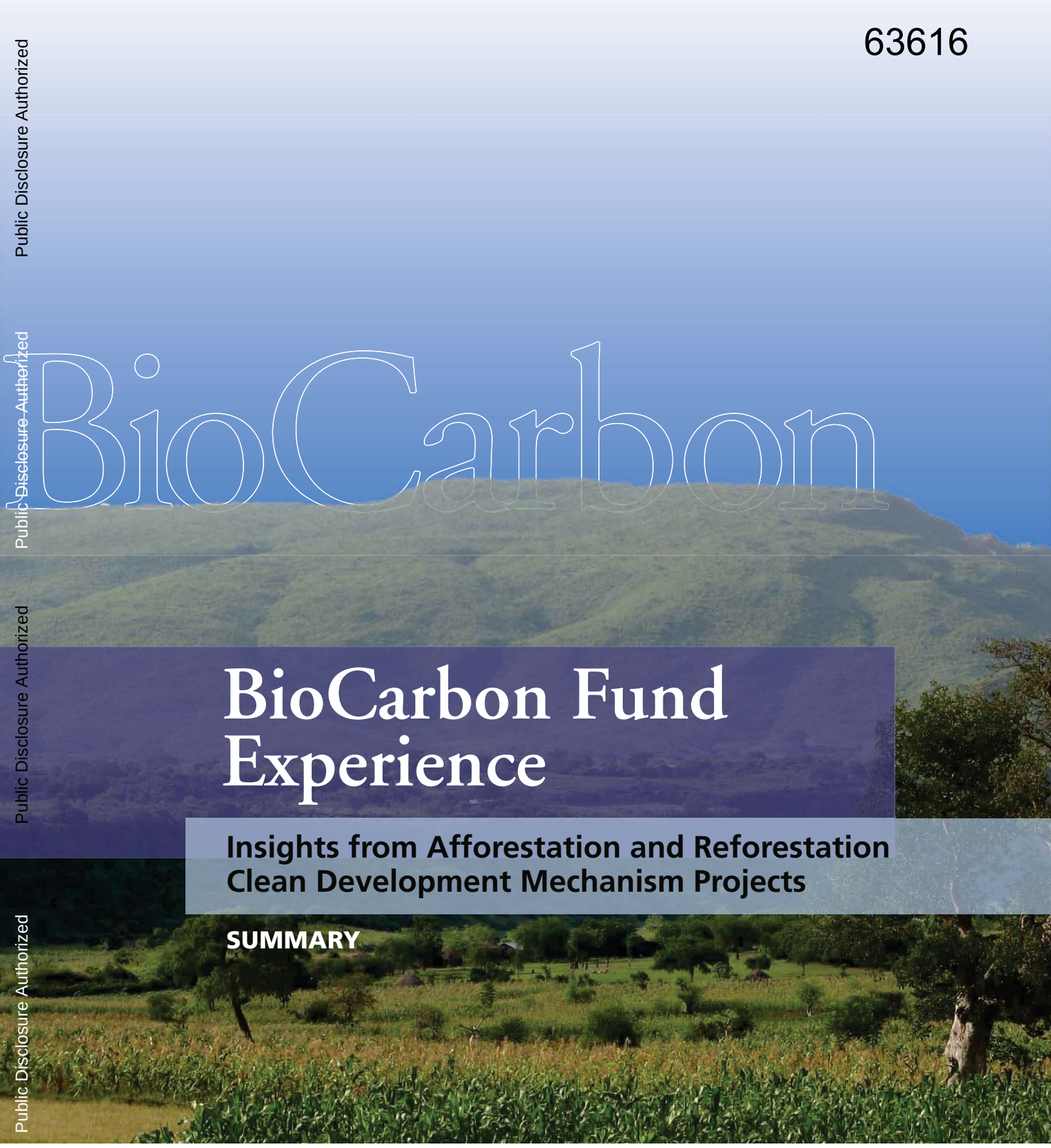
BioCarbon

BioCarbon Fund Experience

Insights from Afforestation and Reforestation Clean Development Mechanism Projects

SUMMARY



BioCF

Carbon Finance
AT THE WORLD BANK

The BioCarbon Fund

Housed within the Carbon Finance Unit of the World Bank, the BioCarbon Fund (BioCF) is a public-private initiative mobilizing resources for pioneering projects that sequester or conserve carbon in forest- and agro-ecosystems, mitigating climate change and improving local livelihoods. The overall goal of the Fund is to demonstrate that land-based activities can generate high-quality emission reductions with strong environmental and socio-economic benefits for local communities.

The BioCF became operational in 2004 with Participants providing funds for both Afforestation and Reforestation projects (A/R) under the Clean Development Mechanism (CDM) and other land-based projects currently excluded from the CDM (e.g., Reducing Emissions from Deforestation and Forest Degradation-Plus (REDD+) and sustainable agricultural land management). The Fund has two tranches. The first tranche became operational in 2004 with total capital of $53.8 million; because of the high level of interest in land-based carbon a second tranche, capitalized at $38.1 million, was opened in 2007. Participants investing in the BioCF include six public entities and 12 private companies.

Most of the BioCF resources (about 80 percent) have been earmarked to A/R CDM projects (first windows of each tranche); the remainder has been allocated to REDD+ and sustainable land management projects (second windows). The Emission Reductions (ERs) generated by these projects are purchased by the BioCF on behalf of its Participants and are subsequently transferred to them *pro rata* their financial participation in the Fund. The contractual undertakings of a project entity and the BioCF for the sale and purchase of ERs are contained in an Emission Reductions Purchase Agreement (ERPA).

