

**Economic instruments for the
conservation and payment of
environmental services:
lessons learned in the fields**

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Various categories of payment for environmental services

- Land owner are paid to change land use
- They may stop certain activities-
farming,development
- They modify other(not use pesticides)
- Examples
 - Payment to farmers to divert and change land use
 - Payment to prevent deforestation
 - Payment to reduce development
 - Payment to reduce waste
 - Payment to allow access to water
 - Payment to reduce pollution
 - Payment to sell water

The Multidimensionality of ES (environmental services)

- **The same land may provide a multitude of ES**
 - No tillage sequesters carbon and reduced soil erosion
 - A wetland may purify water and support wild life
- **ES may be complementary or substitutes**
 - Growing Wetland acreage may reduce areas with native plants
 - Reduction in runoff may be accompanied in less wind erosion
- **ES may provide regional, national & global benefits**
- **Benefits of ES vary across individuals & groups**
 - Bird watchers & hunters benefit from better bird habitat
 - All citizens gain from flood control-but the risk reduction vary by location

Divergent buyers to various ES products

- **Governments** (Global, National, regional) need to buy ES that have public good
 - Government may Pay for ES as a subsidy mechanism
- **Businesses and utilities** - buy ES if save or make money (PES to save cleanup costs by utility)
- **NGO and non profits**- buy ES reflecting members' interests (Ducks unlimited)
 - Willingness to pay for ES is constrained by ability to pay
- **Public/ private cooperation**
 - Matching fund
 - Tax credit

Mechanism to Obtain ES

- **Direct controls (feasible only to governmental bodies)**
 - Zoning: restricting land use to certain activities
 - Permitting: conditional approval of development activities
 - Incentives-payments for ES, penalties for damages
- **Establish Aggregate targets of ES and use tradable permits (CAP and trade)**
 - No reduction of wetlands.
 - Kyoto targets may be attained by CO₂ Sequestration
- **Purchasing Funds-target & buy assets or pay for ES**
 - Nature conservancy buys lands & development right
 - Utilities pay for carbon sequestration in Costa Rica & Iowa)

Features of markets

- **Buyers and sellers**
- **Trading mechanism**
 - Exchanges (live,electronic)
 - Auctions
 - Bulletin board
 - Informal
- **Facilitator of transactions** (clearing house)

Features of products are determined by

 - Transaction costs
 - Features of product

The Challenges of marketing ES

To have an effective ES program it is useful to think in marketing terms-

Marketing helps to

- find buyers

- Increase earning

Why marketing

- There is large supply of ES
- People say that they are willing to pay for ES
 - **Actual willingness to pay for ES is modest**

There is a difference between stated and actual willingness to pay

- Building Demand = enhancing willingness to pay and made markets for ES a reality
- Need to identify potential buyers and how to make them spend their money on ES

Establishing tradable commodities from “one of a kind” items.

- **Standard Markets requires homogenous products-**
 - Quantification of the quality, volume or performance of these products.
 - Establishing exchanges and clearing houses
- Quantity of carbon sequestered is a good example of a product-(if it can be measured and delivered)
- **For each ES determine whether to sell as a commodity or a differentiated product**
- The more global the ES, the valuable is the use of a market
- Unique items should be auctioned and sold individually

Creating demand

- **Potential Buyers may not know about the product**
 - Need to educate inform and promote ES
 - Need to figure out potential beneficiaries and approach them
- **Worry about performance**
 - Need to demonstrate and quantify ES performance and benefits
 - **Research should be done to demonstrate and quantify value**
- **Willingness to pay may be affected by reputational needs**
 - Making Buying ES “cool” will bring the funds
 - Consider providing naming opportunities
- **Buyers may have multiple concerns** (environmental protection, poverty alleviation)

Demand for ES-environmental awareness & appreciation of recreation

- Societies with more developed Environmental & recreation culture
 - Encourages consumers to demand green product
 - Increases willingness to pay for ES
- Environmentalism and recreation increase with income
- But also depend on awareness
- Increase environmental awareness is step in build demand for ES

Creating demand by Legislation

- Restriction on total pollution may lead to demand for ES by developers and polluters
 - Wetland banking
 - Carbon sequestration
- Tax exemption and matching funds will enhance demand for ES
 - Demand creation for **global public goods** will benefit from international agreement to subsidize them

Enhancing the earning of buyers of

ES

- Demand for Es will increase if buyers gain more
- Buyers desire reliability and predictability-
 - You can not control nature- but you can insure to mitigate its impacts-
 - **Warrantees (insurance) or Money back guarantee will enhance value**
 - ES generation should be **monitored** - and contract for provision **enforced**
- Buyers appreciate liquidity and flexibility
 - **Enhanced by capacity to buy &sell options and future contracts**
 - Strive for Large volume of transaction with low transaction costs

Payment depend on the deliverable

- Buyers will pay less if
 - Property rights are not secured
 - Monitoring and enforcement of contracts is difficult
 - Benefits are not well specified and quantify
- **Reform** (property right definition, more effective governance) and **research** (benefit assessment) -improve earning

