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## The Florestas para a Vida Project in Espírito Santo, Brazil

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## Abstract

The *Florestas para a Vida* project, which is financed by a grant from the Global Environment Facility (GEF) and is being implemented by the World Bank, was designed to address threats to biodiversity and water services, and to contribute to watershed development in the state of Espírito Santo, Brazil. To achieve this, it includes several interventions aimed at improving watershed management in the upper part of the Jucu and Santa Maria da Vitoria watersheds, including two distinct Payments for Environmental Services (PES) programs: a short-term PES program and long-term PES program. This paper discusses the plans for these two PES programs, which are currently being developed.

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## Keywords

Payments for Environmental Services (PES), Watershed, Biodiversity, Brazil

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## Cover photo

Upper part of the Santa Maria da Vitória watershed (Stefano Pagiola).

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## 1. Introduction

The Forests for Life (*Florestas para a Vida*, FpV) Project focuses on two watersheds of high biodiversity, located in the south central region of the state of the Espírito Santo: the watersheds of the Jucu and Santa Maria da Vitoria rivers, which cover an area of 4,010 km<sup>2</sup>, or 9 percent of the state.

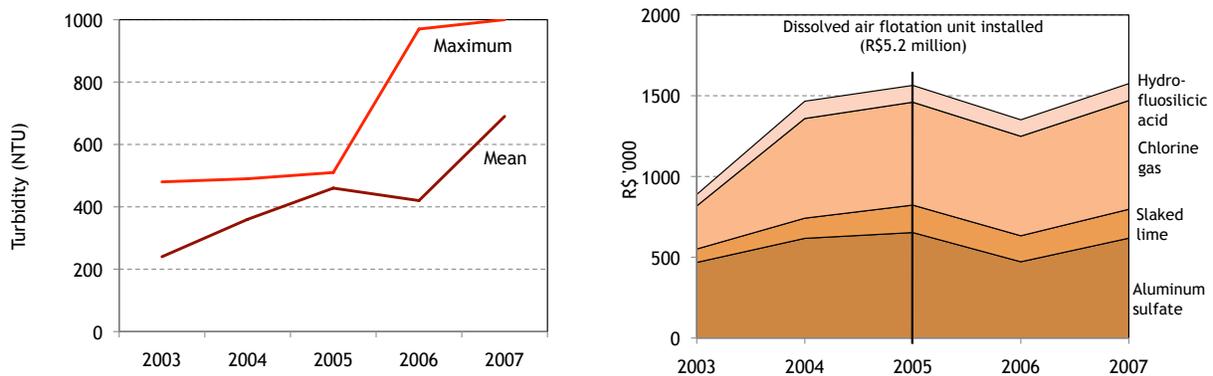
Existing forest cover in the headwater regions of these watersheds provides extremely important environmental services, such as the regulation of hydrological flows, groundwater recharge, soil conservation, and water quality preservation, including the reduction of sedimentation in water bodies, in addition to contributing to the local climate. In particular, water from these areas supplies 95 percent of the population of the Metropolitan Region of Vitória (*Região Metropolitana da Grande Vitória*, RMGV). The RMGV has about 50 percent of the state's population. Moreover, these two watersheds have great potential for hydropower generation, with four small hydroelectric power plants in operation and two others under construction.

These watersheds are also of great importance for the Atlantic Forest (Mata Atlântica) biome, with forest cover ranging up to 50 percent of their area—significantly more than state and national averages for this biome. Although the municipalities in the lower part of the watersheds (Victoria, Vila Velha, and Serra Cariacica) are predominantly urban, the municipalities in the upper part of the watersheds (Domingos Martins, Marechal Floriano, Santa Maria, and Santa Leopoldina Jetibá) have forest cover exceeding 40 percent of their areas, and account for more than half the total area of Atlantic Forest in the state, about 1,900 km<sup>2</sup>. Despite being quite fragmented, these forest areas have extremely high levels of biodiversity in all categories (endangered, vulnerable, etc) and have been identified as priority areas for biodiversity conservation in the Central Ecological Corridor of the Atlantic Forest.

