EM Market Insights :: **Communities and Developing Countries**

A Tale of Two Continents

Ecosystem Services in Latin America and East and Southern Africa

THE KATOOMBA GROUP'S
Ecosystem Marketplace

2006

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A Tale of Two Continents

Ecosystem Services in Latin America and East and Southern Africa

For the past two years, the Ecosystem Marketplace has been delivering the latest information about market mechanisms and payments for ecosystem services such as carbon sequestration, water quality, and biodiversity. To get a better sense of how the concepts of environmental markets, market-like mechanisms and payments for ecosystem services are likely to impact communities in developing countries, the Ecosystem Marketplace has collected stories from two regions: Latin America and East and Southern Africa. In these stories we see the new and innovative ways that the value of nature's services is being accounted for—all emphasizing the strengths of each region's diverse ecosystems and the challenges that face the people who live among them.

In the following pages, we hope to spotlight the uniqueness of each region through a series of feature articles, profiles of environmental leaders, and personal perspectives. Our hope is that by putting these stories together, we may be able to start making some unusual—but fruitful—connections in this nascent field.

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Introduction

Reuniting Two Continents: The Future of Biodiversity and Ecosystem Services

It is a truism that the majority of the world's biodiversity is to be found in the tropics, in those parts of the world commonly referred to as developing countries. It is here that the magic and variety of the world's ecosystems are in constant and vibrant bloom. It is here, also, that the struggle to preserve the world's biodiversity will be won or lost. And it is here that the many services provided by nature can fully be appreciated.

To get a better sense of how the concepts of environmental markets, market-like mechanisms and payments for ecosystem services are likely to impact communities in developing countries, the Ecosystem Marketplace has collected stories from two regions: Latin America and East and Southern Africa. In these stories we see the new and innovative ways that the value of nature's services is being accounted for—all emphasizing the strengths of each region's diverse ecosystems and the challenges that face the people who live among them.

Ecosystems, in these two regions, may appear quite different. Strikingly arid areas within parts of Southern Africa's Cape region seem, at first glance, to have nothing in common with the leafy, multihued greens that fill much of the Amazon watershed.

Yet visitors to areas within South America and Africa will notice many connections. Not only is the geology essentially the same in Brazil and the western regions of Southern Africa (looking closely at a map will reveal that the two continents were in fact connected many millions of years ago), but the human and institutional challenges that the two regions face are also remarkably alike. And since the problems are somewhat similar, it follows that some of the solutions, too, might be applicable in both places. Clearly, there is no "one size fits all" approach to payments for ecosystem services, but this does not mean that Latin America and Africa have nothing to learn from each others' experiences.

To start the dialogue between these two vibrant regions, the Ecosystem Marketplace has compiled some of its best stories on emerging markets and market-like mechanisms for ecosystem services in Latin America and in East and Southern Africa. For the past two years, the Ecosystem Marketplace has been delivering the latest information about market mechanisms and payments for ecosystem services such as carbon sequestration, water quality, and biodiversity. In the following pages, we hope to spotlight the uniqueness of each region through a series of feature articles, profiles of environmental leaders, and personal perspectives. Our hope is that by putting these stories together, we may be able to start making some unusual—but fruitful—connections in this nascent field.

Latin America: The Early Innovator

Latin America's expansive—and threatened—swaths of diverse forests are known as global strongholds of carbon, biodiversity, and a host of other ecosystem services. This diversity also extends to the ways in which innovative Latin American programs have explored how environmental markets and market-like mechanisms can be used to support the environment and local communities. "Because Latin America has been at the

forefront of these issues for the past ten years, you see a wide spectrum of markets and market-like programs—including regulatory, voluntary, and ad-hoc projects," says Carina Bracer, manager of the regional Katoomba Group for Tropical America.

Read on and you'll get a taste of this diversity with stories about rehabilitated cacao plantations in Costa Rica, reforestation in the Sierra Gorda Biosphere Reserve in central Mexico, and a novel carbon fund in Argentina, the first of its kind in the developing world. All are examples of the different ways that market mechanisms and payments for ecosystem services can be used in developing countries.

The Kyoto Protocol's Clean Development Mechanism has led the way for some of these programs. Now, new openings in these rulings focusing on the value of avoided deforestation could boost attention and funding to even more forest-oriented projects.

"One of the key challenges to conservation in developing countries is the lack of financial resources for conservation measures such as the management of national parks and other conservation units," says Beto Borges, director of Forest Trends' Communities and Markets program. The possibility of selling carbon credits for avoided deforestation, he says, "has the potential to provide much-needed funds for conservation in developing countries, where traditional forest communities hold directly or indirectly the control of very large areas extremely rich in biodiversity."

Pulling together the region-wide programs could offer a status check for what's working, what isn't, and how to address both problems and successes. Bringing together this wealth of work, too, could be the catalyst for making ecosystem services more attractive to private sector investors as well as to governments and NGOs.

East and Southern Africa: Looking to the Future

This same private sector potential could open up new doors for African communities looking for novel ways to address conservation of both the environment and of rural livelihoods. Carbon sequestration, biodiversity conservation, and watershed protection are among the candidates for emerging programs that seek to pay for ecosystem services.

From grassy savannas to woodlands, from wide river valleys to offshore coral reefs, Africa's incredibly varied ecosystems play a critical role in the lives of its inhabitants. Several forward-thinking projects have already established themselves as what may be the first of many approaches to valuing this natural capital. In these pages, you'll find stories covering South Africa's visionary Working for Water program and its many offshoots, a tree-planting program that ties farmers in several African countries with investors worldwide, a Cape Town–based firm's launch of the world's first structured instrument for carbon trading, and more examples of projects starting to link markets and market-like mechanisms with the environment.

"While traditional methods of protecting the environment can be effective, mainstreaming payments for environmental services into policy and planning can complement these approaches and provide incentives for conservation," says Alice Ruhweza, coordinator of the East and Southern Africa Katoomba Group. "In particular, I'm very interested in payments for watershed services since these have not taken off in most countries and yet there are clearly problems of water scarcity everywhere in East and Southern Africa."

It's clear that there's a need for increased attention on Africa's natural and human environments. The Millennium Ecosystem Assessment points to the degradation and disappearance of ecosystems on an enor-

mous scale across many of the continent's regions—a situation that threatens biodiversity, access to water, food security, and other arenas that affect economic development, and even life itself.

A Lively Debate

For any of these programs to succeed, it seems critical to tailor their design to the needs of individual ecosystem and communities. However, a little across-the-ocean sharing of models and methods seems reasonable, even inspiring. After all, is imitation not the sincerest form of flattery?

Not everything, of course, is flattery. In fact, one of the most important issues facing markets for ecosystem services in developing countries is also the most fundamental: Do these approaches make sense in the developing world? Critical questions about the value of ecosystem services programs need to continue to be addressed. Here, we offer perspectives from market critics as well as supporters. Simone Lovera, of Friends of the Earth International, questions whether markets can successfully help the poor, while Emily Tyler of SouthSouthNorth ponders how the regulated carbon markets (and CDM in particular) may not be supporting the sort of sustainable development projects that the developing world needs.

Both regions face issues related to program transparency and accountability. These programs can require complex frameworks to function well; community-based programs therefore need substantial, accessible information available to the people who will be most affected by the work. There is a risk, Borges says, of these markets turning into ones "where private financial interests dominate the market to the benefit of few."

But if these ideas are applied thoughtfully, there's a possibility of jumpstarting positive changes for the environment and for communities. "At the same time," Borges says, "there is great potential, if proper regulation is implemented, that future PES programs and markets create fair and dynamic exchanges between sellers and buyers, providing for a market that is based on sustainable development practices that are socially inclusive and promote the conservation of ecosystem services, especially the quality of water, biodiversity and climate."

These programs can also create a shift in mindset of how work in developing countries is traditionally funded. Instead of having only a few options—either supporting government-run programs or writing a check—potential donors could also have an opportunity to make their contribution an investment in preserving and protecting both the environment and the local community.

And in turn, ecosystem service providers may have the chance to make their own investments in themselves and their children. One of these providers, schoolteacher Beatrice Ahimbisibwe, has started to plant trees on her land in Uganda, selling carbon credits and using the funds to invest in her home and her family. "Not only do I use my work as an example when I teach my school children, and not only do I get to talk to and meet people from all over the world," she tells the Ecosystem Marketplace, "but now my neighbors come and ask me questions about my carbon and my trees."

In reading these and other stories, we hope you will better understand why the Ecosystem Marketplace feels that what happens in Africa and Latin America is likely to be so central, not only to biodiversity protection, but also to a better understanding of whether (or not?) payments for ecosystem services and other market-based mechanisms have a role to play in addressing the critical challenges of environment and livelihood that face these regions, both now and in the future. Perhaps the idea of payment for ecosystem services will also take root and blossom in the sun-drenched and fertile soil of the tropics.

—The Editors

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PART I

Spotlight on Latin America

Different Strokes: Countries Try Out Varied Opportunities in Carbon Finance

The Argentine Carbon Fund Helps Developers Dance the Dance

by Teddy Krolik

The Argentine Carbon Fund was the first carbon fund launched in the developing world in 2005. The Ecosystem Marketplace checks in to see how the fund is progressing.

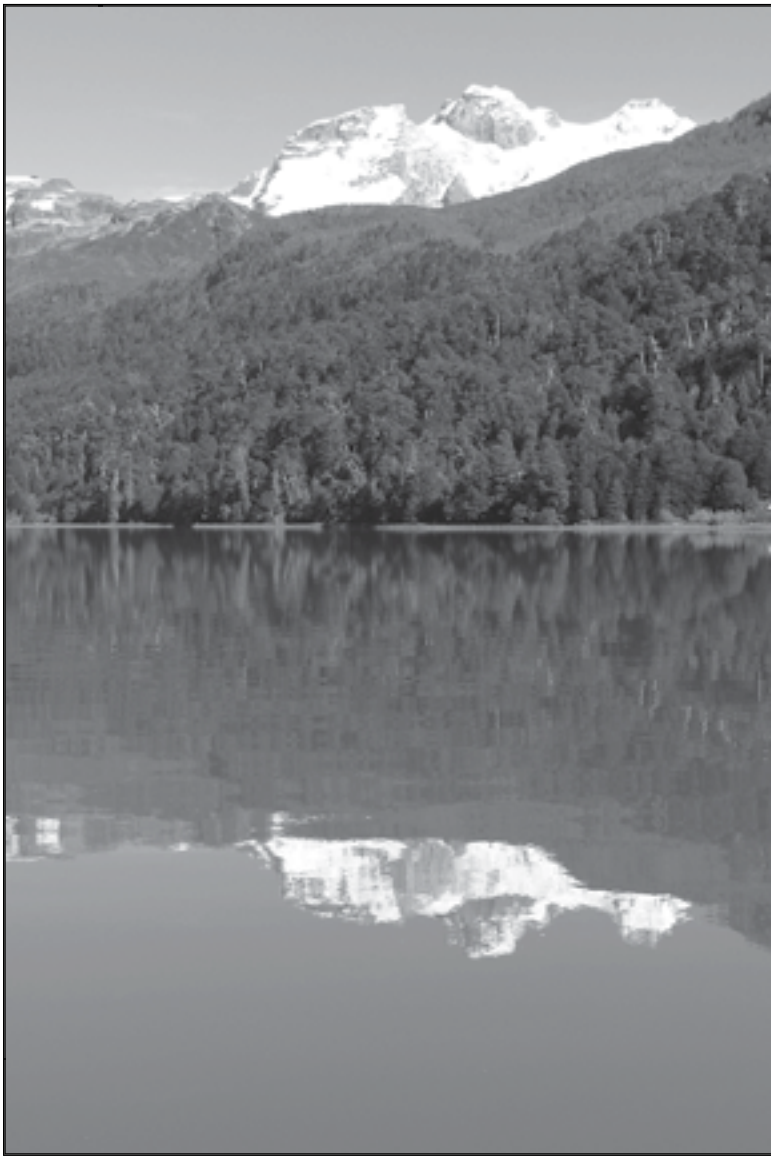

PHOTO BY RAFAEL MARTIN-GAITERO

If it had been a worldwide cut in beef consumption, Argentina's gloom would have been well-captured by the aching sorrow of a classic tango song. When it came to a global cut in greenhouse gas (GHG) emissions, however, Argentina stepped forward with the gusto of a samba partner from the very beginning of the Kyoto dance.

Of course, Argentina's enthusiasm for the Kyoto Protocol makes sense. The nation's developing country status leaves it under no obligation to reduce its emissions. Instead, Argentine projects that reduce emissions are in a position to sell carbon credits—known as Certified Emissions Reductions (CERs)—to industrialized countries that, under the Protocol, need to cut their emissions by an average of five percent. These so-called Clean Development Mechanism (CDM) projects are designed to make it easier for industrialized countries to meet emissions targets at least cost while simultaneously fueling sustainable development in emerging economies around the world.

Argentina formally ratified the Kyoto Protocol in 2001, and the Argentine government and local businesses have observed the Kyoto process ever since. Now, they are hoping to realize the return on their investment with the help of an innovative initiative called the Argentine Carbon Fund (ACF).

A New Model

In September 2005, Argentine President Néstor Kirchner signed a decree announcing the creation of the first carbon fund in a developing country: the Argentine Carbon Fund. Unlike other carbon funds designed by industrialized countries, the ACF will not concentrate on purchasing CERs; rather, the fund hopes to increase the supply of domestic CERs by developing CDM projects that are economically viable and technologically sustainable. Overseen by the secretariat of environment and sustainable development, the ACF is setting out to prove that developing countries are capable of arranging the institutional and financial support for a portfolio of CDM projects.

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Hernán Carlino, director of the ACF, says the fund offers four features to would-be investors and project developers: a streamlined source of CER credits, the distribution (and thus minimization) of the transaction costs associated with obtaining CDM approval, application of CERs as an additional source of capital for projects, and management support from local financial institutions to assuage concerns by outside investors about project risks. CDM projects, in turn, would promise to inject capital into the national economy, create jobs, promote more efficient technology, and improve the overall competitiveness of Argentina in the international carbon marketplace.

Despite the fact that the ACF is still in its nascent stages, it maintains the eventual objective of reducing carbon emission by 30 million tons annually, which, depending on price fluctuations in the CER market, could mean as much as US$250 million for a country of roughly 36 million people. The ACF concluded its first call for CDM project proposals in December 2005, and is now offering technical assistance to project developers who made the cut.

Providing the Missing Link

Since the Kyoto Protocol came into force in February 2005, the United Nations Framework Convention on Climate Change (UNFCC) reports 760 current projects in the CDM pipeline, including 189 registered projects and 73 requesting registration. Despite the explosion of CDM projects, their distribution has been dominated by a few developing countries. According to the World Bank's "State and Trends of the Carbon Market 2006," between January 2005 and March 2006, Asia supplied 73 percent of all project-based contracts, and China single-handedly claimed 66 percent. Though Latin America in the same time period accounted for 17 percent of the contracted volume of all CERs, Brazil alone represented 10 percent of the worldwide offering.

There are many reasons why Argentina—a country rich in natural resources and technical capacity—has not participated in CDM projects to the same extent as China and Brazil. Most of these reasons, market observers say, are related to the devastating consequences of Argentina's financial crisis in 2001–2002. According to Carlino, the paucity of domestic loans to the private sector, coupled with the challenge of attracting international financing for individual small-scale projects, severely limits Argentina's ability to promote CDM projects. "Finance is a key issue because you might have a good project, but the traditional institution doesn't take you into account," Carlino says.

"Not just for Argentina, but for any developing countries I would say one of the obstacles is that many of the projects don't have access to good financial conditions, to financial resources in competitive conditions," says Eduardo Dopazo, fund program manager for the World Bank's Spanish Carbon Fund. "The project, no matter if it's a good CDM project, could be delayed because of the lack of financial resources or the costs of those resources."

Dopazo believes that a second obstacle for developing countries is the matter of transaction costs accumulated (ranging from $50,000 to $250,000 depending on the scale of the project) by CDM projects as they meander through a registration process that can last up to three years. By the time the United Nations' CDM Executive Board finally registers a typical small-scale CDM project, the United Nations Development Programme calculates that the project's total up-front costs will account for 14 to 22 percent of the net present value of its CER revenue.

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Despite the impediments to CDM projects in developing countries, there is substantial international interest in participating in CDM projects in Argentina. "There's fierce competition for CERs … People will start looking places where not everyone else has been," says Jorund Buen of Point Carbon, an analysis company.

Based on this recognition, the ACF was born to give project developers the lift they needed to get over some of the financing obstacles facing them as they sought to engage investors. As Carlino puts it, "We just thought, what are the difficulties of projects here?"

A Means to an End

Carlino views the ACF as "an instrument or tool … to help projects find their way around the market." This instrument, he continues, could "connect dots within the financial system, with NGOs working with climate change, with the governments of provinces." According to Carlino, however, many potential local project developers and investors lack a firm grasp of CDM possibilities. In order to expand awareness for CDM opportunities, the Buenos Aires Stock Exchange (BASE) and the Argentine government have pledged their support.

Over the past year, BASE has presented itself as an independent CDM information clearinghouse aimed to match local project developers with international investors interested in financing projects or buying CERs. The exchange organized a March 2006 conference for British investors to negotiate with Argentine CDM project developers, and it recently hosted a similar event with representatives from the Argentine Secretariat of Environment and Sustainable Development and the World Bank. Future meetings are planned with delegations from Germany, Canada, and Japan.

Less than a month after BASE's first Argentine-British CDM convention, the Argentine Senate approved a biofuel law that promises tax incentives and a market-share guarantee of 15 years for farmers who use vegetable oil to produce biodiesel, sugar cane or corn to produce ethanol, or organic waste to produce biogas.

While carbon dioxide emissions produced by biofuel are comparable to those of diesel fuel, the Argentine government believes that the expansion of biofuels will encourage production of oilseeds, which are touted by the government for their ability to reduce net emissions levels. The cultivation of oilseeds, as a result, would be considered eligible for CDM status.

Local promotion of CDM projects, though not always specifically organized with the ACF in mind, would complement the international support already offered to the ACF by the World Bank and other established carbon funds in industrialized countries such as Spain, the Netherlands, and Canada.

"This is an opportunity to open up new possibilities and we are trying to find strategic partners," Carlino says. "[The ACF will] give some idea of what can be done when you manage to integrate environment and economy in a positive way."

The ACF aims to support small- and mid-scale renewable energy projects, expand efforts in industrial sectors, and promote transportation, biomass, and forestry projects.

Toward this end, the ACF aims to support small- and mid-scale renewable energy projects, expand efforts in industrial sectors and promote transportation (14 percent of total Argentine carbon emissions), biomass, and forestry projects. "It's not a matter of large numbers of projects. We want projects in key areas," Carlino explains.

The ACF is now in the midst of planning a second solicitation period for new CDM proposals. According to ACF calculations, local CDM projects with registered project design documents currently possess a potential carbon reduction of nearly four million tons. By the end of 2006, Carlino is optimistic that Argentine CDM projects will produce a total close to 15 million tons of carbon reductions.

Nonetheless, the content of the projects, rather than their potential for credits, appeals to Carlino. "Economic activity, sustainable development are the results…CERs are just a small part, a means to an end," he says.

Teddy Krolik currently is living in Buenos Aires, where his favorite cut of beef is "bife de chorizo" and his adopted local fútbol team is Independiente. He may be reached at teddykrolik@gmail.com.

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Horses for Courses: Voluntary vs. CDM Carbon Projects in Mexico

by Amanda Hawn

Despite its considerable advantages, Mexico has been slower than other Latin American countries to sign purchase agreements for carbon via the Clean Development Mechanism. In March 2005, however, Mexico signed its first emissions reduction purchase agreement. In addition, a local NGO recently sold forestry carbon credits into the voluntary carbon market. The Ecosystem Marketplace looks at what these two deals might tell us about Mexico, the CDM, and the implications of carbon markets for communities in developing countries.

PHOTO BY JOSEPH

A 30-foot heap of fetid food, old tires and decrepit shoes hardly sounds like a "clean development mechanism," but the World Bank is betting that, in Mexico at least, it will prove to be just that.

In March, a Mexican business signed its first emissions reduction purchase agreement for a Clean Development Mechanism (CDM) project, paving the way for a $US8.4 million investment in the country's waste management and energy sectors by the World Bank's Prototype Carbon Fund (PCF).

The fund says it has agreed to purchase two million metric tons of carbon dioxide equivalent from the Waste Management and Carbon Offset Project.

The Kyoto Protocol requires that industrialized countries reduce their carbon emissions to five percent below 1990 levels, either by cutting emissions domestically or via a variety of so-called "mechanisms for flexibility," the most prominent of which involves investing in carbon emissions reduction projects in developing countries. This latter option, known as the CDM, is the Protocol's primary means of involving developing countries in its attempts to reduce greenhouse gas emissions.

So far, India, Korea, Argentina, Brazil, Chile and Colombia have all attracted more investment in CDM projects than Mexico, a fact that makes this first Mexican CDM deal that much more important. Not only is it likely to shed light on what investors might be looking for when considering CDM deals in the country, but—when it is compared to another, very different, carbon deal now being negotiated by a small Mexican NGO—it also highlights why voluntary markets, and not the CDM, may be the only way for communities in developing countries to enter the much-touted carbon market. In other words, which Mexican projects should entertain hopes of receiving CDM money? And, just as important, which should not?

Green "Black Gold"

The Waste Management and Carbon Offset Project, owned and operated by the private company Sistemas de Energia International SA (SEISA), plans to capture methane at three landfill sites in Mexico, using it to generate electricity at two of them and burning it at the third.

When garbage decays within the oxygen-starved depths of a landfill, bacteria metabolize the waste anaerobically, giving off methane as a byproduct. Solid-waste landfills leak between 30 and 70 metric tons of methane (a greenhouse gas with a warming effect roughly 21 times greater than carbon dioxide) into the atmosphere each year. As methane is a more powerful greenhouse gas than the carbon dioxide that results from its combustion, burning it, as SEISA plans, can be desirable.

SEISA hopes to harness this giant natural gas leak for energy production, fashioning a tidy solution from a messy problem.

"The project will put wells into the waste and then pump out the methane from below," explains Fernando Cubillos, project manager for Mexico and Central America, the Caribbean, and Colombia in the carbon finance division of the World Bank. "Then the gas is either burned to convert it to carbon or used in place of fossil fuels to generate electricity through combustion."

Clinching the Deal

The technology behind the SEISA venture is nifty, but Cubillos stresses that the World Bank Prototype Carbon Fund (PCF) invested in the project because it represented a good business deal, not just an elegant science experiment.

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"We are buying on behalf of our investors," Cubillos says. "When we do that, we look for a reliable sponsor who has a good project with a substantial sustainable development component."

