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An introduction to incentives for forest-water ecosystem services

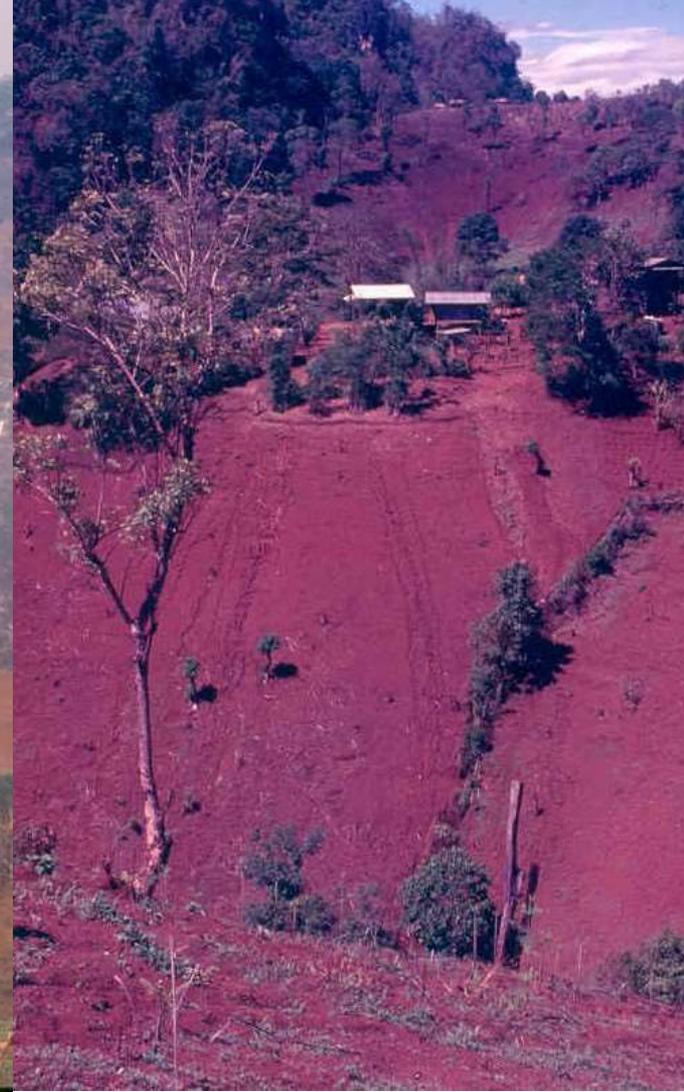
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Forest-water ecosystem services

What do we know?

- There is a solid body of scientific information, developed over past 50 years, for understanding and interpreting forest-water relations (Don Gilmour in 15 minutes)

Northern Thailand 1992



Direct drivers of deforestation and forest degradation

Deforestation

- Agriculture (subsistence and commercial; small- and large-scale)
- Mining
- Infrastructure development (incl. for tourism) and urban expansion (usually indirectly)

Forest degradation

- Logging (illegal and legal)
- Forest fires
- Livestock grazing in forests
- Fuelwood collection



Examples of indirect drivers

International level

- Markets, commodity prices, politics

National level

- Population growth
- Domestic markets
- National policies, fiscal incentives and subsidies
- Weak governance and institutions
- Poor cross-sectoral coordination
- Poverty

Local level

- Change in household behaviour



How to address drivers to generate environmental services?



- Control and command approaches
- Fiscal transfers (e.g. India)
- Market-based approaches (e.g. provision of incentives for ecosystem services such as PES)

Legal, but dangerous, and politically feasible?



Fiscal transfer: The case of India

- In 2015, the 14th Finance Commission decided to consider area covered by forests as one of the important criteria for horizontal devolution. The devolution formula, thus, enables the States to consider forests as a national treasure that needs to be protected. It assigned 7.5 per cent weight to forest cover.

HORIZONTAL DEVOLUTION FORMULA IN THE 13TH AND 14TH FINANCE COMMISSIONS

Variable	Weights accorded	
	13th	14th
Population (1971)	25.0	17.5
Population (2011)	0.0	10.0
Fiscal capacity/Income distance	47.5	50.0
Area	10.0	15.0
Forest cover	0.0	7.5
Fiscal discipline	17.5	0.0
Total	100	100

Source: Reports of 13th and 14th Finance Commission

Fiscal transfer: The case of India

- Here's how it will work: every year India's central government collects about US\$200 billion in taxes. It then passes along about US\$80 billion to the 29 State governments.
- The share of tax revenue (about US\$6 billion or roughly US\$120 per hectare) depends on how much forest States maintained, as monitored by India's 2013 Forest Survey. When the formula is recalculated in five years, the share of tax revenue may go up or down based on how much forest a State conserved or replanted.

