Does sustainable use of forest resources and agroforestry-business lead to better livelihood? The case of the DECOFOS project in Mexico

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Outline

- Context
- Project description
- Research question
- Approach and methodology
- Results
- Conclusions

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Background and Context

- Mexico: very diverse landscapes and biodiversity
- Forest areas cover about 30% of its territory
- When we include also wildlands it adds up to about 73% of the total territory: i.e. 140 million hectares
- Starting from the '80s very large deforestation rate
- Most of the total forest land in Mexico (about 80%) is owned by communities and *ejidos*

The DECOFOS project and its logic

- **Financed jointly between IFAD, GEF and the Government of Mexico**

- **The project had a dual goal:**
  - improving the livelihood of people living in poverty and extreme poverty in degraded or marginalized areas by supporting the implementation of sustainable productive activities
  - contributing to climate change adaptation and mitigation through reforestation and sustainable use of natural resources

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DECOFOS theory of change (cont'd)

To achieve these objectives the project was structured around two main components:

- **1: Improve organizational, planning, and managerial capacities of local communities/*ejidos and support the start up or scale up of micro and small business initiatives***

- **2: Promote and facilitate sustainable use of forest resources and of agroforestry**

The logic of the project is such that it is expected to have impacts at two different levels:

- At the **household/community level** by reducing households' poverty mainly through increased income and greater diversification of economic activities (i.e. new income sources and employment opportunities) related to sustainable production of timber and non-timber forest products;

- At the **environmental level** through the adoption of agroforestry, reforestation and sustainable use of forests.

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Project coverage and targeting

Eligible project areas were identified based on the following criteria:

i. high and very high marginalized areas,

ii. presence of communities without ongoing forest management programs,

iii. areas with limited attention from institutions and governmental programs (especially forest programs such as "Procymaf" and "Proárbol"),

iv. areas characterized by the presence of spots with high biodiversity and potential to provide goods and services,

v. areas with scarcity of natural resources but with potential to develop products that can satisfy the demand of local industries (e.g. plantations) and restore the wood mass.

Approach and methodology

- **Quasi-experimental mixed method approach**

- **Qualitative and Quantitative data**
  - FGD, KII
  - Data collection on HH and Community through surveys questionnaire
  - GIS data merged with geo-referenced HH and community

IA design: data and methodology

Sampling

1step Village level:

Treatment group: randomly selected Communities/*ejidos* out of beneficiary list

Control group:PSM 3 nearest neighbours of the list of eligible villages using INEGI censos ejidal and using variables used in the targeting

2nd Step: Selected Village Validation through expert consultation with KI in each of the three states

3rd Step: Within selected villages random selection of HH in treated and in control communities based on power calculation using key indicators established by the project and using the most conservative number of HH

IA design: data and methodology

Communities/*Ejidos*	Treatment	Control
Campeche	20	20
Chiapas	20	20
Oaxaca	14	15
TOTAL	**54**	**54**
Households	**Treatment**	**Control**
Campeche	408	403
Chiapas	418	399
Oaxaca	302	300
TOTAL	**1,128**	**1,102**

