

Environmental Values and Ecosystem Services

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Environmental values

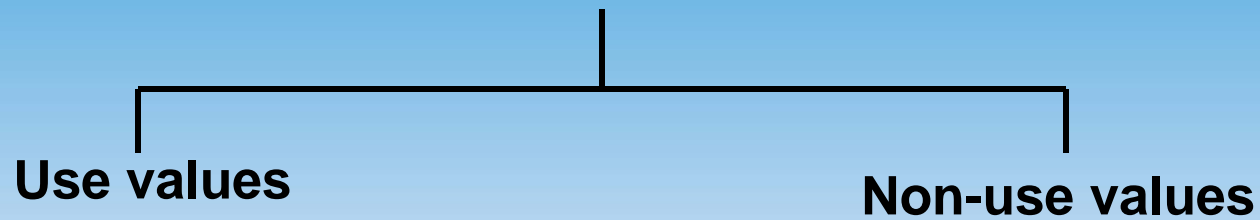
- What are environmental values?
- How do we measure environmental values?
- What are payments for ecosystem services?



Environmental values



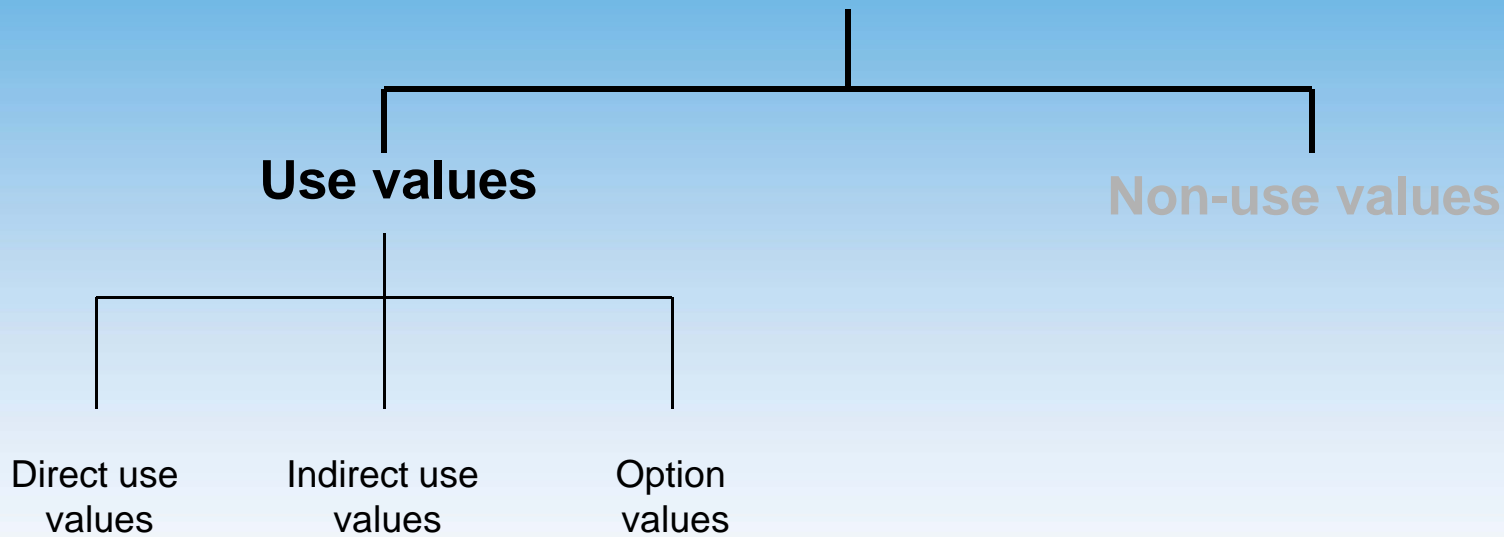
Total economic value



Environmental values



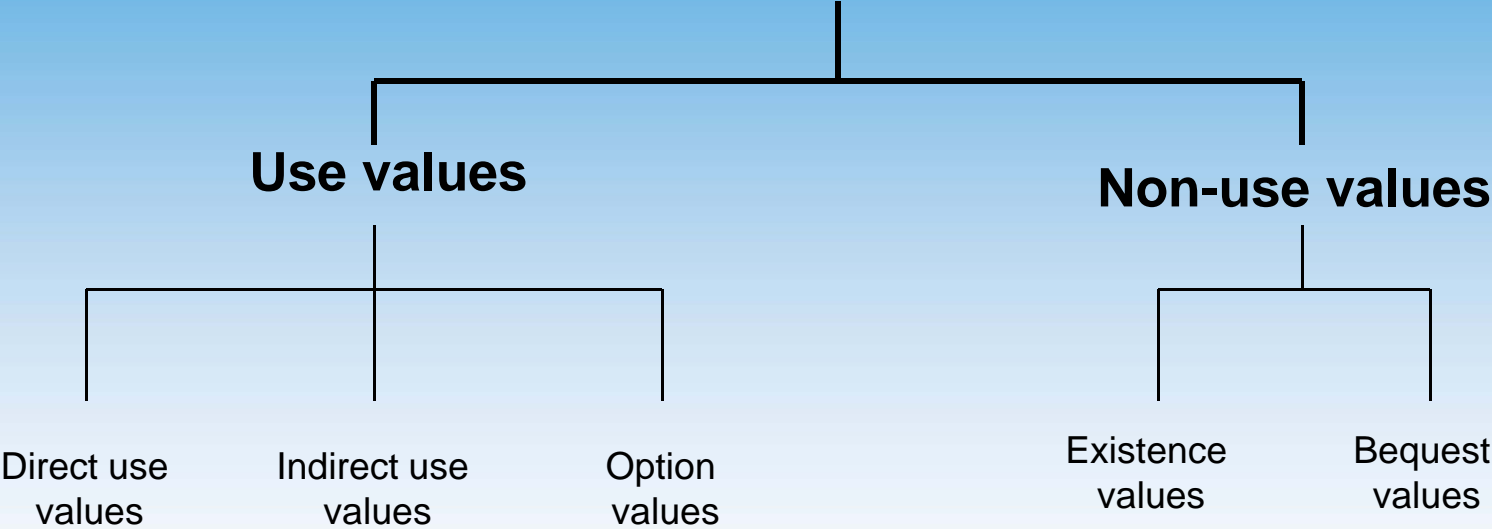
Total economic value



Environmental values



Total economic value



Public and private goods



Rival?

Yes

No

Yes

Classic private goods

ex. cars, computers,
housing

Market price value
available

Collective consumption

ex. theater, online software
purchase, bridge

Non-rival if no congestion

Excludable?

No

Common pool

ex. water reserves, oil
wells, forests, fisheries

No exclusion/unlimited
access destroys incentive
to conserve

Public goods

ex. lighthouse, clean air,
clean water, uncrowded
beach, scenic views,
biodiversity, defense

No market price value
available, free rider problem

Environmental valuation

- What are environmental values?
- How do we measure environmental values?
- What are payments for environmental services?



What is environmental valuation?



- Placing a value or price on environmental goods and services that are left out of market transactions
 - watershed protection
 - carbon sequestration
 - erosion control
 - pollination
 - clean air
 - biodiversity



Estimating values

How do we estimate non-market values?

- **Productivity Approaches**

- A basic “price x quantity” approach, e.g. changes in production of crops or fisheries as a result of a change in soil or water quality

- **Revealed Preferences**

- Observing the behavior of people in markets or other situations, e.g. measuring travel costs or replacement costs

