PAYING SHRIMP FARMERS FOR ECOSYSTEM SERVICES: POTENTIAL AND INSTITUTIONAL IMPLICATIONS

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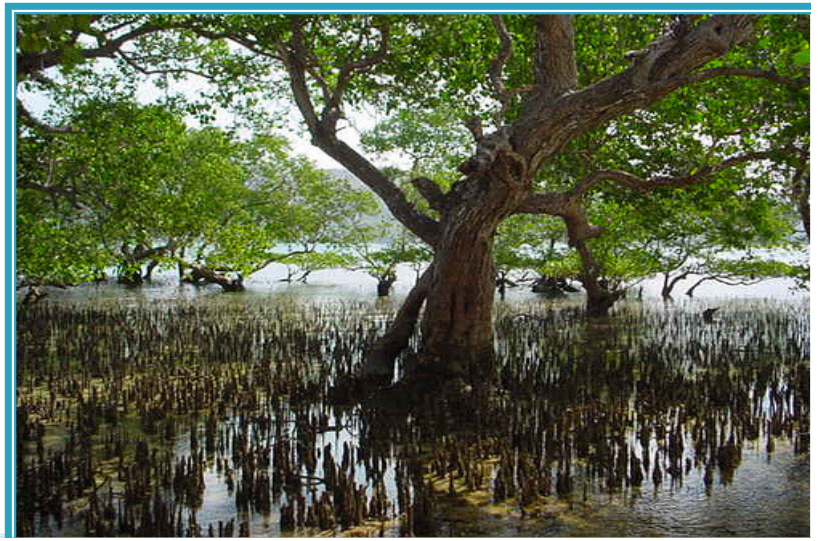
Background

Global aquaculture associated with:

Positive impacts: food security, compensating for declining capture fisheries landings, and income opportunities for rural households.

Negative impacts: biological disruption, effluent discharges, and

mangrove deforestation.



Mangrove's ecosystem services

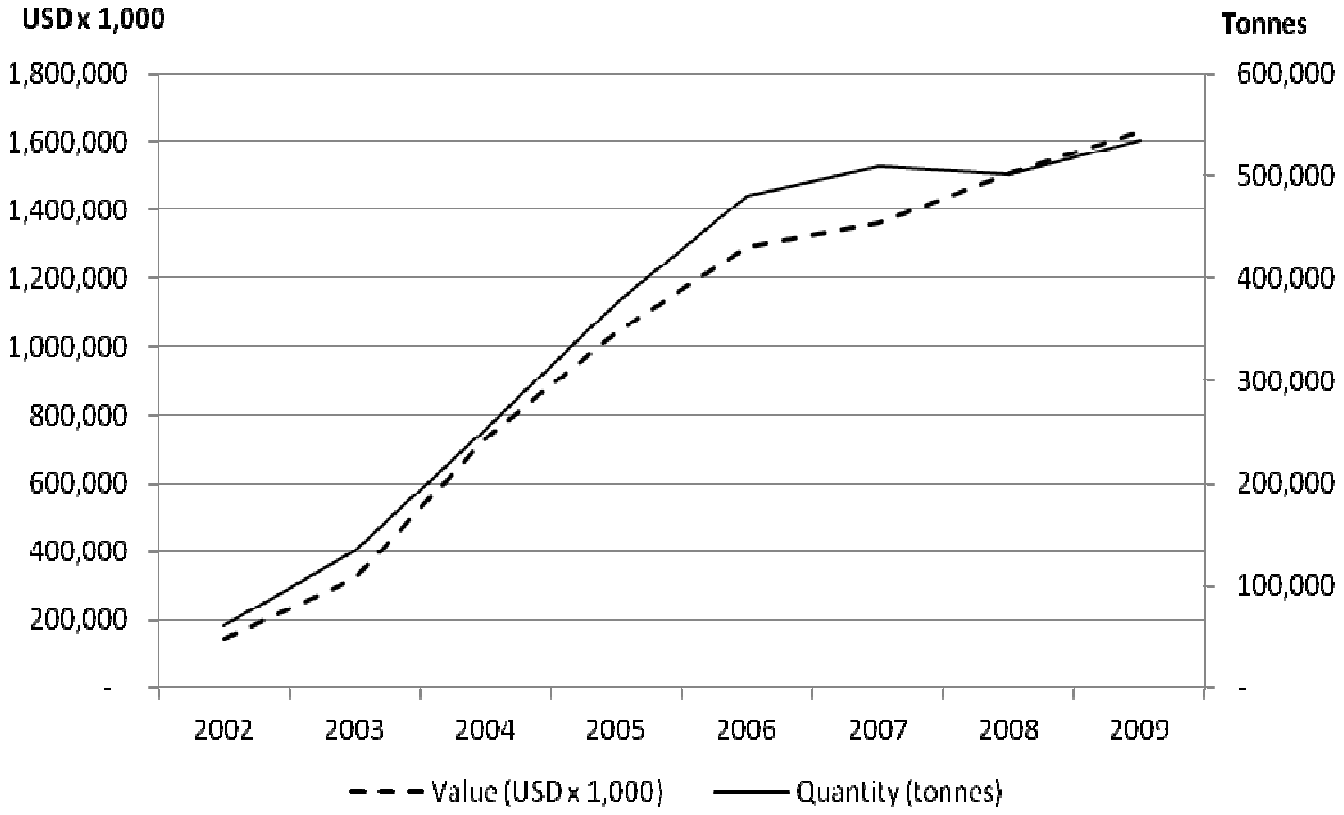
Regulating services	Supporting services	Cultural services	Provisioning services
Climate/gas Disturbance prevention Water / nutrient Waste treatment	Refuge Nursery Coastal protection	Aesthetics Recreation Cultural Science & Education	Food Raw material Genetic RR Medical RR Ornamental RR.

