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Case studies on
Remuneration of Positive Externalities (RPE)/
Payments for Environmental Services (PES)
Prepared for the Multi-stakeholder dialogue 12-13 September 2013 FAO, Rome

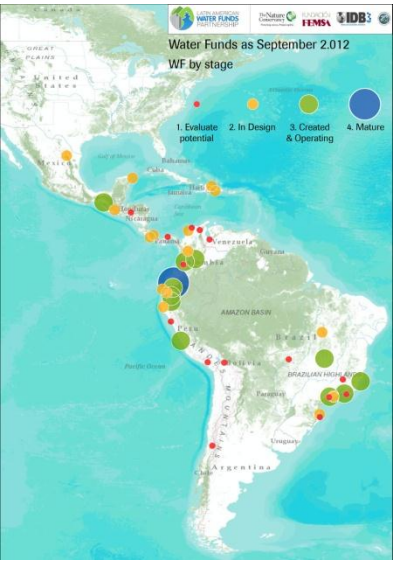
Cauca Valley is Colombia's largest sugarcane producing region. Irrigation demands, combined with the needs of a growing population, of around 1.2 million living in five cities, have led to increased water scarcity in the region.

As in many other Andean regions, use of the upper watersheds for cattle grazing and small plot farming has led to altered water supplies, increased erosion and landslides, diminishing water quality and new challenges for irrigation.

Water for Life and Sustainability Water Fund Cauca Valley, Southwestern Colombia

Overview

Over the last decade, The Nature Conservancy and its partners have been working to implement and refine the innovative Water Funds concept to secure freshwater for people living downstream in urban centers and other large water users such as irrigated farmers by compensating those living upstream for conserving or restoring watershed headwaters. Investors—the large water users—pay into an endowment fund (the water fund) whose earnings leverage public and private funds and benefit local communities through a self-sustaining funding mechanism that supports efforts such as watershed conservation and habitat restoration and enables sustainable small businesses. There are also some cases where instead of endowment funds, it has been created a flow of constant revenues based on water users' contribution. Because of their intrinsic flexibility, water funds are well-suited to global replication, which sets the stage for their application in a range of geographies and political realities.



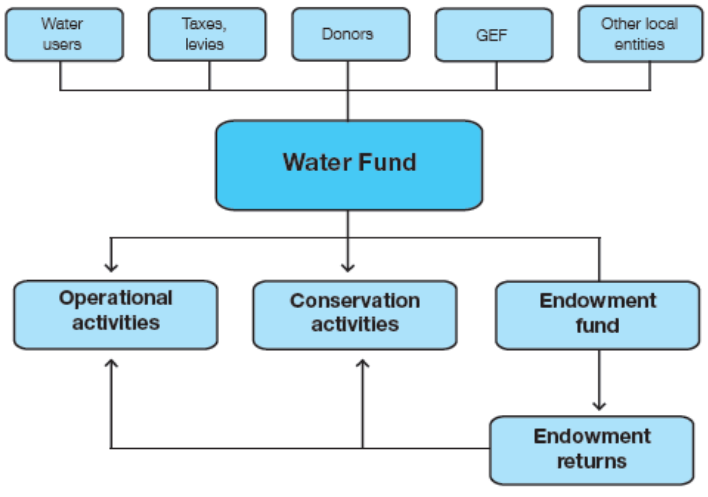


Figure 1: Schematic diagram of the key roles

Background

The Sugar Cane Farmers (and Mills) Association — ASOCAÑA — has worked for more than 15 years in the watersheds that supply aqueducts of some municipalities and sugar cane plantations in the Cauca Valley in southwestern Colombia. Although it is a highly fertile and productive region, climate factors cause occasional water scarcity during the summer. ASOCAÑA's work has focused on activities with the communities of the higher zones of 12 specific watersheds. This is an important region in terms of biodiversity. Some of these rivers have their headwaters in Las Hermosas National Park, a heaven for endemic species where high- Andean forests and páramos are being increasingly threatened by livestock activity. These rivers feed the Cauca River, which is part of the greater Magdalena River basin.

