

Ecuador- Pimampiro

Nueva America forest management plan: Payments for Environmental Services (PES) component

SUMMARY

The programme was launched in 2002 as part of a larger community forest management plan. The PES scheme is based on a 20 per cent increase in water use charges in the town of Pimampiro and involves payments to upstream forest landowners located in the area of the municipality water intake pipe. The municipality created its own environmental unit (which now also conducts other environmental management activities) and the scheme was set up in collaboration with the NGO Cederena. Interestingly, users are not aware that the increase in water charges was due to the PES; they accepted the payment because there were simultaneous improvements in the water supply infrastructure that did, in fact, greatly improve supply.

MATURITY OF THE INITIATIVE

Ongoing. Programme launched in 2000. Payments commenced in January 2001 and are to be reviewed every five years.

DRIVER

Interest in improving water supply to the town of Pimampiro. Payments were set up to protect the "Nueva América" forest located in the headwaters of the municipality's water system. The new pipes effectively alleviated water shortages problems in the town of Pimampiro. (Prior to this the town only had running water two hours a day, three days a week (Ordóñez, 2004a).

Context of the PES programme.

The Pimampiro PES initiative began as part of a natural resource management and agricultural assistance project (DFC), an FAO-funded project for *community forest management* worked with the Nueva América Association (ANA) to develop a management plan for their forest.

Later, with support from CEDERENA (an NGO that evolved from DFC), the municipality and with funding from the Inter-American Foundation, the project that had focused mostly on soil conservation, organic farming and sustainable forest management techniques, was updated. It now includes five programmes: 1) forest and *páramo* management (Non-Timber Forest Products (NTFP) such as medicinal plants and orchid-growing projects), 2) environmental awareness and education, 3) *environmental services*, 4) agro-ecological production and 5) research (Ordóñez and Puglla, 2004).

STAKEHOLDERS

Supply

Private landowners -20 families part of the Nueva America Association- Agriculture and Cattle Production Association, who own the forest area (390 hectares are forest and 163 hectares are páramo -high altitude grassland) located at the headwaters of the Rio Palaurco, where the town of Pimampiro (32 kilometres downstream) has its drinking water intake pipe. The forest is located in the buffer zone of the Cayambe Coca Ecological Reserve.

Demand

Local government: municipality of Pimampiro representing 1,331 water users. Water is also used for irrigation and negotiations are underway to try to encourage these users to participate in the payment scheme as well.

Intermediary

No intermediary, direct negotiation between the municipality of Pimampiro (representing final users) through its newly created environmental department (UMAT) and farmers

upstream, who although belonging to the association, have signed contracts on an individual basis.

Facilitator

Local NGO, CEDERENA- Corporation for the Development of Natural Resources.

MARKET DESIGN

Service

Maintenance of water quality and quantity through forest conservation.

Commodity

Conservation and protection of existing ecosystems through forest and páramo conservation.

Best Management Practices, through land use management contracts.

Payment mechanism

Fund - local NGO and municipality/user fees. A fund was created to finance PES payments through seed capital from an initial investment of US\$15,000 (US\$10,000 from the IAF, via CEDERENA, and US\$5,000 from the FAO-funded Community Forest Project, and a 20 per cent increase in municipal water charges.) Contributions are pooled into a fund specially created for the PES by the municipality ("*Fondo para el pago por servicios ambientales para la protección y conservación de bosques y páramos con fines de regulación de agua*"). The fund is jointly managed by CEDERENA and the municipality's environmental department (UMAT).

Participant landowners agree to protect native vegetation from deforestation and land conversion. The agreement stipulates which areas are covered, establishes a land management plan and determines payments in accordance with current land use (Echavarría et al., 2004). To receive payment, each member of the Nueva América Association must sign an agreement with the municipality of Pimampiro. Payments are made through the local offices of the Banco de Fomento.

Determining the payment level: The levels of payment were not based on any economic valuation of the cost to the landowners of providing the services or the benefit to the users (their willingness or ability to pay for the improved service). The initial calculation was solely based on how much land could be included in the scheme and how much money would be required (Ordóñez and Puglla, 2004).

