

## **Lessons Relearned:**

Can previous research on incentive-based mechanisms point the way for payments for ecosystem services?

B. Kelsey Jack

*co-authors:*

Carolyn Kousky  
Kate Emans Sims

*Sustainability Science Program  
Harvard University*

March 3, 2007  
ISTF Annual Meeting  
Yale University

# Increasing the supply of ecosystem services

- Ecosystem services are often underprovided or threatened
  - Externality problem: individual actions provide public benefits → underprovision
  - PES solution: provide incentives to individuals (or communities) to increase service provision
    - Other solutions: command and control approaches or indirect incentives
- Ecosystem service-related goals:
  - Increasing provision ecosystem services (*environmental effectiveness*)
  - Reaching an increased service level at least cost (*cost-effectiveness*)
  - Alleviating poverty (*equity*)

## Framing: PES as an incentive based mechanism

- Incentive-based mechanisms (IBMs) for environmental policy
  - Give a signal that encourages behavior, rather than explicit directive
  - Include charges, tradable permits, market-friction reductions
- Previous experience with IBMs for environmental policy—mainly pollution control—has suggested answers to these questions:
  - When are IBMs likely to achieve environmental-effectiveness, cost-effectiveness, and equity?
  - How can changes of IBM design help to reach these goals?
- Lessons focus on supply side design issues

# Lesson 1: The science of ecosystem services matters

## **Lesson: Achieving environmental effectiveness may require a detailed knowledge of how environmental benefits are produced**

- Non-linear environmental damages may hinder effectiveness
    - Thresholds or increasing damages are not addressed through simple incentive mechanisms
    - Also an issue for bundling services
  - Poorly mixed damages generate “hotspots”
    - Addressing spatial configurations requires targeting and spatially explicit incentives
  - Proxies for environmental outcomes rely on an understanding of relationship between activities and outcomes
    - When service outcomes are difficult/impractical to monitor, suitable proxies must be used
- Differential treatment of providers has equity implications

## Lesson 2: Heterogeneity in costs leads to cost savings

**Lesson: The costs of a policy are lowered by targeting emissions reductions to those who can abate most cheaply**

- Incentives can lead to a least cost allocation of abatement by equating marginal costs
    - Providers increase provision until an additional unit of activity equals the benefit from the incentive
  - Cost savings over a command and control approach are greatest when heterogeneity in cost is high
    - An approach that enrolls low cost providers generates cost savings over a uniform requirement
- If low cost providers are also poor, both cost effectiveness and equity gains may be achieved through the same mechanism

## Lesson 3: Transaction costs can undermine cost-effectiveness

**Lesson: Cost-effectiveness also depends on other implementation costs, including transactions costs – particularly monitoring and enforcement costs**

- Implementation costs are higher when many sources are involved or when emissions are difficult to monitor
  - Working with many small landholders will also be more costly, both in the contracting phase and in the monitoring and enforcement phase
  - Use of intermediary groups can reduce these costs
- Credible incentives require supporting institutions, including monitoring and enforcement capacity and property rights
  - In some cases, private organizations may complement public institutions
- Tradeoffs between cost-effectiveness and equity in engaging smallholders
  - Eligibility implications of land tenure institutions may also generate equity implications if property rights are a prerequisite for eligibility

## Lesson 4: Incentives create unintended consequences

### **Lesson: Incentive-based mechanisms may create incentives for unanticipated undesirable side effects or be undermined by existing subsidies**

- Incentives change prices, can lead to new entry or ransom behavior
    - Rewards for service provision increases profitability from certain landuse, which may result in new conversion
    - Participants may demand ransom by manipulating existing conditions
    - Historical baselines and small-scale projects mitigate these problems
  - Net effects may be undermined by relocation of harmful activities
    - Can occur with partial enrollment of landholdings
  - Existing incentive programs may undermine new policy effectiveness
    - Removal of environmentally harmful subsidies may be as effective as a new incentive scheme
- If relevant baselines do not favor poor then equity impacts may be negative

## Lesson 5: Incentive effects are dynamic

**Lesson: Effective solutions today may not be effective solutions tomorrow: design should consider the possibility of change**

- Incentives can lead to dynamic technological innovation if incentives are closely tied to outcomes and policy is perceived to be long term
    - Rewards tied to services make it in landholders' interests to seek cheaper ways of providing services
  - Flexible mechanisms are more resilient to price changes, though price changes may also undermine overall cost effectiveness
    - Price changes may make a particular proxy activity more expensive – flexible mechanisms allow landholders to switch to cheaper alternatives
    - Price changes can also render the scheme infeasible (too costly)
- Dynamic effects also have distributional implications
- Wealthier participants may be better able to invest in innovation
  - Tying rewards more closely to services improves mechanism but places more risk on participants

## Lesson 6: Feasibility is in the politics

### **Lesson: Political feasibility depends on both design and institutional context**

- Political economy literature shows political feasibility of incentive based approach depends on the relative influence of “winners” and “losers”
  - New or unfamiliar approaches may meet political resistance
- Design of mechanism will affect feasibility
  - Approaches that complement existing institutions are more likely to be feasible and gain political support
- Since poor tend to be less politically influential, policies that benefit them may have less political support
  - On the other hand, a “pro-poor” spin may be more politically tractable than an environmental conservation one
  - Political feasibility considerations most relevant to government-led projects, though NGOs still have donors, headquarters, constituencies

# Conclusions

- Context matters: ecosystem science, political environment, existing institutions, and cultural norms all mediate between design and outcome
- Existing research on related approaches to public policy goals can provide insights into the design and implementation of PES mechanisms
- Simultaneously achieving environmental effectiveness, cost effectiveness and equity outcomes through PES requires special attention contextual conditions
  - In particular, depending on the characteristics of poorer landholders, design may face tradeoffs between program effectiveness and equity
- More rigorous evaluation and implementation that allows for clear lessons from the emerging suite of PES projects can guide future projects
- Incentive based environmental policy research says little about conservation finance potential of a PES approach or about specific differences between publicly and privately led initiatives



Thank you!

Email: [Kelsey\\_Jack@ksgphd.harvard.edu](mailto:Kelsey_Jack@ksgphd.harvard.edu)

Paper is available at: <http://www.cid.harvard.edu/cidwp/grad/015.htm>