The municipalities in the upper watershed have been occupied for over a century by European immigrants, mostly descendants of Pomeranians, Italians, and Germans. They are predominantly used by traditional small family farmers, with an average farm size of 20 to 30 ha, an average of about two families for property, and a tendency for increasing fragmentation. The main agricultural activities are the cultivation of maize, beans, root crops, coffee, bananas, horticulture, orchards, plantations, livestock, and poultry. Other economic activities found in the area include mining, eucalyptus plantations, and small hydropower plants.

Traditional agricultural practices in the headwater regions of these watersheds has resulted the reduction and fragmentation of forest cover. In turn, this reduction, coupled with the rugged local relief, has resulted in soil erosion, which has harmed water quality, leading to higher treatment costs and reducing the storage capacity of

reservoirs. As shown in Figure 1, the treatment costs of the Water and Sanitation Company (*Companhia Espírito Santense de Saneamento*, CESAN) have continued to increase, despite the company having invested R\$5.2 million in the installation of dissolved air flotation units so as to improve the capacity of its water treatment plants to deal with higher turbidity levels. Moreover, deforestation has also had a negative impact on hydrological flows of rivers, with an increase in both floods and low flows. Even though rainfall has remained unchanged, aquifer recharge has been adversely affected. It is important to note that, although the use of steep slopes for agriculture has diminished in recent decades, allowing many areas to gradually recover, habitat loss and degradation from traditional agriculture remains a significant threat to biodiversity and ecological functions, including water quality and the regulation of water flows.



Source: CESAN data.

**Figure 1: Water turbidity in the Rio Santa Maria da Vitória and its impact on treatment costs at the Carapina Treatment Plant**

Espírito Santo, therefore, is facing serious medium- and long-term threats to the water supply for the RMGV, power generation, and industrial use. Problems such as soil erosion, siltation of rivers, as well as the mitigation of extreme hydrological events (floods and low flows), can be addressed by managing land use and landscape (especially vegetation), particularly on slopes and other areas of permanent preservation (*áreas de preservação permanente*, APP). Moreover, increasing forest cover by restoring denuded and degraded lands can also benefit biodiversity.

The FpV project was designed to address threats to biodiversity and water services, and to contribute to watershed development. To achieve this, it includes several interventions aimed at improving the environmental conditions of the Jucu and Santa Maria da Vitoria watersheds, including two distinct Payments for Environmental Services (PES) programs: a short-term PES program and long-term PES program. This paper discusses the plans for these two PES programs, which are currently being developed.

## 2. The Florestas para a Vida Project

The FpV project was proposed by a partnership between the State Government of Espírito Santo, through the State Secretariat for the Environment and Water Resources (*Secretaria Estadual de Meio Ambiente e Recursos Hídricos*, SEAMA) and the State Institute for the Environment and Water Resources (*Instituto Estadual de Meio Ambiente e Recursos Hídricos*, IEMA), and non-governmental organizations (NGOs) working in the Atlantic Forest, with support from the private sector. The project was developed by the state government with support from a team of consultants and specialists from the World Bank. Project implementation began in 2009.

The project has a budget of US\$12 million, of which US\$4 million is contributed to the State of Espírito Santo by the Global Environment Facility (GEF) as a grant, and the remaining US\$8 million provided by the state government, through IEMA, CESAN, and the Espírito Santo Institute for Research, Technical Assistance, and Rural Extension (*Instituto Capixaba de Pesquisa, Assistência Técnica e Extensão Rural*, INCAPER), by the private sector, and by farmers. The project is being implemented by the World Bank.

The project's main objective is to encourage the adoption of sustainable land use practices, which will increase farmer revenues, improve the quality of water for human consumption, and improve biodiversity conservation. To achieve this goal, the project includes four components:

1. Strengthening watershed management;
2. Biodiversity protection and protected area management;
3. Mainstreaming biodiversity in productive areas. This component is subdivided into two sub-components: 3(a) inducing adoption of sustainable land use practices through a short-term PES program, and 3(b) development of a long-term PES program; and
4. Monitoring, evaluation and project management.

Although this article focuses on the PES activities under sub-components 3(a) and 3(b), it is important to note that these activities are part of a broader approach to solving problems in the target watersheds.