As of May 2011, the BioCF had contracted 8.6 million Emission Reductions from 21 A/R CDM projects. These projects are located in 16 countries and five regions of the world. The BioCF resources are allocated to projects on degraded lands: half to projects with environmental restoration purposes, 25 percent for fuel-wood and 21 percent for timber. All of the projects directly benefit poor farmers; in 17 of them, farmers are planting their own lands. At the time of writing, nine BioCF projects have been registered under the CDM, one is under review at registration, two are requesting registration, six are undergoing validation, and three are under preparation. Registered projects are preparing for verification. Projects duly validated start receiving carbon payments as per ERPA provisions.

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The full version of this report can be found on the website of the World Bank's Carbon Finance Unit: www.biocarbonfund.org

Washington, DC, May 2011

Uganda Nile Basin Reforestation Project

Executive Summary

The Clean Development Mechanism (CDM) of the United Nations Framework Convention on Climate Change (UNFCCC) is one of the flexible mechanisms of the Kyoto Protocol intended to reduce the concentration of greenhouse gas (GHG) emissions in the atmosphere in a cost effective manner. The CDM allows developed countries to use Certified Emission Reductions (CERs) generated from sustainable development projects in developing countries to meet part of their emission reductions targets under the Kyoto Protocol. Developing countries in return receive investments in clean technology and revenue from the sale of these emission reductions, once they are generated. Emission reductions are certified by the Executive Board of the CDM (CDM EB). One CER is equivalent to one tonne of carbon dioxide (tCO_2e).

The land use, land-use change, and forestry (LULUCF) sector is responsible for about 17 percent of global anthropogenic GHG emissions.[1] The UNFCCC has recognized the importance of this sector for stabilizing concentrations of GHG in the atmosphere, and has included Afforestation and Reforestation (A/R) as one of the 15 sectors that are eligible to generate emission reductions and offset credits under the CDM. A/R projects remove carbon from the atmosphere through planting trees and assisting in the natural regeneration of degraded lands. Quantification of emission reductions is done by applying baseline and monitoring methodologies approved by the CDM EB.

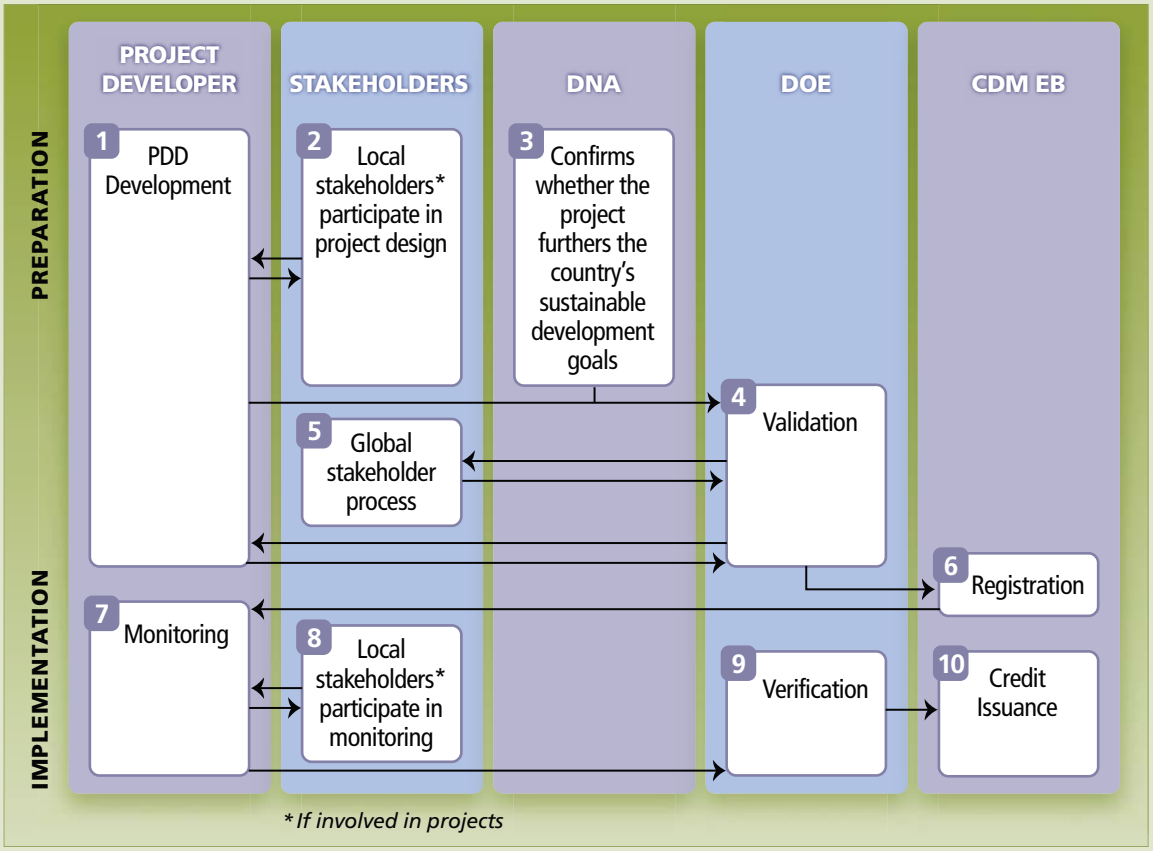
1 IPCC (Intergovernmental Panel on Climate Change), 2007. Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Geneva.

Box 1

Processes for A/R CDM Projects

A/R CDM projects follow the same processes as projects in other CDM sectors: project preparation, validation, registration, monitoring, verification, and issuance of certified emission reductions. The crediting period of an A/R project is either a 30-year or a 20-year period that is renewable twice.

FIGURE 1 PROCESSES AND STAKEHOLDERS INVOLVED IN THE A/R CDM PROJECT CYCLE



Steps 1 and 2: Following CDM rules, project developers and local stakeholders produce a Project Design Document (PDD). To do this they have to apply a CDM-approved baseline and monitoring methodology.

