



Pesmix



# PES in Mexican common forests: Who gets it and what does it change?

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# Plan

1. Motivation
2. Distribution of the payments
3. Impact on production behaviour
4. Concluding remarks

# Motivation

- PES and PES-like broadly developed over the world
- By many respects, national-PES differs from Coasean definition of PES (Muradian et al., 2010 ; Vatn, 2010)
- The intermediary often becomes the main actor (Kosoy and Corbera, 2010 ; Corbera, 2009)
- Two issues becomes crucial :
  - ▶ Targeting (who and how ?) with scarce resources
  - ▶ The permanence with short-term contract
- Explore these issues with a focus on Mexican PSA-H in a sub-region of Yucatan

# Motivation

- In Mexico, 80% of the forest cover is managed by small communities called *ejidos* (Bray et al., 2003 ; Kaimowitz, 2005)
- In this setting, the final beneficiaries are not clearly identifiable (Corbera et al., 2007)
  - ⇒ Who are the final beneficiaries ?
- The PSA-H proposes short-term contract in order to adjust the scheme over time (Sims et al., 2013)
- With short term contract (five years and yearly payments), the impact on economic behaviour becomes crucial for permanence
  - ⇒ What is the impact on agricultural behaviour ?

# Plan

## 1. Motivation

## 2. Distribution of the payments

### 2.1 Adverse selection in PES allocation

### 2.2 How does the Mexican PSA-H tries to deal with adverse selection ?

### 2.3 PES in commons

### 2.4 Econometric analysis

## 3. Impact on production behaviour

## 4. Concluding remarks

# Fairness criteria and PES

- The allocation of the PES depends on underlying fairness conception and is more or less oriented toward economic efficiency (Pascual et al., 2010)
- It is often necessary to direct part of the payments toward non-threatening agents :
  - ▶ For equity and legitimacy reasons (Adger et al., 2003 ; Corbera et al., 2007)
  - ▶ To avoid a general environmental blackmail (Wunder, 2007)
- But, with scarce resources, achieving (short term ?) additionality requires focusing at least partially the program on threatened forest

# Adverse selection

- Adverse selection may generate informational rents
- Payments should consider deforestation risk and be set as close as possible to the OC (Alix Garcia et al., 2008 ; Ferraro, 2008)
- Payments should not be directed toward beneficiaries that meet the compliance criteria without payments (Persson and Alpizar, 2013)
- How do practitioners deal with these theoretical results ?

# Presentation of the scheme

- The PSA-H : a federal scheme of Payments for Environmental Services Hydrological
- Payments for forest conservation since 2003
- Five-year contracts and yearly payments
- Managed by the federal forest commission
- Financed through a fee on water use
- With moderate payments and short-term contract :

**PSA-H targets cattle-ranching and traditional agriculture**



# Eligibility zones and deforestation risk

- The federal commission defines eligibility zones, *hot spots* of deforestation, based on land-use change maps and advise from regional offices

FIGURE : Evolution of eligible areas



Source : Authors

- The scoring system emphasizes the risk of deforestation and other environmental indicators (Rolon et al., 2011)
- Payments are differentiated according to a deforestation risk index (Muñoz-Piña et al., 2008)

# The specificity of PES with commons

- The Mexican PSA-H is clearly oriented toward compensation and tries to direct payments toward threatened forests (Muñoz-Piña et al., 2008, 2011)
- When forests are owned as commons, payments are made to the assembly that can decide :
  - ▶ To invest the payment
  - ▶ To redistribute the payment
- *Ejidors* are heterogeneous and a second adverse selection issue arises
- In the *ejido*, the PSA-H is perceived as a reward for not using the forest and working at its preservation

# Adverse selection within-ejido

- Some *ejidatarios* decide to remain outside of the program
- Beneficiary from the same *ejidos* receives heterogeneous payments according to their use of the commons

**We hypothesize that the relative payments received by one household compared to its peer *ejidatario* is directly linked to the type of land-users and reflects current use of the commons more than compensation**