In 2008, based on the model already established in Ecuador, TNC approached ASOCAÑA to propose the establishment of a long-term financial mechanism, a Water Fund, that would include an additional technical component based on the use of scientific tools that would allow for greater returns on the investment done in the field. The idea was to have additional technical tools to identify priority conservation areas in the region where ASOCAÑA had been working randomly up to that point, with the objective of finding the most efficient ways to maintain base flows, reduce sediment load and protect the areas that contribute the most to the hydrologic balance of the region's watersheds.

With support from its strategic partners, Natural Capital Project (a partnership among Stanford University, University of Minnesota, TNC and WWF) and the International Center for Tropical Agriculture - CIAT, TNC carried out the necessary studies to develop a strategic plan for Water for Life. These included the following components: a) Use of hydrologic models to identify priority areas for conservation using land use alteration scenarios; b) Cost analysis of investment alternatives, using different activities that would be developed to identify which alternatives were most cost effective; c) Preparation of an investment portfolio for Water for Life, identifying medium- and long-term goals for the fund.

In four of this water fund's 11 sub-watersheds, analysts from the Natural Capital Project used prioritization models to create investment portfolios that target the parts of the landscape where water fund actions are practical and likely to give the best return on investment on groundwater recharge, baseflow regulation, erosion control and biodiversity connectivity. InVEST models were used to estimate biophysical improvements in erosion control that can be expected from these investment portfolios at several different budget levels. At the lowest budget explored, ~$5.5 million across the four watersheds, managers can expect a 4% reduction in erosion in the least sensitive watershed and a 41% reduction in the most sensitive watershed. There is also a large range of possible benefits when higher budgets are considered. At the highest budget level, ~$11 million, the benefits range from 5%-58% reduction in erosion, depending on the watershed. The models also showed a potential maintenance on the base flow, service extremely relevant for the main water use in Cauca Valley as noted below.

The largest water user in the Cauca Valley region is the sugar cane industry. Sugar cane yields are sensitive to the amount of irrigation applied, so growers in the region commonly use five to six irrigation cycles per year to maximize yields. Applying one less irrigation cycle per year would reduce sugar cane yields by 9% (10 tons/ha). The area is under severe water stress and it is thought that irrigation may need to be reduced by one cycle per year in the near future. If the water fund could make investments that improve groundwater recharge and stabilize local water supply, this reduction in irrigation could be avoided. Monitoring has not yet revealed how effective the fund is at increasing groundwater recharge, but if the fund was effective with a seven year investment level of $1.75 million, crop production benefits would be ~$36.8 million yearly after the 8th year.

The providers of environmental services

In Water for Life Fund, the environmental services focused are: base flow maintenance and the reduction of sediment load.

All Water Funds have a feasibility studies phase, where the prioritization sites are defined and the expected ecosystem services provision according several land-use scenarios is predicted through the use of ecosystem services models, such as InVest and RIOS, both developed by the Natural Capital Project.

In the case of Cauca Valley, the expected ecosystem services will be monitored in two pilot watersheds by CENICAÑA (a top-level research centre associated with the local sugar industry) with support of the local communities following a protocol designed under an agreement between TNC and CENICANA, and supported by USAID which contributed with US$ 300 K to this monitoring work which has hydrologic, biological and socioeconomic components. This protocol is under the final phase of design and will start soon to be implemented on the field.

So far, the conservation activities promoted by the Water Fund have reached around 6,160 hectares, distributed in activities of conservation, restoration and/or best management practices involving 1,491 families located in the upper part of the watersheds. These activities have been implemented in watersheds with a total area of 415,330 hectares. The practices supported are:

- Paramos (High altitude Andean grasslands) and forest conservation;
- Paramos and forest restoration;
- Fencing of riparian buffers;
- Cattle-ranching and agriculture best-management practices;
- Environmental education and awareness;
- Environmental-friendly small local businesses

Providers are indigenous communities, local communities and/or landowners that live in the upper part of the watersheds who according the management that they do on their lands can generate positive or negative impacts downstream. In the case of Cauca Valley, the local communities are organized in several associations of users of the Cauca Valley's rivers.

