

# FINAL BRIDGING ACTIVITY REPORT

*Analysis Required for Payments for Watershed Environmental Services (PWES)*

**PI:** Douglas Southgate, Ohio State University

## **I. Executive Summary**

Carried out in the vicinity of Quito, Ecuador, this bridging activity demonstrated the potential for local financing of watershed conservation through the use of payments for environmental services and other innovative approaches. Household-level surveying required for this study was completed in Paquiestancia (a rural community upstream from the small city of Cayambe and an important source of drinking water in the region) in early 2006. From April to June, survey data were analyzed and a manuscript was submitted for peer-review to *Land Economics*, a leading journal in the field of environmental economics. In addition, research results were shared at a workshop held in Quito on June 26, as well as in meetings with USAID staff and local stakeholders. The terminal date of this project has been extended to November 30, to allow for preparation, printing, and dissemination of the workshop proceedings to key stakeholders in the country.

## **II. Research Outputs, Results, and Impacts by Objective**

The fundamental purpose of this bridging activity was to demonstrate the degree to which watershed conservation can be financed locally – specifically, through the use of PWES collected from the beneficiaries of conservation, who by and large live and work in lower watersheds.

One specific objective was to estimate the price increases that the customers of potable water systems would pay (WTP) for the sake of conserving water sources. With concurrence from the Management Entity (ME), this objective was dropped a few months into the project because of political realities in the small city of Cayambe, Ecuador (northeast of Quito), which was the site chosen for WTP estimation. The municipal government of that city had recently raised prices charged for potable water, thereby eliminating all subsidies. To win acceptance of this policy-change, local officials promised a multiple-year moratorium on additional price increases. As a result, they were unenthusiastic about any research, such as ours, that suggested higher prices might be in the offing. Since these officials facilitated our research in various ways, we decided to agree to their request not to ask about WTP.

That left another specific objective of the project having to do with economics, which was to estimate the compensation that people in the upper reaches of drainage basins would accept in return for altering resource use for the sake of watershed conservation. The sensitivity of this compensation – willingness-to-accept (WTA) – to household-level livelihood strategies was a particular concern of this study.

An additional objective of this project was to identify legal issues associated with the implementation of PWES.

### **Objective 1: WTA Estimation**

A primary contribution of this bridging project has been to produce empirical evidence concerning the linkage between household-level livelihood strategies on the one hand and conservation payments on the other. To be specific, household data collected in rural communities close to Cayambe has been used in econometric analysis that has yielded two general lessons.

1. Households that are highly dependent on farming, with very limited non-agricultural earnings, use conservation payments to diversify income-sources. By and large, the payments they demand in exchange for reducing farmed area are relatively low.
2. Households with diversified earnings place a high value on resources that can be harnessed for subsistence production, especially during periods of below-normal, non-farm income. As a result, they demand high payments in exchange for reducing agricultural land use.

These findings, which fall into SANREM's farm-level category, while also having direct implications for the management of watersheds, as well as policy and governance, are reported in a manuscript written by D. Southgate, T. Haab, J. Lundine, and F. Rodríguez, "Responses of Poor, Rural Households in Ecuador and Guatemala to Payments for Environmental Services," which was submitted to *Land Economics* on June 8, 2006. Reviews were received in August, and the manuscript is currently being revised in anticipation of resubmission to the same journal.

The main impact of this research in terms of development is to introduce a note of caution concerning PWES. Some advocates of payments suggest that actual compensation levels need not be very high – generally reflecting average levels of output from land being taken out of production. This standard for determining compensation overlooks the de facto insurance value of resource-access to rural households and, therefore, underestimates minimally acceptable levels of conservation payments.

The schedule originally envisioned for data collection was delayed slightly because of leadership changes in the rural communities where household surveying took place. Once the project was explained, however, data collection was accomplished without any problems. Subsequent analysis and the writing of reports and scholarly papers happened on schedule.

### **Objective 2. Legal Analysis**

Alegría Corral, who received a J.D. from the Catholic University of Quito with a focus on environmental law in 2005, was commissioned to prepare an assessment of laws and regulations bearing on the use of payments for environmental services (PES) in Ecuador. This assessment, which relates to the "policy and governance" level in the SANREM hierarchy, was completed on time.