In the case of the Carbon Waste Management and Offset Project, Cubillos says those directing investment strategy at PCF were already familiar with project

developers at SEISA because they had worked with them on a very similar Global Environment Facility–funded landfill project in Monterrey in 2003.

In addition, the SEISA Project allowed PCF managers to tick off two other boxes—namely, the project had both clear environmental and social components. Fifteen percent of the net revenues from the sale of emissions reduction credits will go towards keeping groundwater pollutants from leaching out of the landfills. The methane burned will provide electricity for the rural community of Ejido Los Lirios in Nuevo Leon.

"This project shows that landfill gas for energy is a viable Clean Development Mechanism option that can complement global with local priorities," says Jaime Saldana of SEISA.

The familiarity of its sponsors, the clear opportunity for environmental improvement, and the contribution to sustainable rural development all made the Carbon Waste Management and Offset Project a pretty sure bet for those at PCF. But, says Cubillos, the make-or-break consideration was that the project was pretty much ready-to-go.

"Ultimately, we look for projects that are feasible, projects that are not just good ideas but that are actually likely to happen within the next two or three years," he says.

No Quick Fix

Two to three years represents a pipedream of a timeframe for those working on a carbon offsets project in the Sierra Gorda Biosphere Reserve of central Mexico. Here, subsistence farms lie scattered across steep hillsides and forests surround tired, terraced fields.

For many of the same reasons that made SEISA's landfill project attractive to buyers, the Sierra Gorda project has proven a tough sell.

The reserve's patchwork of people and nature extends across its million acres and includes roughly 100,000 people. Against this backdrop, Bosque Sustenable, A.C., a local NGO, is planting thousands of small tree plantations to suck up and store carbon, prevent erosion, and pave the way for sustainable forestry.

In the dying light of a spring afternoon, Jose Dolores Herrera, a 69-year-old farmer, and Juan Carlos Hernandez Ramirez, the regional sub-coordinator of a $31 million project to protect biodiversity in the reserve, sit on a log surveying Dolores' small tree plantation on the opposite slope. Holding a Gatorade bottle at an angle resembling that of the slope, Hernandez moves a pencil along the bottle to demonstrate the angle and space at which Dolores should plant future trees.

It is a makeshift forestry lesson on the frontlines of the world's fight against climate change. But, as in most battles, things are often messiest up at the front. And Mexico's frontlines, both men acknowledge, can be a tough place to do business.

Growing trees for sustainable harvesting is incredibly difficult in Sierra Gorda where the average plot size is just three hectares and the average grade is back-breakingly steep. After four years, Hernandez reckons, Dolores might be able to harvest his first trees. But it will be another two years before he is able to recoup some of the money he invested in planting them.

"The natural conditions and the social conditions in Sierra Gorda are not fit for fast progress," Hernandez says. "The progress is very, very slow—but it is real."

Pati Ruiz Corzo, the energetic director of the Sierra Gorda Biosphere Reserve, says she has been trying to market reforestation efforts in the reserve as a carbon offset project for seven years. But, for many of the same reasons that made SEISA's landfill project attractive to buyers, the Sierra Gorda project has proven a tough sell.

Since poverty drives much of the world's deforestation and unsustainable agriculture, combating global warming via reforestation could also mean combating poverty in some of the poorest and most remote areas of the developing world.

For obvious reasons, CDM investors generally look to minimize risk when shopping for certified emissions reductions (CERs); they want to be sure that the projects in which they invest will deliver CERs on time, satisfaction guaranteed. Projects like the SEISA venture, with a proven technological fix, easy-to-crunch emissions numbers, and prospects for rapid progress (not to mention methodologies already approved by the CDM Executive Board), are much more likely to attract investment dollars than projects like Sierra Gorda's reforestation program, which features none of the above. To make matters worse, the EU Emissions Trading Scheme (EU ETS), the largest potential market for carbon offsets, does not accept carbon credits generated via reforestation.

Round Peg, Square Hole

This, Ruiz and others argue, is not as it should be. Despite the difficulty of putting a forestry project through the CDM hoops, 20 percent of greenhouse gas emissions in the world today are thought to be the result of deforestation and unsustainable agricultural practices. Trees take up and store carbon as a natural part of their nutrient cycle, creating carbon "sinks" around the world in the form of forests. Since poverty drives much of the world's deforestation and unsustainable agriculture, combating global warming via reforestation could also mean combating poverty in some of the poorest and most remote areas of the developing world.

"Some developing countries will benefit from the Clean Development Mechanism by hosting renewable energy and energy efficiency projects, but many countries, and especially the poorest ones, do not have the energy or industrial infrastructure that would allow them to benefit from the CDM in a significant way," reads an introductory brochure for the World Bank's BioCarbon Fund, a fund set up to invest in reforestation projects like that in Sierra Gorda. "For many, and in particular large rural populations that are the home of so many of the poor, sinks are the only significant avenue for participating in the carbon market."

According to those in Sierra Gorda, however, meshing the demands of the business world with the realities of the developing world is no easy task.

"Our project has a really strong emphasis on sustainable development, so we are working with extremely low-income property owners on small plots of land spread across a huge area. When it comes to cost we are at a disadvantage when compared to a project designed solely for efficiency where just one landowner is involved

with a single large property or where smaller properties are contiguous," says David Ross, a project manager for Sierra Gorda's carbon offsets program.

Lack of proper documentation regarding land ownership is also a problem. For instance, Ross observes that while people in the reserve plan to reforest 1600 hectares, only 500 or so of these are likely to have proper documentation of land rights.

Even with papers in order and trees planted, any credits generated for the CDM market must be verified, an expensive prospect for places plagued by rural poverty. "We prefer to keep resources local and for the CDM, you have to use an external body for certification," Ross explains.

Last but not least, reforestation in Sierra Gorda requires upfront investment since impoverished farmers lack the startup capital necessary to purchase and plant the first trees. The CDM, on the other hand, requires that verified reductions exist before they are sold. "CDM rules are too high and too expensive to create a good deal for the people of Sierra Gorda," Ruiz concludes.

Round Peg, Round Hole

Relaxing over a cup of tea after a long day of meetings about the future of the reserve, Ruiz sighs when thinking back on her struggle to design a carbon sequestration project for CDM investors.

Since 1998, Ruiz's Grupo Ecológico has been working with Woodrising Consulting, Inc., an environmental consulting firm in Canada, to identify investors for a large-scale forestry offsets project in Sierra Gorda. The project has been "investor-ready" since 2002, but has yet to get a nibble from corporations affected by new climate change regulations.

"After all these years of looking for ways to package the product, I was very disappointed," Ruiz says. Then Ruiz went to Australia, where she "saw a whole menu of innovative programs for ecosystem services."

Inspired by what she saw in Australia, Ruiz decided to take another look at developing a carbon offsets project in Sierra Gorda. "I saw that there were many, many ways to use these markets. And so, when I came back, I decided that we would cut our own suit for a custom fit instead of trying to fit inside of the CDM guidelines. That's when I began looking at the voluntary market."

"CDM rules are too high and too expensive to create a good deal for the people of Sierra Gorda."

The Voluntary Market

The world's first carbon sequestration deal was brokered in 1988, when AES Corp., an American electricity company, invested in an agroforestry project in Guatemala. AES Corp., like other companies since, hoped to reduce its "ecological footprint" for philanthropic and marketing reasons, not because it was forced to do so by legislation or global treaty. The deal was voluntary, marking the beginning of the "voluntary carbon market" that remains as controversial and interesting today as it was back then.

The voluntary market was the only carbon market that existed for many years until the World Bank funds got up and running some years ago, and until the Kyoto Protocol was ratified and the EU ETS went into effect earlier this year. Unlike the newly minted regulation-driven markets, the voluntary market does not require its tradable carbon credits to undergo a certification process ensuring their measurable emissions reductions. Voluntary carbon projects also frequently require upfront investment from their credit buyers, rather than just a commitment to purchase the credits once they are generated. CDM projects, by contrast, don't collect from their buyers until after the credits are generated.

These differences have won the voluntary market a great deal of criticism from some environmentalists who claim that it is a game of smoke and mirrors rather than an engine of actual environmental progress. The differences, however, also make the voluntary market much more accessible to community forestry projects like that in Sierra Gorda.

"I know now that I will not sell my carbon to corporations, I will sell it to buyers on the voluntary market who want to offset their emissions for philanthropic reasons or for marketing reasons," Ruiz says.

Recent events suggest she is right. The Sierra Gorda Biosphere Reserve will announce its first sale of carbon credits to a buyer on the voluntary market this month. "After so long trying," Ruiz says, "it is very satisfying to finally have a deal."

A Spade is a Spade

In some respects, all's well that ends well, but in other respects, the differences between the SEISA and Sierra Gorda carbon offsets projects in Mexico offer a telling lesson.

The CDM is designed for corporate businesses looking to limit their risk and maximize their buying power in a regulated, compliance-driven market. Clearly, then, policy makers should not abandon the high legal, investment, and scientific standards to which CDM projects are held. To sell unverified carbon credits which do not meet some basic criteria to businesses would be to subvert the Kyoto Protocol's most basic aim: namely, to curb global warming in the most effective way possible.

At the same time, however, community leaders like Ruiz stress that policy makers must recognize, and probably even publicize, the limitations of the CDM in fighting for sustainable development in some of the very places where it is needed most. To claim that the CDM is the perfect tool for fighting both abject poverty and environmental degradation in Mexico, she argues, seems a slightly dishonest form of green branding. And, importantly, it is a perversion of the truth that can cost time and money to those who need it most.

Leaning forward in her chair to emphasize the point, Ruiz observes, "If only someone could have told me seven years ago that my project wasn't right for the CDM, it would have saved so much time, so much energy, so much money." Ruiz now hopes the hard lessons her group has learned will help others facing similar predicaments. Even this cloud has a silver lining.

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On the Ground: Communities Embark on Carbon Projects

Organic Cacao Project Changes Lives and Landscapes in Southern Costa Rica

by Ree Strange Sheck

Indigenous people who live in the Talamanca-Bribri Indian Reserve in Costa Rica rehabilitate cacao plantations to increase productivity, protect biodiversity and create a regional market for carbon. The Ecosystem Marketplace gets the scoop on the innovative project.

PHOTO BY DANIEL GUSTAVSSON

SHIROLES, COSTA RICA—Gerardina Morales barely breaks stride as she lops off a damaged cacao pod with her machete. Her black rubber boots tread lightly along the trail through her 2.5-acre cacao farm within the Talamanca-Bribri Indian Reserve in southern Costa Rica, just across the river from Panama.

For almost four years the 31-year-old mother of three has pruned these cacao trees, grafted superior stock onto old, unproductive trees, and controlled the devastating disease moniliasis, or frosty pod rot, which reached cacao farms here in 1978. Diseases and low prices for cacao, from which chocolate is made, caused many to abandon or remove their trees.

Morales' rehabilitation efforts and those of 400 families in 14 villages stem from a World Bank–financed organic cacao and biodiversity project created and implemented by the Tropical Agricultural Research and Higher Education Center (known by the Spanish acronym CATIE), headquartered in Turrialba, Costa Rica.

On these small indigenous farms, CATIE researchers focused on improvements in cacao quality, increased production, development of biodiversity-friendly

products to generate additional income for poor farm families, and monitoring of species to establish the first database for biodiversity on farms in Talamanca. Basic to project success was strengthening local indigenous associations.

The region's subsistence economy was transformed to a commercial one with the coming of United Fruit Company's large banana plantations in the early 1900s.

In the past, most of these farmers planted seed, which produces harvestable pods in five years. Now they know how to work with grafted cacao, which produces in a year-and-a-half and has a good success rate. Farmers get bud wood and rootstock from clone farms or from neighbors trained through the technical assistance program. Research continues on demonstration farms in eight villages.

Morales took full advantage of CATIE's field-based training. "They say I am stubborn about learning," she discloses. Her smile is shy; her eyes speak of purpose. "I can say I know how to manage my cacao."

Every three months, her small plantation gets a thorough, weeklong tune-up. In the Bribri and Cabécar tradition of community work groups, family and friends help out. Cacao for these indigenous societies traditionally was a subsistence crop grown under forest cover. It had ceremonial uses as well as significance in creation stories.

The region's subsistence economy was transformed to a commercial one with the coming of United Fruit Company's large banana plantations in the early 1900s. When floods and fungal diseases halted banana production, United Fruit switched to cacao, and when it pulled out in 1938, farmers continued with cacao. It was the most important cash crop until moniliasis swept in.

Cacao and Conservation

Though Morales helps her companion on his small banana and plantain farms, she is culturally closer to the agroforestry system that combines cacao, timber and fruit trees. Her people live within the biologically rich Mesoamerican Biological Corridor, which runs from Mexico to Panama. In Costa Rica, the area is identified as the Talamanca Biological Corridor. Cacao grown here under the shade of fruit and timber trees extends habitat for wildlife outside of the corridor's national parks, biological reserves and wildlife refuges.

As part of the project's biodiversity conservation thrust, CATIE trained farmers to monitor selected wildlife. Morales was one of 59 farmers who tracked species to establish the first database of biodiversity on Talamanca farms.

They monitored birds and mammals—species well known by local people and that have diminishing populations due to excessive hunting. Also on the list were dung beetles, which are indicators of forest cover and habitat quality.

"The idea was to find out which system had the most wildlife," Morales explains, "cacao, forest, banana or plantains. We started at 5:30 in the morning, listening to birds, looking for tracks. In the plantains we never saw tracks, except for opossums. In cacao and the forest, we saw tracks of paca, agouti and peccary."

Results were shared throughout the region. Morales says those who had cut forest for monoculture plantations of plantains said they didn't know they were having a negative impact on wildlife. "We learned where there are no trees, there are no animals."

Enrichment of tree species that shade the cacao also enhanced biodiversity. According to Marilyn Villalobos, CATIE project coordinator, 65 farms added high-quality fruit trees. Native, high-value and endangered tree species were planted on 134 farms.

Morales has laurel and cashá timber on hers. Though she can apply for a permit to cut and sell the timber, she only harvests wood for her use, as she did three years ago to build a small house.

Organic Chocolate

Cacao produces year-round, but Morales' big harvest is in November and December. "My cacao is like a savings account for me," she says. "I use the money from it for end-of-year expenses and save part to pay for school supplies for the kids," whose school year begins in February.

Those who had cut forest for monoculture plantations of plantains said they didn't know they were having a negative impact on wildlife.

She sells to the Association of Small Producers in Talamanca (APPTA), which certifies the organic cacao and markets it in the United States and Europe. Walter Rodríguez Vargas, general manager for the 800-member association, says the monitoring provided scientific data that allows APPTA to label products as environmentally friendly, a marketing plus.

Morales also sells to the Talamanca Women's Indigenous Association (ACOMUITA), which operates a small organic chocolate business. CATIE trained members of this women's organization in improved fermentation practices and drying of cacao beans. The business adds economic value to crops and reinforces the traditional practice of chocolate-making.

As a member, Morales takes a turn making the chocolate. Production has grown from simple chocolate balls to packaged products that also contain raisins, peanuts or macadamia nuts. Products sell at local stores and schools and at the Saturday market in the coastal town of Puerto Viejo de Limón.

Ancestors and Carbon Exchange

In recent months Morales has assumed new responsibilities as one of 12 community members trained by CATIE to work with fellow cacao farmers in a pioneering carbon sequestration project in Talamanca, also financed by the World Bank. ACOMUITA has a lead role in the carbon project, which builds on the success of the organic cacao and biodiversity project.

Interest is high, Morales says, because the goal is to establish a regional market for carbon in which, for the first time, individual farmers would receive payments—environmental service payments—for carbon dioxide stored in their trees to offset carbon emissions in other countries.

She laughed when asked how she explains carbon exchange. "It was very hard when we first went into the field to explain it. We came back to CATIE and got more training." Now she talks about it this way: "The proposal is to see how we can help the environment not be contaminated. Trees need carbon to grow—they turn it into wood. The climate is changing, and it is hot. With our trees here, we can help for parts of the world where there aren't trees."

It's not strange that farmers understand carbon sequestration better when she explains in the culture and language of the Bribri, where everything has a story. The ancestors knew that the leaves of the trees drink up the air, just as trees drink up water and give it back out in dry times.

The goal is to establish a regional market for carbon in which, for the first time, individual farmers would receive environmental service payments for carbon dioxide stored in their trees to offset carbon emissions in other countries.

Morales and fellow promoters travel to villages far and near to analyze small farms. "Our studies tell farmers how much carbon is on their farms," she says. The amount is derived from comparisons of farm plots to a demonstration plot where the carbon dioxide fixed in leaves, branches and trunks has been calculated.

"How much does a farmer get from cacao, bananas, corn and beans? If a farmer is planting beans, he earns so much," she says. "If he lets trees grow there, how much would he earn from environmental service payments?" With this information, farm families can make realistic decisions about land use and know the value of keeping trees.

Sitting in the house on her small farm, Morales looks beyond her village, her people, beyond Talamanca. "This is a pilot project," she says. "All other Central American countries can do something similar because they would have our experience of how to do it."

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Scolel Té Puts a Human Face on Carbon Finance

by Cecilia Lartigue

As the world begins to pay more attention to the voluntary carbon market, the Ecosystem Marketplace spotlights a pioneering project in southern Mexico that has been using a sustainable development model to produce—and sell—carbon offsets for more than 10 years.

PHOTO BY ELISA LOCCI

In the Tzeltal dialect of southern Mexico, Scolel Té means "the tree that grows." According to those involved, this translation suits the fast-growing Scolel Té carbon sequestration project in Chiapas, Mexico.

Scolel Té uses the sale of carbon credits on the voluntary carbon market to fund agroforestry efforts that reduce greenhouse emissions while advancing much-needed sustainable development. Since its launch in 1994, the project has expanded from Chiapas to Oaxaca and is now a viable business, involving more than 400 farmers from 30 different communities and a range of ecosystems.

The project, which is jointly managed by the Edinburgh Centre for Carbon Management (ECCM) and a cooperative of foresters and agronomists known as AMBIO in Mexico, finds carbon buyers who want to buy carbon credits for reasons other than compliance and connects them with farmers who want to sell carbon credits generated by innovative land-use practices on their land.

In a market where many believe that cost-effective greenhouse gas emissions reductions and sustainable development in impoverished rural areas do not usually go hand-in-hand, Scolel Té's success is noteworthy.

But the Mexican and British researchers who work with indigenous farmers on the project say the secret to their success is surprisingly basic. Instead of giving key responsibilities to outsiders, this project puts a strong

emphasis on making community members participate. "The greatest strength of this project is social participation," says Miguel Angel Castillo, head of the Laboratory of Geographical and Statistic Information of Ecosur in Chiapas.

> Instead of giving key responsibilities to outsiders, this project puts a strong emphasis on making community members participate.

Of course, the project is not exempt from the problems of the real world and Castillo is the first to admit that working with poor rural communities can be difficult. "Because approximately 70 percent of the forests in Mexico are under a common property regime called *ejido*, this project is mainly addressed to the inhabitants of ejidos. These people live in areas with high biological richness but are very poor," Castillo says. "Working with poor people with strong social conflicts implies high administrative costs. Also, it means that management procedures are time-consuming and that it takes a lot of effort to explain the project to community members."

On balance, though, Scolel Té seems to have come up with a system that is satisfying both the indigenous farmers generating carbon credits and the companies and individuals buying them. How does the system work? According to those involved, it all boils down to a simple step-by-step process.

Step-by-Step

The first step, says Castillo, is to look carefully at the economic realities and priorities of the region in which you are working. And the best way to ascertain people's priorities, he says, is simply to ask them what they are.

For instance, farmers attending a workshop in the Marqués de Comillas region recently concluded, "Cattle raising is currently the most important economic activity from the point of view of our communities. That is why its planning must be considered a priority, the same as the implementation of projects that reduce the pressure on forested areas...In the near future, forestry and agroforestry can become one of the main activities. Therefore, it is compulsory to develop mechanisms that encourage them."

After the first appraisal phase, farmers joining the Scolel Té project are asked which activities they want to implement. With the assistance of local promoters, they generate *planes vivos* ("working plans") that suit their particular needs. According to the farmers: "Planes vivos are tools that help us plan our work and to supervise it. At the same time we can identify the drawbacks of our productive systems. Planes vivos also help us to find alternatives and solutions."

If the plans comply with a set of specifications preset by farmers, technicians and scientists, they are registered with the trust fund Fondo BioClimatico and are eligible to generate carbon services.

In Oaxaca, Servicios Ambientales de Oaxaca (Environmental Services of Oaxaca), a local nonprofit, collaborates with AMBIO, but both organizations also rely heavily on community teams to do the fieldwork. "The desertion rate is very low. Only about two to three percent of the farmers have deserted. The project is solid because it's based on the local people's own priorities and decisions," says Elsa Esquivel, AMBIO's legal representative.

"The advantage of keeping community members involved in the project from beginning to end," says Richard Tipper, head of science at ECCM, "is that it allows farmers to acquire useful skills such as mapping, surveying, financial planning, and silviculture. And with the help of community members, each project can work with a small administrative and technical staff of just two to four people."

Keeping administrative numbers down means that more money can go back to the farmers who need it most. In 2002, for instance, Scolel Té generated roughly US$180,000 through the sale of its carbon credits. Of the sale price, 60 percent is assigned to farmers and communities for the implementation of forest activities and 40 percent goes to technical, financial, legal and administrative support. The improvement of local livelihood is not huge but considerable (each family gets between $300 to $1,800 per year).

One way of measuring the possible benefits of the project (and of gauging opportunity costs) is to compare the potential revenues of the timber being grown by the project to the potential annual revenues of producing corn, the predominant alternative in the region. A rough comparison of these two activities shows the annual return of one hectare of trees (at 800 trees per hectare) can be as much as one-and-a-half times higher than the annual return of one hectare of corn.

By the Numbers

Even with all the local involvement, AMBIO's Esquivel says the project management costs can creep up. "We have a very good price," she says of the $12 to $15 per ton that Scolel Té charges for its carbon. "We actually should sell at higher prices because we work with small-scale farmers working on half a hectare or three hectares at the most. Therefore our administrative costs are high. Even when $15 seems to be a good price, it just covers the farmers' costs and the true profits will come when trees grow and the timber can be sold, but that usually takes a long time. Higher prices would immediately benefit the local economy and encourage farmers to keep up with forestry activities."

"Other organizations," Esquivel says, "sell at three to four dollars per ton of carbon, but some of them come and go, while we represent permanence in the market. We've been selling carbon for nearly 10 years."

Scolel Té's comparatively long history in the carbon market also allows it to refine its estimates concerning just how much carbon is sequestered when farmers adopt each of several land-use practices. For instance, researchers originally estimated that, in a 25- to 35-year period (depending on the tree species involved and on-site conditions), protecting closed forests would generate 300 tons of carbon per hectare. Converting pastures to tree plantations, on the other hand, was thought to lock up 120 tons of carbon per hectare, while growing fruit and timber trees (such as Spanish cedar) intercropped with maize or other annual crops was believed to sequester 70 tons of carbon per hectare. Because the project now boasts several plots that have been established, researchers at Ecosur are running tests to determine whether these numbers are accurate. The first results will be available in January 2007.