Since its conception, the project aimed to create and implement an incentive mechanism that could preserve and restore forest cover in strategic areas for the conservation of biodiversity of global importance and restoration of hydrological environmental services, such as regularizing stream flow and improving water quality. The main strategy to achieve this was the use of PES as the primary incentive to induce adoption of sustainable land uses.

In Brazil, environmental externalities have traditionally been addressed through legislation. However, as in many other states and countries, the implementation and enforcement of these ambitious laws has been limited. A growing awareness of the value of environmental services by those who benefit from them or suffer the consequences of their degradation, combined with the failure of traditional approaches to conservation, has led to a search for new approaches.

Previous approaches to inducing land use change in the region have not been able to produce an effective conservation of the remnants of this biome, with its globally significant biodiversity, in the face of continuing threats of human occupation, and restore or enhance connectivity between forest fragments. The mechanisms currently in use have proven ineffective because they do not consider the need to improve the quality of life of landholders. The adverse impacts of deforestation or forest degradation, often do not affect landholders. As a result, landholders do not take them into account when making decisions regarding land use.

Based on the lessons of new approaches to PES in Brazil and elsewhere in the world, and taking into account local conditions, the FpV Project takes on the challenge of mainstreaming biodiversity in production landscapes, through its sub-components 3(a) and 3 (b):

- 3(a) Measures to remove obstacles to the adoption of land use practices that are beneficial for both farmers and for the environment, that is, actions that generate mutual gains (“win-win”). In general, the most common obstacles that hamper farmer adoption of such win-win practices are lack of knowledge, unavailability of inputs, and high initial costs. To address such cases, the project provides technical assistance (TA) and offers short-term payments. This short-term payment mechanism aims to fund the transition from current forms of production to win-win forms of production.
- 3(b) Measures to encourage the adoption of practices that generate positive externalities—especially those that contribute to biodiversity conservation and the maintenance hydrological services—but are unattractive to farmers. In such “win-lose” cases, long-term payments will be made (by offering sequential contract renewals) so as to compensate landholders for the loss of revenue they face by allocating productive land to conservation practices.

The development of the FpV project drew on the experience of many previous projects that have implemented PES approaches, including the Costa Rica PES program (Pagiola, 2008); the Mexico PES program (Muñoz-Pina and others, 2008); the *Regional Integrated Silvopastoral Ecosystem Management Project* implemented in Colombia, Costa Rica, and Nicaragua (Pagiola and others 2004, 2007); as well studies of best practices throughout the world (Pagiola and Platais, 2007). Lessons were also drawn from similar projects recently developed in Brazil with support from the World Bank and GEF, such as the *São Paulo Ecosystem Restoration of Riparian Forests Project* and the *Rio de Janeiro Sustainable Integrated Ecosystem Management in Production Landscape Project*.

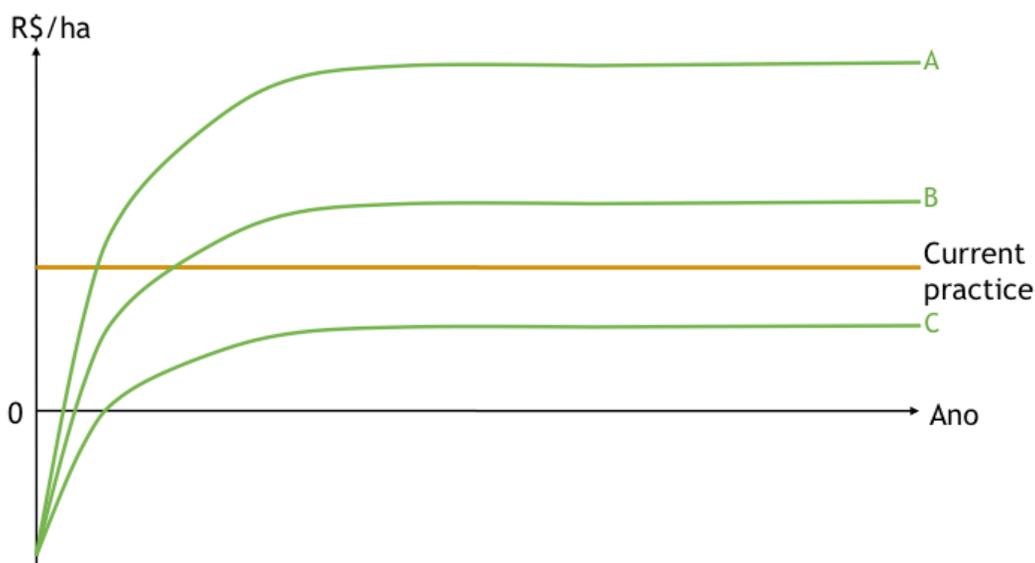
According to the project’s budget estimates, US\$ 4.5 million will be used exclusively for the implementation of sustainable land use practices, of which US\$ 3.2 million are allocated to sub-component 3(a), including the cost of the short-term PES program, and US\$1.3 million to component 3(b) for the development of a long-term PES program.