Nevertheless, valuation studies of the environmental service provided were conducted later, with the objective of making the system self-sustaining. The valuation methodology was based on the formula developed for the ESPH in Heredia, Costa Rica (see Case Profile) by Barrantes and Castro (1999). The formula estimates the value of protection of the ecosystem (in this case the forest) in terms of water produced; plus the restoration value of the forest, which is the value that should be charged to invest in recovering the hydrological capacity upstream. The application of the formula results in: the protection value of the forest for the production of water is equal to US\$0.03 per cubic metre) and on the cost of forest restoration was found to be US\$0.10 per cubic metre, suggesting that the value of the environmental service is US\$ 0.13 per cubic metre. This value corresponds almost exactly to the increase made initially: 20 per cent increase in the existing charge, which corresponds to US\$0.16 per cubic metre.

Although the formula is relatively easy to apply, it received critics when it was applied in Costa Rica as it is strongly based on the perception (unproven by hydrological studies) that forest increases water quantity; and the methodological incongruity of adding two values calculated by different methods.

Terms of payment

cash-payment, on-going payments. The municipality collects payments from users on a monthly basis (on average US\$1.2 per family per month (for average use of 30 cubic metres per month) and payments to landowners are made on a quarterly basis. Payment categories vary according to the condition of the value of the ecosystem to protect: US\$1 per hectare per month for undisturbed páramo or primary forest, US\$0.75 per hectare per month for old secondary forest and US\$0.50 per hectare per month for new secondary forest.

Funds involved

(after Álbán and Wunder, 2005)

- Start-up costs US\$38,000 representing US\$76 per hectare. Three CEDERENA technicians and a representative of the municipality worked together in the design phase and stakeholder negotiation process, for a year (implementation of the payments was carried out in four months).
- Donor seed funds: US\$15,000 used to set up the trust fund (non-depleting fund, only uses interest raised, which in 2005 was around US\$700-800 a year).
- Payments from users (from water fee): around US\$4,700 a year (on average).
- Payments to providers: around US\$4,200 a year (on average). The difference is paid back in to increase the fund.
- Monitoring (US\$4,800) and Management (US\$1,800) costs are covered by the municipality.

ANALYSIS OF COSTS AND BENEFITS

Economic

There was also an assessment of the users' willingness to pay for water resource improvements, however this was not taken into account, due to the fact that it is was too low (0.035 US\$ per cubic metre for a monthly consumption of 20 cubic metres, corresponding to 0.01% of the average monthly income of these families (Ordóñez and Puglla, 2004).

Transaction costs are about US\$6,600 per annum- this amount is about one third over the funds collected through the water use fee and corresponds to 50 per cent of the entire annual costs of the programme, including payments to landowners. These costs are covered by the municipality and not internalised into the scheme.

Income benefits: on average, participants receive US\$21.1 per month, which is equivalent to 30 per cent of monthly household expenditure. According to Echavarría et al. (2004), these extra funds are mostly used to cover basic expenses and the families' short-term needs: food, agricultural production, health and education. Due to the lack of funds however, landowners outside the Nueva America who have an interest in participating in the PES scheme, (like the community of La Florida) have not been able join and may consider themselves discriminated against by the municipality.

Environmental

Delivery of the service: there was a real improvement in water quantity and quality reaching the city, mainly due to the infrastructure improvements (undertaken by the municipality).

Additionality: there has been reduced intervention in forest and páramo land. Although monitoring shows that at some point there have been some violations to the agreements

(in the form of slash-and-burn practices, unauthorised selective timber extraction and soil and undergrowth extraction), the frequency and intensity has reduced following introduction of the PES.

Vogel (2002, and personal communication, 2004) highlights that payments could have been devised to reflect these different opportunity costs: the areas within the forest are under less conversion pressure, than the rims.

Ordóñez, R.Y. (2004 b) highlights an increase in environmental awareness among the families involved in the project. At the same time, the creation or strengthening of environmental institutions, to deal with the PES system, like the municipal environmental unit, has allowed other environmental problems to be addressed).

According to Wunder and Albáan (2008), targeting of the small scale scheme in Pimampiro has contributed to stopping deforestation and to the marked recovery of native vegetation, contrary to trends happening in most neighbouring villages. Before the introduction of payments in 2000, approximately 30 per cent of the total area had been converted to cropping and pastures, compared to a reduction of only 14 per cent in 2005. It is hard to check what the effect on water availability is, with no baseline studies to draw on or appropriate counterfactuals. Downstream perceptions of increased water flows can be strongly affected by improved infrastructure created parallel to the beginning of the PES scheme (Echavarría et al., 2003).

