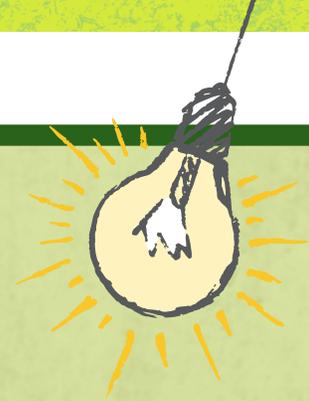


# CAN ENVIRONMENTAL CASH TRANSFERS REDUCE DEFORESTATION AND IMPROVE SOCIAL OUTCOMES?



*What is the impact of payments for ecosystem services (PES) on avoided deforestation, land management activities, social capital and socio-economic outcomes?*



Photo courtesy of CONAFOR

## Mexico's Federal Payments for Ecosystem Services Program

### IMPLEMENTING AGENCY:

National Forestry Commission — <https://www.gob.mx/conafor>

### TARGET AREA:

National program, present in all 32 states.

### NUMBER OF DIRECT BENEFICIARIES:

Since its creation, more than 3 million enrolled hectares. Payments are differentiated by forest type. Payments per hectare per year range between 16-80 USD.

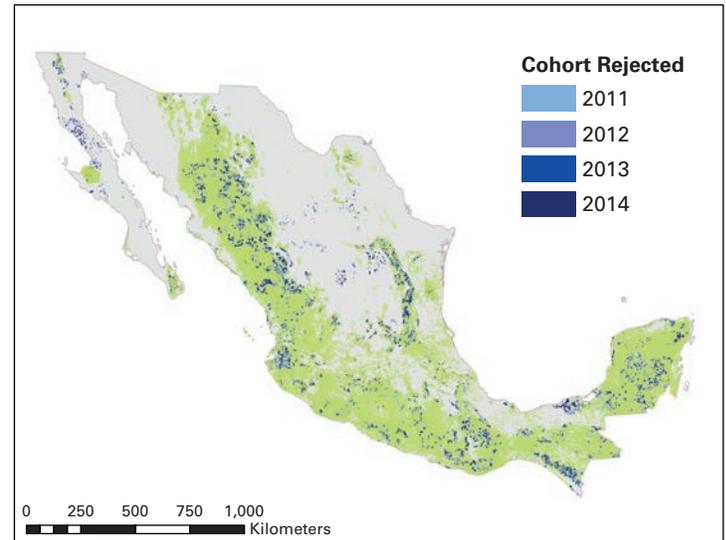
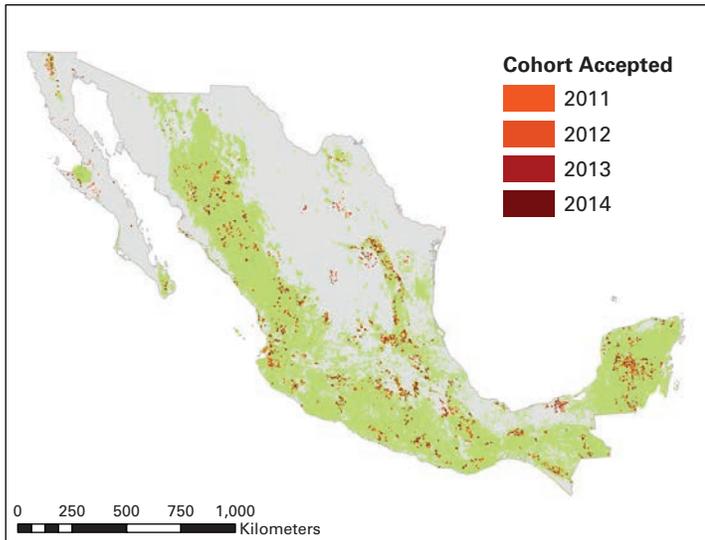
## RESEARCH FINDINGS

- Communities that received payments for ecosystem services increased management activities to protect land cover—such as patrolling for illegal conversion, building fire breaks or combatting soil erosion—by 48 percent compared to similar communities that did not receive payments.
- The program reduced the loss of tree cover in areas at high risk of deforestation (by 29 percent compared to controls), with larger effects for communities in the program the longest.
- Payments reach poor communities. However, the estimated impacts on household socioeconomic indicators are generally small and not statistically significant for recent cohorts.
- The program increased community social capital by 9 percent and did not crowd out other community work freely contributed by households such as maintaining communal infrastructure, indicating positive co-benefits for communities.