One of Dr. Corral's findings is that constitutional provisions and other legal arrangements related to PES are focused on foreign payments for environmental services of global significance produced in Ecuador. The conclusion is unmistakable. The Ecuadorian state has been much concerned with establishing the institutional framework required for it to profit from the production of these services. In contrast, existing legal arrangements for PES within the country, specifically including PWES, are poorly developed, although legislation on municipalities gives local governments' wide latitude to employ PWES. Several municipalities have chosen to do exactly that.

Along with the results of economic analysis, Dr. Corral's report has been used to help guide decisions made by local governments interested in PWES. Among these is the government of Cayambe. Under the auspices of this project, similar policy-dialogue was undertaken with local authorities in Gonzalo Pizarro and other locations.

Dr. Corral presented her findings at the June 26 workshop, which is described in greater detail below, and her written report will be included in the volume of workshop proceedings that will be published in November 2006.

### **III. Degree and Non-Degree Training Activities**

No degree training was provided under the auspices of this project. Non-degree training occurred during a workshop on watershed conservation held in Quito on June 26, 2006 and organized by Fundación Antisana. The program for the workshop is attached. As indicated in the attached table entry, approximately 75 representatives of governmental agencies, NGOs, educational institutions, and other stakeholders participated in this event.

### **IV. Publications, Presentations, and Other SANREM CRSP Products**

All publications and presentations are listed in the Publications, Presentations, and Other Products table. All but three of the publications have been provided already to SANREM, accompanying previous quarterly reports. One of the other two is a lessons-learned document that was completed and submitted on August 1.

The manuscript is currently being revised before resubmission to *Land Economics*, which is a peer-reviewed journal. The other publication is the proceedings of the June 26 workshop, which will be published and distributed by November 30, as made possible by an extension of this bridging project.

### **V. Networking Activities**

Much of the networking that took place in this project occurred in the aforementioned workshop that Fundación Antisana organized in Quito on June 26, 2006. This event – titled “Experiencias de Manejo de Cuencas Hídricas en el Ecuador” (Experiences with Watershed Management in

Ecuador) – was attended by approximately 75 individuals and featured presentations by representatives of various local governments that have implemented, or are implementing, payments for environmental services for the sake of watershed conservation. SANREM investigators Alegría Corral (environmental attorney), Fabián Rodríguez (natural resource specialist), and Douglas Southgate (economist) also made presentations.

In addition, María Helena Jervis (executive director of Fundación Antisana) and Dr. Southgate met on multiple occasions with the mayor of Cayambe, Dr. Diego Bonifaz. Lessons learned from SANREM-funded bridging project that are relevant to watershed conservation in and around Cayambe were discussed, as were opportunities for implementing PWES. Also, Dr. Southgate made a presentation at USAID on June 30, 2006. The mission's biodiversity strategy was discussed, as were the implications of SANREM-funded research.

## **VI. Project Impact Highlights**

- Economic research in the vicinity of Cayambe suggests that rural households that are highly dependent on farming, with very limited non-agricultural earnings, use conservation payments to diversify income-sources. By and large, the conservation payments they demand in exchange for reducing farmed area for the sake of watershed management are relatively low.
- The same economic research also indicates that rural households with diversified earnings place a high value on resources that can be harnessed for subsistence production, especially during periods of below-normal non-farm income. As a result, they demand high payments in exchange for reducing agricultural land use.
- As in other countries, national PES legislation in Ecuador largely reflects the desire of the national government to capture international payments for services of global significance produced inside the country. This legislation has little to say about the potential of PES inside the country, including watershed conservation. Nevertheless, local governments are proceeding with PES schemes; making use of the power they have under Ecuador's municipalities' law to safeguard local water-sources.

### Publications, Presentations and Other Products

Category	Bibliographic Citation*
Articles Published in Refereed Publications	Southgate, D., T. Haab, J. Lundine, and F. Rodriguez. "Responses of Poor, Rural Households in Ecuador and Guatemala to Payments for Environmental Services," to be resubmitted in October 2006 to <i>Land Economics</i> , for second review.
Books/Book Chapters	Rodríguez, F. and D. Southgate. 2006. "Local Resolution of Watershed Management Trade-Offs: The Case of Cotacachi, Ecuador," in R. Rhoades (ed.), <i>Development with Identity: Community, Culture, and Sustainability in the Andes</i> . Cheltenham: CAB International, 2006.
SANREM CRSP Annual Reports and Highlights	Southgate, D. "Sharing Experiences with Watershed Management in Ecuador" (SANREM lessons-learned document), August 2006.
Conference Proceedings	Jervis, M. <i>Memorias del Taller sobre Experiencias del Manejo de Cuencas Hidrográficas en el Ecuador</i> . Quito: Fundación Antisana, November 2006.
Papers/Seminars Presented	Southgate, D., T. Haab, J. Lundine, and F. Rodriguez. "Payments to the Rural Poor for the Sake of Conserving Tropical Watersheds: A Contingent Valuation Analysis in Ecuador," presented at annual meeting of Association of Environmental and Resource Economists, Providence, RI, July 2005.