Social

The PES is inserted in (and complemented by) a wider sustainable development project that includes several other environmental management initiatives aimed at improving overall livelihoods by complementing income and increasing food security (for more details on this see Ordóñez and Puglla, 2004). Through the scheme, participants received technical assistance and training to develop agro-ecology projects (creation of organic family gardens) and agroforestry projects (medicinal plants collection and commercialisation, and production of highly valued ornamental plants, like orchids). *Poverty issues.* Although San Pedro de Pimampiro is a poor rural municipality, it could be argued that farmers receiving PES in Nueva America are relatively well off, as but most of them live (and have land) in the mid-section of the watershed. However, livelihood opportunities are very limited, access is very difficult, and the land is not very productive. The PES has become a very significant part of the family income.

LEGISLATION ISSUES

This scheme presents an example of how a PES scheme can be set up to encourage landowners to adhere to existing (but poorly enforced) Forest Law (1981) that forbids forest from being converted to other uses without permission; this has been a controversial characteristic of this PES scheme, and common to others, in the sense that it is questionable whether paying somebody to follow the law is the correct approach.

In the national legal context of Ecuador, PES is a recognized tool to "create and promote the legal basis and mechanisms to allow the payment for environmental services provided by forests, so that their owners will receive a monthly payment in cash for the services they render" (in Ecuador's second Strategy for Sustainable Forest Development). The National Biodiversity Policy, recommends establishing PES for the protection of mountainsides, provision of water from forests and *páramo* and coastal protection, for hydroelectric generation and human use by providing adequate compensation to the landowners of the lands that generate these services.

MONITORING

Monitoring has only been carried out to ensure compliance with the PES agreements. The committee chooses four families at random and technical experts from UMAT, CEDERENA and the municipality to evaluate the condition of their land. The experts then write a report, which is assessed by the committee before payment is made. There has not been any assessment of the hydrological changes due to the PES protection. Water quantity is

restricted by infrastructure deficiencies and the quality is not monitored, only pollution sources are prevented.

MAIN CONSTRAINTS

UNSUSTAINABILITY OF THE FUND:

Shortfall of funds collected as water charges due to:

- i) low collection rates (only 60 per cent of the water billed is actually paid for) and
- ii) insufficient demand being captured by the project, since irrigation users, as the largest and most inefficient users, are still not included in the project. At time of writing negotiations with the Irrigation Boards had ceased.

High running costs: Monitoring and administration costs alone are higher than the total annual input to the scheme, which is about US\$5,500 (water fees and interest raise from the fund), rendering the scheme financially unsustainable.

Lack of support for PES investment: Users believe that funding raised through the water fee is being invested in general water improvements (including infrastructure for increasing water flow (water uptake and transport, treatment and distribution), and not PES payments to upstream landowners. Álbán and Wunder (2005) point out that, in fact, the municipality has not found the right momentum to inform the users of the existence of the PES scheme, even though willingness to pay for watershed conservation was verified. In the future, this may be one of the main constraints for expansion of the scheme, particularly due to strong pressures from the providers, to increase the level of payments. In addition, Ordóñez (2004 b) believes that "the main obstacle is the lack of 'payment culture' of people in small cities."

Since the leading NGO CEDERENA has now recently left the scheme Álbán and Wunder (2005), consider that it is uncertain whether the Municipality will assume the monitoring and management costs, and from what sources it would finance it. In addition, they highlight the fact that since the funds are kept in a simple saving account, instead of in a structured trust fund, these could easily be assigned to other purposes, due to the municipal control on the decision-making organ of the fund.

Contracts were to be renewed in 2005 and the amounts awarded were to be re-negotiated as well, according to participants' requests. We could not contact people in CEDERENA or the municipality (UMAT) to learn how the process was organised or if there had been any recent changes in the scheme.

MAIN POLICY LESSONS

WATER QUANTITY: FOREST OR PIPES? The real problem addressed here was more the lack of basic water supply, due to infrastructure deficiencies, rather than forest degradation. Had there not been parallel investments in the supply system, potential benefits from forest protection would remain undermined by the inadequate supply system. Users' willingness to pay certainly owes more to this, than to forest conservation, in this case. In fact, according to Álbán and Wunder (2005), the two main factors that led to the support for the PES scheme were the long period of drought during 1999 and the construction of a canal to increase the flow of water. The combination of both resulted in a very visible increase in the quantity of water available to the city in the following year, and this created a very positive environment for the municipality to establish the new water fees. According to the same authors, "the municipality has not yet told the population of the city about the PES process. They fear that they will be against it."

