pressure for further forest clearances, improved stoves and sustainable charcoal production.

Note K: Income diversification, improved land use, poverty alleviation, soil conservation, improved water quality and management, capacity building, and climate change adaptation.

Note L: Increased supply of forest products, additional income from the sale of timber and non timber forest products, and job creation for semi-skilled community members through planting and tending to trees.

Note M: Increased supply of forest products, additional income from the sale of timber and non timber forest products, and job creation for semi skilled community members through planting and tending to trees

Note N: The projects offer significant employment in a poor rural region where few other job opportunities exist - namely 50 permanent and more than 1,000 temporary people employed in Mapanda and Uchindile, All carbon revenues will be re-invested in Tanzania and 10% of the carbon revenues will be spent on additional community projects.

Note O: The Uchindile and Mapanda Forest Projects applied an approved Clean Development Mechanism methodology for aforestation/reforestation, and has carried out supplementary analysis in line with the VCS requirements to determine the size of the risk buffer.

South Africa, Zambia

Project Name	The Ferncliffe-Tshalanimithi Nature Reserve	Qwa Qwa Reforestation	Dunavant Cotton Carbon Project	ICRAF/Zambia	COMACO	UN REDD	Peace Parks Initiative	Kawaza Village Tree Planting Project
Start Date	**2008**		**March 2010**	**2010**	**August 2009**	**2008**	**2009**	**2007**
Country	**South Africa**	**South Africa**	**Zambia**	**Zambia**	**Zambia**	**Zambia**	**Zambia (also Malawi & Mozimbique**	**Zambia**
Location/ Ecosystem	Pietermaritzburg, South Africa	Qwa Qwa region adjacent to the Royal Natal National Park	Southern/Eastern/ Central Provinces	Southern/Eastern/ Central/Western Provinces	Luangwa Valley in Eastern Province Zambia	Sites still being identified	Kasungu National Park (Central Malawi), neighbouring Zambia / Mozambique	Kawaza community (Kawaza basic school and Nesfu school)
Size (ha)	250 hectare plot	10 ha	12,000 hectares - 12,000 farmers planting one ha each	150,000 farmers in Zambia have adopted techniques of conservation agriculture	19,583 - 51,000 farmers planting one lima each	TBD	TBD	
Practices to Sequester Carbon	Replant 50 hectares with 20,000 trees of 35 native Afromontane species	Forestation	Soil and tree (agroforestry with Faidherbia Albida trees)	Soil and tree (agroforestry with Faidherbia Albida trees)	Soil and tree (agroforestry with Faidherbia Albida trees)	REDD+	Avoided deforestation, fire management, carbon sequestration compliance market after 2012	Agro forestry and reforestatiion: a combination of indigenous species, fruit trees
Categorization of Carbon Sequestering Activity[19]	1	1	2	2	2	2, 3	3	1, 2
Implementation Status[20]	1	4	2 PIN completed	1	2 PDD in Development	1, Specifics of program in development	1	1
Emissions Reductions (actual and/or target)	Offsets 9,000 tons CO_2	150 tons CO2e per year	91,2000 / yr at full tree stand	TBD	148,831 /yr at full tree stand	TBD		TBD

[19] 1. Off-farm rehabilitation 2. On-farm tree-planting, agroforestry, agricultural soil management 3. REDD 4. Other

[20] 1. Still in scoping/planning phase, 2. Project plan developed 3. Practices in place, but no money exchanged, 4. Money exchanged

Project Name	The Ferncliffe-Tshalanimithi Nature Reserve	Qwa Qwa Reforestation	Dunavant Cotton Carbon Project	ICRAF/Zambia	COMACO	UN REDD	Peace Parks Initiative	Kawaza Village Tree Planting Project
Farmer's Benefits	Succession, suppression of invasive vegetation, & higher net increase in carbon mitigation	Soil rehabilitation in a devastated landscape	Increased food security and financial benefit from credits	See Note C	75% of profit from VERs and substantially increased yields	REDD+ benefits	Funding	See Note G
Other Ecosystem Services Benefits (Biodiversity/ Watershed)			See Note B	See Note B	See Note B	TBD	See Note F	See Note H
Standard/MRV Methodology	TBD		VCS – intend to leverage SALM	TBD	VCS - intend to leverage SALM	TBD	REDD	TBD
Developer/ Investor & Type[21]	Climate Stewards (1)	PrimaKlima-Weltweit	Africa Carbon Credit Exchange (ACCE)/ USAID PROFIT (4, 6)	Envirotrade is providing a feasibility study April 2010 in Western Province for CFU/ Royal Norwegian Embassy is donor (5)	See Note D	UN-REDD (4)	Peace Parks Foundation, Wentezel Bowers (WWB) Law firm, NP, Communities, concession lease holder (1, 7)	Robin Pope Safaris (6)
Field Program Manager & Type [22]	A Rocha (3)	PrimaKlima-Weltweit (1)	Dunavant and ACCE (6)	CFU (3)	COMACO (3)	UN-REDD	Peace Parks (1)	Amanda (Robin Pope Safaris) (6)
Sellers/Role of the Sellers/ Organization of the Sellers/Other Info and Seller Type[23]	Climate Change Stewards aids high-density planting	See Note A	ACCE - role will be to facilitate best deal possible	TBD	COMACO/WCS will sell credits directly	TBD	Climate Change fund to be created	Community members growing Jatropha to sell on carbon market.
Buyers/Role of the Buyers/ Organization of the Buyers/Other Info and Type[24]		PrimaKlima demands only 2 € per ton of CO2 absorption	Buy credits	TBD	PIN submitted to World Bank Biocarbon fund to date (1)	TBD		Buyers can buy trees to offset their carbon for trips into Robin Pope Safaris (2)

[21] 1. International environmental NGO 2. International development NGO 3. Local/national NGO 4. World Bank/multilaterial/bilaterlal donor 5. Carbon developer 6. Private business operating in non-carbon activities (agribusiness, forestry, energy) 7. Private foundation 8. Private bank 9. CGIAR/research institute, 10. Local/national government 11. Local/national company

[22] 1. Environmental NGO 2. Development NGO 3. Local/National NGO 4. World Bank/multilaterial donor 5. Carbon developer 6. Private, non-carbon agribusiness, timber 7. Local farmer/community org 9.National government agency 10. CGIAR/research institute 11. Local energy company 12. School

[23] 1. Farmers/producer org 2. Newly formed groups 3. Large scale private

[24] 1. World Bank/donor 2. Individuals 3. Agribusiness, no credits yet (NC) 4. Private philanthropy 5. Private intermediary/broker 6. Private business

Project Name	The Ferncliffe-Tshalanimithi Nature Reserve	Qwa Qwa Reforestation	Dunavant Cotton Carbon Project	ICRAF/Zambia	COMACO	UN REDD	Peace Parks Initiative	Kawaza Village Tree Planting Project
Other Institutional Arrangement Info, Roles of Other Project Participants	A Rocha South Africa, Msunduzi Municipality, DUCT Dduzi-u Mngeni Conservation Trust		USAID PROFIT providing technical support for carbon assets	Backed by national policy and supported by the Zambia National Farmers Union	See Note E	TBD		See Note I
Land Tenure Status	Conservation land (Msunduzi Municipality)		Customary - allocated by local chief	Customary - allocated by local chief	Customary - allocated by local chief	Customary - allocated by local chief		Customary - allocated by local chief
Support Services From Other Intermediaries	Municipal co-operation and provision of conservation land.		Dunavant extensive infrastructure and network	TBD	COMACO has full infrastructure in place	TBD		
Additional Notes	All benefits with local community. Carbon rights not traded		Project started in early 2010 - provided PIN to WB biocarbon fund April 2010	No extension services and the fact that many people do not have title to their land hinders farmers taking up conservation agriculture	Project has applied for Noraid funding to develop this and REDD projects.	Additional funding for program approved in March 2010	Stakeholder consultations on-going now	See Note J
For More Info	http://www.climatestewards.net/cs-int-en/projects/southafrica.html	http://www.carboncatalog.org/projects/qwa-qwa-reforestation/ www.prima-klima-weltweit.de	www.africacce.com , sbell@africacce.com, jfay@africacce.com	CFU Zambia	http://www.itswild.org/	http://www.un-redd.org/	http://www.peaceparks.org/Home.htm	http://www.robinpopesafaris.net/its-monday/mon-2007/mon-20070514/

Note A: Planting fast growing pine & eucalyptus trees and native species near 7 schools for the quick installment of soil protection of a stripped landscape. (1)
Note B: Reduced deforestation, decreased erosion, increased resilience to climate change, increased biodiversity, decrease habitat loss and deforestation.
Note C: Local farmers will enjoy a direct improvement of their income through the payments for environmental services. Indirect social benefits will also stem from the forest products and improved social organization and capacities. The plantation method will allow for integration of the various farmers activities to reduce potential leakage. Permanence will be secured through the strong involvement of and benefits to communities, tripled maize yields in some areas of the country, and shows promise both in protecting yields from extreme weather. Also, farmers can spread out their labor over time as steady work to prepare the land for the planting season can take place over a six month period. Normally farmers simply wait to hire a plow when the rains start. Conventional farmers wait for rain to add moisture to the soil before plowing, and often end up waiting in long queues to hire or borrow oxen, which can delay planting. Costs are also high, with plow rental typically costing $50 and tractors going for more than $180 per hectare.
Note D: COMACO supported by WCS and numerous donors, led by Royal Norwegian Embassy / carbon asset being developed by John Fay and Sam Bell (1, 3)
Note E: Cornell University has provided significant support through the USAID SANREM Grant and Cornell Centre for Sustainable Futures to identify VER opportunity and move it forward.
Note F: Increase climate change resilience, increase watershed management, and decreased erosion.
Note G: The fruit trees and agro-forestry species are trees which will be used for the carbon offset portion of the project. These trees are all species which will benefit the local community and hopefully will not be cut down. There are also some indigenous fruit trees which we will try to concentrate on using. Looking to plant variety of fruit trees which will contribute to overall health of the community, Neem, a plant which has a large array of uses and can also help to increase the fertility of the soil, Jatropha, which can be used to create an alternative fuel source (can be used to make bio-gas, but also can be pressed and oil can be used in lieu of paraffin), for example.
Note H: Trying out solar cooking methods. The usage of solar stoves will significantly reduce the amount of firewood that is used by each household and therefore reduce carbon emissions as well as slow the deforestation process. It will also save the women the agony of collection and facing the wrath of local forestry officers.
Note I: Kawaza Basic School and Nsefu School have already designated land for their nurseries and are planning to start clearing this week. It will be a great opportunity for the kids to learn more about trees and also to contribute to the environment and the community.
Note J: The project started with a tree nursery with the Nsefu community planting 1000's of trees. All was going well until the flood destroyed this first attempt but the project has been rebooted. There is also a voluntary emissions project.

