

SEPTEMBER 2011

## **ABOUT THIS PROJECT**

### **Name**

What types of investment can most cost-effectively ensure ecosystem service provision? A randomised program evaluation

### **Principal investigator**

Nigel Asquith, Fundación Natura Bolivia

### **Partners**

Kelsey Jack, Sustainability Science Program, Harvard University; Sampurno Bruijnzeel, Vrije University Amsterdam

### **Time frame**

July 2010 to June 2012

### **ESPA regions**

Amazonia

### **ESPA themes**

Biodiversity, Forests, Political Economy, Water

### **Objective**

Using a controlled experimental design modelled on the natural sciences, this project is evaluating the impact of a payments for ecosystem services (PES) scheme on water quality, biodiversity, forest cover and the socioeconomic welfare of the poor in Bolivia's farming communities.

### **Summary**

Despite the billions spent on programmes to conserve ecosystems and help poor communities, there is rarely good evidence that these projects have their intended impacts. In the Santa Cruz valleys of Bolivia, a unique large-scale experiment is underway, testing a forest conservation scheme across 130 villages — divided randomly into groups who do or do not receive payments for protecting forested watersheds. The experiment will show whether conditional in-kind payments for conservation actually lead to environmental and economic improvements, and will shed new light on the relationship between poverty and ecosystem service provision.

The results will provide useful feedback for NGOs and governments rolling out similar schemes elsewhere. And it is hoped that the project's scientific approach will serve as a model for other action-research groups.

# **Do ecosystem conservation projects work?**

**How can NGOs and donors measure the impact of work on forest conservation and poverty?**



Imagine running an pharmaceutical trial in which you take a patient suffering from a fever and give them an aspirin. If the patient gets better, you'll conclude the aspirin worked. If the patient's condition worsens or becomes fatal, you'll conclude the aspirin was not the best treatment. Of course, the patient might have improved without the drug, and if their condition had worsened you wouldn't know if the aspirin had slowed the decline — that's why real drug trials enrol many patients and use control groups. But you have an ailing patient, and you think a pill should help. It simply seems wrong not to try.

Most monitoring and evaluation of conservation programmes takes an analogous approach, argues Nigel Asquith — especially when the aim is to protect ecological resources for the benefit of the poor. Asquith, a conservation policy researcher at the Bolivian NGO Natura Bolivia, is leading a project to introduce more rigour to the field.

For the past two years, Natura Bolivia and colleagues from Harvard University and Vrije University Amsterdam have been preparing

large-scale, controlled tests of a programme that compensates local people for conserving forests in south-eastern Bolivia.

With funds from the European Union and other donors, Natura Bolivia has successfully piloted reciprocal watershed agreements — small-scale, locally-managed payments for ecosystem services (PES) initiatives — since 2003. The NGO has worked with local governments and water cooperatives to explain to communities that cattle-grazing in forests along streams contaminates water supplies and exacerbates droughts for downstream farmers. Water users and providers then negotiate in-kind payments — such as beehives — so that landowners can preserve the upstream wooded watersheds while gaining steady income from them.

The Natura-led initiative has grown from 1,235 protected acres to 22,000 acres in 2010. In 2007, a new 1.8-million-acre protected area was created to conserve the forested headlands of the Santa Cruz valleys, providing an opportunity for villagers within the protected area to adopt their own watershed agreements.

Facing the opportunity for a huge scale-up, Natura wanted evidence that reciprocal agreements not only brought forest areas under contract, but that the conservation of these forests, watersheds, and the livelihoods depending on them was both additional and effective. Experts at Harvard's Sustainability Science programme designed an evidence-based evaluation, including the complex statistical formulas needed to analyse and compare 130 villages across the protected area.

In this way, ESPA funding has enabled Natura Bolivia to borrow approaches from experimental economics to generate new knowledge and evidence. This highly innovative project is one example of how ESPA's framework grants can pioneer new approaches linking ecosystem services and poverty alleviation.

## A tale of two samples

To establish a baseline, researchers surveyed the area's 2,700 families on their socioeconomic situation, perceptions about the environment and local institutions. In each community, Natura Bolivia's staff also measured water quality, vegetation cover and, as a proxy for biodiversity, the abundance and diversity of beetles, amphibians and aquatic macro-invertebrates.

