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Photo: Marcela Quintero, CIAT

PAYMENT FOR ENVIRONMENTAL SERVICES

SEEKING INCENTIVES TO PROMOTES
THE SUSTAINABLE USE OF RESOURCES
AND TO GENERATE NEW
DEVELOPMENT DYNAMICS
IN WATERSHEDS

Payment for Environmental Services is one of the instruments used for the conservation of ecosystems and for the generation of new development initiatives. At present, there is no single method in existence to establish a scheme for payment for environmental services . CONDESAN has responded by establishing a method for the identification and assessment of external environmental effects, as well as for the identification of beneficiaries and interested parties. Currently, there is a project underway to measure the impacts produced by changes in the land uses. This project should remedy the current situations of pollution, non-sustainable use of resources and poverty, as well as generating dynamics for environmental service payments based on experiences that are effective, efficient, fair and sustainable through time.

THE PROBLEM

Economic and financial instruments for the preservation of ecosystems and for the generation of development dynamics have been in use during last years. One such instrument is Payment for Environmental Services (PES), which is focused on motivating positive external environmental effects through the transfer of financial resources from the beneficiaries of certain environmental services, to those who provide the services (1).

Many of the methods proposed for the prevention and preservation of the ecosystems were based on the premise that "those who pollute, pay". Efforts were made through taxes, ecological fees and other tools to prevent negative external environmental effects. While the mechanisms based on this premise attempt to have those generating negative external environmental effects provide compensation for the damages inflicted upon society, PES aim at having those who benefit from positive external effects (environmental services) pay those who generate such effects. The main difference in the PES approach is that it tries to find incentives for the generation of positive external effects, and not just prevent the negative effects. An effective, efficient and fair transfer of resources, as well as the sustainability of the PES schemes, is the key factors that will guarantee its success.

Regulatory approaches could end up affecting living conditions in poor communities, driving them to adapt illegal survival patterns. In comparison, the PES schemes try to be more flexible and influential, and therefore they become an important alternative

for the prevention of ecosystems degradation, and probably for the reduction of poverty. They may also generate a continuous flow of payments, guaranteeing their sustainability (1).

The environmental services identified so far can be classified into four different categories: water services, carbon recovery, preservation of biodiversity and beauty of the landscape.

In the Andes, such essential environmental services are being threatened by erosion, climate change, greenhouse gas emissions and natural disasters. The situation becomes more critical as a result of the actions of farmers living on the slopes of Andean watersheds, who are normally the poorest. Falling agricultural prices and fewer investments in the rural sector drive farmers to perform soil-degrading and water-polluting agricultural practices, thus affecting the environmental services in the lower part of the watersheds (2). They are forced to expand the agricultural boundaries, destroying the unique natural ecosystems found in the upper zones, such as the paramos, an special highland ecosystem of the Andes.

In situations such as those existing in the Andes, there is a notable potential for the provision of environmental services and the corresponding transfer of resources - from those who receive them to those who generate them - that has yet to be exploited. One of the causes that has been identified preventing the provision of environmental services is the lack of scientific evidence.

Many farmers use methods that degrade the soil, which affect the environmental services in the lower areas and push the agricultural boundaries upwards, destroying the unique natural ecosystems .