Background

- 50% of mangrove loss around the world.
- Up to 80% of mangrove loss from shrimp farming in Southern Asia.
- **Thailand** held around 240,000 hectares of mangroves in 2005, compared to 474,500 hectares in the early 1960s.

Background

Value and production of shrimp farming in Thailand



Background

Shirmp Farming Policies in Thailand:

- Subsidies, income tax exemptions, loans, assistance, land concessions or open access to land resources.

- Voluntary standards:

  GAP : 10,085 shirmp farmers

  COC: 85 shrimp farmers

  BMP : limited participation

Safe and environmentally friendly production

<u>Low adoption suggests shrimp farming may not become a sustainable practice in Thailand without further intervention with programmes such as PES</u>

Research question

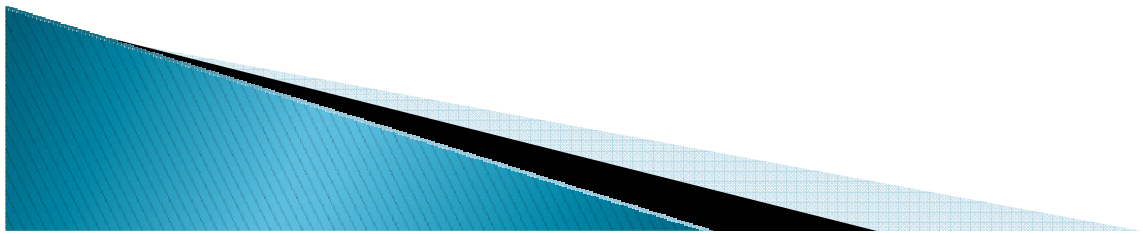
To what extent could a PES scheme in shrimp aquaculture improve the provision of Mangrove Ecosystem Services, or minimize the negative impacts of this activity?