The agreement

Ownership

Besides a financial mechanism, water funds are an important governance mechanism.

Using watershed conservation as a common objective, water funds create a multi-institutional governing body bringing together public and private partners, included the representatives of the local communities, interested to restore and conserve the watershed.

Water Funds represent a typical PES based on water, but we can see that due to their governance characteristic and the conservation benefits that they generate, we can have also other ES buyers beside the water services buyers; and even other institutions interested in the livelihood improvement aspect provided by the Water Fund activities.
In the case of Cauca Valley, the main services' buyer is ASOCANA, but there are also contributions from other institutions as following: Corporación Autónoma regional del Valle del Cauca (CVC); ECOPETROL; PROCAÑA; PAVCO Pipelines; The Nature Conservancy; Sab Miller Bavaria; The United Nations Children's Fund (UNICEF); United States Agency for International Development (USAID). In general, there are two main groups of contractual agreements under the Water Funds scheme. The first group is related to the Water Funds' contributors and the governance scheme. These agreements establish the role of each partner, its contribution, etc.

In the case of Cauca Valley, a cooperation agreement was signed in 2009 by ASOCAÑA, nine associations of users of the Cauca Valley's rivers (grassroot organizations), the Vallenpaz Foundation, and TNC. Through this document, the parties committed to developing a conservation program in line with TNC's studies and to creating management bodies to implement such a program. They agreed to establish a board of directors with representatives from all partner institutions, to appoint a technical secretary to carry out projects and to contribute resources to a trust fund in order to guarantee transparency in their management and earn interest. To that end, ASOCAÑA initially allocated US$1.8 million to cover operational costs, the technical secretary's salary and the necessary funding for conservation projects in accordance with the guidelines provided in the TNC's studies. Since its creation in 2009, seven new river users' associations have been accepted as partners of Water for Life, as well as CENICAÑA, a top-level research center that promotes sugar cane research, and Procaña, a trade association of sugar cane producers.

The second group of agreements are related to the relationship established between the Water Fund and its beneficiaries, with whom will receive the resources to make the conservation activities. In the case of Cauca Valley, these agreements are done between the Water Fund and the local beneficiaries through a process of projects' approval under call for proposals launched by the Water Fund.

Public-Private

Investors
The most important private funder is ASOCANA, which assembles the contribution of 13 local sugar mills. There is a combination of operational interest, based on the perception of water risks, and CSR interest based on the search of a good relationship with the local communities. There are also other private contributors, such as ECOPETROL, based on CSR and EIA; PAVCO driven by CSR, and SAB-Miller Bavaria driven by operational interest and CSR. Besides these companies, there are also contributions from the non-profit private sector, such as the support received from TNC, local water users' associations and indigenous councils.
Regarding in country public support, the Water Fund has been received funds from the Corporación Autonoma Regional de Valle del Cauca (CVC), the governmental agency in charge of the promotion of the regional development in Colombia, according each region of the country. Another source of public funds has been the budget of the National Park Las Hermosas and the local municipalities.
International public funds have been also supporting the Cauca Valley Water Funds activities. There are contributions from GEF; USAID and UNICEF.

Besides a financial mechanism, water funds are an important governance mechanism. Using watershed conservation as a common objective, water funds create a multi-institutional governing body bringing together public and private partners, included the representatives of the local communities, interested to restore and conserve the watershed.

Lessons Learned

Incentives

In Cauca Valley Fund, there are farmers represented on the both sides of the scheme. From the providers' (sellers) perspective, the communities located on the upper part of the watershed, represented by their local associations on the Water Fund board, and target audience of the investments on the watershed, the main motivation to be part of this process has been the support that they have been receiving in two main ways. The first one is the concrete support that they receive to increase their cattle ranching management practices, improving their productivity through the use of silvo-pastoral systems. There is evidence of increase of more than the double in their income due to this change of their management practices. There are also other activities tied to food security, such the implementation of vegetables' garden or raise of chickens, supported by the Water Fund, which is also very well received by the local communities.