Steps 3, 4, and 5: The PDD is validated by a Designated Operational Entity (DOE), an independent auditor. This assessment aims to ensure PDD conformity with the A/R CDM rules and stakeholder comments, as well as the project's contribution to the host country's sustainable development goals. The latter is confirmed by a Designated National Authority (DNA).

Step 6: With a positive validation report, the DOE submits the PDD for registration under the CDM. Before registration, the CDM EB checks the completeness of documentation submitted by the project and reassesses it to address concerns if any were brought up by at least three of its members or a project participant.

Steps 7 and 8: The monitoring plan is implemented by the project developer and local stakeholders. Such a plan is designed based on the GHG accounting methodology selected for the project.

Steps 9 and 10: At verification, the DOE verifies the monitoring report submitted by the project developer; a positive verification report will result in the issuance of Certified Emission Reductions.

The BioCarbon Fund (BioCF), housed within the Carbon Finance Unit (CFU) of the World Bank, is a public-private initiative mobilizing resources for pioneering projects that sequester or conserve carbon in forest- and agro-ecosystems, mitigating climate change and alleviating poverty. Most of the BioCF resources (about 80 percent) are earmarked for A/R CDM projects using different carbon sequestration technologies, including assisted natural regeneration, forest restoration, community reforestation, agroforestry, and silvopastoral systems.

This report presents insights from the BioCF's seven years of experience designing and implementing A/R CDM projects in 16 developing countries. All of the projects directly benefit poor farmers. The report is intended to inform project developers of the challenges and opportunities that A/R CDM projects have encountered on the ground. The insights presented here are also relevant for policymakers and negotiators currently involved in the debate to reform the CDM rules and for informing discussions on new market-based strategies for climate change mitigation in the Agriculture, Forestry, and Other Land Use (AFOLU)[2] sector.

The BioCF experience shows that initially A/R CDM project developers encountered significant difficulties applying the methodologies approved by the CDM EB and preparing their Project Design Documents (PDDs), a requirement for project registration under the CDM. In response to feedback about these challenges, the CDM EB has improved and simplified the A/R CDM rules and procedures. As a result, some project developers are now replicating and scaling up their activities. Some governments are also working on mainstreaming carbon finance into their national sustainable land-use strategy. BioCF projects have demonstrated that forest carbon finance can contribute to climate change mitigation while achieving important co-benefits in rural areas.

Despite its potential to mitigation and adaptation to climate change, the A/R sector remains underdeveloped for two main reasons. First, the demand for forest carbon credits is still very limited.[3] Second, most project developers still lack the capacity to apply today's rules for greenhouse gas accounting effectively. The A/R CDM rules and procedures need to be further simplified to become more pragmatic and to accommodate realities on the ground. Moreover, communication between the CDM EB and project developers needs to be more effective and the local capacity for developing forest carbon projects strengthened.

The main insights from the BioCF experience in developing and implementing A/R CDM projects is presented in nine chapters: (i) CDM regulations, (ii) land-related issues, (iii) GHG accounting, (iv) nonpermanence, (v) finance, (vi) institutional arrangements, (vii) under-delivery risk, (viii) co-benefits, and (ix) looking ahead.[4] A summary of the main insights from each section of this report is presented in this Executive Summary. The report concludes with a discussion of how this experience could inform the debate about the Reducing Emissions from Deforestation and Forest Degradation, the role of conservation, sustainable management of forest, and enhancement of forest carbon stocks (REDD+) mechanism and could promote synergies between the UNFCCC and other UN Conventions and development goals. To support the reader of the Executive Summary, the main technical issues pertaining to A/R CDM projects are briefly described in Box 2.

Regulatory Issues: The Challenge of Pursuing Forest Carbon Credits with Environmental Integrity, Efficiency, and Effectiveness

- **Designing a project and developing a PDD can be a time-intensive and costly task.** Projects developed by highly motivated entities with good managerial capacity in countries with a strong forestry sector have been the most effective in project preparation and PDD development. Developing a forest carbon project–including writing the PDD–requires a wide range of technical and managerial expertise (e.g., forestry, forest carbon, financing, land-use change, economics, institutional and legal, coordination). Gathering such multidisciplinary teams in rural areas of developing countries is

2 AFOLU is a term that superseded Land Use, Land-Use Change, and Forestry (LULUCF) in the latest guidelines of the Intergovernmental Panel on Climate Change (IPCC), integrating agriculture, land use, and forestry.

3 The European Union (EU) excludes forest carbon credits from the categories of eligible assets to be used by EU operators to comply with their emission reductions commitments under the EU Emissions Trading Scheme (EU ETS).

4 The report is based on an analysis of in-depth desk review of Project Idea Notes (PINs), PDDs, reports on environmental and social assessments, BioCF annual reports, World Bank evaluation reports, safeguard policy compliance, and CDM validation reports. The data collected were analyzed with descriptive statistics, and illustrative examples were used as case studies.

Box 2

Key Rules for A/R CDM Projects

LAND ELIGIBILITY

Developers must demonstrate that the A/R project will not cause deforestation or prevent natural regeneration. To do this, they have to prove that the land remained deforested from December 1989 until the project start date. Project developers must also demonstrate that any observed deforestation is not temporary. Evidence of this can include satellite images, aerial photography, and/or participatory rural appraisal results. Projects make this assessment based on the national definition of forest for the CDM, which delineates forest area, minimum tree height, and crown cover.

