# Rice fish – land use diversification with many socioeconomic and environmental potentials

Elisabeth Simelton[1,2], Hoang Thi Hieu[3], Dam Viet Bac[1], Nguyen Thi Hoa[1], Pham Thanh Loan[1]

## INTRODUCTION

Land use and income diversification are well-known approaches to spread and reduce the risks of harvest losses. However, with the increasing pressure on the uplands for food, fiber and fuel, the role increases of land uses that serves multiple purposes, such as agro/biodiversity conservation, watershed protection, food security and livelihood improvement.

The objective of this research is to identify pathways towards multifunctional land-uses, in particular identify socioeconomic and environmental trade-offs associated with these transitions. Here we present the results for rice-fish cultivation – a traditional way of organic agriculture and land use diversification.

## METHODS

Focus group discussions in total 17 farmers and 3 commune leaders from six villages in four communes in Bac Kan province, using semi-structured questionnaires. The farmers represent households with and without rice-fish cultivation (Figure 1). The main ethnic groups are Tay and Nung.

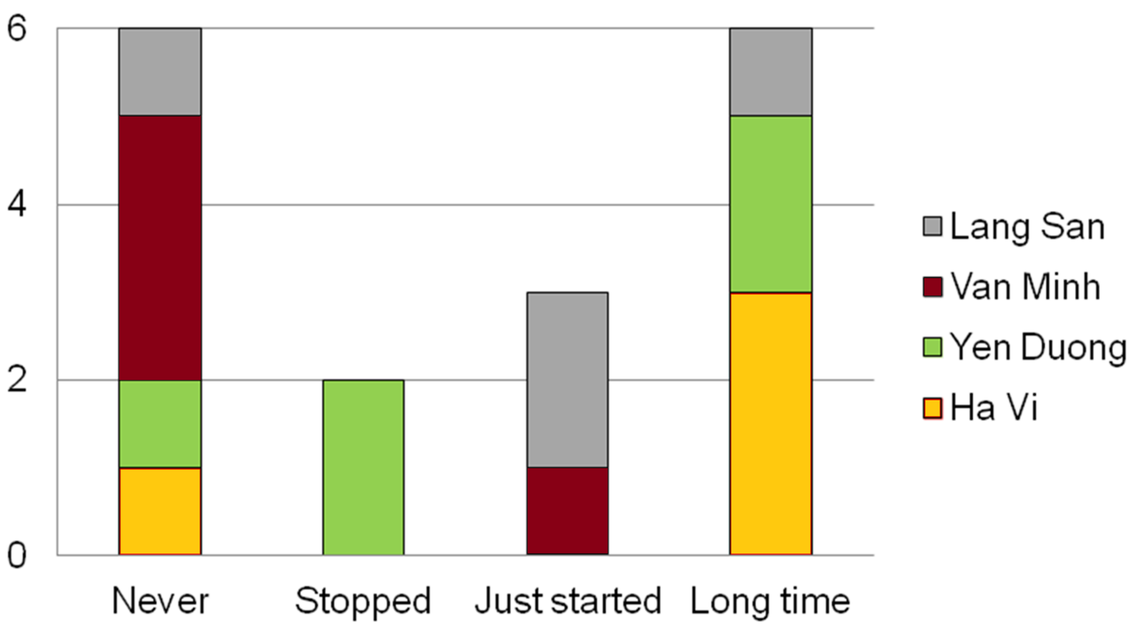


**Figure 1.** Number of farmers participating in focus group discussions in the four communes (n=17), who (i) Never had rice-fish, (ii) Stopped, (iii) Just started, or (iv) had for Long time (>2 years).


**Image 1:** ICRAF Vietnam scientist interviewing farmers about rice-fish cultivation. Photo: ICRAF Vietnam/ Nguyen Ngoc Huyen



**Image 2, 3:** Rice-fish field in Na Ca village, Ha Vi commune, Bac Kan province. Photo: ICRAF Vietnam/ Elisabeth Simelton

## FINDINGS

The key preliminary results from the focus group discussions show that Rice-fish cultivation is an autonomous practice with history beyond living memory. Currently 9-42% of the households in the six villages have rice-fish. The biggest change in rice-fish cultivation was an increase in fish ponds. Sometimes this was considered a pre-requisite for rice-fish, sometimes instead of rice-fish. Only one commune (Ha Vi) had external support for rice-fish, a small-scale project from the province offering some technical support.

Rice-fish was considered by all farmers to have an important contribution to the household income. This contribution is three-fold: higher rice yields, higher price for rice-fish than pond-fish, saved money on using less or no inputs. A SWOT-analysis synthesizing the results, show that the key reason for not raising rice fish was lack of stable water sources (Table 1).

**Table 1.** SWOT analysis of rice-fish cultivation in four communes in Bac Kan (n=20).

| | Weaknesses | Strengths |
|---|---|---|
| | Natural disasters:<br>- Temperature stress (heat, cold) → requires pond or refuge (chuom);<br>- Drought risk → requires pond or refuge;<br>→ Refuge reduces rice area.<br>- Flood risk → fish may escape.<br><br>More extensive labor demanding than pond or mono-rice (daily maintenance) | Extra food source<br>Extra income source & environmental services:<br>- Higher rice yield/production<br>- No/less fertilizer (fish manure)<br>- No/less pesticide (fish eats bugs)<br>- No/less herbicide (fish "weeds")<br>- Less disease with rice fish than pond fish → no medicine (compared to pond);<br>- Higher price for rice fish than pond fish<br>Less labor intensive than mono-rice (no weeding/adding input; annual total labor) |
| **Threats** | Polluted water from upstream fields | |
| **Opportunities** | Agree with neighbor to add agro-chemicals when fields are dry.<br>Improve irrigation system.<br>Upscale technical support projects:<br>- Short technical training courses for commune extension workers<br>- Small project with farmers to develop training material. | Branding rice-fish villages for by-passing consumers/eco-tourism.<br><br>Rewards for providing environmental services (clean water and landscape beauty). |

## CONCLUSION

Rice-fish cultivation is an example of an autonomous multi-functional land use that produces a range of environmental services, improves household economy and contributes to food security. The main threat to rice-fish cultivation in the investigated villages was lack of secure water sources (quantity and quality).

## RECOMMENDATIONS

There is a potential to develop rice-fish villages that supply clean water to downstream villages. A scheme for Payment/Reward for the generated Environmental Services (PES) could finance irrigation systems required to maintain and expand current rice-fish fields.

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[1] World Agroforestry Centre (ICRAF) Vietnam;
[2] Centre for Climate Science and Policy Research (CSPR), Linköping University, Sweden;
[3] Department of Agriculture and Rural Development Bac Kan, Vietnam

Contact: e.simelton@cgiar.org