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Forest resources, poverty and inequality in Peruvian Amazon: The role of tenure regimes and remoteness

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1 Introduction

- Peru: Fourth largest tropical forest worldwide.

- Communal land in Peruvian tropical forest:
  - ✓ 12 millions ha.
  - ✓ Owned by indigenous population.

- Deforestation:
  - ✓ Slash and burn agriculture.
  - ✓ Industrial crops (oil palm and cacao).

Objectives

- To analyze the role of forests in poverty and inequality and to evaluate if communal land ownership and remoteness have an impact on forest dependency.
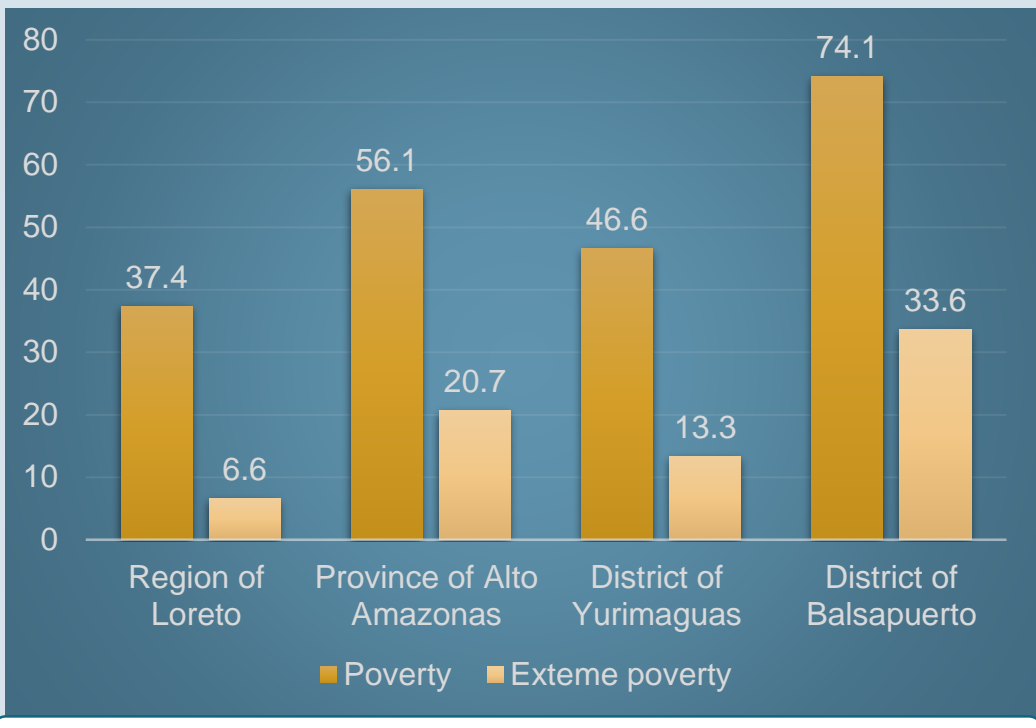

Fig. 1. Incidence of poverty in the study area

2 Methods

Research area

- Lowland tropical forest (Northeast Peru).

Data collection

- Baseline survey May-August 2017.

- 400 HH in 50 villages (two different tenure regimes and two levels of remoteness).

Poverty and Inequality

- Foster, Greer and Thorbecke (FGT) index.

- Gini coefficient.