The second line of activity which generates incentives for farmers is the restoration and conservation activities per se which provides income for those involved on their implementation through the payment of their work days and also through the support of the implementation of communal nurseries, which initially sell seedlings for their own use, but also which have become a small local business providing different types of seedlings not only for restoration, but also for orchards and gardens.

Negotiation

In the case of the most important buyer, the association of sugar mills, there are one main driver that engages them to be part of this PES scheme. It is the perception of the environmental degradation associated with the water use and the need to take action to mitigate it. This perception added to the complex social environment where the local communities live pushed for the need to create mechanisms of governance which allow the work on those places, such as the water users associations developed for each sub-watershed. The Water Fund came after that as a financial and governance mechanism that can promote the optimization of the investments, reinforced by the robust science applied to show the priority places to be invested and the potential returns of the investments in terms of environmental services provision.

Ownership

One of the key components of any Water Fund is their social governance attribute. The Water Fund is governed by the members who established them and/or joined later as recognized partners, already mentioned in the case of Cauca Valley. All of them are their decision makers, who make the investment allocations together in meetings of the board members, guided by the conservation plan previously approved by them. This process generates a huge empowerment and ownership of all Water Fund's members about it.

MRV

How to balance the cost and the rigor of your methods to monitor impact has been one of the key challenges in the Cauca Valley Water Fund. Based on the partnership established among TNC and CENICANA, also supported by the Natural Capital Project, these partners have been trying to establish a feasible monitoring protocol which can be applied on the field relying on a strong participation of the local communities, and also considering complex security issues. The main lesson learned so far is the need to engage the communities into this process, without losing the expected scientific rigor.

Public-Private

The sugar cane industry has been already providing a strong support in terms of the monitoring process through the participation of its research arm, CENICANA. They have been also providing the logistics for the operation of the Technical Secretary and the space for the Water Fund's meetings.

Future outlook

Water Funds have three main components which once summed have been proving to be a strong and innovative PES mechanism. The first one, is the building of a long term sustainable source of funds, which basically allow a long term investment plan; the second one is the aggregation of most of the watershed relevant stakeholders, private and public, who have interest on the conservation of the watershed, organized in a body which takes decision and support the projects' implementation on the ground; and third, the two previous components informed by robust science which promotes the prioritization process of locations and activities that should be implemented. The three components together bring sustainability, resources allocation efficiency, and transactions costs reduction.

More specifically in the case of Cauca Valley Fund, besides the common points with the components mentioned above is noteworthy the leadership of the sugar cane industry, which clearly understood the water risks associated to their business, especially related to the capacity of keep the irrigated agriculture operating. This experience can be seen as a strong case for the other agribusiness based on the intense use of water across the globe.

The Latin America Water Funds Partnership, a joint initiative among TNC, FEMSA Foundation, Inter-American Development Bank and the Global Environmental Facility have the goal to support the implementation of 32 Water Funds across Latin America and The Caribbean. So far, there are 12 water funds already established and 16 being designed. The great opportunity is to use examples like the Cauca Valley Water Fund and the lessons learned there to inform the establishment of these new ones.

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Photos from Water Funds Business Case (below)

References

Water Funds Manual:
http://conserveonline.org/library/fondos-de-agua-conservando-la-infraestructura-0/view.html

Water Funds Business Case:
http://conserveonline.org/library/water-funds-business-case-conservation-as-a-source/@@view.html

General Information Water Funds (Spanish):
http://espanol.tnc.org/habitats/aguadulce/alianza_fondos.html

http://www.fondosdeagua.org

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Remuneration of Positive Externalities (RPE) / Payments for Environmental Services (PES) in the Agriculture and Food Sectors
A project of FAO Natural Resources Management and Environment Department, 2012-2015
Project website: www.fao.org/nr/aboutnr/environmental-services

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Project implemented with the support of:

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