

Presentation given at the Marine Katoomba meeting

**Katoomba XVI:  
Building a Blueprint to Harness New Investment for the Protection  
of Marine and Coastal Ecosystem Services**

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Hosted by the Katoomba Group



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# Katoomba Meeting XVI: Marine PES and other market-based mechanisms

## Lessons from the *Pago por Servicios Ambientales Hidrológicos* Program in Mexico

Instituto Nacional de Ecología,  
SEMARNAT



# The initial setting

- People in Mexico strongly believe (know) that forests are important for water.
- A clear policy gap. Building on economic research for the design of a new type of policy instrument.
- Convincing the Secretary to put the initiative forward, and negotiating through inter-agency conflict/cooperation
- Taking it to Congress and getting the votes.

# A working definition of PES

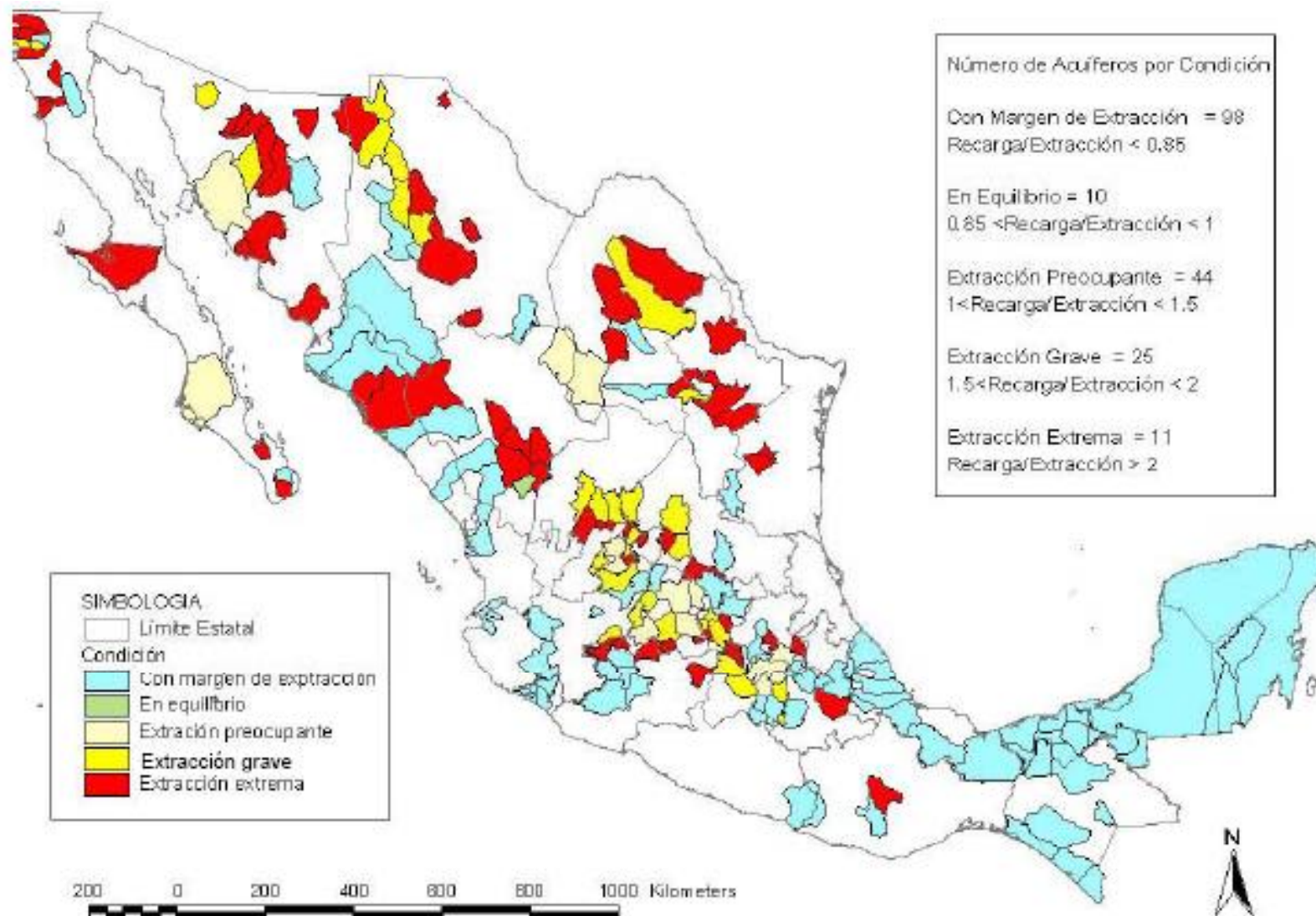
- A **voluntary** transaction where
- a well-defined **Environmental Service**, or a land-use likely to secure that service
- is being 'bought' **by** a (minimum one) ES buyer
- **from** a (minimum one) ES provider
- **if and only if** the ES provider secures ES provision (conditionality).

