Can Programs of Payments for Environmental Services Help Preserve Wildlife?

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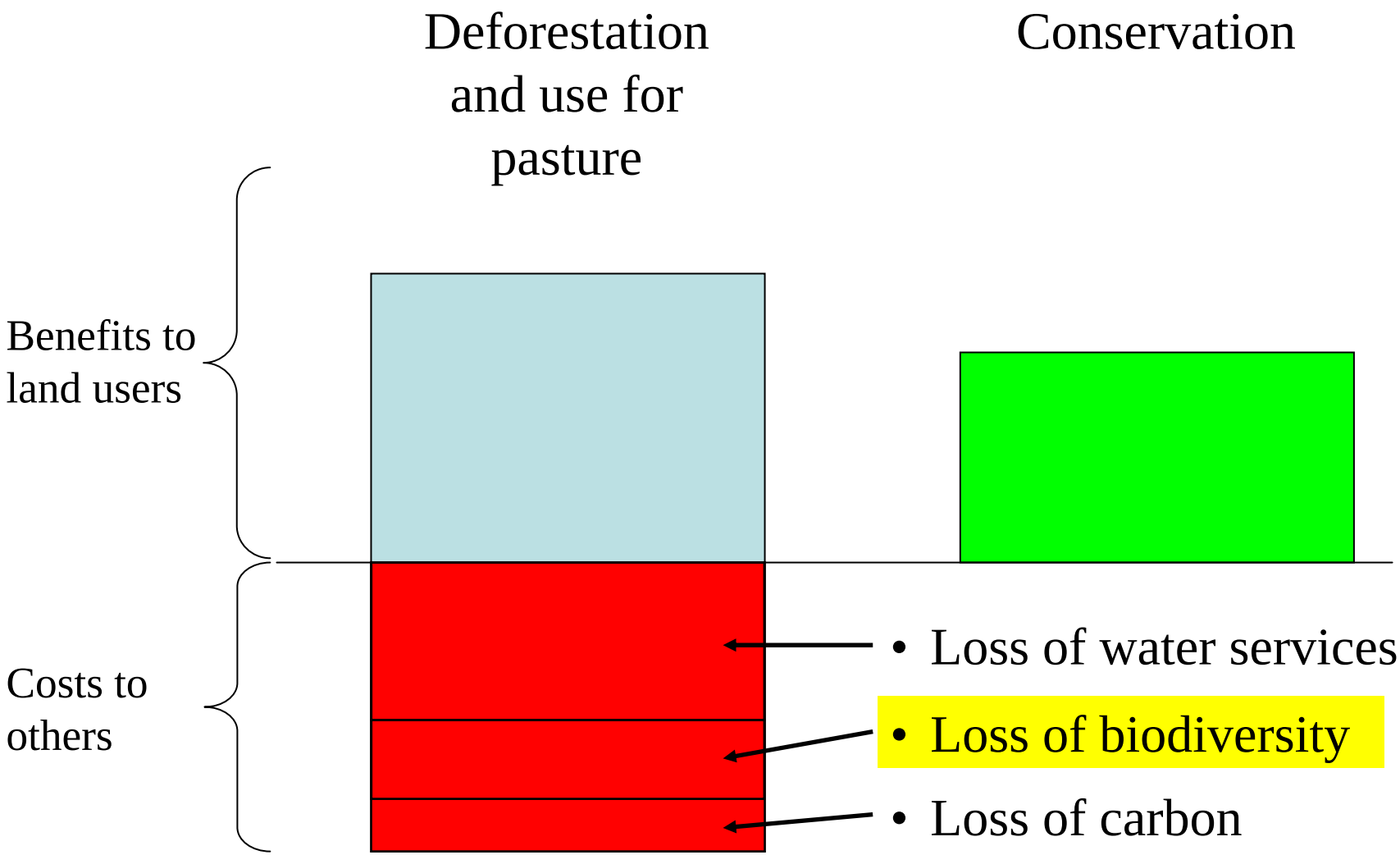
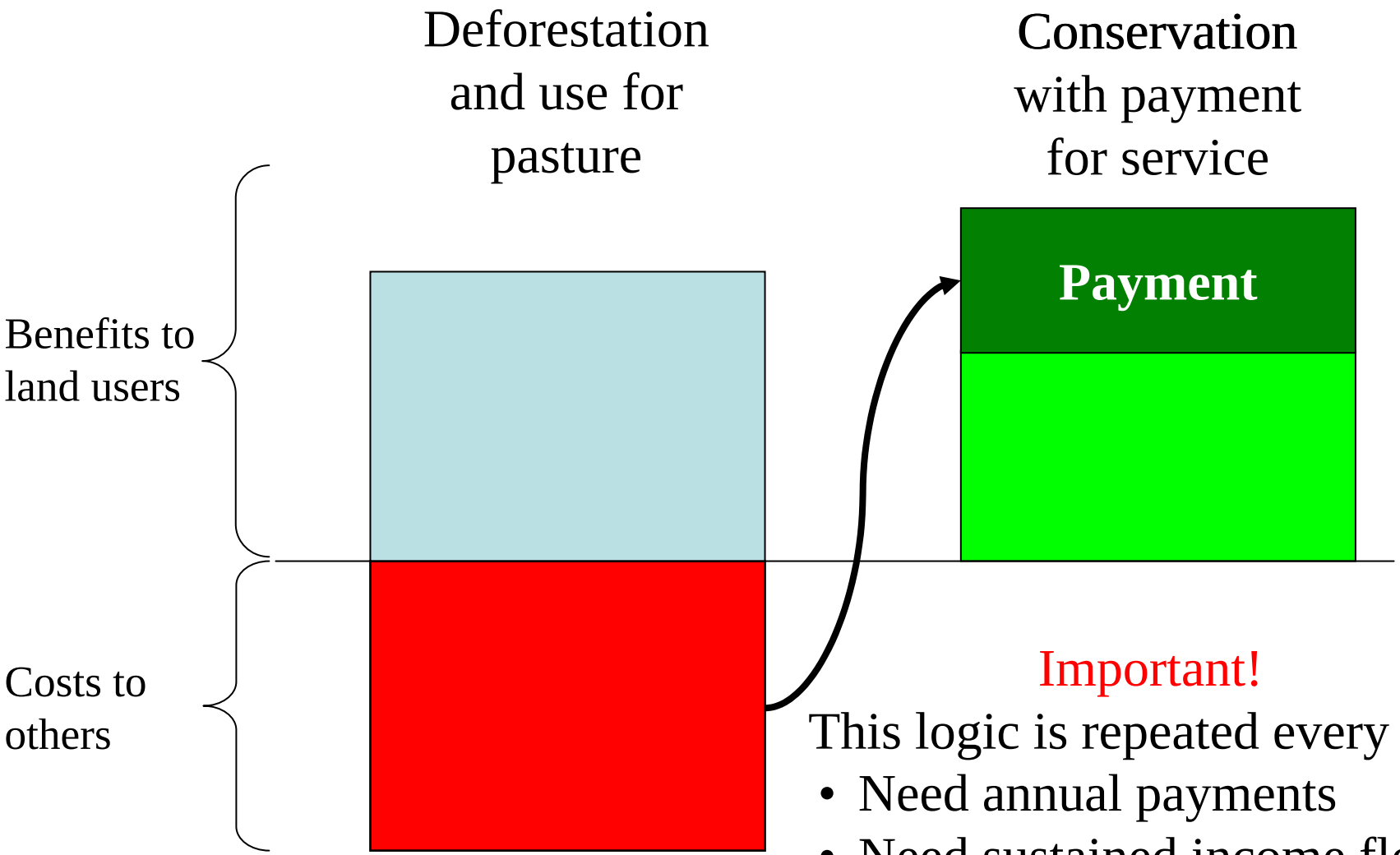
The problem