Econometric analysis

- Total income and Forest dependency.
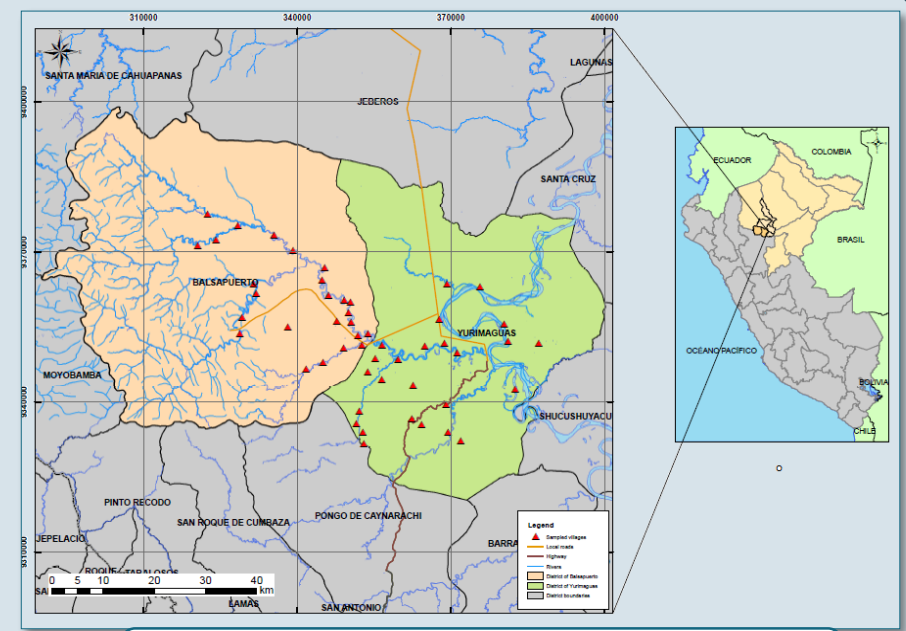
- Ordinary least squares (OLS) and Fractional logit model.

Fig. 2. Map of the study area

3 Results

Table1.
FGT poverty index by land tenure regime and remoteness

	Without forest income			With forest income (aeu)		
	FGT (α=0)	FGT (α=1)	FGT (α=2)	FGT (α=0)	FGT (α=1)	FGT (α=2)
Total	0.635	0.286	0.166	0.334	0.101	0.045
Tenure regimes						
Private	0.561	0.240	0.138	0.327	0.110	0.053
Communal	0.709	0.332	0.195	0.342	0.093	0.037
Difference	-0.148	-0.092	-0.057	-0.015	0.017	0.016
Change (%)	↑26.38	↑38.33	↑41.3	↑4.59	↓15.45	↓30.19
Remoteness						
Non-remote	0.589	0.248	0.139	0.311	0.100	0.048
Remote	0.694	0.334	0.201	0.364	0.102	0.041
Difference	-0.105	-0.086	-0.061	-0.054	-0.002	0.007
Change (%)	↑17.76	↑34.69	↑44.04	↑17.28	↑1.87	↓14.85

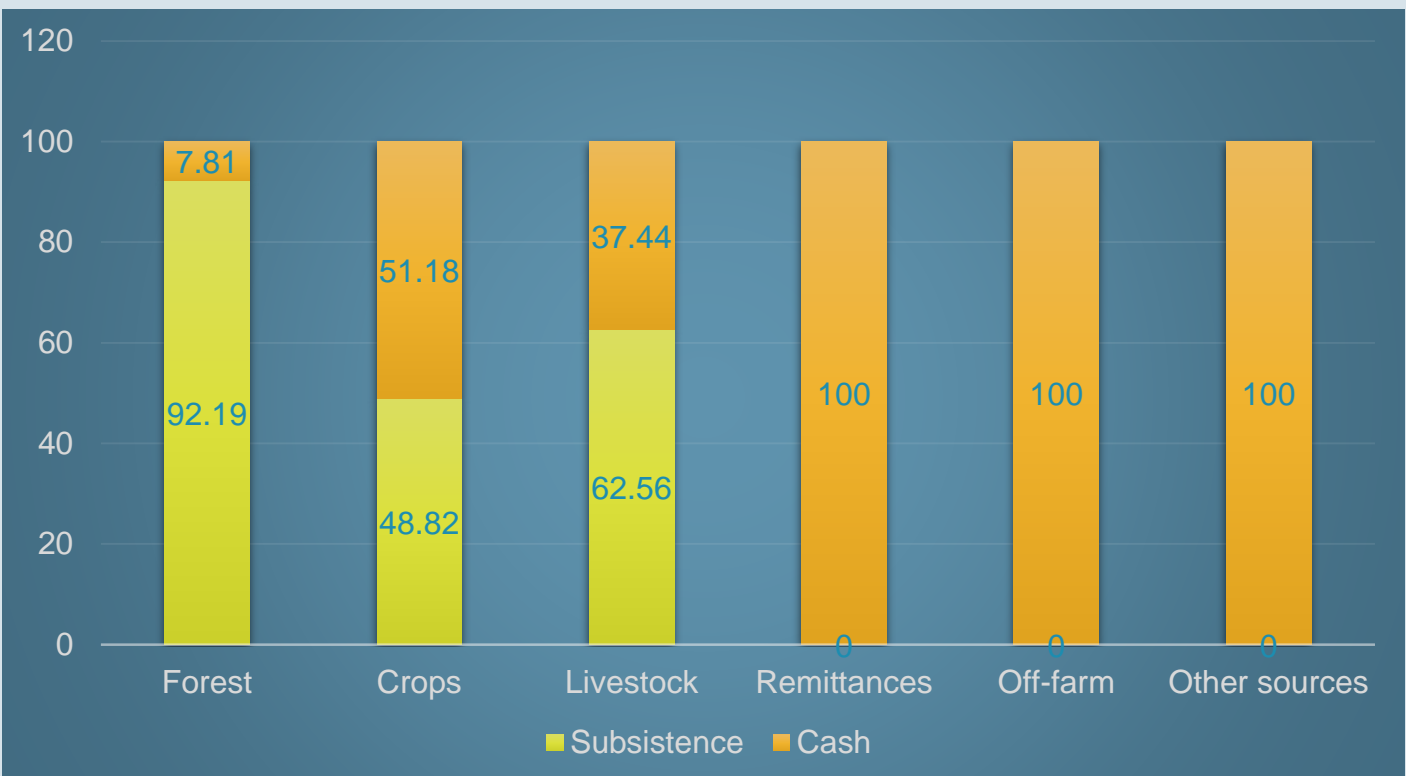FGT(0)=Poverty headcount, FGT(1)= Poverty gap, FGT(2)= Poverty severity