Using an ESPA grant, the NGO then hired technicians and research managers to launch the PES scheme. All 130 communities have received information about the threats to watersheds, better cattle-grazing practices, and alternative ways to live off forests. Half the villages — chosen randomly in a public lottery — now have the chance to enrol in the payment scheme.

Follow-up data will show whether forest conservation is more effective where compensation is paid, as well as the effects of payments on local livelihoods and outlooks. It's the comparison with the 65 villages receiving no payments that makes the study uniquely robust; at best, environmental NGOs may measure the situation before and after their interventions, but donors virtually never require them to assess an untouched site as a control.

That's a mistake, says Asquith — mainly because including a control site is the best

way to judge cost-effectiveness. As Paul Ferraro and Subhrendu Pattanayak — two environmental economists who have long proposed the use of program evaluations in the environmental field — note, "If we want to ensure that our limited resources make a difference, we must accept that testing hypotheses about which policies protect biological diversity requires the same scientific rigour and state-of-the-art methods that we invest in testing ecological hypotheses."

The ESPA-supported project's rigorous results will be equally useful to experts and practitioners asking broader questions about whether poor communities gain when ecosystem services such as watersheds are protected.

There are side benefits to the ESPA-supported project. Asquith reports that in the process of designing a well-controlled evaluation — asking which key elements for impact should be included in the 'experimental' group and left out of the 'control' — his team identified several ways to improve the seemingly successful existing PES payment schemes.

This led Natura Bolivia to try to improve the incentives for conserving the most valuable parcels of forest in the programmes. If Natura Bolivia's research on conservation incentives were a trial of aspirin, it would not only have created a comprehensive study that doctors worldwide could rely on, but would have also come up with epiphanies along the way about what's likely to be the best dosage.

## Next steps

Landowners have begun signing up for PES contracts, and payments are being lined up with support from local municipalities and international donors. ESPA funds will back project implementation until June 2012, when researchers return to the field to assess preliminary results. With data in hand, the group will consider how to engage NGOs and donors with their findings and experimental approach.

Meanwhile, Bolivian officials have drafted a national strategy based on the project; Natura Bolivia is helping to pilot the plan, and is seeking sites elsewhere in the world to further develop the randomised evaluation model.

## NEW KNOWLEDGE

- When NGOs and donors evaluate conservation programmes — in particular efforts to protect ecological resources for the benefit of the poor — they usually ask the wrong questions, measure outputs rather than outcomes and exclude appropriate 'no-intervention' controls. This project explores how to rigorously measure the impact of conservation and development programmes.
- This study is perhaps the first to apply a classic scientific approach to conservation and development, testing a PES scheme over a large sample of communities and comparing 'experimental' to 'control' sites.
- Project partners have gathered baseline data on forest biodiversity, water quality and socioeconomics in 130 communities, which will be useful to other researchers, local NGOs and policymakers; discussed with communities how forest degradation affects farmers downstream; and initiated conservation payment contracts.



## CREATING IMPACT

- The process of designing a well-controlled experimental assessment focused attention on potential flaws in existing local PES schemes, prompting project implementers to rethink and improve their programme design — despite its apparent success in earlier pilot projects. This emphasises the value of involving non-researchers early in the research process.
- A randomised programme evaluation is complex, time-consuming and requires cutting-edge statistical work. Other research groups can use the economic tools and surveys developed in this project to get a head start, while innovating and adapting the method to new purposes.
- Incomplete and inappropriate evaluations result in wasted money. With the spread of this project's approach, and growing data on which interventions really work to improve people's environments and livelihoods, donor investments can do more good.

**The Ecosystem Services for Poverty Alleviation (ESPA)** research programme funds high-quality, cutting-edge research to improve our understanding of the way ecosystems function, the services they provide and how they can contribute to poverty alleviation and enhanced wellbeing. This provides the evidence and tools to enable decision makers to manage ecosystems sustainably and in a way that helps improve the lives of the world's poorest people.