Deforestation and use for pasture
Conservation
Benefits to land users
Costs to others
• Loss of water services
• Loss of biodiversity
• Loss of carbon sequestration

The logic of payments for environmental services (PES)



Important!

This logic is repeated every year

- Need annual payments
- Need sustained income flow

Payments for environmental services: National initiatives

Colombia:	▪ Cauca Valley water user associations
Costa Rica:	▪ FONAFIFO/*Pagos por servicios ambientales* ▪ Heredia: Environmentally adjusted water tariff
Ecuador:	▪ Quito: FONAG ▪ Cuenca: ETAPA
El Salvador:	▪ *Mesa permanente de servicios ambientales* ▪ Tacuba, San Francisco de Menéndez
Mexico:	▪ *Pago por servicios ambientales bosques-agua* ▪ Coatepec pilot
Venezuela:	▪ CVG-Edelca payments for conservation of Río Caroní
South Africa:	▪ Working for Water Program

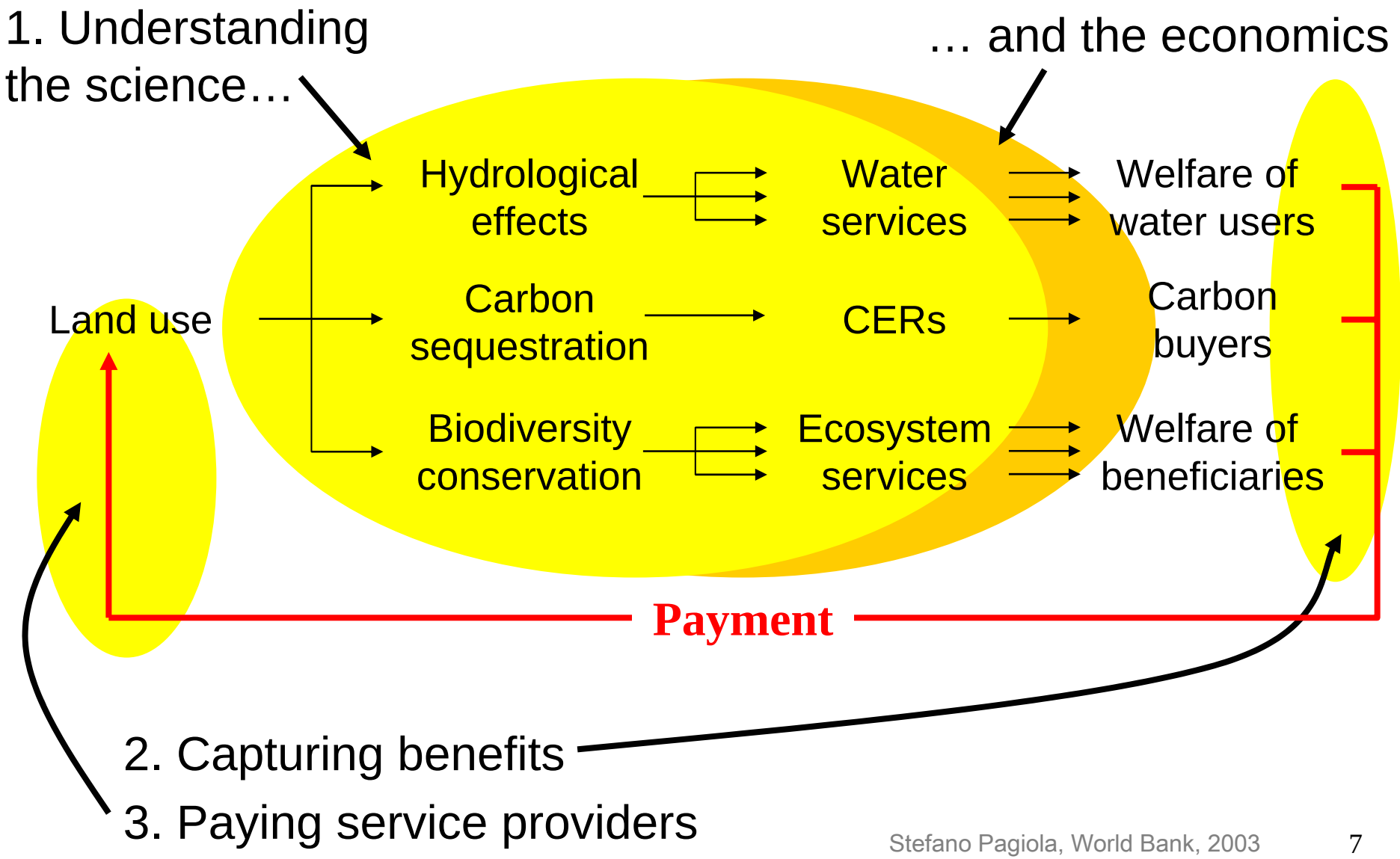
Payments for environmental services: World Bank support