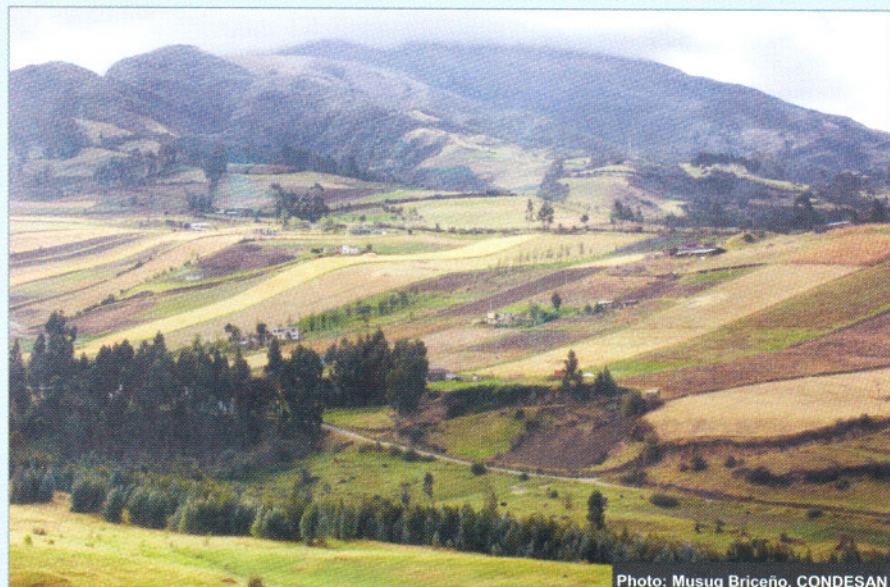


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OUR PROPOSAL

To establish mechanisms that will enable payments for environmental services, there must be a method that will be of help in the key steps. Among these, the following are worth highlighting:

- Quantification of environmental services related to water and soil (soil use – soil – water relationship).
- Identification of priority areas to implement changes in soil use and/or soil management practices at the watershed level.
- Identification of enhanced soil management or soil use alternatives for a better environmental service.
- Calculation of opportunity costs for the proposed alternatives as well as of shadow prices for the environmental services.
- Negotiation and creation of financial and/or economic schemes to promote the desired alternatives.

PES mechanisms must aim to be Effective, Efficient and Fair (1) in addition to being sustainable through time. To achieve these goals, there must be an optimal payment for the services, a decrease in the transaction costs and fairness with regard to the beneficiaries and producers of the environmental services.

CONDESAN has established an analytical method that permits to design a scheme of Payment for Environmental Services. This method falls within the framework of the key steps mentioned before and focuses mainly on the following points:

- Clear establishment of where exactly the external effects originate, how much effect is generated, and who is affected. With the aid of a water-soil process simulation model, it has been possible to identify a Hydrological Response Unit (HRU) and to use it to quantify the services. This is done using the Arcview 3.1 SWAT Interface (Soil and Water Assessment Tool) (USDA 1999).
- Through the use of experimental economics, an assessment is made of the willingness to pay for such environmental services by designing and implementing economic games.
- Assessment of the external effects and determining the opportunity costs: This is accomplished through the use of an enhancement model for ex ante assessment of production alternatives and



Photo: CONDESAN

It must be considered that mechanisms for the Payment of Environmental Services must attempt to be effective, efficient and fair, in addition to being sustainable through time.

for the quantification of positive external environmental effects in the Andean watersheds. ECO-SAUT (Quintero et al., 2006).

- Implementation of the alternatives collectively chosen to be the most suitable by means of economic and/or financial mechanisms.

So far, CONDESAN has been able to analyze 100 watersheds (2500 HRU) in four Andean countries, both biophysically and economically.

At present, the project entitled "*Payment for Environmental Services as a mechanism to promote rural development in high altitude watersheds in the tropics*" (Project CPWF PN 22: CONDESAN, CIAT, DIIS and GTZ), studies how the negative effects of the non-sustainable uses of the soil can be minimized. The project explores the feasibility of credit arrangements and direct payments to poor farmers living on the slopes of the watersheds, to thus improve their agricultural practices and increase family income. Through the credits granted, farmers will have the option of changing their agricultural practices, thereby minimizing soil degradation and water pollution, so that the residents of the lower parts of the watershed are favorably affected.

URH: Hydrological Response Units. These units are areas defined with a unique combination of soil use, soil type and other hydrological conditions assumed by the SWAT model, which will have a single response with respect to water flows and transport of sediment.

One of the main achievements of the project is the institutional part for credit arrangements to encourage the implementation of new agricultural practices in areas being given priority for the reduction of negative external environmental effects. The aim is to evaluate the short, medium and long term impacts that generate changes in soil use, and in the environmental services. By this, the attempt is to also generate payment dynamics that are sustainable over time, as the groups involved (government entities, NGOs, farmers) witness the results obtained from changes in soil use practices.