1.- Find those who benefit

# 1.- Find those who benefit

- Mexico has enormous challenges regarding water:
  - Overdrafted aquifers, with deforestation threatening recharge areas.
  - Declining water quality due, with erosion from deforested watersheds
  - Silting in dams, irrigation infrastructure and municipal water operations
  - Floods and other natural disasters associated with high precipitation events.

# Over-exploited aquifers in Mexico



# 1.- Find those who benefit... and find a way to charge them for the service

- The *Federal Fees Law* in Mexico was designed to maintain capital. Enter **natural** capital.
- Natural Protected Areas access fees also designed with this tool.
- If issue is a public good (non-excludability) then general tax systems is the option.
- With regulation, consumers and producers eventually share the burden.



## 2.- Remember: it is a Contract

- Design conditions to be met on indicators that can be actually monitored.
  - PSAH: Satellite images, aerial photographs, ground(?)
  - Tailor-made indicators (Zurita and C.I.)
- Be sure the **consequences** of not fulfilling them are **known** by all and **credible** of being carried out.
- Institutions might have incentives to overlook unfulfilled obligations (moral hazard).

### 3.- Beware, prices are sticky

- INE, based on **opportunity cost** analysis recommended lower payments than those eventually negotiated (~US\$25 p/ha)
- Once **excess demand** was observed no political will to lower payments. **One way around:** Discriminate on **quality** (targetting).
- Natural Protected Areas fee also exhibited **price hysteresis**. The US\$2 p/day fee difficult to change. (Managing demand makes them nervous)
- Vaquita Marina. Price adjustments are perceived as unfair and threaten the “cooperation atmosphere”.

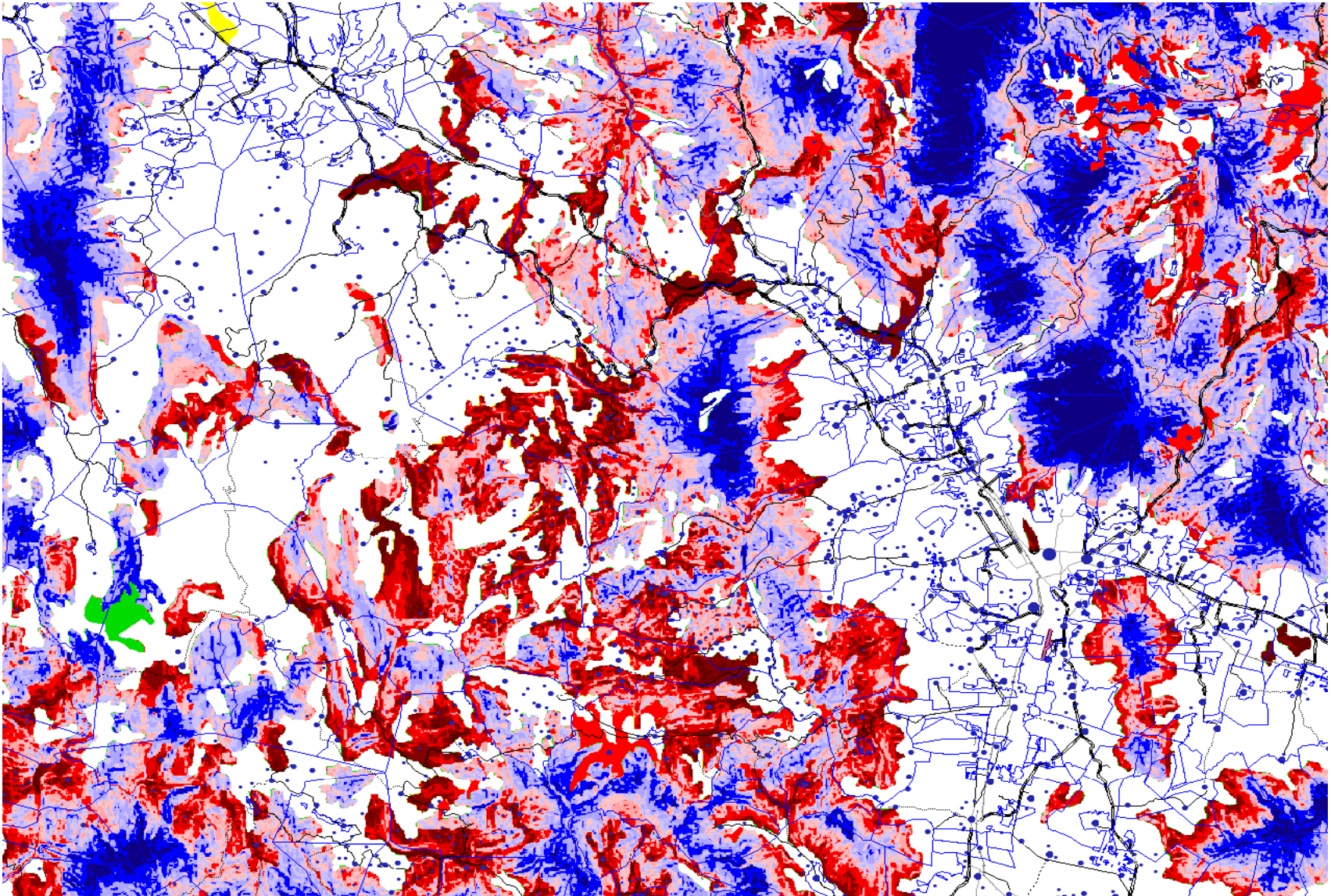
## 4.- Getting the basic property rights, right and the PES will help further improvements