- Projects under implementation:
  - **Costa Rica:** Ecomarkets Project ($33 million WB + $8 million GEF)
  - **Colombia/Costa Rica/Nicaragua:** Regional Integrated Silvopastoral Ecosystem Management Project ($4.5 million GEF)
  - **Guatemala:** Western Altiplano Natural Resources Management Project (US$32 million, incl. US$2 million pilot PES component)
- Projects under preparation:
  - **Mexico:** Technical support to national PES program
  - **Venezuela:** Canaima National Park Project
  - **South Africa:** Cape Action Plan for the Environment (CAPE)
  - **Dominican Republic, Ecuador, El Salvador:** Pilot PES projects
- Research:
  - Case studies
  - Hydrological aspects
  - Valuation
- Capacity building:
  - Courses in Ecuador, Venezuela, Panama, Perú, Mexico, South Africa, Senegal

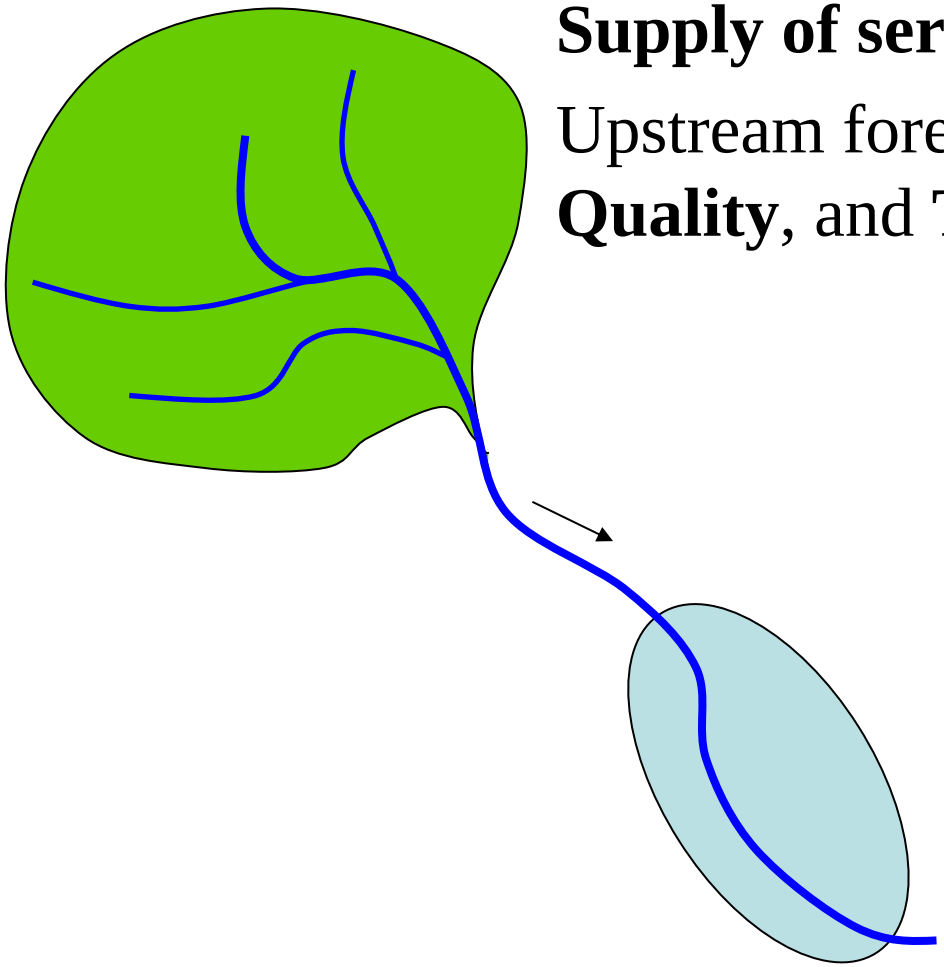
How can this help preserve endangered species?

- How PES mechanisms work
  - Characteristics of supply - understanding the science
  - Characteristics of demand - who is going to pay?
  - Contracting with service providers - making sure we get what we want
- Example of water services
- Application to wildlife

Developing payments for environmental services



Water services



Supply of services:

Upstream forest cover can affect the **Quantity**, **Quality**, and **Timing** of water flows

Demand for services:

Possible beneficiaries:

- Domestic water use
- Irrigated agriculture
- HEP
- Fisheries
- Recreation
- Downstream ecosystems

Hydrological effects: myths and reality

Myth: Forests increase precipitation
Reality: Minor effect, except at continental scale

Myth: Forests slow runoff
Reality: True

Myth: Forests increase total annual water flow
Reality: Because of increased evapotranspiration, forests usually *reduce* total annual water flow.
Exception: Cloud forests

