



TRANSACTION COSTS

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Introduction

Transaction costs are the costs of negotiating, contracting, implementing, and monitoring a PES program. They include all costs borne by a PES program other than those of actually producing an environmental service (such as investment in new land-use practices). These costs include not only monetary but also non-monetary costs, such as time expended by various program participants. Transaction costs can be divided into two broad categories: (1) *ex ante* or initial costs of achieving an agreement, and (2) *ex post* or costs of implementing an agreement once it is in place. The specifics under each of these categories can vary by case. In general, PES programs face costs related to searching for program partners, negotiating contracts, obtaining necessary approval, monitoring program activities, complying with contractual agreements, and insuring against the failure to secure the environmental service, as shown in the table below.

Kinds of transaction costs for PES programs	
Cost category	Type of cost
Search	Finding interested partners to the transaction Communication (e.g., expenses for telephone and sales representatives) Price information and quality control (e.g., agents)
Negotiation	Coming to an agreement (e.g., time, visits, and drafting of contract)
Approval	Expenses that arise when the trade must be approved by a government agency (e.g., modifications)
Monitoring	Establishing the baseline, observing the transaction and verifying adherence to the terms of the contract (e.g., hiring a verification service)
Enforcement	Insisting on compliance once divergence from contract is detected (e.g., suing the seller)
Insurance	Insurance policies (e.g., for compensation in the event of loss of the good)

Source: Dudek and Wiener (1996)

Transaction costs are a significant component for most PES programs. One study on carbon sequestration projects found that transaction costs ranged from 6% to 45% of the total PES cost.

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Scolec Te in Mexico, a community carbon sequestration project covered by the study, spent more than \$1.3 million on transaction costs, 33% of the total budget.

Need for reducing transaction costs

Transaction costs increase the expense of securing an environmental service through PES. In fact, some environmental services are so difficult to monitor that payment is impossible. Even in less extreme cases, high transaction costs reduce the quantity of an environmental service traded, reducing the gains from trade and the size of the market for an environmental service.

Transaction costs have a high fixed component, which means that relative costs decline as the volume of environmental services being traded increases under any given project. Consequently, a big PES program, covering a large volume of environmental services, faces much lower costs per unit than a small program. Moreover, transaction costs tend to escalate when more parties are involved. Therefore, costs are much higher in absolute terms when dealing with multiple parties rather than a single party. Both these factors have an adverse effect on feasibility of PES programs that aim to work with smallholders. High-volume PES programs that contract with a few large landowners face much lower transaction costs than those that need to enroll a large number of service providers who own only small pieces of land. As a result, PES programs that aim to alleviate poverty by contracting smallholders can find it difficult to break even. To maintain their pro-poor focus and share a larger proportion of revenue with service providers, PES programs must find a way to reduce their transaction costs. There are three broad ways to achieve this: by simplifying guidelines for design and formulation of PES programs, reducing costs of monitoring and measurement, and adopting institutional innovations.

Simplifying guidelines

Most PES programs work under some kind of regulatory system or a set of guidelines. These can include multilateral environmental agreements, national policy frameworks, even how participating agencies design a particular program. Simplification of guidelines is a must if transaction costs are to be reduced and thus for programs to be pro-poor. For instance, initial guidelines under the Kyoto Protocol were considered too strict for small-scale carbon sequestration projects. The protocol's executive board has now simplified requirements (design, registration, validation, and monitoring) to reduce transaction costs for carbon sequestration projects that target low-income communities and generate emission reduction of less than 8,000 tCO₂ annually. Similarly, the CCX has formulated a very simple set of rules governing the sale of carbon sequestration offsets from no-till lands in the United States. The CCX issues carbon offsets to no-till farmers at a flat rate of 0.75 t CO₂ per acre annually. This is a lower bound of the average sequestration rates in the United States but helps landowners to save transaction costs associated with estimating each separate farm's sequestration rate.

Reducing costs of monitoring and measurement. Payments under PES programs are contingent on observable improvements in the quality or quantity (as contracted) of an environmental service. Therefore, programs must carry out regular monitoring to verify that proper land-use practices are indeed being followed and to measure or estimate the specific amount of environmental service being generated. Usually, PES programs prepare a baseline before the program is initiated and then monitor the impact of prescribed land uses at regular intervals. The purpose is to justify the continued provision of economic compensation by demonstrating that the program has been able to secure the environmental service. Monitoring rules are also prescribed by the policy frameworks under which specific PES programs function. For instance, the Kyoto Protocol requires carbon inventories to be assessed every five years by independent verifiers.

Monitoring and measurement costs are a significant component of transaction costs. These costs tend to escalate further when program sites are non-contiguous. Thus monitoring costs are lower for large landowners and higher for smallholders with fragmented pieces of land. To save on monitoring costs, PES programs should involve local experts for monitoring rather than rely only on external experts. Moreover, research organizations are developing new, less expensive ways to monitor that can be more easily adopted. For example, ICRAF has developed a simple approach to measuring sediment in a river that can help determine the impacts of land use changes. For carbon sequestration, monitoring on small land holdings can be done using simple forest measurement techniques to estimate tree growth and a handheld GPS (geographical positioning system) device to identify the location. The GPS devices are relatively inexpensive, easy to use, and can help in more rigorous tracking of carbon plantations. The TIST project in India has trained village-based volunteers to take field measurements using this technique. A single carbon expert in the central office then uses the field measurements to calculate carbon credits for each site.