Burundi, Democratic Republic of Congo, Ethiopia

Project Name	Ecosystem Restoration Association Burundi Projects	Congo Biochar Initiative	Ibi Bateke Carbon Sink Plantation	Carbon Sequestration and Rural Alternative Energy in the Tshilenge Savannah, Kasai Orinetal	Humbo Assisted Regeneration	Lig Afforestation Project
Start Date		**2009**	**Aug-09**	**Jul-05**	**Dec- 2006**	**2-Jul-05**
Country	**Burundi**	**DRC**	**DRC**	**DRC**	**Ethiopia**	**Ethiopia**
Location/Ecosystem			Ibi Bateke plateau, Congo, See Note B	28 williages in the Tshilenge district, savannah	Humbo, in Southwestern Ethiopia	Oromiya regional state, semi-arid
Size (ha)		10 villages in the Equateur Province	4,120 ha	14000	Approximately 2,728 hectares	106
Practices to Sequester Carbon		See Note A	See Note C	See Note H	See Note J	To produce wood lots that would supply industrial, construction, and fuelwood uses. The community will get also learn about the production of marketable woodlots, mainly for export market.
Categorization of Carbon Sequestering Activity[25]	1	2	1	1,2	1	1
Implementation Status[26]	1	1	4	1	4	1
Emissions Reductions (Actual and/or Target)			2.4 million tons of CO2 in the next 30 years		0.03 Mt CO2e by 2012 and around 0.25 Mt CO2e by 2017; 29,343 metric tonnes CO2 equivalent per annum	
Farmer's Benefits			See Note D	See Note I	See Note K	Reduced soil erosion; alternate income generating activities to the communities living around the site; cash payments from carbon
Other Ecosystem			See Note E		See Note L	Restored watershed

[25] 1 Off-farm rehabilitation 2. On-farm tree-planting, agroforestry, agricultural soil management 3. REDD 4. Other

[26] 1. Still in scoping/planning phase, 2. Project plan developed 3. Practices in place, but no money exchanged, 4. Money exchanged

Project Name	Ecosystem Restoration Association Burundi Projects	Congo Biochar Initiative	Ibi Bateke Carbon Sink Plantation	Carbon Sequestration and Rural Alternative Energy in the Tshilenge Savannah, Kasai Orinetal	Humbo Assisted Regeneration	Lig Afforestation Project
Services Benefits (Biodiversity/ Watershed)						
Standard/MRV Methodology			CDM		CDM; AR-AM0003 ver. 4 - Afforestation and reforestation of degraded land through tree planting, assisted natural regeneration and control of animal grazing	
Developer/Investor & Type[27]		Congo Basin Forest Fund (CBFF) (4)	UMICORE, SUEZ and the AFD (French Development Agency. CASCADE is providing technical assistance (4)	CBPF (Congo Basin Partnership Fund) is financing the first stage, implementation of the fields (4)	World Vision Australia is financing the project (2)	Bager Safe Environment for Health Services PLC, loan expected from an agricultural development bank (5)
Field Program Manager & Type [28]		ADAPEL-Congolese conservation organization (3)	NOVACEL (Nouvelle Société d'Agriculture, Culture et Élevage) (3)		World Vision Ethiopia and Australia, the Ethiopian Agriculture, Rural Development & Forestry Coordination Office, and the community cooperative societies (2)	Bager Safe Environment for Health Services PLC, (5)
Sellers/Role of the Sellers/Organization of the Sellers/Other info and Seller Type[29]			NOVACEL, and integrated agricultural, livestock and forest productions with the agro-industrial production of commodities		Community has developed 7 community cooperative societies (2)	

[27] 1. International environmental NGO 2. International development NGO 3. Local/national NGO 4. World Bank/multilaterial/bilaterlal donor 5. Carbon developer 6. Private business operating in non-carbon activities (agribusiness, forestry, energy) 7. Private foundation 8. Private bank 9. CGIAR/research institute, 10. Local/national government 11. Local/national company

[28] 1. Environmental NGO 2. Development NGO 3. Local/National NGO 4. World Bank/multilaterial donor 5. Carbon developer 6. Private, non-carbon agribusiness, timber 7. Local farmer/community org 9.National government agency 10. CGIAR/research institute 11. Local energy company 12. School

[29] 1. Farmers/producer org 2. Newly formed groups 3. Large scale private

Project Name	Ecosystem Restoration Association Burundi Projects	Congo Biochar Initiative	Ibi Bateke Carbon Sink Plantation	Carbon Sequestration and Rural Alternative Energy in the Tshilenge Savannah, Kasai Orinetal	Humbo Assisted Regeneration	Lig Afforestation Project
Buyers/Role of the Buyers/Organization of the Buyers/Other info and Type[30]	NC		See Note F		World Bank Biocarbon Fund	
Other Institutional Arrangement Info, Roles Oof Other Project Participants			Supported by the Ministry of Environment of Conversation Nature		World Vision	Oromiya regional state
Land Tenure Status			See Note G		Community-owned land	
Support Services from other Intermediaries			They are workjng with the Cocoa Carbon Initiative as implementing partner, they are getting private loans from Suez and Umicore. UNEP's CASCADe program is providing technical assistance.		Communities have established seven forest cooperatives with legal ownership of the community land	
Additional Notes			Once the first bloc of 4000 ha is completed, the IBCSP plans to extend to a 8,000 ha forest able to guarantee almost 4 million tCO2 stable stock.			
For More Info	http://www.eraecosystems.com/projects/projects/burundi/	http://biocharfund.org/index.php?option=com_content&task=view&id=42&Itemid=62	http://www.forestcarbonportal.com/project/ibi-bateke-sink-plantation-project; www.kuapakokoo.com; Ministry of Environment	Nyamwoga Bayengeha Flory, flo.nyamwoga@gmail.com	http://wbcarbonfinance.org/Router.cfm?Page=Project&ProjID=9625	Girma Kebede, girma_k2007@yahoo.com (from MICCA inventory)

Note A: The approach improves the fertility of soils through the introduction of "biochar" — charcoal produced from the burning of agricultural residues and waste biomass under reduced oxygen conditions — thereby increasing crop yields and reducing the need to clear forest for slash-and-burn agriculture.

Note B: Ibi Bateke plateau, Congo, 150 kn south of Kinshasa.The plateau is composed of 90% herbaceous or shrubby savanna, 10% of forest savanna deforested by local populations for subsidence farming and charcoal production.

Note C: It will convert natural grassy savanna, disturbed by man-initiated fires, into an abundant and sustainable fulewood supply for charchoal production. Carbon sequestration from the atmoshpere is combined with a reduction in GHG emissions, resutling from the disappearance of savanna fires and the and the energy switch to non-fossil fuel. To complete these objectives, the IBCSP will establish 4,120 hectares of fast growing forest plantations (Eucalyptus urophyllia, various species of Acacia and local species) on grass savanna with few scattered shrubs

[30] 1. World Bank/donor 2. Individuals 3. Agribusiness, no credits yet (NC) 4. Private philanthropy 5. Private intermediary/broker 6. Private business

Note D: Emission reductions that will be sold to finance the expansion of the project as well as health, education and agro-forestry activities in the local community 55 to 60 permanent jobs, and from 40 up to 400 temporary jobs over 4 to 6 months a year, equivalent to 210 to 225 full time positions
Note E: Producing charcoal from the plantation will reduce the deforestation of the remaining forest galleries, generally used to make charcoal. It will also avoid bush fires and all the generated negative impacts. In the long term, plantations managed in a sustainable way will also provide shelter to wildlife
Note F: World Bank BioCarbon Fund, Orbeo. A part of the wood production will be turned into charcoal to supply the city of Kinshasa, capital city of the DRC, with almost 10 million inhabitants. Harvested wood will also be commercialized locally as timber and lumber
Note G: Land was legally titled by the Ministère des Affaires Foncières in the form of a 25-year lease (bail emphytéotique) to Olivier Mushiete, general director of NOVACEL. The Mushiete family signed on January 1, 2008, a long term lease (30 years renewable, effective since January 1, 2007) with NOVACEL, for the area of the reforestation project. Hence, NOVACEL currently possesses the land use
Note H: Cultivation of Jatropha Curcas in support of food production and rural energy provision in replacement of timber forest products (charcoal) traditionally used. Intercropping J-C with food crops on unproductive, marginal land, and soil amending by Jatropha grain press residue will sustain the food production, while oil extracted from press will provide alternative domestic energy sources.
Note I: In addition the energy potential of Jatropha, a parallel industry of manufacturing soap and of maintenance of equipment, business and work in Jatropha will by created around this activity, and will provide a source of supplementary revenue for households. Finally, the meal and other residues of pressed grain will be used as organic fertilize, to amend the land where crops are grown including maize and vegetables.
Note J: Farmer Managed Natural Regeneration (FMNR) technique in which existing tree and shrub root material in the soil is identified, selected, pruned, and managed to enable re-growth. Only native species will be regenerated since the technique is based on genetic material already present in the sites.
Note K: Many households will be self employed for pruning and harvesting, and the forest will increase the safety of local livelihoods, particularly through the provision of new sustainable income and food sources, and the protection of springs and streams originating in the project area. The additional income from carbon sequestration is planned to be partly invested in local infrastructure and food security activities. Finally, training will be provided to communities in the FMRN technique. This technique is also applicable on small private farms and it is expected that the knowledge will spread throughout neighboring regions.
Note L: The regeneration of the native forest will provide habitat for many local species and enrich local biodiversity. Major environmental benefits will stem from the reduction of soil erosion and local flooding. In particular, sediment runoff currently threatening the fragile ecosystem of Lake Abaya - located 30 km downstream from the project site - will be reduced.

Kenya

Project Name	Kenya Smallholder Coffee Carbon Project	TIST in Kenya	Western Kenya Integrated Ecosystem Management Project	Machakos and Kitui Local Community Forestry Initiative	Kwale Forestry Project	Araboku Sokoke Forest Management and Conservation Project
Start Date	**2008(?)**	**1999**				
Country	**Kenya**	**Kenya**	**Kenya**	**Kenya**	**Kenya**	**Kenya**
Location/Ecosystem	Central Kenya	Meru and Nanyuki	Western Kenya, in Nyando, Nzoia and Yale Basins (largely the Lake Victoria Basin)			
Size (ha)	Phase I: 7,200ha; (50% coffee, 50% subsistence agriculture)Phase II: 10,000 ha					
Practices to Sequester Carbon	Transitioning from full sun into shade production		See Note A			
Categorization of Carbon Sequestering Activity[31]	2	2	1, 2			
Implementation Status[32]	3	4	1			
Emissions Reductions (actual and/or target)	~30,000 tCO2e/year, phase I; 2.4 tCO2e soil					

[31] 1. Off-farm rehabilitation 2. On-farm tree-planting, agroforestry, agricultural soil management 3. REDD 4. Other

[32] 1. Still in scoping/planning phase 2. Project plan developed 3. Practices in place, but no money exchanged 4. Money exchanged

Project Name	Kenya Smallholder Coffee Carbon Project	TIST in Kenya	Western Kenya Integrated Ecosystem Management Project	Machakos and Kitui Local Community Forestry Initiative	Kwale Forestry Project	Araboku Sokoke Forest Management and Conservation Project
	organic carbon C/ha/yr 1.6tCO2e biomass C/ha/yr					
Farmer's Benefits	0.5 tons of cherry/hectare, can be brought up to 1.5 tons					
Standard/MRV methodology						
Developer/Investor & Type[33]	Project developer is ECOM Agroindustrial Corp (6)	USAID/Kenya (5)				
Field Program Manager & Type [34]	Project developer is ECOM Agroindustrial Corp (6)	Jointly implemented by Institute for Environmental Innovation (I4EI) and Clean Air Action Corporation (CAAC) (5)	ICRAF, KARI, various gov bodies provide leadership and research			
Sellers/Role of the Sellers/Organization of the Sellers/Other info and Seller Type[35]	Komothai smallholder farmers cooperation, 9000 members (1)	Small groups of farmers (2)				
Buyers/Role of the Buyers/Organization of the Buyers/Other info and Type[36]	1	For TIST: Dow — US$1.2 million, WB — US$45,000 (1,6)	GEF co-financed by National Governament of Japan			
Support Services from Other Intermediaries	Komothai smallholder farmers coop	TIST credits can now by purchased on eBay				
For More Info		www.tist.org; Scurrah-Ehrhart (2006)	http://www.gefonline.org/projectDetails.cfm?projID=1362	KG inventory	KG inventory	KG inventory

Note A: Improved management practices on and off farm for soil and water protection. The project advocates for moving from short-term planting like maize to more sustainable forms of agriculture – including tree-based enterprises such as orchards and fodder plantations for livestock – are more promising in the long term.