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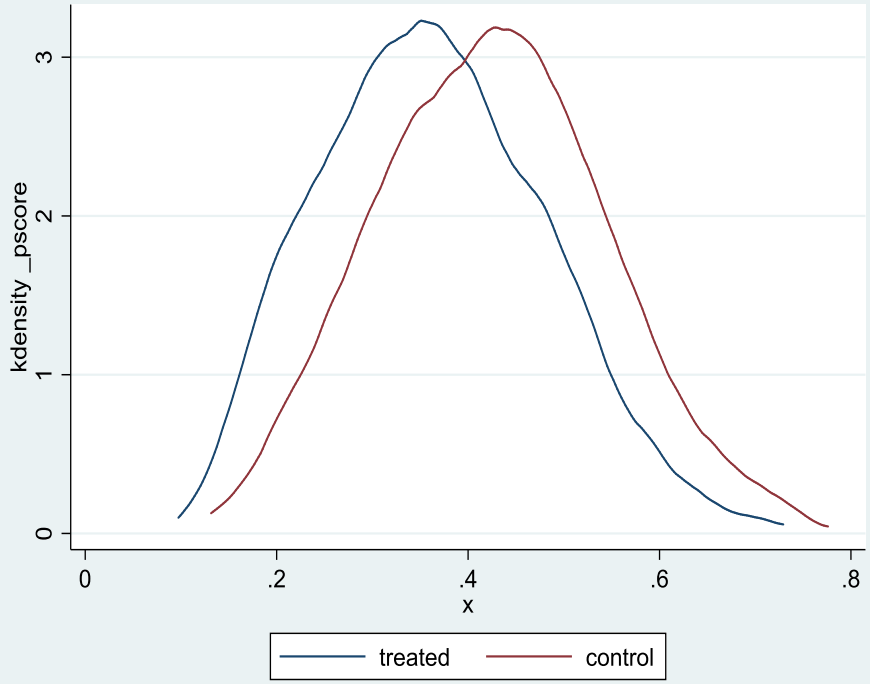
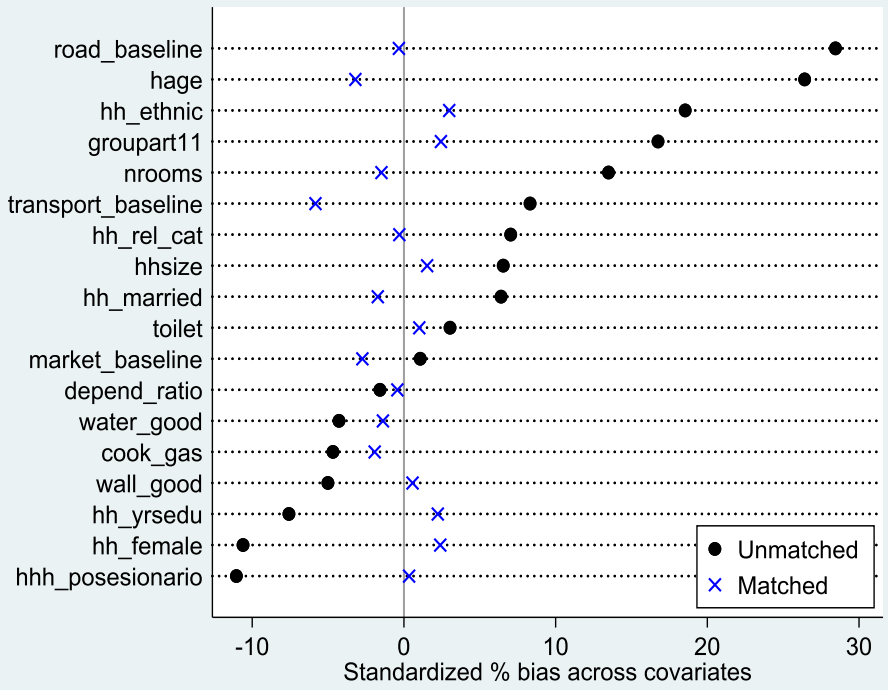
Matching

Common support between treatment and control groups



Bias reduction before and after matching



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Profile of the project area and sample

Three scenarios with different probability of occurrence naturally emerged:

1. Communities/*ejidos* that benefited only from low-expected-impact activities (20%);
2. Communities/*ejidos* that benefited only from high-expected-impact activities (30%);
3. Communities/*ejidos* that benefited from both types of activities: low-expected-impact as well as high-expected-impact activities (50%).

Activity	CAMPECHE	*CHIAPAS*	OAXACA
High and (Low + High) impact activity	**%**	**%**	**%**
Modulos Agroforestales	34.66	3.1	21.21
Proyectos de transferencia de tecnología	14.34	16.72	15.15
Viveros comunitarios	8.37	5.26	6.06
Ejecución de Proyectos de Microempresas Rurales	7.17	24.15	6.06
Constitución y registro legal de microempresas rurales	7.57	7.74	4.24
Total	**72.11**	**56.97**	**52.72**

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Analysis

- **Three different approaches:**
  - PSM nearest neighbour caliper 0.01
  - IPW
  - IPWRA

- **Results are very robust across the three methodologies**
- **Results reported are based on IPW**

Questions

- Did forest and vegetation area increase (compared to the baseline)?
- Did the project translates into higher use of land for agroforestry?
- Did the project translate into higher and more diversified income sources?
- Did the project translate into higher and stronger social capital?
- Did the negative effects of climatic variability and extreme weather events decrease thanks to agroforestry as well as the adoption of other natural resource management?