It should be mentioned that the *ProdutorES de Água* program, which also uses PES, did not yet exist when the FpV Project was developed. *ProdutorES de Água* was

established under State Law No.8995/2008 establishing the Program of Payment for Environmental Services (PES) in the state of Espírito Santo. The state also enacted Law No.8960/2008 which establishes a State Water Resources Fund (*Fundo Estadual de Recursos Hídricos*, FUNDÁGUA) which receives, among other revenue sources, 3 percent of royalties from oil and natural gas production. FUNDÁGUA must devote 60 percent of its funding to PES.

### 3. Short-term PES

Given the aforementioned context, the environmentally-friendly land use practices to be supported are categorized into three levels (Pagiola, 2012), using as a basis the current average return from current practices (Figure 2): (A) environmentally-friendly land use practices that are very profitable when adopted by landholders; (B) environmentally-friendly land use practices that are profitable for landholders once established; and (C) environmentally-friendly practices that are not profitable to landholders, even once established. This categorization of practices is of paramount importance as it will indicate the need for PES, and the type of PES needed (short- or long-term). For practices categorized as (A), the economic advantages to landholders are so large that they will adopt them with no outside assistance except for some TA and/or access to credit. For practices categorized as (B), the benefits to landholders compared to current practices are insufficient to induce their adoption, but short-term payments could tip the balance in favor of their adoption. Finally, for land use practices categorized as (C), benefits to landholders will always be inferior to those of current practices, and so long-term payments will be necessary.



Source: Pagiola, 2010.

**Figure 2: Categorization on environmentally-friendly land use practices**

Sub-component 3(a) aims to help farmers to adopt environmentally-friendly land use practices in categories (A) and (B). Technical assistance will be provided to practices

in both categories (A) and (B), and short-term PES will be provided to practices in category (B). As the investments needed in these cases will be temporary, short-term funding sources, such as the GEF grant, can be used. Thus, funding for sub-component 3(a) consists essentially of GEF resources, and focuses mainly on land use practices and areas that are particularly important for biodiversity. Considering its experimental character and the limited resources available, this sub-component will work with 300 farms located in four upper watershed counties, while short-term PES will focus on 160 farms located in two micro-watersheds selected based on technical criteria.

### ***Priority areas***

The selection of priority areas was based on their relevance for the environmental services sought by the project (biodiversity and water quality), which were analyzed using geographic information system (GIS) data and field visits. The criteria used to select these areas were:

- ***Biodiversity:*** (1) location within or adjacent to the priority areas of the Ecological Corridors Project, as defined by Decree No.2529-R, dated 2 June 2010; (2) location within the areas listed as being of high priority for conservation, according to Decree No.2530-R, dated 2 June 2010; and/or (3) vicinity to protected areas.
- ***Water:*** (1) the watercourse in the micro-watershed contributes to human supply; (2) coincides with some of the critical areas identified by CESAN as critical for sediment delivery to watercourses.
- ***Existing actions:*** areas where local actors have undertaken environmental projects.

