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Self-selection into payments for ecosystem services programs

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Designers and funders of payments for ecosystem services (PES) programs have long worried that payments flow to landholders who would have conserved forests even without the program, undermining the environmental benefits ("additionality") and cost-effectiveness of PES. If landholders self-select into PES programs based on how much conservation they were going to undertake anyway, then those who were planning to conserve should always enroll. This paper discusses the less-appreciated fact that enrollment is often based on other factors too. The hassle of signing up or financial costs of enrollment (e.g., purchasing seedlings) can affect who participates in a PES program. These enrollment costs reduce overall take-up, and, importantly, they can also influence the composition of landholders who select into the program—and thereby the program's environmental benefits per enrollee. Enrollment costs can increase a program's benefits per enrollee if they are systematically higher for (and thus deter enrollment by) landholders who would have conserved anyway. Alternatively, enrollment costs can dampen per-enrollee benefits if their correlation with status quo conservation is in the opposite direction. We illustrate these points with evidence from two studies of randomized trials of PES programs aimed at increasing forest cover in Uganda and Malawi. We also discuss how in other sectors, such as social welfare, policy designers have purposefully adjusted the costs of program enrollment to influence the composition of participants and improve cost-effectiveness. We propose that these ideas for targeting could be incorporated into the design of PES programs.

payments for ecosystem services | self-targeting | cost-effectiveness | avoided deforestation | afforestation/reforestation

Payments for ecosystem services (PES) is a type of conservation program in which individuals are offered payment in exchange for providing ecosystem or environmental services. For example, to promote forest cover, PES is used to compensate landholders for leaving forest intact or for planting new trees. PES is an especially popular approach in low-income countries where requiring landholders to conserve or asking them to do so without compensation could exacerbate poverty.

A core principle in PES programs is that participation is voluntary. A payment is offered for some environmental outcome, and a landholder chooses whether to participate. The voluntary nature of PES makes self-selection into a program one of the key factors determining its environmental benefits and cost-effectiveness.

Theoretically, PES programs will be more attractive for landholders who do not have to change their behavior (they were going to preserve their forest or plant trees anyway) to qualify for payment. Meanwhile, those who were not going to conserve incur a cost of conserving and complying with the program conditions (such as foregone income from deforesting or time and effort to plant and maintain seedlings).

This self-selection is central in the literature evaluating the impact of PES on conservation outcomes, where the objective is to measure the "additionality" of a PES program: How much of the conservation behavior is because of the program? Additional conservation is distinct from the observed level of conservation because some of the conservation among program participants might have happened anyway. Simply comparing those who enroll and those who do not leads to misassessment of the program's additionality; the two groups differ in their forest-cover outcomes both because of any impacts of the program and also because of what they would have done with their forest in the absence of the program. The challenge of isolating the counterfactual conservation (what would have happened in the absence of the program) has led to calls for randomized trials to better isolate causal program impacts (1–3) and to the use of matching and other program evaluation statistical techniques to adjust for self-selection using observable variables (4–6).

In this article, we use two recent randomized trials of PES, one that compensated avoided deforestation (DEFOR) in Uganda and one that compensated afforestation/reforestation (AFFOR) in Malawi, to show how counterfactual conservation varies across eligible landholders and affects enrollment (9, 10).

Our main goal, however, is to highlight that other factors affect the landholder's enrollment decision and may help determine a program's ultimate additionality. Programs often entail nonmonetary administrative burdens or financial costs to enroll, such as filling out paperwork, or buying seedlings or other inputs. These enrollment costs dampen take-up, but they also change the composition of who participates. This can improve the environmental benefits per dollar spent if enrollment costs are negatively correlated with additionality, or it can decrease the benefits if the correlation goes in the opposite direction. We lay out these ideas in a simple framework and then show evidence on these points using the same two randomized trials.

PES programs are not unique in that participation in them is shaped by numerous factors, which also influence overall program impacts. This is true for conservation programs other than PES, and for social programs more broadly. We conclude with examples of how policy makers could manipulate these administrative and financial costs of enrollment to improve program cost-effectiveness and discuss examples of policy makers doing this in the context of social programs outside of conservation.

**Conceptual Framework**

Our conceptual framework considers the goals of a program designer and the decisions of eligible landholders to illustrate three key points:

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program—and thereby the program's environmental benefits per enrollee. Enrollment costs can increase a program's benefits per enrollee if they are systematically higher for (and thus deter enrollment by) landholders who would have conserved anyway. Alternatively, enrollment costs can dampen per-enrollee benefits if their correlation with status-quo conservation is in the opposite direction. We illustrate these points with evidence from two studies of randomized trials of PES programs aimed at increasing forest cover in Uganda and Malawi. We also discuss how in other sectors, such as social welfare, policy designers have purposefully adjusted the costs of program enrollment to influence the composition of participants and improve cost-effectiveness. We propose that these ideas for targeting could be incorporated into the design of PES programs.

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