Impacts of DECOFOS

Results on indicators of environmental impacts and resilience

	Whole sample			Campeche		Chiapas		Oaxaca	
	ATET	Control mean	N	ATET	Control mean	ATET	Control mean	ATET	Control mean
Normalized difference vegetation index (NDVI)	0.017***	0.639	1 934	0.037***	0.635	-0.011***	0.656	0.018***	0.633
Ability to recover from shocks	0.171***	2.204	1 238	0.073***	2.455	0.169***	2.100	0.262***	2.007
Households affected by climatic shocks since 2011 (%)	-6.203***	59.255	1 934	-3.221***	80.928	-1.331***	37.549	-7.724***	49.759
Households affected by drought (%)	-7.491***	45.520	1 934	-1.336***	69.807	-6.471***	25.702	-7.087***	28.768
Household is required to have permission to exploit common land	7.329***	8.186	1 634	6.646***	3.518	13.786***	9.591	1.437***	9.183

Results on indicators of economic mobility

	Whole sample			Campeche		Chiapas		Oaxaca	
	ATET	Control mean	N	ATET	Control mean	ATET	Control mean	ATET	Control mean
Total net household income (USD)	227.762	1 038.798	1 919	55.442	1 047.286	632.859	1 171.869	34.720	716.920
Total gross household income (USD)	243.422**	1 102.319	1 919	194.207**	1 404.669	474.667**	1 229.833	218.286**	642.975
Income diversification (Number of income sources)	0.092*	2.123	1 919	0.339*	1.932	0.076*	2.277	-0.224*	2.193
Durable assets index	0.004	0.451	1 919	0.007	0.509	0.011	0.432	0.005	0.385
Productive assets index	0.106**	0.260	1 919	0.378**	0.435	0.066**	0.040	0.007**	0.158
Total assets index	0.029**	0.189	1 919	0.103**	0.252	0.021**	0.126	0.003**	0.145
Households below asset-based poverty line, 40th percentile (%)	-1.160	35.521	1 919	-2.806	13.316	-6.271	45.694	0.218	59.517
Households below asset-based poverty line, 60th percentile (%)	-4.144*	56.158	1 919	-7.326*	28.982	-9.876*	70.774	-4.936*	85.909

Impacts of DECOFOS

Results on indicators on income composition

	Whole Sample			Campeche		Chiapas		Oaxaca	
	ATET	Control mean	N	ATET	Control mean	ATET	Control mean	ATET	Control mean
Households exploiting natural resources from common land (%)	6.538**	50.959	1 634	18.133**	49.408	5.337**	52.455	-7.858**	47.681
Income from sales of natural resources from common land (USD)	21.185***	3.033	1 634	52.450***	6.016	4.284***	1.536	-0.319***	0.534
Parcels operated by the household (Nr.)	0.199***	1.780	1 634	0.254***	1.461	0.491***	2.237	-0.194***	1.144
Business activities sell products from common land (%)	0.013*	0.014	1 934	0.020*	0.012	0.022*	0.010	-0.008*	0.021
Households entered into new business since 2011 (%)	0.022*	0.056	1 934	0.008*	0.091	0.042*	0.035	0.016*	0.033
Net income from business activities (USD)	78.113*	50.373	1 934	46.733*	68.147	165.491*	21.883	37.881*	28.213
Gini-Simpson index of crop diversification	0.044**	0.243	1 634	0.070**	0.257	0.077**	0.226	-0.052**	0.269

Results on indicators on indicators of food diversity, food security and resilience

	Whole Sample			Campeche		Chiapas		Oaxaca	
	ATET	Control mean	N	ATET	Control mean	ATET	Control mean	ATET	Control mean
Food Insecurity Experience Scale score for Adults	-0.200**	1.786	1 934	-0.141**	2.051	-0.145**	1.555	-0.514**	1.895
Household Dietary Diversity Score (HDDS), weekly	-0.143	9.835	1 934	-0.438	10.323	0.062	9.663	-0.080	9.461
Number of meals per day consumed by the household	0.068***	2.635	1 910	0.102***	2.594	0.094***	2.633	-0.071***	2.751

Conclusions

- Rather innovative type of intervention which merges public environmental benefits with private ones
- Reflects the different topographical, agro-ecological and socio-economic differences of the three southern states involved: Chiapas, Campeche and Oaxaca
- Results are perfectly aligned to the different strength and emphasis the project has put on the different components
- Successful on environmental benefits (NDVI, increase of permits, increase of parcels, the increase of income coming from access to natural resources, use of trees and other common land resources) – more so for Campeche
- Successful on income diversification and on income from business enterprises – more so for Chiapas
- Good results, stronger for more focussed when more tailored-to-development-needs and context

Any questions?

Thank you!

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