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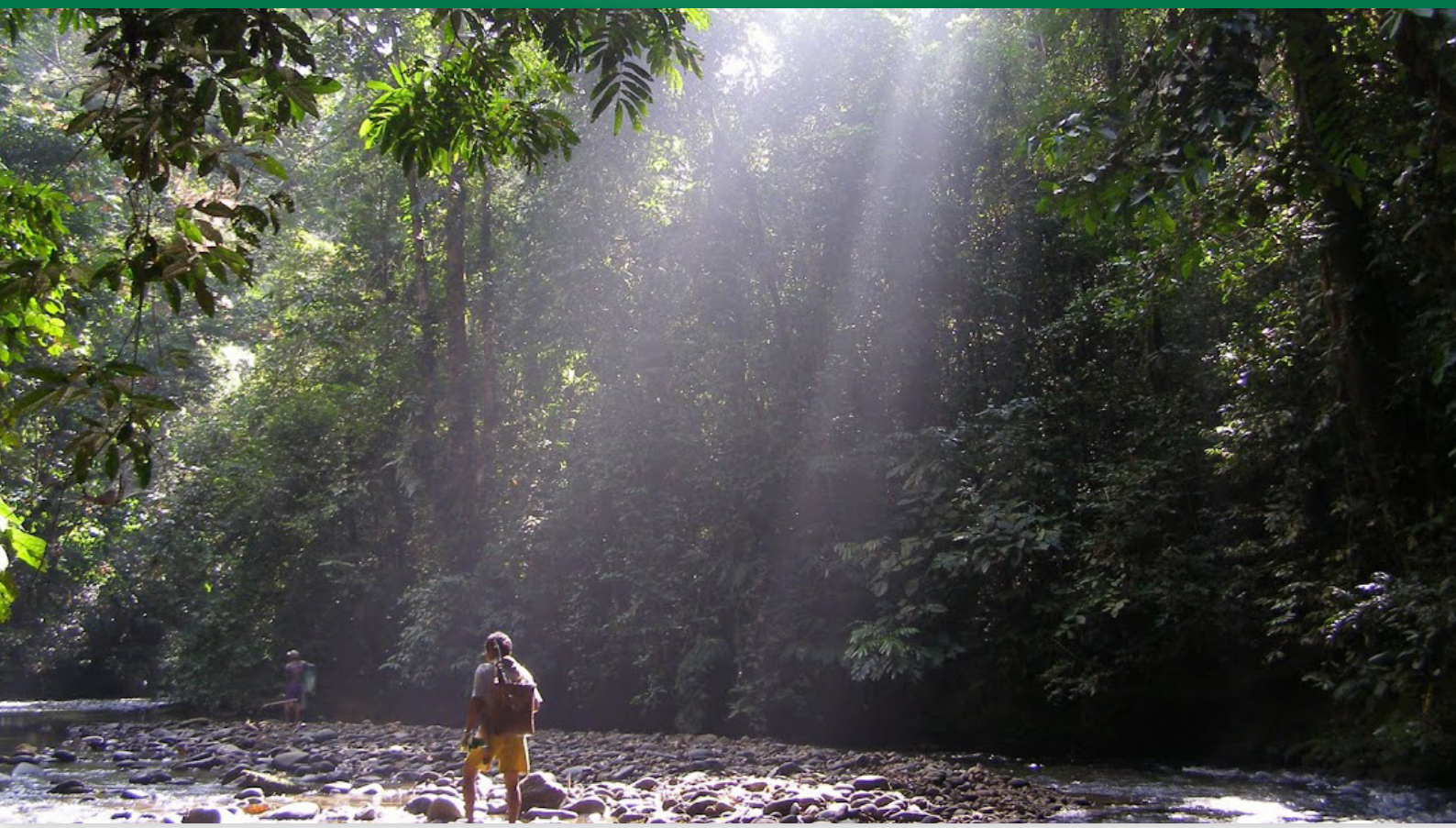

Paying our dues

People are accustomed to benefiting from tropical forest environmental services for free or at minimal cost. We use the clean water tropical forests deliver, take for granted their function in absorbing and storing carbon, and exploit their biodiversity in agriculture, the pharmaceuticals industry and forestry.

The time has come, however, for the world to start paying for these environmental services—or face the consequences of losing them. An underlying cause of tropical forest loss is that agriculture out-competes forest as a land use, and, as a result, tropical forests continue to be cleared or degraded. On the other hand, demand for tropical forest environmental services is increasing: expanding cities need more drinkable water, biodiversity is increasingly seen as an essential resource for ecotourism, science and agriculture, and climate change due to rising atmospheric concentrations of greenhouse gases looms as a global calamity, which can partly be mitigated by maintaining healthy tropical forests.

Payments for environmental services (PES) can help bridge the gap between the economic returns from agriculture and those from sustainable forest management (SFM) and, in so doing, can help reduce and eventually reverse tropical forest loss and degradation. This edition

Special edition: International Forum on Payments for Environmental Services of Tropical Forests

ITTO

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Images: Tropical forests perform a wide range of essential environmental services. *Photo: Sarawak Forestry Department* (cover)
Payments for environmental services schemes can help in restoring degraded forest landscapes. *Photo: ITTO* (above)

... Editorial continued

of the TFU summarizes discussions at the International Forum on Payments for Environmental Services of Tropical Forests, which was convened in April 2014 in San José, Costa Rica, by ITTO, the Food and Agriculture Organization of the United Nations (FAO), and Costa Rica's National Fund for Forestry Financing (FONAFIFO). Among other things, the Forum examined existing PES schemes in tropical countries, including Costa Rica, and showed that such schemes are increasingly widespread, although mostly still at a small scale.

The Forum had six main components: an opening ceremony, featuring speeches by forestry leaders, including Costa Rica's Minister of Environment, Energy and Oceans, Dr René Castro; four sessions on, in turn, the potential role of PES in promoting sustainable forest management, the development of innovative financing mechanisms, ensuring benefits for local communities, and establishing robust governance and institutional arrangements; and a discussion of the way forward. This edition of the TFU follows this format, summarizing the presentations and capturing the discussion on the way forward in the recommendations contained in the Forum's summary statement, published in full on pages 28-32 of this edition.

Forum participants concluded that PES schemes can help alleviate rural poverty, reduce tropical deforestation, stimulate the rehabilitation of degraded forestlands and increase the adoption of SFM. Overall, however, such schemes are having their desired impacts in only a few tropical forests, and action is needed, therefore, to scale them up. To do so, a number of actions could be taken, including to: better quantify and value the environmental services provided by tropical forests through scientifically sound studies; work collaboratively to raise awareness of the importance of tropical forest environmental services and the need to pay for them; create enabling conditions to increase demand and develop markets for PES; increase collaboration and exchange on PES experiences and options; and provide support for scaling up PES schemes.

Several Forum participants noted that PES schemes are not a magic bullet. On their own, PES will not save tropical forests from destruction or the inhabitants of those forests from poverty. Most tropical forests will continue to be harvested for wood and non-wood products but as long as SFM principles and guidelines are adhered to, such harvesting will not jeopardize the delivery of environmental services and in some cases can enhance it.

PES schemes will become an increasingly significant component of SFM approaches. One of their most important roles is symbolic—they provide forest dwellers, owners and managers with tangible evidence that societies recognize and value their contributions (through the sustainable management of their forests) to local, national and global well-being. PES schemes are also an opportunity for governments to address injustices in forest tenure, and for companies to improve their images as responsible corporate citizens.

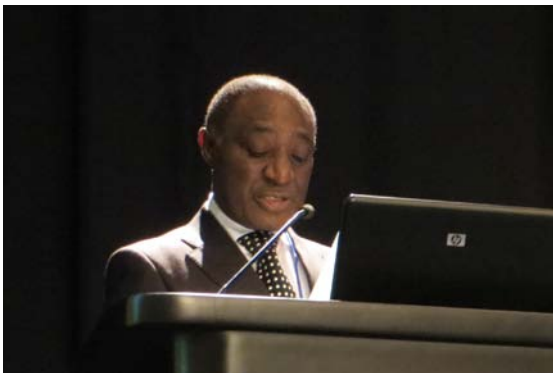
There is much to be done before the global beneficiaries of tropical forest environmental services pay their full dues, but a good start has been made. In 2014, the outcomes of the Forum will be transmitted to the FAO Committee on Forestry, the World Parks Congress and the 50th Session of the International Tropical Timber Council, among other bodies. Forum participants said they wanted international organizations such as ITTO and FAO to use their convening power to inform policy development and promote action on PES in tropical forests. We will continue to do so.

Steve Johnson, ITTO
Eva Muller, FAO
Alastair Sarre, consulting editor

Opening ceremony

Payment for the environmental services of tropical forests is an idea whose time has come

Emmanuel Ze Meka
Executive Director, ITTO, Yokohama, Japan



Emmanuel Ze Meka speaks at the opening ceremony of the International Forum on Payments for Environmental Services of Tropical Forests. *Photo: H.O. Ma/ITTO*

The important role of Costa Rica in pioneering the development of payments for environmental services (PES) is widely recognized and, indeed, Costa Rica has become one of the world's great champions of PES. I am certain that Costa Rica's PES experience will provide not only a valuable source of information but also considerable inspiration for many countries that are represented here today and are interested in exploring PES programs.

ITTO has always recognized the importance of maintaining a continuous supply of goods and services from forests to ensure their optimal contribution to socioeconomic development through SFM, with due consideration of social and environmental safeguards and biodiversity conservation. Achieving SFM requires sufficient financial resources as well as positive incentives that promote and support it. Payments for forest environmental services such as those associated with carbon sequestration, biodiversity conservation, watershed protection and the maintenance of landscape values can help finance SFM and tropical forest conservation.

In 2008, ITTO began implementing thematic programs on issues crucial to the attainment of SFM. One of these is known as "Reducing Deforestation and Forest Degradation and Enhancing Environmental Services in Tropical Forests", or REDDES. More than 20 countries have now received funding from ITTO under REDDES to promote the capacity of developing member countries and their stakeholders to ensure the continued provision of tropical forest environmental services and payments for them.

Local people make the best partners in the sustainable provision of environmental services and it is therefore essential that they have a strong incentive to be involved on an ongoing basis. PES schemes can provide a very strong incentive indeed. PES schemes can also be an effective framework for consultation, cooperation and policy development. They can be a vehicle for the sustainable delivery of environmental services, provide a mechanism for compensating forest communities, owners and managers who maintain environmental services, and help engage indigenous peoples and local communities in conservation and sustainable development opportunities. PES schemes can also help improve forest law enforcement and governance because the services being paid for need to be monitored. The improved land and forest tenure systems and control mechanisms established under robust PES schemes discourage illegal activities while generating sustainable incomes for tenure-holders. PES schemes can also be a means by which tropical countries can secure payments from the international community for the environmental services their forests provide. For all these reasons, and others, PES is an important mechanism whose time has come.

I hope and expect that the diverse partnerships and networks that will be reinforced here in San José will help advance PES across the tropics. In this regard, I would like participants to consider the merits of establishing a platform for promoting PES in the tropics. The purpose of such a platform would be to take concrete actions in the field to make PES a reality in tropical countries. This could be done by:

- promoting policy reforms in tropical countries aimed at incorporating PES into forest laws and regulations;
- compiling and disseminating successful experiences on PES in tropical forests;
- building capacity and support programs and projects directed at PES; and
- analyzing, establishing and promoting linkages between PES and such global issues as biodiversity conservation, climate-change mitigation and adaptation, water regulation, food security and energy production.

Forest environmental services perform a range of functions, such as protecting stream and river channels from erosion. *Photo: R. Carrillo/ITTO*

What are forest environmental services?

The environmental services (also called ecosystem services) of forests are the benefits people obtain from forest ecosystems. They include provisioning services, such as food and water; regulating services, such as the regulation of floods, droughts, land degradation and disease; supporting services, such as soil formation and nutrient cycling; and cultural services, such as recreational, spiritual, religious and other nonmaterial benefits. Forest environmental services perform a range of functions, such as: moderating weather extremes and their impacts; dispersing seeds; mitigating drought and floods; cycling and moving nutrients; protecting stream and river channels and coastal shores from erosion; detoxifying and decomposing wastes; controlling agricultural pests; maintaining biodiversity; generating and preserving soils and renewing their fertility; contributing to climate stability; purifying air and water; and pollinating crops and natural vegetation. Tropical forests provide all these services and are often particularly important for carbon sequestration, biodiversity conservation, the protection of watersheds and the regulation of regional climates.

Sources: Ecological Society of America undated. Ecosystem services. Fact sheet. Washington, DC, USA; Hassan, R., Scholes, R. & Ash, N. 2005. *Ecosystems and human well-being: current state and trends.* Millennium Assessment. Island Press, Washington, DC, USA.

The aim of such a platform would be to build awareness of the importance of environmental services provided by tropical forests and to support field programs focused on globally agreed international policies in such domains as biodiversity conservation, climate-change mitigation and water catchment protection, and on designing ways to secure payments for these. ITTO would be a willing partner with FAO and other institutions represented here to make such a platform a reality.

Eduardo Rojas Briales

Assistant Director-General, FAO, Rome, Italy

Eduardo Rojas Briales (left) at the opening ceremony of the International Forum on Payments for Environmental Services in Tropical Forests with René Castro and Emmanuel Ze Meka. *Photo: H.O. Ma/ITTO*

One of the bottlenecks in conserving our forests and ensuring their sustainable management is the lack of alignment between those who are implementing SFM and those who are benefiting from it through the provision of environmental services. PES schemes offer the hope of empowering local communities by paying them for their good management and the consequent provision of valuable environmental services.

Why is it important to pay for environmental services? Forestry has long been outcompeted as a land use because markets do not remunerate many of the most important aspects of forests—the environmental services they provide. Agriculture generates an annual income; SFM has a much slower turnover and overexploitation, therefore, is likely. Today we know how to manage forests sustainably, but simple economics often leads to the depletion of the resource. Based on the products they grow, it is likely that few natural forests will ever generate a rate of return for owners and managers equal to or greater than most alternative land uses or even to meet the costs of sustainable, multifunctional forest management. The absence of markets for environmental services, the often great physical distances between the forests and the beneficiaries of those environmental services, and the lack of alignment between those who bear the costs of SFM and those who benefit from it help explain why most accessible forests in the world are under threat of overexploitation.

This is a blatant failure of the market to account and compensate for the positive externalities of forest management. Environmental policies have sometimes attempted to mitigate negative externalities but, for a combination of reasons, including intellectual inertia, few environmental policy instruments have been designed to address the positive externalities, and the lack of such instruments perpetuates gross inefficiencies and inequities in forests.

Payments for environmental services have been emerging timidly as a spontaneous response with great potential. Despite its lack of comprehensive design, the PES concept has spread worldwide, and considerable experience has been accumulated and should be consolidated, which is one of the tasks of this forum.