- Opportunity cost approach
- Institutional approach

Opportunity cost approach

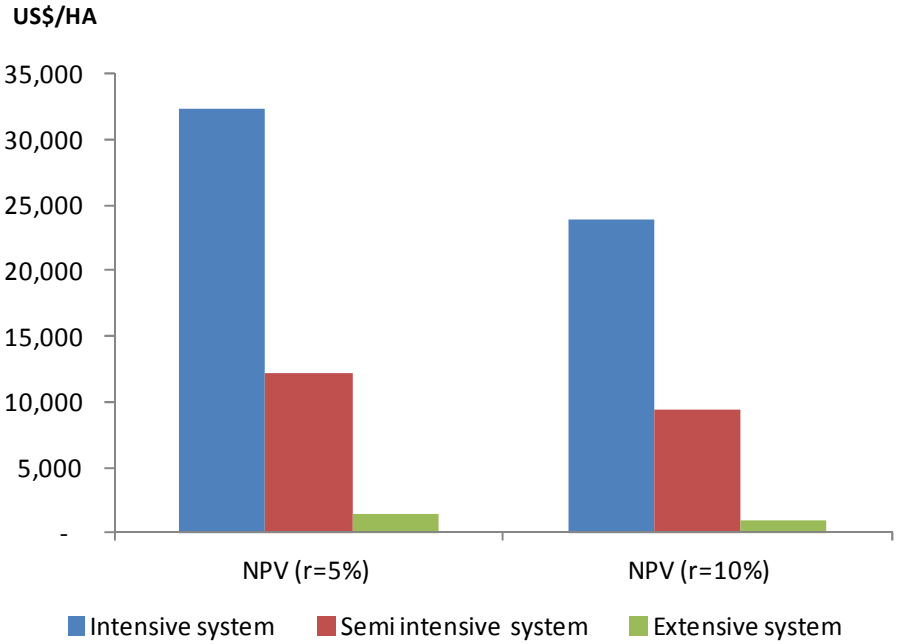
Opportunity Cost :

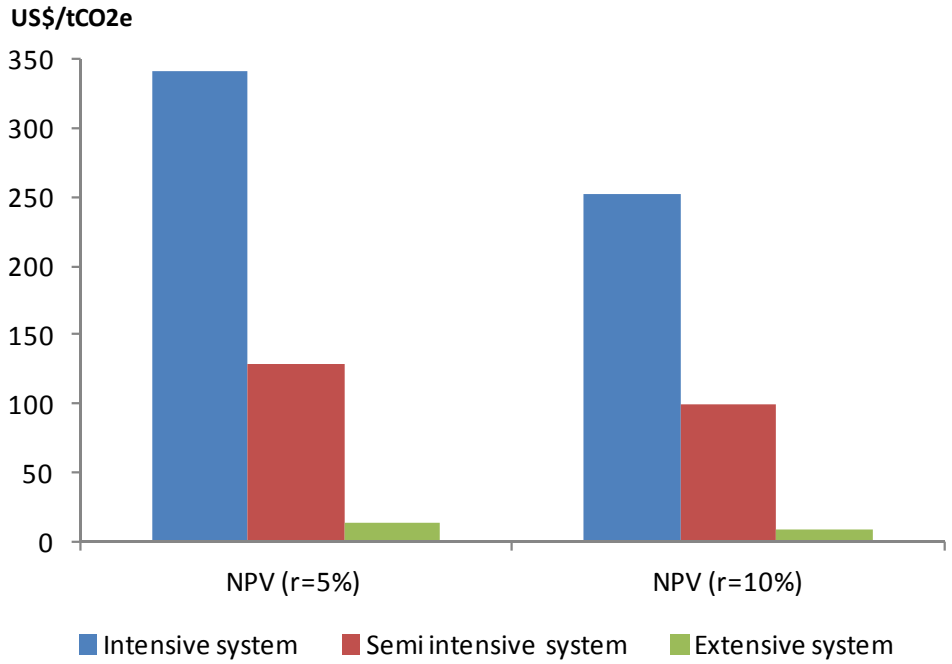
- “The forgone profits from alternative land uses” (Wertz-Kanounnikoff, 2008: 6).
- The minimum willingness to accept of those who will sell the ES (shrimp farmers).
- The net present value



