Paying for Environmental Services: Using the Contingent Valuation Method to Estimate Willingness to Pay for Conservation in the Sho'llet Forest, Peru

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Introduction

Many environmentalists claim that nature should be conserved regardless of the costs, and in line with this they dismiss any attempts to value environmental services in monetary terms. However, empirical evidence shows that environmental and species destruction is increasing worldwide, particularly in developing countries. More work needs to be undertaken to understand the value of ecosystems from the perspective of humans as beneficiaries, as it is our own preferences which give value to any good or issue (Brauman et al. 2007). With this, the benefits that conservation of nature offers to people can be valued and compared with the relevant costs, allowing the adoption of conservation measures when it can be demonstrated that they generate economic benefits. This is the basic idea behind a PES scheme, and the following article covers one methodology for calculating payment values.

Methodology

Several methods for valuation have been designed, one of them being the Contingent Valuation Method (CVM). This measures people's preferences through carefully designed surveys, where respondents are presented with a scenario and asked to state their preferences in monetary terms as a willingness to pay for a benefit or accept a loss. The CVM methodology is popular among practitioners due to its flexibility in constructing a market, whereby the researcher can ask for an economic decision related to the good that is being valued (Carson 1998). In the case study of this article, the contingent valuation methodology was applied to the Sho'llet Forest in the Central Jungle of Peru, where an electricity transmission line and power towers were set up over a decade ago, before the area was declared a Municipal Conservation Area (MCA). Currently work is being initiated to expand the line and install additional and bigger towers that will increase electricity coverage, but also environmental degradation through forest clearance for construction of the pylons.

View of one of the current electricity towers in the Sho'llet Forest.
Photo: Gabriella Torres Alva.

View of one of the bigger towers that are to be installed in the Sho'llet Forest.
Photo: Gabriella Torres Alva.

Background

The Sho'llet Forest consists of 1428.12 hectares scientifically known as *sclerophyllous* cloud forest, and is situated at the foot of the Yanachaga mountain range. Two rural towns share the forest, Oxapampa and Villa Rica. While the latter benefits from water provision that originating in the forest area and from the electricity that flows through the transmission line, the former is a somewhat bigger town but currently derives no economic use from the forest; it does not receive the water or electricity flow, nor has it set up any touristic activities in the forest.

This cloud forest has areas located at heights between 2400 and 2700m, where the soil is uniquely organic and thin and filled with trees 15 to 20m high on a very heterogeneous surface, generating microclimates within them that bring

about the existence of considerable flora and fauna diversity as well as several ecological niches. A recent study (Catchpole and Aguilar 2009) found 775 species within the forest's limits, some of which are species that had never been found before at those altitudes, and 55 of which had not been found before in any other protected area. Currently, around thirteen years after the installation of the first power towers, no vegetation has grown again in the cleared paths; it is estimated that if left alone it could take about 175 years for the organic cover to grow back to its natural level (Catchpole and Aguilar 2009).

The survey

In the Contingent Valuation survey, 201 households (from both cities) were surveyed using a stratified sampling methodology. 87% of the respondents answered that they would indeed be willing to pay some amount to minimise the tower's impacts on the forest, with the average amount being PEN[1] 2.22 (US $0.74) per month for five years. To obtain some context for this, 74% of the respondents' household monthly average income is below PEN 1000.00 (US $333.33), with around half in the monthly income band of PEN 550.00 (US $183.33) or less. The scenario was carefully constructed and the respondents were given a hypothetical situation whereby they would make these monthly payments as an addition to their electricity bill. The payments would then be collected by the electricity company and given to the Municipality via a designated team, which would manage and use the funds for the conservation and maintenance of the forest. This scenario was accepted by most of the respondents as viable, which is a vital condition for a successful PES scheme to work out.

The average of the willingness to pay responses was totalled for the population and brought to the present value in order to compare them with the costs of conservation and maintenance of the forest, using a simple cost-benefit analysis. To obtain this present value, two different market discount rates were used in order to do a sensitivity analysis. Using the social discount rate of Peru,[2] which at the time of the study was 11.0%,[3] the total value of the Sho'llet Forest is PEN 577,558.71; while using the Peruvian financial system's average interest rate, 5.4%,[4] the total value is PEN 668,601.29. Meanwhile the calculated costs of reducing the impact of the electricity towers through conservation maintenance work add up to PEN 397,976.21[5] using the social discount rate of 11.0%, and PEN 437,065.56 using the financial system's interest rate of 5.43%. Using these calculations, it can be observed that the benefits of conservation outweigh the costs in the case of the Sho'llet Forest by about 50%.

Current degradation from the installation of the towers done back in 1996.
Photo: Gabriella Torres Alva.

Out of all the people who answered they would not pay anything (zero willingness to pay), some gave "protest" reasons, e.g. they took the opportunity to complain on an issue indirectly related to the proposed scenario but not relevant to the question of valuing the forest. Once the protest answers were removed, those who stated a zero willingness to pay had as main reasons the lack of extra money (36%) and other more important expenses (24%), not a lack of concern for conservation or mistrust of the payment mechanism. Those who were willing to pay said that their main motives were because of the diversity of species in the area, because of the forest being a water source, and because of the air purification capacity of the trees. Tourism potential was not ranked highly as one of the reasons for people willing to pay, suggesting that residents were more concerned about sustaining the services provided by the natural environment for their own sake rather than for accruing extra revenue.

For the statistical analysis, an ordinary least squares (OLS) regression[6] was run on the data to find the correlations between willingness to pay and other variables, in order to try to find out which factors condition people's responses. The explanatory power of the regression obtained was quite sound for a study of small magnitude, with an R^2 of 20% for the OLS with robust standard errors. Previous knowledge of the respondents about the towers in the forest has a positive and highly significant effect on their willingness to pay. Income is also highly significant and positively correlated with willingness to pay, whilst, perhaps more surprisingly, having children is negatively correlated.

Conclusion

The study shows that people care highly for the forest because of the benefits they feel they obtain from it, even if they have a low income and make no actual use of the area (which was the case in the town of Oxapampa). Though policy makers and many civil society actors usually express concern about the low value that people give to environmental goods, especially those that are not directly used, the case of the Sho'llet Forest Conservation Area shows that, on the contrary, people value the direct and indirect environmental services that they receive from the environment. In this instance this manisfests itself as willingness to pay to reduce the negative effects of the electricity towers. The calculation of the payment has challenged the belief that protecting the environment is too costly to be attainable (Albertini and Kahn 2006).

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1 Peruvian Nuevo Sol (local currency).
2 Social discount rates are used by economists to evaluate the future costs and benefits of policies, programmes and actions, adjusting market interest rates for taxes, transaction costs and risk (Cowen, Tyler. "social discount rate." The New Palgrave Dictionary of Economics. Second Edition. Eds Steven N. Durlauf and Lawrence E. Blume. Palgrave Macmillan, 2008).
3 www.mef.gob.pe
4 www.sbs.gob.pe
5 Costs have been calculated from data provided by the NGO IBC (Instituto del Bien Común - www.ibcperu.org) from a study undertaken for the purpose of negotiations with the electricity company.
6 A statistical technique for estimating the parameters in a linear regression model in order to find out the strength of the relationship between certain variables.