

Funding forest conservation with payments for ecosystem services in Indonesia: are economic signals lost in the way?

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Building on a model of economic signals (incentives), their receiving by recipient farmers, and the latter's resulting strategy, behaviour and land use chosen, this article analyses a payment for ecosystem services (PES) scheme in the Cidanau watershed, Indonesia. In this area, land use changes, erosion and sedimentation are associated with decreased water quality and quantity and thus have led a downstream private water plant company to willingly pay, through an intermediary non-governmental organization (NGO), several groups of upstream farmers to plant and conserve a minimum number of trees on their individual private lands. Contract run for a renewable five-year period and payments are conditioned by participating farmers' compliance with rules (no cutting or felling of trees, conserving 500 trees per ha minimum) and annual monitoring by the ecosystem service buyer together with the NGO.

In January 2013, within the INVALUABLE BiodivERsA research project, we administered a structured survey questionnaire to a random sample of 270 participating farmers (75% of all households joining the scheme) so as to investigate several research questions: a) is the economic signal (payment in the PES scheme) sent to appropriate actors (receivers)?; and b) do the governance structure of the PES scheme allows participating farmers to correctly understand the economic signal and behave accordingly?

To answer such questions, household surveys allow us to analyse farmers' rationality and capacity, as well as their behaviours and motivations. Contributing to the growing behavioral literature on PES, results on farmers' motivations first show that participating farmers do not join the PES scheme for economic reasons but rather for intrinsic, including cognitive and social, motivations; as a result, contrary to assumptions in the standard economic theory of PES, economic signals sent (payments) seems marginally essential when ES providers decide to participate and modify land-use strategies. Second, farmers receiving the signal are not well targeted as most of these already displayed 'pro-environment' behaviours and actually conserve trees prior to the project. Third, understanding about the PES (signal) is low among farmers: while most of them generally know about rules associated with the scheme, almost none of them do know about the periodicity and amount of payments. On the contrary, decisions are felt to be centralized in leaders' hands. In fine, one cannot expect this PES scheme in Cidanau to prove environmentally effective and additional. Chosen land-use patterns are indeed far from being influenced by the project economic signal, but rather determined by already existing social influence, traditions and dependency to forest as a main source of livelihood. This in turn casts some doubts on the strong economic assumptions underlying the recent emergence and

development of PES schemes in developing countries, and calls for further research on farmers' motivations and behavioral response to such environmental schemes.

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