

Mapping information flows

A case study of communities on the island of Leyte in the Philippines found that farmers were using a wide range of technologies to try to stop environmental degradation. The studies focused on the role of the agricultural information system in helping farmers to cope with change and improve sustainability. It turned out to be easier to understand this when a visual mapping method was developed. The author reports on this mapping experience.

Anna Lawrence

Farmers in the remote upland communities of Matalom, Leyte, grow maize and rootcrops in a shortened fallow cycle, with some lowland rice in the valley bottoms. They have stayed more or less isolated from the Green Revolution. Although seed of new varieties has found its way into the villages from relatives in other areas, farmers do not buy seed or use chemical inputs, and visits from extension workers are almost unknown. Men and women all say the soil fertility has decreased dramatically and soil erosion has increased over the last thirty years during which much of the forest has been cleared. Also the climate has become hotter and drier. However, some people say that they have not experienced an overall change in productivity - some years are good and some are bad.

New techniques adopted

Many have started farming in new ways to improve the soil. Most farmers now have some ipil-ipil (*Leucaena leucocephala*) on their land, and some of them form contours on their steep fields by ploughing, or planting napier grass. Many farmers say they have stopped burning their fallows when they start cultivating and that there is an increasing interest in planting trees. Some of these ideas came from the farmers themselves, and some were stimulated by work with outside organisations. These include the Department of Environment and Natural Resources which paid farmers to build rock walls on state-owned forest land; the Catholic church, which organised ecological seminars in the villages; and a farming systems research institute (FARMI) which employs research assistants to work closely with farmers in a participatory way to develop contours and agroforestry systems. FARMI uses the traditional labour exchange group (*alayon*) as an informal organisation for sharing information and decisions. The changes brought about by these innovations, according to visual assessments and the opinions of farmers, lead to improvements in soil and water conservation, soil organic matter and nitrogen content, recycling and systems diversity.

Lives improved but still insecure

Despite these changes, farmers are cautious about the sustainability of farming. They are all too aware of the year-to-year changes in climate which can have disastrous

effects on their crops and although they would like to make more improvements on their farms, they know they can only do it if weather, time or money allow them. Many farmers, especially those who have planted perennial crops, do feel their lives have improved. If they can plant abaca, coconuts and coffee, they have escaped from the more risky dependence on food crops, and they also know they can make some income. But typhoons and drought are common and farmers still want to wait and see before they feel sure of their future.

Visualising information flow

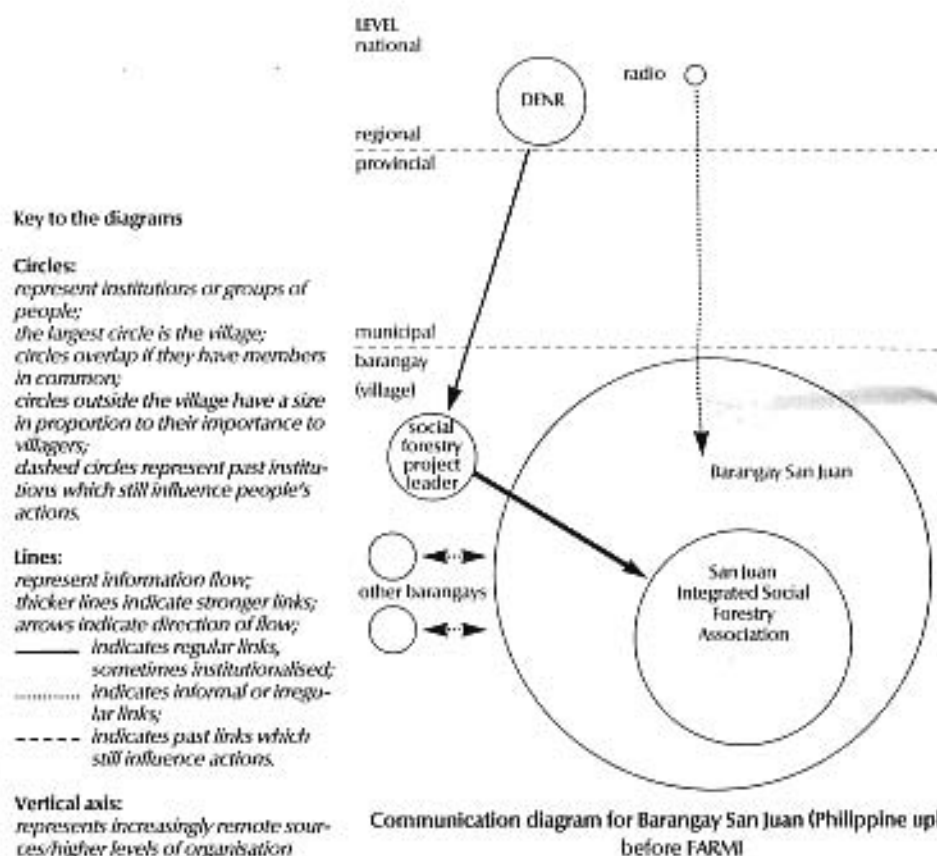
The study focused on finding out what information has helped the farmers to start using these new farming practices. It was difficult to understand how the pattern of information flow had changed in the communities, until we tried using a mapping method to show how the information moved between groups of people. These information maps show the sources of information which farmers said had influenced them to make changes towards more ecologically sound farming (see Diagrams).