Scolel Té's comparatively long history in the carbon market also allows it to refine its estimates concerning just how much carbon is sequestered when farmers adopt each of several land-use practices.

For the time being, buyers seem ready to take the original estimates on faith. In 2005, Scolel Té says it sold 10,038 tons of carbon offsets to clients that included the FIA Foundation (a leader in road safety campaigning and research), the World Bank, and the Cathedral of Guadalajara. For 2006, the FIA Foundation has confirmed that it will purchase 8,300 tons of carbon, while The CarbonNeutral Company, a UK-based offsets retailer, has said it will buy 5,090 tons from the project. Esquivel says it would be ideal if buyers would confirm purchases, but, she adds, "the truth is that carbon emissions are sold day-to-day, so we will only know the 2006 balance by the end of the year."

Plan Vivo

For interested observers, the real test of Scolel Té's model will probably be whether or not it can be replicated in other countries. Scolel Té was the original test-bed for the Plan Vivo System, a certification standard for offsets that was developed by ECCM.

All Plan Vivo projects share the objective of safeguarding the investments of carbon service purchasers while enhancing rural livelihoods and improving the environment. Farmers' plans for forestry activities are always registered in local trust funds, allowing buyers to purchase offsets through the trust fund. Drawing from the Mexican experience, Plan Vivo recommends a set of procedures that deal with issues such as administration, planning, monitoring and processing transactions.

Currently, projects following the Plan Vivo system are operating in India, Mozambique, and Uganda. The "tree that grows," it seems, is spreading its branches far and wide.

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Leading the Pack: People and Payments for Ecosystem Services

Directing a Symphony for Sustainability: A Profile of Pati Ruiz Corzo

by Amanda Hawn

Achieving sustainability in Mexico can be difficult work. Fortunately, Pati Ruiz Corzo, the founder and director of the Grupo Ecológico Sierra Gorda, is up to the task. For nearly 20 years she has been weaving a tapestry of conservation in central Mexico using people and markets as the warp and woof on which all else depends. The Ecosystem Marketplace visits this indomitable force for good.

In Spanish, when someone has taught herself how to do something—cook, garden, fix cars—it is said that she has learned the skill *lyricamente*, which translates, directly, as lyrically. The English translation, of course, not only carries connotations of competence but also of grace. In both the Spanish and English senses of the word, then, Pati Ruiz Corzo has come by her approach to ecology and conservation lyricamente.

A chamber violinist from a hard-working, upper-middle-class family in Mexico, Ruiz explains, "I lived a very urban life, but in the city I was full of strength, with no cause." Ruiz says she found her cause when she moved with her family 20-plus years ago to the ranch where her husband was born in the Sierra Gorda mountains of central Mexico. In the mountains, she began home-schooling her two young boys, surrounding them with books and music in the mornings and hiking with them in the woods each afternoon. It was through this very personal "return to nature" that Ruiz says she discovered and subsequently developed her deep commitment to conservation.

PHOTO BY WAI CHAN

Grupo Ecológico

Mexico remains one of the most biologically rich countries on Earth. In the Sierra Gorda, where Ruiz now lives, orchids explode from the trunks of oak trees in a cloud forest on one side of a ridge and tall pine trees stretch toward the sky on the other. Bright pink hummingbirds stir the air near red-tailed hawks, monarch butterflies and the world's last population of military macaws. Endemic species abound and jaguars still roam mountaintops. Unfortunately, Sierra Gorda, despite its stunning diversity, exhibits several other modern Mexican legacies as well—namely, environmental degradation and poverty.

Sierra Gorda, despite its stunning diversity, exhibits several other modern Mexican legacies as well—namely, environmental degradation and poverty.

Mexico is thought to have one of the world's worst rates of deforestation. More than one million hectares are logged each year, many of them illegally, and according to Ruiz, the destruction is starting to add up. "The water couldn't be dirtier, the soil is bad, the aquifers are drying."

Concerned about deforestation and the loss of biodiversity in Sierra Gorda, Ruiz and her husband, Roberto Pedraza Munoz, founded an environmental nonprofit called Grupo Ecológico with friends in 1987. The group undertook a widespread campaign of environmental education, advocating recycling and reforestation through community projects, school programs and weekly radio shows. Their efforts paid off and in 1997, Grupo Ecológico, with Ruiz at its helm, successfully lobbied the Mexican government to create a biosphere reserve in the region. Today, the Sierra Gorda Biosphere Reserve covers a million acres of mountainous terrain—from arid foothills to forested peaks—and houses roughly 100,000 people within its borders.

Ruiz has always been keenly aware that the fate of the reserve's million acres depends, without a doubt, on that of that of its 100,000 residents. Accordingly, she says she is constantly looking to weave a "tapestry of solutions" that will both further conservation aims and combat the rural poverty she sees around her. Sierra Gorda, because it is steep, far from market and lacks good grazing, is bad for traditional kinds of agricultural and livestock production. Traditional kinds of agricultural and livestock production, because they require that forested hillsides be cleared or used for grazing, are bad for biodiversity conservation. Ruiz argues that, from these two wrongs, it is possible to make a right. "We must set up an economy of conservation for the people here," she says.

By making it financially rewarding for the reserve's residents to switch from extracting their natural resources to stewarding them, Ruiz hopes to prove that people and environmental progress are not incompatible in Sierra Gorda. Grupo Ecológico now has some 20,000 local people involved in different conservation projects. Various communities now boast carpentries, bee-keeping projects, ceramic workshops and flower production and dehydration facilities. Handsome ecotourism cabins have been built in one of the area's prettiest and poorest valleys where birding books have been designed, hiking trails announced and local residents licensed as guides. Thousands of small forestry plantations have been planted throughout the reserve and the first sustainable harvests are planned for this year. The hope is that as current plantation owners begin to reap the rewards of their efforts, other community members will come forward to plant trees as well. In Sierra Gorda, it seems that conservation success may soon prove a feedback loop of the best kind.

Recognizing this, the Global Environment Facility (GEF) provided seed funding in 2000 for an ambitious seven-year project (2001-2007) to expand biodiversity conservation in the reserve. Grupo Ecológico used this

US$6.7 million to leverage additional funding from a range of local and international partners, generating a total project fund of just over $31 million.

An Economy of Conservation

Midway through the project, Ruiz says that Grupo Ecológico, in combination with its offshoot forestry group, Bosque Sustenable, A.C., and the Mexican government, is increasingly looking to establish revenue streams to pay the reserve's residents to act as stewards of its ecosystem services. Payments for environmental services like water filtration, flood control and carbon sequestration, Ruiz says, are "something we owe the people here for their willingness to protect the land. It's compensation long overdue."

Sierra Gorda is an important area for hydrological recharge in a country in need of more water. Heavy summer storms known as *temporales* sweep in from the Gulf of Mexico and douse Sierra Gorda's peaks in rain. The water seeps through the region's porous rock and then collects in underground caverns that act as natural cisterns. While the precise role of forest cover in moderating this hydrological cycle is not yet understood, healthy forests are thought to facilitate groundwater recharge by making the soil more penetrable, prevent soil erosion and local flooding by providing land cover, and filter impurities from water by passing it through complex root structures.

Based on their hydrological importance, Mexico's federal forestry commission (known by the Spanish acronym CONAFOR) began paying to protect forests in Sierra Gorda two years ago. Specifically, the Payments for Hydrological Environmental Services program pays high-altitude residents $30 to $40 per hectare per year if they agree not to log forest on their property. "The CONAFOR payments were an important piece of the puzzle for us because we didn't have any compensation for landowners in old growth areas before the program," Ruiz says.

Participants in the CONAFOR program, which now protects some 13,000 hectares in the reserve and puts money in the pockets of 45 local residents, say that it has been a success in Sierra Gorda where on-the-ground monitoring efforts by Grupo Ecológico ensure conservation actually takes place. The federal government, too, is optimistic about the results, saying that it plans to extend the CONAFOR program to include payments for carbon sequestration and biodiversity conservation as well.

In Sierra Gorda, it seems that conservation success may soon prove a feedback loop of the best kind.

Importantly, Ruiz says she also wants to develop private funding streams for Sierra Gorda's ecosystem services so that conservation will remain sustainable long after the GEF or government money runs out. Toward this end, Grupo Ecológico has set out to gather scientific evidence of the reserve's hydrological importance to take to downstream water users like hydroelectric companies and mining ventures. Twelve hydrological sites now measure precipitation, filtration and flow in the different ecosystems—cloud forest, pine forest, jungle—in Sierra Gorda. Scientists at the University of Queretaro plan to use the data in combination with information concerning land cover and soil type to model hydrological processes throughout the reserve. "Maybe in three years we will have enough historical data to convince businesses to pay to conserve our watersheds," Ruiz says. Then she sighs and takes a swig of tea to suggest that this particular climb may prove a long one.

Luckily, tough terrain rarely seems to slow Ruiz down too much. After battling for seven years to market a carbon sequestration project in Sierra Gorda to potential Kyoto buyers interested in a Clean Development Mechanism (CDM) investment, Ruiz says she has now found a new way to slice the cake. "I finally realized that CDM rules are too high and too expensive to create a good deal for the people of Sierra Gorda, so now we are going to sell our carbon on the voluntary market." And the first voluntary market deal, she notes, is now in the final stages of negotiation.

> Ruiz wants to develop private funding streams for Sierra Gorda's ecosystem services so that conservation will remain sustainable long after the GEF or government money runs out.

Ruiz is also optimistic about the new possibility of selling biodiversity credits to buyers looking to offset development impacts elsewhere. The CONAFOR program, she observes, has already shown her the important role such credits might play in introducing ever more people to an economy of conservation. "There is a man who has been coming into the office for many years to complain because a jaguar has been killing his cows and goats. Now, we can pay him what we owe him for these many years, for his many cows. Now, he can join us on our side."

Gaining Ground

One is aware that Ruiz's battle for sustainable development and an economy of conservation is far from won when driving through Sierra Gorda. A rubbage dump burns on a hillside outside the small city of Pinal de Amoles, swaths of hillside lie denuded and thin livestock graze in roadside forests next to feral donkeys. Anyone involved in conservation in the reserve admits that some people remain uninterested in conservation work and that, despite generous grants from the Mexican government and international NGOs, there isn't even enough money to compensate everyone who is. But, of course, ubiquitous and tidy is not what on-the-ground conservation looks like. And where there is progress in Sierra Gorda, it is real and encompassing.

"I see sustainability like a symphony," Ruiz says. "When I look at the schedule of programs here in Sierra Gorda, I see sheet music with many different voices, many different instruments. Trying to direct on time and in tune can be very, very hard but it is satisfying work."

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Innovating Water Markets in Latin America: A Profile of Marta Echavarria

by Ricardo Bayon

From the rivers of Colombia to the highlands of Ecuador, Marta Echavarria, an enterprising environmentalist with a business background, is becoming a leading actor in the creation of systems that pay for watershed conservation services in Latin America.

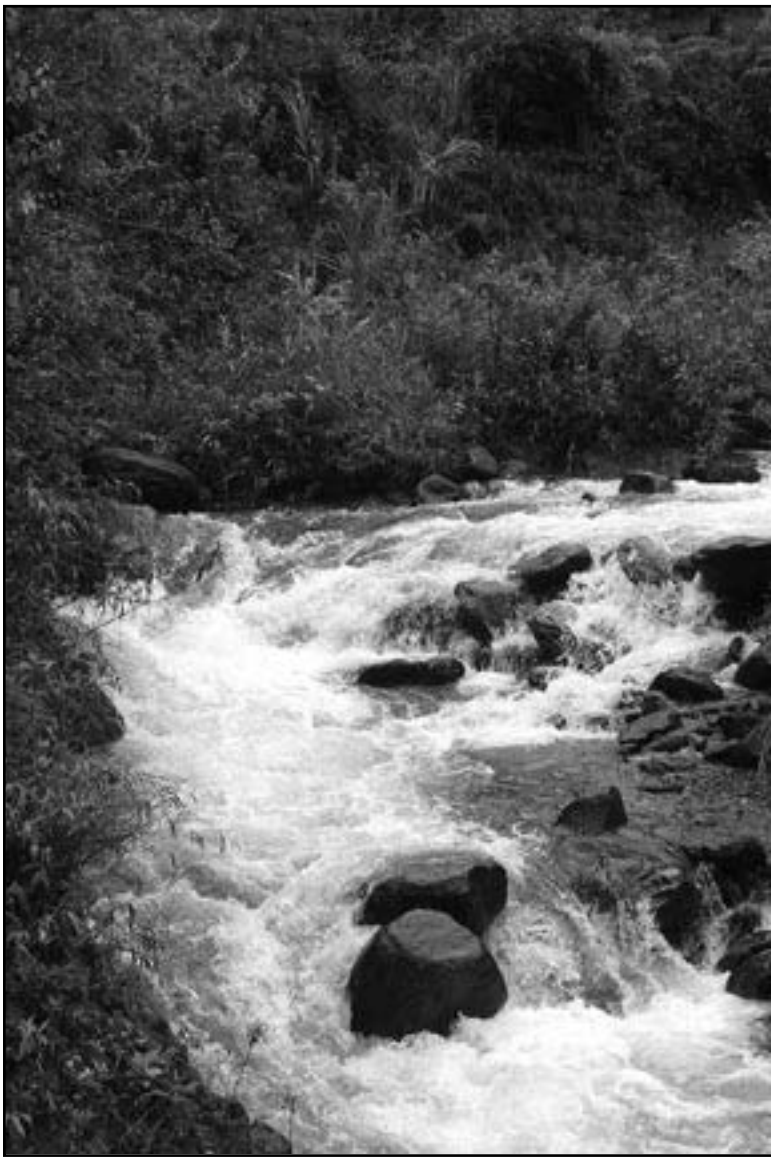

PHOTO BY JENNIFER STONE

For Marta Echavarria, the journey into the world of ecosystem markets began in the valley of the Cauca River, one of Colombia's largest waterways. The Cauca flows northward some 1,348 kilometers (838 miles) from its source in the Andes all the way until it meets the country's largest river, the Magdalena, just shy of the Caribbean. The river—which passes through two of the Colombia's largest cities, Cali and Medellin—is essential to the country's economic well-being. Not only does it support huge industrial and agricultural bases of production, but the river's surrounding highlands and watersheds are the source of nearly two-thirds of the country's coffee, nearly all of its sugar, and a variety of other crops.

So important, in fact, is this river that in 1959, Colombia created the Corporación Autónoma Regional del Valle del Cauca (Cauca Valley Corporation, or CVC). The CVC, modeled on the U.S. Tennessee Valley Authority, was designed to oversee the management of the precious Cauca watershed. It has since gone on to become one of the most influential social experiments in the history of Colombia.

Echavarria, then head of environment for Colombia's Sugar Producers' Association (Asocaña), soon realized that the Cauca was also serving as the laboratory for another equally important experiment, this one related to the creation of markets for watershed services: an experiment that could have repercussions for all of Latin America.

The experiment involved farmers and communities living in the watershed of the Guabas River, a tributary of the Cauca. Though the region normally has abundant rainfall and water supplies, a growing user base and increased deforestation of the watersheds had forced local farmers to face the possibility of water scarcity. Rather than risk not having water to grow their crops, these farmers decided to create an association of water users, a private legal entity composed of users of the same water source who come together to work for its protection and management.

To pay for their watershed protection activities, the members of Asoguabas (as the association ultimately came to be known) agreed to pay into the association a voluntary fee based on their water usage. This money, they decided, would be used to pay for a variety of activities (including economic aid to upstream communities, reforestation, erosion control, and the purchase of land for conservation) aimed at keeping their water flowing.

Asoguabas may have been the first water users' association in Colombia, but it was not the last. Its success soon inspired imitation and today there are more than 12 such groups, all of which work closely with the CVC to develop and implement management plans for the watersheds in the Cauca River Valley.

"I find the story of these associations really remarkable," Echavarria says. "These are groups of users coming together and voluntarily agreeing to pay money to meet a perceived environmental need. It is rare, but it exemplifies the power of water as a unifying force, bringing upstream and downstream communities together for a common cause.

Echavarria's encounter with the water users' associations of the Cauca River Valley was to inform much of her future work.

"I find the story of these associations really remarkable," Echavarria says. "These are groups of users coming together and voluntarily agreeing to pay money to meet a perceived environmental need. It is rare, but it exemplifies the power of water as a unifying force, bringing upstream and downstream communities together for a common cause."

From Asocaña, Echavarria moved to Ecuador to set up EcoDecisión, a consulting company focusing on issues of environment and business. Her clients and her experience may have been in the private sector, but issues of water have never been far from her mind. "Water has always been a constant stream running through everything I do," she says. "At the university I did graduate and post-graduate work on issues of water."

So in 1998 when the Nature Conservancy (TNC), working with its members in Ecuador, needed someone to help them link conservation and water production upstream with water users downstream, it was only natural they came knocking at Echavarria's door.

"The idea of linking the conservation of national parks and issues of water in Ecuador was not a new one. People had been talking for years about how many of the country's large cities get their water from rivers and aqueducts that originate in national parks—a situation, by the way, that is mirrored in most Latin American countries. But no one knew quite what to make of it."

That is until TNC and a local nonprofit, the Fundación Antisana, came to Echavarria with the idea of creating a fund that would make an explicit financial link between the use of water and the conservation of the watershed. They wanted Echavarria's help in designing the institutional structure of the fund, and in giving the concept what Echavarria calls "more body, more flesh."

With Echavarria's help, the fund, called the Fondo para la Conservación del Agua (Water Conservation Fund, or FONAG), was up and running by early 2000. It received its seed capital and initial contributions from TNC, with the help of the U.S. Agency for International Development (USAID) and the Quito Municipal Sewage and Water Agency (known by its Spanish acronym, EMAAP-Q).

By 2003 the fund had received US$480,000 from Quito's water agency ($15,000 in seed capital plus one percent of water sales annually for three years), $90,000 from Quito's electrical utility (which uses the water for hydropower), and $6,000 from Cervecería Nacional, a local brewery. By mid-2004 the fund had close to $1.7 million, thanks to a significant increase in the water agency's sales and financial returns.

"The process has been very slow and painstaking," says Echavarria. "And project implementation is just beginning because we work only with the interest, not the capital, on the money in the fund. But it has been highly instructive."

"The process has been very slow and painstaking," says Echavarria. "And project implementation is just beginning because we work only with the interest, not the capital, on the money in the fund. But it has been highly instructive."

Some of the lessons of FONAG include:

1. The first step in creating a fund like this is raising awareness. In most places, like in Quito, people don't realize that the quantity and quality of their water depends to a large extent on the conservation of protected areas upstream. In the case of Quito in particular, as much as 80 percent of the city's drinking water comes from just two ecological reserves: Antisana and Cayambe-Coca.

2. Secondly, key water users need to be identified, prioritized, and informed. In the case of Quito, the largest water user by far was the Municipal Sewer and Water Agency, a public entity that responds, ultimately, to the city's mayor. For this reason, city government (and, as a result, the city's residents), became a key target audience for FONAG. One of the first—and Echavarria says one of the most influential—things FONAG did was to produce a short and attractive publication detailing the idea for the fund and the importance of conservation to the maintenance of water quality and water flows, among other things. This publication, explains Echavarria, eventually became a useful tool for convincing not only the mayor's office, but also the boards of directors of the water utility, the electric utility, and all other participants in the fund.

Marrying her experiences in Colombia and with FONAG, Echavarria has recently helped start another, smaller, fund in Ecuador designed to let downstream water users pay for the conservation of watersheds upstream. "To me," she explains, "the key issue is always how do you involve all stakeholders and communities in the project from the beginning. People may instinctively understand the value of water, but unless that value becomes more tangible, they may not change their damaging behaviors. And unless they believe in the project, it won't be maintained." She also considers that we need to rigorously monitor and evaluate the effectiveness of these projects: Are people really changing their behaviors as a result of the project, or would they have changed anyway? Is that change truly leading to more and better water? Are the bad behaviors just moving somewhere else? In other words, she says, questions of additionality and leakage are just as important when it comes to water as they are for carbon.

"People may instinctively understand the value of water, but unless that value becomes more tangible, they may not change their damaging behaviors. And unless they believe in the project, it won't be maintained."

And yet, despite the difficulties inherent in creating these sorts of projects, Echavarria is hopeful. She sees in the payment for water services a tremendous potential to change not just the way people relate to water and the environment, but also the entire economic system. She is so hopeful, in fact, that she believes we will one day see such systems being put into place throughout Latin America.

Thanks in no small measure to Marta Echavarria, Ecuador and Colombia are likely to be but the beginning of a much broader trend.

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IV Room for Debate: Views on Markets for Ecosystem Services

Beyond "Markets": Why Terminology Matters

by Sven Wunder and Maria Teresa Vargas

What's in a name? Does a rose by any other name truly smell as sweet? Aware that terms such as "markets" and "payments for ecosystem services" have encountered resistance in some parts of the world, the Ecosystem Marketplace asked two practitioners based in Latin America to explore how the concepts of "markets" and "payments for ecosystem services" are being perceived in developing countries.