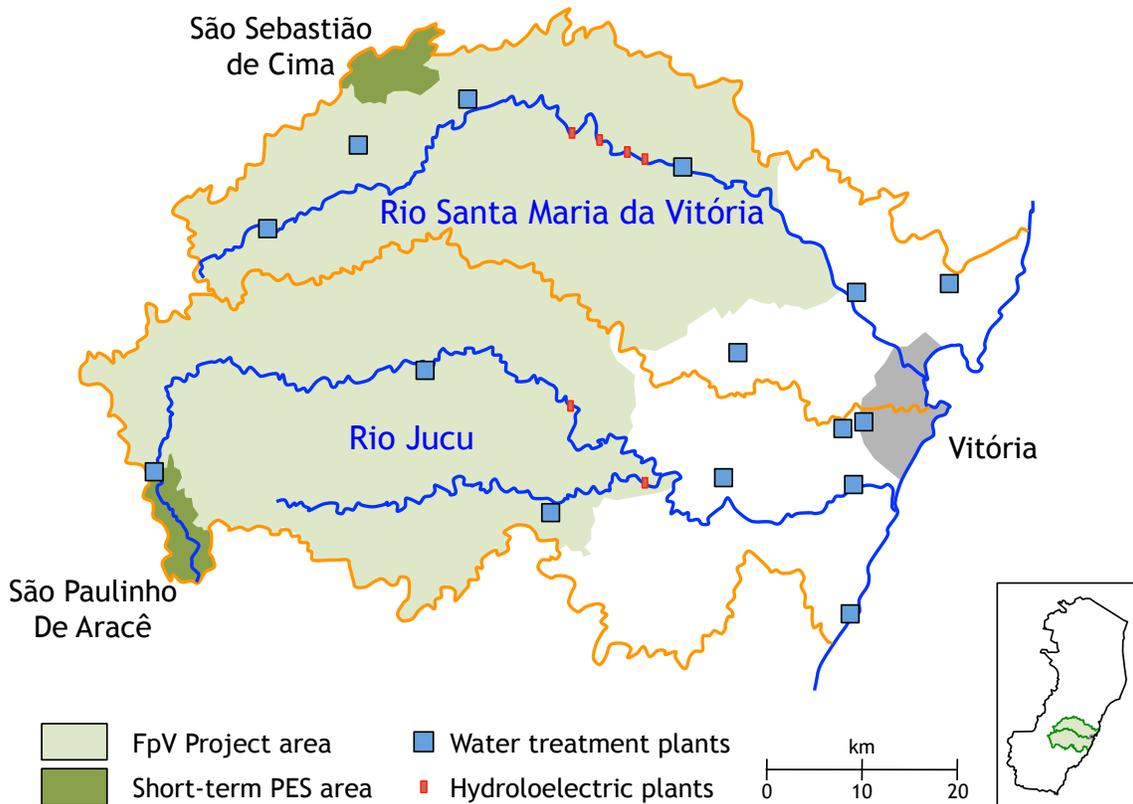
Based on these criteria, two areas were identified that are strategically located upstream of water intake points for local water supply: San Sebastião de Cima, in the municipality of Santa Maria de Jetibá, and São Paulinho de Aracê, in the municipality of Domingos Martins (see Table 1 and Figure 3). Comparisons of parameters such as turbidity to historical data in these areas will allow an assessment of the effects of land use changes on these parameters, which will in turn allow simulations to be conducted of the likely effects that could be produced by replicating the project's actions throughout the watersheds.

### ***Practices to be encouraged***

To define the list of land use practices to be encouraged by the project under this sub-component, a survey is being conducted by a team consisting of technicians from IEMA and INCAPER and with the participation of NGOs and local authorities. Identifying land use practices that are both biodiversity-friendly and profitable for farmers (category B in Figure 2) is of vital importance, since short-term PES will only work for these practices. The specific practices that belong to this group are likely to change from one location to another, depending on agro-climatic conditions and factors such as distance to markets.

