

Payments for Ecosystem Services and Poverty Alleviation

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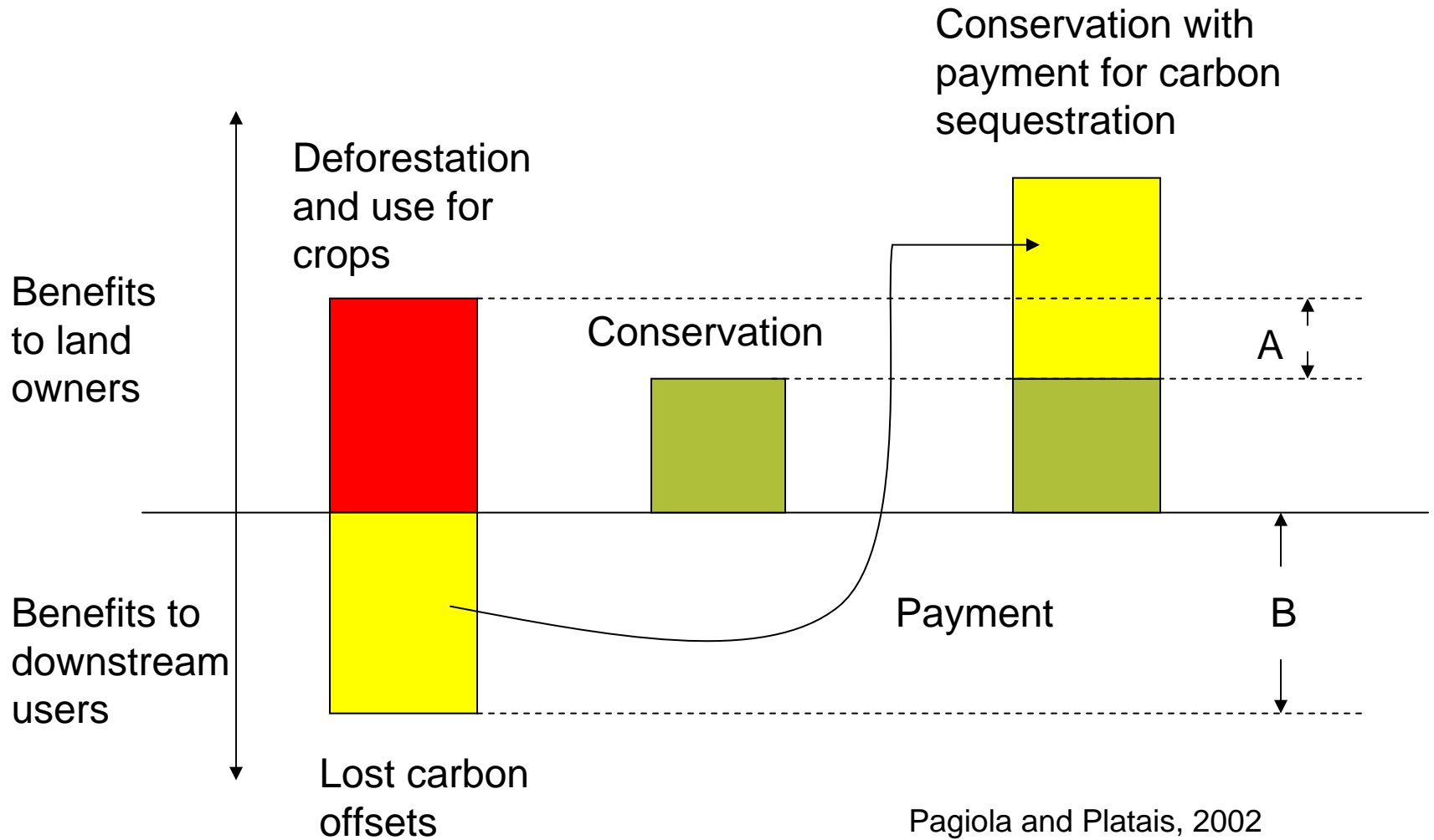
Structure

1. Introduction to payments for ecosystem services (PES).
2. PES and poverty alleviation.
3. Framework for poverty impact assessment.
4. Empirical evidence from Nhambita.
5. Conclusions

Payments for Ecosystem Services (PES)

- Voluntary transaction under which people who use an ES pay those who provide the service, conditional on the ES being secured:
 - Carbon sequestration
 - Watershed conservation
 - Biodiversity
 - Scenic beauty

How the payment works?