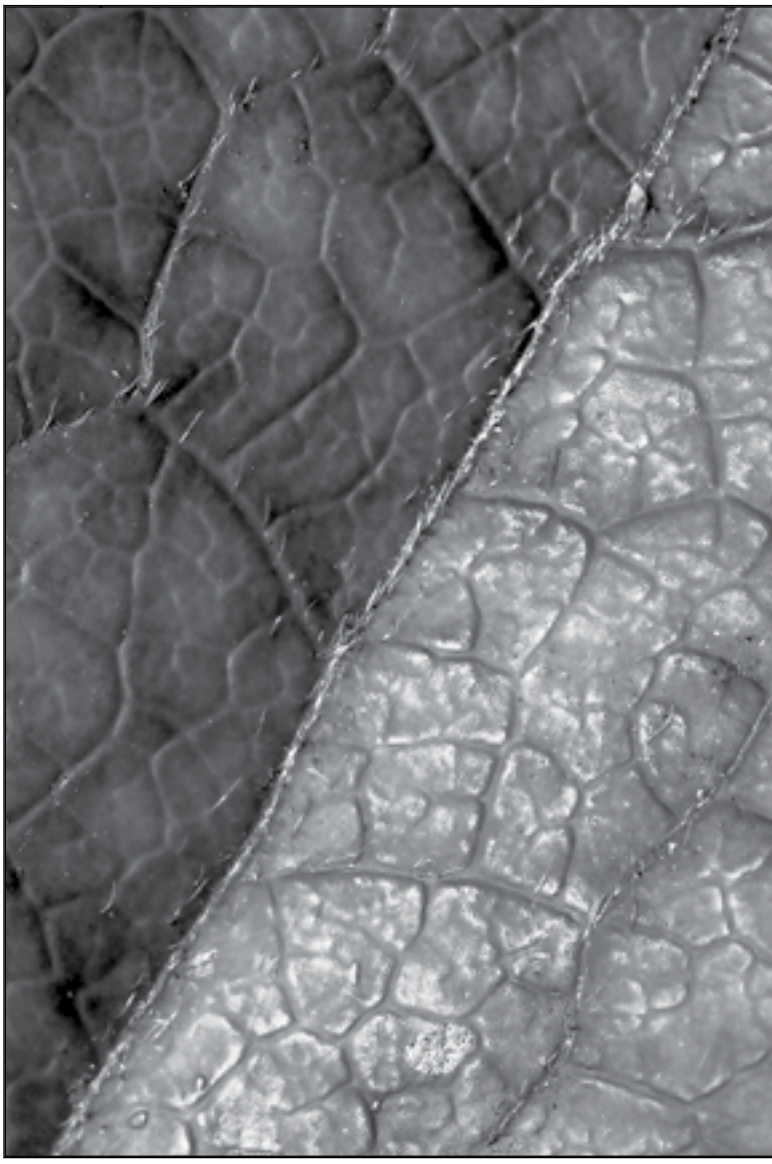

PHOTO BY MACIEK BARAN

It has now been nearly two decades since the Berlin Wall collapsed, the Cold War ended, and capitalism arguably became the planet's dominant ideology. Surely by now, decision-makers around the world have been convinced of the superiority of market institutions in securing desirable societal outcomes? Or have they?

Though it may seem that capitalism and markets reign supreme the world over, there remains much doubt, particularly in the Southern Hemisphere, about the ultimate desirability of markets. Such market skepticism may at times be conveniently coupled with hostile attitudes towards globalization, U.S. foreign policy, the World Bank and other Bretton Woods institutions. And while many in the North continue to insist religiously on markets as the universal remedy, this discourse—often led by economists—frequently ends up fostering more resistance than persuasion in developing countries.

Payments for Environmental Services (PES) are an excellent example of the case in point. Eloquent theoretical arguments have been made (including in this publication) about the superior performance of direct payments for watershed protection, carbon sequestration, biodiversity conservation, landscape beauty, and other such services as compared to more direct command-and-control or project-based approaches aimed at achieving the same goals. There is no shortage of market enthusiasts eagerly promoting the concept of "markets for environmental services." Beyond the concepts of "payments" and "markets" for ecosystem services, an alternative branch of the literature has opted for terms such as "compensations" and "rewards" for ecosystem services, hinting at the alleged equity and entitlement aspects of service exchanges.

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Moving beyond the battlefield of discourses to the real world, how have these "payments," "compensations," "rewards," or "markets" for environmental services fared so far? If we look only at the tropics, at the developing countries of the world, the implementation of these schemes has been slower than their apparent advantages would make us expect. Some of the main obstacles identified by our research for this slow adoption rate have been the lack of trust and "social capital" that exists between providers and users of these services. Also, users often lack the willingness to pay for services that they had previously received for free. Yet, part of the problem resides in the genuine difficulty that exists in communicating a complex subject that many in the real world still consider an economist's toy.

These problems notwithstanding, we tend to share with the market optimists the belief that the increased use of markets and economic incentives for environmental protection is both desirable and promising. Indeed, while some market skepticism is sound and necessary—especially when it relates to the equity implications of markets—a good share of the skepticism that exists is based on irrational fears, for example, when Andean peasants believe that carbon trading means "selling the oxygen to the gringos."

Further, we believe that detaching environmental service transactions from the quid pro quo incentive principle—as some have suggested—and over-burdening it with equity-driven and poverty-alleviation side objectives is likely to just reproduce the tired old project-driven approaches to conservation: old wine in new bottles. But, on the other hand, is it adequate or even wise to always talk across the board about environmental service "markets"? If we are not careful, the terminology itself could become a major stumbling block in the creation of new approaches to environmental protection.

Except for the emerging carbon markets, it seems incorrect to constantly refer to some of these schemes as "markets for environmental services." After all, they are seldom true markets, since spatial specificities usually restrict or eliminate any of the competitive forces so fundamental to the proper functioning of markets. Certainly that is the case for watersheds, biodiversity and landscape beauty—probably in that order of relevance.

Take, for example, the case of an urban water utility. If it thinks the price for watershed protection charged by upstream farmers is too high, usually it cannot just go to the next three watersheds for better offers. Likewise, if a large private forest owner charges too much for protecting the habitat of an endemic charismatic species,

it is seldom possible for biodiversity buyers to just forget about that site and turn to neighboring plots instead. In other words, the nature of highly localized environmental services, combined with structural impediments to competition in the rural tropics, severely restrict the scope for market forces.

Instead of true markets, what we mostly find in the real world—both in developed but especially in developing countries—are bilateral, mutually-negotiated agreements between ecosystem service users and providers. Usually, these agreements make both parties (as well as the natural resource base) better off. And, at the end of the day, isn't that what we are all looking for from these arrangements? So why insist on referring to all these agreements as "markets," something that, even analytically speaking, in many cases they are not? The overuse of the term "market" would appear to be designed to cater to a post–Cold War trend in developed countries where anything to do with markets is seen as "sexy" by donors, the media, and even politicians.

Yet in most of the developing world, "markets"—like other labels with a clear monetary association—may not be considered sexy at all; they may actually turn people off. Indeed, we have found that the notion of "reciprocal solidarity arrangements" and similar terms are seen as much more culturally acceptable in many parts of the developing world. In Pimampiro, Ecuador, for example, a pilot watershed payments scheme recently changed from "payment for environmental services" to "retribución" (recompense) for these services because that term was deemed more politically palatable to the urban water users who finance the monetary payment to upstream farmers. Similarly, in Vietnam, tiny payments for watershed protection are being routinely made, but to visualize them as money changing hands to buy a service was perceived as inappropriate, since it could be associated with corruption.

The overuse of the term "market" would appear to be designed to cater to a post–Cold War trend in developed countries where anything to do with markets is seen as "sexy" by donors, the media, and even politicians.

Perhaps the most illustrative case of the terminology problem comes from Bolivia. In February 2005, Bolivia's president, Carlos Mesa, tendered his resignation, in part because of continued conflict over the privatization of water supplies to the city of El Alto. The trigger for the latest conflict was not poor performance on the part of the concessionaire (Aguas de Illimani, owned by the Suez Lyonnaise des Eaux), which by all accounts seemed to be doing reasonably well. Rather, it stemmed from the visceral hatred of large sectors of the campesino community for everything terms like "markets" and "privatization" were believed to represent.

In Bolivia, it would appear that the general argument against markets is that they have seldom delivered what they were supposed to. It is doubtful, for example, whether privatization and liberalization so far have brought jobs, better incomes and better lives to Bolivians. Following the Cochabamba Water War (a conflict over similar issues that led to violence in 2000), the Bolivian social movement has argued that privatization simply serves multinational companies, allowing them to take away Bolivia's natural resources—the continuation of a process that began almost 500 years ago. Whether this radical analysis of the impacts of privatization is fully correct or not, the discourse against its implementation has found ample resonance in Bolivian society, in particular among the indigenous groups in the highland region.

Within this context, Fundación Natura began to develop a small "payments for environmental services" project in Bolivia's Los Negros Valley. Natura quickly realized that their use of the word "payments" was causing problems. Campesino groups were confused: they associated the Spanish word "pago" with privatization and land appropriation. Farmers' unions and social groups ideologically opposed to environmental conservation quickly took advantage of the situation and began claiming that the project was simply a new form of forest privatization—a mechanism for selling Bolivia's assets to foreigners. Trying to change this popular perception has taken months. Although the agriculturalists that participate in the system now know that Natura has no intention of appropriating their forest, doubts periodically resurface in the community. Changing the project name from payments to "compensation" has not yet reduced tensions, so participants now prefer to discuss the project simply in terms of "improved management of hydrological resources." Natura staff members are convinced that if they had started the dialogue using terms other than "markets" or "payments," progress towards project sustainability would have been faster and far easier.

And yet, despite these setbacks, there is also some good news from Bolivia regarding the potential for using traditional "reciprocal arrangements" (what economists might call "market-based mechanisms") for managing watersheds for hydrological sustainability and improved livelihoods. Communities such as Chimboco, in the Sacaba Valley close to Cochabamba (site of the aforementioned "water war" over privatization), maintain their customary laws and have developed many innovative institutions to manage natural resources. Such associations are often entirely autonomous and self-managed; they generally have complex rules and norms that revolve around rights (often water rights are de-linked from land rights), responsibilities, and conflict resolution. A number of the water users' unions, such as the 960-member Association of Users of the Larati Lagoon (AULL) even serve as de facto local governments.

Anyone who wants to use water either for irrigation or consumption in the Sacaba Valley must become a member of the users' association and assume all of the responsibilities that this implies. Current water distribution is based on rules developed in 1903. Of course, as in any human society, transactions between resource owners are common, especially as a way to maximize efficiency, but such "markets" are a small component of these integrated systems of water management, which are based largely on the concept of reciprocity.

Beyond the Sacaba Valley, the case of Tiquipaya is especially interesting since it, too, is close to Cochabamba and serves as a counterpoint to the furor over water privatization in that city. The Tiquipaya watershed supports a number of functionally independent irrigation systems, each of which has developed its own approaches to allocating water usage, some of which involve water "turns" that can be bought and sold. The crucial innovation in many of these systems is that resource users have the right to a fixed amount of water, and can use it for irrigating any of their plots, even those outside the system. In this way, the systems have disconnected the water/land relationship and thus separated land and water rights. The evolution of this "water market" (though no one would call it a market!) has been accelerated by prior fragmentation of land for different agricultural uses.

Even under extremely dry conditions, the systems have worked, allowing for the negotiation of complex water transfers between a variety of actors. For example, one well-known agreement is the tripartite arrangement between the National Irrigation Systems, the Saytu Ckocha community, and the SEMAPA drinking water utility (now named Aguas del Tunari), through which SEMAPA "compensates" Saytu Ckocha for its extraction of drinking water through investments in local system improvements, such as well-boring and the purchase of heavy machinery for community use.

Now, clearly these systems revolve around access to water—rather than markets for ecosystem services—but they can still provide some interesting lessons. For one, they show that there is a considerable institutional foundation in some developing countries. Second, they show that incentive-based cooperative agreements can develop endogenously (i.e., without external interference) within local systems of natural resource management. We have yet to find examples of these locally developed systems being involved in outsider-driven environmental management programs, but it is clear that developers of projects that in developed countries would be called "payments for environmental services" could take advantage of the extensive social capital and institutional diversity that exists in developing countries for natural resource management.

Given the above, we believe that market-based resource management mechanisms and forms of "payment for ecosystem services" may be feasible in Bolivia—but in most cases only within the larger context of community-based reciprocal agreements for water management and conflict resolution. It also has become evident that referring to these mechanisms as "markets" is likely to be highly counterproductive in places like Bolivia.

To sum up, the advance of market mechanisms, stewardship payments, and other economic incentives for environmental services is a positive trend—one that we believe will be of benefit to service users, service providers, and the environment. But this trend is young, and requires support if it is to thrive. What is certain, however, is that calling everything a "market" does not help matters much.

Calling everything a "market" does not help matters much.

One concern is that many of these arrangements are not "markets" in the proper sense of the term. Another is that even those arrangements that could legitimately be called "markets" may sometimes be better served by referring to them under a different label. Buzzwords are not mere semantics; they can and often do make the difference between adoption and rejection of a project or approach! And, just as we package some non-market transactions, calling them "markets" to sell them to a donor in the North, we also need to show a similar sensitivity to local perceptions when these projects take place in developing countries.

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Guest Editorial: Environmental Markets Impoverish the Poor

by Simone Lovera

PHOTO BY KATO INOWE

While there has been much interest in the use of markets to protect the environment of late, not everyone is convinced that markets are ultimately good for the environment or good for communities. Aware that environmental markets are still controversial, the Ecosystem Marketplace asked Friends of the Earth International's Simone Lovera, a prominent critic of markets, to express her views in a guest editorial.

The Quechua, an indigenous people living in a large part of the South American Andes, believe that the Earth is a mother who cares for people as if they were her children. They call this Mother Earth "Pachamama."

In this perspective, the concept of markets for ecological services is a very strange one. According to the concept, the different functions healthy ecosystems provide to local people—services such as the provision of food, medicines, fuelwood, water, construction materials, and local climate mitigation—can be translated into monetary terms, turning people who use these "services" into clients; clients that will, one way or another, have to pay for these functions. For the Quechua, such an approach would be like arguing that a family should force its children to pay for the care their parents provide.

The Centre for International Forestry Research has calculated that one hundred million people depend on forests to supply key elements needed for their survival: goods, services, and incomes. At least one-third of the world's rural population, they say, depends on forests for their firewood, medicinal plants, food, and compost for agriculture. And the women of the world have a special relationship with the environment: In many communities, they are the ones who are responsible for fetching water, fodder and fuelwood, as well as gathering medicinal and edible plants. Because they have less money, it is of crucial importance to them that these resources are available, that they are of good quality, and that they can be obtained for free.

When forest values are privatized and commoditized as part of the process to create a market in ecosystem services, the access of nearby communities to the forest tends to be blocked, leaving women without access to the energy, fodder and medicines that make their lifestyles possible. They therefore find themselves forced to buy these products on the market. However, women form the overwhelming majority of the world's monetary poor, largely due to the fact that they spend a great deal of their time on economic activities that are not remunerated in monetary terms. Childcare, parental care, caring for domestic animals and the vegetable garden, cleaning the house and homestead, and cooking—these are all very important economic activities that ensure household survival and the reproduction of the workforce, but are not recognized in official accounts as contributing to a country's national product. They are particularly important for the monetary poor: families who cannot afford to pay for professional child or parental care, domestic help, or commercially purchased eggs, milk and vegetables.

When forest values are privatized and commoditized to create a market for ecosystem services, community access to nearby forests can be blocked, leaving women without access to the energy, fodder and medicines that make their lifestyles possible.

Women in developing countries work 60 to 90 hours a week. They provide 75 percent of healthcare services and more than 75 percent of the food consumed throughout Africa. Yet women seldom get paid for all this work. As they spend so much time on unpaid activities, their income in monetary terms is, by definition, much lower than that of men. Moreover, women worldwide are paid 30 to 40 percent less than men for comparable work. Even in the UK, the average full-time weekly earnings of women are 72 percent that of men.

In other words, the money needed to pay for the resources and environmental services that women previously accessed from the forest for free would therefore likely be earned by their husbands, who spend more time on activities that are remunerated in monetary terms, and who earn more cash per hour. The market in environmental services could therefore lead to a greater dependence of women on men.

In this way, blocking free access to medicinal plants, fuelwood, clean water and other resources that are vital for people's livelihoods not only leads to the economic impoverishment and social marginalization of women and other poor sectors of society, it also leads to a cultural and spiritual impoverishment. After all, nature not only provides communities with vital resources, it also provides them with beauty, inspiration and joy.

Regretfully, there is an increasing trend towards blocking free access to vital livelihood resources like water, wood for fuel, and traditional medicinal plants. Neo-liberal market theories have stimulated or forced politicians to incorporate these goods, and the carbon sequestration functions of forests, into so-called "markets in environmental goods and services." As demonstrated by the Mbaracayu carbon sequestration project in Paraguay, the privatization and commoditization of forests, and the privatization and commoditization of the carbon sequestration and other services they provide tend to go hand in hand, as the companies or conservation NGOs that acquire the rights to the carbon sequestration usually demand secure rights over the forest itself. After all, the carbon sequestration services are valueless without full control over the forest itself. Privatization,

commoditization and the creation of markets for environmental goods and services are thus all interrelated aspects of one and the same trend: to privatize what used to be communal property through market-based conservation mechanisms.

The growing market in environmental goods and services has already led to a seemingly unstoppable trend to privatize the provision of drinking water.

The growing market in environmental goods and services has already led to a seemingly unstoppable trend to privatize the provision of drinking water. Despite rapidly growing opposition by social movements and the slowly growing concern of environmental policy-makers, the World Bank and other powerful institutions are still enthusiastically promoting the privatization of water services. In fact, privatization often forms a condition for loans and grants relating to the water sector. And while the privatization of public water services and the privatization of ecological services seem to relate to separate trends, they are both motivated by the same belief in market mechanisms as a panacea for inadequate public management of what is, in the end, a common resource: the water and biodiversity our planet provides.

These institutions are also very much involved in the promotion of other market-based conservation mechanisms like the sale of protected areas to eco-tourism companies or large conservation NGOs, the sale of genetic resources and associated knowledge to pharmaceutical companies, and the sale of forests to oil companies and other industries that want to offset their carbon emissions and other polluting activities.

As a general trend, these market-based conservation mechanisms tend to block access for those who cannot pay for the environmental "services" nature provides. In part, the movement stems from a belief by many conservation institutions that local communities have a negative impact on natural resources. This belief persists despite the fact that decades of so-called "modern science" and centuries of community experience have shown that indigenous peoples and local communities are perfectly capable of living in harmony with nature. This harmony, however, is only possible as long as their traditional management practices are not devastated by the "blessings" of "modern" industrialization, and as long as their original lands are not taken over by large-scale monocultures, dams and/or mining companies, all of which can force them to move onto fragile lands to which they are not adapted.

Other institutions have accepted the notion that local communities are the key actors in conservation, but they still promote market-based conservation mechanisms, as they argue it would reward communities for the conservation efforts they are making. But experience has shown that communities are seldom—some would argue never—competitive in the tough international market for environmental goods and services. The few exceptions are generally the result of pro-active government intervention in the form of development aid or other financial incentives. This fact is clearly demonstrated by the famous case of the Costa Rican environmental payment scheme, which was set up through a major grant by the Dutch government. Fact is, that the Costa Rican scheme for selling carbon credits turned out to be totally uncompetitive as soon as the official development aid dried up.

The trend to privatize biodiversity and watershed services through market-based conservation schemes is also defended with an argument that refers to a very well-known disease: the lack of political will of governments. Just as initiatives like Future Forests are dumping inappropriate trees all over the world to offset the responsibil-

ity of hundreds of "Easyjetters" and other irresponsible oil consumers, water privatization, carbon sinks, and other market-based schemes are off-setting the responsibility of governments to provide affordable, clean water for all, halt climate change, and conserve biodiversity.

As mentioned above, including natural resources in the market for environmental services also makes women more dependent on men. It makes indigenous peoples and local communities who used to manage and collect their own natural resources dependent upon jobs that provide them with a monetary income, thus forcing them to abandon their traditional lifestyles and find employment on large haciendas or in mines. In short, it makes those who do not have money more dependent upon those who do. It makes the poor dependent upon the rich.

The most important Millennium Development Goal governments agreed upon in 2000 is to reduce poverty. Poverty is morally unacceptable in a world that has more than enough resources to provide a decent livelihood for all. Even more unacceptable is the ongoing trend to further impoverish women and other "monetarily disadvantaged" sectors of society through the introduction of neo-liberal market mechanisms that block their access to the resources and services that are vital for their daily survival. Markets for environmental services might be a win-win-win strategy for big industries and large landholders, but for the world's poor they are undoubtedly a lose-lose-lose proposition.

Experience has shown that communities are seldom competitive in the tough international market for environmental goods and services.

Simone Lovera is now campaigns coordinator of the Global Forest Coalition, a worldwide coalition of NGOs and Indigenous Peoples Organizations working on international forest policy; she also works for Sobrevivencia/Friends of the Earth-Paraguay. She may be reached at simonelovera@yahoo.com.

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From the Ground Up:
South Africa Sets Up Foundations for Environmental Markets

Ecosystem Farming: The Precursor of Markets in South Africa?

by Amanda Hawn

Following its success with the innovative Working for Water program, South Africa has begun experimenting with a whole new approach to conservation and restoration, an approach that has scientists "mapping" ecosystem services and land users "farming" them. The Ecosystem Marketplace takes a closer look at these recent developments and considers whether "trading" will be the next new verb for ecosystem services in the RSA.

The photo looked like it came from Mars: a reddish, dry riverbed running beneath yellowed marshlands and brown hills. Even the sky, where white streaks striated a pale blue horizon, looked parched. The printer had run out of blue ink. The result was an image of South Africa's Gariep River that appeared decidedly thirsty.

And yet, embedded as it was in a document entitled "Working for Wetlands, South Africa," the unintended photograph seemed strikingly appropriate, even prescient. It read like a warning: take care of South Africa's wetlands or the Gariep Basin may itself run out of blue in the decades ahead.

South Africa is a dry country and recent climate projections suggest that much of the nation will grow drier in the years to come. By 2025, according to a recent WWF document, "the country's water requirements will outstrip supply unless urgent steps are taken to manage the resource more sustainably."

PHOTO BY ROSS JAMES JOHNSON

Fortunately, South Africans are taking steps to conserve their water resources and, notably, they are using an ecosystem service–based approach to fuel their progress. Protecting watershed services in South Africa has, in fact, become the catalyst for a whole new approach to conservation and restoration in the country, an approach that some in the business are calling "ecosystem farming."

Public and private interests are testing the feasibility of paying landowners to put land into a new form of production—one geared toward ecosystem services.

Ecosystem farming is interesting because it implies a very different approach to a long-recognized environmental conundrum: biodiversity conservation and people's need to earn a living from their land don't always coincide. In the United States, the government generally has resolved this conflict by paying farmers to take their land out of production. In South Africa, both public and private interests are currently testing the feasibility of paying landowners and laborers to do the opposite, i.e., to put land into a new form of production—one geared toward ecosystem services.

Against this backdrop, the recently published ecosystem services map of the country's Gariep Basin is especially intriguing. Could the project—a product of the Millennium Ecosystem Assessment (MA), a four-year international effort to assess the state of Earth's ecosystems—represent a road map, not just for the development of the Gariep Basin, but also for the whole of South Africa and, by extension, for the rest of the world?

A New Kind of Map

The Gariep is not only the longest river in South Africa, it is also among the most important and most heavily regulated. Large dams and complicated transfer schemes knit together more than 665,000 square kilometers of catchment, as the river flows from the mountain nation of Lesotho through Gauteng Province and on into the arid western reaches of South Africa and Namibia. On its way, the Gariep system supplies water to Johannesburg, the economic hub of Southern Africa, fuels South Africa's "grain basket" (where food for approximately 70 percent of the nation is produced), and supports two international biodiversity hotspots.

