

Universidad de la Frontera

Property size as determinant of forest conservation in Chile: Implications for policy design

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Introduction

- Native forests are mostly private owned in Chile
- Most of remnant forests are distributed as protection areas along streams and rivers, or surrounding water bodies
- Forest cover increases with altitude and slope (in the measure it becomes less feasible for alternative uses)
- Property size plays a crucial role in the level of native forest conservation

Conceptual model of land-use decision

- We assume a landowner that decides the land use allocation of his/her land along a land quality continuum
 - Lower land quality is allocated to forestry production
 - Native forests (VII-VIII)
 - Plantations(V-VI-VII)
 - Higher quality to agriculture (I-II-III-IV)
- Land rent is the main determinant of the current land use across the landscape
- This can be represented by a Ricardian land rent model



Land rents as explained by land quality and optimal solution of the land use allocation

Ricardian Model of Land Rent

- Current land-use is explained by:
 - Rents of alternative land-uses (Agriculture, tree cropping, Native forests)
 - Other factors:
 - Conversion costs
 - Endogenous attributes of landholders
 - Regulations / Laws
 - Level of access to other markets (e.g., Labor market and credit),
 - Preferences for non market goods,
 - Property size, etc.

Study Area: La Araucanía Region, Southern Chile



Methods

- Intersection of following covers:
 - Current Land use
 - Feasible for production land
 - Native forests
 - Tree crops
 - Agriculture
 - Rural properties cover
 - Identification of small landowners versus big landowners (Small ones are those with less than 200 ha)

Results: La Araucania Region area (ha)

Use class	Big Landowner	Small Landowner	Not Classified	Total
Non Productive	134.910	20.851	22.194	177.955
Native Forests	438.750	314.483	258.508	1.011.741
"Matorral"	77.099	63.649	64.308	205.056
Productive	525.844	1.175.621	83.996	1.785.461
Total productive	1.041.694	1.553.754	406.811	3.002.259
Total	1.176.604	1.574.605	429.005	3.180.214

Results: % of Total Region Area

Use class	Big Landowner	Small Landowner	Not Classified	Total
Non Productive	11,47	1,32	5,17	5,60
Native Forests	37,29	19,97	60,26	31,81
"Matorral"	6,55	4,04	14,99	6,45
Agric + Tree plantations + others	44,69	74,66	19,58	56,14
Total productive	88,5	98,7	94,83	100,00
Total	100	100	100	

Results: % of productive land Area

Use class	Big Landowner	Small Landowner	Not Classified	Total
Non Productive	12,95	1,34	5,46	5,93
Native Forests	42,12	20,24	63,54	33,70
"Matorral"	7,40	4,10	15,81	6,83
Agric + Tree plantations + others	50,48	75,66	20,65	59,47
Total productive	100,00	100,00	100,00	100,00
Total				

Discussion

- Small property size suggests an historical higher level of land-use pressure due to a higher population density, which has resulted in a higher level of land subdivision.
- The property size is also explained by higher level of accessibility and land quality.
- Level of conservation in small properties is 20,24% compared to 42,12% in large properties
- In percentage, large properties have 2,08 times more native forests than small properties

Conclusions

- We found that the level of conservation of forest in small properties (and small landowners) is significantly lower than in large properties.
- The different level of conservation of native forests by size of property (and type of landowner) must be taken into account in policy design
- This information confirm the need of targeting small properties (landowners) when designing conservation policies

LUClass

• Native forests:

Include Native forest plus mixed native forests

• Matorral:

– Shrubs+ forest re-growth

• Agric+ tree crops+ others... :

- Cropping land, forestry plantations, prairies

• Non productive

All other non productive land