PES IS ONLY ONE PART OF THE LIVELIHOOD PUZZLE: It is important not to count on PES alone as a livelihood improvement tool. Other components are required to generate alternative sources of income, such as the sale of NTFP (medicinal plants, orchids) and ecotourism, and to alleviate the pressure on forest, while giving the communities

alternative rural activities to engage in. As Cuellar and López (2002) have put it: "Payment for ecosystem services does not solve all the socio-environmental problems of an area. It's important to complement this conservation strategy with the implementation of a variety of alternatives to bring about social, environmental and economic improvements."

OTHER INFORMATION

Replication of the experience in Pimampiro- the case of El Chaco: Based on this model, the InterAmerican Foundation (IAF), has also awarded CEDERENA a grant of US\$320,400 over three years, to "launch Payment for Environmental Services Protection Programs in ten municipalities based on its successful water conservation model in the Pimampiro municipality. Its project will include activities to increase capabilities of Municipal Environmental Unit staff, training for 1,200 farming families, and exchanges and dialogue between key stakeholders" (IAF 2004). One of these projects is in *El Chaco*, where there have been ongoing negotiations between the municipality and two landowners (total of 50 hectares). According to Alban, M. (personal communication) the scheme is encountering difficulties because the two families do not accept the proposed agreement and the municipality is considering expropriating the land.

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REFERENCES

Alban, M and Wunder, S. 2005. Payment for Environmental Services: the Cases of Pimampiro and PROFAFOR in Ecuador. Article presented at the ZEF workshop on "Payments for Environmental Services Methods and Design in Developing and Developed Countries". Titisee, Germany, June 15-18, 2005. Bonn, Germany, Centre for Development Research, University of Bonn.

Barrantes y Castro (1999). Estructura tarifaria hídrica ambientalmente ajustada: Internalización del valor de variables ambientales. Documento preparado para la empresa de servicios públicos de Heredia S.A. Costa Rica.

Cuellar, J. C. López A. 2002. Seminario Taller: *Los Servicios Ambientales en el país, con énfasis en el recurso agua*. Contribution for the 2nd week of the forum on Rural Municipalities and participatory local management in mountain areas. May 29th - July 5th - 2002. CONDENSAN. Peru.

Echavarría, M. 2003. Three watershed protection experiences at different scales in Ecuador and Colombia. Presented at the training workshop on "Reward Mechanisms for Environmental Services: How to Assess, Negotiate and Monitor" 17-25 September 2003, Chiang Mai, Thailand.

Echavarría, M. Vogel J. Alban M and Meneses F. 2004. The impacts of payments for watershed services in Ecuador. Emerging lessons from Pimampiro and Cuenca. MES 4London, Environmental EconomicS PROGRAMME- IIED. Markets for Environmental Services- MES. <http://www.iied.org/pubs/display.php?o=9285IIED&n=3&l=7&s=MES>.

IAF (2004) http://www.iaf.gov/grants/awards_year_en.asp?country_id=8&gr_year=2004.

Ordóñez, R. Y. 2004a. *Pago por la Protección de servicios ambientales: una propuesta para la conservación de bosques y páramos. El caso de la Asociación Nueva América Pimampiro-Ecuador*. Revista Agroecología y Desarrollo, Revista de CLADES No.14 (but was it actual quantity available or quantity gathered, treated and supplied to the town?), Centro Latino Americano de Desarrollo Sustentable CLADES.



Ordóñez, R. Y. 2004b. personal communication.

Ordóñez, R. Y. and Puglla R. C. 2004. *El manejo de recursos naturales renovables: Una experiencia práctica de desarrollo*. Quito, Ecuador, CEDERENA.

Wunder, S., Albán, M., 2008. Decentralized payments for environmental services: The cases of Pimampiro and PROFAFOR in Ecuador. *Ecological Economics* 65, 685-698.

LINKS

http://www.iaf.gov/publications/fact_sheets_text_en.asp?pageLevel=cover&fr_id=43&fr_year=2005

http://www.zef.de/fileadmin/webfiles/downloads/projects/devcom/PES_workshop_files/Ca se_study_Ecuador.pdf