

Soil erosion? That's not how we see the problem!

As a result of increasing pressures on upland and highland areas in Southeast Asia in recent decades, the soils are eroding. Christine Pahlman indicates however, that farmers hold a different perception of soil erosion and conservation. Only one out of 240 farmers spontaneously mentioned soil erosion as a major problem! Farmers regard (fruit) tree integration as the most important conservation measure for their fields, as it gives the highest economic returns.

Christine Pahlman

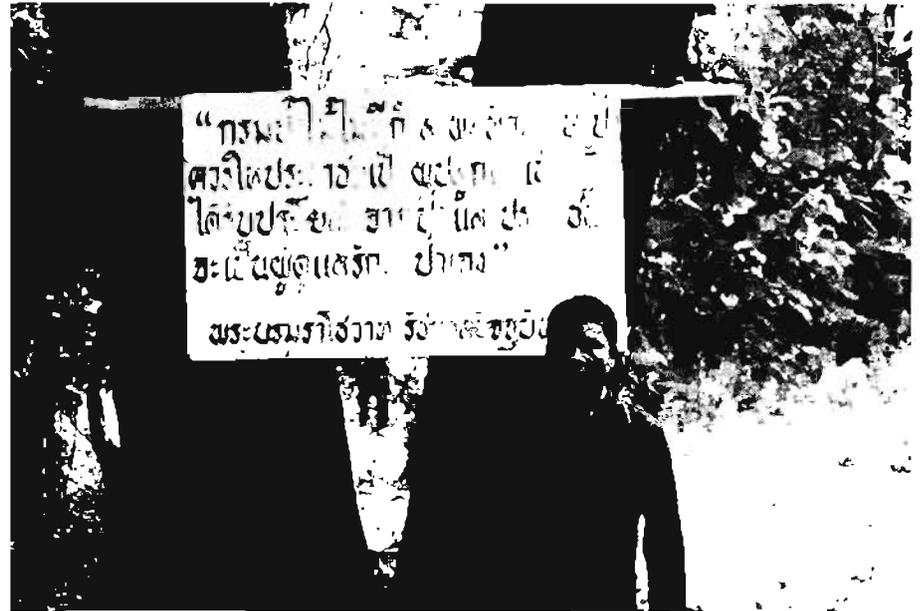
The reasons for increased pressure on upland and highland areas in Southeast Asia are complex, but it is at least partly a response to the demands of a growing population and the transformation of subsistence communities to market economies. This has led to more intensive cultivation of marginal sloping lands, and the breakdown of the stability of traditional swidden systems of agriculture. Fallow periods have shortened and lands are being increasingly cultivated before soil recovery is complete.

In Thailand, one of the most devastating consequences of intensified farming of the uplands is soil degradation. Upland soils tend to be of moderate to low fertility and highly susceptible to soil erosion. Srikhajon et al. (1980) estimated that 33% of the Kingdom's total land area was moderately to severely eroded, particularly on upland slopes. Indications are that the extent and degree of erosion has increased since then.

Dependance on land for survival

Although it can be argued that a significant proportion of the sloping lands of northern Thailand are too steep and poorly structured to be suitable for any form of agriculture, it is probably neither realistic nor acceptable to ban farming in these areas – the land which hundreds of thousands of people depend on for their survival. For this reason there is an urgent need to develop sustainable agricultural systems appropriate for upland communities, capable of supporting the inhabitants whilst conserving the soil resources upon which they depend.

Much work has been and is being directed toward developing more sus-



tainable farming practices for sloping land. Promising and potentially appropriate methods including various agroforestry systems such as alley cropping have been developed. Nevertheless, the rate of farmer adoption of these practices remains notably low and, in northern Thailand, is still insufficient to have any real impact on the situation. This suggests a disparity between the perceptions of researchers and development workers on one hand and those of farmers on the other. While researchers may perceive soil erosion as a major problem, the low adoption rate of soil conservation practices suggests that farmers perceive their problems quite differently, or perhaps cannot adopt these innovations for reasons not well understood by others.

Farmer perception of sustainability

As part of a Masters thesis to develop an understanding of how upland farmers perceive their farming problems and the sustainability of their farming systems, a group of 240 ethnic Thai farmers from eight villages of Non Province, northern Thailand were interviewed. Farmers were selected on the basis that they were farming mostly rainfed upland areas and derived most of their food and income from these activities. Questions were answered mostly by the household heads, usually males, although other family members often contributed.

It was found that a typical farmer has little if any formal education, is farming an area of less than 1.8 ha located more than 2 km from the house and has an an-

The headman of Ban Giw Muang standing next to a sign erected to honour the community forestry project recently initiated in the village. The sign is a quote from the King of Thailand, HRH Bhumibol Adulyadej and reads: "The Department of Forestry does not have sufficient capacity to protect the forests. It should be the people who plant forests and derive the benefits from the forests, and the people should be guardians and the caretakers of the forests". Photo: Christine Pahlman.

nual household income of less than USD 400. The main crops grown are glutinous upland rice, corn and groundnuts in the wet season and mungbeans in the dry season. Cultivating fields in rows going up and down the slope and burning crop residues is standard practice. The dry season is characterized by widespread burning of fields by fires that are lit and then left largely uncontrolled to run their own course. Fields lay bare and vulnerable to the impacts of the hot tropical sun during the dry season and the highly erosive monsoonal rains at the onset of the wet season.