Given its ecological and economic importance, the Gariep Basin is, in many ways, just the sort of place in need of an ecosystem services map. And so it was that, in 2000, the Gariep Basin Millennium Ecosystem Assessment was born. Broadly speaking, the aim of the project was to provide a map that would be useful to policymakers balancing the trade-offs associated with the protection and use of ecosystem services at the local, national and regional scales. Toward this end, the scientists used models and participatory methods to assess the location and "irreplaceability" of three types of ecosystem services in the basin: water services, food and fuel production, and services linked to biodiversity.

Water reaches were assigned classifications ranging from A to F, according to their level of ecological integrity and industrial/agricultural function. "A" regions of the river carried proposals for strict management practices that would support biodiversity in a near-natural state. In descending order, Bs, Cs and Ds allowed for successively greater alterations of natural flow, water quality and temperature. Finally, recommendations were made that Es and Fs—stretches of the river so modified by human activity that their function potentially was impaired irreversibly—should be restored to D level when and where possible, but that some reaches of the river should be treated as sacrificial "workhorses" for industrial, agricultural and municipal water needs. Once the basin's

present water resources had been mapped, the researchers next used models to forecast attainable classifications for each area in the future. This second map described the restoration capacity of the catchment over the course of five years, charting a path toward an increased net flow of watershed services to a variety of sectors.

A similar approach was taken in mapping biodiversity and food production services. The basin was gridded and each cell, representing a piece of land, was ranked according to the level of service it provided in three areas—the production of protein, cereal and biodiversity. "We used the notion of irreplaceability to assign comparable values to areas of land," the report explains. "Irreplaceability is a measure of how important the features that an area contains are to the achievement of a stated goal."

In the case of Gariep Basin, the scientists defined their goals as the provision of the nutritional needs (in terms of protein and calories) of 70 percent of South Africa's population and the preservation of a baseline measure of biodiversity.

Market-based mechanisms may have a role to play in the basin's most irreplaceable ecosystem service hotspots.

The resulting map, in which areas with high irreplaceability values look like bright spots on an electricity grid, indicates those regions that should be managed most carefully for each of the respective services. Importantly, the map also reveals regions of overlap, where the same geographic area provides irreplaceable services in terms of both biodiversity and food production. It is in these ecosystem service hotspots, the scientists stress, that different management practices should be considered most carefully, with decision processes that weigh trade-offs explicitly and pricing policies that reflect the full cost of the land being used.

While the project's managers are quick to point out that, "framing a question of ecosystem services only as an economic issue has several shortcomings," they also acknowledge that market forces can play an especially important role in assigning values to services in areas where the trade-offs between two or more management regimes must be considered. The basic notion of economics, of course, is that economic forces give price signals that, because they are continually revised, are an especially useful means of assigning and tracking value in dynamic systems.

Thus, it is in the basin's most irreplaceable ecosystem service hotspots that market-based conservation mechanisms may have a role to play: "We are currently exploring markets for ecosystem services," says Christo Fabricius, one of the lead investigators on the project, "but there are no examples in South Africa, that I know of, where this has been successfully implemented...yet."

Brick by Brick, Tree by Tree

While true market-based conservation programs per se aren't up and running in South Africa, a suite of public works programs is laying the foundation upon which they might soon be built. Throughout the 20th century, public works projects generally focused on regulating rivers—through dams, dikes or irrigation schemes—in ways that made them less natural. In the first decade of the 21st century, South Africa has been widely recognized for turning this paradigm on its ear through a program called Working for Water. By restoring watersheds to their "natural" state, South Africans are harvesting the benefits of ecosystem services while simultaneously providing jobs to their nation's poor.

Invasive species suck up a great deal of water in South Africa—a single eucalyptus can use up to 400 liters of water in a day. Consequently, their removal immediately increases the amount of water available to recharge water tables. Recognizing that two of the country's wrongs—unemployment and water scarcity—might make a right, the South African government began paying people to clear invasive species out of river catchments in 1996. They called the program Working for Water and, in the decade since its inception, they have watched it grow from strength to strength.

Now, Working for Water's impact is rippling ever wider through a series of spinoff programs: Working for Wetlands opened up shop in 2000 to restore the water filtration services of native marsh habitat; likewise, Working on Fire began dispatching crews to sustain healthy forests/veld and prevent wildfires last year; and a new program near Port Elizabeth, called Working for Woodlands, is beginning to restore pastoral lands to sustain biodiversity and sequester carbon. Taken as a whole, the projects constitute not only the largest conservation program on the African continent, but also a sea-change in terms of the recognition of the value of the services provided by healthy ecosystems.

"We could use more programmes like this—with lots of synergy and potential income generation possibilities based on land users acting responsibly, looking after their land."

"Programmes like Working for Wetlands, Working on Fire, and Working for Woodlands, not only provide 'value' and employment because of their pro-poor policies, but also engender a conservation ethic amongst their workforce," says Val Charlton, advocacy coordinator of the Working on Fire Programme. "We could use more programmes like this—with lots of synergy and potential income generation possibilities based on land users acting responsibly, looking after their land."

The idea that land users might not only act as stewards of the ecosystem services flowing from their land but also benefit financially from doing so is the win-win goal of modern conservation—the environmentalist's version, so to speak, of having one's cake and eating it too. In the case of South Africa, however, the idea is that land users are, at the same time, baking more cakes. This, in a nutshell, is the basic notion behind ecosystem farming. And so, importantly, the new programs in South Africa are not only mapping and harvesting ecosystem services like soil protection, water delivery and carbon sequestration, they are also investigating the long-term economic returns that might convince private stakeholders to invest in increasing them.

Those at Working on Fire, for instance, are stating their case to private agricultural and silvicultural enterprises. "The commercial sectors of Forestry and Agriculture suffer extensive financial loss as uncontrolled fires destroy crops, plantations, buildings and equipment," reads the program's website. "As this project aims to provide direct benefits to private sector bodies, it is expected that this sector will in return, support the venture."

Working for Woodlands, meanwhile, is investigating potential income streams to entice private and communal land-users to undertake restoration work on their land. "Ultimately the aim is to remunerate the land user for delivering services such as biodiversity conservation and the protection and maintenance of ecosystem func-

tions—i.e., erosion/soil regimes, water delivery and quality and—the most talked about one at the moment: carbon sequestration," says Christo Marais, the executive manager of strategic partnerships at South Africa's Working for Water Programme.

Working for Water and its sister programs—because they are seeded and sustained by government money rather than by direct payments from the users of their services—are not true market-based mechanisms, but rather an excellent example of how innovative public programs can create positive synergies between poverty alleviation and ecosystem restoration. Nonetheless, as the programs explore new funding streams in the private sector and begin to cultivate the notion of ecosystem farming among landowners, they are inching South Africa ever closer to the widespread deployment of market-based conservation.

Experts in the field, however, warn that before the mapping and farming of ecosystem services can actually generate trading in South Africa, uncharted and tricky waters have yet to be navigated.

Here Be Sea Monsters?

"South Africa is a mix of both first and third world economies, with all the challenges associated with such," says Charlton of Working on Fire. "At the third-world level, poverty is dire, and it is extraordinarily difficult to preach ecosystem services approaches to an audience that is starving—they are not thinking about tomorrow, only the meal that needs to be put on the table today. Thus the first challenge is to make conservation meaningful to the poor."

Charlton's point is an important one. In a country where eight million people still lack access to safe drinking water, the notion of farming the resource for others is a foreign, even absurd, idea. "Although payments for environmental services (PES) are understood as a market-based mechanism, in most instances in this country and region, poor communities are providing environmental services without compensation and these are typical cases of market failure and a lack of bargaining power in the transaction of services," says Paula Nimpuno of the Ford Foundation. "[Our] current work with Resource Africa has the intention of mapping but also of improving our understanding of how to make the ecosystem market approach benefit the poor."

If they are to succeed, market-based conservation mechanisms like the users-pay approach to ecosystem farming must justify their relevance in the starkest of terms.

Bread-and-butter politics reign supreme among the poorest of the poor in South Africa. If they are to succeed, market-based conservation mechanisms like the users-pay approach to ecosystem farming described above (also known as a PES or ESP model) must justify their relevance in the starkest of terms. Equally important, they must make sure the poor can access buyers for the services they render and that they can negotiate with them on equitable grounds.

It Is Not All Poverty

Although poverty is perhaps the most pressing issue relating to ecosystem services in South Africa, it is worth noting that 83 percent of the country is privately owned, much of it by white landholders who are not impoverished. What of market mechanisms in these areas?

Mark Botha, of the Conservation Unit at the Botanical Society of South Africa, cautions that important conservation opportunities are likely to be missed if these parties are not welcomed to the table. "Tenure and ownership are well-defined in the private areas, and there are opportunities to link specific payments to well-defined management actions [such as biodiversity-friendly land use, increased runoff, and increased carbon storage]. However, international NGOs and donors are not prepared to test PES with this politically marginal and not-poverty-stricken group," says Botha, who has looked carefully at the PES approach in South Africa. "The focus on poverty and communities has taken us away from some more direct PES opportunities."

Clearly, private property owners are well-positioned, and perhaps ready, to take up the challenge of ecosystem farming on a much wider scale than anyone else.

Evidence exists to suggest that Botha is right in looking closely at private as well as communal land users. Private landholders in the country have had the right to use and manage the wildlife on their land for the last several decades, and the result, according to the Millennium Assessment "has been a doubling of protected land as well as increased economic benefits." Clearly, private property owners are well-positioned, and perhaps ready, to take up the challenge of ecosystem farming on a much wider scale than anyone else.

The Voyage Ahead

Finding the synergies between poverty alleviation and ecosystem service conservation, while at the same time ensuring market access to both economically and politically marginalized populations, is the next challenge for South Africa as it moves from mapping and farming its ecosystem services to trading them. Tied up as this challenge is in the past as well as the future, striking the right balance will be neither simple nor easy.

History has shown, however, that it would be a mistake to count out this particular nation's possibility of success simply because of political, social, and economic complexities. When it comes to the successful navigation of troubled waters, there may be no better boat to follow than that flying the green, black and yellow flag of the new South Africa.

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South Africa Makes Gas Liquid

by Amanda Hawn

Beating others to the punch, a South African financial services company introduced the world's first structured instrument for carbon trading. The Ecosystem Marketplace investigates Sterling Waterford Securities' sophisticated new offering and finds out why some of the carbon market's most influential players got involved in the deal.

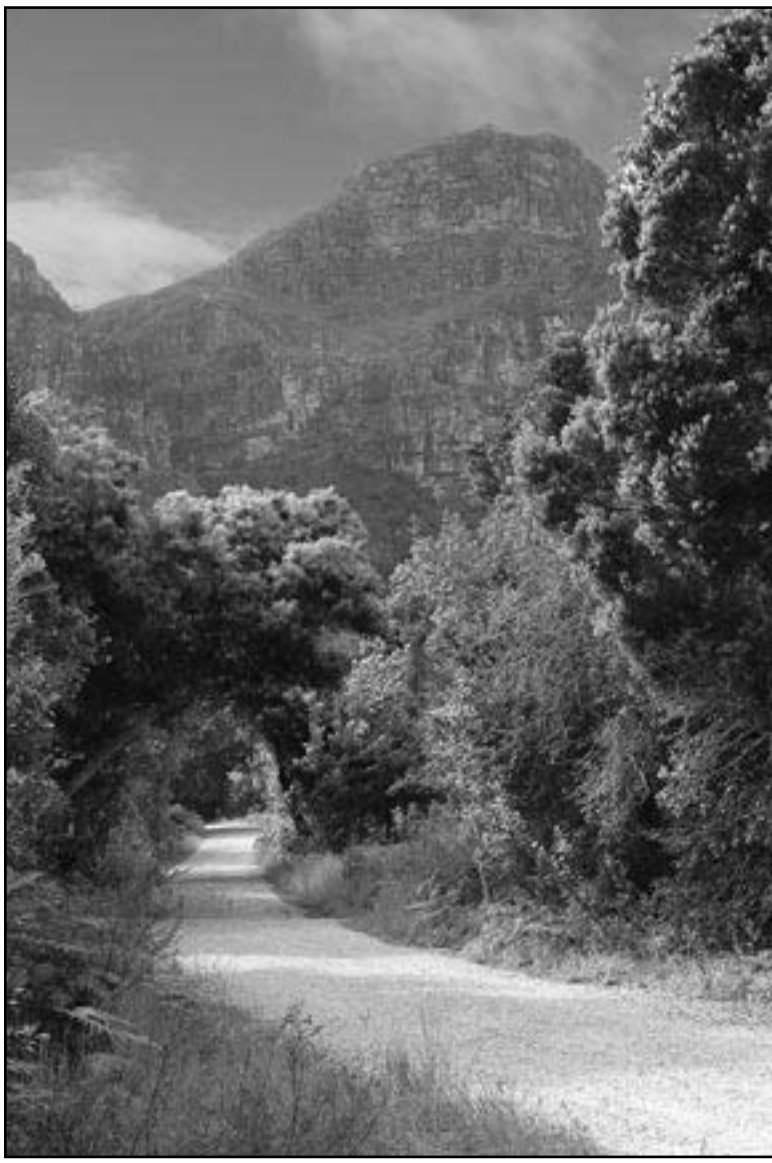

PHOTO BY DOXA

As the global carbon market rounds the corner on its six-month birthday and steams toward toddlerhood, some personality traits are starting to emerge. One of the market's most pronounced tendencies is the geographic segregation of its players: most of the financial institutions screening, investing and developing project portfolios for certified emissions reductions (CERs) are in Europe, Britain and the United States, while most of the projects themselves are in Latin America, Africa and Asia.

Proving that early developmental paths often take unexpected (and welcome) turns, however, the first negotiable carbon credit instrument recently emerged from a black-owned financial services company in South Africa.

In late April, the Cape Town–based company Sterling Waterford Securities announced the first listing of its Carbon Credit Note (CCN, share code CBN) on the Johannesburg Securities Exchange (JSE). The notes are traded as derivatives, with carbon credits as the underlying security. Each CCN, in other words, represents an obligation on the part of Sterling Waterford to deliver a carbon credit, or the cash equivalent thereof, to the note holder at a future date, in this case, 2008.

The notes are revolutionary because they represent the first true liquidity mechanism in the carbon market, allowing investors to trade carbon offset credits—also known as allowances or carbon emissions reductions (CERs)—on the open market before the associated offset projects have been fully developed.

"South Africans have always been great innovators and this bears testimony to that. We are small and agile enough here at the southern tip of Africa to have stolen the march on our larger and better capitalized European counterparts," says Gregor Paterson-Jones, CEO of Sterling Waterford.

The notes are revolutionary because they represent the first true liquidity mechanism in the carbon market, allowing investors to trade carbon offset credits—also known as allowances or carbon emissions reductions (CERs)—on the open market before the associated offset projects have been fully developed.

What's Novel

Small and agile are good descriptors not only of South Africa's new carbon financiers, but also of the innovative instrument they have designed.

Sterling Waterford's maiden offering of carbon notes totaled just US$12.6 million, but the transaction attracted some heavy hitters because of the instrument's unique flexibility for carbon investors. In June, the well-established environmental finance company EcoSecurities Group Ltd. announced that it would act as the counter-party for the first listing of the notes, agreeing to supply all of the notes' underlying carbon credits from a global portfolio of emissions reductions projects.

"Sterling Waterford contacted us to provide this hedge, as we are one of the few organizations in the world that has a CDM project pipeline robust enough to give investors the certainty of delivery," explains Pedro Moura-Costa, the managing director of EcoSecurities. "It was an obvious fit, and it also fits with our plans to create more sophisticated structures based on carbon."

International law firm Baker & McKenzie, which acted on behalf of EcoSecurities in inking the deal, suggested that the notes might be the first in a wave of negotiable financial instruments based on carbon credits. "As we see EU allowances for carbon reach prices of Euros 20 or more per unit…it will be critical for industry to have access to structured products such as this to help them manage their carbon exposure," explains Baker & McKenzie's Anthony Hobbey. "We expect this to be the first of many such structured carbon transactions."

Until now, companies looking to manage their carbon risk via the Kyoto Protocol's Clean Development Mechanism (CDM)—a mechanism that allows businesses in developed countries to offset their emissions at least cost by paying for emissions reductions in developing countries—have had two choices. They could either invest in carbon offset projects themselves or they could invest in a private or public sector fund that, in turn, would manage a portfolio of carbon offset projects for them.

Both of these options, however, lock up capital without return until the offset projects have been fully developed and the carbon credits certified for sale on the open market. That, as most market players well know, can take years.

Enter Sterling Waterford and the invention of a promissory note that can be traded on the open market in place of actual carbon credits. The big advantage of such a note, explains Paterson-Jones, is liquidity for the investor. “If the market for CERs begins to run, the owner of a CCN doesn’t have to wait for four years to lock in a profit but can rather sell the obligation.”

Forward trading, of course, opens Sterling Waterford and, should they go under, their investors to the risk that EcoSecurities will not have the carbon credits necessary to back up the promissory notes in 2008. In order to hedge this risk, Sterling Waterford says it has structured a deal with EcoSecurities that requires EcoSecurities to post collateral at six-month mark to market dates for the amount of its exposure, namely the difference between the forward-price it will receive for the carbon credits from Sterling Waterford and the current price of those carbon credits on the market.

In the absence of a spot price for carbon, the carbon credit market price is determined by asking an agreed-upon group of brokers what they would pay for similar carbon credits from EcoSecurities’ portfolio on the appointed day.

EcoSecurities posted collateral at the first of these mark to market dates on July 5. After Standard Bank of South Africa polled four brokers, it determined EcoSecurities’ exposure to be US $1,040,973. Playing it safe by a wide margin, the company posted a total of $3,032,115 with the bank in the form of cash and non-cash assets (the latter being forward contracts for carbon credits with a value of $5,856,030).

“If the market for CERs begins to run, the owner of a CCN doesn’t have to wait for four years to lock in a profit but can rather sell the obligation.”

What’s Nifty

While trading in CCNs necessarily entails some risk, it also opens up a secondary market for both individual and institutional investors ahead of 2008. For the first time, then, smaller players can get into, and out of, the carbon market with relative ease.

South Africa is not on the list of countries required to cut greenhouse gas emissions under the Kyoto Protocol, so South African businesses, at the moment, have no stick nudging them into the carbon market. In Sterling Waterford’s new notes, they do, however, have a relatively juicy carrot hanging in front of them.

Prices for CERs historically have been quoted in dollars regardless of where trading activity takes place. Accordingly, the Reserve Bank of South Africa recognizes Sterling Waterford’s CCNs as a dollar-denominated asset class that can be bought and sold by South African investors on the JSE using rands, the local currency. By using rands to purchase a dollar-denominated promissory note, South African investors are able to hedge the risk of fluctuating exchange rates.

“The advantages are that investors would be protecting their investment in the event of the rand weakening against the dollar,” explains Phillip Bouwer, a director at Waterford Sterling. Anyone who has watched the rand dance between six and 13 rand to the dollar since the turn of the century understands that structuring a pure rand hedge sometimes pays off.

Of course, the ultimate, and probably primary, buyers of CCNs will not be South Africans, but rather international investors who are subject to the regulatory stick of the Kyoto Protocol and the EU Emissions Trading Scheme (EU ETS). For these investors, the attraction of the notes lies elsewhere, namely in their price. Under the rules of the EU ETS, any company emitting more than its allowance of carbon dioxide in 2008 will have to pay a 40 euro per ton penalty (roughly US$50 at today's exchange rate). Carbon credits, meanwhile, have been on a bull run of late and are currently trading in the neighborhood of $27 per ton. In contrast, CCNs are currently trading at ZAR 89 per ton or just $13.50.

Half-price deals have been known to lure shoppers in off the street before, but it should, nonetheless, be remembered that carbon prices on the EU ETS have already proven they can be bearish as well as bullish. Likewise, for South African investors looking to hedge against a weakening rand, what goes down can also come up when it comes to exchange rates.

> "We expect much larger activity once we start actively marketing to the EU parties."

For the time being, however, investors have deemed Waterford Sterling's new carbon instrument nifty enough to leave the company's first listing of the asset fully subscribed and to create a secondary market in CCNs that has been liquid, if not yet robust.

"We expect much larger activity once we start actively marketing to the EU parties," Paterson-Jones says. "We expect funds to come in more actively in the second half of the year."

What's Next

Plans for the future indeed seem to be on the horizon at Sterling Waterford. The company says it plans to announce a second listing within six months, mentioning numbers in the range of US $50 million. And, if all goes well, Sterling Waterford may also introduce a hybrid product based on carbon credits in the not-too-distant future. "We are currently investigating a high-yield bond product with the uptick related to carbon underlying and a term compliance insurance product for smaller players not in the allowance market," Paterson-Jones says.

"It is a nascent market," Paterson-Jones acknowledges. "But we think we're right at the beginning of a significant curve. The market could be worth $15 to 20 billion per year in the near future—which is significant, measured against trade on the JSE." For South Africa, this CEO says he is betting that "the carbon market is the next big thing."

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Taking Action: Approaches to Payments for Ecosystem Services

Payments for Ecosystem Services in Rural Africa

by Jennifer Austin

More and more agencies are expressing interest in the concept of payments for ecosystem services in rural Africa. The Ecosystem Marketplace finds out whether or not they are on to something.

PHOTO BY STEFFEN FOERSTER PHOTOGRAPHY

Driving a few kilometers outside the congested capital city of Kampala, Uganda, the lush green of the countryside is striking—not what most expect of a landlocked African country situated on the equator. The roadside is punctuated by vibrant displays of carefully stacked tomatoes, bright banana bunches, hanging pineapples and many other fruits and vegetables being sold by the local women. Further along, men hold out large fish recently pulled from Lake Victoria.

If anyone understands how critical natural resources are to human survival, it is the people living in rural African villages, some of whom depend directly on neighboring natural forests for as much as 35 percent of their annual income.

While the dependence of rural African communities on natural resources is no secret, actually quantifying the value of the services derived from the surrounding environment is difficult. The concept of payment for ecosystem services (PES) is a way of giving economic value to the services ecosystems naturally provide.

PES is growing in popularity among conservationists worldwide and has proven effective in many places as a conservation tool. One of the most commonly cited PES success stories is that of the New York City water

department project, where an ecosystem and billions of dollars were saved by restoring a watershed's naturally purifying forests instead of building a costly water filtration.

The moneysaving or moneymaking potential of PES has led some to consider it as a tool for promoting both conservation and development in third world countries. Early projects in Uganda suggest there is, indeed, a place for PES in rural Africa. Equally important, they point the way toward some of the biggest challenges facing those hoping to use PES to achieve conservation and poverty alleviation at the same time.

High Risk, High Return

Perhaps the biggest challenge when it comes to implementing PES programs in the rural areas of Africa is finding buyers for ecosystem services. Women and children who spend many of their waking hours walking to collect water from local springs do not have the money to pay for the natural water filtration services that they clearly rely on for clean, healthy drinking water. Successful PES programs in this setting must recruit another buyer who also benefits from the ecosystem and is willing and able to pay for its preservation or restoration.