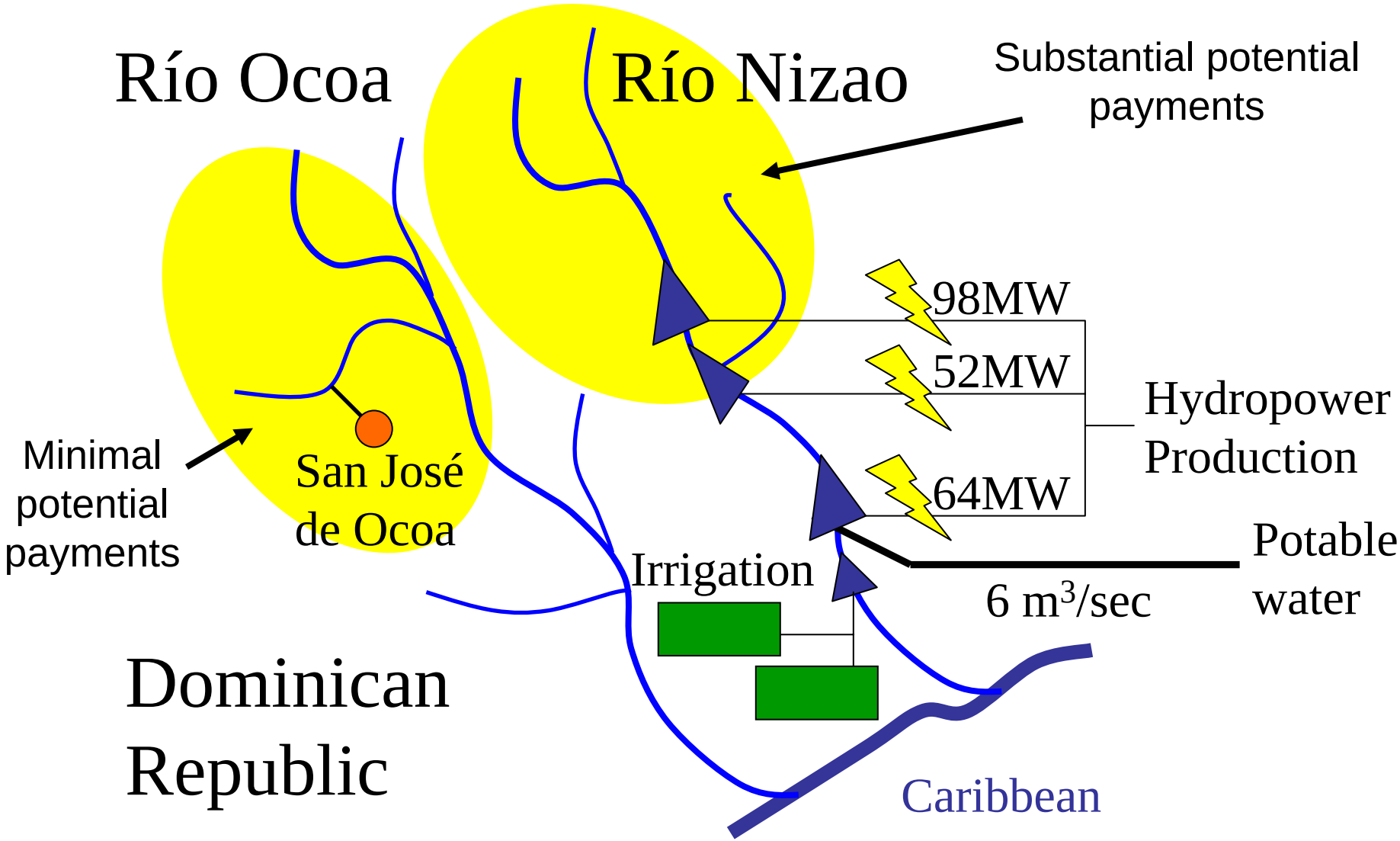
Myth: Forests increase water flow in the dry season
Reality: Unclear

Myth: Forests reduce flooding
Reality: True at small scales, not at large scales

Myth: Forests reduce erosion
Reality: Depends on use that is made of deforested areas

Water services: key characteristic

Water services vary substantially



Identifying environmental services

Demand:

- What specific services?
- Who benefits from these services?
- How much benefit do they receive?

Supply:

- How are these services generated?
- How much more or less of these services would we receive if land use changed?
- Who generates these services?