PROJECT BOUNDARY, CONTROL OVER THE LAND, AND LAND TENURE

Project developers must delineate and provide geo-referenced coordinates of the discrete land areas where trees will be planted. The sum of discrete areas encompasses the project boundary. At validation, the project developer must provide the coordinates of the total project boundary and evidence of control over at least two-thirds of the lands; the remaining evidence must be provided at verification. Evidence of control over the land includes land-use contracts between the landowner and the project developers. Developers must also demonstrate clear legal title to the land, forest rights, and rights to the carbon credits.

GHG ACCOUNTING

The baseline and monitoring methodologies prescribe the procedures to estimate the *ex-ante* "net actual anthropogenic emission reductions by sinks" achieved in projects, which is translated into tonnes of CO_2e. In doing this, project developers deduct the GHG removals by sinks that would have occurred in the baseline from the actual emission reductions achieved in the project scenario. The emissions attributable to the project happening within and outside its boundary (leakage) must be deducted from the actual removals within the project boundary. The carbon stocks and changes in the baseline are estimated through sampling of the project area before project implementation. To estimate the carbon stock and changes in the project scenario, developers take into consideration the forest management plan and apply existing tree growth data. At monitoring, project developers sample the project to estimate actual planting growth and calculate *ex-post* emission reductions, following the methodology.

EMISSIONS AND LEAKAGE

Sources of emissions are, for example, the use of fossil fuels for project preparation and biomass burning. Sources of leakage include activity displacement from the project area to agriculture, grasslands, and forest lands. Early versions of methodologies required project developers to account for several more sources of emissions and leakage. Most recent versions are simpler in this regard as they do not consider insignificant sources relative to the project's total emission reductions.

NON-PERMANENCE

Reflecting the UNFCCC's approach to non-permanence in the A/R sector, tonnes of CO_2e produced in projects are accounted for as temporary credits. Conversely, credits originated in other CDM sectors are considered permanent. Temporary forest credits have a limited life: credits having a five-year life are called temporary CERs (tCERs) and those expiring at the end of the crediting period (30 years or 20 renewable twice) are called long-term CERs (lCERs). Buyers of tCERs and lCERs must replace them with permanent credits before their expiration date.

SCALE OF PROJECTS

Projects producing less than 16,000 tonnes of CO_2e per year are considered small-scale projects and are allowed to apply simplified modalities and procedures for A/R. Small-scale A/R projects have to be developed or implemented by low-income communities. Following defined rules, a project developer is allowed to bundle small-scale projects as a way to benefit from economies of scale.

a challenging task. Reliance on external consultants remains high, increasing projects' transaction costs. Lack of host countries' forestry sector information for additionality has proven to be a major challenge for timely completion of PDDs.

- **DNAs can have an effect on the time projects spend on validation.** DNAs must play a supportive role and focus on the analysis of the project's contribution to the national sustainable development objectives. In some countries, these entities have at times delayed the issuance of documentation required by projects at validation. This is sometimes due to the DNA's lack of understanding of its role in contributing to the project success for registration and overall project feasibility. It is important to recognize, however, that DNAs are also on a learning curve; in some countries this challenge has already been overcome.

- **Validation is often delayed because many project developers do not fully grasp the rules for GHG accounting or lack the capacity to track the changes in rules, methodology versions, and required documents forms.** Increased experience in PDD preparation and the development of tools to facilitate GHG accounting have partially addressed these challenges. The CDM EB continues consolidating methodologies and presenting rule changes in a more consistent manner. Still, additional efforts are needed in this direction. In countries with minimal capacity this remains a problem. Also, project developers have serious difficulties tracking the latest versions of CDM EB guidance to update their PDDs, and this is a major source of delay in validation. Because of this, developers continue to rely on external consultants for validation, which prevents total ownership of the project and has serious implications for effective implementation of later stages of the project cycle (e.g., monitoring).

- **Delays at registration and issuance are expected to be significant in A/R projects due to the stringent scrutiny by the CDM EB.** At registration, project documentation undergoes a "completeness check" process. Projects frequently fail this check as developers get overwhelmed with complying with the validation process and disregard the importance of presenting the required documentation in a comprehensive and accurate manner. The difficulties in tracking CDM EB decisions are also reflected in this poor performance. Moreover, additional technical review may be required if at least three members of the CDM EB or a party involved in the proposed project activity request it. As stated in the World Bank report *10 Years of Experience in Carbon Finance*,[5] this review was frequent in the past. Although the CDM EB has made important improvements to revert this trend, some A/R projects have been reviewed at registration. Extra examinations at registration and issuance may put A/R projects at risk of not getting credit issuance before the end of the first commitment period of the Kyoto Protocol because the queue of projects requesting registration and credit issuance is increasing as 2012 approaches.

- **The verification process can be delayed when PDDs are not strictly followed.** Project developers and field teams often disregard the importance of strictly following the PDD at implementation. This is compounded by the live nature of such projects and, sometimes, the fact that project developers and field teams are not involved in the preparation of the PDD. Also, the monitoring of A/R projects has its own complexities as it requires developers to assess many variables. Significant deviation from the PDD at project implementation will increase the number of formal processes since a revised monitoring plan must be approved by the CDM EB; this consequently will delay credit issuance. To overcome this challenge, it is important to further simplify the monitoring rules and increase local capacity.

The A/R CDM Land-related Rules: Challenges and Opportunities

- **Complying with the land eligibility and project boundary rules is a challenging task for project developers.** It demands both human and technical capacity to interpret satellite imagery and resources to invest in technologies. Also, developers have struggled with tracking the many changes that the CDM EB has introduced to the land eligibility rule. These changes have created ambiguity and generated different interpretation of the rules by validators and project developers. Since consultants that are external to the project have usually been in

5 World Bank, 2010. *10 Years of Experience in Carbon Finance. Insights from working with the Kyoto Protocol*. Washington, D.C., 113.