Opportunity cost approach

Net present values of shrimp farming 2001-2002





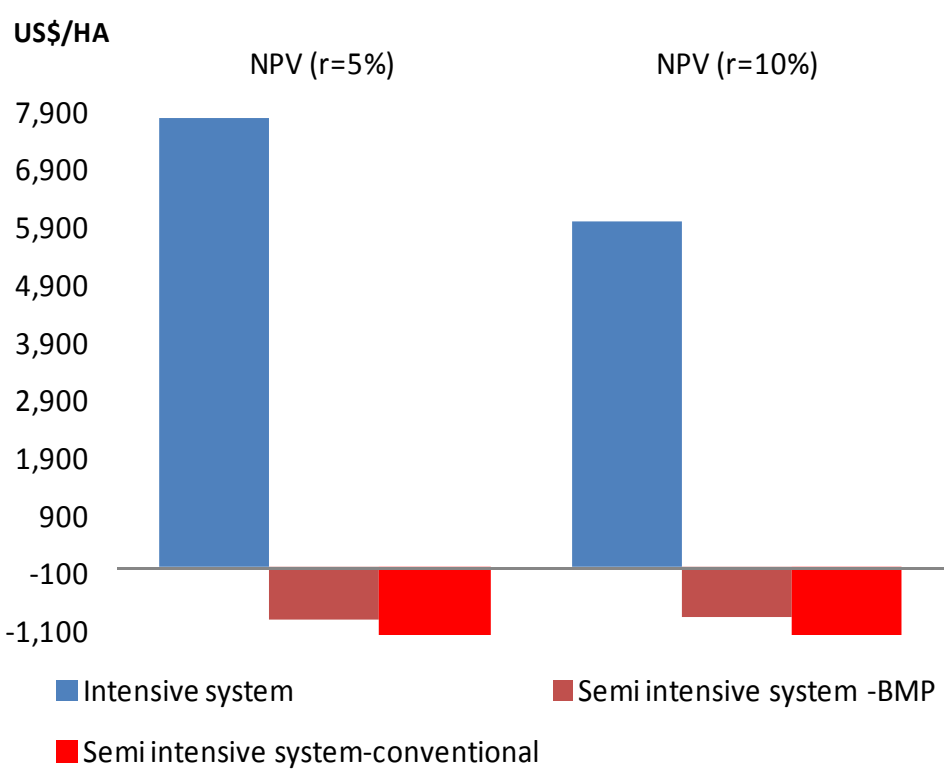
Carbon Prices (US $/tC02e):

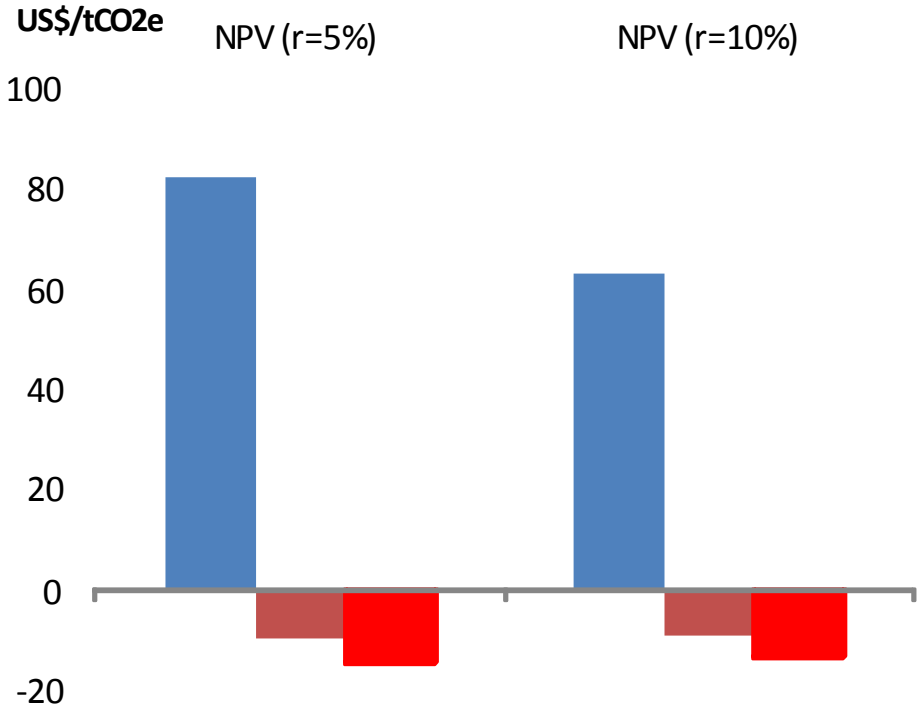
Voluntary market : 0.1-11.4

CDM: 8.21-13.68

Opportunity cost approach

Net present values of shrimp farming 2010





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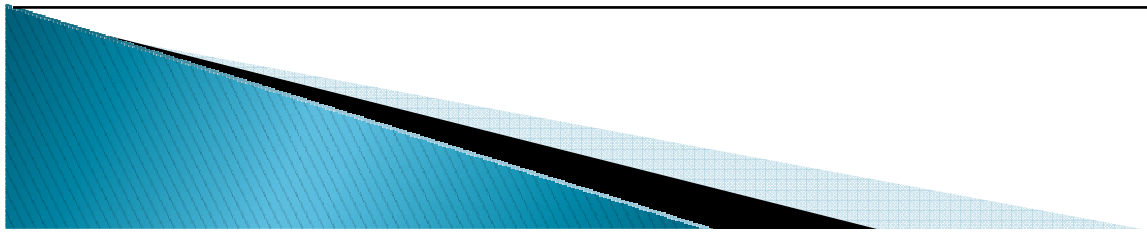
Institutional Approach

Analytical domain	Analytical variables
Institutional design	Actors, interests involved.
Institutional performance	Participants, hectares, impacts.
Institutional interplay	Institutions, interactions.