There are many questions to be answered and many issues to be resolved. One of the most critical is the risk that managed forests will not qualify for PES schemes. We should recall that wood production still accounts for 98 percent of forest revenues globally, and there is no scientific justification for excluding these actively managed forests from PES schemes. To the contrary, PES schemes require active management to induce forest restoration and to minimize a range of risk factors, such as wildfire, pests and illegal activities. SFM, therefore, helps forests deliver their environmental services. Monitoring the implementation of forest management plans is essential.

A PES scheme that requires forest communities to live without work would be conceptually perverse and may constitute a new form of rent seeking. The goal must be to ensure that PES schemes do not become a block to development but, rather, a support. From a social perspective, PES schemes could be the missing economic link that will enable forest communities to live in conditions comparable with their counterparts in agricultural and urban areas, and from an environmental perspective they can be integrated into management decisions to help solve the Gordian knot of SFM, in which

a mono-functional income (from wood) must pay for the achievement of multiple objectives.

But we cannot just focus on the output of the process; we must also look at the inputs—sustainable sources of funding. REDD+[1] may eventually provide a significant source of finance from the international community. In the medium to long term, however, PES schemes will need to be based on sound national funding. Costa Rica has taken the lead by addressing the parallel needs for a reliable funding source (a tax on fossil fuels, for example) and an institutional arrangement for managing this funding—FONAFIFO. Nevertheless, funding through taxation must be understood as a temporary option until the consolidation of markets for environmental services.

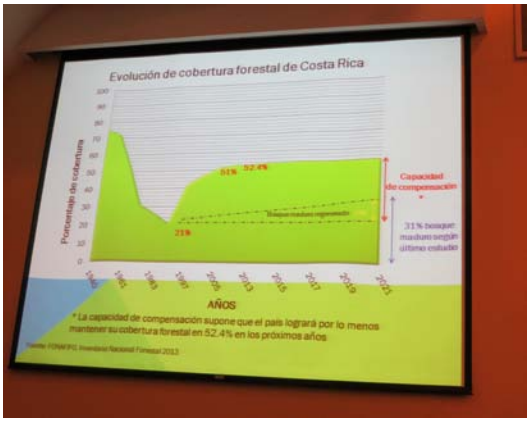
René Castro Salazar

Minister of Environment, San José, Costa Rica

René Castro speaks at the opening ceremony of the International Forum on Payments for Environmental Services of Tropical Forests. *Photo: H.O. Ma/ITTO*

I am on my second tour of duty as Minister of Environment—I was also minister from 1994 to 1998—and now my second term is almost over. PES schemes are a mechanism by which Costa Rica will achieve carbon neutrality. It is one reason why Costa Rica dared to set a date, 2021, by when it will become a carbon-neutral country—possibly the first in the world. Many people say we've gone crazy. But I want to share with you how this 20-year effort on PES has helped us get to a position where this is possible.

Thirty years ago, in 1983, Costa Rica's forest cover had declined dramatically—to 21 percent of the national land area. Then we made an important change. We, as a country, decided we would no longer reward people to clear forest, and we started to recover the forest. By 1998, we were able to say publicly that Costa Rica had turned an environmental disaster around. A few days ago, we received the latest estimate of forest cover, which showed that 52.4 percent of the country is now forested.



A slide from Dr Castro's presentation, showing deforestation in Costa Rica between 1940 and the 1990s, and the subsequent forest recovery. *Photo: H.O. Ma/ITTO*

Some people don't agree with the way we are paying for environmental services because of the opportunity cost of spending those funds for environmental services instead of on other things. The nation has to pay this opportunity cost, but the nation is not capable of paying it. Money for the environment has to compete with spending on hospitals, schools and so on. But the rest of the world is not willing to pay the opportunity cost, either. We have a tax on fossil fuels, which in the last two decades has generated US$900 million; 80 percent of our PES scheme has been paid by this tax and 20 percent has come from other sources. So I say to the United Nations Framework Convention on Climate Change, don't tell me there is no money to fight climate change, because Costa Rica is investing this sort of money out of its own pocket.

Some people think that "carbon neutral" means zero emissions, but in fact it means that greenhouse gas emissions minus sequestration equals zero. By 2020 we will be emitting four tonnes of carbon per capita in Costa Rica, but we also have an expanding forest biomass, and we have calculated that the amount of carbon absorbed in this biomass accounts for 81 percent of the goal. The remainder we need to achieve by reducing emissions through investments in, for example, the transportation system, energy efficiency and renewable energy.

One of the reasons I am mentioning Costa Rica's goal of carbon neutrality is because of upcoming global meetings on climate change. In Costa Rica we believe it is possible to test what we have done here elsewhere, through REDD, and to show that the forest sector is the only realistic option the world has to mitigate climate change—the only option that the developed world can pay for. It would cost US$7–8 billion per year. We hope that the international community will show leadership and push for forest PES as a least-cost solution to climate-change mitigation. We hope the international community is prepared to do more than just talk.

1 Reducing emissions from deforestation and forest degradation, plus the role of conservation, sustainable management of forests and enhancement of forest stocks in developing countries.

Session 1: PES for sustainable forest management

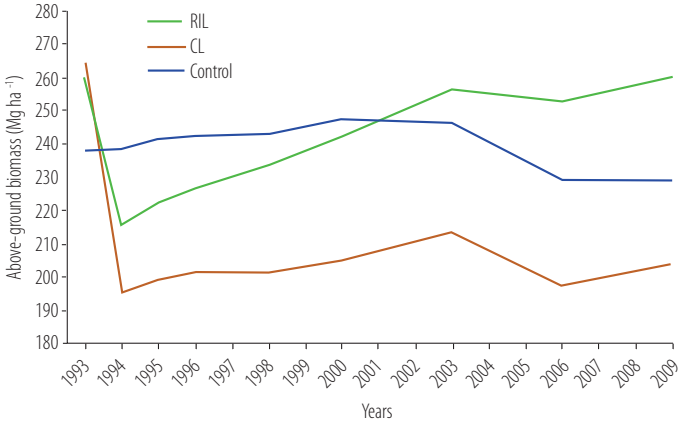
Payments for environmental services can promote the sustainable management of forests and landscapes

Is certification capturing PES in tropical forests?

René Boot
Director, Tropenbos International, Wageningen, Netherlands

Figure 1 shows a comparison of carbon stock in a tropical forest after logging with conventional (highly destructive) methods and with reduced-impact methods as a component of SFM. Under conventional methods, there is a huge decrease in carbon held in the forest, and the carbon stock recovers only slowly. Under reduced-impact logging, there is substantially less of a decline in carbon because fewer trees are harvested and much less damage is done to the remaining forest, and at the same time the recovery of the carbon stock is much faster. After about 15 years, the carbon stock is more-or-less the same as it was prior to harvesting.

Figure 1: Carbon stock in managed forests



Note: RIL = reduced-impact logging; CL = conventional logging.

Source: West, T.A.P., Vidal, E. & Putz, F.E. 2014. Forest biomass recovery after conventional and reduced-impact logging in Amazonian Brazil. *Forest Ecology and Management* 314: 59–63.

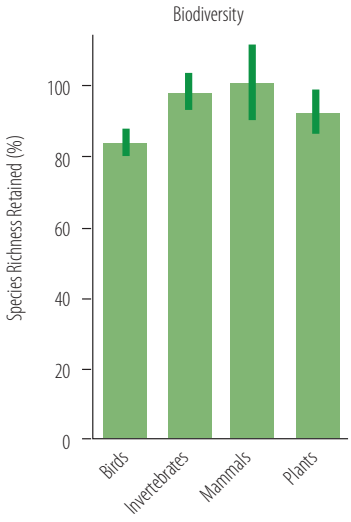
SFM also involves management practices to protect water catchments by employing buffer zones along streams and other waterways and the careful planning and construction of roads and bridges. SFM therefore contributes to regulating water supply and the provision of clean drinking water.

Figure 2 summarizes a meta-analysis of more than 100 studies looking at the impacts of SFM on biodiversity. The analysis found that selectively logged forests have only a minimal effect on biodiversity; birds are most affected, but, even so, about 85 percent of bird species are the same in a logged forest compared with undisturbed old-growth forest.

These results show that SFM contributes to three important environmental services: carbon storage, regulating water supply, and biodiversity conservation.

Markets for environmental services. What are the markets for these services? At a global level there is much discussion about carbon, but lumber exports remain by far the largest economic good from forests in terms of market

Figure 2: The effect of selective logging on biodiversity in tropical forests



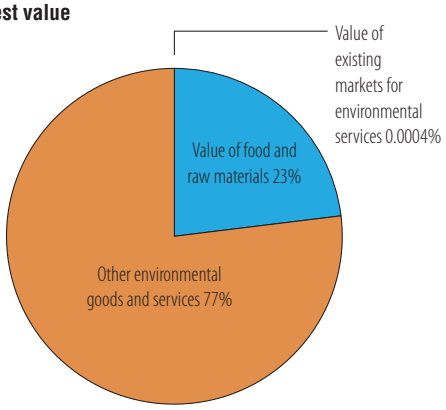
Source: Putz, F.E., Zuidema, P.A., Synnott, T., Pena Claros, M., Pinard, M.A., Sheil, D., Vanclay, J.K., Sist, P., Gourlet-Fleury, S., Griscom, B., Palmer, J. and Zagt, R. 2012. Sustaining conservation values in selectively logged tropical forests: the attained and the attainable. *Conservation Letters* 5 (2012): 296–303.

size; the international trade in wood products was worth about US$237 billion in 2008, while the international trade in non-timber forest products was worth US$11 billion. In 2010 the global market for forest carbon was worth an estimated US$178 million, the global market for water catchment protection services was worth US$9.25 billion, and the global biodiversity compensation market was worth US$2.4–4 billion. Figure 3 shows that, at least by some valuations, environmental services potentially account for more than three-quarters of the total value of forests, but only a tiny fraction of that value is being remunerated in the marketplace.

Forests provide many environmental services. The Millennium Ecosystem Assessment distinguished four categories—supporting, regulating, cultural and provisioning. But not all these services can easily be quantified, measured and traded. Tangible forest goods such as lumber, biomass and water can be measured and traded, and there is a clear role for the private sector in these markets. But intangible services such as soil formation or cultural services are difficult to measure and trade, and other mechanisms are needed for these services.

One option is to "bundle" all (or a range of) services, which may reduce the complexity of the payment system and the cost of quantifying the services delivered. Bundling also has potential disadvantages, however; for example, different services may have different beneficiaries and bundling makes it more difficult to ensure that users pay for the environmental services they receive. Moreover, incorporating the cost of maintaining all environmental services into a single tangible good, such as lumber, may make it difficult for such goods to compete with, for

Figure 3: Ecosystem market value compared with economic forest value



Sources: analysis based on various Ecosystem Marketplace reports; TEED 2010. The economics of ecosystem services and biodiversity: ecological and economic foundations, edited by Pushpam Kumar. London and Washington, DC, Earthscan.

example, illegal lumber and substitute commodities (such as concrete and aluminium).

Certification. Forest management certification, which developed in the early 1990s, is a voluntary market instrument that attempts to capture, among others, the environmental services provided by forests in the price of wood by providing a "premium" if such wood is obtained from well-managed forests. In 2010, about 26 percent of the global lumber production was in forests where management was subject to third-party certification, but only 0.1 percent of certified lumber was tropical. Twenty years after forest certification began, only about 6 percent of tropical production forests are certified, although the growth in the area of tropical forest subject to certification has been almost exponential from a very small base. A study commissioned by the Dutch Sustainable Trade Initiative found that the costs involved in certifying forests—i.e. the reduction of revenue caused by a reduction in the annual allowable cut, additional management costs associated with certification, and the cost of certification auditing—reduces the gross profit and the price premium on certified wood—where there is one—often does not make up for this shortfall.

Voluntary markets for environmental services—such as certified wood markets—have the advantage of being a coalition of the willing in which producers and consumers come together for a mutually beneficial purpose. They have some significant disadvantages compared with compliance markets, however, such as their generally small size, the difficulty in scaling them up, and high transaction costs. Governments can assist the growth of voluntary markets by, for example, adopting public procurement policies to favour certified wood, and enforcing national laws and regulations to create a level playing field between conventional logging and SFM.

Reduced-impact logging involves, among other things, the use of rubber-tired machinery, the careful planning of skidding trails and lifting the end of the log to reduce the damage caused to soil and vegetation. *Photo: R. Boot*

Making people aware

Banks, insurance companies, pension funds and many other investors are looking for opportunities to invest in sustainable practices and the restoration of degraded lands. Tropical forests provide many important environmental services, but few people beyond the forest sector know this. Thus, the first step to creating viable PES schemes is to raise awareness—to tell people about the provisioning, regulating and cultural services of tropical forests. Target groups for awareness-raising include companies, policymakers, banks and other investors, the media, religious leaders, non-governmental organizations, foundations, the general citizenry, and students (the chief executive officers of the future). Messages should be developed based on knowledge of the audiences they will be aimed at.

The messages that should be conveyed include:

- Tropical forests are sources of water.
- Standing tropical forests render more revenues in the long term than conversion renders in the short term.
- Tropical forests are life-support systems for us and for our children.

It is clear that forests also have a crucial role to play in "healing the world"; they are a least-cost option for mitigating climate change. We need to plant more trees, manage our forests better and produce more "green" products and environmental services. We can call it "REDD+", PES or a green economy; it doesn't matter. We don't need to invent anything, but we may need to repackage it. The important thing is that the crucial global role of forests is recognized and paid for.

We need to spread the message that tropical forests are a giant carbon dioxide vacuum cleaner and manufacturer of green, renewable biomass, and that their sustainable management provides enormous global benefits.

Sources: based on presentations by Meindert Brouwer, author of The ecosystem promise, and Yetti Rusli, Senior Advisor, Ministry of Forestry, Indonesia.

A landscape approach to PES

Meine van Noordwijk
Leader, landscape component, CGIAR Research Program on Forests, Trees and Agroforestry, and Chief Scientist, World Agroforestry Centre, Nairobi, Kenya

We may need to broaden the discussion from forests alone to landscapes with multiple functions. Forestry and agriculture are often seen as if they are a dichotomy. In this view, the more intensive agriculture is, the more forest can remain (the "land-sparing approach"). Another way to approach it is to think of landscapes as integrated mosaics ("land-sharing"), where functions of natural forests, tree (crop) plantations, agroforestry and open-field agriculture are managed jointly. Such landscapes come to life when people and institutions are seen as part of a complex socio-ecological system, interacting with the natural resource base and external markets and expectations. Landscapes are not just mosaics of multiple land covers and land uses; they are spaces within which lives and livelihoods run their course, and they include aspects of identity, pride and concern for the environment, with greater or lesser degrees of social coherence. Landscape approaches are attempts to reconcile local and external perspectives on what constitutes desirable landscape outcomes. Economic instruments such as PES complement regulatory and motivational dynamics.