- **A Hirschman's situation.**
- **Forests:** Only exclude the specific areas with conflicts.
- **Vaquita:** A dynamic process with inter-agency conflict
- **Natural Protected Areas:** Terrestrial no problem.

## 5.- Focus on modifying behaviour

- Payments are used because of their decentralized nature and freedom of choice
- Contract terms ask for **observables**, but a baseline scenario is needed to know if the PES is actually changing the **outcomes**.
- For PSAH
  - 2006: targeting tool based on probabilities using econometric analysis.
  - 2009: evaluation using quasi-experimental design (control group and intervention)

# Predicted Probability of deforestation (Oaxaca region)



# Targetting: Risk of Deforestation

Risk of deforestation (quintiles)	Forests: National Level	Elegible area CONAFOR	PSAH 2003	PSAH 2004	PSAH 2005	PSAH 2006
	%	%	%	%	%	%
Very high	20	12	4	11	7	6
High	20	6	7	17	13	10
Medium	20	18	17	20	21	16
Low	20	25	30	30	27	25
Very Low	20	39	42	22	33	43
Total	100	100	100	100	100	100

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Very high	20	12	4	11	7	6	14	
High	20	6	7	17	13	10	20	
Medium	20	18	17	20	21	16	18	
Low	20	25	30	30	27	25	22	
Very Low	20	39	42	22	33	43	27	
Total	100	100	100	100	100	100	100	

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Does the Economic Risk of Deforestation index really work as a prediction/targetting tool?

***Risk of Deforestation* index classification  
all forests in Mexico**

Quintiles (Version s2-s3 using 90s data)

	Very Low	Low	Medium	High	Very high
Rate of Deforestation observed (2000-2007)	1.8%	3.8%	5.3%	9.8%	19.1%

## 5.a Be bold, measure if its making a difference

- Creating a way to test if behaviour is actually being modified.
- Economic analysis of program evaluation use quantitative tools to measure effect. I.e. anti-poverty programs.
  - Participants vs non participants, taking into account selection bias
  - Controlling for the effect of other variables

## 5.a Be bold, measure if its making a difference

- 1.8 million hectares under PSAH between 2003 & 2007, joining at different years.

	PSAH participants	Non-participants
Rate of Deforestation observed (2000-2007)	0.6 %	3.7 %

- But the 2.9 percentage points are not the real difference.

## 5.a Reduced deforestation at the pixel level

- Using econometrics, a group containing the equivalent *risk of deforestation index* is selected

	PSAH participants	Equivalent Non-participants
Rate of Deforestation observed (2000-2007)	0.6 %	1.6 %

- That percentage point reduced is equivalent to 18 thousand hectares of RD.
- In terms of REDD, at least 1.2 million tons of CO2

# Three additional lessons

- The choice of instruments is redistributive
  - Make it transparent
  - Make it useful
- Subsidies and PES
  - Might co-exist, but keep pointing at them
- Build in the program a way to **adapt** as knowledge is gained, but careful because door is opened to interest groups rent-seeking.

More information available at  
[www.ine.gob.mx](http://www.ine.gob.mx)

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