Payment for Environmental Services (PES)

A PES is (Wunder 2005):

1. a *voluntary* transaction where
2. a *well-defined* ES (or a land use likely to secure that service)
3. is being 'bought' by a (minimum one) ES *buyer*
4. from a (minimum one) ES *provider*
5. if and only if the ES provider secures ES provision (*conditionality*).

Viet Nam

- Since 2011 and through Decree 99, Viet Nam's payments for forest environmental services (PFES) program has generated US\$140 million for more than 350,000 rural households (and others) to protect around 4 million hectares of the country's forests. Households are helping to patrol and manage vital forest and watershed areas, and are compensated for their efforts.
- The average annual payment per household was approximately US\$540-615, representing a 400 percent increase over previous forest protection payments made by the government.

Viet Nam

- Of the total sum, payments from hydropower plants account for nearly 98%, water companies for about 2% and tourism for 0.1%. Overall, PFES revenue represents 0.8% of the national forestry budget (CIFOR 2013).
- Transaction costs are high.
- Some local communities have become discouraged about forest protection and development because they do not have legal status (no land titles) to enter into PFES agreements.
- Opportunity costs are high and PES payments cannot compete with crops such as coffee.

Viet Nam

- Transactions are not **voluntary** between buyers and providers.
- Environmental services are not **well-defined**, as they are described as activities such as watershed protection, conservation, carbon sequestration and the like.
- Hydropower plants, water supply companies and ecotourism operators are the **buyers**.
- Households, communities, state-owned companies or private companies with land title are the **providers**.
- Lack of **conditionality**, as forest area is used as a proxy indicator of environmental service.

Costa Rica

- Since 1997, the PES program has helped to conserve nearly one million hectares (although some researchers question this).
- The program is structured around four ecosystem services: capturing and storing atmospheric carbon, protecting water sources, and conserving biodiversity and scenic beauty.
- The program benefits people directly, through payments and potentially new jobs, and indirectly, for instance by promoting healthier ecosystems.
- It appears that PES has also helped to gradually regularize property ownership among smaller landowners.

Costa Rica

- The five eligible activities include protection (90%), reforestation, regeneration, forest management and agroforestry and annual payments range between US\$41 and US\$294 per hectare.
- Sources of funds include government, mainly through earmarked tax revenues from water and fossil fuels, the private sector (such as hydroelectric companies), international banks and bilateral agencies.
- There were 15,375 contracts (between 5 and 15 years) in 2011.
- Costa Rican deforestation decreased significantly during the 1980s and 1990s, which raises the issue of additionality.

Costa Rica

- Transactions are **voluntary** through contracts.
- Environmental services are not **well-defined**, as activities.
- Government, private sector (only around 3%), international banks and bilateral agencies are the **buyers**.
- The **providers** include legal entities, such as “publicly limited companies” (49%), individuals (31%), indigenous groups (13%) and cooperatives (7%).
- Lack of **conditionality**, as forest area is used as a proxy indicator of environmental service.

France

- In response to the increasing trend in nitrate rates in its “natural mineral waters” Nestlé Waters, an important employer in the Vosges region (eastern France), proposed to farmers in 1988 to transform their intensive dairy farming system into extensive, hay-based dairy farming with no pesticides and chemicals. Farmers were originally reluctant. Hence, Nestlé developed a set of incentives to encourage farmers to permanently change their farming practices.
- The buyer of the ecosystem service is Nestlé, through its intermediary Agrivair. Sellers are the 37 farmers active in the catchment when the PES program was first implemented.

France

- The creation of an intermediary institution, Agrivair, located in the midst of the farming area acted as a catalyst.
- The ability to maintain farmers' income level at all times and finance all technological changes was an important element of success.
- Agrivair allocates funds to research and forecasting activities.
- One past challenge has been skyrocketing cereal prices and declining prices of milk, raising the opportunity costs and farmers were pressing to revise their contracts and use pasture land for cereal production.

France

- Transactions are **voluntary** between one buyer and 37 providers.
- The environmental service is **well-defined**, as nitrate level.
- The **buyer** is Nestlé Waters, which became the largest bottled water brand in the world in 2008.
- The **providers** are 37 farmers.
- Strong **conditionality**, as nitrate levels are monitored in the soil all year around across 17 sites across four soil types and two types of farming systems. Water quality is monitored daily by Nestlé Waters laboratory in Vittel. Agrivair also monitors farming practices, livestock stocking rates, use of new building facilities (ensuring animal waste is properly disposed of) and reviews all farm accounts.

Conclusions

- Are PES schemes really addressing the key direct drivers of environmental (forest or watershed) degradation?
- Can PES really overcome indirect drivers?
- What should be the role of PES when degrading activities are illegal?
- PES or PEA?
- There is a clear role for combining PES with command and control approaches.
- The French case clearly demonstrates that there is a strong business case for private sector participation in water-related PES (particularly in terms of water quality), but we need to get the science right and have conditionality.



Thank you!

Effects of deforestation