PES schemes were initially seen as a simple exchange between (relatively) poor people living in environments where there is plenty of natural capital (e.g. biodiversity and carbon) and (relatively) rich people elsewhere living in environments that are poor in natural capital; it would then seem that a simple exchange—money for environmental services—could serve the needs of both sides. But this is not so simple in practice because all the various kinds of capital—social, human, natural, financial and institutional—are linked. Successful PES schemes adjust to this complexity. People on the forest edge and in rural landscapes need respect, recognition, commitment and co-investment in their livelihoods as much as they need cash transfers. So there is a need for a more integrated approach between social and economic approaches to PES. We found that the concept of co-investment covers desirable system aspects of shared risk, benefit and commitment.

Landscape approaches to PES require understanding of the who, what and where of land use and land-use change, the consequences of this change for environmental services and stakeholders, and the opportunities for stakeholders to gain leverage on the drivers of change. *Photo: DGFRN, Benin*

There is often a need to nest PES at different scales: landscape, region and international aspects such as REDD+. There is a common view that nesting must be like a set of Russian dolls and that PES schemes at all scales are essentially the same. But this is more restrictive than necessary. Landscape-scale co-investment PES mechanisms (removing bottlenecks to a local green economy) can be nested in subnational compensation PES schemes (equitable sustainable development support across regions), and nested again in global commodification PES schemes (carbon credits for money at the national border). PES may thus have a different form at each scale, with important translation steps on the nodes.

Landscape approaches require a basic understanding of the who, what and where of land use and land-use change in time and space, the consequences of this change for environmental services and the various stakeholders, and the opportunities for stakeholders to gain leverage on the drivers of change at the local level. Negotiation support tools for learning landscapes have recently been compiled and can help in fine-tuning local efforts.

Positive externalities

Philipp Aerni
Director, Center for Corporate Responsibility and Sustainability, Zurich, Switzerland

Positive externalities are the co-benefits produced by rural economic activities that are not taken into account in economic transactions but which benefit society and the environment. PES schemes in developing countries focus on reducing negative externalities (PES as "use-restricting"), but building up assets through entrepreneurship and innovation is necessary to ensure financial sustainability. Thus, existing PES schemes tend to overlook the potential for creating new markets.

PES schemes can be aligned with the interests of local people if they are allowed to be in the driving seat; this would provide them with the opportunity to become entrepreneurs themselves and thus increase their motivation to participate and assume responsibility. But enabling local people to become entrepreneurs also requires support and coaching from the public sector. This facilitation role is about building up an entrepreneurial infrastructure, which so far has been neglected. Clear policies can help create markets for environmental

services, but matching grants and other incentives may still be needed to encourage entrepreneurs to tap into these nascent markets and eventually scale them up.

Where local partners are striving to adopt sustainable practices, the creation of a market for environmental services has two key requirements:

- a government that actively aims to minimize (through regulation) negative externalities and maximize (through innovation) positive externalities by
  - designing environmental services investment policies
  - strengthening national innovation systems
  - using procurement policies with sustainability strings attached
  - rewarding the creation of positive externalities.
- an innovation-driven private sector with a willingness to
  - share knowledge and expertise
  - participate in business deals with local actors
  - source certain goods from local providers
  - offer awards for good custodianship
  - offer awards for local initiative.

PES is based on the assumptions of neoclassical welfare economics, but there is a need to align PES theory with experience on the ground. Scaling up PES is possible only if local people have the opportunity to participate as entrepreneurs—not just as recipients of monetary compensation. It is important to minimize negative externalities, but there is also a need to facilitate positive externalities by promoting innovation in local communities.

Comments from the floor

- The multi-functionality of forests is paramount, and a big question is how much should be paid for multiple services. The state must understand that it is a facilitator, not a manager of PES schemes. It is a business for forest owners and managers; it is not simply about compensation.
- In Mexico, 80 percent of forests are in the hands of communities—they are the owners and managers. A key element for the success of PES schemes is the organizational level of the communities. Therefore, an important role for government is promoting the organization of communities through training and enabling the creation of community associations. As communities become organized they are also better placed to make use of their traditional knowledge in PES schemes.
- Let me tell you about a small community in northern Thailand, where rampant deforestation destroyed the environment. The local people were aware that this was excessive. They organized a conservation group to assist with payments, and they protected the forest and carried out reforestation activities, and now the area is reforested and the community is benefiting from the goods and services supplied by the forest they protect. The carbon stock increased by 36 percent in four years and is still increasing. The key factor in making this PES scheme work for SFM is the participation of local people. Over 50 percent of biodiversity in Thailand is in our local region. We are working strongly on PES, but we are asking for more help from the international community.
- We have heard of a number of good examples of successful PES schemes in tropical forests. It's not so difficult to find such examples; the big challenge is how to scale these up. A responsive and active government can help by promoting pilot programs and scaling up those that work—this can increase the chances of success. Many of the experiences are in the south, so south–south and triangular collaboration can be important.
- Branding is an important way to add value to environmental services. We have seen it in Costa Rica, and we are seeing it emerge in Indonesia.
- I agree that there is a tremendous opportunity for PES schemes as part of climate-change mitigation. The new challenge for foresters is how to introduce our accumulated experience and data to climate-change negotiations. I hope that ITTO and FAO will get more involved to ensure that all their good work is made known to climate-change negotiators.
- In New Zealand we have had many trials of different approaches. Some of the key things we've learned: you need to understand what behaviour you are trying to change. Every stakeholder and owner is different, so you have to offer a variety of payment mechanisms and means. You also need to understand that sometimes payments are not the best way to get the outcomes you want, so work with stakeholders to determine which approaches will work best.
- There is very little evidence that PES works (or doesn't work). We only see "before" and "after"; it's hard to know what is cause and effect, and other factors may have contributed to the success of the measure, or PES may have hindered the change. There are some data: the World Bank carried out a study in Colombia, with a control group, which determined that, yes, the PES intervention there had had a big impact. My recommendation is to include assessment measures in the project design. Often we only think about assessment at the end, but we need to design it at the beginning. If we exclude it, we will remain with vague, inconclusive or mistaken results that will be unconvincing.

A Forum participant makes a point during the plenary session.
Photo: H.O. Ma/ITTO

Session 2: Developing innovative financing mechanisms

PES schemes have made use of a range of financial mechanisms

Costa Rica's experience

Jorge Mario Rodriguez
Director, FONAFIFO, San José, Costa Rica

I would like to relate the experience of Costa Rica in PES schemes. Although PES began formally in 1997, the truth is that, as early as 1979, Costa Rica was making certain incentives available for reforestation. These early experiences proved invaluable for the later establishment of the PES scheme for forest management and conservation.

Costa Rica has 4.6 million inhabitants, and 70 percent of the national territory is designated as forestland. Minister Castro noted earlier that, at a certain point in time, we were champions of deforestation: we were deforesting at a rate of 75 000 hectares per year, which was 1.5 percent of the national territory. But the country has taken a number of important actions since the early 1980s to arrest this trend.

In the 1960 and 70s, policies were in place to favour exports of traditional cash crops such as sugar, beef and coffee, and landowners were compelled to clear their forests or they would not have access to credit. At the same time, the country's first conservation areas were created, and the first laws were enacted aimed at reducing deforestation and recovering degraded forest areas. Nevertheless, agriculture continued to expand, and it was not until 1987 that deforestation bottomed out—the remaining forests were state property. In the 1980s there was strong debate on forests, and in 1986 a forestry law was passed which aimed to stimulate reforestation by private landholders by authorizing tax credits in the form of Forestry Investment Certificates (*Certificados de Abono Forestal*). This was followed by other similar instruments, including Natural Forest Management Certificates (1990).

The country's leaders were aware that they had a catastrophic problem on their hands, and the revised forestry law of 1997 (Law 7575) articulated, for the first time, the concept of environmental services and payments for them. That law created a PES scheme with four main pillars: the legal framework; institutions; finance; and evaluation and monitoring.

Legal framework. Law 7575 sets out the purposes of the scheme as the mitigation of greenhouse gas emissions; the protection of water resources; the protection of biodiversity; and scenic beauty. It creates FONAFIFO, and it provides scope for revenue to fund the scheme through a tax on hydrocarbon fuels.

Institutional framework. The Ministry of Environment, FONAFIFO and a range of forestry, academic and regulating institutions are linked to the work.

Financing. All Costa Ricans pay a fuel tax to pay for the PES schemes. In addition, loans and grants, including from the Global Environment Fund and the World Bank, totalled

A waterfall in Cartago, Costa Rica. The country's PES scheme has proven to be an effective instrument for stopping illegal logging and land-use change. Photo: *FAO/Riccardo Venturi*

US$90 million between 2000 and 2010. But the bulk of the funds are derived from the tax on fossil fuels.

As a country we have shown our ongoing commitment to this scheme; the Government of Costa Rica signed the last credit line in 2007, and the legislators approved it unanimously, even though they were from eight parties and had widely varying ideologies. It was one of very few projects approved unanimously.

German cooperation assistance has also helped us, providing €10.2 million for specific activities in the north of the country.

These funds are not sufficient to fund the entire program, so additional fundraising mechanisms are *Certificados de Servicios Ambientales* (Certificates for Environmental Services), sold to the private sector, and the *Canon de Agua* (Water Canon), which is a tax on water consumption used to compensate farms providing catchment protection services.

Payments are made on the basis of reforestation, agroforestry, forest protection and natural regeneration, and for each of these there is a different payment. If endangered species are involved, we pay 40% more.

Monitoring and evaluation. The fourth pillar is monitoring and evaluation. Each participant in the scheme has a geo-reference, and we have various information layers. Monitoring is very important—we have to show that the resources are being used correctly and effectively. Monitoring is done both by FONAFIFO and by third parties to show that resources are being invested in the right way.

The PES scheme enjoys ongoing political support: it has been a priority program for all administrations since 1997 (in which time there have been five presidents and ministers of environment). To some extent, the tax on fossil fuels is controversial; industry, for example, argues that it makes them less competitive than their rivals in other countries, where there is no such tax. Thankfully, however, the tax remains in place.

Achievements. After more than a decade of operation, the PES scheme has proven to be an effective instrument for stopping illegal logging and land-use change. It has successfully engaged private-sector users of environmental services, who contributed more than US$18 million to the scheme between 2003 and 2010. Partnerships with private companies and international agencies for PES reduce the investment needed from the state.

The PES scheme encompasses 934 000 hectares and involves 13 500 families, and more than 4.6 million trees have been planted. In total, the scheme has resulted in an investment of more than US$400 million in rural areas, including more than US$35 million on 110 000 hectares of indigenous territories.

Challenges. Costa Rica's PES scheme faces a number of challenges, such as:

- legal limitations on certain potential beneficiaries entering the program;
- the need to better measure the impact of the scheme;
- a lack of adequate accounting to assess the real impact of environmental services on the economy and the importance of the forest sector in general; and
- an ongoing need for more resources to pay all those supplying environmental services.

A public financing mechanism for forest environmental services

Li Zhiyong

Project leader, Research Institute of Forestry Policy and Information, Chinese Academy of Forestry, Beijing, China

The Grain for Green Project (G4G) is China's largest and most fruitful PES, poverty-alleviation and eco-restoration project. The total financial input for the first round of the G4G was 326.2 billion yuan (US$53.5 billion). It led to the creation of 29.4 million ha of forest, comprising 9.27 million ha of forest established on agricultural land and 20.1 million ha of forest established on bare land and mountains suitable for afforestation. The first round benefited more than 32 million farmer households, each of which was paid (on average) more than 7000 yuan (US$1150). The second round of the project will be launched in 2014.

The first round of the G4G has had two phases, with phase 1 spanning 1999–2006. The core policy involved the state subsidizing farmers or individual contractors who converted agricultural lands to forests with an appropriate amount of grain, seedlings, an afforestation fee and cash, on the basis of the area of converted land on slopes above 25 degrees. The grain compensation standard was 100 kg of grain per mu per year (equivalent to 1500 kg per ha per year) in the Yellow River area and the Northern Region, and 150 kg per mu per year (2250 kg per ha per year) in the Yangtze River area and the Southern Region. The cash compensation standard was 20 yuan per mu per year (US$50 per ha per year). If converted to cash, the grain is paid in accordance with the coefficient of 1.4 yuan per kg (US$0.2 per kg). The compensation period was tentatively for eight years for "ecological" forest; five years for economic forests; and two years for grassland.

In Phase II of the first round (2007–2014), Central Finance allocates funds and continues to pay farmer households that converted agricultural land

G4G has led to an increase in China's forest area, improved environmental quality, and growth in the incomes and livelihoods of farmers. *Photo: Li Zhiyong*

to forest with a cash subsidy designed to improve the livelihoods of the farmers. The compensation standard is 1575 yuan (US$258) per ha per year in the Yangtze River area and the Southern Region and 1050 yuan (US$172 per ha per year) in the Yellow River and the Northern Region. The original livelihood subsidy of 20 yuan per mu per year (US$50 per ha per year) continues to be paid to farmers as long as they fulfil their obligations for managing and protecting the forests. The compensation period remains at eight years for ecological forest, five years for economic forest and two years for grassland.

The second round of the scheme will run from 2014 to 2020: a major difference is that farmers are free to decide the sort of forest they want, such as an economic forest or an ecological forest. Priority will be given to arable land on slopes above 25 degrees (around 4.314 million ha), arable land in key areas at risk of desertification, and arable land in critical water-supply areas, among others.

Politically, the G4G carries a number of risks. China has a population of 1.37 billion people and only a limited area of arable land: there is a risk that the G4G project will be seen as removing arable land from food production, leading to a reduction in the grain supply. In addition, forest-tenure reforms associated with the project have weakened government control. There is also a question of social equity: is G4G an equitable way of distributing benefits?

From an ecological point of view, it is too early to properly evaluate the impact of the G4G. There have been a number of issues, such as a lack of ecological planning and evaluation; a lack of diverse or appropriate species being planted; a lack of improved seeds; insufficient forest tending; the over-preparation of soils prior to planting; and the use of invasive species.

Economically, the high inputs required, and the long management period, mean that annual economic returns are low, especially in the early years—and there is uncertainty about the markets for forest products when they reach harvestable sizes. The compensation for planting forests was relatively low and declined over time as agricultural reforms increased farmer profits from other land uses.

Despite its shortcomings, however, the G4G project has, overall, been a success. The forest area is increasing nationwide, environmental quality is increasing, and the incomes and livelihoods of farmers are growing. The G4G project is expected to continue into the future; there is a general political consensus on the need to pursue green development as a way of alleviating rural poverty and bridging the rural–urban gap. To reduce the risks associated with G4G, proposals include: increasing the compensatory standard; broadening the funding (including through the private sector); increasing the rights of farmers to manage their land independently; increasing technical support, including for value-adding industries; and improving monitoring and financial management.

A PES public–private partnership in Nicaragua

William Schwartz
Director, INAFOR, Nicaragua

The scheme to compensate forest owners for environmental services in the municipality of Belén in western Nicaragua is an example of an effective public–private partnership. The scheme draws on a range of local instruments, such as the municipal development plan, which includes elements on land use and watershed management; regulations on zoning and land use; and municipal forest management and environmental plans.