Albania Assisted Natural Regeneration on Degraded Lands Project

charge of doing the eligibility assessment, the stakeholders involved in projects become increasingly frustrated as the process of selecting eligible lands has to be repeated.

- **Project developers in tropical agriculture lands struggle with identifying eligible lands; this especially affects projects involving multiple farmers.** Tropical vegetation may regenerate quickly, reaching the forest definition; if this coincides with validation, auditors may judge these lands as ineligible (even though these lands may be only temporarily stocked with carbon). Developers find it difficult to demonstrate the temporary nature of land regeneration as this would require undertaking broader and more complex studies on land-use patterns and ecology. Often developers have to redo the land eligibility analysis until finding enough eligible lands to ensure project viability, delaying project implementation. Such delays affect eligible farmers' willingness to participate in the project as they lose their confidence in the potential benefits of committing their land and investing labor and time in the project. The CDM EB simplified this rule by allowing project developers to present evidence of control over the land for two-thirds of the project area at validation, but they still have to present the delineation of the total project boundary.

- **The "1990 rule" excludes areas with significant potential for A/R and results in scattered planting plots.** Many areas in developing countries were deforested and degraded in the 1990s and are therefore ineligible for A/R CDM projects. In some cases, areas neighboring the projects are excluded from participating because of the same rule. This leads to "patchwork forests" negatively affecting the social, ecological, and financial aspects of projects.

- **Carbon finance can contribute to increasing land tenure security in project areas.** With the right institutional instruments in place different land tenure systems can provide enough security for the development of sound forest carbon projects that ensure farmer's long-term commitment. The indicia of sufficient tenure security for project purposes will differ from context to context. In some contexts, long-established customary rules may suffice even if individual parcels are not formally documented and registered, provided there is political and legal recognition of the legitimacy of those rules. In other contexts, the absence of clear records may be a real concern that needs to be addressed. The possibility of achieving higher levels of land tenure security can be an additional incentive for farmers to participate in forest carbon projects.

- **However, securing land tenure can be a costly and time-consuming process.** Carbon finance has contributed to increasing the level of land tenure security in five projects, but this came with a cost as it required time. Depending on the existing level of land tenure security, the costs can be prohibitive. But, in some cases, the benefits of investing in land

tenure security—both in terms of project performance and improving local livelihoods—outweigh the costs.

Accounting for Emission Reductions: The Rigor and Practicality Imbalance

- **The level of complexity of early methodologies made them less accessible to project developers.** Only highly skilled professionals were able to understand and follow the first versions of the A/R CDM methodologies. As a result, the CDM EB and the BioCF developed tools to make these methodologies more user-friendly. Still, project developers with low capacity need intensive help to apply them, increasing project transaction costs and under-delivery risks.

- **The simplification initiated by the CDM EB has been helpful to a certain extent.** The projects registered using the early versions of methodologies did not benefit from the simplifications and they still need to account for GHG emissions as prescribed in older versions of methodologies. Most recent versions of methodologies are shorter, but the number of procedures, tools, and guidelines has increased. To further streamline the registration process, it is necessary to remove certain requirements for estimation of project emissions and leakage which, relative to the minimal volume of emissions measured, is time-consuming and costly to determine. The use of default data to calculate emissions and leakage based on robust research should be encouraged.

- **Training of project developers is required to strengthen their capacity for GHG accounting.** It is easier for project developers to apply procedures that are closer to those that they are familiar with from traditional forestry projects (e.g., measurement of tree biomass growth). Many forest carbon procedures, however, are not generally used in traditional forest inventory, including estimation of carbon stocks in the baseline as well as measurement of carbon stock changes in non-tree vegetation, soil, litter, and deadwood pools. Similarly, project developers are usually unfamiliar with calculations of project emissions and leakage, as well as principles of stratification, sampling, statistical procedures of monitoring and measurement.

- **Lack of available data on native species negatively affects projects with a biodiversity focus.** The information required for accounting emission reductions in A/R projects with a large number of native species is rarely available. Projects that propose to plant these species have to use default data from the Intergovernmental Panel on Climate Change's 2003 *Good Practice Guidance* or other published sources. Use of default data, which is generally conservative, typically penalizes projects (especially with regard to expansion factors). Lack of suitable data may force some projects to change the composition of species or to reduce the portion of the project area that is planted with native species. Alliances between project developers and universities or research institutions are needed to produce and publish data to support these projects.

- **Estimation of activity-shifting leakage is time- and information-intensive.** The information required for estimation of leakage emissions associated with shifting of grazing and fuel wood collection is not available in many rural areas of developing countries. Project developers need to spend significant time and resources to collect this data. There is a need to simplify the estimation of leakage emissions. In addition, projects located in degraded areas often have very low leakage risk because of the status of degradation of the surrounding areas; they should be exempted from the monitoring and estimation requirements. In situations with a high probability of leakage, the guidance for leakage assessment in A/R methodologies for large-scale projects should be simplified to allow for the use of discount factors in the calculation of emission reductions (following the guidance presented in the small-scale methodologies) to make the assessment of leakage more practical.

- **Practical challenges arise in monitoring biomass growth.** The effort required for monitoring the carbon component of the project exceeds the workload for monitoring a conventional forest project. Projects have to create a monitoring unit, build and sustain capacity, and maintain reliable records. Since the carbon credits that will be issued are calculated based on verified monitoring data, activity that is not monitored will not earn credits.

The Temporary Crediting Approach to Non-permanence: A Narrow Window of Opportunity for A/R CDM Projects

- **Temporary CERs are more flexible commodities than long-term CERs.** In the BioCF experience, the shorter lifespan of tCERs is more compatible with the carbon market, land-use-change dynamics, and existing information on project risks. From the buyer's perspective, determining prices for lCERs requires precise and long-term information on project risks, which can be difficult to obtain in certain areas and for certain project types. This conclusion may point to the BioCF's own strategy of acquiring replacement credits; other buyers may arrive at a different conclusion depending on their willingness to take on additional risk.

