Scaling up adoption of contour-hedgerow farming in the southern Philippines: the landcare approach

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Abstract

Technological packages are available to conserve soil resources while enhancing farm productivity, but these need to be scaled up to generate greater economic and environmental benefits more rapidly. The issue of poor adoption has been studied in the Philippines, leading to the conclusion that these technological packages need to be “unwrapped” to make them more adoptable and that small farmer groups with appropriate external support could effectively promote technology adoption. This paper reports on a case study of the scaling up technology adoption through the landcare approach. In the southern Philippines, the development of contour barriers in the form of natural vegetative strips (NVS) has provided a simple, cost-effective solution to the problem of soil erosion, while allowing for step-wise adoption of other productivity-enhancing technologies. These technologies have been rapidly adopted and scaled up through the landcare approach, based on a partnership between landcare groups, local government units, and external agencies. It was found that the flexibility of NVS enabled farmers to enrich the system to suit varying goals and circumstances. This was supported by effective communication, training, follow-up, and facilitation. The minimum requirements for scaling up were an adoptable technology and a facilitated, farmer-led extension process. Thus, the adoption and elaboration of a simplified conservation technology (a process of technological change) was facilitated by a social process, namely, the development of landcare institutions and activities. In general, the successful scaling up of productivity-enhancing and resource-conserving technologies requires planned intervention to combine effectively the technical and social dimensions of the adoption process.

Media summary

The landcare approach promoted rapid adoption and scaling up of simple conservation and productivity-enhancing technologies in the southern Philippines.

Key Words

Agroforestry, Sloping Agricultural Land Technology, step-wise adoption process

Introduction

The concept of scaling up programs for agricultural development and natural resource management has recently gained the attention of development analysts and policy-makers. It is argued that, to be considered successful, new farm technologies need to generate larger economic and environmental benefits more rapidly. The International Institute for Rural Reconstruction defines scaling up succinctly as a process of bringing more benefits to more people, more quickly, over a larger area (IIRR 2000). The implication is that technology diffusion will not occur rapidly or extensively enough to make a major impact without external facilitation. Such facilitation requires building the capacity for effective farmer-to-farmer communication of locally adapted technologies.

Conservation farming systems based on the generic concept of contour hedgerows have been widely promoted among farmers and extension workers in the Philippines. The Mindanao Baptist Rural Life Centre (MBRLC) in Davao del Sur introduced Sloping Agriculture Land Technology (SALT) in the 1980s. SALT is an elaborate and highly specific package of soil conservation and crop production technologies, based on contour hedgerows, that involves 10 basic steps and four alternative versions (SALT I to IV). The MBRLC has disseminated SALT through intensive farmer training, and the technology has been incorporated in the programs of central government departments. Positive results have been observed and reported in experimental and demonstration sites and pilot projects. However, widespread adoption by farmers on a larger scale has been limited. A series of evaluation studies of upland projects in the Philippines based on the SALT system found that the limited uptake was partly due to the attributes of the technology itself, and partly due to constraints in the social, economic, and institutional environments in which the technology has been promoted (Cramb 2000). The conclusions were: (1) that adoption of the generic contour farming technology would be enhanced by unwrapping the specific SALT package, allowing farmers to adopt individual components in a step-wise process and to pursue alternative adoption pathways; and (2) that effective community-based extension programs involve “small groups of neighbours and close kin, who can work together to achieve a limited number of practical outcomes”, rather than larger communities, and that “external support for conservation efforts needs to focus on mobilising and supporting such groups, providing back-up and linkages within and beyond the community, which the larger social system does not otherwise provide” (Cramb 2000). These two elements were seen as important in scaling up the adoption of contour farming technologies.

This paper examines the adoption and scaling up of a simple contour farming practice, particularly natural vegetative strips (NVS), which first developed and promoted in Claveria, Misamis Oriental Province, then extended to Lantapan, Bukidnon Province both upland municipalities in the southern Philippines. The scaling up process involved the landcare approach, which centres on the formation of community landcare groups and municipal-wide landcare associations, supported to varying degrees through partnerships with government and non-government agencies. Such groups identify problems at the local level and mobilise information, community effort, and finances to help improve the management of natural resources while increasing farm productivity. Hence landcare is an example of a facilitated, farmer-led approach to scaling up technology adoption.

Methods

This case study is part of a larger study of the scaling up of Landcare, using the following sources of data: (1) key informant interviews with farmers, project staff, local officials, and other key partners; (2) focus group discussions with landcare groups; (3) project databases; (4) local government statistics; and (5) participant observation. Data collection was conducted from July 2002 to March 2003.