## Content

### Program summary and context

Payments for Ecosystem Services (PES) are a leading policy tool for global efforts to protect biodiversity and reduce deforestation or land-cover change. PES programs change landowner incentives by offering compensation in exchange for conservation activities that promote ecosystem services such as watershed protection, biodiversity conservation and carbon sequestration. The popularity



**Study population: accepted and rejected applicants for the 2011–2014 cohorts of Mexico’s federal PES program.**

of PES stems partly from its voluntary nature, which contrasts with more traditional conservation mechanisms such as protected areas or laws prohibiting land conversion. However, because PES are voluntary, they may attract applications from landowners who already would have conserved, thereby limiting the additional environmental benefits. PES programs also remain controversial within the global conservation community because of concerns that they could make landowners worse off or could disrupt existing social structures.

Mexico’s National Forestry Commission (CONAFOR, for its acronym in Spanish) launched its PES program in 2003, today the program is present in all 32 states. Mexico’s program is a good example of a case study because of its size, longevity, and efforts to improve program targeting and differentiate payments by environmental benefits and risk of ecological loss. Mexico is also

an important setting to study social capital, as most of the area enrolled in the program is held as common property by *ejidos* or *comunidades*, so land-use decisions must be made jointly.

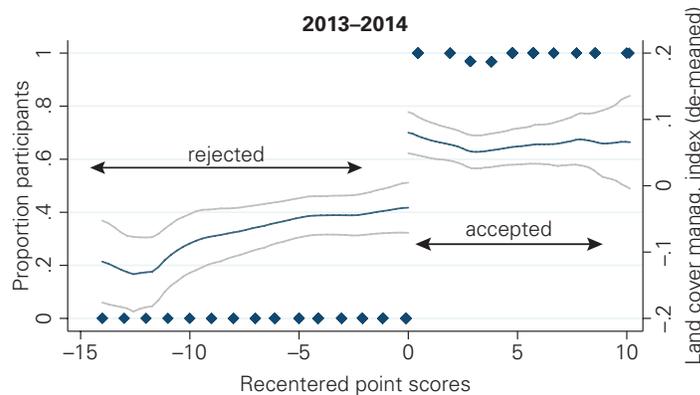
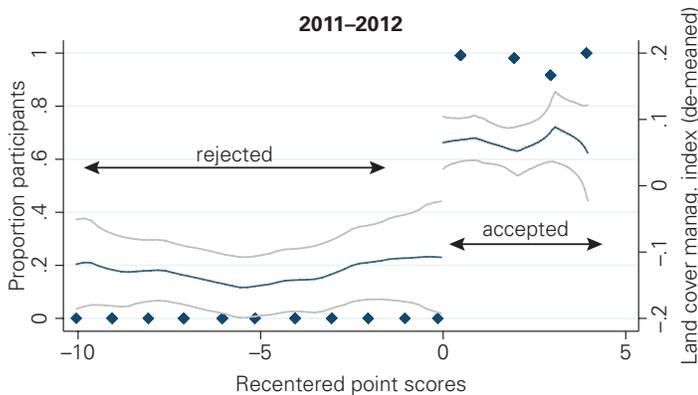
## Impact Evaluation Research

The partnership between CONAFOR and the World Bank Development Impact Evaluation (DIME) started in October 2014, when the initial design was developed at the DIME Energy and Environment Workshop in Lisbon, Portugal. The study identifies PES impacts using a regression discontinuity (RD) design, which compares program participants to similar rejected applicants who just missed eligibility cut-offs due to limited funding in each state. The impact evaluation uses satellite data on land-cover change and a survey collected in 2016 for a representative sample of more than 800 community leaders and 8,000 households across 12 states. The study measures impacts for program recipients who started the program in 2011–2012 (3–4 years in the program) and in 2013–2014 (1–2 years in the program).

The PES program had substantial effects on land management activities which supported the provision of ecosystem services. Participant communities increased management activities by an estimated 48 percent or 0.60 standard deviations relative to controls, with effects being larger for the 2011–2012 cohort (0.80 standard deviations). The study found a significant increase of 2.7 days per year per household devoted to land management activities. Additional time spent in land management activities did not crowd out other community work devoted by households. The study found suggestive evidence that the program reduced the rate of loss of tree cover (though effects were not significant,



Photo courtesy of CONAFOR



**The graphs present the index for community land-cover management activities for the control (rejected) and treatment (accepted) communities for the 2011-12 (left) and 2013-14 (right) cohorts. Diamonds represent the proportion enrolled in the five-year program. Substantial and significant effects are observed for both cohorts, with effects being larger for communities that started the program in 2011-2012.**

due to satellite data limitations and overall low rates of forest cover change during the study period). However, within areas at high risk of deforestation, the program significantly reduced the loss of tree cover by approximately 29 percent, with larger effects for those communities that have been in the program longer. Estimated impacts on socioeconomic indicators (i.e., change in average household assets, housing stock, food consumption and primary education) were small and not statistically significant. Across all cohorts, the study found a significant increase of 9 percent on an index of community social capital relative to controls (a magnitude of 0.41 standard deviations). These results were robust to a series of specification checks.