[33] 1. International environmental NGO 2. International development NGO 3. Local/national NGO 4. World Bank/multilaterial/bilaterlal donor 5. Carbon developer 6. Private business operating in non-carbon activities (agribusiness, forestry, energy) 7. Private foundation 8. Private bank 9. CGIAR/research institute, 10. Local/national government 11. Local/national company

[34] 1. Environmental NGO 2. Development NGO 3. Local/National NGO 4. World Bank/multilaterial donor 5. Carbon developer 6. Private, non-carbon agribusiness, timber 7. Local farmer/community org 9.National government agency 10. CGIAR/research institute 11. Local energy company 12. School

[35] 1. Farmers/producer org. 2. Newly formed groups 3. Large scale private

[36] 1. World Bank/donor 2. Individuals 3. Agribusiness, no credits yet (NC) 4. Private philanthropy 5. Private intermediary/broker 6. Private business

Kenya (cont'd)

Project Name	Osentu Agroforestry and Ecotourism Project, Greenbelt movement	Kasigau Corridor REDD Project	Treeflights Kenya Planting Project	Western Kenya Smallholder Agricultural Carbon Project	"Forest Again; Compassionate Carbon Offsets" Restoration Project	Carbon Micro Credit System in Kenya	Green Belt Movement
Start Date	**2008**	**2009**		**01/01/2009 to 01/12/2029 (20 years crediting period)**		**Apr-08**	**2006**
Country	**Kenya**	**Kenya**	**Kenya**	**Kenya**	**Kenya**	**Kenya**	**Kenya**
Location/Ecosystem	Narok River Basin	30,000 ha of forest and savanna that bridge Kenya's largest protected areas — Tsavo East and Tsavo West	In Bore near to Malindi in Kenya's Coastal Province	Western Kenya Region See Note A	Kakamega	Biomas	Aberdare Range and Mount Kenya watersheds
Size (ha)				86,000 ha our of potential 116,000 ha	490 ha		1,876 ha
Practices to Sequester Carbon		Organic farming and agroforestry initiatives for local communities	Cashew trees distributed to local farmers to plant on their own land	See Note B	Reverse forest losses through enhanced management, reforestation, development of alternative income projects and fuel wood reduction strategies	Note N	Tree planting with a long term goal to use the re-grown forest in a sustainable manner for a variety of products including fuel wood, charcoal, timber, medicinal and other uses
Categorization of Carbon Sequestering Activity[37]	1, 2	3	2	2	1	4	1, 2
Implementation Status[38]		3 or 4	4	4 See Note C	4	4	4

[37] 1. Off-farm rehabilitation 2. On-farm tree-planting, agroforestry, agricultural soil management 3. REDD 4. Other

[38] 1. Still in scoping/planning phase, 2. Project plan developed 3. Practices in place, but no money exchanged, 4. Money exchanged

Project Name	Osentu Agroforestry and Ecotourism Project, Greenbelt movement	Kasigau Corridor REDD Project	Treeflights Kenya Planting Project	Western Kenya Smallholder Agricultural Carbon Project	"Forest Again; Compassionate Carbon Offsets" Restoration Project	Carbon Micro Credit System in Kenya	Green Belt Movement
Emissions Reductions (actual and/or target)		Aims for 3.5 million tons over its 20-year lifetime		516,000 tCO2e/yr (maximum); 1.5 tCo2e soil C and 4.5 CO2e biomass C/ha/y; By 2029 would have squestered 1236373 tCO2	1320 tons CO2/ha, project is projected to sequester over 420,000 tons of CO2		The project is expected to sequester around 0.1 Mt CO2e by 2012 and 0.38 Mt CO2e by 2017.; 791,825 tCO2e over the life of the project
Farmer's Benefits		Construction of new schools, free health programs, and organic farming and agroforestry initiatives for local communities	Cashew trees yield cash crop in ~4 years, therefore farmers have strong vested interest in survival	See Note D	See Note J	Each family that cooks more efficiently may claim approximately 3 tons of CO2 offsets/year, which is worth about US$ 20 - 35 when sold in Europe on a regulated or voluntary carbon-offset market. The family also saves far more on fuel -- from US$ 70 - 150/year.	The project will pay local communities and provide them with the technology and knowledge to reforest these lands and manage the new forest.
Other Ecosystem Services Benefits (biodiversity/ watershed)					Biodiversity conservation through restoration of indigenous rainforest habitat		Note Q
Standard/MRV Methodology		CCBA	Over the Counter (?), each tree has reference # and on record, buyers receive a 'confirmation of planting'	See Note E	December 2009 - Forest Again and EC02 receive a Gold Level CCBA (2nd edition) Certification through the Rainforest Alliance.		CDM

Project Name	Osentu Agroforestry and Ecotourism Project, Greenbelt movement	Kasigau Corridor REDD Project	Treeflights Kenya Planting Project	Western Kenya Smallholder Agricultural Carbon Project	"Forest Again; Compassionate Carbon Offsets" Restoration Project	Carbon Micro Credit System in Kenya	Green Belt Movement
Developer/Investor & Type[39]		World Bank's Forest Carbon Partnership Facility (4)	Lampeter/Bore Community Carbon Link, administrative costs covered by Welsh Assembly Government's Gold Star Communities Scheme (1, 4)	Developer is VI-Swedish CooperativeCentre (SCC); SIDA has recently committed funding to SCC-ViA for the implementation of the carbon project for the next years (1, 4)	See Note K	Carbon Manna Unlimited (2)	Green Belt, WB (3, 4)
Field program Manager & Type [40]		Wildlife Works in partnership with local communities and the Kenya Forest Service (KFS). CAAC, I4EI (1, 7, 9)	Tree Flights (1)	Note F (1)	Eco2librium (5)	2	NGO Greenbelt Movement manages projects, aggregates credits (3)
Sellers/Role of the Sellers/Organization of the Sellers/Other info and Seller Type[41]			Various. 4 trees cost 10 pounds	Note G	Note L	Note O	Community Forest Associations plant the trees
Buyers/Role of the Buyers/organization of the Buyers/Other info and Type[42]		World Bank	end buyers are mostly airline passengers (2)	WB biocarbon fund (1)	Registering and retiring all carbon credits generated within 40 years period	Note P	World Bank biocarbon fund (1)
Other Institutional Arrangement info, Roles of other Project Participants				Note H	Note M	A carbon auditor has to regularly verify that the carbon offsets are indeed produced and notify the necessary parties	

[39] 1. International environmental NGO 2. International development NGO 3. Local/national NGO 4. World Bank/multilaterial/bilaterlal donor 5. Carbon developer 6. Private business operating in non-carbon activities (agribusiness, forestry, energy) 7. Private foundation 8. Private bank 9. CGIAR/research institute, 10. Local/national government 11. Local/national company

[40] 1. Environmental NGO 2. Development NGO 3. Local/National NGO 4. World Bank/multilaterial donor 5. Carbon developer 6. Private, non-carbon agribusiness, timber 7. Local farmer/community org 9.National government agency 10. CGIAR/research institute 11. Local energy company 12. School

[41] 1. Farmers/producer org, 2. Newly formed groups 3. Large scale private

[42] 1. World Bank/donor 2. Individuals 3. Agribusiness, no credits yet (NC) 4. Private philanthropy 5. Private intermediary/broker 6. Private business

Project Name	Osentu Agroforestry and Ecotourism Project, Greenbelt movement	Kasigau Corridor REDD Project	Treeflights Kenya Planting Project	Western Kenya Smallholder Agricultural Carbon Project	"Forest Again; Compassionate Carbon Offsets" Restoration Project	Carbon Micro Credit System in Kenya	Green Belt Movement
Land tenure status			-	Privately legally owned farms by individual farmers (farmers with title deeds)			Kenya Forest Service owns the land and gives the carbon and NTFP rights to the CFA if they plant trees, but not, the timber.
Support services from other intermediaries			Administrative costs for this project are covered by the Welsh Assembly Government's Gold Star Communities Scheme	Note I			
Additional Notes		This is the first REDD project in Africa to win GOLD level validation under the Climate Community and Biodiversity (CCB) Alliance's REDD Standard			Gold Level certified in November 2009 projected by CCBA and validated by Rainforest Alliance.		
For More Info		http://news.mongabay.com/2009/1217-kenya.html , http://www.climate-standards.org/projects/files/taita_taveta_kenya/rukinga_ccb_pdd.pdf	http://www.treeflights.com/kenyainfo.html	Project developer is VI-Swedish Cooperative Centre (SCC); farmer associations a aggregate the credits		David A Palella, Founder Carbon Manna Unlimited San Diego, Califonia, Tel: +1-858-945-0887 carbonmanna@gmail.com	http://wbcarbonfinance.org/Router.cfm?Page=BioCF&FID=9708&ItemID=9708&ft=Projects&ProjID=9635

Note A: Bondo, Siaya, Kisumu and Bungoma districts, ranging from Upper midlands (UM4) slopes of Mt. Elgon to Low Midlands (LM4) shores of Lake Victoria Agroecological zones. Area densely populated with small scale agriculture land use on two major river drainage area - watershed (R. Nzoia and R. Yala) draining into Lake Victoria.

Note B: Incorporating organic matter into the soils (crop residues, farm yard manure), sustainable agroforestry practices (using nitrogen fixing trees, more tree establishment within the farm, fodder trees for dairy animals, fruit trees for use by the family, reducing large less productive herds of cattle with fewer more yielding breeds of cattle, farmer enterprise development – more business oriented kind of farming which enables the small holder farmers earn an income from their farms (e.g. poultry rearing, dairy farming, fruit production, vegetable production, banana production etc). This is linked with training on marketing, value addition, using a group approach and better organization of farmers through their own organizations as opposed to being alone hence not being able to voice concerns, an emphasis on soil health, rehabilitation of degraded farm lands, tree planting activities in public places like schools and churches, sensitization of various farmer groups on the importance of SLM practices and support for farmers with various Agroforestry tree seeds. Roll out plan: Qualified staff within the communities will mobilize, sensitize and train the community members on the new methods and approaches on SLM practices, continuously monitor the implementation process by having field coordinators and unit staffs who work together with the field offices and farmer groups towards implementation of the planned activities, involvement of various stake holders who supplement field activities to achieve maximum impact through complementarities, identifying and strengthening farmer groups to aid in data collection and introduce various aspects of participatory monitoring and evaluation. Challenges include: investment barriers; institutional barriers; technological barriers; barriers related to local tradition; barriers due to prevailing practice; barriers due to local ecological conditions and barriers due to social conditions.