**Table 1: Priority areas for short-term PES**

<i>Micro-watershed (Municipality)</i>	<i>Size (ha)</i>	<i>Selection criteria</i>
São Sebastião de Cima (Santa Maria de Jetibá)	5307	<ul style="list-style-type: none"> <li>▪ Located in areas listed as high priority for Atlantic Forest conservation in accordance with Decree No.2530-R/2010</li> <li>▪ Proximity to the Center North Serrano ecological corridor</li> <li>▪ Supplies water to the town of Santa Maria de Jetibá</li> <li>▪ Identified points by CESAN as critical for sediment delivery to the river</li> </ul>
São Paulinho de Aracê (Domingos Martins)	5171	<ul style="list-style-type: none"> <li>▪ Mostly located within the areas listed as high priority for Atlantic Forest conservation in accordance with Decree No.2530-R/2010</li> <li>▪ Proximity to the Pedra Azul State Park (PEPAZ)</li> <li>▪ Located partly within the corridor between the Pedra Azul and Forno Grande state parks</li> <li>▪ Located in the recharge area of a CESAN water intake</li> </ul>



**Figure 3: Florestas para a Vida (FpV) project area**

## ***Methodology***

A communication plan has been developed and has begun to be implemented in the selected priority areas. The communication strategies employed include, in particular, meetings between the project team and key local actors (leaders of communities, associations, farmer unions; municipal environment and agriculture secretariats; NGOs; churches and schools). Considering the importance of a conceptual shift from traditional land use practices, comic books have been created, with characters that depict local culture, to transmit the information of most importance to children. These comic books have treated topics such as sustainable land use practices, pesticide use, creation of Private Nature Reserves (*Reservas Particulares do Patrimônio Natural*, RPPNs), ecotourism, and PES.

Registration forms were provided at meetings with local actors, and also left at strategic points in each area, such as the local offices of INCAPER, of departments of environment, and so on. Landholders who fill in the form demonstrate their interest in participating voluntarily in the project, and a technical inspection of their property is performed. During the inspection, a detailed worksheet is completed, with information such as property size, the presence of streams and springs, the potential to connect forest fragments, preexisting environmentally-friendly land use practices, and the presence of endangered wildlife species. Analysis of this information allows areas to be identified where the desired ecosystem services are found, or where the likelihood of generating additional services is greatest, and, on that basis, to prioritize participants.

Following prioritization, landholders are informed whether they have been accepted into the project and a further visit is made, this time to perform a detailed diagnosis of current land uses, which includes, among other activities, mapping of APPs, legal reserve, and main uses, and recording current degradation and productivity. Based on the diagnosis a proposal that integrates biodiversity into productive areas, taking into account the potential for receiving short-term and/or long-term payments, can be elaborated.

Subsequently, the proposed land use plan is presented to the landholders. Once they agree, they sign a commitment/contract to allow the start of actions on their property. Short-term and/or long-term payments would begin after the signature of formal contracts with landholders, as provided for in those contracts.

## ***Amounts to be paid***

The amounts to be paid for environmental services will be determined based on several factors, including the opportunity cost of foregone land uses, the additionality of environmental services generated from the adopted practice, as well as the values currently established by State Law No.8995/2008.

The characteristics of the contracts will depend on the nature of payments made. Short-term payments will be made as long as necessary to accomplish the transition to improved land use practices and until the new practices become more profitable than current practices, thus giving sustainability to the process. In the *Regional Integrated Silvopastoral Ecosystem Management Project* implemented in Colombia, Costa Rica, and

Nicaragua, payments for a period of four years were sufficient to induce significant adoption of such practices (Pagiola and others, 2007). In some cases, shorter periods may be sufficient.

### ***Implementation arrangements***

Implementation and TA will be conducted by the project team in the first two years. During this phase, detailed reports will be prepared to allow the resources required to achieve the desired goals to be estimated accurately. Based on this information, the actions will be scaled up by contracting skilled labor or establishing partnerships.

One of the challenges is to avoid implementation bottlenecks such as those that limited the development of the *ProdutorES de Água* program, which had insufficient staff to carry out the necessary activities in the field. As a result, this program only enrolled 1910 ha of forests in its first three years.

In mid-2012, Espírito Santo replaced *ProdutorES de Água* with an improved PES program, called *Reflorestar*, which takes its basis in a revised state PES law, No.9864 of 26 June 2012. Rather than establishing separate implementation arrangements, it was decided that *Reflorestar* would be used to implement FpV's PES program.