Most farmers were unaware of soil erosion, or thought that soil erosion was not serious enough to require action, or were unaware of what they could do about soil erosion and/or were unable to adopt soil conservation strategies due to economic and resource constraints.

Interestingly, despite general recognition among the research and extension community that soil erosion is a critical problem in northern Thailand, only one farmer (out of 240 questioned) spontaneously mentioned soil erosion when asked generally about major

farming problems. Instead, the primary concerns of farmers were centred around weeds, insect pests and a shortage of water. When specifically questioned on the incidence of soil erosion on their fields, 43% said there was none, 34% acknowledged a moderate degree of erosion and only 23% said there was substantial erosion on their fields.

Lack of new land

However, despite the seemingly low awareness and concern about soil erosion, declining soil quality/fertility was recognised as a problem by most of those questioned. According to the farmers, the major reason for this decline in soil quality is the lack of new land to clear, making it necessary to practise more continuous farming of fields and reduce the length and frequency of fallow periods. It became clear that farmers are well aware of the soil degradation that results from continuous slash-and-burn cycles on a single piece of land. To them, it is like a law of nature: "Fallows are necessary to rest the soil; without fallows, the soil eventually dies" Many farmers therefore do not see the problem so much in terms of farming practices, but rather as lack of land (making fallowing and soil regeneration impossible). Farmers' views on the suitability and effectiveness of five potential soil conservation measures (integration of trees, contour farming, bench terraces, alley cropping and rock/log barriers) were sought. Farmers clearly regarded the

integration of tree crops, e.g. fruit trees, to be both the most effective and the most suitable conservation measure for their fields.

Nevertheless, although tree crops are already widely used in some form and the majority of farmers are aware of the benefits of tree crops on soil quality, soil conservation as such does not seem to be a major incentive to plant trees. For example, 141 of the 200 farmers growing or interested in growing fruit trees said it was for economic returns, whereas only 10 farmers said it was for soil erosion control. This is an important consideration given the low level of concern about soil erosion.

Food and income needs

Farmers also spoke of the value of growing tree crops to suppress weed growth (their major farming concern) and to mitigate against the effects of deforestation including declining infiltration of water and dwindling supplies of timber and forest food resources. Findings of the study confirmed the importance of developing and extending soil

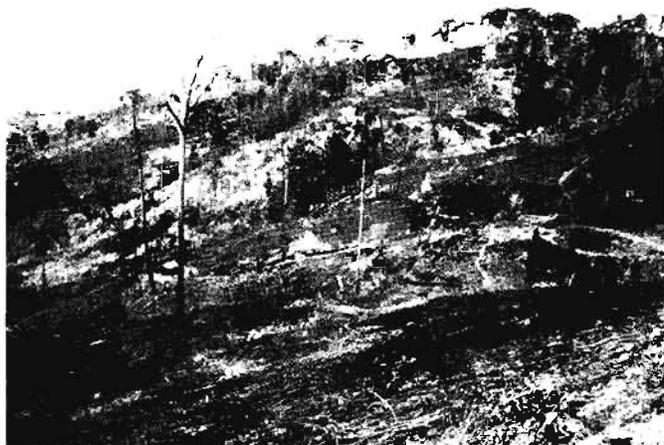
conservation techniques that have a direct and clear relevance to food and income needs of farmers, and do not just address environmental sustainability.

In the view of the farmers interviewed, the main constraints to using tree crops (in order of importance) are lack of resources/funds, lack of water, the possible reduction in yields of their field crops that would arise from growing trees, and security problems associated with protecting trees and their produce from uncontrolled fires and theft and damage from people and villagers.

Land tenure makes no difference

Of the fields being farmed by the surveyed farmers, 50% were without any form of legal title, and only a few were covered by what is considered to be highly secure legal tenure. Conservation literature has generally argued that secure land tenure is a necessary precondition to the adoption of long-term sustainable farming practices. It is

Upland fields of Nan province after dry season burning. Photo: Christine Pahlman.



Nai Anorak and his wife at their farm, looking over their fish pond above which they raise pigs. Photo: Christine Pahlman.



therefore highly interesting that 69% of farmers interviewed thought that land tenure made no difference to farming practices and did not limit the establishment of permanent tree crops. Of the farmers who had already planted fruit trees, 40% did not have any form of legal land tenure and only 6% had highly secure tenure. In fact, some farmers even went so far as to say that planting fruit trees was a way for them to make a more secure and permanent claim to the land they were farming.