Note C: About 16,559 households have been sensitized and 8,128 committed. Sustainalble Agriculture Land Management (SALM) practices have been implemented on about 7000 ha, sequestering about 10,500 tCO2 in 2009

Note D: Yield benefits for maize of about 4.5 tCO2e/ha/year can be reached within a few years; benefits are likely in terms of improved soil fertility and water absorption capacity, as well as resilience of farming system to extreme weather events, especially droughts which are expected to grow more frequent and intense in areas of sub-Saharan Africa.
Note E: As part of the project a robust and cost effective carbon accounting methodology outlining how to quantify these emission reductions has been developed. The cost of quantification is being reduced by using a farmer self assessment approach for reporting the adoption and maintenance of management practices, and independent third party verification. The amount of carbon sequestered by different management practices is being estimated using a biophysical simulation model. The project plans to modify and fine-tune these values based on actual measurement of soil carbon sequestration rates of various practice and technologies.
Note F: Developer is VI-Swedish Cooperative Centre (SCC). SCC-ViA will directly work with farmer groups. The NGO's extension staff – in collaboration with public agents - will provide advisory services to participating groups. These groups are also the main contact for reporting and verification of adoption of SALM practices, and measurement, verification and aggregation of emission reductions (ERs) (1)
Note G: Regarding aggregation and selling of ERs to the World Bank, SCC-ViA will act as a third party intermediary on behalf of the farmers. Small-scale farmers committed and organized in groups and will be contracted by Vi Agroforestry. While SCC-ViA uses part of the carbon revenues to cover extension service costs, the project developer also has to ensure that a significant proportion of the revenues are channeled back to the farmer group level. The farmer groups will decide on the usage of the carbon revenues received.
Note H: SCC-Vi applies a participatory extension approach focusing on community empowerment, using tools and methods such as participatory rural appraisals [PRA], farmer field schools, agricultural training centers and farmer-to-farmer study tours. SCC-ViA extension staff will provide demand-driven advice and training on all issues related to sustainable agricultural production and marketing. The extension staff will work closely with other institutions such as the Ministry of Agriculture and the Kenya Forestry Service. SCC-ViA advice is also focusing on farm enterprise development. Farmer groups and organizations are strengthened through capacity building and development of entrepreneurial skills. Extension staff works with smallholders to organize farming activities as a business, react on market demands and integrate them into the value chain. Unique Forestry and Johanneum Research Consulting Firm.
Note I: Registered farmer associations covering an area with about 80,000 farms. Farmer groups and organizations are strengthened through capacity building and development of entrepreneurial skills. Extension staff works with smallholders to organize farming activities as a business, react on market demands and integrate them into the value chain. Farmers agricultural land management problems and training needs are identified and Vi Agroforestry field staff plan with farmers using community/group action plans or strategic plans and trainers selected or sourced if field staff in person cannot to offer a farmer friendly training either training community resources persons or farmers immediately. Demonstration plots, farmer learning centers, trial and field schools are put straight in the community where farmers learn by seeing and field staff constantly backstop farmers and make follow-ups. Most trainings are offered by Vi field staff and also facilitate farmers to train one another or service providers like line ministries officers train farmers when planned together. Farmers are in constant support by field officer. The most important trainings farmers get include agroforestry, agronomic practices, livestock management, soil and water conservation options, land rehabilitation and restoration, group dynamics, village savings and loaning, farmer enterprise selection and development, organic farming, leadership and democracy (etc according to group needs). Farmers sign a farmer commitment form to show the willingness to participate in carbon smart activities within the group, the group keeps records, open an account, and sign a contract with Vi Agroforestry. Farmers are given tree starter seeds, some special seedlings and germ-plasms and crop seeds only when demonstrating an activity. The group monitors individually group members SALM activities, crop yields, biomass of trees, livestock management, farm enterprises and household income. The social survey is conducted annually to estimate community wealth status, socioeconomic or livelihoods (water access, energy, financial services or mobilization etc). Summary of specific services to farmers include advisory services, better soil productivity, being equipped on value addition, market sourcing, equipped to do farming as a business, through strengthening of farmer groups, expansion of social networks; through the groups, have a block attractive to local leaders, politicians, thereby having a voice, and linkage with other development agents/ NGOs/government institutions.
Note J: Funds from offsets are predicted to provide for over 200 jobs both directly and indirectly related to reforestation over 40 years. In addition, 25-40% of the offset revenues will fund the expansion of Kakamega Environmental Education Program (KEEP) activities, which include developing non-timber sources of forest-related income (e.g. butterflies, honey, medicines), HIV/AIDS health programs, conservation education, and capacity building to enhance tourism and provide management assistance to the Kenya Forest Service forest station. The project will also use offset funds to help leverage additional funds for clean water and micro-hydropower development in adjacent communities. An additional 10% of gross seedlings will be produced by the project annually to give to families living adjacent to the forest. This is expected to help with community awareness and acceptance of program, and in the long-term help reduce forest use and leakage.
Note K: Eco2librium is the developer, April 2009 - EC02 (formerly named Making Connections) received a competitive climate grant from Hyundai Automobile Company. Forest Again was one of three world-wide grant recipients. These funds provided the starting capital to initiate the project and to certify Forest Again, November 2009 - Forest Again and Eco2 receive grant from USAID/PactKenya. (5, 4, 7)
Note L: Establishing subprojects that reduce human pressure on forest resources through on-farm tree planting, livelihood development based upon non-timber forest resources and dissemination of energy efficient wood cooking stoves, capacity building, educate communities and children on forest conservation.
Note M: Kenya Forest Services, KEEP, National Museum of Kenya, Moi University Dept. of Forestry, Muleshi community Forest Association. Their role is to ensure effective long-term management and technological, community and political support during the accounting period and thereafter.
Note N: Employs SMS (simple message service) and unique identifiers to allow farmers to claim the carbon offsets they produce by using more efficient cooking methods such as a modern charcoal stove or solar cooker, instead of an inefficient open-pit fire burning biomass. As a result, each family is able to monetize directly its own contribution to mitigating global warming, while also reducing nationwide rates of deforestation and desertification.
Note O: Carbon offset at family level by using more efficient cooking methods such as modern charcoal stoves or solar cooker. Villagers dial in and claim their carbon-micro credit money from the cell phone company on a bi-weekly or monthly basis
Note P: Purchase cell phones and matching solar or modern charcoal stoves and distribute them to participating villagers Sell carbon offsets in bundles on carbon emission trading platforms such as the European Climate Exchange and disseminate the profits to participating families through their cell phones.
Note Q: The project is targeting specifically denuded steep sloped lands in important water catchment areas. The reforestation will therefore bring important environmental benefits by reducing the erosion process, protecting the water sources, and regulating water flows. Biodiversity will also benefit from the re-introduction of a wide range of natural tree species. These forests host a high number of threatened fauna species and are internationally recognized as an Important Bird Area (IBA).

Madagascar, Rwanda

Project Name	Makira Forest	Mandtadia Corridor Initiative	Verama	Ankeniheny–Zahamena – Mantadia Biodiversity Conservation Corridor and Restoration Project	Rwanda/Ecosystem Restoration Associates
Start Date	**2007-2037**	**2006 - 2036**	**2006 - 2012**	**2006 - 2036**	**September, 2008**
Country	**Madagascar**	**Madagascar**	**Madagascar**	**Madagascar**	**Rwanda**
Location/Ecosystem	Northeast Madagascar	Madagascar island's eastern half in three national reserves: Mantadia, Ankeneny, and Zahamena	Masiloka Cashew Estate in Majanga Region, Madagascar	Analamazaotra Special Indri Lemur Reserve, the Maromizaha Private Forest and Mantadia National Park	Kibira National Park
Size (ha)	4600 km sq	425,000 h forest protected; 5,000 h begin reforested	6000 Ha.	425,000 ha	130,000 Ha
Practices to Sequester Carbon	Train farmers to produce higher yields from same plot of land to prevent deforestation	Rain forest protection, planting fruit gardens, native species on degraded land	Install and manage an industrial cashew plantation (6mx6m density, total number of trees: 1,440,000) on sterile land with a severely degraded soil	Deforestation and forest degradation (REDD)	Agroforestry/ afforestation/reforestation project
Categorization of Carbon Sequestering Activity[43]	3	2,3	1, 2	3	1,2
Implementation Status[44]	4	4	2	4	3 or 4, MOU signed with Government of Rwanda n September 2008
Emissions Reductions (Actual and/or Target)	9.5 million tons of CO2 emissions	Prediction to cut atmospheric CO2 by 10 million tons over 30 year life of project	30 753 t CO2e through 2012	BioCF ERPA Emission Reductions tCO2e 200,000. Total Project Emission Reductions Generation tCO2e 436,637	
Farmer's Benefits	Higher yields, community benefits - more rights over natural resources, training in irrigation for lowland rice field and has the potential to bring new jobs and ecotourism to the area.	Creation of 200 jobs over 7 years, improvements in agriculture and ecotourism, income from carbon credits, more sustainable production and sale of fuel wood and NTFP	Create long-term employment, create wealth, and improve living standards of local population. Produce premium cashew nuts and cashew balm.	Promoting alternative livelihood activities for impoverished communities	The Project will reduce deforestation and socio-economic dimensions will assist adjacent communities to replace such unsustainable activities (inside and outside the park) with sustainable ones such as ecotourism, agro-forestry, and bio-product cottage industries.

[43] 1. Off-farm rehabilitation 2. On-farm tree-planting, agroforestry, agricultural soil management 3. REDD 4. Other

[44] 1. Still in scoping/planning phase, 2. Project plan developed 3. Practices in place, but no money exchanged, 4. Money exchanged

Project Name	Makira Forest	Mandtadia Corridor Initiative	Verama	Ankeniheny–Zahamena – Mantadia Biodiversity Conservation Corridor and Restoration Project	Rwanda/Ecosystem Restoration Associates
Other Ecosystem Services Benefits (biodiversity/watershed)	Biodiversity, wildlife shelter (incl. primates)	Corridor crucial for saving endemic species	Create a carbon sink, create long-term employment, create wealth, & improve living standards of local population. Demonstrate that infertile lands can be developed in the form of perennial exploitation with sustainable and environmentally friendly management techniques.	Mimic natural forests by planting over 80 different indigenous species. The project will also establish wood and fruit gardens, providing alternative livelihoods to local communities in the project area.	The Project will result in the removal of vast tonnages of carbon dioxide from the atmosphere, and the storage of carbon in forest biomass, by the establishment of new forest cover within and adjacent to Kibira National Park.
Standard/MRV Methodology	Climate, Community, Biodiversity (CCB) Standards; CDM and/or VCS	A REDD Methodology developed by the BioCF. Buyer's standard = 1.	A REDD Methodology developed by the BioCF	REDD Methodology developed by the BioCF	
Developer/Investor & Type[45]	Mitsubishi Group, NavTech and the music band Pearl Jam.	Conservation International, World Bank BioCF, The National Association for Environmental Action (ANAE) (1, 3, 4)	VERAMA (6)	World Bank, Conservation International and ANAE (a local NGO) (1, 3 ,4)	ERA Carbon Offsets Ltd, 5
Field Program Manager & Type [46]	Wildlife Conservation Society (WCS) (1)	Madagascar Ministry of the Environment (9)	Xavier Metz, Director Verama (6)	Ministry of the Environment of Madagascar (1)	Multisector Investment Group Ltd (5)
Sellers/Role of the Sellers/Organization of the Sellers/Other info and Seller Type[47]		The initiative is helping protect more than 425,000 hectares of healthy rain forest through the creation of a sustainable use protected area, reducing GHG emissions from deforestation and forest degradation. (REDD)	The selection of 30 well-performing varieties of cashew and the installation of a 13 Ha "bank" for future plantings (3)	Income from carbon credits	Plant trees using money paid by companies in the west to offset their carbon emissions.
Buyers/Role of the Buyers/Organization of the Buyers/Other info and Type[48]	The project is registered for the sale of VER credits and has, to date, retired 40,000 tons of CO2e. CCBA and VCS validation is in progress with issuance planned before 2009.	The purchase 430,000 tCO2e of VERs from the REDD component of the project	TBD	By buying carbon credits, the buyer creates an incentive for the community to conserve the region's forests.	Investing about US$ 800,000 in the activities every year for a period of twenty years. (6)