PES requires a system of clear property rights, a mechanism for certifying and monitoring service delivery and a way of making payments.

Where buyers exist, communities stand to benefit doubly from PES markets: first by earning money for protecting the ecosystem, and second by ensuring that today's survival does not jeopardize tomorrow's economic progress by depleting resources.

Identification of buyers is just one step in the successful implementation of PES in developing countries. Startup capital is needed for projects requiring an initial investment and transaction costs must be kept low enough to allow for small-scale involvement. Ecosystem services must be quantifiable and measurable so that a value can be agreed upon and payments can be made. PES requires a system of clear property rights, a mechanism for certifying and monitoring service delivery and a way of making payments.

Despite these hurdles, there is a lot of enthusiasm for PES for in Africa and a sense that it could be a better tool than government- or donor-funded projects in the long run. "We have these [donor-funded] projects that come and go. PES is a long-term solution," says Byamukama Biryahwaho, the program officer for special projects at EcoTrust Uganda, a grant-making environmental organization that has recently launched a carbon credit-funded reforestation project in rural Uganda.

Linking the economic incentives directly to the outcome of the project helps keep people involved. "With donor- or government-funded projects, people can just say they are planting trees. Here payments are made based on the success of the project. If a tree dies, the person is going to replant to get the money." Byamukama explains. "There is no obligation to plant a certain number of trees, they continue to plant because they see they can make money. The key is consistency in monitoring and followup."

Structuring Payments

While practitioners of PES generally believe the model's greatest potential lies in its ability to engage the private sector in conservation, most PES schemes in Africa still depend on government or donor funding.

In part, this is because very poor communities lack the startup capital necessary to launch projects credible enough to attract non-government buyers.

This can be overcome in a variety of ways. When EcoTrust began its reforestation project, they provided seedlings to the farmers for free, but it became clear that this was too costly to sustain. EcoTrust moved instead to a loan program in which seedlings were given to farmers in exchange for a promise to pay back the loan at the time of the first ecosystem payment. Now, in areas where the project is well established, private tree nurseries have sprung up based on the same model.

Acknowledging that the lack of startup capital is a problem, Byamukama suggests that a contract farming type system could be set up for carbon credit markets. He suggests that this could parallel other production systems in which the buyer, usually a processor of raw goods, invests money in the farmers from whom he plans to buy. Once the ecosystem service payments began to flow, the investor would see a return on his investment in the form of a self-sustaining supply chain.

Even the best buyers often find it difficult to structure sustainable certification, monitoring and payment systems that don't entail huge transaction costs.

Alice Ruhweza, lead agencies coordinator at the National Environmental Management Authority (NEMA) in Uganda observes, however, that startup capital isn't the only reason few private sector buyers have materialized in Africa. An equally important factor, she says, is that working with the many small service providers is a logistical challenge, making it tempting to enter instead into larger deals with governments. "It is easy to work with government and write one big check. The problem is, government is a bad buyer, often they do not follow up and there is no one checking to be sure they redistribute the money properly" for conservation and community development.

Even the best buyers often find it difficult to structure sustainable certification, monitoring and payment systems that don't entail huge transaction costs. EcoTrust has helped overcome this challenge in Uganda by developing innovative ways to facilitate payments between their large overseas corporate buyers and the many small farmers who are planting the trees. Payments are made to EcoTrust and then distributed to farmers through existing village banks. This has worked well, and farmers are clearly seeing the benefits. The banks have reported that the early payments are significant compared to other deposits usually made by the farmers.

When paying farmers individually, property rights are clearly important, but the lack of a proper land title does not necessarily preclude PES programs from working. "Often the west holds lack of land titles as a major hang up and an insurmountable limitation across the board in developing countries," Byamukama notes. "This is not necessarily the case as long as local ownership is clear."

EcoTrust insists on proof of ownership from all farmers enrolling in its reforestation program. This proof, however, can come in the form of a proper land title, or approval and endorsement by the local council. As long as ownership is firmly established within the structures of the local community there is no problem.

Projects carried out on communal lands require a different payment mechanism, but they too can work. Uganda Wildlife Authority's (UWA) cooperative management framework, for instance, shares 20 percent of all park entry fees with local communities. UWA has established Community Protected Area Institutions (CPIs) based on community leadership structures associated with local parishes. CPIs serve as an advisory body and liason between

the community and UWA. They help communities identify development projects of interest and then present project proposals to the chief park warden who allocates funds to the districts to implement projects. "The community leadership structures in place are strong enough for this system to work well," says Aggrey Rwetsiba, UWA's monitoring and research coordinator. "The communities also take better care of the projects because they feel they own them. They have chosen what they want to spend the community money on and they know there isn't more money to come fix them or build them again."

Communities around the more popular national parks are clearly benefiting from the tourist-generated income. Lillian Nsubuga, UWA's public relations manager, explains: "These CPIs are most active around the more popular national parks, where the tourism is highest. These parks tend to be in the west, and if you take a drive out that way you can see that the lifestyle is improved. The communities have built better schools and clinics, implemented water projects and improved roads."

From Talking to Walking

UWA also runs another program called the Forest Certification Initiative. The initiative is an ongoing PES project promoting conservation stewardship around two of Uganda's national parks. It has helped restore natural ecosystems, clarify park boundaries, and raise local awareness of environmental conservation. At the same time, the program has provided employment and valuable skills to many local villagers.

"Awareness raising and capacity building are two important elements of the program. The people this project has employed were picked from the villages. Now they feel a stronger attachment to the park, and are stronger workers. Many have gone back and become leaders in their villages. Some have private tree nurseries and trees of their own because now they know the value," Rwetsiba says.

"The people this project has employed were picked from the villages. Now they feel a stronger attachment to the park, and are stronger workers. Many have gone back and become leaders in their villages. Some have private tree nurseries and trees of their own because now they know the value."

While successful on many levels, the project could be even more valuable if UWA were able to sell carbon credits and use the money for the restoration of other parks or implementation of community projects. Unfortunately, because the project was not originally designed as a Clean Development Mechanism (CDM) project under the Kyoto Protocol, it must now be modified and retrofitted to satisfy the rigid CDM criteria. UWA is not the lead agency in the country on CDM protocol; therefore figuring out how to do this involves many players from UNFCCC, Government of Uganda Department of Meteorology, NEMA and others, making the ongoing effort a slow and complicated process.

In general, slow and complicated still seem to be the most common adjectives when it comes to describing PES in Africa. There are many projects and proposals in the planning or early implementing phases, with few examples in which money has actually changed hands. Nonetheless, many of these early efforts look promising and are

already yielding lessons about the feasibility of PES in a rural African setting.

Based on experience, Byamukama and others involved in pilot projects are optimistic about the potential for PES in Africa. "There is a lot of interest. People see their neighbors being paid for restoring or protecting ecosystems, and they want to get involved," says Byamukama. "We need to get learning centers and more projects on the ground, otherwise we'll just keep talking."

While successful on many levels, the project could be even more valuable if UWA were able to sell carbon credits and use the money for the restoration of other parks or implementation of community projects.

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EBay Shoppers and Subsistence Farmers Meet on Virtual Ground

by Amanda Hawn

PHOTO BY PAUL VAN EYKELEN

The International Small Group and Tree Planting Program (TIST) is a standout carbon project based on a mix of poverty alleviation and cutting-edge technology. The Ecosystem Marketplace highlights TIST's efforts to make the world's carbon markets work for the rural poor and asks the curiously related question—have eBay shoppers just stumbled across the sustainable development deal of a lifetime?

Internet shoppers can now find greenhouse gas offsets from Kongwa, Tanzania on eBay, just a click away from their favorite antique collectibles. Through a novel program called the International Small Group and Tree Planting Program, sustainable development has come to the world's largest online marketplace.

Greenhouse gas offsets, also known as carbon credits, are marketable certificates representing reductions in greenhouse gas emissions. Offsets generated by emission reductions in Kongwa, the theory goes, may be used to cancel out excess greenhouse gas emissions anywhere in the world.

In the case of TIST, subsistence farmers generate offsets by planting trees that absorb carbon dioxide as they grow, locking up greenhouse gases that might otherwise contribute to climate change in the atmosphere.

The TIST eBay store has sold 150 tons of offsets so far and is now routing money back to subsistence farmers planting trees in Tanzania, Kenya, Uganda and India.

In part because of its innovative use of technology, TIST has become a flagship greenhouse gas offset project; unlike most community-based forestry initiatives—which have struggled to attract investors because of scientific and regulatory uncertainties (see Horses for Courses: Voluntary CDM Carbon Projects in Mexico)—

the project has claimed a spot in the portfolio of a prominent carbon fund at the World Bank. (Carbon funds are not unlike mutual funds, but instead of a portfolio of investments in companies they direct investment in a portfolio of carbon offset projects).

On August 31, 2005, the World Bank's BioCarbon Fund officially closed Tranche One of its investment portfolio, moving a step closer to its goal of proving that Land Use, Land Use Change and Forestry (LULUCF) projects can provide creditable, cost-effective emissions reductions. Notably, TIST was the only multi-country project to make the cut.

"The [TIST] project is a model for demonstrating the developmental impact of carbon finance and how remote communities in the developing world can harness the carbon market to help themselves and contribute to the global good," trumpets the fund's website.

In part because of its innovative use of technology, TIST has become a flagship greenhouse gas offset project.

Virtual Cash Crop

To understand the circuitous route of Tanzanian carbon to eBay and the World Bank, one must follow a man named Ben Henneke. Henneke, the president of Clean Air Action Corporation, was on a trip in Tanzania in 1999 when the idea of marrying sustainable development and the emerging global carbon market first began to take shape in his mind.

"If you go where people need the opportunity the most, you are in places that are very far off the beaten path," Henneke observes. "The wonderful thing about ecosystem services markets is that you aren't trying to transport products."

Familiar with markets in pollution credits from his work in the United States, Henneke says he began to wonder: "'What if we could create an income stream that was adequate to change people's lives by selling greenhouse gas credits?'"

The farmers and church leaders with whom Henneke was working welcomed his idea of a "virtual cash crop" that could buoy local incomes while reforesting villages with native trees. And so, led by Clean Air Action Corporation, 40 small cooperative groups (with 10 to 12 farmers per group) organized to create TIST in 1999. The TIST board voted to create a for-profit organization called TIST Ltd. the following year.

Today, TIST has expanded to over 2000 groups spanning four countries—Tanzania, Kenya, Uganda and India—and TIST farmers have planted a total of four million trees (2000 mature trees account for 1000 metric tons of carbon dioxide equivalent). A typical small group now earns around $40/year from TIST for planting trees that generate carbon credits and another $450/year from the adoption of conservation farming techniques that increase crop yields.

"The tree planting and improved agriculture produce hope among the group members," says Vanessa Henneke, chairmain of the board of the Institute for Environmental Innovation, the not-for-profit arm behind TIST in the United States. "They become willing to tackle harder issues such as HIV/AIDs, family planning, and other health issues. The TIST groups then become a good example for other villagers—providing leadership with their own actions."

TIST estimates that its farmers should sequester a total of around 1.5 million metric tons of CO2 by 2012 (for comparison, personal computers in California emit about 1.7 million metric tons of CO2 per year). And, if all goes as planned, TIST trees should have soaked up more than 2.3 million metric tons of CO2 in some 40 countries around the world by 2017, marking a real contribution to the fight against climate change while generating a stable income source for those who need it most.

Building Bridges

While TIST's rapid growth suggests that creating a market for carbon credits in places like Tanzania was an idea waiting to happen, those involved in the project stress that pitching a tree-planting project in rural Africa to Western investors is anything but easy.

"There is this very large mismatch between cultures," Ben Henneke says. On one end, he explains, you have a demand for very high quality data from regulators, environmentalists and investors in the Western world and on the other you have villagers without electricity.

Executives at Clean Air Action Corporation understood, from the beginning, that if they were ever to recoup their investment in TIST, their best bet was to create carbon credits that could be sold into the compliance market created by the Kyoto Protocol. Specifically, they knew that TIST would have to navigate the stringent rules and regulations of the Protocol's Clean Development Mechanism (CDM), which allows companies in industrialized countries to fund greenhouse gas reduction projects in the developing world in exchange for carbon credits.

> "If you go where people need the opportunity the most, you are in places that are very far off the beaten path," Henneke observes. "The wonderful thing about ecosystem services markets is that you aren't trying to transport products."

"When the CDM is the only real market out there for this kind of project, you have no choice but to work from scratch to build a project that will be replicable within a CDM framework," says Edward Kirk, senior program manager at Clean Air Action Corporation.

In impoverished regions—where just three minutes worth of a phone call cost the average farmer a day's wages—TIST's founders knew that they would have to be innovative in order to generate the kind of data that would attract CDM investors. "We set out to marry Western accounting practices with East African and Indian cultures and realities," Kirk recounts.

And so, in order to establish a clear baseline, TIST began training farmers to collect the necessary data using a host of new technologies. "We used all the battery-based stuff [global positioning systems, palmpilots, laptops] to be more or less independent of the electricity grid," says Henneke, Clean Air Action Corporation's president.

Notably, TIST farmers found that modern technology allowed them to leapfrog some of the hurdles that had plagued their efforts to access markets in the past. They no longer needed to transport products such as mangoes or tea across long distances on unpaved roads; they simply needed to transmit information across oceans. Amazingly, they found that, in today's world, crossing oceans often is easier than bumping along dirt roads.

Using a global positioning system (GPS) and a personal digital assistant (PDA), subsistence farmers now can send the coordinates and measurements of the trees they have planted to investors in Washington, D.C. or London from tree groves in the middle of rural India or Africa. The TIST website lists the precise latitude and longitude of each farmer's grove and tracks the number of trees and seedlings that are planted. "The web helps drive accountability to western investors," Kirk explains.

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Investors who have taken note of the project say that they are, indeed, impressed by the tech-savvy tracking system that TIST farmers have developed.

"TIST is unique," says Benoit Bosquet, manager of the World Bank's BioCarbon Fund. "It brings a very simple concept and project structure, yet a very modern monitoring technique [and] it has put in place a very transparent monitoring system." Indeed, he concludes, "[TIST] is testing techniques, delivery mechanisms, etc., which are going to be useful to many other LULUCF project developers."

10,000 Tries

Trail blazing usually generates some nice buzz, but being out in front also means that people take note when things go wrong. Some in the world of carbon finance say that they are both impressed and skeptical of the level of technological sophistication employed by TIST.

A dose of this skepticism, at least, has proven healthy.

Visitors to the TIST website will spot the steep drop in the number of trees depicted in a bar graph on the home page. Last year, TIST listed data for 2.1 million trees, but this year, the number has dropped to 1.4 million. What happened?

Part of the discrepancy, Ben Henneke explains, can be attributed to a drought that has afflicted East Africa in recent years. In other words, some trees just died. Much of the discrepancy, though, is due to misreporting rather than tree death. Quantifiers caught many of the problems and TIST welcomed an audit by the World Bank last year, but such a downscaling of numbers might, in many business circles, give pause to potential investors seeking assured carbon credits for the regulatory market.

In the new and largely untested world of LULUCF projects, however, such adjustments are hardly uncommon. Consequently, potential investors generally apply the rule of conservatism, committing to buy many fewer credits than a project can generate. "We would not buy more than one Mt of CO2 from this or any other project. So the problem is more one of lower revenues to TIST than lower carbon deliveries to the BioCarbon Fund," Bosquet explains.

Bosquet, in fact, says he considers the drop in numbers to be a sign of progress. "It is a normal adjustment based on improvements in data collection and tighter controls in the monitoring process," he says. "In my view, the fact that TIST readily recognizes the need for adjusting their numbers increases the level of confidence in their business ethics."

Indeed, the TIST model is based on continual adjustment, with small groups meeting regularly to share lessons and refine techniques. "We do, we learn, we iterate," Kirk explains. "We at Clean Air Action repeatedly had to remind ourselves that we were not teachers, we were facilitators."

Invoking the idea that it took Thomas Edison 10,000 tries to make a working light bulb, Ben Henneke explains that the idea is not to avoid making mistakes so much as it is to avoid making the same mistakes over and over again. And the resulting evolution, he says, has been towards a more, rather than less, comprehensive sustainable development package.

"In my view, the fact that TIST readily recognizes the need for adjusting their numbers increases the level of confidence in their business ethics."

Anyone engaged in the realities of sustainable development in rural communities, can attest to the fact that one problem cannot be treated in isolation of the rest. Subsistence farmers whose health is declining because they suffer from AIDS, for instance, will never be able to plant trees and operate GPS units for concerned investors back in the carpeted hallways of the developed world.

"The needs of the communities that we wanted to serve went way beyond tree-planting," Vanessa Henneke explains. "You are hoping for a longer term benefit within the system of the small groups, within the system of the villages."

Accordingly, TIST now provides training in conservation farming techniques, runs family planning programs for women, and disseminates public health information about HIV and AIDS in addition to coordinating its tree-planting efforts.

"The program," Kirk concludes, "is much more holistic than it was originally."

"Financing Gap"

As reactions to TIST's forecast adjustments and evolving methodologies show, potential LULUCF investors manage the uncertainties associated with community-based carbon offset projects in impoverished parts of the world by buying conservatively, leading to lower revenues. In other words, they shift their financial risk over to project developers. Project developers, meanwhile, react to these same problems by investing more time and energy in the health and education of participants, leading to higher costs.

The reactions of both project investors and project developers are correct (carbon funds must purchase credible carbon credits and developers must confront the realities of working in rural Africa), but they widen the gap between potential revenues and probable costs ever further. If global carbon markets are truly going to succeed in advancing sustainable development in impoverished rural communities, then the developed world must figure out how to plug this financing gap.

While many project developers are looking toward TIST's technological solutions when thinking about how to structure a LULUCF project for the carbon market, regulators might do well to look closely at the project's financial challenges.

"The real policy question," Kirk says, "will be whether governments and the CDM Board will establish policies that encourage local groups to take action that benefits the environment, or whether the process will be so restrictive and cumbersome that only 'big' projects with major investment in the front end to satisfy the requirements will be successful. It will be a shame if carbon finance can't help small farmers solve the problem."

Given this dilemma, TIST's greatest achievement in the context of the LULUCF market—if it can pull it off—may not be its innovative use of technology to bridge the distance between the realities of developing countries and Western accounting strategies, but rather its innovative use of philanthropy to bridge the financing gap that exists between costs and revenues for LULUCF projects in their first decade.

Two Tributaries

Kirk, at the Clean Air Action Corporation, describes the Institute for Environmental Innovation's not-for-profit philanthropic funding and TIST's for-profit carbon credit revenues as two flows coming into the same stream. At first, the tight cooperation between the for-profit investors behind TIST's carbon sequestration project and the not-for-profit backers of TIST's larger sustainable development initiatives seems a little too close for comfort. Considered thought, however, suggests that such a public-private relationship might actually make a great deal of sense.

At the urging of the Dow Chemical Company Foundation—which was uncomfortable donating money to a for-profit venture, but wanted to see TIST expand its model beyond Tanzania—TIST's founders helped set up the Institute for Environmental Innovation in 2001 as a non-profit arm based in the United States. Dow immediately contributed $1.2 million to the Institute and TIST's sustainable development initiatives suddenly had a new champion. Since then other donors have also added to the charity's coffers.

On the business side, meanwhile, the Global Development Alliance (an arm of USAID) has provided TIST with $500,000 to put toward its efforts to become self-sustainable. The Global Development Alliance, according to its website, believes that "public-private sector conversations almost always lead to a better understanding of the challenge."

At first, the tight cooperation between the for-profit investors behind TIST's carbon sequestration project and the not-for-profit backers of TIST's larger sustainable development initiatives seems a little too close for comfort. Considered thought, however, suggests that such a public-private relationship might actually make a great deal of sense.

While TIST is hardly alone in its mix of non-profit and for-profit aims (most community-based carbon offset projects in the world today have philanthropic origins), the project serves as a unique kind of control, dem-

onstrating that even with all the technological savvy and market knowledge in the world, even with careful planning and much adaptive management, the financing gap for carbon sequestration projects still exists. Importantly, the project's object lessons don't stop there: TIST highlights that, in their struggle to plug this gap, LULUCF projects are beginning to light on some opportunities as well as problems.

Combining short-term philanthropic support of public health and environmental initiatives with the long-term promise of sustainability offered by carbon credits has convinced Kirk of the potential fit between sustainable development efforts and the carbon market. "The subsistence farmers would be waiting years if carbon were the only driver," he explains. And, on the other end, "participation [in the regulatory carbon market] is a huge carrot on the end of the sustainable development stick."

"We have to be optimistic about the future of the carbon market," he continues, "because there is so much hope for the small groups of subsistence farmers."

Two Markets

Specifically, those involved in TIST, like most LULUCF developers, are holding out hope that the European Union Emissions Trading Scheme (the largest of the regulatory markets) decides to allow carbon credits from LULUCF projects in the future, something it currently does not permit.

Looking to the regulatory markets alone to solve the financial challenges facing LULUCF projects, however, may be missing the real opportunity at hand. Many market analysts point out that businesses required to meet compliance targets in the near future are not the natural investors for the relatively expensive and risky carbon credits generated by LULUCF projects in developing countries. Instead, community-based land use and forestry projects represent a chance for well-invested international aid to act as seed capital for projects that will carry their own weight in the carbon market further down the line.

The regulators behind the compliance markets, then, might be asked to prepare the way for mature LULUCF projects to enter the marketplace. For instance, the EU ETS might agree to admit LULUCF projects that had already successfully piloted scientific, monitoring and delivery methodologies for a set number of years.

"We have to be optimistic about the future of the carbon market because there is so much hope for the small groups of subsistence farmers."

While five to ten years is a long time for a subsistence farmer to wait on revenues from carbon credits, it is no time at all for an international aid donor to wait on sustainable social and environmental returns from a project. And, critically, eBay shoppers may have already hit upon the infrastructure necessary to streamline this kind of international aid—the voluntary carbon market.

The voluntary market was the only carbon market that existed until the Kyoto Protocol was ratified and the EU ETS launched in early 2005. Voluntary market buyers—be they eBay junkies, UN initiatives, or American corporations—generally purchase credits for philanthropic or marketing reasons, rather than for compliance reasons. Importantly, the voluntary market does not require its tradable carbon credits to undergo a certification process as stringent as that required by the Kyoto Protocol's Clean Development Mechanism (CDM).

While this difference has led some environmentalists to criticize the voluntary market for failing to ensure environmental progress, it also makes the voluntary market much more accessible to community-based carbon projects.