Water is a strategic element in land-use planning in the municipality. After an initial process involving wide consultations with local farmers, the Gil González catchment was prioritized for payments for hydrological services as a way of improving the management of the municipality's water resources. The Gil González River flows from west to east for about 25 km before emptying into Lake Nicaragua. The upper part of the catchment is populated mainly by poor farmers who raise cattle and cultivate corn, beans and rice, and much of the land is degraded, lowering the quality of water flowing into Lake Nicaragua. A public–private partnership was initiated to restore and conserve forests in the Gil González catchment.

Under the PES scheme in western Nicaragua, payments are made to farmers for protecting forest areas, leaving areas to regenerate naturally, and establishing connectivity between fragmented forests. *Photo: FAO/ Saul Palma*

The partnership is a mixed-management model involving local farmers, the large sugar company CASUR (*Compañía Azucarera del Sur*), and national and municipal governments. CASUR grows sugarcane in the lowlands and operates a sugar mill at Lake Nicaragua, so it was in its interest to be involved in the project to ensure the supply of good-quality water. Government institutions have two roles—regulation and technical assistance.

A financial mechanism raises and manages funds and ensures a long-term, continuous flow of income for financial sustainability. The project has received financial support from GIZ (the German development cooperation agency), FAO and the national government, as well as from CASUR. The main source of funding for the payments is CASUR, the municipal government and FONADEFO (*Fondo Nacional de Desarrollo Forestal*—National Forest Management Fund).

Payments are made through annual contracts that stipulate the obligations of farmers, and compliance is assessed before payments are made. The supervisory mechanism keeps transaction costs low and ensures transparency and credibility, which are essential for maintaining trust in the system. A board of directors comprising representatives of the environmental service providers (i.e. the farmers), users and government, oversees the scheme, and there is also a technical committee and a coordinating executive committee which, among other things, monitors changes in water quality in the catchment.

Under the scheme, payments are made to farmers for protecting forest areas (e.g. by establishing firebreaks and using selective harvesting), leaving areas to regenerate naturally, and establishing connectivity between fragmented forests (e.g. live fences). The payment represents compensation for the opportunity costs of conservation and the adoption of sustainable land-use practices such as agroforestry and silvo-pastoral systems.

Conservation areas attract annual cash payments of C$819 per ha, and the establishment of live fences receives a one-time payment of C$5000 per km (the Nicaraguan cordoba currently trades at around 26 to the US dollar). We also provide tools such as pick axes to help establish the live fences. To date, 85 farmers have conserved more than 500 ha of forest and established 23 km of living fences. Most farmers in the catchment have been geo-referenced in a geographic information system, strategic alliances have been created with trusted partners, and 60 local people have been trained as promoters of watershed management.

Payments generated by the scheme are insufficient to fully sustain local livelihoods, so the scheme also provides farmers with technical assistance to plant fruit trees and pursue other livelihood options such as beekeeping. It has helped train people in fire prevention and other management practices and to raise environmental awareness in local communities.

The keys to the success of the scheme are:

- the willingness of the municipal governments to include all producers in the scheme, regardless of their political colours;
- the clear defining of agreements and commitments—clear rules of the game are essential for the scheme to be sustainable;

- the engagement of local farmers through empowerment and awareness-raising;
- the transparent handling of information and resources; and
- the participation of the private sector from the start of the project.

Brazil's Atlantic Forest Fund

Julia Mello de Queiroz
Project analyst, FUNBIO, Brazil

FUNBIO is a private, not-for-profit institution that mobilizes resources for biodiversity conservation. We have four units, and I work in the Financial Mechanisms Unit. We design financial mechanisms to help fund biodiversity conservation, map and analyse financial demands and opportunities, and link programs and policies with the public and private sectors.

Under Federal Law 9.985/2000, companies are obliged to support the conservation of protected areas to compensate for their significant environmental impacts. In Rio de Janeiro, where I am based, many investments were planned, but companies have not known how to make their compensatory payments. Nor did the state government have sufficient capacity to implement a scheme, so there was a need for a financial middleman.

In 2007, the Government of Rio de Janeiro contracted FUNBIO to develop a financial mechanism—the Atlantic Forest Fund (*Fondo Mata Atlântica*—FMA)—to mobilize these private compensatory resources and to direct them to protected areas in the state. A pilot phase began in 2008 and the full scheme started in 2010.

The FMA is a private finance mechanism with public governance through the Environmental Compensation Board (*Câmara de Compensação Ambiental*—CCA), and FUNBIO is its financial manager. The FMA is flexible and transparent, and it preserves the public nature of decision-making through its governance structure. It is also designed to allow short-, medium- and long-term investments in conservation units. Other positive aspects include the following:

- FUNBIO has low execution costs.
- Procedures are uniform.
- The FMA is a voluntary option for executing the requirements of the law.
- The FMA is an easy solution for meeting compensation obligations through an efficient mechanism.
- The FMA model can be replicated in other states of Brazil and in other countries.

As of December 2013, the FMA was funding 56 projects valued at about US$115 million, of which about US$30 million had been delivered. Prior to the creation of the FMA, large investments in the management of conservation units in Rio de Janeiro were rare, and many protected areas were just on paper; now they are being managed and the state system of conservation units has started to take meaningful shape. The private sector bought into and trusted the process because companies could see the benefits it could bring. The public–private nature of the partnership brings credibility to the process, and, in Rio de Janeiro, almost all companies with obligations under the law have chosen the FMA as the mechanism through which to fulfil those obligations.

Main challenges. The public sector is risk-averse, so it can be difficult to be innovative, and there is a continual need for political will—public-sector managers may have other interests and priorities. In designing the mechanism, there is a need to match modalities with the needs and realities of stakeholders, so validation is essential. For the mechanism to work well in practice there must be sufficient flexibility to meet the needs of stakeholders.

Lessons learned. It is important to listen to stakeholders and to find out what they want. Establishing an effective mechanism involves a complex process of persuasion and conversion, which takes time. The private sector is most likely to be interested when the benefits are clear, the risk is low and the process is economically efficient. The mechanism must have effective and transparent oversight and political legitimacy, and it needs clear rules and laws. One of the big lessons we have learned at FUNBIO is that we have many initiatives, but to develop successful innovations we have to look in many directions for funds and for a large diversity of financial mechanisms.

The GEF's work on PES

Jaime Cavelier
Senior Biodiversity Specialist, Global Environment Facility, Washington, DC, USA

The Global Environment Facility (GEF) is a financial mechanism of the three environmental conventions. Countries deposit funds with the Facility, and most are handed over to recipient countries, which decide on the use of those resources within the general GEF framework. The GEF Secretariat verifies the projects that are submitted.

The GEF has explicit language on the possibility of using GEF resources for the development and implementation of PES schemes, and proposals are welcome. We have a new SFM strategy—which means that additional funds are available to supplement the resources available to each country in the focus area of biodiversity.

The last two funding cycles of the GEF have generated funds close to US$8 billion, of which almost 50% is allocated to biodiversity conservation. The major focus of 14 projects worth a total of US$70 million is on the development of PES schemes; these projects have also attracted US$395 million in cofinancing. PES schemes are a significant component in another 15 projects worth US$73 million (US$281 million in cofinancing), and a minor component in 28 projects worth US$82 million (US$918 million in cofinancing). PES schemes developed as part of GEF projects may have international, national or local buyers.

The environmental service that generates most demand in GEF projects is water-resource protection, followed by carbon sequestration. Why? PES schemes are likely to be developed and implemented in areas where water

is in high demand, and conserving the water source is less expensive than all other alternatives, including water treatment and relocation. PES schemes are also being used in pilot carbon schemes in countries where there are significant carbon stocks, technical capacity and legal certainty for buyers seeking to offset carbon emissions.

There is no project in the GEF in which the main objective is to create a PES scheme for biodiversity; where biodiversity is included, it is part of a basket of services. This seems to be the main way in which biodiversity conservation will be the subject of PES schemes in the future: as part of a package with other environmental services for which there is real demand.

Comments from the floor

- Question for Jaime: There is plenty of interest in PES in Africa; many concepts are brought to us, but one of the challenges is the "captive buyer". Would the GEF be willing to allow projects to use funds to pay for credits as a way of "testing the water" and encouraging users to get involved?
- **Jaime's response:** Yes, we do have cases where GEF projects have not only set up the PES scheme, they have also "primed the pump". But if you don't really know if there is a buyer, what is the point of setting up a scheme? Who in the business world would set up a business without a sense of what the market is?
- One of the problems with PES schemes is how to scale them up, but there is also the problem of "scaling down"—ensuring that payments are spent effectively at the local level.
- In China, the G4G program has run for more than 15 years and it has passed through three stages. In the first stage, farmers were paid to plant trees, but after a few years the farmers said the money was not enough. In the second stage, the program assisted local governments in working with farmers to develop follow-up industries so they would have new ways of making money, such as through ecotourism and the sale of other products. Now, in the third round of the program, we want to improve the policy to focus on capacity building—training farmers and building roads and schools, so they can create more opportunities for themselves.
- We need to understand that the deforestation problem is not usually a forestry problem; it is more about pressure for land from other sectors. Often this is simply because those sectors make inefficient use of their land. So we need to identify the deforestation drivers and then develop a compensation mechanism to combat those, such as by developing more productive ways of managing existing cleared land. PES schemes are not only about money—they might involve, for example, alternatives for other sectors so they stop putting pressure on forest resources.

A Forum participant speaks during a facilitated plenary discussion. *Photo: H.O. Ma/ITTO*

- In Uganda we are working with small-scale landholders to engage them in voluntary carbon markets. The scheme provides a system whereby several small-scale landholders can aggregate to create scale and connect with companies looking to invest for corporate social responsibility purposes. Even if you start small, it gets easier to scale up because the experiences of the pioneers can inspire other communities to join producer groups.
- We want long-term sources of funding—for example, a hydroelectric plant is likely to want to invest in the long term in high-quality catchment management. Some existing mechanisms, such as a GEF grant, might provide short-term bursts of funding and then they're over. Grants are short-term unless they can be converted into a trust fund that can finance certain conservation activities in the long term. It's important that we distinguish between the types of mechanisms: will they be there in the long term, or will they be depleted?
- The core of the issue is how to finance all these schemes in the long term. In Costa Rica, we had great expectations after the Rio Earth Summit in 1992; we established a self-imposed tax on greenhouse gas pollution, but we are still to see real action at the international level; there has been no echo internationally to our national efforts.

Session 3: Ensuring benefits for local communities

PES schemes must take into account the social, cultural and ethnic diversity of tropical forests

Tropical forests are socially, culturally and ethnically diverse, and any PES scheme must account for this diversity and ensure that all people benefit. *Photo: N. Kingman*

PES: an opportunity to honour human rights

Myrna Cunningham
Former Chair of the United Nations Permanent Forum on Indigenous People, Nicaragua

I salute you on behalf of the indigenous and Afro-descendant communities in the autonomous region of Nicaragua. We have been building a process that enables us to exercise our rights as citizens of Nicaragua and as members of indigenous and Afro-descendant peoples. This is a process that is changing Nicaragua into a multi-ethnic country. One of the main objectives of any PES scheme is sustainability, so that the women and men of local communities can enjoy completely their human rights—to have enough food and to be able to improve their quality of life and wellbeing.

Tropical forests are socially, culturally and ethnically diverse. Even in a local area, people may be indigenous, non-indigenous, nomadic, displaced and others, and any PES scheme must account for this diversity and ensure that all people benefit. In many places, most forest resources are considered owned by the state, and there is no acknowledgement that indigenous peoples have been living there and managing those forests for many centuries and indeed are the main contributors to the conservation of the forest. Indigenous peoples have never received any payments for the services their management provides, but they have received many favours from Mother Earth.

When we compare maps, we can see that there is a huge overlap between forest biodiversity and the presence of indigenous peoples. Places with high biodiversity are those that have been managed traditionally by indigenous peoples. With this in mind, it is essential that any PES scheme respects the rights of indigenous peoples. Forests have spiritual as well as commercial value, and they provide indigenous peoples with hunting and fishing resources, as well as fuel, medicinal products and much more. A woman once told me, "the forest is our supermarket and our pharmacy".

As owners and users, our communities have regulations and guidelines for the use and management of the forest, and they continually patrol the forest to ensure that these regulations are followed. Indigenous peoples continue to fight every day to keep their land; they are constantly being pushed out by monoculture plantations, mining, forest companies and infrastructure construction. PES schemes can potentially provide indigenous peoples and other local communities with a range of benefits, but I would like to point out some of the challenges for improving PES approaches.

Human rights. The legal protection of the rights of indigenous peoples and their traditional knowledge should be a prior requirement for any project. The United Nations Declaration on the Rights of Indigenous Peoples, and other human rights agreements, stipulate the principle of free, prior and informed consent—if this is adhered to, we

will have better results. Governments should harmonize national laws with their international obligations on human rights.

Establishing trust. In most countries, indigenous peoples have no trust in the government or the private sector. Collaborative efforts through PES schemes could serve as a basis for establishing trust and can also contribute to the application of human rights. In 2011, the United Nations Human Rights Council endorsed the *Guiding Principles on Business and Human Rights*, which has three pillars: the state's duty to protect against human rights abuses by third parties, including business enterprises; the corporate responsibility to respect human rights; and access to remedy for victims of business-related abuses. So PES initiatives should be based on these pillars, which, if adhered to, will help build trust.

Spiritual beliefs. PES involves voluntary transactions between a buyer and a seller—so the premise is that the service is saleable. From the point of view of many indigenous peoples, however, natural resources are the basis of life and are not for sale; they give life to the universe. We interact with and take care of the forests; some cultures have supernatural forces that protect them. So it is important that PES schemes take these spiritual elements into consideration. This also applies to sacred sites, which have been handed down through the generations. We cannot consider placing a monetary value on such sites.

Many PES schemes will involve the use of intermediaries in negotiations. But it takes time for such intermediaries to earn the trust of the people—usually longer than project cycles. So there is a basic incompatibility between PES schemes and short-term projects.

Decentralization. Decentralization works, and it is important to take it into account, especially where indigenous peoples have been advancing their rights and processes of autonomy are underway, such as in Nicaragua, Colombia, Mexico and Panama, among others.

Women. Women have a special role in protecting forests and using resources sustainably for housing, food and medicine. Women also produce non-wood forest products and are usually important actors in ecotourism. PES schemes must include women.

Ethical aspects. There is a need to incorporate a cultural pillar in sustainable development, in additional to the social, economic and environmental pillars. We believe the cultural aspect has to do with the moral values associated with taking care of the territory and includes spirituality. We proposed it strongly at Rio+20. Culture serves to deepen relationships and increase the sense of responsibility towards Mother Earth.

A second ethical aspect has to do with payments for abandoning agricultural practices. Where so many people are starving, we need to assess this concept in the light of the opportunity cost for indigenous peoples.

PES is an opportunity to overcome the history, conflicts and danger surrounding the use of natural resources, to find better ways than the economic models of monocultures, and to apply methodologies that are appropriate for each ecosystem and region. PES can serve as a reference for the structural transformations we are promoting in our countries. We are having this discussion on PES at a good moment, especially as we continue to negotiate on REDD+. We need to establish safeguards to protect the rights of indigenous peoples. I encourage you to continue working in this spirit, so we can build a fairer world in which there is greater respect for diversity.