MORE INFORMATION

- [1] Mayrand, K., Paquin, M. 2004. Environmental Service Payments: Study and assessment of current schemes. Commission for Environmental Cooperation (CCA). UNISFÉRA.
<http://www.infoandina.org/recurso.shtml?x=4466>
- [2] Estrada, R. D., Quintero, M. 2003. *Propuesta metodológica para el análisis de cuenca: Una alternativa para corregir las deficiencias detectadas en la implementación del pago por servicios ambientales* (Methodological proposal for watershed analysis: An alternative to remedy the deficiencies detected in the implementation of environmental service payments).
<http://www.infoandina.org/recurso.shtml?x=4467>
- [3] Rubiano, J., Quintero, M, Estrada, R.D., Moreno, A. 2005. Multiscale Analysis for Promoting Integrated Watershed Management. Water International. (Submitted).
- [4] Neitsch, S.L., Arnold, J.G., Williams, J.R., 1999. Soil and water assessment tool user's manual. Version 99.2.
<http://www.infoandina.org/recurso.shtml?x=4469>
- [5] Quintero, M., Estrada, R.D., Garcia, J. 2006. *Modelo de optimización para evaluación de alternativas productivas y cuantificación de externalidades ambientales en cuencas andinas ex ante. Modelo de evaluación económica, social y ambiental de usos de la tierra* (Model to enhance the assessment of production alternatives and for the quantification of external environmental effects on *ex ante* Andean watersheds. Economic, social and environmental assessment model of soil use) (ECOSAUT). Centro Internacional de la Papa (International Potato Center — CIP).
<http://www.infoandina.org/recurso.shtml?x=4465>

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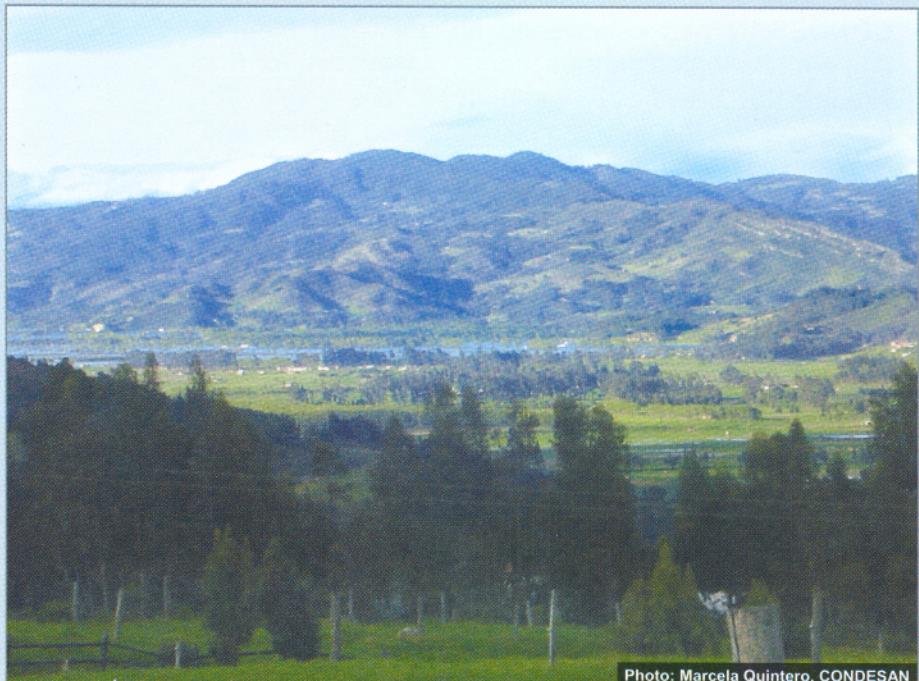


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Sharing knowledge for the sustainable development of the Andes