Fig. 3. Subsistence and cash income by income source

Table2.
Gini decomposition by income source and land tenure regime

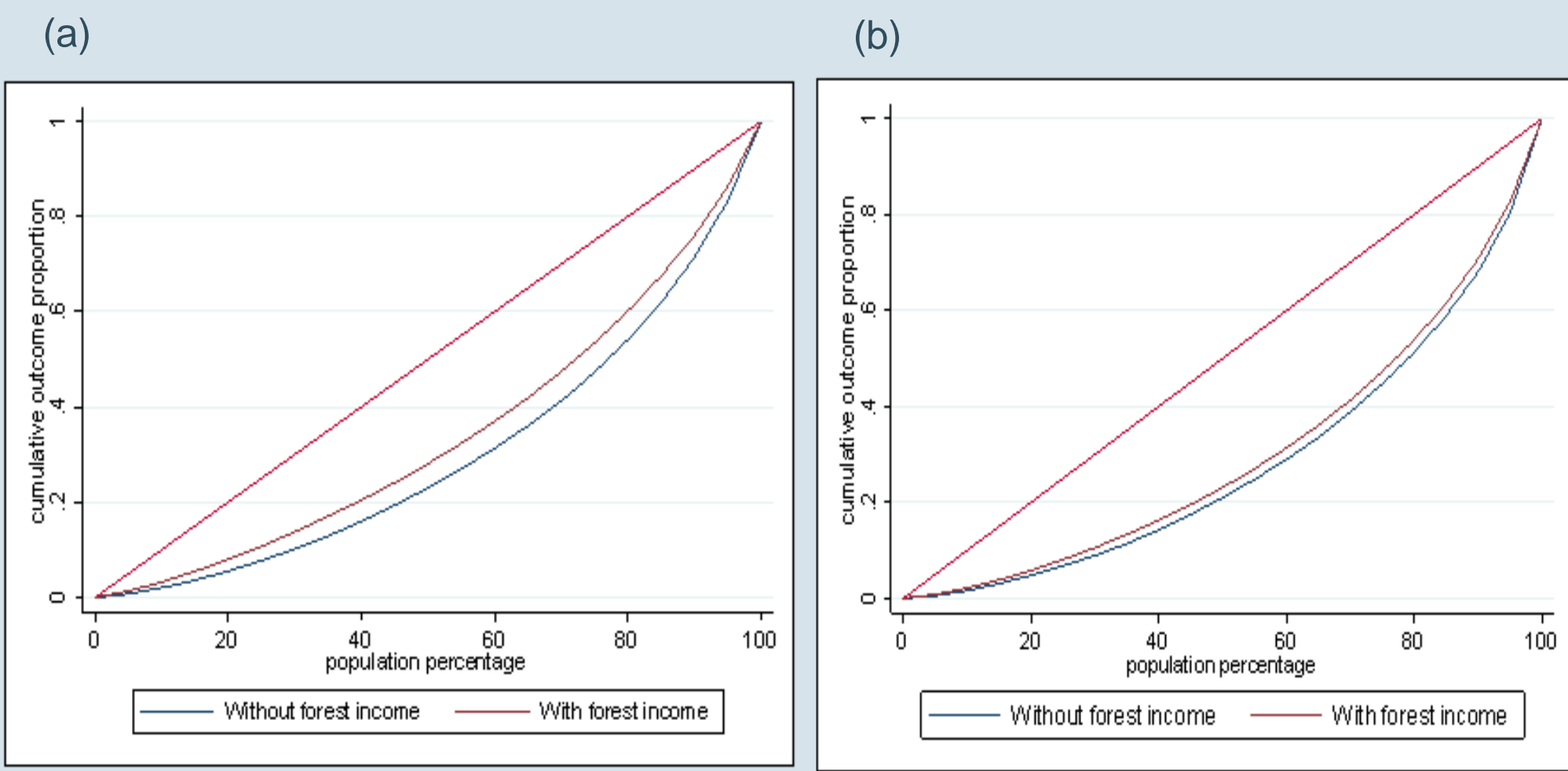| Income source	Private ownership		Communal land ownership	
	Gini	% Change	Gini	Change %
Agriculture	0.585	0.009	0.543	0.037
Livestock	0.790	0.013	0.727	0.041
Forest	0.562	0.015	0.382	-0.054
Off-farm	0.815	0.069	0.866	0.108
Remittances	0.929	0.002	0.953	-0.003
Other sources	0.391	-0.108	0.335	-0.128
Total	0.396		0.317	