- **Stated preferences**

- People stating their preferences in hypothetical situations - contingent valuation methods using survey-based techniques, e.g. willingness to pay to save panda bears or visit new protected area



Challenges of valuation

- Expensive, time consuming
- Uncertain and open to criticism
- Most public policy decisions are political decisions, not economic decisions
- Things that may be most important to us are often most elusive to economics
(love, relationships, values, spirituality)

Payments for ecosystem services

- What are environmental values?
- How do we measure environmental values?
- What are payments for ecosystem services?





Payments for ecosystem services

- The idea: Society pays people for positive externalities



Payments for ecosystem services

“The benefits people obtain from ecosystems”

Supporting services:

- nutrient cycling
- soil formation

Environmental goods:

- food
- water (quantity)
- fuel
- fiber

Regulating services:

- climate regulation
- flow regulation
- disease regulation
- water purification

Cultural services:

- aesthetic
- spiritual
- educational
- recreational

PES: Today's markets

Air emissions, carbon

Water quality & quantity

Habitat & biodiversity



Conditions that favor an environmental payment system



- People agree who owns the service
- There is demand for it
- Sellers can find buyers inexpensively
- The service is measurable (inexpensively)
- There's a third party to enforce contracts
- The service is compatible with – hopefully dependent on – conservation of a natural ecosystem and cheaper than conservation alternatives



Conclusions

- Focus on workable schemes, not just true markets
- PES is not a substitute for government action