[45] 1. International environmental NGO 2. International development NGO 3. Local/national NGO 4. World Bank/multilaterial/bilaterlal donor 5. Carbon developer 6. Private business operating in non-carbon activities (agribusiness, forestry, energy) 7. Private foundation 8. Private bank 9. CGIAR/research institute, 10. Local/national government 11. Local/national company

[46] 1. Environmental NGO 2. Development NGO 3. Local/National NGO 4. World Bank/multilaterial donor 5. Carbon developer 6. Private, non-carbon agribusiness, timber 7. Local farmer/community org 9.National government agency 10. CGIAR/research institute 11. Local energy company 12. School

[47] 1. Farmers/producer org 2. Newly formed groups 3. Large scale private

[48] 1. World Bank/donor 2. Individuals 3. Agribusiness, no credits yet (NC) 4. Private philanthropy 5. Private intermediary/broker 6. Private business

Project Name	Makira Forest	Mandtadia Corridor Initiative	Verama	Ankeniheny–Zahamena – Mantadia Biodiversity Conservation Corridor and Restoration Project	Rwanda/Ecosystem Restoration Associates
Other Institutional Arrangement Info, Roles of other Project Participants		Verifier and buyer: World Bank BioCarbon Fund		This Program implements the National Environmental Action Plan of the Government.	Carbon offsets generated from the Project will be validated and verified to leading international standards for forest-based climate mitigation for the voluntary carbon markets, and will be made available to organizations that wish to support community-based climate mitigation to offset their ecological footprints.
Land Tenure Status	Community owned and state land tropical rainforest).	Tropical Rainforest - state land	Industrial agric. land	Conservation area	Kibira National Park has been legally protected since 1933
Support Services from Other Intermediaries	WCS, CI and the Madagascar Ministry of Environment, Water, Forest and Tourism (MINEEFT)			The project is part of the Third Environment Program of the Republic of Madagascar, a US$150M program to protect natural resources on the Island.	
Additional Notes	Through a developing structure to manage distribution of carbon revenue, 50% will return to the communities; 25% will go toward management of the protected area; and 25% will go toward monitoring and marketing.		Project's choice for manual shelling is set by the following arguments: low need for fossil fuels [recycling of nut shells as a fuel to generate the heat needed in the shelling process], creation of jobs for the local community, occupying of a female workforce, better yield in almonds resulting in a better profit, better planning of time and space according to the specific needs.	Supported by World Bank Carbon Finance	The company will invest $1m in its first year of operations in Rwanda and subsequently between $0.5 million $0.8 million every year till 2038.
For More Info	http://www.conservation.org/learn/climate/forests/Pages/project_makira.aspx ; http://www.conservation.org/act/live_green/carboncalc/pages/carbon_quality_assurance.aspx http://www.unitedbankofcarbon.com/project_28.html	http://www.conservation.org/learn/climate/forests/Pages/project_mantadia.aspx http://www.conservation.org/act/live_green/carboncalc/pages/carbon_quality_assurance.aspx http://www.forestcarbonportal.com/project/mantadia-corridor-redd-initiative	Xavier Metz, Director Verama cajou.metz@unima.mg http://www.cascade-africa.org/ManageProjects/tabid/91/ctl/Detail/mid/407/ItemID/37/Source/AreaOfExpertise/language/en-US/Default.aspx	http://wbcarbonfinance.org/Router.cfm?Page=BioCF&FID=9708&ItemID=9708&ft=Projects&ProjID=9638	Investor Relations: Stevenson & Associates Investor Relations Ltd. Kyle Stevenson, President Telephone: (604) 687 1779 Email: kyle@stevesonir.com

Uganda

Project Name	Kikonda Forest Reserve	Potential Uganda project of Capturing N20 from Fertilizer Production	TIST in Uganda	Trees for Global Benefits	Reducing Methane by Bio-digesting Livestock Wastes(Potential)
Start Date	**2002**		**August 1, 2003 was the starting date of the first crediting period Length of the first crediting period: 10**	**2004**	
Country	**Uganda**	**Uganda**	**Uganda**	**Uganda**	**Uganda**
Location/Ecosystem	Tropical dry forest, Uganda		TIST has three sites in the southwest corner of Uganda: Bushenyi, Kabale, and Kanungu.	Ruhinda Kiyanga Bitereko) and Bunyaruguru (Ryeru & Kichwamba) counties of Bushenyi District Western Uganda Area: 600ha	
Size (ha)	120km² (12,182 ha) and employs more than 200 people; expected to store at least 200 000 tons of CO2	The materials needed to make it are locally available, accessible, and free.Over 45,000 farmers and growing engaged in organic farming in Uganda, and the Government is formulating an organic agriculture policy	Total number of trees planted is 418,319 to date	The pilot project baseline study indicated that forty seven percent of all the respondents inthe pilot area had between 5-10 acres of land, of which 23% were purchased, and about21% inherited	
Practices to Sequester Carbon	Afforestation/reforestation, 998,790 trees have been planted on over 1000 ha. (1084 trees per ha)..	See Note B	Planting three million trees specifically to sequester carbon	Trees planted provide for soil conservation for improved agriculture, trees for food (cashews), fodder for livestock and medicinal values; Required conservation management practices is mainly planting of indigenous tree species	NUTRIMIX-Uganda Cattle Feed Project- NutriMix Feeds Ltd. and TransAlta Corporation are presently implementing a Clean Development Mechanism (CDM) project
Categorization of Carbon Sequestering Activity[49]	1	4	2	2	4
Implementation Status[50]	4		3	4. Deal 1 contract signed in 2004.Second deal contract signed in 2005.Most recent deal was in 2008	
Emissions Reductions (Actual and/or Target)	200000 tCO2 ; 53,470 credits sold			Note C	

[49] 1. Off-farm rehabilitation 2. On-farm tree-planting, agroforestry, agricultural soil management 3. REDD 4. Other

[50] 1. Still in scoping/planning phase, 2. Project plan developed 3. Practices in place, but no money exchanged, 4. Money exchanged

Project Name	Kikonda Forest Reserve	Potential Uganda project of Capturing N20 from Fertilizer Production	TIST in Uganda	Trees for Global Benefits	Reducing Methane by Bio-digesting Livestock Wastes(Potential)
Farmer's Benefits	Community (forestation=secured workplace for over 200 ppl), tree planting training, 200,000 seedlings provided free, reduction of illegal logging (Uganda, Congo, Sudan)		Carbon rightstransferred to CAAC.All others, including timber, NTFPs go to the community.	Farmers receive carbon payments directly	
Other Ecosystem Services Benefits (biodiversity/ watershed)	20% of area set aside for conservation			See Note D	
Standard/MRV Methodology	Carbon Fix			Plan Vivo	
Developer/Investor & Type[51]	Global Woods (5)	Uganda National Agro Inputs Dealers Association (UNADA) NUTRIFARM SERVICES – UGANDA (5)	USAID & Dow chemicals provided start up funds (5)	Initially USAID funded (2)	TransAlta Corporation is the primary investor in the establishment of the project and is actively participating in project activities (5)
Field Program Manager & Type [52]	Global Woods (5)		Jointly implemented by Institute for Environmental Innovation (I4EI) and Clean Air Action Corporation (CAAC) (5)	Ecotrust (3)	NutriMix Feeds Ltd. and TransAlta Corporation (6)
Sellers/Role of the Sellers/Organization of the Sellers/Other info and Seller Type[53]			2	Individual Smallholder Farmers in Ruhinda and Bunyaruguru county of Bushenyi District through ECOTRUST Uganda	
Buyers/Role of the Buyers/Organization of the Buyers/Other info and Type[54]			For TIST: Dow — US$1.2 million, WB — US$45,000 (1, 6)	Tetra pak Future Forests through Bioclimatic Research & Development New Buyers since 2005 U&W Humbleside Individual buyers who want to offset their carbon footprint	

[51] 1. International environmental NGO 2. International development NGO 3. Local/national NGO 4. World Bank/multilaterial/bilaterlal donor 5. Carbon developer 6. Private business operating in non-carbon activities (agribusiness, forestry, energy) 7. Private foundation 8. Private bank 9. CGIAR/research institute, 10. Local/national government 11. Local/national company

[52] 1. Environmental NGO 2. Development NGO 3. Local/National NGO 4. World Bank/multilaterial donor 5. Carbon developer 6. Private, non-carbon agribusiness, timber 7. Local farmer/community org 9.National government agency 10. CGIAR/research institute 11. Local energy company 12. School

[53] 1. Farmers/producer org. 2. Newly formed groups 3. Large scale private

[54] 1. World Bank/donor 2. Individuals 3. Agribusiness, no credits yet (NC) 4. Private philanthropy 5. Private intermediary/broker 6. Private business

Project Name	Kikonda Forest Reserve	Potential Uganda project of Capturing N20 from Fertilizer Production	TIST in Uganda	Trees for Global Benefits	Reducing Methane by Bio-digesting Livestock Wastes(Potential)
Land Tenure Status	Matthias Baldus, baldus@global-woods.com			Besides land availability, the two districts have relatively secure land tenure systems. The pilot project baseline study indicated that 47% percent of all the respondents in the pilot area had between 5-10 acres of land, of which 23% were purchased, and about 21% inherited.	
Support Services from Other Intermediaries	See Note A			See Note E	
Additional Notes				See Note F	
For More Info	http://www.carbonfix.info/kfr	Katoomba Group Uganda Country PES Inventory	www.tist.org; Scurrah-Ehrhart (2006)	http://www.planvivo.org/fx.planvivo/scheme/ugandadocuments.aspx (http://planvivo.org.34spreview.com/wp-content/uploads/PDD_Trees_for_Global_Benefits-PlanVivo-Uganda.pdf)	Katoomba Group Uganda Country PES Inventory