It is useful to remember that markets for many environmental services did not exist because it was extremely difficult (and expensive) to monitor them. Recent technological advances have helped to address this problem for only a few environmental services. Therefore, researchers and scientists will continually need to strive to develop more effective and efficient means of monitoring.

Institutional innovations

Institutional innovations pertain to both changes in organizational setup and modifications in formal and informal rules of operating a PES program. Institutional innovations make up a vast field, and the aim here is to focus on key ideas. Some are discussed below, while others are just listed in the table on the following page.

Intermediaries. Groups such as NGOs, government agencies, and international experts help reduce transaction costs by linking buyers with service providers. Many consultancy groups and research networks now host free information portals on the internet (e.g., Katoomba Group's www.ecosystemmarketplace.com) that help spread information about the location of potential suppliers of environmental services and about large corporate investors willing to pay for them. Donors can help catalyze PES programs by providing essential financial aid to cover transaction costs, at least in the initial stages. For example, the United Kingdom's Department for International Development funded the initial administrative costs for setting up the Scolel Te carbon sequestration project in Mexico. Similarly, the Global Environment Facility has supported many biodiversity protection projects all over the world in the hope that they will become self-sustaining over time.

Contracting with small farmers in groups. Working with groups rather than individuals can achieve economies of scale. Group contracts can supply environmental services from both common and private lands. The major innovation in this regard is that instead of setting up individual contracts, the program formulates a single contract with the entire group. This encourages the participation of smallholders and even landless people who have a role in managing common lands. New formal institutions under PES programs should complement the pre-existing formal or informal organizations among community members. PES programs also must ensure that the poor members gain equally from group-based sales

Institutional Innovations to Reduce Transaction Costs		
INSTITUTIONAL INNOVATION	ACTIVITIES	EXAMPLES
Create specialized services from intermediary organizations	Specialized firms or agencies for community-based projects can: <ul style="list-style-type: none"> - provide technical expertise in project design - support central negotiations - establish mechanisms for financial transfer - verify PES actions - Baseline measurement and performance monitoring? 	The Nature Conservancy role in brokering forest carbon projects in Belize, Bolivia, and Brazil. RUPES works as an intermediary between the government and local NGOs in the HKm Forestry Project in Indonesia.
Build on existing community development programs	<ul style="list-style-type: none"> - Diagnose local needs, priorities, and PES opportunities - Strengthen community organization and local knowledge related to a PES project 	Farmer-researcher partnership in Scolel Te, Chiapas, Mexico
'Bundle' environmental service payments	<ul style="list-style-type: none"> - Develop multiple payments for different activities on the same piece of land 	Costa Rica PES program bundles carbon, biodiversity, and watershed protection services .
Establish large-scale, area-wide projects	<ul style="list-style-type: none"> - Develop project over entire jurisdiction - Partner with other small providers to share transaction costs of project development 	Forestry project in Madhya Pradesh, India, is working with 1.2 million households.
Create cost-sharing mechanisms	<ul style="list-style-type: none"> - Contributions by national or state agency, overseas development assistance, development, or environmental NGO, private companies, municipal utilities, local communities 	Australian forest conservation: rice farmers to market 'green' rice at premium
Reduce data costs	<ul style="list-style-type: none"> - Improve data and methods for project planning, baseline development and monitoring 	Low-cost participatory carbon monitoring methods, such as at Noell Kempff project in Bolivia

Source: Smith and Scherr, 2002.

of environmental services, as some kinds of rewards, particularly cash, are often prone to elite capture. Indivisible, in-kind rewards such as tenure security (where appropriate) may benefit everyone in the group.

It is important to consider that contracting with farmers as a group does not entirely eliminate the transaction costs associated with contracting with smallholders. Some of the costs that no longer occur between the buyer and seller instead are incurred within the group. For example, the buyer only need contract with and monitor compliance by the group as a whole, but the individual group members must jointly agree to enter the contract, monitor each other to ensure compliance with the buyer, and share the payment among all the contributing members. These activities can be arduous and a group-based PES arrangement is more likely to be viable for some groups than others. It is not a universal solution.

Portfolios of projects. These can also reduce transaction costs as implementing agencies share valuable physical and human resources across projects. As standardized operating procedures develop at one project site, they can be easily replicated elsewhere. For example, the Edinburgh Centre for Carbon Management initiated its Plan Vivo system for carbon sequestration under the Scolel Te project in Mexico and then replicated it in Uganda and Mozambique. Similarly, the FACE Foundation manages carbon sequestration on about 170,000 hectares of land across six countries. Such a diverse portfolio also helps distribute risk while sharing learning from one site to another.

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