Conservation farming approaches

In the sample group, there were two examples, one of an individual farmer (Nai Anorak Seetabul) and one of a village community (Ban Giw Muang), who have actively sought and developed ways to farm more sustainably and, in this regard, were not typical of the interviewed farmers. Their success provides some insights into the technologies and processes that may be appropriate for more sustainable farming in the upland areas.

Nai Anorak Seetabul

Nai Anorak Seetabul is a young, hard-working and thoughtful farmer who recently acquired a 2-ha plot of degraded upland through a government land reform programme. His own experiences and observations led him to believe that a continuous cycle of slash-and-burn farming with annual crops would inevitably lead to soil degradation and decreased productivity. He therefore sought to develop a diversified and integrated farming system incorporating perennial tree crops, food crops throughout the year for family consumption, cash crops for monetary income, low use of external inputs and the recycling rather than the burning of crop residues. Having witnessed many fellow villagers fall into a downward spiral of debt and hardship, Nai Anorak wanted to develop his farm without borrowing money.

With training and advice from local extension personnel, Nai Anorak started experimenting with different cover crops and began propagating fruit trees and planting them in between various field crops. In recognition of his commitment and interest in conservation farming, Nai Anorak was selected as a "model farmer" by a local agricultural project. This meant that he received modest technical and material support to develop his farm in return for trying out new and untried crops and technologies on his farm and helping to extend successful ones to other farmers. So far, he has experimented and attained moderate success with alley cropping, growing wheat as a supplementary dry-season crop, digging fish ponds and

raising fish and pigs.

Within four years, Nai Anorak and his family have transformed 2 ha of relatively unproductive deforested and degraded sloping land into a diversified and integrated farming system incorporating tree crops, field crops, animals and conservation structures. This has been done with a lot of hard work, few external inputs and little capital investment. It is a system which Nai Anorak believes will produce enough food and income to support his family throughout the year.

Ban Giw Muang

The farming approach of villagers in Ban Giw Muang could be described as unique for the uplands of northern Thailand. The majority of farmers in the village have not only been integrating fruit trees into their fields for several years, but have also been contour farming as opposed to cultivating up and down the slope as is the norm in northern Thailand. Villagers were exposed to the concept of contour farming by local extension workers and a few farmers experimented with the technique. More and more villagers adopted the technique when they realized that it produced better crop yields and resulted in less soil loss. The village headman explained that, when maize is planted up and down the steep slopes around the village, the field can be cropped for only one year and then the soil is so degraded that it must be fallowed for three years. Contour farming, on the other hand, enabled fields to be farmed for two successive years before it was necessary to fallow.

Farmer-to-farmer extension was also the method by which the integration of fruit trees has become so popular in Ban Giw Muang. One of the villagers had thought out the economic and conservation benefits of growing trees amidst field crops and, with the resource assistance of a local conservation-minded monk, he began experimenting with tree species. Interest amongst villagers quickly spread.

Protecting existing forest

Planting fruit trees on their fields presents many challenges to these farmers. So far, villagers have been restricted to growing trees on fields close to the village to afford greater protection from uncontrolled fires, damage from animals and theft from other farmers. The farmers have had to cut grass and dig around the trees in the hope of creating a firebreak from dry-season burns. The village headman envisages that the threat from fires will reduce in future years as more and more farmers start to grow trees in their fields.

Recently, becoming increasingly con-

cerned about the effects of deforestation in their area, Ban Giw Muang villagers joined together to protect remaining forest close to the village. A community forestry area was proclaimed and a blessing ceremony was held and a small shrine erected by local Buddhist monks to bless and sanctify the area.

In addition to protecting existing forest, the villagers are also planting tree seedlings in the school and temple grounds, along roads and in other public areas. Although a local development worker supported and was involved in these activities, the main initiative came from the villagers themselves.

"Selling" conservation?

The move toward more sustainable farming practices involves both appropriate practices and a process of developing and extending these practices. This study provided some useful insights into the characteristics of appropriate farming practices for sustainable farming and the process of developing and extending these practices.

Farming practices which are developed for, and extended to, upland farming communities of northern Thailand need to:

- address immediate and short-term needs for food and income;
- be based on existing practices, i.e. modify rather than replace;
- diversify farming practices;
- minimize capital/resource requirements and external inputs;
- provide economic returns;
- meet labour availability.

In the process of developing and extending farming practices, involvement of the whole community, farmer experimentation and farmer-to-farmer extension are necessary. It favours a process of developing and extending farming practices which are appropriate in the perception of the local people. With a view to sustainable land use in the upland farming areas, emphasis should be placed on practices which meet the needs perceived by the local farmers (e.g. for food and income). Simultaneously, these practices should contribute to resource protection, e.g. the planting of economic trees. There is no point in trying to "sell" conservation-farming practices to farmers for the sake primarily of conservation, if they see their problems differently. ■

Reference

– Srikhajon, M. et al. 1980. Soil erosion in Thailand. Department of Land Development, Bangkok, Thailand.

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