### Non-degree Training

Program type (workshop, seminar, field day, short course, etc.)	Date	Audience	Number of Participants	Training Provider (US university, host country institution, etc.)	Training Objective
Workshop	06/26-2006	Representatives of government organizations, NGOS, universities, etc.	75	Fundación Antisana and Ohio State University	Share ideas on payments for environmental services and other innovative approaches to watershed management in Ecuador

TALLER EXPERIENCIAS DE MANEJO DE CUENCAS HÍDRICAS  
EN EL ECUADOR

UNIVERSIDAD ESTATAL DE OHIO – FUNDACIÓN ANTISANA  
(PROYECTO SANREM)

QUITO, JUNIO 26, 2006

Lugar: Facultad Latinoamericana de Ciencias Sociales, FLACSO  
Pradera E7-174 y Diego de Almagro

AGENDA

- 09h00-09h10 Bienvenida  
María Helena Jervis, Directora Ejecutiva de la Fundación Antisana
- 09h10-09h35 Manejo de la cuenca alta del Río Dashino  
Ing. Santiago Echeverría, Municipio de Gonzalo Pizarro, Provincia de Sucumbíos
- 09h35-09h50 Discusión
- 09h50-10h20 Manejo de cuencas en el páramo de El Ángel, Provincia del Carchi  
Ing. Mauricio Proaño, Presidente Corporación Randi-Randi
- 10h20-10h35 Discusión
- 10h35-11h00 Refrigerio
- 11h00-11h25 Manejo descentralizado de las fuentes de agua en el Cantón Cayambe, Provincia de Pichincha  
Ing. Yolanda Cáceres, Jefa de Recursos Hídricos, Municipio de Cayambe
- 10h25-11h40 Discusión
- 11h40-12h10 Programa de Servicios Ambientales en el Cantón Pimampiro, Provincia de Imbabura  
Ing. Aurelio Guerrero, Municipio de Pimampiro
- 12h10-12h25 Discusión
- 12h25-12h50 Proyecto SANREM – Salinas, Provincia de Bolívar  
Dr. Jeff Alwang, Virginia Tech University – INTERVENCION CANCELADA
- 12h50-13h00 Discusión

- 13h30-14h00 Almuerzo
- 14h00-14h25 Manejo de cuencas hídricas en la ciudad de Cuenca, Provincia del Azuay.  
Ing. Jeanneth León, Directora Ambiental de la Empresa Pública Municipal de Telecomunicaciones, Agua Potable, Alcantarillado y Saneamiento de Cuenca.
- 14h25-14h40 Discusión
- 14h40-14h55 Costo de Conservación de las Cuencas Hídricas  
Dr. Fabián Rodríguez, Proyecto SANREM
- 14h55-15h10 Discusión
- 15h10-15h25 Servicios Ambientales en la Legislación Ecuatoriana  
Dra. Alegría Corral, Abogada
- 15h25-15h40 Discusión.
- 15h40-16h00 Refrigerio
- 16h00-17h00 Conferencia. Conclusiones y cierre, Dr. Douglas Southgate, OSU
- 17h00 Cóctel

“Sharing Experiences with Watershed Management in Ecuador”  
(lessons-learned document)

Douglas Southgate  
Department of Agricultural, Environmental, and Development Economics

August 1, 2006

To mark the end of a SANREM bridging project focused on watershed management in Ecuador, Fundación Antisana, the project’s national counterpart, organized a workshop on innovative conservation initiatives attended by 75 individuals.

Most of the presentations were made by representatives of local governments responsible for these initiatives. For example, the municipality of Pimampiro, which is located in the northern Andes of Ecuador and has about 7,000 residents, has attracted international attention for its use of payments for environmental services (PES). As explained by Aurelio Guerrero during the workshop, households in the mountainous region that supplies the city with its drinking water pledge not to engage in logging, farming on steeply sloped land, and other activities that would harm water quality or create seasonal shortages. In return, they receive payments based on the area they conserve.