### ***Monitoring and evaluation***

The establishment of effective short-term PES programs is of great importance, because they are generally easier to implement than long-term PES programs. Moreover, the results of monitoring efforts and impact assessments will be vital to efforts to obtain additional funding for replication of short-term PES programs in other areas of the Jucu and Santa Maria da Vitoria watersheds, and in other parts of the state. Therefore, the project's activities and their impact will be carefully monitored and evaluated. The main impacts to be identified are: (a) changes in the behavior of landholders who receive short-term PES; (b) increases in forest cover resulting from this change in behavior; and (c) reduction of water turbidity as a result of wider use of sustainable land use practices, adopted thanks to this project.

For the results to be measurable, work will be concentrated in specific areas. Thus, the adoption of watersheds as basic units for project implementation was critical to ensure that the effects arising from actions taken can be measured. The project will seek to enroll all rural properties within the target microwatersheds so that the environmental benefits achieved by the project are not obscured by the actions of non-participating properties, thus avoiding possible biases in the measurement of outcomes.

### ***Sustainability***

The sustainability of land use practices adopted thanks to short-term PES is based on the expectation that these practices are not only environmentally beneficial but also profitable for the landholders themselves, so that they will maintain them even after the support offered by the project ends. To ensure this, two measures are being taken:

- Technical assistance will help landholders to adopt practices that best suit their conditions and to implement them effectively, thereby maximizing the benefits

received by landholders. This is important because, while silvopastoral practices and organic agriculture have the potential to be highly productive when well implemented, they may also be disappointing if poorly implemented.

- Offering short-term PES creates the risk that landholders will adopt good practices only to receive the payment, with the intention of abandoning them once project support ends, as has been observed in many previous projects. To reduce this risk, the payments will be kept low: just sufficient to induce landholders to adopt improved land uses.

#### **4. Long-term PES**

Many previous efforts to induce the adoption of land uses that generate significant external benefits failed because they offered only short-term incentives for practices that were not profitable for farmers, even once established (group C, Figure 2). Once these projects ended and incentives ceased, farmers often reverted to earlier practices. The long-term PES approach avoids this problem by providing long-term payments to landholders who adopt and maintain these practices, as long as they respect the terms of their contracts.

The conservation of APPs is an example of a practice that requires long-term PES to be attractive to homeowners, as well-conserved APPs may not generate any income. Moreover, even productive practices that protect water and biodiversity can be unattractive to landholders, compared to available alternatives. Soil conservation practices, for example, can increase costs. Thus, many practices that help protect water and biodiversity will not be adopted by the owners without long-term support. Providing such long-term support depends crucially on the availability of long-term financing.

The sustainability of this approach to land use change, therefore, depends on the sustainability of the PSA mechanism. To ensure the sustainability of this mechanism, the project benefits from the lessons learned in previous PES projects. These experiences demonstrate that well-designed PES mechanisms can be sustainable because they depend on the mutual interests of users and service providers (Pagiola and Platais, 2007). The PSA program in Costa Rica, for example, has signed contracts with many different water users, who are paying for the program to conserve the watersheds from which they draw water. It is significant that the first contracts were renewed by the private hydroelectric companies that signed them, demonstrating the potential sustainability of these contracts (Pagiola, 2008).

Plans for the long-term PES program are still being developed. Based on lessons from other programs of the PSA, the steps being taken to develop the long-term PES program include:

- Obtaining scientific data to ensure that payments are made for land uses that would actually produce the desired services, and in areas where they would have the greatest impact. This requires detailed technical studies using advanced techniques. The development and implementation of a hydrological model is planned. This model will be used to identify priority areas for action for the desired services, based on information related to water (precipitation and

evapotranspiration, for example), soil and biodiversity (flora and fauna). To develop this model, the project will hire expert advice and seek to establish partnerships with educational institutions so that the experience gained during its development can be absorbed and internalized by local professionals who can continue its development. Unlike the short-term PES program, the long-term PES program will be deployed throughout the Jucu and Santa Maria da Vitoria watersheds (although it may be initially piloted in some specific areas), in the priority areas identified by the hydrological model. The hydrological model will also help estimate, through simulations, the likely impacts of changes in land use on water services, including sediment delivery to waterways.