Note A: Graduates from Makerere University are taken as trainees and subsequently as employees, student excursions to Kikonda. Scientists are hired for consultancies (botany, soil etc.). University of applied Forest science, Rottenburg, Germany: interns, master thesis Nyambyeya forestry college: graduates taken as trainees and subsequently as employees, staff holding workshops.
Note B: NUTRIFARM SERVICES –located in Masindi aims to process organic solid waste into compost manure; (the Black Gold) for the promotion of organic farming in Uganda for better nutritional standards. Mature compost helps plants to grow better. It enriches soil, which loses nutrient to food– hungry plants. By using compost, people can grow more vegetables and fruit trees to feed themselves. One plant will be able to produce 500 – 600 kg of compost each day by processing 2-3 tons of household waste.
Note C: ECOTRUST staff will be visiting the project area at least four times a year (twice a year for training and twice a year for monitoring). It is expected therefore that a total of 500lts (8km per liter of fuel for 1,000km four times a year) will be consumed for the four trips. This amount multiplied by the IPCC emission coefficient of diesel (0.934kgCO_2 per liter) comes to 0.467tCO_2 annually.
Note D: Promotion of indigenous tree species and expansion of native islands and corridors, restoration, protection and management of degraded and threatened, ecosystems, improved protection of protected areas through provision of alternative sources of wood, regulation of micro-climates, water purification, soil stabilization, and improved moisture retention on slopes.
Note E: The payments are channeled through a European based carbon broker Bioclimatic Research and Development (BR&D) and a Ugandan national conservation trust fund (ECOTRUST) to individual farmers; ECCM-technical support and carbon accounting ECOTRUST- Administration of carbon funds and both field/technical support to carbon farmers and monitoring. ICRAF/ECOTRUST/BR&D develop technical specifications. BR&D is in charge of the marketing /brokerage of carbon sales Tetrapak- carbon purchase. Future Forests heads the carbon purchase.
Note F: The project will build local and regional capacity and develop generic carbon management systems that may be replicated in other communities throughout the country. Furthermore, small-scale production of fuel wood and timber will alleviate pressure on nearby forest reserve and national park resources.

Benin, Cameroon, Liberia, Mali

Project Name	Rehabilitation of degraded lands of Djidja	Community based woody savanna management and woodlot for carbon sequestartion	Protection of Cameroon Estuary Mangroves	Oil palm regeneration and recycling of oil palm by-products	Revitalizing Communities through Conservation Agriculture Bong County, Liberia	Mali's Acacia Senegal Plantation Project	Agro-Industry Development- SA AID
Start Date	**2007**	**1997-2003**			**Feb-09**	**2007**	**2010**
Country	**Benin**	**Benin**	**Cameroon**	**Cameroon**	**Liberia**	**Mali**	**Mali**
Location/ Ecosystem	Djidja	Norrthern Benin near Parakou	Douala-Edea mangrove forest within the Cameroon Estuary	Momo in the Northwest Region, Ngie sub Division	Four districts (Suakoko, Jorquelleh, Panta, Kpaai) in Bong County, Liberia, sub-humid February 2009 – February 2012 Donor: Howard G. Buffett Foundation Partners: MoA, CARI, A2N, PNO	Dialoubé is in a region of sparse savannah in north-western Mali, near the Mauritania border.	Savannah in Northen Mali
Size (ha)	2184 ha	176000 ha	20 000 ha;	115,000 ha	6,000 ha	6,000 ha	200,000 ha
Practices to Sequester Carbon	See Note A		Sustainable utilization, management and conservation of mangrove systems as fisheries support systems and buffers against climate change impacts through the promotion of the use of energy-serving fish smoke houses	See Note E	Promotion of conservation agriculture techniques and soil quality	Reforestation with Acacia Senegal, a species endemic to the African Sahel. The project will also re-introduce agricultural activities through intercropping with groundnuts and cowpeas.	Reforestation of Shea trees and restoration of original forest cover
Categorization of Carbon Sequestering Activity[55]	1	1	1	2	2	1	1, 2
Implementation Status[56]	1	4	3 or 4	1	1	3	3

[55] 1. Off-farm rehabilitation 2. On-farm tree-planting, agroforestry, agricultural soil management 3. REDD 4. Other

[56] 1. Still in scoping/planning phase, 2. Project plan developed 3. Practices in place, but no money exchanged, 4. Money exchanged

Project Name	Rehabilitation of degraded lands of Djidja	Community based woody savanna management and woodlot for carbon sequestartion	Protection of Cameroon Estuary Mangroves	Oil palm regeneration and recycling of oil palm by-products	Revitalizing Communities through Conservation Agriculture Bong County, Liberia	Mali's Acacia Senegal Plantation Project	Agro-Industry Development- SA AID
Emissions Reductions (actual and/or target)	Up to and including 2012: 12 000 t CO2e; Up to and including 2017: 15.000 t CO2e	5300000 tCO2	51,234 t CO2e through 2012			The project is expected to sequester around 300,000 tons of CO2e by 2017 and 800,000 tons of CO2e by 2035	Need to investigate.
Farmer's Benefits	See Note B			See Note F	See Note G	See Note H	See Note M
Other Ecosystem Services Benefits (Biodiversity/ Watershed)	See Note C					See Note I	Increased forest cover and regeneration of natural tree species that can support increased biodiversity. Also, increased soil nutrients and water retention.
Standard/MRV Methodology	CDM	Sustainable forest management				CDM	REDD
Developer/Investor & Type[57]	French Global Environment Facility (FFEM) (4)	Global Environment Facility (4)	financed by the French World Environment Funds (FFEM) (4)		Care International. Howard G. Buffett Foundation (2)	Déguessi Groupe; World Bank biocarbon fund also an investor (6)	Terra Global Capital (5)
Field Program Manager & Type [58]	LOKOSSOU Achille Orphée : lokossouo@yahoo.fr	Government and local communities	Cameroon Wildlife Conservation Society (3)	Rural society for thrift and loan, Cooperative Ngie (3)	Care International in Liberia (2)	See Note J 6)	Dr. Ibrahim Togola, aidsamali@gmail.com
Sellers/Role of the Sellers/Organization of the Sellers/Other Info and Seller Type[59]			Use of improved fish smoked houses in order to reduce greenhouse gases emissions associated to fish smoking, but also to reduce the pressure on wood resource			The initiators of the projects are local communities, NGOs and entrepreneurs	Mali-folkecenter Nyetaa

[57] 1. International environmental NGO 2. International development NGO 3. Local/national NGO 4. World Bank/multilaterial/bilaterlal donor 5. Carbon developer 6. Private business operating in non-carbon activities (agribusiness, forestry, energy) 7. Private foundation 8. Private bank 9. CGIAR/research institute, 10. Local/national government 11. Local/national company

[58] 1. Environmental NGO 2. Development NGO 3. Local/National NGO 4. World Bank/multilaterial donor 5. Carbon developer 6. Private, non-carbon agribusiness, timber 7. Local farmer/community org 9.National government agency 10. CGIAR/research institute 11. Local energy company 12. School

[59] 1. Farmers/producer org. 2. Newly formed groups 3. Large scale private

Project Name	Rehabilitation of degraded lands of Djidja	Community based woody savanna management and woodlot for carbon sequestartion	Protection of Cameroon Estuary Mangroves	Oil palm regeneration and recycling of oil palm by-products	Revitalizing Communities through Conservation Agriculture Bong County, Liberia	Mali's Acacia Senegal Plantation Project	Agro-Industry Development- SA AID
Buyers/Role of the Buyers/ Organization of the Buyers/Other info and Type[60]						World Bank	
Other Institutional Arrangement Info, Roles of other Project Participants	UNEP RISEO, World Bank's Community Development Carbon Fund (CDCF), CIRAD, French national Forestry Office		administered by the United Nations Environment Program (PNUE), ONF International gives technical support			Note K	The Mai-Folkecenter is an NGO funded by the Danish Folkecenter
Land Tenure Status	Unknown	All products belong to the community				Developed on Public and Private Land	Land belongs to small owners of Shea trees
Support Services from other Intermediaries				Spire International, local cooperative	Ministry Of Agriculture CARI (Central Agricultural research Institute) A2N (Africa 2000 Network) PNO (Project New Outlook)		Small farmers are organized in cooperatives that assemble small farmers into a big coordinated entity. This is to allow easier monitoring and verification procedures
Additional Notes	See Note D					See Note L	See Note N
For More Info	www.cascade-africa.org	Winrock International report		elumenjoh@yahoo.com	Henry Khonyongwa, henry.khonyongwa@co.care.org	http://wbcarbonfinance.org/Router.cfm?Page=BioCF&FID=9708&ItemID=9708&ft=Projects&ProjID=24878, http://www.ipsnews.net/africa/nota.asp?idnews=50004	www.malifolkecenter.org

Note A: For the reforestation and the restoration of the lands, three different plants will be used: Anacardium occidentatlis (for Cashew nuts production), Gliricidia sp, Acacia sp Senne siamea (for soil fertility restoration) and Tectona grandis, Gmelina Eucalyptus sp Khaya sp (for Timber production). All tree species used in the reforestation activities are proven in the area and not known to be invasive. Based on conservative estimates, with a yearly rotation cycle for all tree species, the project will save up to and including 2017: 15.000 t CO2e. Agro forestry technologies will be used and the planted plots will be geo identified and referenced. Furthermore, the project includes not only site preparation, planting, tending, weed control, thinning and pruning but also fire management, pest control and disease management.

[60] 1. World Bank/donor, 2. individuals, 3. agribusiness, No Credits yet (NC) 4. private philanthropy 5. private intermediary/broker 6. private business