# The Cono Sur

FIGURE : The Cono Sur of Yucatan



Four principal economic activities :

- ▶ Traditional slash-and-burn
- ▶ Mechanised agriculture
- ▶ Cattle-ranching
- ▶ Off-farm

# Distribution of the payments : Estimation

$$PSA_{ij} = \alpha + \beta A_{ij} + \gamma X_{ij} + \eta D_j + \epsilon_{ij} \quad (1)$$

- Explained variable : Average payments received for one year of reception of PSA-H
- Explanatory variables : Dummy variables for each type of activities
- Control for basic characteristics of the household such as age, gender and education of the head, size and remittances
- OLS estimation with dummy-*ejido* to capture between-*ejido* heterogeneity and focus on within-*ejido* heterogeneity
- Surveys with 156 households from 27 *ejidos*

# Distribution of the payments : Results

TABLE : Distribution of the payments(OLS with Fixed effects per ejido)

VARIABLES	(1) psahval_an	(2) psahval_an	(3) psahval
dum_mec05	3.255*** (1.205)	2.804** (1.144)	12.81* (7.634)
dum_trad05	3.327*** (0.888)	3.644*** (0.925)	15.01*** (5.008)
dum_ranching05	-1.486** (0.741)	-1.653* (0.859)	-6.287* (3.785)
dum_wagework05	-0.481 (0.790)	0.182 (0.666)	0.0955 (3.986)
dum_selfemp05	1.557* (0.882)	0.762 (0.828)	14.63** (5.897)
Observations	156	144	156
R-squared	0.790	0.848	0.787

All estimations include *ejido*-fixed effects

Robust standard errors in parentheses

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

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# Impact and permanence

- National PES proposes short-term contract in order to gain flexibility and adjust the program over-time
- Impact analysis have focused on short-term impact on the forest cover
- The scheme may end for lack of political support
- The payments may not be able to compete anymore with alternative land uses
- The impact on economic activities determines the long-term impact



# Impact on economic activities : Methodology

- Explained variables : Variation between 2005 and 2013 of :
  - ▶ Hectares of traditional agriculture cultivated
  - ▶ Hectares of mechanised agriculture cultivated
  - ▶ Hectares of pasture cultivated
  - ▶ Cattle heads
  - ▶ Fertilizer per hectare
- Explanatory variable : Total payments received between 2005 and 2013
- Control for :
  - ▶ Type of activities to account for distribution effect highlighted in the previous section
  - ▶ Land-use at *ejido*-level to account for potential endogeneity bias at *ejido*-level
  - ▶ Basic characteristics of the household
- *Seemingly Unrelated Regression* to account for correlation between error terms
- Surveys with 187 households (beneficiary and non-beneficiary)

# Impact on economic activities : Results

TABLE : Impact of the PSA-H : SUR

VARIABLES	(1) mecha1305	(2) tradha1305	(3) pastha1305	(4) cattle1305	(5) fert1305
psahval	0.00180 (0.00444)	0.00338* (0.00186)	0.0175* (0.00896)	0.0219* (0.0112)	0.0222** (0.00950)
psahval2					-0.000137** (5.49e-05)
Observations	187	187	187	187	187
R-squared	0.083	0.240	0.151	0.133	0.099

Standard errors in parentheses

\* \* \*  $p < 0.01$ , \* \*  $p < 0.05$ , \*  $p < 0.1$

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# Concluding remarks

- The program designed as a compensation mechanism is perceived as a reward by the *ejidatarios*
  - ▶ The specificity of PES has not been appropriated at each level of decentralisation
  - ▶ The *ejidos* reinterpret the program according to their own conception of fairness
- Payments have been partially invested in potentially-degrading activities
  - ▶ Potential perverse effects in the future if the program stops or is not able to compete anymore
  - ▶ Lack of economic conditionality on the use of the payments
  - ▶ Potential for "Investment-PES" (Pirard et al., 2010 ; Karsenty, 2011)

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