Traditionally, project developers have considered the voluntary and regulatory markets to be separate. As a result, many projects are designed specifically for one or the other. As TIST's eBay boutique demonstrates, however, there is no reason that the voluntary market cannot be used as a staging ground for LULUCF projects bound for the regulatory market. While CDM methodologies are refined and delivery methods honed to meet the high standards of corporations and governments involved in the regulatory market, it may be up to the rest of us—eBay shoppers and international aid agencies alike—to enter the voluntary market and thereby plug the financing gap for projects that promise both social and environmental benefits.

As TIST's eBay boutique demonstrates, there is no reason that the voluntary market cannot be used as a staging ground for LULUCF projects bound for the regulatory market.

Many of the world's top economists argue that helping the poorest among us to help themselves probably offers a better return on investment for global society than anything else out there. And so, when sustainable development could be just a click away, it is a purchase we all must consider for economic reasons…not just moral ones.

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Pioneers: The Faces of Ecosystem Services in Africa

From Ugandan Schoolteacher to International Carbon Consultant: A Profile of Beatrice Ahimbisibwe

by Ricardo Bayon

For years forestry carbon—paying for the carbon sequestered by trees—has been the subject of intense debate among those interested in the world's carbon markets. Critics claim these projects are all about greenwashing, naysayers say they are difficult to monitor and skeptics charge they lead to large plantations of eucalyptus. But, while the debate around forestry carbon rages, a forestry carbon project in Uganda has benefited local communities, local biodiversity and local businesses while, arguably, helping the global climate. The Ecosystem Marketplace profiles Beatrice Ahimbisibwe, one of the program's local participants.

When Beatrice Ahimbisibwe—a widow, single mother, and schoolteacher living in western Uganda—first signed the contract agreeing to sell carbon sequestration credits from her small parcel of land, her neighbors thought she was crazy. Ahimbisibwe's neighbors weren't sure what carbon dioxide was, how it was made or where it went, let alone who would want to pay for it.

"You are giving away your land for nothing," local residents told her. "One day they'll just come and take it."

PHOTO BY ADAM DAVIS

She felt protecting the environment was the right thing to do.

Although she didn't believe them, Ahimbisibwe admits the reactions of those around her gave her a bit of pause. She decided, nonetheless, to go through with the deal because—as she had often instructed her students—she felt protecting the environment was the right thing to do.

And so, in June 2003, two years before the Kyoto Protocol was even ratified (let alone accepting forestry-based carbon credits from Africa), Ahimbisibwe entered into a contract with ECOTRUST, a Ugandan NGO, which, working with a variety of international organizations (including the Edinburgh Centre for Carbon Management, or ECCM), agreed to buy Ahimbisibwe's carbon. In return for carbon payments, Ahimbisibwe—along with 30 other landowners in Uganda—agreed to sell the rights to the carbon sequestration generated by planting native species of trees on their land.

Extremely Fortunate

Despite the many difficulties she has had to face, Ahimbisibwe believes she is fortunate to live near the village of Bushenye, in the Bitereko sub-county of southwestern Uganda. The country is marked by a stunning set of lush, plantain-covered mountains and dotted with incredibly deep jade-green crater lakes that rise from the Rift Valley at Africa's center. A few kilometers down the road from Ahimbisibwe's farm lies Queen Elizabeth National Park: a land of elephants, lions, antelopes, hippos, and, improbably, chimpanzees. Not far away, the famous Rwenzori ("mountains of the moon") provide some of Africa's last refuges for mountain gorilla.

For an area rich in natural beauty, Ahimbisibwe's home is also desperately poor. In this, again, she is luckier than most. The starting salary for a secondary-school teacher in her part of Uganda is US$150 per month. Ahimbisibwe has been teaching for more than 16 years, so she probably makes more than that. This compares to an average salary for that part of Uganda of $70 a month. Besides, Ahimbisibwe, because she is a geography teacher, has read about (and taught about) pollution, the environment, the problems of global warming, and the Kyoto Protocol.

In addition to all this, Ahimbisibwe has for some years been a member—indeed the chosen leader—of a local women's collective called the Bitereko Women's Group, and is the chairperson of a local micro-finance institution. So she has had experience working with loans and grants, filling out forms, and writing reports.

"In fact," says Byamukama Biryahwaho, the progam officer in charge of the carbon project at ECOTRUST, and one of the program's architects, "that is how we found Beatrice. At ECOTRUST we've had a number of projects in this part of Uganda. First, in 1999 we provided a grant to the Bitereko Women's Group to set up woodlots, obtain energy-saving stoves, and get involved in sustainable agriculture. Then, in 2002, we helped provide goats to the local women. In both these cases, the Bitereko Women's Group performed admirably: they were great at writing reports for the grants. In fact, they have been so good at getting resources for their members that now men are beginning to try and join the group. So, when we began working with ECCM on a project to pay local farmers to sequester carbon, we knew this group [of which Ahimbisibwe was a part] would be a good one to start with."

Jessica Orrego, Biryahwaho's counterpart at ECCM in Scotland, explains: "Generally speaking, the decision was made to work in Bushenyi because ECOTRUST (and CARE) already had a presence there. It was decided to

approach organized community groups as a way to attract farmers with some level of organizational capacity. Also, access to these farmers was facilitated through the leaders of these groups."

Enter the Carbon Markets

That is how Ahimbisibwe got involved in the carbon markets. In 2002 and 2003, ECOTRUST, together with its technical partners, ICRAF, CARE, LTS International, and ECCM, began talking to farmers in Uganda about carbon, climate change, and the possibilities available to them through the sale of carbon sequestration credits. They told farmers that in exchange for agreeing to plant native species of trees on their land, they could receive payments for the carbon they would be sequestering, payments that would come from individuals and organizations in developed countries contributing to global warming.

"At first," remembers Ahimbisibwe, "we weren't sure what this was all about. We couldn't understand how or why anyone would want to pay us for the air our trees use. For us carbon was something to do with burning wood and with charcoal. But after it was explained to us in terms of pollution, and how our trees would help reduce pollution, it began to make more sense."

In any case, Ahimbisibwe says the deal that ECOTRUST was offering looked pretty good. She had land she was not using and she was happy to plant native trees that would benefit the environment and provide her with extra income. The process, however, was daunting. Interested farmers had to prepare applications that included clear indications of the land they intended to put into the program—including some form of proof of ownership—as well as obtain the signatures of all family members undertaking to protect the trees for the requisite amount of time.

Ahimbisibwe says that once she got over the initial paperwork, her particular deal was relatively straightforward: she agreed to clear and plant a hectare of her land with native species of trees. In return, experts determined she would generate 57 tons of carbon sequestered over 10 years (assuming the trees survived) and would be paid US$8 per ton, for a possible total of $456 over 25 years. Additionally, Ahimbisibwe would be able to recoup any other benefits from the land, as long as the trees themselves weren't harmed: she could let her goats graze the land, she could use any wood pruned from the trees and, after some 15 years, she could use or sell the wood.

"For us carbon was something to do with burning wood and with charcoal. But after it was explained to us in terms of pollution, and how our trees would help reduce pollution, it began to make more sense."

In order to protect against unforeseen eventualities, all of the program participants also agreed to set aside 10 percent of their carbon and not sell it. In other words, for the 52 or so tons of carbon she would be selling, Ahimbisibwe would be getting paid $416 in installments. The first installment of 30 percent (or around $120) would be paid upfront, once the land was planted. Thereafter, the plantings would be monitored and payments would be made as follows: 20 percent one year after planting the whole plot, 20 percent in year three, 10 percent after year five, and 20 percent after year 10.

A Living Pension Fund

Although the regular payments are nice, Ahimbisibwe says that what really sold her on the carbon sequestration project was the prospect of selling the timber 15 to 20 years down the line. "In 20 years I will be retiring from my job as a teacher," she explains, "and the money I get from selling the timber will be very useful for me and my children." In other words, given the limited social security system in Uganda, and considering she is a single mother with little available capital (and nowhere local to invest it if she had it), Ahimbisibwe is putting her retirement in the hands of her land and living trees: a sound—if not positively solid—investment decision. Not only is she using a piece of land that wasn't being used otherwise, but she is also getting some upfront capital (the carbon payments) to help subsidize her investment in retirement. And she is doing all of this at the same time that she helps address global warming. It is unlikely that even the best Wall Street pension fund advisors would be able to come up with such a financially prudent (not to mention socially responsible) pension investment plan given Ahimbisibwe's unique circumstances.

Not only is she using a piece of land that wasn't being used otherwise, but she is also getting some upfront capital (the carbon payments) to help subsidize her investment in retirement. And she is doing all of this at the same time that she helps address global warming.

Ironically, Ahimbisibwe's major concerns about the carbon sequestration program are not about the rigorous contractual processes to date, but about what will happen if the program succeeds. She explains that she and her neighbors are worried about some of the unforeseen consequences of once again having native vegetation. "What happens," she asks, "if the old species of trees come back, and as a result, we see some of the wild plants and animals come back?"

The return of wildlife seems an obvious positive for Northern environmentalists, but for the people of Uganda, the issue is more immediate. Ahimbisibwe explains that, with native trees come native monkeys that steal food and damage crops. Native species of venomous snakes such as tree vipers and rhinoceros vipers also may reappear. "This," Ahimbisibwe says, "is what we worry about. In some ways we would be more comfortable planting eucalyptus."

Eucalyptus would have been the easy choice in others ways too: Eucalyptus seedlings, paradoxically, are easier to get in Uganda than seedlings of the native African cherry (*Prunus africanus*), musizi (*Maesopsis eminii*), Funtumia, and Khaya that Ahimbisibwe and her colleagues are planting. "Many of us didn't even remember these trees," Ahimbisibwe says, "but some of our older neighbors recognized them right away as the trees of their childhood. This makes us proud."

Where are the Buyers?

The use of native species is also something of great interest to carbon buyers who, in this case, are mostly in Europe. Bill Sneyd, the Director of Operations for The CarbonNeutral Company (formerly known as Future Forests), represents one of these buyers. He says that in the voluntary carbon markets, his company's specialty, having a certain amount of forestry operations can be "hugely valuable in terms of communication and raising awareness, particularly if there is also a community angle."

He explains that buyers of voluntary carbon, unlike buyers for the regulated carbon markets established by Kyoto and the European Union's Emissions Trading Scheme (EU ETS), actually prefer forestry carbon. "There is something," he says, "about growing trees that serves as a simple and engaging way to communicate what we are doing [in terms of buying and selling carbon]...In many ways it is easier for buyers to get engaged with these projects than it is for them to get engaged with technology projects [such as wind turbines]." He notes that his company, for this reason, has decided to keep an important part of its portfolio in forestry projects such as the one in Uganda. "People like the connection to trees," he adds, "and they also like the feeling that they are contributing towards helping people's lives."

By way of example he notes that many of the celebrities in the music and entertainment industry, people like Leonardo di Caprio, Dido, Mick Jagger, and Pink Floyd, some of whom are customers of The CarbonNeutral Company, specifically request forestry projects. "The band Coldplay is a great example of this," Sneyd says. "In offsetting the carbon emissions of their two latest albums, they specifically requested forestry projects in developing countries. At first, they were involved in a project in India, but more recently they have been involved in a forestry/community project in Mexico. And they have gotten so excited and engaged that they are talking about visiting the project after one of their upcoming tours in Mexico… It all just makes for such a superb and multi-faceted story that it draws people."

"I guess," he continues, "there is a history of musicians getting into forestry-type projects." It should therefore come as no surprise that of the 10,000 tons of sequestered carbon that The CarbonNeutral Company bought from the project in Uganda, a portion has already been allocated to offset the carbon emissions of the massive "Live 8" benefit concert that took place this summer in Scotland.

> "There is something about growing trees that serves as a simple and engaging way to communicate what we are doing."

Sneyd says part of the reason his company chose to invest in the Uganda credits is due to the fact that "they are part of the Plan Vivo system developed by ECCM." (for more on the Plan Vivo system, see www.planvivo.org) He explains that this system, which "has been developed, perfected, and refined over more than eight years," gives his company the necessary assurances that the project has been adequately designed, measured, and monitored. "It would have been a lot more difficult to invest in the Uganda project if it hadn't been part of the Plan Vivo system. It just gives us confidence that the carbon we are paying for—and the community benefits we want—are truly there."

Carbon as Business Strategy

Although TCNC has recently bought 10,000 tons of carbon from the ECCM-ECOTRUST project in Uganda, they did not buy Ahimbisibwe's carbon. Her 57 tons of carbon were sold to Tetra Pak UK, the UK branch of the large multi-national food packaging company. Indeed, Tetra Pak UK is the largest single buyer of Ugandan carbon. Every year they buy around 8,000 tons from the Ugandan project to offset their emissions.

"In essence," explains Samantha Edgar, environment officer for Tetra Pak UK, "we like the idea of investing in growing trees because it links back to our everyday business of producing packaging which is largely tree-based...[W]e see our offsetting program as a way of pre-empting [compliance with] climate change regulations that will likely affect us more and more in the future. We also see this as a way of strengthening

our ability to dialogue with our stakeholders, and to motivate and communicate with our staff… The carbon projects are very important and fit in quite nicely with our company's overall environmental policy."

Since Tetra Pak began working with ECCM to develop a carbon management program in 2003, the company has created a computer-based carbon monitoring system that allows them to better gauge their carbon footprint on a yearly basis. By 2004, TetraPak UK had managed to reduce their carbon emissions by 13 percent as compared to their 2001 levels, and their target for 2005 has been to raise the reduction to 15 percent below 2001 levels.

These reductions, however, don't include offsets that, according to Edgar, are used to compensate for unavoidable emissions, thus making the company "carbon neutral." In 2004, for instance, TetraPak UK's carbon footprint was just over 11,780 tons, so this is the amount they are buying for that year. To date, 80 percent of TetraPak UK's offsets come from the Uganda projects—including Ahimbisibwe 's carbon—while the remaining 20 percent comes from biomass and solar energy projects in India and Sri Lanka.

TetraPak UK (the only division of TetraPak currently offsetting at these levels), says Edgar, is very happy with their investment in the Uganda project. "Our carbon management program, including the offsets in Uganda, have been great stories and recently helped us win the overall Wales environmental award," she explains. "So yes, we are quite pleased with this program."

From Teacher to Consultant

Thousands of miles away, back in Uganda, Ahimbisibwe, too, is happy with the program. Her trees are growing nicely, and she has already received two payments for her land's carbon. With these two payments, she has made some upgrades to her home, installed needed food storage spaces, bought furniture, and otherwise invested in her family's future. "Oh," she says, "you should have seen my children's faces when the new sofa came in! They were so happy with the trees and the carbon."

Ahimbisibwe's neighbors were also impressed by the sizable influx of cash. "How did you do it?" they asked. "How come they didn't take the trees?" they wondered. "And you are going to receive more money and still be able to sell the timber in 20 years? What is the secret?"

The determined and visionary Ahimbisibwe smiles deeply as she tells the story: "I am so proud," she says, "not only do I use my work as an example when I teach my school children, and not only do I get to talk to and meet people from all over the world, but now my neighbors come and ask me questions about my carbon and my trees. Can you believe, I have become a consultant!"

In a short period of time, Ahimbisibwe, with a little help from the world's carbon market, has evolved in the eyes of her neighbors, transforming herself from the schoolteacher with strange and wacky ideas into the local (and at times, international) carbon consultant. If Ahimbisibwe's story isn't the epitome of clean and sustainable development—something that is good for the climate, good for biodiversity, good for businesses, and good for communities—then nothing else is.

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What Do Human Rights Have to Do With Water? …Everything.

by Alice Kenny

As a human rights lawyer and long-time political activist, Kadar Asmal might not have seemed the likeliest choice for the post of South Africa's minister of water affairs and forestry after the fall of apartheid in 1994. Mandela's selection nonetheless proved prescient. By recognizing the connections between healthy people, healthy ecosystems and a healthy economy, Asmal has not only revolutionized water policy in South Africa, but also throughout the world. The Ecosystem Marketplace takes a look at Asmal's revolutionary approach and lasting legacy in the field of ecosystem services.

PHOTO BY MARGARET SMEATON

Thirsty black South Africans, sometimes too dehydrated to sweat, trekked miles, waded through crocodile-ridden rivers, then balanced jugs atop their heads to carry home their fetid treasure one bucket-full at a time. Meanwhile, white South Africans had only to flick a spigot for bathtubs full of cool, clean water. This was the legacy Kadar Asmal—South Africa's first post-apartheid water minister, inherited just over a decade ago—a legacy of apartheid he battled to conquer.

When apartheid ended in 1994, virtually all five million of the nation's white South Africans had plumbing that poured clean potable water into their sinks, their baths and their farmland. Meanwhile, between 12 and 16 million—approximately half of all black South Africans—struggled to survive without access to safe water.

"The difficulties undoing so treacherous a policy of marginalization cannot be overestimated," said Guy Preston, chair of South Africa's Working for Water Program.

To dismantle this entrenched system, Asmal initiated a government-supported ecosystem plan to protect and conserve water while facilitating its equitable distribution. His programs regulating water's supply and demand still rely on government support. But with studies showing that every dollar invested in water yields a five-to-ten dollar return, they are expected to become increasingly more market-based.

Asmal's success has been such that South Africa today boasts a water conservation program that is not only the largest on the African continent, but also is held out as a global model.

For his work acknowledging "key links between water management, social justice and environmental sensitivity," Asmasl was awarded the $150,000 Stockholm Water Prize in 2000 for his "unprecedented efforts in the field of water management."

Rich in Gold, Poor in Water

South Africa, abundantly endowed with gold and diamonds, proved a magnet to treasure hunters. Dutch settlers, followed by English ones, began colonizing the country in the 1600s, creating fertile farmlands in this drought-ridden nation by divvying up scarce water resources among themselves.

Asmal's success has been such that South Africa today boasts a water conservation program that is not only the largest on the African continent, but also is held out as a global model.

The Irrigation Act of 1912 later codified this division of water sources. Stream water, it said, was considered the sole property of the owner of the land on which it rose. "He can do whatsoever he pleases with it and neither the owners of lower-lying land nor even the public can claim to be entitled to make any use at all of that water," the act read. "Where a stream is declared to be a private stream, the whole of its watershed is lost to public use and reserved for the exclusive use of the owner of the soil."

Such a policy would be tough on neighbors even in rain-soaked lands. But in South Africa, rated the 30th-driest nation among 180 worldwide, its consequences on the black majority were devastating. A scant 19.6 inches of rain typically falls here each year, just over half the world's average. By comparison, approximately 28.1 inches dampen Texan fields and pour into wells each year. Meanwhile, all South Africa's major interior rivers have been dammed, hoarding water for white landowners.

Water is Power

Into this fray stepped Kadar Asmal. Today balding and bespectacled with a thick gray mustache, the 70-year-old black South African was born into a nation where apartheid laws legalized white-only elections, white-only jobs, white-only land and, in effect, white-only water. An outspoken advocate for human rights, Asmal fled South Africa, spending 30 years in political exile. He studied at the London School of Economics and taught law at Trinity College Dublin.

Although separated by an ocean, he remained devoted to his people, founding the British and Irish Anti-Apartheid Movements. He was awarded the United Nations Educational, Scientific and Cultural Organization

(UNESCO) Prize in 1983 for his outstanding record teaching human rights law. He also taught international and environmental law, specialties he would later combine when he became water minister.

Professor Asmal, as he is still called, returned to South Africa in 1990, four years before the country allowed its first-ever general democratic election and apartheid's ensuing collapse. He helped draft his nation's constitution and became a member of Parliament. Soon after, his longtime friend and then-president, Nelson Mandela, asked him to take over as minister of water affairs and forestry. Asmal readily agreed.

Today balding and bespectacled with a thick gray mustache, the 70-year-old black South African was born into a nation where apartheid laws legalized white-only elections, white-only jobs, white-only land and, in effect, white-only water.

Spearheading Change

"Like most African countries, water is central to us," Asmal told the Ecosystem Marketplace. It is inexorably linked to the environment, the economy and social justice. "Water," he summarized, "is access to power."

During his tenure as water minister, Asmal transformed South Africa's style of water management, converting it from a supply-side approach that catered to white South Africans to a more conservation-based method that prioritized basic human and ecological needs.

"Professor Asmal sculptured a policy and legal framework for water management, upon which a social and ecological revolution can be founded," said his protégé, Preston, when nominating Asmal for the Stockholm Water Prize.

One of the most important challenges facing those structuring conservation finance schemes around watershed services is figuring out how to assign monetary value to water while at the same time ensuring that it remains accessible to the poorest of the poor. The National Water Act that Asmal introduced in 1998 dismantled the apartheid-era approach that had ceded water control to those owning the overlying land. Under this groundbreaking act, the state instead became guardian of water resources, prioritizing human subsistence and ecological sustainability over entrenched power. Every South African is now entitled to six gallons of free water per day. While a drop in the bucket for the average American who, between drinking, bathing, watering the lawn, and running the washing machine and dish washer, consumes more than 80 gallons per day, the six-gallon minimum represents, for many South Africans, the difference between life and death.

Notably, those seeking additional water in South Africa must purchase water licenses. The more water that businesses, pool owners and farmers use, the more they pay, helping cover the government's cost of providing free drinking water and spurring consumers to conserve. Consumers using excess amounts of water, then, pay more than the actual cost of water delivery, subsidizing poorer consumers who receive their small allotments of water for free. For this ecosystem service–based conservation approach to work, the South African water ministry had to strike a balance when working out the details of this cross-subsidy payment

system. Otherwise, local industries that thought they were paying too-high water tariffs might relocate, leaving South Africa without the necessary industries to foot its water bill.

By declaring access to basic water a human right, on the one hand, and pursuing a "the-more-you-use, the-more-you-pay" approach to water billing, on the other, Asmal has gone a long way toward successfully resolving the potential conflict between market-based conservation tools and human rights in South Africa. Environmental services, he has proven, can simultaneously have priceless humanitarian value and marketable commercial value.

Environmental services, Asmal has proven, can simultaneously have priceless humanitarian value and marketable commercial value.

"The Water Act reaffirms the role of government in society," Asmal said after the bill's passage, "where government provides strength to those who have none and a voice to those who have no voices, including the poor and the environment."

Fighting Poverty, Conserving Nature

Historically, humans have manipulated streams and waterways, building dams, aqueducts and irrigation systems that served their immediate goals but gave short shrift to inevitable repercussions. Asmal has been recognized worldwide for his initiatives reversing this trend, increasing the quantity and quality of available water by restoring watersheds to their natural state. These initiatives include the Community Water Supply and Sanitation Program, the National Water Conservation Campaign and Working for Water.

To connect the thirsty millions with potable water, Asmal initiated a program to lay plumbing across the country, called the Community Water Supply and Sanitation Program. Thanks to this program, more than 10 million rural and poor urban dwellers now have access to clean water.

He created the National Water Conservation Campaign, an innovative program that uses conservation methods to increase water availability. Clearing invasive species out of river catchments where the thirsty plants sucked up precious water often proved more cost-effective than building new dams or filtration plants.

