Designing a Voluntary Mechanism for Private Forest Conservation: An Empirical Test of Provision Point, Seed Money, and Social Interactions

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Motivations

Much biodiversity exists on non-industrial private forest (NIPF) land, which constitutes a substantial share of forestland in the western world. After unsuccessful consequences of the direct regulation approach, where serious conflicts erupted between NIPF owners and the government in many countries, incentive-based conservation schemes have been increasingly and intensively used in recent years for conservation on NIPF land. Much effort has been made empirically to understand NIPF owner's participation behavior in such programs. However, not much literature exists on the design of a voluntary mechanism for efficient private forest conservation.

Designing voluntary conservation schemes is of extreme importance to efficiently achieve the biodiversity conservation on NIPF land. In this paper, we consider two lessons from experimental economics for their design. The first one is the provision point mechanism (PPM) for public goods provision, which is known to mitigate the free-rider problem (Rondeau et al., 2005). The second one is the announcement of seed money. A series of field experiments have shown that publicly announced seed money increases charitable donations (Landry et al., 2006). We empirically investigate whether these lessons help to improve the design of voluntary conservation schemes.

With threshold provision, individual owner's efforts are only worthwhile if others also cooperate in voluntary conservation schemes. Hence, group members need to assure each other that they will cooperate. Namely, individual's expectations about others' participation would increase the likelihood of participation. If this is the case, information about with whom the owner interacts may influence the participation behavior. We shed light on the effects of social interactions at the local community level, with comparison to the municipality level.

Design and Implementation of Survey Experiment

This paper conducts an empirical test of provision points, the announcement of seed money, and social interactions in local communities in order to provide an insight into the design of a voluntary mechanism for efficient private forest conservation. To this end, we designed a survey experiment to investigate the NIPF owner's intention to participate in a hypothetical conservation

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program. We employed a between-subjects, random split-sample design with five treatments: (1) No Threshold (Control); (2) 50% Threshold at the Municipality Level (50% of owners' participation required); (3) 50% Threshold at the Local Community Level; (4) 30% Threshold at the Local Community Level; (5) 50% Threshold with 20% Seed Money (i.e. 30% requirement) at the Local Community Level. We also observed NIPF owner's subjective expectations about others' participation in their municipality or local community. We received 733 responses from the 1430 NIPF owners, to whom we sent the survey in Kuma municipality, Ehime, Japan.

Results

The results of our discrete choice econometric analysis with social interactions are as follows (see the table below). First, we find no statistical evidence of 50% threshold effects at the municipality level on the likelihood of participation, which is in contrast to the findings of the PPM literature. Second, setting community level thresholds of both 30% and 50% increases the likelihood of participation compared with the no threshold, though we find no statistical difference between different levels of thresholds. Third, the announcement of seed money at the community level has a strong positive effect on the likelihood of participation in terms of statistical robustness and the magnitude of the effect. Finally, subjective expectations about others' participation sharply and consistently influence voluntary participation.

Reference

Landry, C. E., Lange, A., List, J. A., Price, M. K., & Rupp, N. G. (2006). Toward an understanding of the economics of charity: Evidence from a field experiment. *QJE, 121*(2), 747-782.

Rondeau, D., Poe, G. L., & Schulze, W. D. (2005). VCM or PPM? A comparison of the performance of two voluntary public goods mechanisms. *J Pub Econ*, *89*(8), 1581-1592.

Table: Estimation Results of Robust Standard Error Logit

	Coefficient	Marginal Effects
50% Municipality	−0.001	0.000
	(0.432)	(0.042)
50% Local Community	0.897	0.087
	(0.458)	(0.042)
30% Local Community	0.740	0.072
	(0.430)	(0.04)
50% Local Community + Seed Money	1.151	0.111
	(0.441)	(0.042)
Subjective Expectations	7.674	0.743
	(1.266)	(0.076)

Notes: Standard errors are in parentheses. NIPF owner's characteristics are controlled.