PES and poverty alleviation

- If:

- participation is voluntary,
- payment > segment 'A' (opportunity cost).

➔ PES should reduce poverty among poor participants.

- Examples:

- Positive impact of PES in Latin America (Greig-Gran et al. 2005).
- Benefits of -\$110 to +\$1,700/ha in Scolel Te project (Tipper 2002).

Impact is not straightforward

- Poor may lose by:
 - being unable to participate in PES,
 - losing control over land to powerful people,
 - losing wage labor as land use patterns change.
- In general, empirical evidence on welfare effects of PES remains sketchy.
- Cause and effect studies are difficult.

Conservation vs. Development

- PES: win-win between conservation and economic development.
- But when these aims are incompatible:
 - what is more important – environment or development?
- Important to consider:
 - PES payments are conditional on ES provision.
 - If an ES is not secured, buyers will not pay
 - no scope for poverty alleviation.
- Need to measure the extent to which a PES program secures an ES.

Framework for poverty impact assessment

Q1. Determinants of participation:

Q1a. Identify factors that determine participation.

Q1b. Extent to which poor are able to participate.

Q2. Impact on participants:

Q2a. Financial impact

Q2b. Non-financial impact

Q3. Impact on non-participants: spillover effects in the community.

Preliminary evidence from Nhambita Community Carbon Project, Mozambique



Nhambita Project

- Based in Chicale Regulado:
 - ❑ 21% of households headed by females.
 - ❑ Female literacy < 20%, almost 40% households completely illiterate.
 - ❑ Food insecurity – 82% of households buy food from outside.
 - ❑ Less than 10% of households with access to a permanent job.

(Source: Baseline survey by Jindal 2004. Sample size = 245 households)

Major activities

- Payment for forest carbon sequestration on private plots (machambas) – agroforestry. E.g. \$518 over 7 years for planting cashew trees on 1ha.
- Payment for avoided deforestation on community land.
- Employment generation activities – saw mill, carpentry shop, extension staff.

Data for impact assessment

- Survey with 271 randomly selected households:
 - Stratification in 'Project' area – Nhambita:
 - with members employed by the carbon project.
 - with carbon contracts but are not employed by the project.
 - neither employed, nor have carbon contracts.
 - Control area – Kudzu
 - Residents.
- Focus groups
- Field transacts.

Q1a. Determinants of participation

Explanatory variable	Coefficient	P-value
Number of household members	0.042	0.02
Farm (machamba) Area	0.072	0.00
More recent migration	- 0.007	0.01
Female headed household	- 0.091	0.18
Constant	14.47	0.01
R ²	0.251	
N	159	

Implications

- Positive effect:

- Households with more members (as an indicator of labor availability) more likely to participate.
- Households with larger farm area more likely to participate.

- Negative effect:

- Recent migrants are less likely to participate.
- Female headed households are less likely to participate (low statistical significance).

Q1b. Are poor able to participate?

- Tentative answer – Yes:
 - >90% households below poverty line.
 - Project covers > 70% of the community.
 - Major barrier in PES is tenure insecurity - absent in Nhambita.
- But less likely to participate in the project :
 - Poorest households without enough land or labor to allocate to tree growing.
 - Female headed households (as proxy for poverty).

Q2a. Financial impact on participants

- For people employed in the project:
 - Regular salary.
- People with carbon contracts (no. = 850):
 - Avg payment/family = 1923 MTn (\$80)/year
~~ about 1 -2 months' wage.
 - People used money to buy:
roofing material, food for the family, books/stationary
for children, clothes.

Q2a. Financial impact

- Consumer durables (proxy for wealth), F-test:

	mean/hh	Prob.>F
□ project employees	= 2.8	0.005
□ families with carbon contracts	= 2.2	
□ among non-participants	= 1.9	

- However, difference between 2nd and 3rd category statistically insignificant.