- **The replacement credit rule increases the risks for buyers of forest credits.** The temporary crediting approach to non-permanence adopted by the UNFCCC for A/R projects allowed this sector to be included in the CDM—but it has also put forest projects at a disadvantage. The price of forest carbon credits depends on future prices for permanent carbon credits, and these are difficult to estimate given the uncertainty and volatility of carbon markets. In addition, since forest credit prices are commonly fixed in an Emission Reductions Purchase Agreement, the willingness to pay for replacement credits is fixed as well. This leaves little opportunity to accommodate variations in discount rates and price uncertainties.

- **The non-permanence approach results in delayed carbon revenue.** Projects can only undertake one verification event per each commitment period of the Kyoto Protocol. This has implications for project viability.

- **Temporary crediting as an approach to address non-permanence of A/R projects has a limited effectiveness.** The impossibility of renewing temporary credits beyond a project crediting period hampers long-term carbon sequestration goals. This could be a perverse incentive for some projects. For example, reforestation projects with environmental goals depend on carbon revenues; the absence of payments after the crediting period could lead to deforestation and forest degradation.

- **The lessons learned from A/R CDM projects presented in this section can be enriched with experiences in the voluntary carbon market where other approaches to non-permanence are used.** The insights from A/R projects on non-permanence should also contribute to the development of the REDD+ mechanism.

Carbon Finance: Catalyzing Underlying Investment for Forest Projects

- **A project entity's ability to secure investment is critical to succeed in the A/R CDM.** A large portion of project idea notes with the potential of emission reductions were submitted to the BioCF, but could not be considered because of lack of financing. Projects were sometimes delayed at being accepted into the BioCF portfolio because project entities struggled with closing a financial gap. Projects having financial gaps were assessed case-by-case and accepted into the portfolio as long as they presented strong evidence of alternatives to fill-in the gap. Delays in closing the financial gap, however, negatively affected the implementation of these projects. Efforts are needed to facilitate the access to financing to developers of A/R CDM projects.

- **Carbon finance has contributed to catalyzing different types of underlying investment.** BioCF projects with adequate access to finance have been able to catalyze underlying investment from a variety of sources, largely because of the opportunity to test the carbon certification process in improving the performance of A/R projects. Government and NGO-led projects have relied on grants from foreign public sources, equity investment, and carbon finance; their financial structure is not very sophisticated. Private sector-led projects have managed to obtain short- and long-term loans from corporate financing institutions and local and foreign banks. Some projects are even complementing their financing with carbon revenue obtained from forward sales of carbon credits in the voluntary carbon market. However, more innovative financing is required to help projects cover upfront investment.

- **Projects led by governments, public agencies, and non-profit organizations usually face more barriers than private sector-led projects.** Carbon

finance mainly helped the former catalyze underlying public investment and overcome ecological, technological, social, and institutional barriers. Projects led by private entities, on the other hand, have used carbon finance not only to catalyze additional private investment but also, to a certain extent, to improve their financial viability.

- **Carbon revenue, depending on its size and timely delivery, can positively impact project viability.** In the BioCF portfolio, the potential for carbon sequestration ranges widely from 3-22 tCO_2e/hectare/year, depending on the design and objectives of the project and the productivity of the lands. The timely delivery of carbon revenue depends on the project entity's capacity to secure investments, develop a forest carbon project, and manage project risks. Delays put projects expecting carbon revenues to cover maintenance costs at severe risk. Delays can also lead to changes in expectations and land-use priorities. Project entities have to manage the expectations of all project participants and design appropriate incentive schemes.

- **Transaction costs of meeting the CDM requirements were high in most BioCF projects.** The World Bank's development costs for A/R projects are higher than for any other CDM sector, exceeding $1 per tCO_2e. The transaction costs represent from 0.5 to 20 percent of project total investment. It is impossible at this point to compare the total transaction costs with the full potential for carbon revenue since projects have only contracted a small portion of their emission reductions with the BioCF. Project preparation costs have tended to decrease in more recent projects as project developers benefit from increased experience in the application of CDM requirements, an improved understanding of project risks, and an enhanced CDM institutional structure with approved methodologies and established DOEs.

- **The price of permanent CDM credits determines the price of A/R credits, limiting the viability of projects.** The non-permanence rule—forcing buyers to purchase replacement credits for each temporary credit purchased—makes the price of a forest carbon credit lower than the price of credits in other CDM sectors. This puts A/R projects at a disadvantage.

- **Project developers' capacity to develop, implement, and manage a forest carbon project strongly determines project viability.** Lack of technical capacity to develop a project can lead to poor management decisions that negatively affect project viability. Strong managerial capacity is also required to ensure a stable flow of capital and coordination among partners.

- **Small-scale projects struggle with achieving project viability.** The limit imposed for small-scale projects on the annual emission reductions (16,000 tCO_2e) is too low to achieve project viability. The simplified modalities and procedures defined by the UNFCCC for these projects did not reduce transaction costs in a significant manner, as expected. The transaction costs of some BioCF small-scale projects are as comparable as those of large-scale projects. In addition, the rule concerning the involvement of low-income communities can further increase transaction costs where capacity is low. In such cases, developers also struggle with bundling projects to benefit from economies of scale. Therefore, the rules should be further simplified and the limit should be increased to facilitate small-scale projects.

