

Payments for environmental services in upper - catchments of Vietnam: will it help the poorest?

Do Anh Tai, Thainguyn University of Economics and Business Administration (TUEBA), Thainguyn City, Vietnam

Damien Jourdain, UMR G-EAU, CIRAD / IRRI, SAM Project, Hanoi, Vietnam

Dang Dinh Quang, Northern Mountainous Agriculture and Forestry Science Institute (NOMAFSI), Phu Ho Commune, Phu Tho Province, Vietnam

Sushil Pandey, Social Science Division, IRRI, The Philippines

Northern provinces of Vietnam suffer from environmental problems such as deforestation, soil degradation, and loss of biodiversity. As a result, the livelihoods of most agricultural households are unsustainable. Moreover, the current land use practices are also producing negative externalities that adversely affect the downstream areas.

Deforestation and slash-and-burn cultivation techniques are blamed by some governmental organizations as the main causes for the problem. A mix of incentives (generally subsidies), technical assistance (usually improved and sustainable agricultural practices), and regulation have been used to address the problem. While some progress can be observed in terms of reforestation, many agricultural households are still employing unsustainable agricultural practices that will in the medium term affect their own livelihoods. Land use practices, which would bring about environmental benefits, include forest plantation, agro-forestry, tree-based land use alternatives and agro-ecologically sound practices such as conservation agriculture (Gouyon, 2002). However, the environmental services these land use provide, i.e. watershed services, biodiversity conservation and carbon storage are usually un-rewarded and only indirectly connected to economic activities (Bui Dung The *et al.*, 2004).

Payments for Environmental Services (PES) schemes present a new approach that focuses directly on creating a conditional benefit transfer between the upland providers of environmental services and the downstream beneficiaries. Such schemes can take the advantage of upland-lowland interactions in generating environmental benefits while improving the livelihoods of upland farmers. The past few years have witnessed a surge of interest in the development of PES schemes in Asia. In Vietnam, while some projects using the conceptual framework of PES are being initiated in the central and southern part of the country (e.g. WWF, 2007), no PES schemes are currently being implemented in the upper catchment areas of Northern Vietnam (Wunder *et al.*, 2005). However, the Vietnamese Government expressed recently its intention to start such a scheme to protect fragile upper-catchments whose degradation is causing problems on hydro-electric infrastructures.

Households in upper-catchments have unequal access to natural resources. The upper-catchments are generally composed of narrow valley bottoms, where irrigated rice fields are found and surrounding sloping land where upland rice, maize and cassava are the principal crops. The differential access to these two types of land has some important consequences on household farming practices and livelihood strategies.

The main objective of this paper is to review the potential responses of the different types of households to a PES scheme that would reward farmers to set aside some land for forestry projects. Subsequently, we will investigate if poorly endowed farmers would gain from participating in such a scheme. While, some analytical work has already given general results (Zilberman *et al.*, 2006), we would look at the specificity of PES schemes targeted at agricultural households of the upper-catchments in Northern Vietnam.

The proposed paper is organized in two parts. The first part proposes a typology of farmers of two typical upper-catchments of the northern province of Yen Bai, Vietnam. The second, using a simplified farm model analyses how households with different endowments would respond to such a PES scheme.

The *Sai Luong* and the *Pan Cang* catchments were selected for their contrasted water availability and access to markets. The villagers of the Sai Luong catchment, in Nam Bung commune, share a relatively large area of flat valley bottom where rice paddies are grown. Most farmers do not have access to the input or output markets. On the other hand, the villagers of the Pang Cang catchment, in Suoi Giang commune, have only access to sloping land. They are now increasingly making use of water runoffs by constructing irrigated terraces along the slopes. Farmers have access to input and output markets and are actively marketing their agricultural products such as tea, maize and cassava. Participatory exercises were conducted to elicit the rules that govern access of households to land and water resources. Household surveys results were used to build a typology of farmers to relate the differences in resource endowments to livelihood strategies and actual agricultural practices.

Results showed that land well-suited for growing paddies, i.e. bottom-valley paddies or terraces established on the sloping areas, is unevenly distributed between households. First, not all bottom-valley plots have access to water during the spring season even if water is abundant in the catchment. As a result, a large proportion of villagers cannot grow rice during that season, while others can grow two rice crops per year. Second, households also have unequal opportunities to build irrigated terraces on the sloping areas. These terraces collect water from very small streams or runoffs. When constructing a new terrace, households have to find a source of water that is not already used to irrigate terraces built by other households ("first come / first served" rule). As a result, households that were allocated land bordering streams, and already built terraces tend to block construction of terraces by other households, or force them to search water further away, therefore increasing these new terraces constructing costs. This inequity in access to water contributes to unsustainable use of sloping land. Households with limited access to water have to grow rice and other food crops on steep sloping land to meet their food needs.

We used farm models to analyse the potential impact of the PES scheme on the different farm types. For this paper, we specifically studied the impact on the poorest agricultural households of the catchment, i.e. with poor access to markets and water. Based on fundamental mechanisms of upland cultivation, a simple model was formulated, focusing on the flow of nutrients, and in particular the use of fallow period for recovering nutrients, the allocation of labour with the purpose of satisfying subsistence needs and maximizing labour productivity, and the management of agricultural land, in particular the re-opening of fields after a fallow period. Heuristic rules have been used to express how farmers select between a numbers of options in order to obtain their goals. Finally, a test of the response of the model to a hypothetical PES scheme is carried out.

The first results showed that farmers with little paddy land are not likely to gain from a PES scheme where some land should be set aside. If the PES scheme is imposed upon them, then the reduction of the cropping area would force them to reduce their fallow period. Land degradation would then increase in the remaining cropping areas. Protection of one part of the catchment will provoke higher degradation rates in other parts of the catchment.

References

- Bui Dung The, Dang Thanh Ha and Nguyen Quoc Chinh (2004). Rewarding upland farmers for environmental services: experience, constraints and potential in Vietnam. Bogor, Indonesia, ICRAF.
- Gouyon, A. (2002). Rewarding the upland poor for environmental services: a review of initiatives from developed countries. *In: RUPES Regional Inception/Planning Workshop*, Puncak, Indonesia, 6-8 February 2002.
- Wunder, S., B. D. The and E. Ibarra (2005). Payment is good, control is better: Why payments for forest environmental services in Vietnam have so far remained incipient. Bogor, Indonesia, CIFOR: 75 p.
- WWF (2007). Paying for ecological services: the use of economic tools to deliver conservation goals in Vietnam - A portfolio of projects. Hanoi, WWF.
- Zilberman, D., L. Lipper and N. McCarthy (2006). When are payments for environmental services beneficial to the poor? ESA Working Paper 06-04. Rome, FAO.