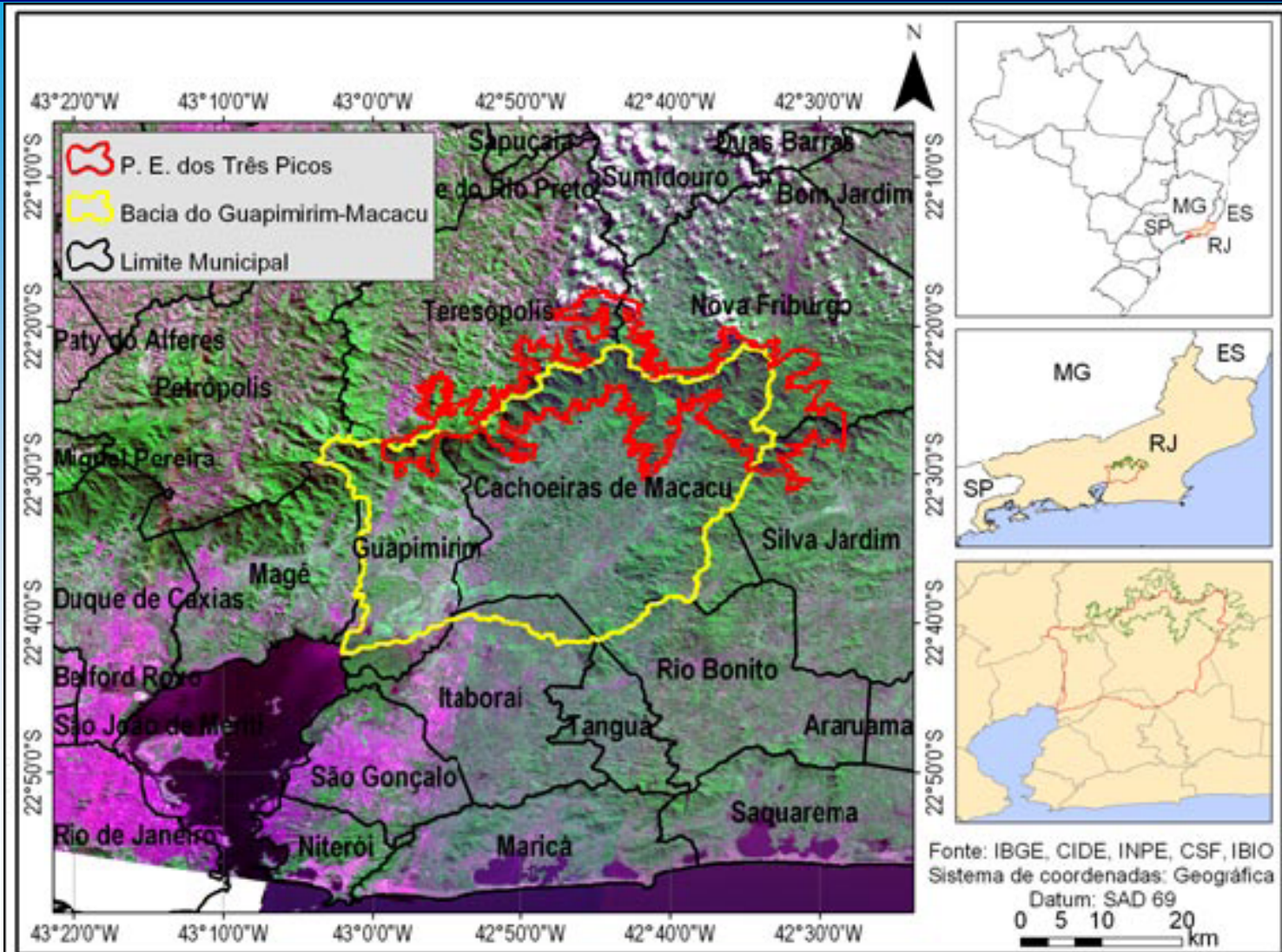
PES example Três Picos State Park



Practice goes where theory
fears to tread!



Três Picos State Park





PES: Três Picos State Park

Analysis

1. Quantified expenditures needed to ensure protection of park's forests
2. Estimated park's total contribution to water supply within basin
3. Analyzed options for allocating park protection costs among water users
4. Proposed institutional arrangements to govern the payment system





PES: Três Picos State Park

What the approach has going for it

- Clear property rights to forest (if not water)
- Lots of demand (buyers)
- Low transaction costs: an add-on to water bills
- Low monitoring costs: easy to track deforestation, no requirement to precisely estimate production
- Dependence on conservation
- Equity adjustments can be made
- Existing legal framework permits payments to parks
- Governance scheme



PES: Três Picos State Park

Obstacles

- Selling a payment for something that has been free
- Bureaucratic inertia
- Oil revenues