Workshop participants were especially keen to hear from Jeanneth León, who represented ETAPA – the municipally-owned company responsible for water supply, wastewater management, and other utilities in Cuenca, a city of 300,000 in the southern Andes. To safeguard water supplies, the company has bought land in areas of critical hydrological importance. In addition, administration of the Cajas National Park, which is the source of much of Cuenca’s water, has been ceded to ETAPA by the national government. Not coincidentally, Cajas is one of the best-managed reserves in the country. In addition, Cuenca has some of Ecuador’s best drinking water. The municipal company also has made significant progress in sewage-treatment.

Contrasting with successful innovation by local governments has been a lack of action at the national level. A reason for this was identified during a presentation made by Alegría Corral, an environmental attorney who participated in the SANREM bridging project and whose work has influenced Paraguay’s new law on environmental services. Constitutional provisions, national laws, and implementing regulations all stress the state’s ownership (as custodian for the Ecuadorian people) of all natural resources that provide environmental services. Many of these arrangements date to the early 1990s, when there were great expectations of international payments flowing to countries with elevated biodiversity. To put it simply, the national government of Ecuador, a country with unusually large numbers of plant and animal species, was very much interested in asserting legal claims that would subsequently allow it to capture a lot of money from other parts of the world.

Given the prevalence of this sort of thinking among national leaders, other policy concerns have been neglected. One of these concerns is adequate support from the central government for provincial and municipal governments attempting to implement PES and other innovative



measures, which Corral's analysis reveals they are legally able to do. This support is of great importance, as economist Fabián Rodríguez (co-principal investigator for the bridging project) emphasized. In particular, he presented evidence that transaction costs of PES (e.g., making sure that landowners in upper watersheds actually honor conservation agreements) are substantial for local communities, especially those with limited populations. Since activities, such as compliance-monitoring, are characterized by economies of scale, it makes sense for the central government to take the lead in this area, thereby reducing the transaction costs for provincial and municipal governments, especially if remote-sensing technology can be applied. So far, however, no such assistance has been provided, which reduces the appeal of PES.

Prospects are not encouraging in Ecuador for national-level reforms conducive to innovative approaches to watershed conservation. Although the "privatization of water" is ill-defined, a large segment of the population is categorically opposed to it and regards measures like PES as nothing more than a subterfuge for accomplishing this change. Douglas Southgate, an Ohio State University faculty member and the principal investigator of the bridging project, lamented the tendency of the debate over water policy toward heated polemics – a tendency that obscures the advantages of well-defined water rights in terms of economic efficiency and social equity.

Southgate also congratulated local governments for their pragmatic approach to watershed management. In a place as geographically heterogeneous as Ecuador, threats to natural resources vary widely, with problems in one setting differing markedly from those in other locations. Aside from commending local leaders for identifying critical issues for their respective communities, he took note of the institutionalization of conservation programs in a number of municipalities, many of which were represented in the workshop. Institutionalization provides assurance that these programs will continue, instead of expiring once one mayor's term expires and someone else takes office. An essential aspect of institutionalization is sustainable financing, of the sort that PES can provide.

Southgate and Rodríguez drew the attention of workshop participants to the recipients of conservation payments: rural people in upper watersheds, most of whom are impoverished. The two SANREM-funded researchers have examined this group's responses to PES, finding in particular that acceptance or rejection of payments depends on household-level livelihood strategies. For example, a family that depends entirely on farming might welcome conservation payments as a way to diversify and enhance its earnings. In contrast, a household with agricultural land, as well as off-farm employment might demand high compensation in return for cutting back on farmed area since it is apt to sustain itself from agriculture whenever there is a shortfall in wage-income. It is clear that understanding the economic circumstances of rural households is essential for PES.

To close the workshop, Southgate suggested that a new culture is emerging in the water sector of Ecuador and other countries – a culture centered on environmental services. Institutions are emerging to enhance the supply of these services and, as this happens, upstream households will be able to put their trust in conservation payments offered by downstream communities and municipal water consumers will have confidence that clean water will flow every time they open a faucet. Sharing experiences with this sort of development, as occurred at the workshop, contributes directly to the culture of environmental services.