And, finally, there is Working for Water, a spinoff of the National Water Conservation Campaign. An antidote to apartheid, Working for Water provided jobs and water to a thirsty people, paying previously unemployed laborers to unleash water supplies by hacking down invasive plants.

Since South Africa is considered among the premier locations for biological diversity in the world, clearing out invading plants that threatened ecological systems has won the program international praise and dozens of awards. And, noting these programs' success and financial rewards, private companies and municipalities seeking additional water have begun employing staff to clear out water-depleting plants.

During his five years as South Africa's first post-apartheid water minister, Asmal revolutionized South Africa's approach to water use, intertwining its people, economy and ecosystems. His users-pay approach to the conservation of ecosystem services has served as a model for those developing payment programs for watershed stewardship around the world.

A Lasting Legacy

Asmal's tenure as water minister ended in 1999 when, at the behest of South Africa's next president Thabo Mbeki, he accepted the position of education minister. He is currently president of the UNESCO Draft Convention Negotiations on Cultural Diversity and of the Financial Action Task Force, and he remains a member of the South African parliament.

But his legacy on water issues continues. Ronnie Kasrils, who took over as water minister when Asmal's term ended, modeled a new program, Working for Wetlands, after Asmal's Working for Water program. The government hired unemployed laborers to clear invasive species from wetlands. This enabled wetlands to act as natural water filters, sparing the government the cost of building expensive filtration plants.

Asmal's success overhauling South Africa's method of water management was so dramatic that leaders from other nations took notice. The World Bank and IUCN-The World Conservation Union elected him as chair to the World Commission on Dams in 2000, harnessing Asmal's vision for water issues worldwide. As world commissioner on dams, Asmal fostered an integrated approach to water management that considered conservation as well as dam building as valid methods for irrigation.

"Upstream countries should not be able to go ahead to the detriment of those downstream," Asmal told Ecosystem Marketplace.

"Upstream countries should not be able to go ahead to the detriment of those downstream."

Looking Forward

Professor Asmal designed a revolutionary approach to water usage that South Africa continues to follow to this day. But while market-based conservation mechanisms like payments for environmental service programs have taken off since 1994, efforts to privatize water delivery infrastructure have proven difficult, even deadly.

The South African government attempted to cede some responsibility for building and maintaining water networks serving underprivileged persons to a variety of private companies. Those efforts had little success because, company owners say, customers failed to cover the companies' costs. In the South African community of Madelbe, for example, residents unable to come up with the $10 connection fee to pump water from company-installed meters, instead resorted to nearby streams and rivers for water. This resulted in a cholera outbreak that infected 120,000 people in 2000 and left 265 dead.

So, today, 95 percent of the country's water utilities remain publicly operated. The current Minister of Water Affairs and Forestry Buyelwa Sonjica reported this month that water infrastructure has been developed to provide free basic water to 67 percent of all South African residents, 31 million people. Among the poor population, many of whom live in rural areas with limited access to infrastructure, 54 percent, or 16 million people, are now served by the free basic water project. That leaves, however, millions of poor South Africans still struggling to survive on less than six guaranteed gallons of clean water a day. Sonjica pledged to eradicate the backlog by 2008.

Looking Back

Deracializing water has not been easy, but the impact has been monumental. When designed to reinforce one another, Asmal has shown that top-down humanitarian policies and bottom-up conservation schemes can harness market-based mechanisms for environmental gain in ways that make both economic and social sense.

Millions of poor South Africans still struggle to survive on less than six guaranteed gallons of clean water a day.

Looking back at the sacrifices he made, the civil rights battles he fought, the constitution he helped write, and the numerous awards he received, Professor Asmal told Ecosystem Marketplace that the years he spent as South Africa's water minister "were the most creative years of my life."

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IV Outlook: Africa's Potential for Environmental Markets

CDM for Small, Sustainable Projects: Where is the Value Added?

by Emily Tyler

The Kyoto Protocol's Clean Development Mechanism was created to encourage clean development and support sustainable development projects in the world's poorest countries. In this guest editorial, Emily Tyler of SouthSouthNorth, a CDM pioneer, unpacks the financial costs and revenues associated with the CDM, and argues that, in SSN's experience, the CDM actually adds little value (indeed, it adds costs) to the very sorts of projects it was designed to encourage.

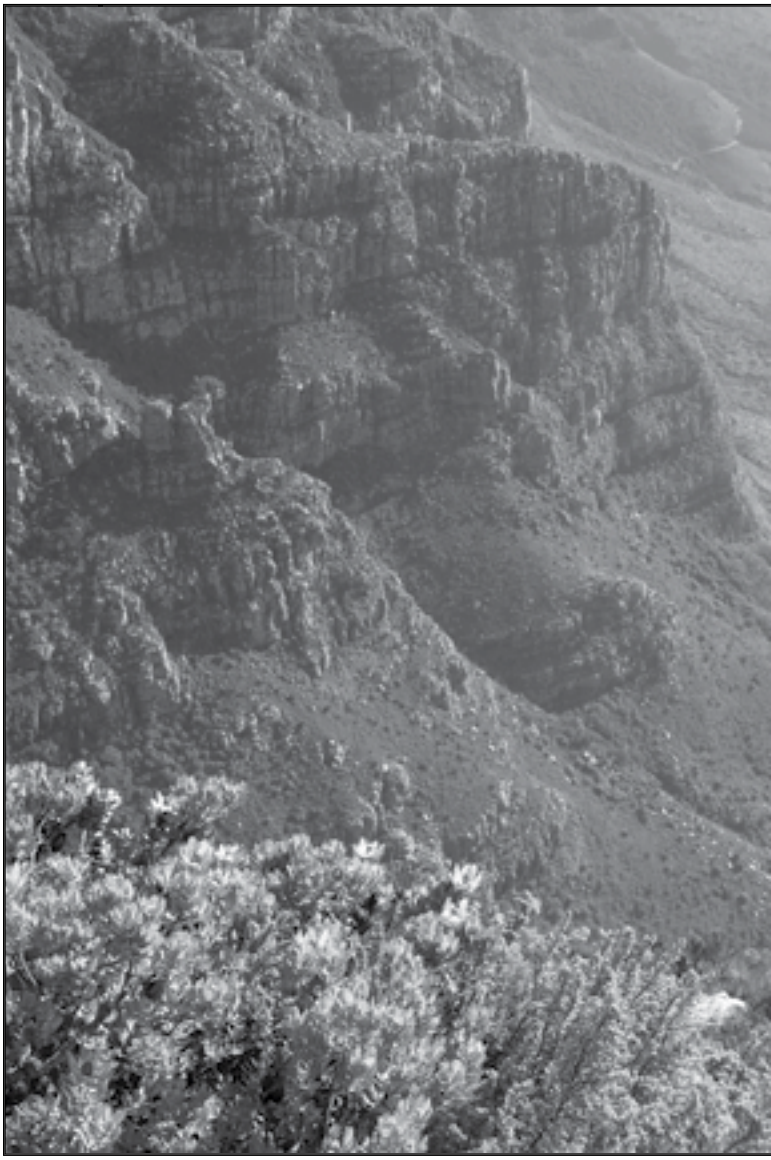

PHOTO BY SOCRATES

Much has been written recently of the failure of the Kyoto Protocol's Clean Development Mechanism (CDM) to meet its objectives: in particular, the objective of contributing towards the sustainable development of the host country. Conceptually too, it appears that the CDM is struggling to meet its intention of incentivising developing countries to develop along less carbon-intensive lines.

The SouthSouthNorth Project, funded by the Dutch government's "International Development Co-operation," has been experimenting with CDM projects, hoping to find ways that this innovative mechanism can help truly contribute toward sustainable development at the same time that it achieves its overall goal of addressing global climate change. Specifically, we have been developing projects that meet rigorous sustainable development criteria at the same time that they help bring about the kinds

of deeper emissions cuts required to contribute to a lower-emissions development path. The majority of the projects in the SSN portfolio are small-scale; most carry the Gold Standard premium label, awarded to "best practise" CDM projects in terms of sustainable development contribution and sustainable emissions reductions; most are situated in the public sector; and the majority have an emissions reduction volume of less than 50,000 tonnes per annum. In other words, we are looking at small-scale, large-impact projects in developing countries: the sorts of projects that the CDM was set up to support.

In the course of experimenting with these sorts of projects, we have learned some interesting—and rather troubling—lessons and made some observations on prices, contract terms, and transaction costs: observations that raise some serious questions regarding whether registration with the CDM Executive Board adds any real value to low-volume, Gold Standard, emissions reduction projects. It is hoped that an analysis of some of these issues may both provide direction for project developers debating going down the CDM route, and support the call for a more comprehensive review of the CDM than the one recently approved in Montreal.

The flagship SSN project has been the Kuyasa Low-Cost Housing Energy Upgrade Project (Kuyasa). This project involves retrofitting 2,300 low-cost houses in Kuyasa, Khayelitsha in Cape Town, South Africa with energy-efficient lighting, insulated ceilings, and solar water heaters. These interventions result in a reduction in greenhouse gas emissions through the avoidance of electricity or alternative fossil fuel use by the households. The project provides numerous additional sustainable development benefits such as improved health, access to energy services through an innovative "suppressed demand baseline,"[1] and employment creation. In August 2005 the project was registered with the CDM Executive Board. It is both the first African and first Gold Standard project to be registered.

The Kuyasa project generates 5,600t CO2e, or Certified Emission Reductions (CERs), per annum over a 21-year crediting lifetime. Currently it is estimated that the compliance market price for CERs from registered projects is in the region of ⁄10[2]. The compliance market is where Kyoto-compliant emissions reduction credits are bought and sold primarily for use against Kyoto targets. CERs from the Kuyasa project were forward-sold on the voluntary offsets market for ⁄15 in September[3]. The voluntary offset market is a market in which emission reduction credits (not necessarily Kyoto-compliant credits) are sold to offset emissions from specific events, corporate travel, and personal lifestyle, among other things.

The voluntary offset market is a market in which emission reduction credits (not necessarily Kyoto-compliant credits) are sold to offset emissions from specific events, corporate travel, and personal lifestyle, among other things.

[1] Please see www.southsouthnorth.org for further information

[2] GTZ CDM Newsletter: CDM Highlights 27, August 2005

[3] The first 10,000 tonnes from the project were bought by the UK to offset the 2005 G8 summit in Gleneagles.

Annual carbon revenues from the project at today's prices are therefore:

Compliance Market	/56,000
Voluntary Market	/84,000

Kuyasa was a highly innovative and experimental project. As such, its development as a CDM project was particularly lengthy and expensive. The project's transaction costs are estimated below, with an adjustment to the cost of design from R3.1m to R250,000 to account for the "path-breaking" costs of the initial project. One verification has been included in the costs for comparative purposes.

Transaction Cost	Kuyasa Replication	In Euros
Project Development and PDD design	R250,000	/31,585
Project Validation		/12,000
Gold Standard Validation		/2,000
Project Registration	$5,000	/4,256
Project Verification and Monitoring		/6,500 per verification
CDM Adaptation Levy, 2% of CERs		/1,120[4]
CDM Administration Costs	Unknown	Unknown
ERPA and legal fees	$25,000	/21,285
Broker commission (7%)		/3,920
CER Tax	Unlikely	Unlikely
TOTAL CDM COSTS		**/82,666**
Revenues: Compliance/Offset		**/56,000 / /84,000**
Revenue / (Shortfall)		**(/26,666) / /1,334**

This table clearly demonstrates that the cost of designing and registering a small-scale, low-credit-volume project such as Kuyasa as a CDM project is unlikely to be financially viable, even at premium CER prices (indeed, some CERs have sold for /5 or less). This in turn suggests there is therefore *no financial value added by the CDM* for the project types which most closely fit the CDM's avowed objectives.

[4] The compliance market price is used to estimate costs as a portion of CERs.

Consider however a second scenario, where these projects are designed for the voluntary offset market and are not registered as CDM. This market bypasses the bureaucracy and expense of the CDM project cycle, and gives the project developer access to voluntary offset market premiums.

Transaction Cost	Non-CDM Offset project costs	Assumptions
Project Development and PDD Design	/15,793	50% cost reduction from CDM as no PDD required, although project design remains an important element.
Project Validation	/6,000	No formal validation required, project validation rests on transparency and stakeholder credibility. 50% reduction from CDM assumed as a conservative estimate.
Gold Standard Validation	/2,000	Remains the same
Project Registration	n/a	n/a
Project Verification and Monitoring	/3,250 per verification	50% cost reduction from CDM due to decreased design requirements. Note that less-frequent verifications than under the CDM would further reduce this transaction cost.
CDM Adaptation Levy (annual), 2% of CERs	n/a	n/a
CDM Administration Costs	n/a	n/a
ERPA and Legal Fees	/10,643	50% reduction from CDM. No legal fees per se, but increased buyer search costs due to the less liquid market. This may be significantly lower if a buyer initiates the project.
Broker Commission (7%)	/3,920	Remains the same
CER Tax	n/a	
TOTAL	**/41,606**	
Revenue (Voluntary offset[5])	**/67,200**	
Net credit revenue and value added	**/25,594**	

The calculation above shows credit revenues for a voluntary offset VER (voluntary emission reduction) project can add considerable value, even when very conservative cost assumptions for VER projects are used. Transaction on the offset market does not necessarily require CDM registration, and many projects have received equivalent prices (or even higher prices) for credits that are validated according to a standard, but not registered with the CDM Executive Board[6].

Whilst some of these projects are able to survive based solely on carbon revenues, most require upfront financing which carbon purchasers are generally unwilling to provide, or provide subject to very restrictive terms. An additional advantage of developing a VER offset project is that it can freely access donor funding to cover this upfront financing gap. Under the CDM, the use of donor funding is restricted due to the ruling on diversion of Official Development Assistance (ODA)[7].

An analysis of the transaction of the Kuyasa project suggests that the additional process costs required by the CDM may not add value to low-volume, high-value sustainable development projects that contribute to addressing global warming. At the same time, it suggests that the voluntary offset market (the market for VERs) may be a more financially sustainable approach for the very projects that the CDM was created to support.

Whilst some of these projects are able to survive based solely on carbon revenues, most require upfront financing which carbon purchasers are generally unwilling to provide, or provide subject to very restrictive terms.

However, the expansion of the voluntary market brings with it a separate set of concerns. The significant value of the CDM is in its rigorous standardization of emissions reductions internationally, protecting the environmental integrity of the system. How a large voluntary market deals with this issue is yet to be seen.

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[5] Assume that a premium of only 20% is secured for non-CDM voluntary emission reductions from offset market projects (/12 x 5,600t = /67,200)

[6] Based on conversations with intermediaries operating in the VER offset market. As price transparency in this market is very low, the author would welcome any additional price information.

[7] Marrakesh Accords 17.CP7 Preamble

Mainstreaming Payments for Ecosystem Services in the Developing World

by Sissel Waage

PHOTO BY ANDRE KLAASSEN

Forest Trends recently conducted a study of the obstacles impeding the uptake of Payments for Ecosystem Services (PES) in the developing world. The Ecosystem Marketplace asks Forest Trends' Sissel Waage what these obstacles are and what is needed to overcome them.

In Kenya, growing flowers has become a lucrative international business. Given the contribution of horticulture to the economy, ministries of economic planning and finance would be judicious to consider a basic need for maintaining this sector: water.

Ensuring the success of any natural resource–based business over time requires attention to the predictable ecological flows on which it relies. Horticulture, agriculture, and forestry all need water and good soil, yet water is becoming increasingly scarce at key times in the growing season in many regions. Soil erosion is also a growing problem.

While payments for ecosystem services (PES) offer a new approach to securing revenue streams for maintaining, conserving, and restoring ecological functions globally, its uptake remains significantly hampered—particularly in Latin America, Asia, and Africa.

In order to better understand why PES is not currently a common tool for conservation, Forest Trends conducted a study focusing on what is required for deals to work on the ground in Latin America, Asia, and Africa. Fifty-seven interviews were conducted with NGOs, governments, and businesses working on the establishment of PES globally.

Engaging Buyers

The biggest barrier to mainstreaming PES in developing regions of the world is the lack of buyers. Some buyers are simply unaware of the PES concept, while others feel it is too risky a mechanism to trust. Many potential buyers lack a clear understanding of what they are buying, as the linkages between specific management practices and ecosystem services outcomes are often unclear. This is particularly true for watershed services and the soil sequestration of carbon. Addressing these issues often requires specific technical skills. Ideally, a base of intermediaries would exist with the skills to assess linkages between management and ecosystem service outcomes, either in-country or at least in-region. At present, however, such technical assistance is limited and tends to be costly.

Connecting Buyers and Sellers

Once willing and able buyers exist, they must be connected to sellers of ecosystem services quickly and efficiently. Today, the transaction costs associated with identifying sellers are significant. In order to assist with the due diligence process on both buyers' and sellers' sides, effective intermediary organizations still need to be developed.

Structuring Deals

Even after buyers and sellers have identified one another, the issue of negotiating and structuring deals serves as another barrier to the development of PES. Structuring payments for ecosystem services requires specialized knowledge of the relationships between natural resource management practices and the desired flow of ecosystem services. In addition, communities may face barriers to the negotiation of deals stemming from a lack of tenure rights, literacy, or familiarity with contracts. Communities can also encounter unfamiliar terrain in terms of the logistics related to receipt and expenditure of funds, particularly when revenues are paid to the community as a whole, rather than to individuals. Further, and even more importantly, rural community members and rural development advisors in areas around the world have expressed fundamental concerns about the establishment of markets for natural resources, and the prospects that the truly poor will not accrue benefits or may even find they become dispossessed of current resource tenure and/or access rights. These concerns, and the lack of trust they fuel, must be addressed to establish PES fully and effectively in many locales.

Ideally, a base of intermediaries would exist with the skills to assess linkages between management and ecosystem service outcomes, either in-country or at least in-region.

Transparency and Security

The fourth barrier is related to the third, but important enough to flag separately, in that it focuses on establishing the accountability and transparency mechanisms for money exchange and deal security over time. These mechanisms may be sanctioned by government and could be run by ministries or agencies. Alternatively, NGOs, for-profit companies, or multi-entity hybrid models could emerge. The essential element is to create a context in which the parties entering into deals feel confident that revenues generated by the PES scheme will be administered appropriately and will go to the uses outlined in the agreement.

If this fourth barrier is to be overcome in a way that will stand over time, it will have to mesh effectively with the current institutional context, both formal and informal. Without consideration of how institutional interactions will occur—between new and old oversight practices within existing entities and/or across new and old entities—it is likely that unintended institutional complexities and consequences will occur. Therefore, the challenge of meshing PES accountability and transparency mechanisms with existing institutions, from a government through a rural community level, is a related barrier to overcome.

Next Steps: Capacity Building

The barriers described above led us to identify a core set of capacity-building needs.

First and foremost, people need to be given the tools to assess PES opportunities under a variety of circumstances. When and where is PES appropriate? Buyers, sellers and regulators need to be able to answer this question at any given point in time.

Practitioners also need to understand a range of issues, including the relationship between management practices and maintenance of ecosystem services, how to conduct baseline studies, and how to structure monitoring plans. People from the business, community, and government sectors will all have distinct interests, levels of expertise, and specific needs in terms of what they need to know and understand given their different roles. Therefore, capacity-building efforts surrounding ecosystem dynamics and best management practices are likely to be related but distinct for the various audiences.

When and where is PES appropriate? Buyers, sellers and regulators need to be able to answer this question at any given point in time.

Third, all parties involved in a PES scheme will need to learn how to administer and manage the scheme over time. As with the technical issues, various parties are likely to have a range of needs that will have to be tailored to the specifics of certain services (water vs. biodiversity) and particular deals. For example, for private deals, government entities may only be concerned with enabling policies and laws. Communities may require much more detailed capacity building in terms of fund management if they are to receive the revenues. For public schemes, complex questions related to moving earmarked funding in and out of the central treasury may emerge for government agencies. Therefore, the most effective capacity building will be audience and issue specific.

Fourth, and finally, capacity building is needed in PES-related systems thinking. This need stems from the importance of ensuring that PES have positive impacts, which are not overburdened by transaction costs and do not result in unintended adverse consequences. This need can be addressed by adapting the well-developed domains of work related to community interactions (and participatory methods for identifying socio-economic dynamics, such as PRA and RRA), ecosystem dynamics and institutional incentives (especially related to governments and businesses involved with deals).

Without serious efforts to highlight the dynamics of the human, ecological, and economic systems that are at play within PES, it is possible that the design will overlook key issues and result in unintended consequences. Specifically, the concern is that without addressing potential negative ripple effects of the projects, equity issues will be overlooked and poverty further entrenched. Therefore, a key element of fully empowering and

enabling all players in PES will require understanding a set of clear frameworks and approaches that provide a structure in which everyone involved—from business through community and government—can openly discuss the many issues that PES raises.

Following from this research, we feel that a program that begins to address the core barriers to PES methodically—through building capacity among the key players in regions and countries—will lay the foundation for significant new revenue streams for ecosystem restoration and conservation well into the future.

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Ricardo's articles on energy, SRI, climate, the environment, and finance have appeared in a variety of publications, including the Washington Post, the Atlantic Monthly, the International Herald Tribune, the San Francisco Chronicle, the Boston Globe, and the Milken Institute Review. He is also a regular contributor for the UK monthly Environmental Finance.

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Ecosystem Marketplace

The Ecosystem Marketplace seeks to become the world's leading source of information on markets and payment schemes for ecosystem services (services such as water quality, carbon sequestration and biodiversity). We believe that by providing reliable information on prices, regulation, science, and other market-relevant factors, markets for ecosystem services will one day become a fundamental part of our economic system, helping give value to environmental services that, for too long, have been taken for granted. In providing useful market information, we hope not only to facilitate transactions (thereby lowering transaction costs), but also to catalyze new thinking, spur the development of new markets, and achieve effective and equitable nature conservation. The Ecosystem Marketplace is a project of Forest Trends. **www.ecosystemmarketplace.com**

FOREST TRENDS

Forest Trends is an international non-profit organization that works to expand the value of forests to society; to promote sustainable forest management and conservation by creating and capturing market values for ecosystem services; to support innovative projects and companies that are developing these new markets; and to enhance the livelihoods of local communities living in and around those forests. We analyze strategic market and policy issues, catalyze connections between forward-looking producers, communities and investors, and develop new financial tools to help markets work for conservation and people. **www.forest-trends.org**

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The Katoomba Group seeks to address key challenges for developing markets for ecosystem services, from enabling legislation to establishment of new market institutions, to strategies of pricing and marketing, and performance monitoring. It seeks to achieve the goal through strategic partnerships for analysis, information-sharing, investment, market services and policy advocacy. The Katoomba Group includes over 180 experts and practioners from around the world representing a unique range of experience in business finance, policy, research and advocacy. **www.katoombagroup.org**