Source: Adapted from Corbera et al. (2009)

Institutional design: Actors, roles, & interests

Potential sellers	Potential buyers	Potential intermediares
Intensive system Extensive system Semi-intensive system	Shrimp exporters Fishers Thai autorities Local, International CC	Conserv.groups Shrimp farmers assoc. Shrimp industry assoc. Shrimp cluster of BMPs



Institutional performance

Participants	Areas
Extensive system Semi-intensive system	30% -80% of farming areas hold dedicated to mangrove conservation
Positive impacts	**Negative impacts**
Mangrove conservation and provision of MES Sustainable shrimp aq.	Leakage Exclusion

Institutional interplay: Institutions & institutional interactions

Compatible to sustainable aquaculture & mangrove conservation	Potential conflicts
Royal Thai Constitution Thai Shrimp Strategy Land-Use Plan National certification schemes: GAP-COC BMPs	Department of fisheries policies boosting aquaculture development

Key results

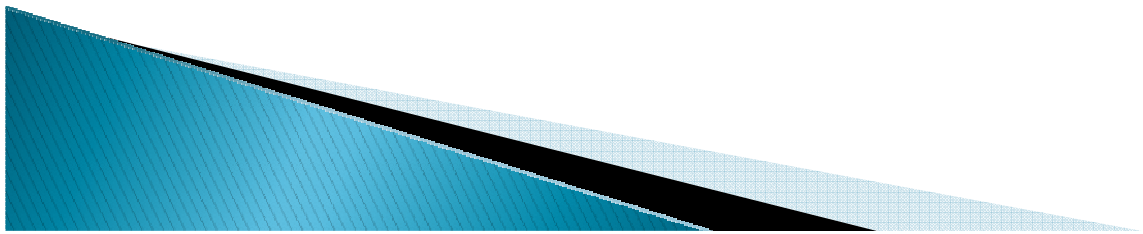
- Extensive and semi-intensive farming might join current carbon markets at the actual carbon prices. Intensive farming cases may require the incorporation of other ES.
- Current sustainable aquaculture policies and programmes appear overall consistent with PES principles.
- Existing market-based instruments can be adjusted to be more compatible with mangrove conservation.

Next steps

- Indicators on ecological processes and flows of ES of mangroves.
- Quantification of transactional and institutional costs.
- Willingness to pay.
- Examination of forestry and aquaculture policies to avoid conflicts.

Conclusion

PES could, under adequate institutional set ups, accelerate the adoption of environmentally-friendly shrimp farming practices, and gain support from policy makers, especially thanks to their added poverty alleviation potential.



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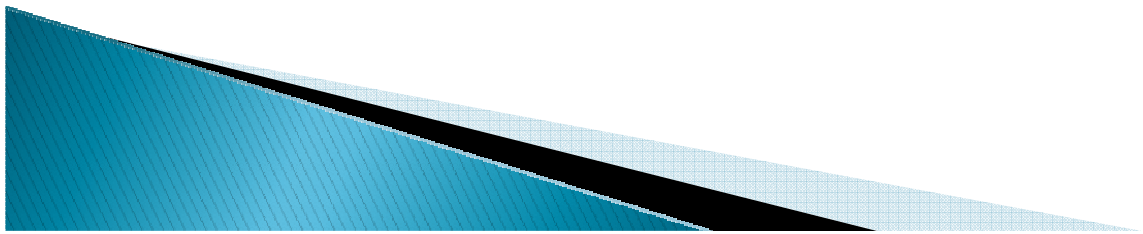

Opportunity cost approach

Total costs of a Potential PES (US$) over 10 years

Discount Rate	US $
at r=5%	98,580,010
at r=10%	72,636,732

Conditions:
-4,100 hectares
-Intensive farming: 2829 (69%)
-Semi-intensive farming: 492 (12%)
-Extensive farming: 779 (19%)