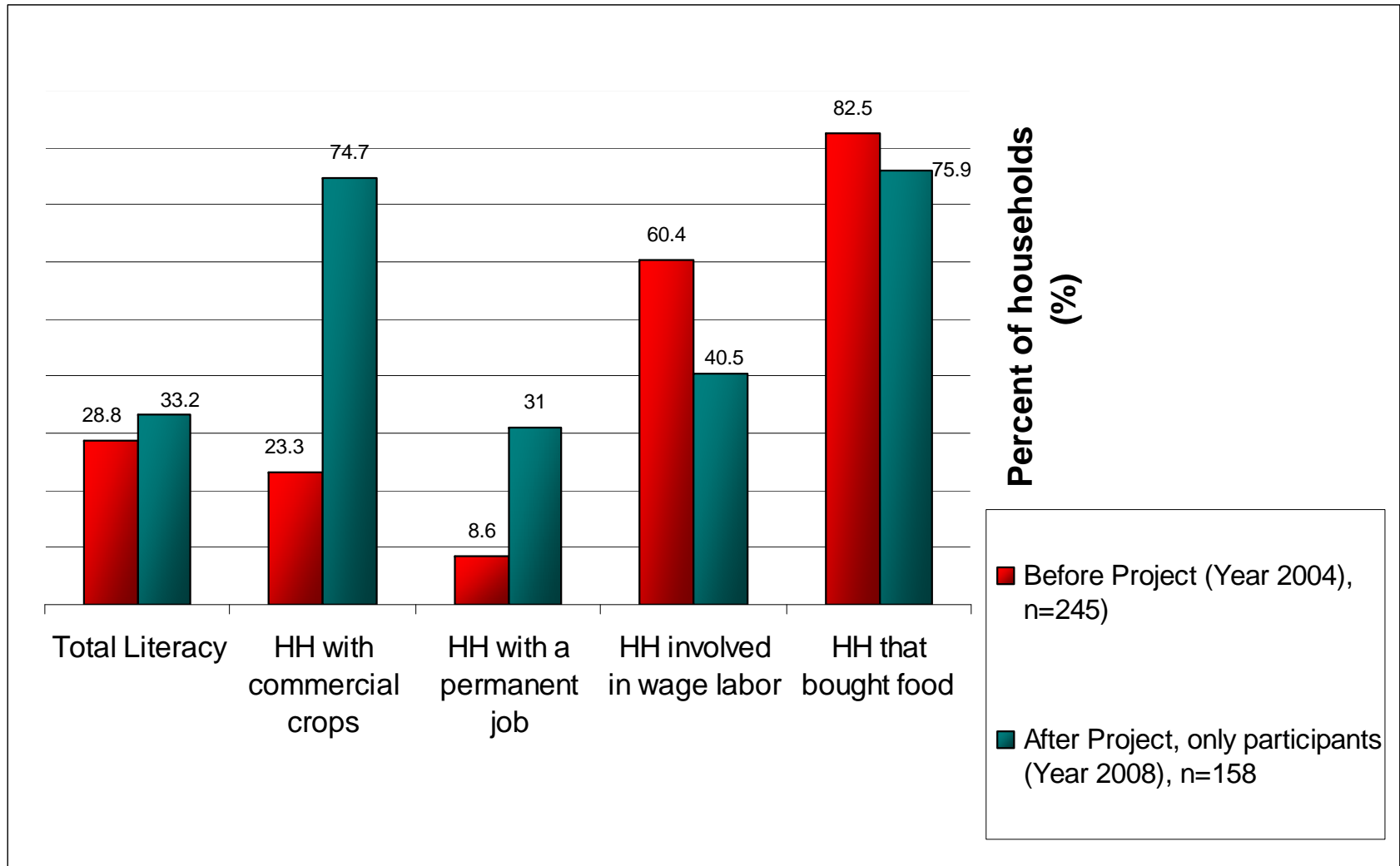
➔ Project employees better-off,

but too early to say for families with only carbon contracts.

Q2b. Non-financial impact

- Benefits from agroforestry:
 - Availability of timber, firewood, other products.
 - Fruits for home consumption and for sale.
 - Increased crop productivity
 - Windbreaks around crops.
- Skill-building through training and apprenticeship.

Q2b. Impact contd...



Q3. Spillover effects

- Positive impact:

- Community fund >65,000 MTn (\$2,700) to support local development.
- Construction of new school buildings.
- New shops in the area.
- Small clinic in the community.
- Project vehicle as an ambulance!