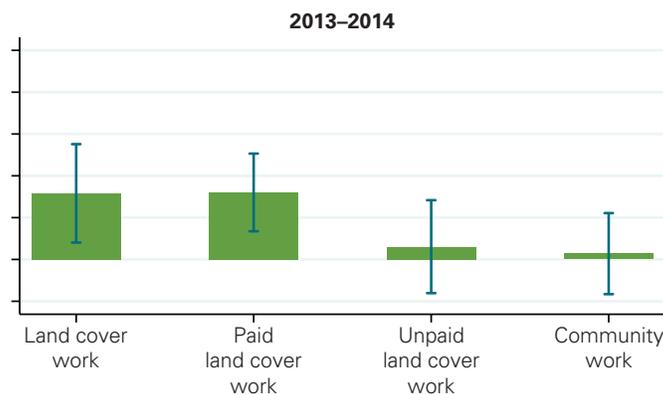
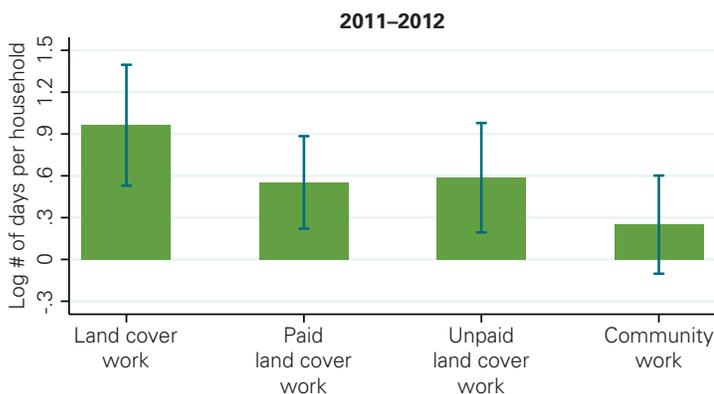
## Policy Relevance

### Policy lessons

As one of the largest PES programs in the world, Mexico's PES serves as a key example for countries seeking to achieve reductions

in deforestation and forest degradation (REDD+) under the Paris Accord or to protect biodiversity under international conventions. As noted in the WB working paper, these findings suggest policy lessons regarding the scale-up of PES programs.

First, the impact on land-cover management activities indicates that the program generated behavioral changes at the community and household levels. These changes may increase the provision of key ecosystem services, including improved watershed functioning, increased biodiversity, fire prevention, and soil conservation. Second, reductions of land-cover change in high risk of loss areas indicate that the program is more effective where land cover is most threatened. This suggests important scope to re-target the program to achieve more avoided change in land cover in the most ecologically important zones. Third, the evidence from examination of indicators of household assets and consumption indicate that PES can meet safeguard standards of REDD+ designed to prevent ancillary harm. However, additional emphasis on environmental additionality may involve a tradeoff



**Household participation in land cover management activities and community work**



Photo courtesy of CONAFOR

between environmental goals and livelihood support. Finally, the finding that PES improves social capital supports the conclusion that that paying for conservation under REDD+ schemes can support pro-social behavior.

The partnership with CONAFOR also helped strengthen institutional capacity. The research team, which includes researchers from Oregon State University, Amherst College and other World Bank units, conducted multiple consultations and delivered a series of hands-on trainings and results sharing events. The research team received an International Best Practice Award from Mexico's National Council for the Evaluation of Social Policy (CONEVAL, for its acronym in Spanish). CONAFOR is planning to launch pilot

impact evaluations for its new programs, such as the integrated territorial management model.

## REFERENCES

- Alix-Garcia JM, Sims KRE, Orozco-Olvera VH, Costica LE, Fernández Medina JD, Romo Monroy S. "Payments for environmental services supported social capital while increasing land management" *Proceedings of the National Academy of Sciences* July 2018.
- Alix-Garcia JM, Sims KRE, Orozco-Olvera VH, Costica LE, Fernández Medina JD, Romo Monroy S, Pagiola S. "Can environmental cash transfers reduce deforestation and improve social outcomes? A regression discontinuity analysis of Mexico's national program (2011–2014). World Bank Working Paper, forthcoming.



**DIME Energy and Environment.** The program on energy and environment of the World Bank's Development Impact Evaluation (DIME) unit in the Development Research Group links project teams from the Bank's Global Practices of Environment and Natural Resources, and Energy and Extractives, as well as bilateral development agencies with researchers to develop rigorous and innovative impact evaluations that both substantially improve the evidence-base for policy making and induce global shifts in energy and environment policy. It is part of the Impact Evaluation to Development Impact (i2i) multi-donor trust fund and is supported by the UKAID's Department of International Development (DFID). The research would not have been possible without the support of CONAFOR and PROFOR. (<http://www.worldbank.org/en/research/dime/brief/energy-environment>)