Note B: Apart from selling products at the local markets, the project region is almost completely lacking income generation opportunities. Therefore, the re-vitalization of the forestry sector creates employment opportunities and is highly beneficial for the integrity of the local communities in the area. The local communities further benefit from the provision of fuel-wood. The employment plan for the project indicates a need for approx. 500 people in the establishment phase of the project. Women find new employment opportunities in nursery work and weeding. After the establishment phase about 200 people will be needed for fire protection, thinning and pruning (until year 14).
Note C: There are several benefits for the environment as well as for the population. The plantation of trees will firstly help with regards to the fixing of soil. The pruning of the branches offers a gain in wood energy for the local populations and reduces the pressure on the forest resources. The legumes will be beneficial for the restoration of the fertility of soils, contribute to the conservation of soils and avoid the clearance of new land within the protected areas.
Note D: Benin has one of the highest deforestation rates in the World. The consequence of the high demographic density in the southern part of the country has resulted in the intensive use of lands and the scarcity of forests. About 70.000 hectares of forests have been destroyed per year between 1990 and 2000 because of increasing needs in agricultural lands, grazing, wood and hunting. Djidja is one of the most degraded parts of Benin. This degradation is due to agricultural practices and degradation of the forest. The only way to restore the lands is to restore the forests. Therefore the project aims at the rehabilitation and restoration of degraded lands of Djidja. The protected domain is about 2184ha. The General Directorate of Forests and Natural Resources will be in charge of land management.
Note E: The goal is to increase the production of palm oil and to sequester carbon by replacing aging palm with improved palm trees. They will plant 200,000 hybrid palms. Spire International has provided one farming group with 1000 improved seedlings this year. Northwest development authority gave 10000 improved seeds to the area in 1998-2000. The oil is processed by local women. The project will be making use of organic manure to produce oil palm waste to improve the soil, to plant systematically under the oil palm without destroying the forest. They also want to educate the farmers on how to fight climate change through best farming practices and to produce biogas for cooking for waste and sludge oil. Everything produced from oil palm will be recycled and used.
Note F: The palm products can be used for vegetable oil, animal feed, the shavings for organic manure, and the sludge oil for biogas methane. The project will help the farmers get an oil mill, an oil palm nursery, and the products will be sold to the local cooperative. People will get technical training from the local cooperative
Note G: 4000 farmers involved to help improve crop yields and soil fertility through smallholder adoption of Conservation Agriculture (CA) techniques, reduce crop and post-harvest losses through improved drying, storage facilities, and processing, strengthen capacities and collaboration among stakeholders to expand conservation agriculture in Bong County, create awareness about conservation agriculture at the national and regional level, and ensure that marginalized groups (including women, youth, immigrants, and returned refugees and combatants) also benefit from CA by receiving specific support, including informal, longer-term land use rights.
Note H: Some of the villagers have permanent employment on the plantation, earning just under $50 a month. During a brief period of heightened activity each year, every able-bodied person in the area finds work on the project. More time is needed before the anticipated revenue from the plantations is sufficient to contribute to building schools and health centers in villages. Apart from the money earned by villagers, the plantations have other immediate benefits, especially from an agricultural perspective. The soil in the area is poor, but Acacia senegalensis enriches its nitrogen content, supporting intercropping of the trees with other crops during the short rainy season from July to September. Hundreds of farming families are expected to receive social benefits from the project through additional revenues generated by Arabic gum, grains and forage, combined with Credit Emission Reductions (CERs). Déguessi Groupe will purchase Arabic gum from participating farmers and IER, and redistribute the proceeds of CERs sale to them
Note I: Acacia Senegal is superbly adapted to harsh ecological conditions and produces several environmental benefits. Besides producing gum, it allows the rehabilitation of degraded areas that have become unfit for agriculture. Acacia's rooting system is very powerful, which makes it efficient for dune-fixing as well as wind and water erosion control. Its nitrogen-fixing ability improves soil fertility up to restoring agriculture. The restoration of a tree cover will also benefit local biodiversity.
Note J: Oumar Oniangado +223 55 76 43 55, oniangado@affribonenet.ml ; Sory Makanguile +223 667 528 59, smakanguile@yahoo.fr; Déguessi Groupe (Deguessi Vert, SA) will develop and manage cost-effective modern nurseries, contribute to farmers' training and assistance for planting trees, maintaining plantations, and Arabic gum harvesting.
Note K: Technical support of the International Center for Research in Agro-forestry (ICRAF) and the International Crop Research Institute for Semi-Arid Tropics (ICRISAT). The project will also work in close collaboration with the Agricultural Diversification and Competitiveness Program (ADCP) financed by the World Bank.
Note L: Although the acacia tree is very resistant to harsh conditions, the saplings are not growing very well in this arid part of Mali. In Dialoubé, the surviving saplings have not yet reached the required size to be eligible for carbon credits; two years after they were planted, they are still short of the 1.3 meter height and 2.5 cm diameter requirement. Another problem is a lack of finances. In 2009, only 600 hectares were prepared in the four villages in this area due to a lack of resources - well short of the planned 1,000 hectares intended to be planted each year.
Note M: Increased Shea butter production because of reforestation. Shea is one of the most important trees to women in Mali. The butter made from it is used for cooking, soap production and skin cream. The butter is in high demand in the market and one woman can sell up to 100 kilos of Shea butter in a good year. However, with the impact of climate change the trees are producing less, which directly affects the income of women. Reversing this trend with local reforestation will create a small microclimatic zone where Shea tress can flourish. So far the lower incomes due to less Shea production have had an impact on health, especially for children. According to local populations, different illnesses have been increasing in the villages in recent years.
Note N: The Ali-Folkecenter (MCF) is a Malian NGO which represents the Danish Folkecenter for Renewable Energy. Their approach to development activities has always been based on grassroots initiatives from the communities concerned, with direct involvement of local people during execution. The emphasis is on comprehensive training to target groups and, where appropriate, creation of maintenance and management committees, in order to facilitate appropriation of activities and build capacity needed for long-term goals. Priority has been given to use income generating mechanisms what can ensure profits go local communities.

Ghana, Niger, Nigeria

Project Name	Bambidie Wood Residue Co-generation Project	Cocoa Carbon Initiative	Nyamkamba Escarpment	Kuapa Kokoo	Shea Butter Carbon	Niger: Acacia Senegal Plantation Project	Sustainable Energy Center of Excellence
Start Date	**2010**	**2010-2011**		**1993**	**Possibly 2011-12**	**2006**	
Country	**Gabon**	**Ghana**	**Ghana**	**Ghana**	**Ghana**	**Niger**	**Nigeria**
Location/Ecosystem	Bambidie Village	Western Region where the last vestiges of intact forest remain	The Nyankamba Community Resource Management Area	Several locations in Ghana including: Goaso, Kakum, Asem	Degraded woodlands dominated by Shea trees	Natural dry forests	
Size (ha)		4,000 ha	48,000 ha	It would cover 68, 162 members in 6 cocoa regions and 58 cocoa districts	8,000 ha	Will reforest over 17,000 ha of Acacia Senegalensis	
Practices to Sequester Carbon	Substitute three generators running on fossil fuel with a cogeneration power plant, which is fuelled with residual wood of the neighboring sawmill	Increased tree cover and sustainability in cocoa agroforestry systems, forest conservation and avoided deforestation linked to enhanced farm productivity, reforestation of abandoned or marginal lands through establishment of cocoa agroforests, or avoided conversion of high-shade/high-carbon cocoa agroforestry systems to full-shade systems	This is basically a REDD project, but the aim is to promote sustainable alternative land uses for the local communities, as sustainable farming and charcoal production, forest management, sustainable harvesting of the NTFP shea nuts), environmental education, social and health programs, ecotourism, etc.	Halt expansion of cocoa cultivation into Forests Reserves in target areas; protect non-reserved forests and secondary forests in communities and the target Districts; establishing new farms in previously cultivated lands like fallows and overripe cocoa	Afforestation of degraded Shea woodlands, agroforestry activities and designation of selected land for timber	Reforestation with Acacia Senegal, a species endemic to the African Sahel.	Planting switchgrass
Categorization of Carbon Sequestering Activity[61]	4	1, 3	3	3	1 and 2	1	2
Implementation Status[62]	4	2, See Note A	1- the prefeasibility study started in August 2009	1	1	3 or 4	1

[61] 1. Off-farm rehabilitation 2. On-farm tree-planting, agroforestry, agricultural soil management 3. REDD 4. Other

[62] 1. Still in scoping/planning phase, 2. Project plan developed 3. Practices in place, but no money exchanged, 4. Money exchanged

Project Name	Bambidie Wood Residue Co-generation Project	Cocoa Carbon Initiative	Nyamkamba Escarpment	Kuapa Kokoo	Shea Butter Carbon	Niger: Acacia Senegal Plantation Project	Sustainable Energy Center of Excellence
Emissions Reductions (actual and/or target)	18200 t CO2e through 2017	To be determined. The calculations of emission reductions is one of the next step envisioned by the project developers.	5,185,152 tCO2 of REDD credits (already discounting project emissions, non-permanence and leakage buffers)	To be determined	537,280 tons in 20 years	The project should allow the sequestration of around 0.24 Mt CO2e by 2012 and around 0.82 Mt CO2e by 2017; 1077926 tCO2e total.	
Farmer's Benefits	Improved livelihood of people with access to reliable energy	See Note B		Bonuses, access to credit, community development projects, women's enterprise groups, revenue from credits split between the farmers' fund	Benefits deriving from the sales of timber and carbon credits.	See Note E	
Other Ecosystem Services Benefits (biodiversity/watershed)	Reduced carbon emissions and reduced dependence on fossil fuel in power generation	More soil nutrients, high biodiversity levels and higher forest cover.		The cocoa farms integrated with the local rainforest would support a large variety of local species	Restoration of degraded land, reduction of soil erosion rate,	Dune-fixing, wind and water erosion control. Its nitrogen-fixing ability improves soil fertility up to restoring agriculture.	
Standard/MRV methodology		REDD+	REDD	REDD+	CDM A/F	CDM	
Developer/Investor & Type[63]	Precious woods holding (6)	The West Africa Incubator, in partnership with the Nature Conservation Research Centre (NCRC) (1)		1	Prof. John C. Lovett, Centre of Technology and Sustainable Development, Twente, Enshede, Netherlands, & Dr. Peter N. Lovett of West Africa Trade Hub(5)	(4)	The Sustainable Energy Center of Excellence at the Energy Commission of Nigeria. There is also some agreement with the World Energy Council (4, 10)
Field Program Manager & Type [64]		Rebecca Asare rasare@forest-trends.org		7	The West Africa Trade Hub. Dr. Peter Lovelett	6, See Note F	

[63] 1. International environmental NGO 2. International development NGO 3. Local/national NGO 4. World Bank/multilaterial/bilaterlal donor 5. Carbon developer 6. Private business operating in non-carbon activities (agribusiness, forestry, energy) 7. Private foundation 8. Private bank 9. CGIAR/research institute, 10. Local/national government 11. Local/national company

[64] 1. Environmental NGO 2. Development NGO 3. Local/National NGO 4. World Bank/multilaterial donor 5. Carbon developer 6. Private, non-carbon agribusiness, timber 7. Local farmer/community org 9.National government agency 10. CGIAR/research institute 11. Local energy company 12. School

Project Name	Bambidie Wood Residue Co-generation Project	Cocoa Carbon Initiative	Nyamkamba Escarpment	Kuapa Kokoo	Shea Butter Carbon	Niger: Acacia Senegal Plantation Project	Sustainable Energy Center of Excellence
Sellers/Role of the Sellers/Organization of the Sellers/Other info and Seller Type[65]		The Katoomba Group with local communities					
Buyers/Role of the Buyers/ Organization of the buyers/Other info and Type[66]	Substitute three generators running on fossil fuel with a cogeneration power plant fueled with wood waste from a sawmill	To be determined and it's too early for investment in carbon futures				1	
Other Institutional Arrangement info, Roles of other Project Participants		See Note C			The DNA in Ghana is the Environment Protection Agency.	See Note G	
Land Tenure Status		Cooperatives of smallowners comprising 1.2 million farmers.		Land rights owned by local farmer associations	Smallholders of Shea farms	Communal land	
Support Services From Other Intermediaries		The Kaupa Kkoo and the Cocoa Abrabapa cooperatives will provide aggregation			An aggregation mechanism has not been discussed yet, but it is very likely that it will be provided by cooperatives of farmers.	ASI, with ICRISAT technical support, World Bank Niger Community Action Program (CAP Niger).	World Energy Council, UN DESA, Global Environmental Faciility (pending finalization); Clouston Energy Research and support from the NRCS of the US Department of Agriculture.
Additional Notes		See Note D				See Note H	
For More Info	Xavier Jaffret xavierjaffret@preciouswoods.com	KG Incubator	www.katoombagroup.org	http://www.ecosystemmarketplace.com/documents/acrobat/katoomba_xv/october_7_2009/Kuapa%20Kokoo_draft%202.pdf;	plovett@watradehub.com	http://wbcarbonfinance.org/Router.cfm?Page=Projport&ProjID=9634	Dr. A.S. Sambo, alternate Sidney Clouston, assambo@yahoo.com cloustonenergy@aol.com , Energy Commission of Nigeria, www.energy.gov.ng

Note A: Once site selection is completed, they will move forward in the second quarter with detailed feasibility studies and the production of at least one project idea note by the end of this year, and a second in 2011.