- Preparing a detailed analysis of the economic costs for water users caused by the turbidity resulting from watershed degradation. Analysis carried out during project preparation showed that a 1 percent reduction in turbidity levels in the watershed could be sufficient to make the project economically sustainable. Further studies have shown that a 0.5 percent reduction in turbidity would result in annual savings of about R\$1 million due to reduced spending on chemicals in water treatment.
- Monitoring of service delivery will show water users the benefits they are receiving or allow the mechanism to be adjusted (for example, to support different land use practices, or to redirect payments to other areas) in the event that results fall short of expectations.
- Another aspect of vital importance - the need to ensure that the management mechanisms of the PSA Program long-term basis after the project closure. Although the intention when designing the Forests for Life project has been to design a specific management structure for the program long-term PSA, the parallel implementation of this kind of mechanism by producers Water Program, clearly demonstrates the need that this structure is proposed based on the combination of adjustments and originally designed by Forests for Life project with those currently being implemented by producers Water Program mechanisms.

Another aspect of vital importance is the need to ensure that the implementation arrangements for the long-term PES program continue working after the project closure. The initial intention was to develop specific implementation arrangements for the FpV's long-term PES program. However, the parallel implementation of a similar PES mechanism under the *ProdutorES de Água* Program led to a decision to use that program's implementation arrangements for the FpV project, as well.

The lessons learned from previous experiences also demonstrate that PES programs financed by the users of environmental services are generally more efficient than government-funded programs (Pagiola and Platais, 2007; Wunder and others, 2008). For this to happen, participation in the mechanism should be completely voluntary, both for providers and for users of environmental services, so that the mechanisms reflects the interests of each. The design will also incorporate sufficient flexibility (for example, the opportunity to periodically renegotiate contracts) to ensure that it continues to

reflect the interests of both parties even as conditions change and lessons are learned. Thus, it is expected that the long-term PES program will be financed mainly by the water users themselves, such as CESAN and hydroelectric power producers.

## 5. Initial results

Although the project has not started making payments under either the short-term or the long-term PES programs, some initial results can already be seen. In particular, this new PES mechanism awakens considerable interest among landholders. However, the PES concept is commonly only associated with long-term payments, and with payments for conservation of existing forests. This vision seems to have originated in the design of the state's *ProdutorES de Água* Program, which only offers long-term payments and only recognizes services provided by standing forests. This points to the need to expand the understanding of the PES concept and of integrating the PES projects currently underway in the state.

Local culture is having an important effect on participation in the project. As noted earlier, the region population is composed predominantly by descendants of Pomeranians, Italians, and Germans. Currently, participation seems to be higher among Italian and German descendants, while participation is lower in areas of Pomeranian descent, demonstrating the need for different communication approaches. The municipality of Santa Maria de Jetibá has one of the largest colonies of Pomeranians in Brazil, and their language is a compulsory subject in that municipality's schools. In rural areas, it is not difficult to find elderly residents who have little understanding of the Portuguese language, demonstrating the strength of this culture.

Despite the difficulties encountered in some areas, it is thought that participation will improve once the project begins concrete implementation—particularly after initial payments are made under the short-term and long-term PES mechanisms.

## 6. Conclusions

The different approaches undertaken by the FpV project, as well as the importance of implementing sustainable mechanisms, directly influence the definition of the source of resource to be used for the short-term and long-term payments. Thus, even though the project budget provided funding to start payments under short-term and long-term PES program, their continuity and expansion depend on securing suitable additional funding. Under this view, short-term payment can rely on sources which are not continuous, such as grant resources. On the other hand, such funding cannot be used to finance long-term payments. In cases where long-term payments are needed because the environmentally-friendly land use are not profitable for landholders even after they are established, it is essential that sustainable, long-term funding sources be identified. These could come from the sectors that benefit directly from the environmental services generated by the project, such as water supply companies and hydroelectric power generators.

Although Brazil has experimented with a wide range of market-based instruments for conservation, the PES mechanism being developed under the FpV project, can be

considered unprecedented in the country. In addition, the fact that the general conditions found in the Jucu and Santa Maria da Vitória watersheds are relatively common in many parts of the state and the country, indicate that there is considerable potential for replication of this approach.

Finally, while previous projects focused either on PSA or on watershed management approaches, this project is also innovative because it integrates PES in a comprehensive watershed management program, complementing other approaches. This integrated approach also has the potential to be replicated in other regions of the country and the world.

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