Community tenure to greenhouse gas emission reductions

Leslie Durschinger
Founder and Managing Director, Terra Global Capital, San Francisco, USA

At Terra Global Capital we work with governments, community organizations, non-governmental organizations (NGOs) and the private sector to help create, secure and monetize environmental assets, including for greenhouse gas emission reductions (i.e. carbon). I will provide examples of how greenhouse gas emission-reduction tenure is being secured under different community-based forest and land-use tenure systems and insights into the impact this has on engaging private-sector investors/buyers.

We do a lot of work with community forestry, and we see that in many countries natural resource tenure is devolved and reasonably well defined. Sometimes there may be boundary conflicts and overlaps, but mostly forest and land-use tenure is devolved and legally recognized under community forestry, co-management or indigenous laws.

What are the mechanisms used to define and secure tenure of the emission reductions that are created in these types of tenure systems? Given that environmental markets are relatively new, only a limited number of countries have federal, state or provincial laws that define emission-reduction tenure; in the absence of laws, contractual agreements are used to secure emission-reduction tenure. The parties who will engage in these contractual agreements are established by evaluating the implied emission-reduction tenure based on natural resource tenure: for example, "I own the land or I have tenure over the trees, therefore I own the greenhouse gas emission reductions". But this could leave forest managers exposed if new laws are passed that conflict with this interpretation, so including governments in these contractual agreements is advisable. In some cases, emission-reduction tenure may be claimed on the basis of first come, first claim. For example, some emission-reduction projects implement fuel-efficient

cook stoves that reduce degradation, and the people who have claimed the emission reductions may not be those with tenure to the forest from which the wood is coming.

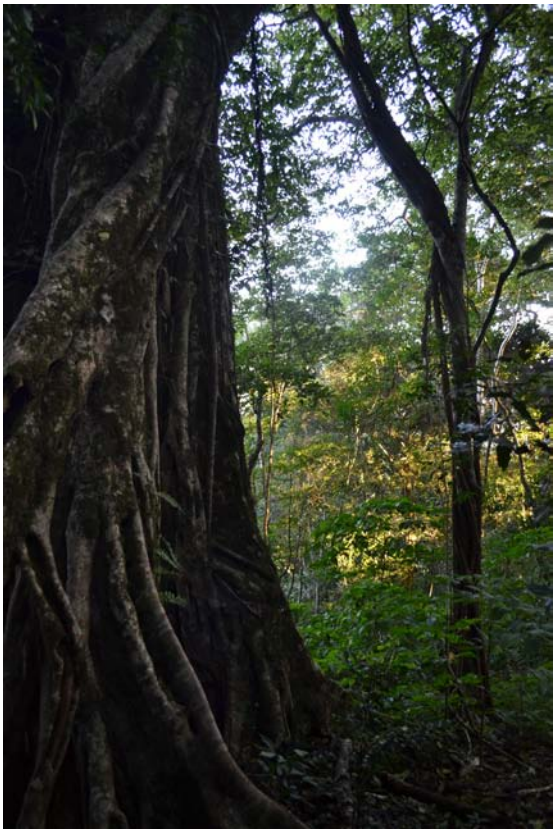
Examples of emission-reduction tenure and payments. Besides securing tenure over the actual environmental assets, which gives the holder the right to make decisions about the control and sale of the asset, communities may receive compensation for producing environmental assets in a range of ways. In Costa Rica, the PES scheme is established by a national law. Landowners sign over emission-reduction rights and receive payments for producing environmental services. However, if the PES program is to be funded by selling emission reductions, there may be a disconnect between what landowners receive and what is received by the national fund (i.e. FONAFIFO) through the sale of emission reductions.

In Acre, Brazil, a public–private partnership company, CDSA, which has the rights to emission reductions produced in Acre, has been established to manage the REDD+ program and engage private-sector investors/buyers. As part of managing the REDD+ program, CDSA provides financial support to implement subprograms with small producers, extractivists and indigenous groups in the state. Private projects can also register with the government in Acre to actually own the emission reductions.

In Malawi, a company was created for a landscape-level REDD+ program that relies on co-management tenure between the Department of Parks and Wildlife and community associations around three protected areas. This REDD+ entity is co-owned by the government and the communities; it owns the emission reductions and uses funds from the sale of these to implement the landscape-level REDD+ program. In Malawi, laws around emission-reduction tenure are in place, so emission-reduction tenure is secured contractually.

So there are many different ways in which benefits can be secured for communities, either through direct ownership of the environmental assets or through some form of payment for producing environmental services, and these systems may even co-exist in the same county.

Lessons for PES schemes seeking to engage private sector investors/buyers. To invest in REDD+, investors need the ability to perform a risk (chance of loss) and return (financial projections) assessment. The scale and design of programs matter, and programs controlled by central governments with multiple facets are harder to assess for risk and return unless investments can be structured like "revenue-based project finance", which isolates components of the program from an operational and financial management perspective. Clear and enforceable land and emission-reduction tenure is an essential aspect of a REDD+ program's institutional



Environmental markets are relatively new and only a limited number of countries have federal, state or provincial laws that define emission reduction tenure. In the absence of such laws, contractual agreements are used to secure emission reduction tenure. *Photo: L. Durschinger*

arrangements. This requires the demarcation of program area boundaries and the resolution of conflicting or overlapping claims. Many buyers of (and investors in) emission reductions are inexperienced in assessing land and emission-reduction tenure and will require clear documentation and education.

Some governments are centralizing emission-reduction tenure through the establishment of new laws. Others are devolving such tenure, and some have provisions in which the government claims ownership of the emission reductions but allows payments to be made to those who produce environmental services. What legal issues do such centralization of emission-reduction tenure raise, particularly in cases where forest tenure has been devolved? Will holders of forest and land-use tenure challenge these laws? Is there a win—win outcome in devolving emission-reduction tenure? Is there value in integrating local PES programs or other environmental credits? Environmental markets, while currently weak, could be an important source of funding in the future. But shallow emission-reduction markets, uncertain prices and uncertainties around the international compliance market mean that many emission-reduction buyers and investors are reluctant to engage in activities that include only emissions as the commercial revenue streams.

A REDD+ case study in Peru

Jaime Nalvarte Armas
Executive Director, AIDER (*Asociacion para la Investigacion Desarrollo Integral*), Puerto Maldonado, Peru

I will describe a REDD+ project underway in a 7749 ha concession in Madre de Dios, Peru, financed by ITTO. The community is highly involved; the project provided training, including in measuring carbon to create a baseline reference. That assessment showed that the concession contains more than 4 million tonnes of carbon.

The project is carrying out activities to avoid unplanned deforestation, and total avoided emissions to 2022 are estimated at 1 million tonnes. We have verified the project through a private company called ANEOR.

What are the benefits for the community? The community owns the carbon credits; it organizes in a general assembly, which has an elected board of directors. The board determines actions for forest conservation, ecotourism, forest harvesting, wood processing, agriculture and environmental education. We have trained people in good forest practices and use; importantly, women and families are strongly involved. An ecotourism company has been formed, and organizational strengthening is underway to assist the community to process and add value to their harvested timber.

Monitoring in 2011–2012 showed that 51.3 hectares were deforested in that period. The predicted avoided deforestation in the absence of intervention was 184.3 hectares, so the actual avoided deforestation in the period was 132 hectares, with a total expected payment of about US$33 600.

Thus, the project has, to date, avoided significant deforestation, which has attracted payments and thereby increased the value the communities place on the standing forest. Better agricultural techniques are being applied on already-cleared areas, too, increasing productivity and reducing the need to clear forest. Other income-generating activities are being pursued that promote the sustainable use of the forest and adding value to harvested products.

In closing, let me say that I agree with many of the things said by Myrna Cunningham. I am a forest engineer, and in forestry school we were taught to become timber producers. As this project has shown, however, our main challenge and best chance of success is to work with the people living in the forest.

Mexico's experience in PES

Francisco Flores Jaquez
CONAFOR, Mexico

CONAFOR (*Comisión Nacional Forestal*) is in charge of a national PES project, and we have accumulated 11 years of experience.

Mexico has 138 million ha of forest cover. The tenure is mostly collective, with a large proportion of forestland owned by *ejidos* and other communities. There are 15 481 communally owned areas covering 62.25 million ha of forests, jungles and savannah, which is 45% of the total forest area. About 11 million people live in these forests, most of whom are indigenous.

In the 1990s the government issued legal documents for these lands, so they are well defined in the law. The general assembly is the highest body in the communities; it decides what the forest will be used for.

The table shows the ecosystems eligible for PES payments—different ecosystem types, and deforestation pressures, attract different payments. There are six categories; the higher the risk of deforestation, the higher the annual payment per ha. The total eligible area exceeds 35 million ha, but resources are assigned to only 500 000 hectares, so there is considerable demand and limited supply.

Resource-sharing mechanisms. *Ejidos* and other landowners can request to participate in the scheme. They

Payment amounts under Mexican PES schemes, by ecosystem type

Payment type	Ecosystem type	Level of economic pressure for deforestation	Payment (pesos/ha)	Area (ha)
1	Mesophyll forest	Very high, high, medium	1100	3240
2	Cloud forest	Low and very low	700	983 703
3	Coniferous forest, deciduous forest, oak forest (oak-pine, pine-oak)	Very high, high, medium, low and very low	382	14 967 130
4	High evergreen forests, hydrophilic vegetation (mangrove)	Very high, high, medium, low and very low	550	4 902 225
5	Deciduous forest and espinosa forest	Very high, high	382	1 238 427
	Hydrophilic vegetation	Very high, high, medium, low and very low		
6	Deciduous forest and espinosa forest	Medium, low and very low	280	13 035 292
	Arid and semiarid zones;	Very high, high, medium, low and very low		
	natural grasslands			
Total area in PES-eligible zone				**35 130 017**

In developing PES schemes in Africa, it is important to understand the internal dynamics of communities: How do they manage conflicts? What is the place and role of women? *Photo: DGFRN, Benin*

must meet certain organizational and legal criteria to qualify, and they must be in an eligible zone. Ultimately, a national technical committee decides on the allocation of resources. There are more than 5000 requests per year, of which only 500 are approved.

The federal government provides 90% of the funds for the PES scheme, which are distributed transparently to communities and audited.

What do communities do with the resources? Of the 1 billion pesos paid to date (over US$75 million at current exchange rate), about 50% has been paid as wages for workers in communities to carry out activities decided by their general assemblies, such as forest management and restoration, creating firebreaks and undertaking forest fire prevention campaigns. About 20% of the funds have been spent to develop infrastructure in the *ejidos*, such as schools, roads and churches. The general assemblies keep their members informed on how the funds are being spent.

If a community applies successfully to participate in the PES scheme, they receive annual payments for five years, pending verification of compliance by CONAFOR. Of every 100 successful applicants, only two will not go the entire five years. So it is almost assured that the forests will be conserved for five years. If the money is not spent, it goes back to general revenue.

Lessons learned. The demand for payments from suppliers is higher than the resources available. That's why at CONAFOR we are encouraging these communities to seek other markets when their five-year participation in the scheme comes to an end. In several cases, *ejidos* are working with municipalities and NGOs to look for alternative markets. In the long run, our PES challenge is to create productive activities for the communities. PES is temporary and involves only small amounts of money. So we work with the communities on the sustainable production of wood and other products, and further processing, so that at the end of the five years they have something for the future. In the next tranche of funds we are asking communities and towns to invest at least 50% of the funds in developing productive activities. Finally, let me say that this project is one of the most important in Mexico, and both major political sides see it as a flagship.

PES schemes in diverse communities

Cécile Ndjebetat

Director, African Women's Network for Community Management of Forests

The African Women's Network for Community Management of Forests (REFACOF) was created in May 2009 in Yaoundé, Cameroon, at the International Conference on Tenure organized by the Cameroon Ministry of Forests and Wildlife (MINFOF), ITTO, the Rights and Resources Initiative and other partners. It has since grown to represent women in forest communities in 16 Central and West African countries, plus Madagascar.

We have heard from others that it is crucially important that communities participate in PES. The challenge is how to make it possible. I propose two phases: the first phase would be preparatory, prior to the PES intervention. It is very important to be aware that local communities are not homogenous; there are many differences. We must start with baseline studies and gender analysis. Secure land tenure is essential for any intervention. In Africa, we have community forestry schemes that can be good starting points because they are legally recognized, and involved communities have already benefited from

considerable capacity building. They know the processes, such as REDD+, and they are usually well organized. They have experience in participation, they have a good understanding of SFM, and they know how to take care of their interests. It's important to understand the internal dynamics of communities: How do they manage conflicts? What is the place and role of women? What are the power dynamics? How can it be ensured that women are included? How do people communicate? What tools do they use? What information do people have access to?

In Phase 2, we propose to promote community-based approaches involving local communities—women, men, youth, and other groups—at all levels and in all activities, including planning and implementation. Seeking agreement and consensus at every stage is very important, as is community support, commitment, engagement and ownership—if they don't have ownership of the process, they will not support it. People also want to know the benefits they will receive.

The effective involvement of local communities in PES schemes is possible as long as there is adequate resource mobilization and long-term investment; mechanisms for dealing with conflict; and effective benefit-sharing mechanisms that cater for all interests. An essential and challenging aspect is getting communities to believe in PES schemes; for this, they will need to see real benefits, not just talk of them. PES schemes should not be passive compensation schemes; they should pursue an entrepreneurship model that encourages the active involvement of communities. For this they will need information, education and sensitization; it can take years but is extremely important. Finally, in any PES scheme, please make sure women are on board. Otherwise, there is a 100% chance of failure.

Making conservation pay in Zambia

Dale Lewis
Director, COMACO, Mfuwe, Zambia

If we have weak statutory and regulatory systems, private-sector activities that are not accountable for their ecological footprint, and farmers in rural landscapes who are not well equipped with skills to live sustainably with their natural resources, we will end up with degraded landscapes.

The Luangwa Valley in Zambia spans 30 000 square miles. It is rich in wildlife but also greatly affected by rural poverty. Tens of thousands of people living there struggle to live on incomes of less than 100 dollars per year. What can we do about it? There is no single solution, but one strategy is to use markets that offer income-earning opportunities in exchange for doing a better job in solving conservation challenges. That's what we embarked on. We started a company, COMACO, and we have made some progress.

COMACO is a food-processing company that focuses on small-scale farmers who lack sufficient skills to have liveable incomes and secure food sources. Our staff work with farmers and teaches them improved ways of producing crop surpluses, and the company buys their surplus and manufactures it into a variety of food products under the brand "It's Wild!", for which we ask consumers to pay a good price. This price premium is returned to the farmers for adhering to conservation guidelines. They sign a conservation pledge, and we monitor their compliance with this pledge as the basis of eligibility for this premium price. If they are compliant, they get 10–15% above the commodity price. The COMACO business of selling It's Wild! products sustains this premium price and must ultimately sustain the overall operation of its farmer-support services. We are still reliant on donor support to carry out these services, but the goal is to be sustainable by 2018.