Results

The emergence of NVS and the Landcare approach in Claveria

Claveria’s landscape consists of steep mountains (up to 2,500 m), rolling hills, and more gently sloping lands. The annual rainfall averages about 2,000 mm. Claveria’s soils are deep, weathered Oxisols, largely derived from volcanic material, generally acidic, and of low fertility. Farmers are concerned with the consequences of excessive soil erosion, since high rainfall causes severe erosion of up to 200 t/ha on slopes that have insufficient cover, and 59% of the cropping occurs on lands of more than 15% slope (Stark 2000). The International Centre for Research on Agroforestry (ICRAF) has a research station in Claveria, which it took over in the early 1990s from the International Rice Research Institute (IRRI).

NVS evolved in the early 1990s in Claveria as a variant of SALT, which had been promoted in the area in the 1980s. Farmers experimented with the hedgerow concept by placing crop residues along the contour lines and leaving the native weeds to re-vegetate in the unplanted strips, eventually forming stable natural barriers to erosion (Mercado & Garrity 2000). Subsequent on-farm research by ICRAF demonstrated the benefits of the NVS system: (1) it reduces soil erosion by more than 90 per cent compared with open-field farming, with increased water infiltration during heavy rains; (2) it reduces the labour requirement for establishing and maintaining contour barriers – no establishment cost is involved other than to mark out the contours before ploughing, and labour for maintenance is less than a quarter of that for the conventional hedgerow system; (3) competition with adjacent field crops is minimised; (4) the vegetative strips filter pesticides, nitrates, and soluble phosphorus; (5) the subsequent formation of terraces results in easier land preparation and crop management; and (6) the system provides a good foundation for the evolution of various agroforestry systems. Thus NVS is a good example of unwrapping the SALT package, permitting flexible, step-wise adoption. By 1995 many farmers were adopting the NVS technology quite spontaneously and others were demanding training. To accelerate the adoption process, ICRAF supported an extension team, comprising a farmer, an agricultural technician, and an ICRAF facilitator, and moved quickly to organise group-based training. Following one such group-training event, a municipal-wide farmer association was formed, named the Claveria Landcare Association (CLCA). The CLCA proceeded to set up landcare groups in the villages to help promote NVS. Landcare thus developed as a facilitated, farmer-led approach that rapidly and inexpensively disseminated conservation farming technologies. Soon the local government units (LGU) became involved, resulting in a three-way partnership between the CLCA, the LGU, and ICRAF. This came to be described as the landcare triangle. Information campaigns, cross-farm visits, and training sessions were organised to promote technology adoption. The CLCA monthly meetings were particularly effective for knowledge sharing and for building friendship and networks among farmers and LGU officials. Landcare facilitators were central to these developments. By 2003, 1,844 farmers had adopted NVS and related agroforestry practices, representing 27 per cent of the total farming population. The aggregate area on which these technologies had been implemented reached 1,820 hectares, which was 23 per cent of the total cropped area. Farmers had also produced almost 290,000 seedlings in landcare nurseries over six years (1996-2002).

Scaling up from Claveria to Lantapan

Lantapan is located in the western part of Bukidnon Province. The elevation averages 600 metres but increases to almost 3,000 metres in the Mt. Kitanglad Range Natural Park (MKNRP). Lantapan encompasses the upper watershed of the Manupali River that supplies an irrigation scheme and a major hydroelectric power plant. About 70% of the area has slopes greater than 10%. Soils are mostly well drained with clayey surface and subsoil horizons, are slightly to moderately acidic with low organic matter and high P fixation capacity, and have a low capacity to retain nutrients (Coxhead & Buenavista 2000). Annual rainfall averages 2,470 mm. Lantapan's population has grown rapidly. In 1995, the National Statistics Office (NSO) recorded a total population of 36,943, which increased to 42,383 in 2000. It was projected that the present population will triple in the next 15 to 20 years. Land scarcity for smallholder production is pervasive due to population growth and the expansion of agribusiness in the form of corporate banana plantations, sugarcane farms, and intensive pig and poultry industries.

The NVS technology was tested through on-farm experimentation and was found to be well adapted to farmers' circumstances in Lantapan. In 1997 ICRAF started to disseminate NVS through the landcare approach, which was transferred or scaled up from Claveria. The involvement of municipal officials at the start was expected to be an effective strategy for institutionalising Landcare in the LGU, reproducing the landcaretriangle. However, a change in political leadership in 1998 provided a major setback to the implementation of Landcare, as the new LGU administration was unsupportive due to political factionalism. From 1999, then, ICRAF became responsible for implementing the Landcare Program. ICRAF appointed facilitators who initiated an information campaign on broad environmental issues and surveyed farmers' interest in conservation farming. There was a rapid response, in terms of learning about NVS and agroforestry technologies and the formation of local landcare groups and a municipal landcare association.