Defining the type of ES products and transaction

Product vary by the extent of freedom and control buyers have

- Permanent sale of asset (land, water)-
- Leasing for period of various duration
 - Rent for 1 season and lease for 20 years are different in commitment and capacity to deliver products
- Sale of NR services (working land programs)
- Option contingent on situation (buy or sell water in case of draught)
- Pay based on measured inputs/measured output
- Management contract

The appropriate ES transaction changes with the product

- Early in life of ES trading requires to solicit buyers and sellers to participate-
- **Auctions and bidding are used in early stages of ES trading**-exchanges requires volume and will come later
- When asset provide several amenities
 - build easy to implement ES indices and evaluate based on aggregate benefits vs.. cost
 - Pay per attribute (CO2 sequestration, water quality)

Valuable market segments

- Producers of food - want assured high quality inputs
 - Coca Cola wants clean water and will pay to reduce residues- same for Nestle, and Dannon
- Insurance companies-want reduced exposure to risk-may buy for wet land to control flood
- Developers want flexibility- may be willing to pay for wetlands and other conservation that will reduce constraints on their activities
- Some Companies want green image
- Recreationalists want good conditions (nice beaches, good hunting)

Potential buyers of ES

- Recreationalists (hunting clubs, bird watchers)
- Insurance companies
- Utilities-water in particular
- Individuals (Angels)
- Environmentalists (people with high non use value of ES)
- Resource companies - **preserve it now use it later**
- Status and redemption seekers (rich people and companies)
- Developers -Buyers of pollution rights

Sell the PES to community

- **It is not enough to sell the ES to buyers**
- The public (NGOs,community) are watching and need to buy the process otherwise the political process
 - will torpedo deals
 - raise objections that will discourage buyers
- **Public tend to overemphasize the value of ES**
 - **Yet concerns are legitimate**
- Inclusiveness and openness (within reason) will go a long way

Scale & Buyers matter in creating ES

- Private parties may invest in **excludable amenity creating** ES (habitat to birds or fish, recreation area)
- NGO's may finance and control **specialized** ES
- National & Local governments may
 - Pay directly for or subsidize private provision of amenity creating ES
 - Establish legal framework to require generation of resource conserving or pollution preventing ES
- Global ES may be generated & controlled by
 - International agreements (Kyoto, Debt for nature)
 - Voluntary agreements initiated by NGO's

Targeting- key for effective PES program

- The criteria for payment determine the outcome
- Know what you want and pay for it
- If riparian land is most desirable - it should be targeted
- Quantify the benefits- think on benefits per dollar
- When scale enhance benefits develop payment scheme accordingly

US agricultural conservation programs

- Conservation reserved program-CRP
 - Pays for taking land out of production
 - Long terms contract (10 years)
 - Criteria - benefit index and bid price (request for pay)
 - Priority- riparian lands
 - May be used for subsidize farmers
- EQIP
 - Pays for changes in practices
 - Subsidizes animal waste management, reduce chemicals
- Conservation security program

Major laws and institutions

- Homesteading- provide ownership to land or water condition on development

Land grants was engine for development

Development rights- engine for conservation

- Endanger species act-
 - Establishing critical habitat for endangered or threatened species
 - Unintended consequences
- National parks-buy or receive land and manage it to provide environmental and cultural contribution

Land Water and wetlands

- Williamson act- land can be classified as ag and be taxed as such for a period of time-aimed to slow development
- California water bank-
 - government buy and sell water during draught
 - Option to buy and sell can be bought
- Electronic water market
 - Provides Match making arrangements, names of buyers sellers
- Wetland banking
 - Ban on reducing wetlands
 - Developers need to buy rights from wetland developers (generate new wetlands)

Selling Development rights

- Landowner receives
 - Cash
 - tax write off, including inheritance tax write offs
- Agreements are permanent -with reversal options
- Buyers or receiver of land
 - NGO (Nature conservancy, Duck unlimited)
 - Conservation district

Costa Rica programs

- Forest conservation
 - Pays farmers not to harvest trees
 - Long term contracts
 - Some aspects of subsidy- some land is not likely to be cut
- Costa Rica-Merck deal
 - Pays for right to bio-prospecting
 - Payment of cash and royalties
- Zoning
- Restriction of development
- Limitation of access by underdeveloping infrastructure in sensitive location

Brazil

- Program to preserve forest
- Subsidy to tropical forest industries
- **Program to subsidize cutting of forest for grazing and development**
- Payment for ES of endogenous communities in forest
 - rubber trapper
 - water shed protection

Panama canal

- Objective -expand canal, reduce erosion, provide jobs
 - Payment for water rights
 - Plantation of trees (to reduce erosion and regulate water flow)
 - paid by carbon credit earning
 - Secured by future earning from lumber (employment to locals)

Other

- Multi-functionality payment in Europe
- Fair trade coffee- paid by consumers
- Payment for certified lumber
 - Certification crucial for eliminating illegal deforestation
- Various land reforms to preserve small farms -
 - willing buyer/willing seller
 - Mandatory sales or distribution
- Land for nature swaps

Kenya

- Program to buy riparian land to allow wild life access to water
 - Sellers vegetable growers, herders
 - Buyers - hotel manager - a per tourist day fee
- Payment for soil and tree sequestration
 - Speculative- not part of Kyoto-you buy an option for \$5 that may be sold for \$15

Thanks