What do we ask farmers to do? Because farmers generally don't own the land, if the soil becomes degraded they typically move on and clear more land. We want farmers to stay in one place to reduce the rate of land-clearing and deforestation, and to do this COMACO wants them to use conservation agriculture with minimal tillage, organic fertilizers and fire breaks, plus agroforestry. On average, COMACO has more than doubled food production from these practices and, as a result, farmers have much greater food security and more diversity of crops and sources of income (e.g. honey).

The real challenge is scaling up these successes across an entire ecosystem. It's a process that involves three key players—our extension staff, who work to improve skills and organize famers into groups. It's a partnership: on market day, when you put the cash in the hands of farmers, they start to believe. Over time, leaders emerge and form cooperatives, and we work with them. The third key player is local government—they provide supervision and an audit of compliance with farming practices and resource use laws.

To help roll this out over an entire landscape, we also use a radio program that reaches over 800 000 people; for many, it touches their hearts. We have transformed over 1200 poachers who have put down their guns and started conservation farming.

This is not a five-year project—it takes a lot of time to get a business like this off the ground. We started with individual households and worked our way up, and we are developing new markets, such as carbon, to better sustain both incentives for conservation and our farmer-support services. Five years ago we would never have been able to convince traditional leaders to put aside areas for conservation. Now they have put more than 320 hectares aside, with a full commitment to protecting these habitat vestiges. It's a start.

Comments from the floor

- About two years ago we did a study here in Costa Rica in which we evaluated FONAFIFO payments in indigenous territories. We found that one of the main benefits, in addition to economic benefits, was the support provided for governance issues through PES payments. For example, some communities were able to use lawyers to help them deal with land-tenure conflicts and land purchases.
- In Viet Nam we have been implementing our PES scheme for the last four years in two provinces on the basis of a policy made by government. Without regulation, the PES scheme would not work in our country. We regulate five users of environmental services: hydroelectricity, water supply, industrial production, ecotourism and aquaculture. The revenue earned is around US$50 million per year, the majority (85%) of which is paid to poor people. In the highlands, for example, each household receives US$400–500 per year, which is high compared with other sources of income. More than 10 000 households receive money from this mechanism, so it is very helpful in these two provinces. But we think that without a clear mechanism created by government, the scheme wouldn't work.
- What I have seen in Nigeria is that when REDD+ came into the community it brought a ban on timber concessions and the clearing of forest for agriculture, and this has had a big impact on the community and affects their livelihoods. Many international instruments say that the rights of indigenous peoples should be respected, but in Nigeria in the last four years REDD+ has not generated any funds for local communities. Most of the schemes, which are bilateral, incorporate safeguards, but these are not being implemented. I want the Forum to look at the implementation of these international instruments and safeguards.
- It's true that millions of dollars have poured into REDD+ readiness, and there has not been a connection between that money and what is being received in the communities. We need to create connections between the top down and bottom up. If communities are to benefit, the "top down" and "bottom up" need to mesh together.
- In Europe, the motivation of people is very important for the success of PES schemes and it is not always financial. It can be symbolic, such as social acknowledgement of the role being played by forest owners in benefiting society. It might be useful to study this further.

Forum participants continue their dialogue on a (rain-affected) field trip in a Costa Rican forest. *Photo: ITTO*

- I am convinced that PES schemes are just complementary to other productive activities; we cannot bet only on them. In Nicaragua, 66% of the forests belong to indigenous peoples or peoples of African descent. PES is an acknowledgement that these communities are benefiting wider society, but creating a dependency on PES would be a mistake. We need to focus on getting communities to do productive activities in their forests.
- We should stop preaching to the choir. We need much more intersectoral interaction to ensure longer-term payments from the beneficiaries of environmental services. Another challenge is indicators—how do we measure the delivery of services?
- Of course we want to encourage other productive activities, but why isn't an environmental service just another commodity? If it makes sense financially, why can't it be the only commodity produced? The key is to provide long-term prices for the services.
- Indigenous people say we are not poor, but we are impoverished by the market development model that has marginalized us. We are the owners of the forest and we want to be considered as owners. Incorporating this ownership in PES schemes will improve equity.

Session 4: Establishing robust governance and institutional arrangements

Successful PES schemes are underpinned by transparent institutions that allow all stakeholders to have their say

Institutional arrangements for PES: lessons and challenges

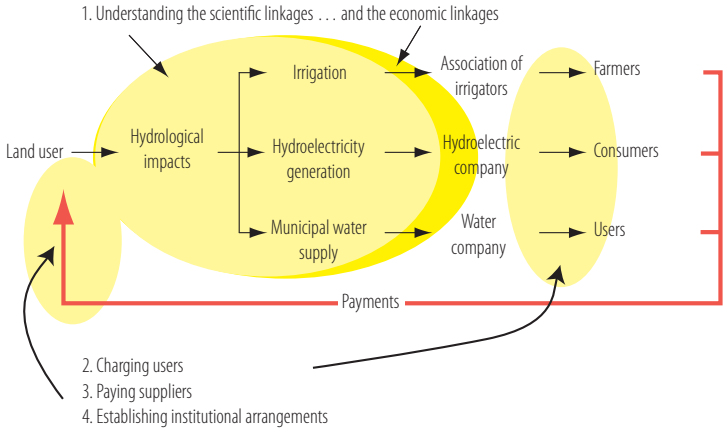
Stefano Pagiola
Environment Department
The World Bank, Washington DC, USA

The issue of institutional arrangements is very important but often doesn't receive the attention it deserves. I will speak about lessons and challenges. I want to begin by defining what I understand as PES. It is a mechanism to improve production for environmental services in which:

- users pay for those services;
- providers are compensated for delivering those services;
- payments are conditional on the provision of the services; and
- payments are voluntary.

There are two types of scheme: those in which the users pay for services, and those in which a third party (usually the government) pays. This affects institutional aspects. Figure 4 shows, schematically, the logic and design of a typical PES scheme.

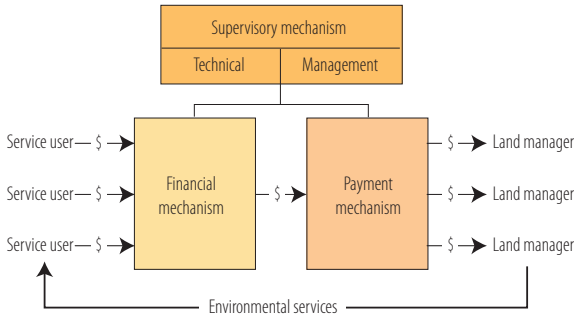
Figure 4: PES—from theory to practice



What is needed for the implementation of a PES scheme? Let's take an example of where a land use affects hydrological flows, which in turn affects users such as hydroelectric power schemes and agricultural irrigators. What we want is a mechanism so that land managers take into account their impacts on the downstream users of the environmental service, which in this case is the provision of good-quality water. So we need a system to charge the users of the service and then to pay that fee to land managers for their good management, which enables the provision of the service.

Such systems have three institutional components: a financial mechanism, a payment mechanism, and an overseeing mechanism (Figure 5). The financial mechanism collects payments and manages the funds, so we need business managers, accountants, information technology specialists, and so on. The payment mechanism is logistically the most difficult, and the fieldwork is the most difficult and costly component of it. It requires outreach agents—people who go into the field and explain the process to those land managers who wish to participate in the scheme. They develop contracts with farmers, provide support and monitor implementation. The overseeing or supervision mechanism requires, among other things, technical specialists such as hydrologists, economists and ecologists to provide technical assistance, identify environmental services and those land uses that are eligible for payments, and monitor the impacts of management activities on environmental services. The supervisory mechanism also has a management component that carries out negotiations with the various parties and resolves issues.

Figure 5: Components of a PES scheme



Various organizational arrangements have been used in PES schemes that are financed by the users of environmental services. An example of direct implementation is *Programa Procuencas*, in which water users pay a tariff to finance the program, which is administered by the municipal government. An advantage of this approach is that it is well adapted to local needs, but it requires that the local administration has sufficient capacity, and it works best in small or medium-scale programs.

A second approach is to subcontract an organization to implement the program. This is the case with the Water and Forest Producers (*Produtores de Água e Floresta*) program in Guandu, Rio de Janeiro, Brazil. In this scheme, all the field functions are performed by an NGO called ITPA, which has sufficient capacity as well as contact with the people. This approach is also well adapted to local needs, and it takes advantage of NGOs with appropriate technical and social networking capacity, where they exist.

A third approach is to establish a dedicated independent organization. An example of this approach is the Fund for the Protection of Water (*Fondo para la Protección del Agua*—FONAG) in Ecuador, which has been established to fund the management and conservation costs of watershed management to meet the water-supply needs of Quito.

This approach is well adapted to local needs, and its main advantage is that it isolates the scheme's finance from wider policy decisions.

A fourth approach is at the national scale, where local providers of environmental services enter into agreements with a national program, such as the PES scheme set up by the Government of Mexico. This sort of approach is cheap and easy (from an institutional point of view), but it has limited capacity to adapt to local conditions and therefore it may not always be what local people want.

Lessons and challenges. Don't underestimate the challenges of implementation—how to do the fieldwork and who will do it? This aspect is often underestimated. Learn from other experiences, but don't copy—every situation has unique characteristics. Adapt organizational arrangements to suit local conditions, and ensure they are flexible so they can be adapted as situations change.

A 10-year-old plantation of klinki pine (*Araucaria husteinii*) at Finca Orosi, Santa Cecilia de la Cruz, Guanacaste, Costa Rica. The next generation of PES schemes must be part of broader forestry business models. *Photo: G. Navarro*

PES schemes must be part of a broader business model

Guillermo A. Navarro

IUCN Regional Office for Mexico, Central America and the Caribbean, San José, Costa Rica

In Costa Rica, forest owners gave up certain rights on what they could do with their forests, and in exchange society agreed to compensate them on the basis of the opportunity costs they would incur. The first amount calculated for the PES scheme was based on the calculation of the opportunity cost of cattle ranching, but this amount has evolved through the political negotiations of interest groups.

The PES scheme is a fiscal mechanism; everyone pays, and if you don't pay you are punished. The main sources of funding for the scheme are a fuel tax and a water tax that are not voluntary. There are still many free-riders, such as the ecotourism and bio-prospecting industries, which are not contributing through a fiscal mechanism to the PES scheme.

If you consume, you have to pay. The PES scheme is not based on a market mechanism, in which the amount paid (the price) is the product of supply and demand. The PES scheme, as a fiscal mechanism, uses the majority rule for allocating resources. FONAFIFO has a board of directors, which decides, by majority rule, where and how payments are made, and who gets them. The mechanism has been successful in recovering the forest, and there have been efforts for the equitable distribution of funds towards poorer areas of the country, as well as to women and indigenous communities. There are some institutional challenges, however—almost 90% of the funds are paid for protection, and most of this money is used as consumption money; it generates very few co-benefits in forestry and is not part of a larger business model that would help develop the forest sector.

In Costa Rica, the National Comptroller General has instructed FONAFIFO that the PES amount should be calculated based on the opportunity cost of the land rent; that is, the difference between the net rent for the forest land use and for the most likely competing land use. So payments are high for conservation (where there is no other cash flow). The difference in the values of these two land rents is the marginal cost that would compensate the landowner in exchange for producing the additional environmental services produced by the forestland use.

Moreover, this opportunity cost will vary depending on where the forest is located in the landscape. Land rents are determined in part by the cost of accessing markets, and these costs increase as we move away from the market; this is the von Thünen principle. Payments for forest environmental services will be higher close to populated areas because forests will have higher opportunity costs there due to the greater intensity of land use, which uses more capital and labour. On the other hand, PES for forests will be lower further away from populated areas, where the opportunity costs are lower and land uses have increasingly marginal land rents.

If we have to compensate the forest against banana or pineapple plantations close to the market, we have to pay around US$400 per hectare per year. But if you move 15 km from the market, the only opportunity cost of forest as a land use is that which is incurred by the displacement of cattle ranching (because pineapple plantations and other intensive cultivation are not profitable at that distance from the markets for inputs and products). The opportunity cost is low, so the compensation can be lower. At a distance of 30 km there is no opportunity cost. This approach will help FONAFIFO to optimize the use of fiscal funds and to orient and prioritize the efforts of conservation based on the real

risks of land-use conversion due to higher opportunity costs and the value of environmental costs.

On its own, however, PES is not enough to conserve forest and maintain human well-being. The next generation of PES schemes must be part of a forestry business model. To bring PES into a sustainable business model, it must be part of a coherent forest development policy package, which involves:

- improving the business climate by reducing transaction costs and technological and political risk, as well as providing investment security;
- simplifying regulations so they protect the public interest but otherwise allow the market to determine outcomes;
- developing sound technological packages that integrate the forest, industrial development and markets;
- paying for environmental services on the basis of performance;
- promoting entrepreneurship and competition along the value chain; and
- ensuring there is adequate environmental education so the public knows the importance of consuming forest goods and paying for forest environmental services.

If the business model is sound, the value of the land goes up, transaction costs go down, forestry as a land use becomes more viable, and PES schemes are more likely to be effective.

Even supposing you can design a good PES scheme embedded in a sound forest business model, we still have the challenge that it could be ineffective in the context of a landscape in which there are high agricultural subsidies—many times higher than the funds offered by the PES scheme. This is the case in Mexico, where, according to Mexico's Secretariat of Finance and Public Credit, more than 200 subsidies are directed at rural development; of those, 90 are programs involving direct payments to farmers, but only 22 are directed to natural resources, and they have a financial weight of only 1.71% of the total subsidies for rural development. Thus, there is a need to align food security and social subsidies with PES. Subsidy schemes should be revised so they do not encourage agriculture in marginal areas at the expense of forest. Moreover, on the international stage, other policy instruments that are not PES are being developed to counter the role of commodity consumption in European countries as direct causes of deforestation in the form of sustainability criteria, forest footprint labelling, and increases in import tariffs. These new kinds of policy options can help revise and reduce agricultural subsidies and make PES schemes more effective.

Building PES institutions at the municipal level in Guatemala

Mario Martin Velasquez Villatoro
Instituto Nacional de Bosques, Guatemala City,Guatemala

Guatemala's National Forest Institute (*Instituto Nacional de Bosques*—INAB) is a public-sector entity in charge of forest policies outside protected areas. We provide technical assistance to those people who make use of the forest. The Forest Incentive Program (*Programa de Incentivos Forestales*) was created about 15 years ago to provide economic incentives, in the form of cash payments, to forest owners or managers for good forest management, reforestation and forest protection.

In 2010 we started to direct part of the funds from the Forest Incentive Program to the creation of institutional arrangements for PES schemes at the municipal level. This was good in theory, but in practice it has been complicated. We brought together all the main stakeholder groups: INAB, communities, municipalities (which sometimes are forest owners), international cooperation agencies (whose financing has been important), and the private sector, which are often the ones making use of the resource and who are also among the major beneficiaries of forest environmental services. We have tried to bring all these groups together to set up a PES scheme.