Fig. 4. Lorenz curve (a) communal land ownership (b) private land ownership

Table 3.
Econometric models [a,b]

Household variables	Total Income	Forest income	
		Absolute	Relative
Communal land ownership	-0.017 (-0.26)	0.248*** (2.65)	0.255*** (2.59)
Remoteness	-0.044 (-0.71)	0.170* (1.92)	0.221** (2.52)
Age	-0.031* (-1.67)	-0.058** (-2.30)	-0.031 (-1.37)
Age [2]	0.000 (1.19)	0.000* (1.67)	0.000 (0.88)
Schooling (years)	0.013 (1.13)	-0.013 (-0.76)	-0.027 (-1.56)
Household size	-0.047** (-2.25)	-0.036 (-1.16)	-0.002 (-0.08)
Origin of HH head (dummy)	-0.042 (-0.35)	0.724*** (3.50)	0.647*** (3.56)
Walking distance HH-forest	-0.003** (-2.16)	-0.004* (-1.92)	-0.002 (-0.92)
Forest size (log)	0.132*** (3.57)	0.201*** (3.79)	0.096* (2.03)
Permanent crop size (log)	0.278*** (8.47)	0.076 (1.44)	-0.233*** (-4.69)
TLU	0.029** (2.25)	0.030 (1.48)	-0.018 (-0.92)
Value assets (log)	0.050*** (2.70)	0.074** (2.52)	0.033 (1.18)
Government transfers (dummy)	0.273** (2.30)	0.017 (0.10)	-0.556*** (-3.96)
Constant	8.626*** (21.53)	7.177*** (13.63)	-0.223 (-0.40)

[a] t-values in parentheses
[b] * p<0.05, ** p<0.01, *** p< 0.001

4 Conclusions

- Forest income is subsistence-oriented.

- Households living in areas with communal land ownership or in remote areas are highly forest dependent.

- Forest income reduces poverty and inequality across households in villages with communal land ownership and in remote households.

- Poorest households under communal land ownership benefit most from forest income.

- Actions to reduce deforestation and forest degradation are needed.