They are based on the Venn diagram, but also indicate the strength and direction of information flow.

The circles represent formal or informal groups or institutions between which information moves, the size indicating the importance of the source to the community being studied. The arrows show the relative strength of information flow (thicker lines), the influence of past information flows (broken lines) and the direction of flow.

Individual interviews

The maps were drawn from the community perspective because the aim of the research was to explore all the possible information sources used by farmers without the bias which can come from assessing the impact of a particular project. Discussion with farmers began with open questions about changes on their farms and in their management practices. Most of these were practices to improve soil conservation. The discussion then focused on where the ideas for the changes came from, exploring information flow into and out of the household, between relatives in different villages, and from extension services or project staff. Thirty-five families participated through individual interviews; it was not a group activity because it was important to explore the diversity within the community, rather than find a consensus. This enabled much cross-checking, and it was remarkable how consistently particu-



larly sources were mentioned - for example the name of the man who had first brought ipil-ipil seeds to the community from Manila, and that it had been in 1975. The villages are not strongly socially stratified and information seems to move particularly easily across the networks of relatives that constitute the upland communities.

Improvement needed

The diversity of this community perspective is important, but it meant that the information maps were drawn by researchers. They are impressionistic and were validated by cross-checking with key informants. They would be more useful if they were validated by the community as well and a group discussion based on the map might lead to further plans for improving the use of outside information or exchange of experience between communities. A 'complete' information map would also explore more 'upstream linkages'; only the ones at municipal level were included in the interviews of these maps, but these are the most significant from the community's point of view and seem to form the boundaries of their information system.

Using these diagrams helped to clarify the differences between information systems, highlighting three important aspects which are difficult to visualise in other ways; the direction of information flow, the relative importance of different links, and different experiences within the community. Change in the information system itself can also be inferred by comparing the information maps from different times and places. The first map shows the most basic information

system, where a government organisation identified the need for tree planting and supported its extension with financial incentives. The second map shows the same community five years later, when one sitio or neighbourhood had been working for a short time with the farming systems research institute and had developed two-way information flows principally with the research institute. The last information map is from a neighbouring village, showing the effect of interaction with the research institute for more than a decade. More farmers are planting trees, adopting soil conservation contours and are actively exchanging information with other farmers. In the last community, they have started to develop their own tree nurseries, and participate regularly in meetings with farmers from similar organisations in nearby villages.

Indicator of innovation

Even though the maps do not all show the same community, the experience of farmers in these communities suggests that the higher levels of innovation are related to the development of a more complex information system, with information flow in several directions, both between outside agents and the community, and between groups in the community and other communities. Some of these linkages are informal. The *alayons* are small labour-exchange groups modelled on a traditional system, meeting informally to help each other with ploughing and to exchange information. The network of *alayons* has been formalised by arranging annual workshops in the municipality. Finally, the research institute is work-

ing on institutionalising the linkages with local government, and these cross-linkages shown in the third information map reinforce other interactions, for example the women's weaving groups also have linkages with the mayor's office. These linkages are relatively new, but are promising for the continuity of the process of information exchange, along the lines which have already been established and encouraged, up, down and across the system. Not only is more tree-planting taking place, but the farmers in the communities with the more developed information systems are more confident about their ability to improve their circumstances - and say they are more satisfied with the information services that they have. Farmers with contours of trees or grasses say they can crop the land for four years now instead of the two years they could use it before. When they follow the land, the leguminous trees from the contours grow up and enrich the soil, at the same time eliminating the troublesome cogon grass (*Imperata cylindrica*). If this trend continues, outmigration from the area is likely to be reduced, and farmers will be able to farm the land they have for longer before the need to fallow it.

Anna Lawrence, Agricultural Extension and Rural Development Department, Box 238, Earley Gate, The University, Whiteknights Road, Reading RG6 6AL, UK

Reference

Lawrence, A. 1995. The neglected uplands: innovation and environmental change in Matalom, Philippines. AERDD Working Paper 95/11, University of Reading, 53pp.