Just as in Claveria, the adoption of contour farming practices in Lantapan followed a step-wise process with multiple pathways. However, this process of adoption and further innovation was facilitated by the use of effective communication channels, training sessions, and systematic follow-up. For example, farmers were initially exposed to the technologies through slide shows and cross-farm visits, followed by one-day, hands-on training. The simplicity of the NVS technology was an advantage, in that farmers could easily set them up on their farms on their own or with some help from a neighbour or relative. In some cases, however, the time lag from training to adoption was longer, requiring the facilitators or group leaders to follow up the farmers personally. Hence, though there was farmer-to-farmer diffusion of the technology, facilitators and landcare leaders played an important role in encouraging and assisting adoption. Once the NVS were in place, farmers readily elaborated on the basic technology by enriching the NVS system with a variety of crops, including root crops (e.g. taro), annuals (e.g. pineapple, guava), perennial crops (e.g. coffee), forages (e.g. Flemingia macrophylla), fruit trees (e.g. durian, rambutan), and timber species (e.g. Eucalpytus spp., Acacia spp., Gmelina arborea) (Fig. 1). This enrichment process was pursued by 55% of NVS adopters because it could compensate the lost crop area and improve total farm productivity. About 17% of NVS adopters were particularly interested in tree-based hedgerow systems because of the perceived greater economic potential of trees. Hence they sought and received training in nursery establishment and set up landcare nurseries to produce fruit and timber tree seedlings. These they planted along the NVS or around farm boundaries or on vacant plots. Hence the adoption of NVS had helped initiate the evolution of smallholder agroforestry.

The role of the landcare groups was important in this process. Some groups formed at the early stage of NVS adoption, with help from facilitators and village officials, but the majority were formed around the establishment of nurseries. These groups were soon federated at the municipal level, linking them to innovative farmers and the activities of the municipal landcare association. Interest developed in further training on specific topics, including germplasm collection, marketing of seedlings, and other livelihood enhancing activities. Farmers' were thus enabled to expand their species-base, experiment with other tree species on their farm, and produce a supply of quality seed for timber and fruit trees.

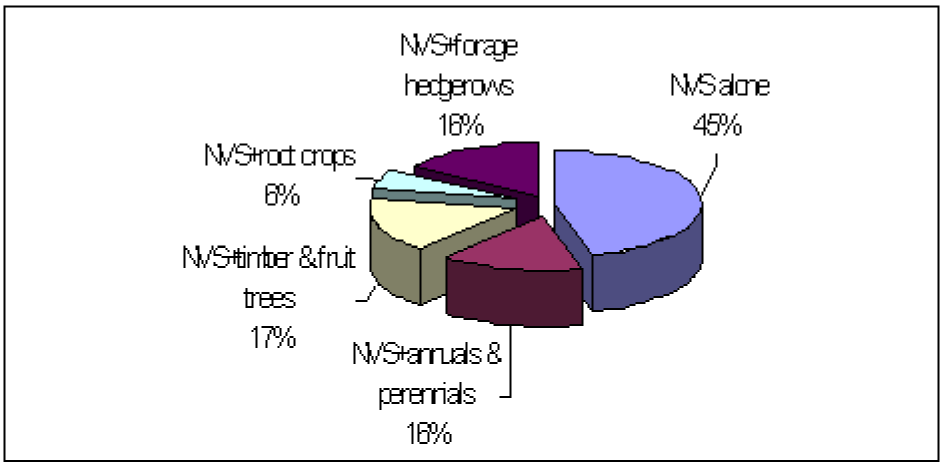

Fig. 1: Enrichment of NVS in Lantapan (1999-2002)

The rate of adoption of contour farming and agroforestry in Lantapan was high compared to the preceding 15-year period, during which there had been various project interventions in Lantapan. During the first three years of the Landcare program (1999-2002) the total number of adopters doubled. The majority of adoption occurred in the environmentally critical upper watershed villages. About 17% of farm households in Lantapan had adopted NVS and agroforestry practices, implementing these technologies on about 23% of the environmentally critical land in the municipality. Thus the landcare approach made a significant impact on farm productivity and resource conservation in a short time.

Conclusion

The process of scaling up the adoption of conservation farming in the southern Philippines involved a technical process in parallel with a social process. Farmers modified the original SALT package by stripping it down to its simplest components, making it much more adoptable, and opened up a step-wise adoption following branching pathways. However, accelerated adoption of this simplified technology only occurred through the parallel evolution of the landcare approach – a facilitated, farmer-led process of communication, training, and support. The replication of the adoption process in another site required active intervention by an outside agency to create a new "node of diffusion", which entailed transfer of the NVS technology and the social innovations embodied in the landcare approach. The subsequent elaboration of the technology through enrichment of NVS was also more than merely a technical process, requiring the involvement of facilitators, local landcare nurseries, and the municipal landcare association.

The minimum requirements for scaling up in this case were an adoptable technology and a facilitated, farmer-led extension process (i.e., the landcare approach). In general, this case study has shown that the successful scaling up of productivity-enhancing and resource-conserving technologies involves planned intervention to effectively combine the technical and social dimensions of the adoption process.

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