A key aspect has been transparency. All stakeholders must be aware of who is contributing funds (and other resources, such as labour), and how much is being contributed and how it is being invested. To achieve transparency, local boards have been created, involving the various stakeholders.

Lessons. The government's Forest Incentive Program has been a driver of the municipal PES schemes. Without it, the PES schemes would not have got off the ground, so we continue to maintain those incentives. We have to involve all the stakeholders who have an interest in PES—leave someone out, and the scheme will not move forward. Some beneficiaries cannot provide cash but can supply labour (e.g. for firefighting or reforestation); it is important to take this into consideration.

Challenges. One of the biggest longer-term challenges is establishing institutional arrangements at the municipal level that are not susceptible to political changes. How can we ensure that decisions are not reversed when the government changes?

Yokohama's 100-year-old PES scheme

Hironori Nukui
Water Resource Forest Management Office, City of Yokohama, Japan

In the early twentieth century, the City of Yokohama relied fully on water from the Doshi River, but the upstream forest commons were becoming degraded due to harvesting for fuelwood. To secure water for its citizens, the City purchased 2780 hectares of upland forests in 1916, at a cost of 5.24% of its budget. The Water Resource Forest Management Office was established in 1917 and forest restoration work started in 1919. The forests were designated as protection forests under the Forest Act.

The City now owns one-third of the Doshi catchment (2873 ha). The objective of our forest management is to sustain the quality and quantity of water from the river and thereby to secure drinking water for the citizens of the city. As you are fully aware, planted forests require continuous care. We are carrying out thinning in our planted forests. Thinning increases

Employees of the City of Yokohama carry out careful thinning operations in the Doshi catchment. Thinning increases light in the forest, induces natural regeneration and improves soils; as a consequence, it enhances the capacity of the forest to conserve water. *Photo: H. Nukui*

light in the forest, induces natural regeneration and improves soils; as a consequence, it enhances the capacity of the forest to conserve water.

The total expenditure of the City was US$2.5 million in 2012 (about US$0.68 per resident), all of which was generated by a water levy paid by water users. This levy ensures sustainable and predictable funding from the beneficiaries. It funds the management of the publicly owned forests in the catchment, and also supports private forest owners in the catchment to improve their management. To support such activities, the City has established a fund comprising donations from citizens. The overall result today is a highly functional forest that has supplied the City of Yokohama with high-quality drinking water for nearly 100 years.

The elements of a successful PES schemes include:

- a legal and institutional framework to ensure sustainable and predictable funding from beneficiaries;
- institutional and technical capacity to implement proper forest management;
- benefit sharing with local communities to support their livelihoods and ensure their contribution to forest management; and
- the promotion of awareness-raising among beneficiaries about the environmental services provided by forests.

The stable governance table

Carmenza Robledo

EcoExistence, Zürich, Switzerland

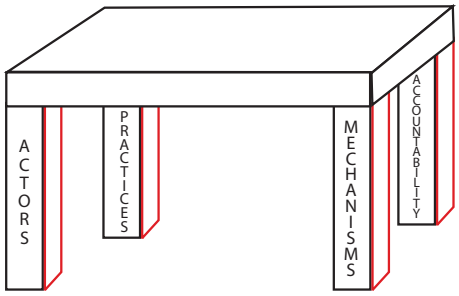
Yesterday afternoon we were asked about success factors for PES: I believe that the answer is governance. The success or failure of any PES scheme rests with governance. Let me explain what I understand as governance. The United Nations Development Programme defines it as:

> … a neutral concept comprising the complex **mechanisms, processes, relationships and institutions** through which citizens and groups articulate their interests, exercise their rights and obligations and mediate their differences … It includes **the state** (at its different levels), the **private sector and the civil society** [author's emphasis]

PES schemes take place within existing governance settings. These governance settings can be at multiple levels—global (e.g. the afforestation/reforestation projects in the Clean Development Mechanism are regulated by agreements under the United Nations Framework Convention on Climate Change and the United Nations Convention on Biological Diversity), national (e.g. Costa Rica's PES scheme), and subnational and local (e.g. PES schemes in Colombia and Viet Nam).

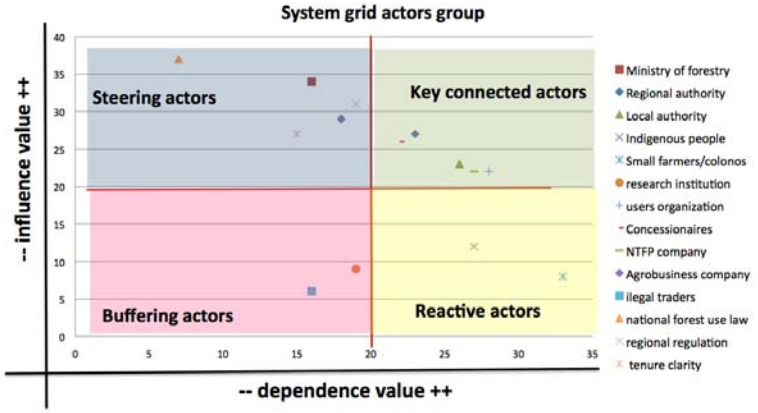
What do we need for good PES governance? I propose an analytical framework "governance table" with four "legs"—actors, practices, mechanisms and accountability (Figure 6). These "legs" constitute the main elements to be clarified for securing good PES governance.

Figure 6: The governance table



The first elements are the actors. Who are the actors, or stakeholders? What is the role of each? At this meeting we have talked about civil society and indigenous communities as providers of environmental services, and to a lesser extent we have also discussed the role of the state. All sectors of society can be important for ensuring good governance of a given PES system. Thus, it is necessary to characterize the roles of different actors. Figure 7 shows an example of the characterization of a social system; it was done in a participatory manner and using actor impact analysis (as defined in the REDD-FORECA [*Forêts Engagées comme Réservoirs de Carbone*–"Committed Forests as Carbon Stocks"] toolkit). Other methodologies for social characterization are available in ITTO partner countries.

Figure 7: Example of a characterization of PES actors



The second element or "leg" of the governance table is forestry practice. What will happen in the forest (e.g. protection, or reduced-impact logging)? What environmental services do these practices provide or secure? What are the management objectives and practices? What are the costs over time? What investment is needed now, versus what will be required in five or ten years? What are the responsibilities and liabilities of each actor over time? Can management accommodate wood and non-wood forest products, as well as environmental services? The forest management plan needs to set out who will do what, and when.

The third "leg" of good governance comprises the mechanisms. The first aspect that needs to be clarified when designing the mechanisms for a PES scheme is the *ownership* of the environmental service. In real life, such ownership is not always clarified to the extent needed for a buyer/payer. For example, we worked in Uganda with women who are planting trees. The Ugandan Constitution says there should be a balance between men and women, but women are traditionally not allowed to own forest property. Women were planting trees, and I talked to them and their husbands about who owned the trees, and they didn't know; however, when they started producing income, the ownership transferred to the men. There is a lack of clear documentation about the ownership of the environmental services provided by these trees. In the San Nicolas project in Colombia, although property rights were clear in over 90% of the parcels, only a few parcels were properly registered. In this case, although property was clarified, the proof required by the (international) service buyer was not available. How does a company purchase an environmental service if it doesn't know who the owner is? Companies need to be sure.

Besides clarifying ownership of the environmental service(s), a PES scheme needs to set clear rules for the making of payments or compensation. What exactly will be paid for, and with what (such as US dollars for an amount of biodiversity secured, or training for X hectares conserved)? What is the means (money, or compensation in-kind)? What are the payment modalities (ex-ante or ex-post)? How will the mechanism for sharing benefits work? Finally, what is the mechanism for deciding on failure? Who is liable for what, and under which conditions?

The fourth "leg" of the good governance table for a PES system is accountability. This refers to how and when to account for environmental services in order to monitor progress. Specifically, I refer here to accounting methods and practices that enable a transparent, understandable and feasible monitoring system. The first thing to clarify is the unit in which the environmental services included in the PES system will be counted. The conservation of biological diversity, water quality and greenhouse gas emissions are measured using different units. Once the unit is clear, what needs to be measured, when, how and by whom, must be clarified.

Campesinos meet to learn about and discuss a PES scheme in the San Nicolas catchment, Colombia. Identifying the stakeholders, and their roles, is essential for the good governance of PES schemes. *Photo: C. Robledo*

To summarize, good governance is essential for securing the success of a PES scheme. A clear design is needed to promote the good governance involving the four legs of the governance table: actors, practices, mechanisms and accountability.

Providing incentives for environmental services in Acre

Monica Julissa de los Rios de Leal
Institute for Climate Change, Rio Branco, Brazil

Our challenge in Acre is to conserve the state's 87% forest cover while also alleviating poverty. We are still one of the poorest states in Brazil, so talking about conservation sometimes seems contradictory.

The State of Acre has an integrated vision of its landscape, and it has worked hard to develop a robust approach to PES. The vision is of a constant improvement in quality of life for the state's 800 000 people while continuing to provide forest environmental services.

The state's first experiment in PES was the Chico Mendes law, which created subsidies for rubber production in natural forests. A range of public policies was designed to solve problems that might lead to deforestation, with three main axes. The first is territorial—that is, resolving land ownership. The second is monitoring and control; and the third is the creation of a forest-based economy. The policies and laws adopted by the state in the last two decades enabled an in-depth dialogue with local stakeholders and society on payments for greenhouse gas emission reductions and to reach an understanding that government needed a state policy that promoted environmental services without direct payments. In this way we created State Law 2.308/2010 (State System of Incentives for Environmental Services—SISA), which establishes principles, policies, institutions and instruments for the provision of environmental services through incentives rather than payments. Payments are vulnerable—they might stop at any time, and, once they stop, the forest users may also stop maintaining the environmental services. SISA is also designed to promote public–private initiatives to achieve the state's goals with respect to environmental services.

In establishing SISA we have explored many of the governance aspects mentioned by Carmenza. SISA articulates the concept of environmental-

service providers, which goes to the ownership of carbon. It also introduces the concept of beneficiaries, establishes principles for deciding on programs for environmental services, and allows for the creation of economic mechanisms that could be used to implement the system. SISA sets out the role of government and civil society in regulating and monitoring policies on environmental services and climate change through the State Commission for Validation and Monitoring. There is also an indigenous working group to ensure that the needs and concerns of indigenous peoples are taken into account. This all sounds nice, but it is very complex.

Acre is pursuing an integrated jurisdictional program in which we are striving to change the development model to one that simultaneously delivers economic growth, human development and conservation. We want to value the forest by consolidating the forest-based economy and a culture of living with the forest. Policies to promote environmental services need a long-term perspective—it takes time to bring about such a change, and SISA includes arrangements designed to promote long-term incentives rather than a payments-based approach, which may not be sustainable in the long term. While the incentives are not monetary, they provide benefits in the form of support and subsidies to encourage actors to change their production practices to more sustainable systems. The technical, institutional and legal frameworks of PES schemes or incentives programs need to address these challenges. SISA was possible because the governance tools and legal framework for environmental and land management had been established in the previous decade or so.

Comments from the floor

- Responding to Carmenza's Ugandan example, I would say you can't force cultural change down people's throats. We need mechanisms that enable men to understand why women need a space in which to operate. There are successful examples where you recruit the household—you don't have to decide who to pay because you pay on the basis of a household plan. When implementing PES, we should not view traditional norms as entirely negative and we should make the process as inclusive as possible.
- Stefano defined PES as something voluntary. There are some considerable costs involved in monitoring, and PES can be very expensive, so it cannot remain at a voluntary level. I imagine it the other way round, where states compel large users to pay environmental service providers.
- **Stefano's response:** the ideal PES situation is always for it to be voluntary. What we want is as close as possible to a normal transaction, such as when a farmer sells a kilogram of corn. Voluntary schemes have certain desirable qualities, such as an incentive to look for the best price, and to make sure you receive what you pay for. In mandatory schemes, however, the incentives structure deteriorates. There are cases where a mandatory element may be needed, but we have to manage it carefully.
- When talking about environmental services and their sustainability, I see it as a balance. We have someone who provides and someone who pays. If one is missing, it becomes unsustainable. I have visited many PES projects involving payments for water, but many downstream users are not included in the scheme. I want to include those downstream users.

A rubber-tapper in Acre, Brazil. The state's first experiment in PES was the Chico Mendes law, which created subsidies for rubber production in natural forests. *Photo: R. Guevara/ITTO*

- We have heard much about carbon. Yet there is reasonable evidence that rainfall in many areas in Latin America depends on recycling of water from the Amazon—do we expect payments from Argentina to pay for the environmental services provided by the Amazon? We are starting to understand such continental-scale environmental services, but we don't have the governance mechanisms to discuss this at a continental scale.
- I have never seen a PES scheme that works among countries in a region because the regulatory agency doesn't exist to monitor the scheme. The examples we have seen at this conference reinforce the long period between the idea and its implementation—often a decade or more.
- Donors typically provide money for 3–5 years and want results very fast. One of the schizophrenic things is that we don't take into account the time needed to create the governance structure we need to implement schemes so they are effective and are able to deliver the results the donors want.
- Forest degradation (and restoration) should be accounted for on government balance sheets, just like built assets are depreciated. But it's not a magic bullet for protecting environmental assets—having a value on paper does not necessarily stimulate action. The mechanisms we are talking about here are more likely to stimulate action on the ground than accounting.

Key messages, summary and recommendations

Key messages

1. Forests provide critical environmental services. Tropical forests, in particular, are giant carbon dioxide "vacuum cleaners" and manufacturers of renewable biomass, and they also protect vital water catchments, harbour a large part of terrestrial biodiversity and help regulate regional climates.

2. Many users of tropical forest environmental services pay little or nothing for them. The absence of adequate payments for environmental services increases the vulnerability of many tropical forests to degradation and conversion to more profitable land uses.

3. There are now many successful examples of schemes to compensate tropical forest owners and managers for environmental services. Some of these PES schemes are national, but most are still at a relatively small scale.

4. By providing forest owners and managers with income and increasing the economic competitiveness of SFM, PES schemes can help alleviate rural poverty, reduce tropical deforestation, stimulate the rehabilitation of degraded forestlands, and increase the adoption of SFM.

5. Overall, however, PES schemes are not having the desired impacts in the vast majority of tropical forests that are vulnerable to deforestation and degradation, and they are benefiting only a few of the many millions of forest peoples and other owners and managers. Action is needed, therefore, to scale up PES.

6. Currently there are more sellers than buyers of the environmental services provided by tropical forests. There is a need to increase demand, develop formal markets with the engagement of the private sector, and increase the availability of secure, sustainable financing by creating an enabling environment.

7. Indigenous peoples, local communities and private forest owners should be able to participate in schemes to pay for tropical forest environmental services as entrepreneurs rather than simply as passive receivers of compensation. PES schemes should promote gender equality, ensure the participation of all stakeholders and encourage employment creation, especially among young people.

8. To be successful and sustainable, PES schemes should use inclusive processes and sustainable practices, be transparent and accountable, and have robust and transparent institutional frameworks and enabling policies, and their benefits should be accounted for.