Identifying water service beneficiaries Example: Municipal water supply

What do they need?

- Minimum quantity
  - Depends on size of the population
  - Needs increase over time if the population is growing
- Constant flow year-round
- Minimum quality

What alternatives do they have?

- Reducing consumption, increasing efficiency of distribution
- Obtaining water from other sources
- Treating water to improve its quality

How could part of this value be captured?

- Water tariff rates

Capturing benefits

- Who benefits from environmental services?
- How much do they benefit?
- How can part of these benefits be captured to help finance conservation?
- How should funds be managed?

Costa Rica: Payments by water users

Firm	*Type of user*	*Watershed*	*Watershed size (ha)*	*Contract area (ha)*	*Payment ($/ha/year)*
Energía Global	HEP	Río Volcán	3,466	2,493	10
		Río San Fernando	2,404	1,818	10
Platanar SA	HEP	Río Platanar	3,129	1,800	10/30
CNFL	HEP	Río Aranjuez	9,515	5,000	42
		Río Balsa	18,926	6,000	42
		Lago Cote	1,259	900	42
La Manguera SA	HEP	La Esperanza		3,000	10
Florida Ice & Farm	Bottler	Río Segundo	3,870	1,000	10

Source: Adapted from S. Pagiola, 2002. "Paying for Water Services in Central America: Learning from Costa Rica." In S.Pagiola, J. Bishop, and N. Landell-Mills, eds, *Selling Forest Environmental Services*. London: Earthscan.

Costa Rica: Payments to providers

Contract	Amount ($/ha)	Distribution of payments (year) 1	2	3	4	5
Reforestation	538	50%	20%	15%	10%	5%
Forest conservation	210	20%	20%	20%	20%	20%

- Based on opportunity costs
- 200,000ha contracted, more than 800,000ha pending
- 83% of contracts for forest conservation
- Only 7% of contracts for reforestation
- But payments insufficient in Heredia's watershed

PES and wildlife conservation

Threats to wildlife	*Is PES applicable?*
▪ Loss of habitat	Yes - Pay for land users to adopt specified land use
▪ Over-harvesting due to insecure tenure	No - first-best is to reform property rights, and PES often not usable if tenure insecure
▪ Over-harvesting due to high demand ▪ Elimination to reduce local costs	Possibly, if access to land is critical for harvesting and access can be controlled (but can be expensive)

PES not universally applicable

Understanding the science

- Characteristics of threatened species
  - Range?
  - Sensitivity to disturbance?
  - Reproduction rates and patterns?
  - Etc
- Characteristics of access
  - Secure tenure to habitat?
  - Secure rights for wildlife harvesting?
- Economics of species
  - Potential market for harvested species?
  - Does species impose costs on local population?

Potential for land-use based payments to aid in conservation

Feasibility of land-use based payments

Cost of land-use based payments

What might a payment for wildlife conservation services look like?

- PES can pay to conserve habitat
  - Useful when:
    - Destruction of habitat a main cause for loss of species
    - Access to land is critical for harvesting and can be controlled
- PES can pay for specific management regimes (*i.e.* no hunting)
  - Can be very specific about what will pay for
    - Reduces potential for un-intended conservation effects
    - But can have other un-intended problems
    - Monitoring can be costly
    - Still land-use based

Lots of buts…

- But:
  - Problems of minimum size, contiguity
  - Won't help with migratory species
  - Doesn't address incentives to over-harvest
- But but:
  - Can make program contingent on size (New York City example)
  - Can help protect critical habitat of migratory species (e.g. wintering sites of Monarch butterfly)
  - Can impose management restrictions in contract
- But but but:
  - Difficult to implement and more expensive
  - 'Weakest link in the chain' problem
  - Need to pay more if impose more restrictions = more expensive
- But but but but:
  - Transaction costs
  - Transaction costs
  - Transaction costs

Who pays?

- In most cases PES need to be made annually, and indefinitely
- Most biodiversity conservation financing mechanisms (GEF, NGOs) not set up to make long-term payments
  - Exception: CTFs, but expensive

PES and wildlife: Tentative conclusions

- Potentially applicable to subset of wildlife conservation cases, but not all
  - 'Accidental' wildlife conservation as result of paying for other environmental services
- Developing effective payments to providers poses lots of implementation problems but probably surmountable
- Who pays? likely to be the main problem