The Institutional Framework: A Key Success Factor for Effective Project Development and Implementation

- **Designing and creating equitable benefit-sharing schemes that effectively improve local livelihoods is essential to the long-term success of forest carbon projects.** The BioCF experience shows that local farmers' participation is driven by the benefits that they can recoup from participating in these projects and also from their trust in the project entity. Due to the CDM's technical complexity, getting local farmers to actively participate in all project activities may be an unrealistic goal. It is important nevertheless to keep them well-informed throughout the process and to ensure that local partners agree with the direction that the project takes. Project entities backed by local communities with knowledge in the project area have fared better.

- **Investing in and sustaining local capacity can ensure the permanence of forest carbon initiatives.** Forest carbon projects are long-term

partnerships, at the core of which are the farmers/communities and the project entity. These partnerships often need to be extended to bring in capacity where it is missing on project design, implementation, management, and funding. Developing capacity in forestry and project management at the local level increases the partnership's resilience to staffing changes. It also creates the potential for communities to take over the project in the future and to continue to invest in forestry activities—increasing long-term sustainability.

- **Institutional agreements defining land use, carbon ownership rights, and benefit sharing play a crucial role in the development of forest carbon projects.** When designed to follow rules of good governance, these agreements help partners understand their rights and responsibilities in the project and reduce the potential for conflicts. Institutional agreements also ensure that all participants share a clear and common vision of the project. Careful planning at an early stage and avoiding complex arrangements are crucial for project success.

- **Public-private partnerships with clear responsibilities for each partner seem to work best.** Having the government as the lead project entity may influence a project's performance. In most cases, projects that have governmental agencies as their lead project entities have performed relatively less well than others. The exception has been countries with centralized governance. However, where the project entity is not the government, the success of the project relies on a constructive collaboration with governmental entities. This is because governments can facilitate the CDM process, and have the opportunity to promote replication of projects in other areas of the country, taking advantage of the synergies between forest carbon initiatives and other national development strategies.

Risk Measurement and Management: Taking Advantage from Early Lessons on Project Development and Implementation

- **The under-delivery risk of A/R projects arises from multiple aspects of the project and can be measured and managed.** Understanding the risk of A/R projects requires an integrated assessment that takes into account the fact that projects navigate at least three cycles: commercial, operational, and regulatory. The BioCF developed a risk assessment methodology that is used to monitor indicators of project performance as the project moves through the several stages of these three cycles.

- **Most of the operational risks can be anticipated and managed.** Risky elements of projects can be effectively addressed through an appropriate forest management plan and sufficient human and financial resources. At the same time, designing and

Moldova Forestry Community Development Project

implementing such a plan, requires project developers with relevant forestry experience and managerial capacity.

- **Project potential threats to the local environment and the socio-economic conditions of involved farmers must be anticipated and managed.** Some activities can pose a potential risk to local communities and the local environment. All BioCF projects assess this potential and propose actions to manage risks so that they can comply with the World Bank safeguard policies and CDM requirements. The World Bank safeguard policies allow for potential risk identification, monitoring, and management throughout the project duration. The CDM requires developers to assess projects and undertake an in-depth impact analysis whenever significant negative impacts are identified. Also, as per national forest laws, some projects have to undertake an impact assessment. Some projects go a step further by undertaking voluntary assessments to get additional certification. For example, projects planting for commercial purposes usually seek independent certification (e.g., Forest Stewardship Council Standards) of their sustainable forest management. In addition, some projects are also voluntarily pursuing the Climate, Community and Biodiversity (CCB) certification, through which they prove that their design will generate the expected co-benefits.

Co-benefits: An Opportunity for Creating Synergies

- **A/R projects have environmental, economic, social, and institutional co-benefits.** The strength of these co-benefits stems from the type of project, the baseline project situation, the project developers' goals, the level of participation by local communities, and considerations made in project design and implementation.

- **Co-benefits are an important incentive for local participation in forest carbon projects.** GHG emission reductions are an abstract concept for most local communities. The possibility of benefiting from greater land tenure security, employment opportunities, and new sources of income in many cases are the main incentives for community participation and long-term commitment to forest carbon projects.

- **Forest carbon projects also contribute to climate change adaptation by increasing the resilience of local environments and communities.** A/R CDM projects contribute to strengthening the natural capital of rural communities participating in projects by recovering severely degraded lands, protecting water resources, and conserving biodiversity. These projects therefore contribute not only to climate change mitigation but also to local communities' adaptation to the adverse impacts of climate change. The fact that these projects are often undertaken precisely for these reasons also makes them potentially more sustainable in the future.

- **There is great potential for synergies between forest carbon projects and other development initiatives.** A/R CDM provides the means for achieving the objectives of other United Nations Conventions, such as combating desertification and promoting biodiversity conservation. A/R projects can also contribute to the Millennium Development Goals by alleviating poverty and promoting the socioeconomic development of rural areas.

Conclusions and Looking Ahead: Building on CDM A/R and Learning Lessons for REDD+

Overall, the BioCF experience with A/R CDM projects has been hugely valuable. It is clear that carbon markets can work to bring in revenue streams to rural communities that otherwise have limited sources of income. Furthermore, it has demonstrated that **these initiatives are not only mitigating climate change but also improving rural livelihoods**, improving resilience to climate change, conserving biodiversity, and restoring degraded lands.

Scaling-up of A/R activities is therefore critical for bringing these benefits to millions of hectares of degraded lands. Whilst successful project entities are willing to replicate their experiences, the overall number of CDM A/R projects remains limited. The BioCF experience has shown that, in order for projects to be successful in the current UNFCCC regulatory environment, they need adequate access to investment, high human capacity, and a strong institutional framework for project implementation. In some cases, carbon finance, in combination with financial support from various sources, enabled projects facing institutional barriers and low local capacity to

2005

Ethiopia Humbo Assisted Natural Regeneration Project

2010

Images courtesy of World Vision

overcome these challenges. However, projects located in countries with weak forestry sectors and low levels of governance still face prohibitive barriers to effective project development and implementation.