9. Forum participants agreed on the need to:

   - Better quantify and value the environmental services provided by tropical forests through scientifically sound studies with the aim of increasing the effectiveness of PES schemes.
   - Work together to raise awareness of the importance of environmental services, the role of tropical forests in providing such services, and the necessity of paying for such services.
   - Create enabling conditions at all levels to increase demand and develop markets for PES.
   - Increase collaboration and exchange on PES experiences, options and support for scaling them up, including through south–south and triangular cooperation and by tapping the convening power of international organizations such as ITTO and FAO.

Summary and recommendations

This international forum explored how payments for the environmental services provided by tropical forests can support forest owners and managers to increase incomes and manage forests sustainably.

Costa Rica hosted the forum because of its ground-breaking experiences in innovative payments for environmental services. The forum was co-organized by ITTO, FAO and FONAFIFO. More than 150 people from 60 countries attended from governments, regional and international development partners, civil-society organizations and the private sector. The following is a summary of the key points raised in presentations, background materials and discussions, and of the recommendations that emerged.

Forest environmental services perform a range of functions, such as protecting stream and river channels and coastal shores from erosion. *Photo: R. Carrillo/ITTO*

The need for payments for tropical forest environmental services

- Tropical forests provide many critical environmental services, especially by protecting water catchments, sequestering carbon and conserving biodiversity.
- However, many people who benefit considerably from tropical forest environmental services—such as urban dwellers, big industry and developed countries—pay little or nothing for them, with the result that tropical forests are often undervalued compared with alternative land uses, leading to forest degradation and deforestation.
- Action is needed, therefore, to increase the financial remuneration for tropical forest environmental services as a means of reducing and reversing forest degradation and deforestation and rewarding forest owners and managers for good forest stewardship. Such remuneration is usually referred to as payments for environmental services (PES).

Tropical forest environmental services maintain biodiversity.
Photo: R. Carrillo/ITTO

- There are many functioning PES schemes in tropical forests. Costa Rica's scheme, for example, arose after catastrophic deforestation reduced forest cover to 21% of the national land area. The introduction of a PES scheme in 1997, in which landholders are paid to retain forest, contributed to an increase in forest to the current 52.4% of the land area.
- An estimated US$1.25 billion was paid for various forest environmental services in 42 developing countries in 2011, most (US$1.11 billion) of which was for watershed protection. The total area covered by these PES projects is estimated at 117 million hectares.[2] Not all these data are for tropical forests, but there are indications that PES schemes are beginning to generate financial flows over significant forest areas in some tropical countries.
- Not all compensation for environmental services is financial. Some environmental service providers may obtain greater benefits from increased tenure security, for example, or from in-kind compensation such as grain to enhance food security. PES also offers opportunities for positive "branding" that might have sufficient value (for a company or a country) to justify long-term investment in PES schemes.

PES for SFM

- PES can help increase the economic competitiveness of SFM by assigning a financial value to previously unmarketed forest benefits. Often there is a considerable gap between the income that can be earned from SFM compared with that obtainable from certain agricultural land uses (such as pineapple-growing, in the case of Costa Rica), known as the opportunity cost. PES can help bridge this gap.
- Properly developed forest management plans can be effective mechanisms for SFM, and their implementation can help ensure the maintenance of tropical forest environmental services. Specifically, there is convincing evidence that timber harvesting in tropical forests applied using SFM principles causes a relatively small loss of carbon compared with deforestation and "conventional" logging, especially when the wood is used for long-term purposes, and that the lost carbon is quickly reabsorbed by the regrowing forest, indicating a sustainable system of carbon storage. There is also strong evidence that the harvesting of timber and non-timber products applied under SFM conserves most forest biodiversity and protects watersheds.
- Timber certification is a way of paying for the services protected or enhanced by good forest management, assuming that such payments can be included in the price of timber. However, the market price of certified timber is rarely significantly higher than the price of uncertified timber, indicating a current low willingness of consumers to pay for forest environmental services through this mechanism or a lack of awareness among consumers of the importance of doing so. The primary benefit provided by certification is access to markets, rather than a price premium. Additional PES mechanisms that focus on environmental services can contribute to the competitiveness of timber from SFM.
- In countries where PES is already an important policy tool for implementing SFM, there is evidence that such schemes are producing significant socioeconomic outcomes. For example, they can provide "bridge financing" to enable communities to pursue other income-generating activities. Local-level PES schemes

2 Source: Payments for environmental services (PES) of tropical forests: a brief review of current approaches. Background paper for the International Forum on Payments for Environmental Services of Tropical Forests, San José, Costa Rica, 7–10 April 2014.

Properly developed forest management plans can be effective mechanisms for SFM, and their implementation can help ensure the maintenance of tropical forest environmental services.
Photo: J. Malleux/ITTO

can be part of broader strategies for climate-change mitigation and adaptation.

- Nevertheless, there is a lack of robust studies on the effectiveness of PES in achieving conservation outcomes, although there is plentiful circumstantial evidence. Globally, the value of PES is dwarfed by, for example, the income generated by timber or agricultural products.
- PES schemes should be sufficiently broad and flexible to encompass the environmental services provided by the full continuum of forests and trees in landscapes. This requires much more intersectoral interaction and cooperation than is evident in most PES schemes to date.
- PES schemes can be particularly effective if they are incorporated within a sustainable development model that integrates ecological, poverty-reduction and economic objectives across sectors and value chains.

Developing innovative financing mechanisms

- In many existing PES schemes, the supply of environmental services far outweighs demand and, in the case of government-funded schemes, the availability of funds. Increasing capacity to assess and value environmental services provided by SFM could help stimulate investment in PES schemes by demonstrating their benefits.
- PES schemes will not succeed if there is no buyer for the environmental services. Even when there is demand, however, PES schemes may fail if there is: a lack of coordination or collective action among environmental service providers; no enabling institutional framework; or cultural or political resistance. PES schemes may also struggle to be effective if compensation is considerably lower than the opportunity cost of foregoing other, more profitable land uses. Financial mechanisms should have clear rules, transparent oversight and political legitimacy.
- PES schemes may be voluntary or compliance-driven. The users of environmental services might choose to invest in PES as a cost-effective way to secure key inputs (voluntary schemes), or regulations might require them to do so (compliance-driven schemes). In the latter, it has been shown that governments can stimulate demand through regulations that "change the rules of the game".
- PES is a mechanism by which companies can achieve corporate social responsibility objectives. There is an opportunity for governments to encourage large corporations to make bigger contributions to PES, if necessary through regulation.
- The key to the success of PES schemes (either voluntary or compliance-driven) is a clear demand for environmental services and the capacity of providers to supply them. Suitable financial mechanisms are most likely to emerge when these conditions exist.
- Most PES markets are currently weak, and the prices for environmental services (for example, in markets for greenhouse gas emission reductions) are uncertain, diminishing the interest of investors in PES schemes. Moreover, subsidies for agriculture and other land uses continue to devalue forests as a land use. Efforts are needed to stabilize, strengthen and diversify financing mechanisms for PES, account for the benefits provided by PES schemes, and create an enabling environment for PES investment.
- The private sector is likely to be interested in PES schemes when the benefits are clear, the risks can be estimated with reasonable certainty, monitoring and compliance are tracked, and schemes are economically efficient. Intermediary organizations can facilitate private-sector involvement by providing flexible investment options and increasing confidence in PES outcomes.
- The most critical and difficult issue in scaling up PES initiatives is a lack of functioning markets, the underlying cause of which is a lack of awareness among users of the need to pay for their use of environmental services, or, if such awareness exists, a lack of a willingness to pay. Converting "free riders"—users of environmental services who do not pay and cannot be excluded from use—into buyers is arguably the single biggest challenge of PES schemes. Effective communication about PES benefits could help increase the interest of potential buyers.
- PES schemes are increasingly marketing services either in merged "bundles" or on an individual service basis with the aims of increasing revenues and reducing or optimizing transaction costs. Most existing examples of such arrangements are in Latin America, where PES markets are generally more mature, but there is growing interest in stacking and bundling PES in, for example, Kenya, Indonesia, the United Republic of Tanzania and Viet Nam.

Ensuring benefits for local communities

- A joint effort through PES schemes can help build trust between indigenous peoples and local communities, government and the private sector and ensure the application of human rights principles in forests. PES schemes are also a way of acknowledging the valuable role of indigenous peoples and local communities in ensuring forest health.

Indigenous peoples, local communities and other forest owners should be active participants in PES schemes as resource owners, rights holders and entrepreneurs rather than as passive receivers of compensation. *Photo: N. Kingman*

- Nevertheless, there is a risk that poorly conceived or implemented PES schemes, especially top-down schemes, can violate the rights of indigenous peoples and local communities. Safeguards such as the right to free, prior and informed consent should be built into all PES schemes and honoured.
- Secure tenure—of land, forests and environmental services—is a precondition for successful PES. Who owns the environmental services of a particular forest or landscape may be determined by legislation or contractual arrangements, or it may be implied, but clarity is needed if financial mechanisms are to function successfully. Overlaps between statutory and traditional tenure must be resolved transparently and fairly.
- Indigenous peoples, local communities and other forest owners should be active participants in PES schemes as resource owners, rights holders and entrepreneurs rather than as passive receivers of compensation. Both women and men play strong roles in resource management, and PES schemes should promote gender equality, including in property rights.
- Considerable effort is required to build capacity in tropical forest communities to implement PES schemes. Given that they are often dispersed and small-scale, such communities may need support from institutions, NGOs or other actors to form cooperatives and other mechanisms to market their environmental services more effectively.
- Another challenge for PES schemes is to ensure effective coordination between policy measures taken at the national or international level with the efforts of local entrepreneurs to market the environmental services provided by their forests. Top-down approaches must be complemented by bottom-up approaches, and methods are needed to mesh the two approaches.

Establishing robust governance and institutional arrangements

- At all levels, good governance in PES schemes requires knowledge of the stakeholders involved, the forest practices required, the appropriate institutional mechanisms, and accountability.
- To develop an effective legal and institutional framework for a PES scheme, understanding is needed of the impacts of forest users on the provision of the environmental service(s) and the characteristics of the service providers, such as whether there are many small-scale or a few large-scale providers.
- Flexibility is critical in the development of PES schemes. Each stakeholder and owner is different, and a variety of payment mechanisms and means should be offered to accommodate such differences. The best way to determine the most effective approaches is to work closely with stakeholders through, for example, multi-stakeholder forums. Capacity building and funding may be required to ensure effective participation in such forums by marginalized people and groups.
- More research is needed on the effectiveness of different institutional arrangements and their costs. In general, however, the best arrangements are likely to be developed with an adequate understanding of local conditions and when they are transparent and easily adapted to changing circumstances.
- Many governments are centralizing the tenure of environmental services, especially emission reductions, but this has potentially serious implications for social cohesion, equity and the effectiveness of interventions. Devolving such tenure offers possible win–win situations for governments, communities and the private sector as well as the potential to better adapt international frameworks to domestic situations.
- In most situations, PES schemes are unlikely to fully finance SFM, so broader business models are needed that include other revenue-generating activities for environmental service providers. PES schemes can act as platforms to support market development and revenue diversification. Increasing the value of forests as a land use will, in turn, make PES more effective.
- Establishing and managing strong, viable, long-term PES programs requires substantial institutional strengthening. Key enabling institutional elements include: well-defined property rights; codes, standards and other legal structures that reduce risk and uncertainty; inclusive policies; and appropriate multi-stakeholder platforms and institutional structures that allow PES to be mainstreamed in national planning and financial decision-making.

- There are excellent long-term examples of payments for water catchment protection financed by water users. The City of Yokohama's scheme, which has been in place for nearly 100 years, fully finances the management of its water catchment by a charge levied on water use by its citizens. This charge is mandated by law and ensures sustainable and predictable funding from users, and awareness-raising programs are implemented to maintain user support for the legal framework. A range of support measures is provided to local communities to ensure the sustainable management of all forests in the catchment.

Recommendations

Proponents of PES schemes are encouraged to:

- Understand the dynamics of the communities with whom they are working and acknowledge, respect, support and accommodate the wide cultural diversity present in most forest environments.
- Assist forest owners and managers to develop and implement forest management plans to maintain forest environmental services, and include measures to assess the effectiveness of PES in the design of PES projects.
- Build in—and honour—safeguards to PES schemes to protect the rights of indigenous peoples and local communities.
- Improve the business climate for PES schemes, such as by reducing transaction costs, ensuring that payments are made in a timely manner, promoting entrepreneurship along the value chain, and continually providing information to society with the aim of increasing payments for goods and services from sustainable forestry.

Governments, civil society, the private sector, donors, academics and PES providers and users are encouraged to work together to:

- Quantify and value the environmental services provided by tropical forests and the outcomes of PES schemes through scientifically sound studies with the aim of increasing the effectiveness of PES schemes.
- Raise awareness of the importance of environmental services, the role of tropical forests in the provision of such services, and the need to pay for them. Important messages to convey include:
  - Tropical forests protect vital water catchments and biodiversity and help regulate regional climates.
  - Tropical forests are giant carbon dioxide "vacuum cleaners" and manufacturers of renewable biomass.
  - Tropical forests are life-support systems for present and future generations.
  - SFM is a means of ensuring the long-term maintenance and enhancement of environmental services in tropical forests.
- Create enabling conditions at all levels to enhance PES.
- Promote south–south and triangular cooperation and other collaboration and exchanges on PES experiences and options and provide support—such as seed funding and capacity building—for scaling up PES.
- Conduct robust studies on the effectiveness of PES in achieving conservation and sustainable-development objectives and the effectiveness and cost of different institutional arrangements for PES.

Promote collaboration and exchanges on PES experiences and options, especially south–south cooperation. *Photo: Gerardo Sánchez V., INECOL, Casasola/El Instituto de Ecología*

Donors are encouraged to:

- Prioritize PES funding to helping start up PES schemes with seed funding.

International organizations are encouraged to:

- Help document and promote experiences on PES, develop appropriate financial mechanisms, build capacity in the delivery of PES schemes in tropical forests, and provide appropriate technical support, including through the possible creation of a global facilitating "platform".
- Use their convening power to inform policy development and promote action on PES in tropical forests.
- Promote policies in other economic sectors to internalize the cost of environmental services with the aim of increasing the size of PES markets.

Expression of appreciation

Forum participants expressed their:

- Appreciation for the warm hospitality of the Government of Costa Rica and gratitude to ITTO, FAO and FONAFIFO for convening the Forum.
- Hope that Costa Rica's exemplary leadership on payments for the environmental services provided by tropical forests will inspire initiatives in other countries.
- Commitment to share information and experiences on PES with the aims of improving the livelihoods of forest-dependent people and increasing the application of SFM in the tropics and worldwide.

These key messages, summary and recommendations were developed by the conference organizers and do not necessarily represent the official positions or views of the member states of ITTO or FAO.
All presentations and speeches from the Forum, details of speakers, videos and other materials can be downloaded at www.fao.org/forestry/84884/en/.