[65] 1. Farmers/producer org, 2. Newly formed groups, 3 Large scale private

[66] 1. World Bank/donor, 2. Individuals, 3. Agribusiness, No Credits yet (NC) 4. Private philanthropy 5. Private intermediary/broker 6. Private business

Note B: If the Ghanian Government decides to increase tree tenure rights for farmers, they could enjoy a combined revenue from the selling of selected timber following increased tree intensification/afforestation as well as revenue from carbon credits.
Note C: The project is financed and implemented by the following consortium: Nature Conservation Research Centre, Forest Trends, The Katoomba Group, The Moore Foundation, The Rockefeller Foundation, Twin and Divine Chocolate.
Note D: Next steps: conduction of a feasibility study at each site, indentifying capacity and interest of site level partner organizations and associations that are working at each site, dialoguing with communities and local stakeholders to begin to gauge interest and capacity.
Note E: About 15,000 farming families are expected to receive social benefits from the project through additional revenues generated by Arabic gum, grains and forage, combined with Credit Emission Reductions (CERs). The project should annually produce about 1,200 tons of gum as well as groundnut, cowpea and other crop production resulting from intercropping; Besides producing gum, it allows the rehabilitation of degraded areas that have become unfit for agriculture.
Note F: Their sale will be coordinated by ASI and will provide the necessary additional income to realize the project. ASI will purchase Arabic gum from participating farmers, and redistribute the proceeds of CERs sale to them (6).
Note G: The project is supported by the World Bank-financed Community Action Program, which assures the financial and technical support to the communities. Recently, the Ministry of the Environment of Niger has also adhered to the initiative, providing financing and technical assistance for community plantations.
Note H: The project will build on a first pilot phase started in 1993 and developed by Achats Services International (ASI), a dynamic local company. Around 7,000 ha have already been planted and an adapted technology has been developed with the support of the International Crop Research Institute for Semi-Arid Tropics (ICRISAT).

Senegal

Project Name	**Asyila Gum Company SARL**	**Industries Chimiques du Senegal (ICS)**	**PRESAL (Restoration of Lands in the Senegal groundnut basin)**	**Senegal Green Charcoal Project**	**Restoration of Lands in the Senegal Groundnut Basin**	**Niokolo-Koba**
Start Date	**2000**	**2007**	**2007**	**2007**	**2007**	**To be determined**
Country	**Senegal**	**Senegal**	**Senegal**	**Senegal**	**Senegal**	**Senegal**
Location/Ecosystem	Area of degraded land, granted by the rural councils and once used as grazing areas for livestock. Arid Savhanna in Northern Senegal	Taiba, the Tivaaoune district and the rural community of Meoune. Reforestation of old quarries	Senegal Groundnut Basin	Saint-Louis Region	Ground nut basin	Niokolo-Koba national park, Southern Senegal
Size (ha)	40,000 ha	6,000 ha	15,000 ha	120 kg of green charcoal per hour; annual production of 700 tons of green charcoal, obtained from about 2,100 tons of renewable biomass	15,000 ha	The size of the park is over 900,000 square km. The project will aim at preserving the park itself by establishing a reforested buffer zone at its edges
Practices to Sequester Carbon	Planting and Reforestation	Reinforcing the rehabilitation of former quarries to reforest about 6000 ha, using carbon benefits to finance the activities. Replanting with two gum tree species. Acacia Senegal will be planted for the	The Afforestation/ Reforestation project PRESAL is a thirty-year program focusing on tree plantation to recuperate 15 000 ha affected by salinization (badlands without vegetation because of salinization).	Replace the wood charcoal and fuel wood used as domestic fuel by green charcoal, an alternative household fuel obtained from the clean carbonization of renewable biomass such as agricultural residues or	Restoration of 3 000 ha of salted lands (tannes), regeneration of agroforestry parklands and improvement of fertility of 2 000 ha of croplands, and capacity building of all actors in sustainable natural	The edges of the national park would be reforested to provide protection against deforestation, illegal logging and illegal charcoal production

Project Name	Asyila Gum Company SARL	Industries Chimiques du Senegal (ICS)	PRESAL (Restoration of Lands in the Senegal groundnut basin)	Senegal Green Charcoal Project	Restoration of Lands in the Senegal Groundnut Basin	Niokolo-Koba
		production of gum Arabica and Anacardium for the production of cashews.	Plantation will be of halophile (adapted) species in the Senegal groundnut Basin.	invasive weeds (typha)	resources management	
Categorization of Carbon Sequestering Activity[67]	1	1	1	4	1, 2	1
Implementation Status[68]	3 or 4	2	3	4	3 or 4	1
Emissions Reductions (actual and/or target)	5,019,972 actual net GHG tCO2 in 30 years	To be determined	52875 t CO2e through 2012	14539 tCO2 through 2014.	52875 t CO2e through 2012	To be determined
Farmer's Benefits	All labor force is recruited for the maintenance, security and development of the project has been recruited from surrounding villages. Also, the project is specifically targeting degraded zones around inhabited areas.	Seedlings are produced in nurseries. Guards secure replanting. The fodder reserve maintains milk production at an acceptable level until the end of the dry season for animals.	Benefits in agriculture and pastoral activities	Cheap fuel, as one kilogram of green charcoal sells for just 20 cents, whereas traditional charcoal currently costs three times that. High incomes, as 1kg of green charcoal, a vendor receives 5 US cents, whereas conventional charcoal brings in almost 20 cents per kilogram	Restoration of degraded lands which will increase farmer yields	The buffer zone would include agroforestry operations and the selling of the credits would support local populations that live at the edges of the park and that are the main cause of environmental degradation of the park.
Other Ecosystem Services Benefits (Biodiversity/ Watershed)	Improvement of soil nutrients, water retention and nitrogen fixation. Also, the Acacias create a microclimate around the target areas.	Grass cover will reduce wind erosion, improved biodiversity, involvement of local communities, he project.	Increasing carbon sinks and climate change adaptation activities for landscape management	Reduction in carbon emissions	Two native woody shrub (Guiera senegalensis J.F. Gmel and Piliostigma reticulatum (DC.) Hochst) are planted.	The park is the only area in Sengal where wild animals have been reintroduced.
Standard/MRV methodology	CDM	CDM	CDM			REDD

[67] 1. Off-farm rehabilitation 2. On-farm tree-planting, agroforestry, agricultural soil management 3. REDD 4. Other

[68] 1. Still in scoping/planning phase, 2. Project plan developed 3. Practices in place, but no money exchanged, 4. Money exchanged

Project Name	Asyila Gum Company SARL	Industries Chimiques du Senegal (ICS)	PRESAL (Restoration of Lands in the Senegal groundnut basin)	Senegal Green Charcoal Project	Restoration of Lands in the Senegal Groundnut Basin	Niokolo-Koba
Developer/Investor & Type[69]	French Global Environment Facility (FFEM) (4)	Industries Chimiques du Senegal and the French Global Environment Facility (4, 6)	French Global Environemnt Facility (FFEM) (4)	Pro-Natura green charcoal (1)	Directorate of Water, Forest, Hunting and Soil conservation (DEFCCS) / PROGERT (1)	Agence Nationale des Ecovillage (3)
Field Program Manager & Type [70]	Mr. Mamadou Ndiaye ndiaymad@hotmail.com	Mr. Alassane Diallo and Mr. Mamadou mboocum@ics.com (6)	Directorate of Water, Forest, Hunting and Soil conservation (DEFCS)/ PROGERT, Ibra Sounkarou NDIAYE (9)			
Sellers/Role of the Sellers/Organization of the Sellers/Other info and Seller Type[71]		Industries Chimiques du Senegal (ICS)			Restoration of 3,000 ha of salted lands (tannes), regeneration of agroforestry parklands and improvement of fertility of 2 000 ha of croplands	
Buyers/Role of the Buyers/Organization of the Buyers/Other Info and Type[72]	European CDM Investors (5)			Installation of a biomass pyrolyzer "Pyro-6F" (2, 6)		
Other Institutional Arrangement info, Roles of other Project Participants	UNEP RISEO, World Bank's Community Development Carbon Fund (CDCF), CIRAD, French national Forestry Office	UNEP RISEO, World Bank's Community Development Carbon Fund (CDCF), CIRAD, French national Forestry Office	UNEP RISEO, World Bank's Community Development Carbon Fund (CDCF), CIRAD, French national Forestry Office	The credits are sold to Air France	The project will complement ongoing research initiatives (to recuperate the salinized zone).	

[69] 1. International environmental NGO 2. International development NGO 3. Local/national NGO 4. World Bank/multilaterial/bilaterlal donor 5. Carbon developer 6. Private business operating in non-carbon activities (agribusiness, forestry, energy) 7. Private foundation 8. Private bank 9. CGIAR/research institute, 10. Local/national government 11. Local/national company

[70] 1. Environmental NGO 2. Development NGO 3. Local/National NGO 4. World Bank/multilaterial donor 5. Carbon developer 6. Private, non-carbon agribusiness, timber 7. Local farmer/community org 9.National government agency 10. CGIAR/research institute 11. Local energy company 12. School

[71] 1. Farmers/producer org. 2. Newly formed groups 3. Large scale private

[72] 1. World Bank/donor 2. Individuals 3. Agribusiness, no credits yet (NC) 4. Private philanthropy 5. Private intermediary/broker 6. Private business

Project Name	Asyila Gum Company SARL	Industries Chimiques du Senegal (ICS)	PRESAL (Restoration of Lands in the Senegal groundnut basin)	Senegal Green Charcoal Project	Restoration of Lands in the Senegal Groundnut Basin	Niokolo-Koba
Land Tenure Status	See Note A	ICS				The area is a protected national park
Support services from other intermediaries						
Additional Notes		See Note B		See Note C		See Note D
For More Info	www.cascade-africa.org	www.cascade-africa.org	Progert@groundnut.sn	Mr. Guy Reinaud E-mail : pro-natura@wanadoo.fr www.pronatura.org	Progert@groundnut.sn Progert@orange.sn	Internal communications and peronal contact

Note A: The strategy of ASYILA's land acquisition is based on the fencing of the granted parcel, a system of sharing the revenues/crops, the gum trees plantation, and the cultivation contracts entered into with the villagers. ASYILA thereby secures the land tenure and avoids any future dispute over the property of the gum trees and the produced gum. The seedlings for reforestation are produced in village nurseries established by the society.

Note B: Within the framework of their environmental policy, important rehabilitation work by reforestation of old quarries has been done in collaboration with the local population, even if Senegalese law does not oblige ICS to do so. The project aims at reinforcing the rehabilitation of former quarries in order to reforest a surface of about 6000 ha, using carbon benefits to finance the activities. The land, which is completely degraded because of former phosphate extraction out of the quarries, will be replanted with two gum tree species, which are adapted for plantation in the area. Acacia Senegal will be planted for the production of gum Arabica and Anacardium for the production of cashews.

Note C: The project was supported by Action Carbone (France). The pyrolysis technology produces 11.6 tons of CO2-equivalent reduction of greenhouse gases per ton of green charcoal produced by Pro-Natura's pyro-7 technology.

Note D: The project has not yet been disclosed publicly. Although funds have been provided, local administration has proved to be slow in the implementation phase.

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