Current regulatory rules are project-based and although opportunities to scale up activities through Programmes of Activities exist, they remain to be tested under the CDM for A/R and are not likely to address the scale needed to reinvigorate degraded lands. To facilitate the scaling up of A/R activities, it is important that lessons are learned and that corrections to bottlenecks and unnecessary obstacles are removed. For this, three critical factors are essential: (i) regulatory improvements, (ii) access to finance, and (iii) strengthening capacity. Based on the lessons that were drawn from the BioCF portfolio, the following actions are recommended:

Regulatory Improvements

- **Remove regulatory uncertainty.** Much has been invested in building the institutional framework to support A/R projects. Project developers are still interested in undertaking and developing such projects in many poor countries where these activities can make a difference in living conditions. However, the prevailing uncertain regulatory environment is creating a dampening effect. In addition, where market signals have been given for post-2012 (as from the EU ETS), credits from the A/R CDM remain disadvantaged despite the significant poverty alleviation implications.

- **Improve the fungibility of forest project credits by addressing the non-permanence of forest carbon in a broader way and allowing A/R projects to use alternative approaches to temporary crediting.** This has already been recognized by UNFCCC negotiators proposing alternatives alongside current tCERs and lCERs. A decision on this issue is urgently required.

- **Further simplify the rules and procedures for baseline determination and additionality demonstration.** This could include allowing developers to use standardized baselines established at the national or sub-national level. Simplifying additionality requirements, without compromising environmental integrity is also important. Projects involving low-income communities with minimal capacity will greatly benefit from such a simplification.

- **Increase the current threshold of 16,000 tCO_2e for small-scale projects and revisit the rule that low-income communities must be involved in this type of projects.** Projects involving low-income communities with minimal capacity are not benefiting from simplified modalities and procedures. Their limited capacity is reflected in high transaction costs and inability to bundle projects to benefit from economies of scale. The threshold must be increased for this type of project to be viable and benefit low-income communities.

- **Continue the simplification and consolidation of large-scale methodologies**, including allowing project developers to use default values for estimation of leakage (in line with the simplification recently made for soil organic carbon) and facilitating the project monitoring process. Appropriate discounting could be included at the project level to allow the use of default factors by project developers with less access to sophisticated technology or lower institutional capacity.

- **Simplify the land eligibility requirements by re-assessing the "1990 rule" and using more flexible criteria to eliminate incentives for deforesting and subsequently reforesting lands.** As the BioCF experience has shown, current land eligibility requirements in the CDM tend to be socially impractical and can create tensions in regions where neighboring farmers may be excluded. This rule also leads to fragmented CDM-project areas, which are impractical from a project development and ecological standpoint.

- **Make the regulatory process more accessible and predictable by streamlining procedures and following strict timelines.** Finding the CDM EB's latest decisions, guidelines, and versions of tools, as well as PDDs and methodology formats, is challenging for most developers and favors specialized professionals. Following strict timelines for registration and issuance will help increase the predictability of credit issuance.

- **Recognize the contribution that A/R CDM projects make to the dual objectives of the UNFCCC, sustainable development and climate change mitigation and broaden the scope of land-use activities:** Policymakers should consider increasing the eligible land activities to cover

croplands, grasslands, wetlands, and sustainable forest management, given the role in environmental restoration and poverty alleviation.

Access to Finance

- **Innovative ways to finance activities are needed.** Carbon finance is a payment on delivery, and yet the upfront investments needed for A/R projects are significant. Economies of scale are not easily attained. Forestry investments are long term and deemed high-risk in many developing countries. Institutional arrangements for financial intermediation, the role of carbon credits in financing agriculture and rural development, as well as *ex-ante* payments based on meeting performance benchmarks are highly needed.

- **Financial compensation for other benefits should be addressed.** The BioCarbon Fund experience has shown that A/R projects encompass both mitigation, through removal of CO_2 from the atmosphere, and adaptation as they build up the resilience of the local environment and communities. Projects improve living conditions, but the significant additional environmental and social benefits (besides carbon) are not rewarded.

Strengthening Capacity

- **Strengthening capacity at the local level is highly needed to ensure successful forest carbon initiatives.** The fact that A/R projects are useful tools to promote both adaptation and mitigation should be harnessed by building up capacity and strengthening programs in an integrated manner.

As the UNFCCC negotiations evolve, a larger-scale dimension—REDD+—is being discussed. Many of the lessons learned from A/R could be helpful in the development of REDD+ in order to avoid the same bottlenecks. Because of the interactions between different land uses, policymakers will need to address the interface of all land-use activities (e.g., A/R, REDD+, agriculture) in an integrated approach. There is also a need to bring in the biomass-energy dimension. The application of an **approach that integrates land-use and energy sectors at a landscape level** would be more practical and cost-effective.

The BioCarbon Fund will continue its support to land-use interventions and is planning to build on the experience to-date in A/R through scaled-up programs. The BioCarbon Fund will further work on areas not yet fully-explored. Such pilots are invaluable for showing the opportunities and challenges that can arise in the application of regulatory rules for climate change projects. The BioCF is also working on developing new methodologies in areas not yet developed, such as croplands. The fund is also exploring where methodological improvements can be made. These include undertaking methodologies and pilots in landscapes where various sectors (land-use or energy) can be considered as a whole. The BioCF is also working on innovative upfront financing mechanisms to assist the scale-up of rural projects and on approaches to compensate projects for their co-benefits. All of this is in line with the World Bank's triple-win-for-farmers strategy in which the forestry, agriculture, and rural energy sectors are treated in an integrated way to increase food security, to improve the rural poor's resilience to cope with the impacts of climate change, and to mitigate climate change.

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