



## Implementation of Payment for Ecosystem Services Schemes by Local Governments: the Water Conservation Project of Extrema/Minas Gerais, Brazil.

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**Short title:** Payments and technical support for reforestation and soil conservation for watershed protection, Brazil.

**Key Message:** Extrema, a city with a population of 25,000 in southeast Brazil, has successfully implemented a payment for ecosystem services (PES) scheme. Innovative initiatives like this one are likely to attract partners – strengthening both the initiative and making it an attractive model for similar projects and initiatives.

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### What is the problem?

In the industrialized state of São Paulo, pollution and sediment have caused water treatment costs to quadruple since 1996 (Bradley, 2010). The “Cantareira System,” an interconnected set of reservoirs, provides more than half of the water supply to the metropolitan region of São Paulo (approximately 18 million people). Water for this system comes mainly from the Piracicaba River Basin which, including tributaries, covers 49 municipalities in two different states (extending far past the boundaries of the metropolitan region). This water system has become an object of concern due to issues related to the maintenance and regulation of water flow. The river basin experiences intense environmental degradation. Approximately 70% of the watershed is used for various human activities, suffers poor quality vegetation and the rivers have an observable reduction in water quality. Diffuse pollution from rural sources, predominantly erosion and sedimentation is a serious threat that may potentially interfere with water quality and the operations of the reservoirs.

### Which ecosystem services were considered and how?

This case gives an overview of the strategy adopted by the municipality of Extrema, a city about 100 km from the metropolitan region of São Paulo. Accordingly to the River Basin Management Plan, Extrema and three other municipalities in the state of Minas Gerais are responsible for 2/3 of the water supplied to the metropolitan region. For this reason, Extrema is a high priority area in the “Cantareira System.”

The municipality considered the ecosystem services approach when deciding on how to improve water quality and quantity. In the late 90s, water management commenced with

water quality monitoring. The municipality then carried out an assessment of its seven sub-basins and developed a Geographic Information System with environmental data and a database of all rural properties in the municipality.

The assessment indicated soil degradation, forest to agriculture conversion and a loss of income for farmers. Aware of its importance to the “Cantareira System,” the assessment led to the development of “Conservador das Águas” (the Water Conservation Project) with the aim of restoring forest cover. It focused particularly on vegetation that protected river banks, and springs and soils with higher susceptibility to erosion. It also aimed to adopt improved soil management practices and environmental protection measures. Water quality (a decrease of sediments) and flow regulation (in increase of infiltration) are the ecosystem services central to the project. Implementation was planned in steps, with focus on the seven rivers in the territory one at a time – beginning with the rivers with the largest areas of deforestation.

### **Which policies were adopted on the basis of this information about ecosystem services?**

Extrema, with its population of about 25,000, established the first water payment for ecosystem services (PES) scheme in Brazil. The local government, on its own initiative, enacted a municipal PES law in 2005 creating Conservador das Águas (ed the Water Conservationist Project). It authorizes the use of the municipality’s own funds to support rural producers who voluntarily commit to measures aimed at soil conservation, reforestation and environmental improvement. Further regulation of the law (2006) turned to the methodological aspects of the project – providing guidelines for its practical implementation.

Participating rural producers (farmers) commit to individually defined targets based on the full environmental state of their property. They are paid monthly for a period of four years. The payment is based on the total area of their property and on a reference value defined by the municipal administration (equivalent to ~87 USD/hectare/year in 2009). In order to continue receiving monthly payments, the farmer must demonstrate compliance. They are rewarded for their commitment and are also supported in implementation of the environmental improvement measures.

This initiative has attracted 70 farmers so far (approximately 2,180 ha), according to institutions involved in the project.<sup>1</sup> To date, more than 438 ha have been restored. In most cases restoration has involved closures of areas used for cattle ranching or agriculture so that vegetation on river banks and around springs can recover. The project still has a long way to go (it is now addressing the second of the seven sub-basins) but it continues to expand. In 2009, the Municipal Fund for Payment for Environmental Services was established with the goal of extending payments to rural producers for a period longer than the four year term.

### **What was necessary for development and implementation?**

The case of “Conservador das Águas” is an example of the role of investment in the capacity for local government to meet environmental goals. This process, from the initial engagement of the municipality in river management issues to the first payments, took more than a decade (1996 to 2007). Between 1996 and 1998 the municipality participated in a project with the Ministry of Environment aimed at fostering decentralized river basin management. Realizing that successful management measures were not possible in the context of a lack of information about its water resources, Extrema launched the project “Água é Vida”, or “Water

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<sup>1</sup> Fernando Veiga Neto, personal communication, November 17, 2010

is Life". This project, financed by the Ministry of Environment and Extrema's own resources, assessed the sub-basins and was a building block for the Water Conservation Project. A study is currently being carried out to determine the exact costs of the PES scheme because it involves multiple partners who contribute both cash and in-kind contributions.<sup>2</sup> It is estimated that one third of costs are related to the PES itself (including payments, personnel and administration) and that the rest is directed towards implementation of soil conservation measures and reforestation on farms.<sup>3</sup>

### **What other factors were important for a successful policy uptake?**

The municipality has a history of environmental commitment. Extrema's long-term commitment to environmental issues has been recognized through prizes received even before initiating the "Conservador das Águas" project. This commitment, supported by administration and management for the past two decades, could be considered an important contributing factor to the project's success. In addition, the pioneering character of Extrema's initiative attracted diverse partners, including The Nature Conservancy (TNC), the National Water Agency (ANA), and the forest agency of the state of Minas Gerais (IEF). These partners offered financial and/or technical support that strengthened the project's development.

Since 2007, The Water Conservation Project has been included in a broader initiative instigated by the Water Agency (ANA) that aims to conserve and foster natural restoration of local water resources. It plans to establish PES schemes in which water usage fees are collected and used as a financial resource in priority Brazilian river basins. This broader project, called Produtor de Água (Water Producer), has selected the Piracicaba Basin for its pilot scheme. Extrema and two other municipalities in the state of São Paulo are included in the scheme and payments are likely to start this year.

The adoption of three kinds of practices will be rewarded with financial incentives: riparian forest restoration, forest fragments conservation and soil conservation. Payment values are based on local land-use opportunity costs, the area of the property committed to the project and the quality of the environmental services provided. The program includes the 70 farmers in Extrema, the soil conservation area of 510 ha, the conservation of 540 ha of forests and the restoration of 218 ha in Joanópolis and Nazaré Paulista (the other two municipalities). Other studies are currently in progress to verify the possibility of program implementation in other municipalities in the same region.

This pilot initiative has been replicated in the Guandú watershed (also located in the Atlantic Forest region), a vital source of drinking water for about 7 million people in the city of Rio de Janeiro. The initiative has also been replicated in the Pípiripau basin, where ANA and TNC are developing plans for the scheme because it is an important source of water for the Federal District. The Camboriú watershed, one of the most important tourist centers in southern Brazil has also used the initiative as a model.

As another outcome, the São Paulo state government proposed the introduction of a state PES policy that focuses on areas where the economic potential for providing environmental services is greater than the economic potential for agriculture – strategic areas for the provision of drinking water and areas of special environmental interest.

### **Based on:**

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<sup>2</sup> Fernando Veiga Neto, personal communication, November 17, 2010

<sup>3</sup> Paulo Pereira, personal communication, June 22, 2010

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