- But,

- need to explore the status of seasonal labor among non-participants, and
- the busiest shop is the village bar that sells alcohol.

Revisiting conditionality

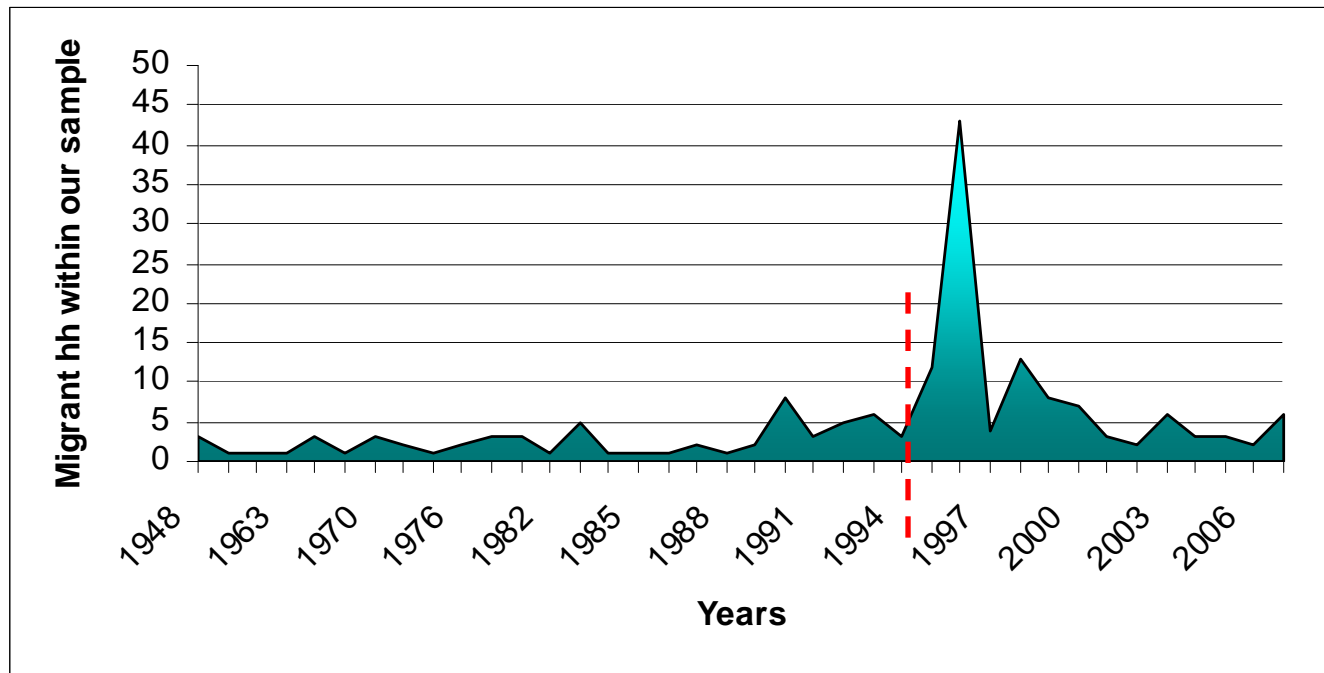
- Payments conditional on increase in biomass or reduction in deforestation.
- Instead of absolute change, consider per capita change due to migration.

Q. Are people migrating due to the project?

- No, the major reasons being:
 - land available to set up new farms (machambas),
 - relatives or family ties in the village.

Migration into Nhambita

	<u>1997</u>	<u>2008</u>
Num of households	102	995
Population	612	5071



Conclusions

- Participation:

- Poor able to participate,
- perhaps not the poorest (female headed, hh with small farm area).

- Financial impact:

- Significant on people who are employed.
- Carbon payments supplement family income, but
- Too early to see on hh with only carbon contracts.

Conclusions

- Non-financial impact:
 - Improvement in health/education facilities.
 - Perceived benefits from agroforestry.
- Due to migration, trade-off:
 - Immediate economic impact by saturating fewer hh with multiple carbon contracts, or
 - Slower impact by enrolling more hh with at least one contract – equity based.

Project follows the second approach.

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