

## **The Landcare experience in the Philippines: Technical and institutional innovations for conservation farming<sup>1</sup>**

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### **Abstract**

Sustainable land use is one of the focal issues in the debate about rural development in the Philippines uplands where about 18 million people eke-out a living. Contour hedgerow farming with leguminous trees has come to be viewed as an important agroforestry technology to ensure food security, alleviate poverty, and protect the environment. This paper relates our experiences in a participatory approach to develop technology and institution for agroforestry at the ICRAF research site in Claveria, northern Mindanao, Philippines. For several years we focused our efforts in assessing the management strategies to address key technical constraints of the contour hedgerow system. We observed that adoption by farmers is low. The reasons for this include high labor in establishment and maintenance of the hedgerows, resource competition above and below-ground between the hedgerows and associated crops, limited value-added from the hedgerow prunings, and poor species adaptation.

We therefore refocused our efforts toward finding alternative system that will address the technical and institutional issues of conservation farming. We found that natural vegetative filter strips (NVS) provide simple solution to the technical constraints of soil conservation on slopes. These are buffer strips that are laid out on the contour in which the natural vegetation is allowed to re-grow into a thick, protective cover. NVS also provide a foundation for farmers to evolve to complex agroforestry systems with fruit and timber trees. We now see a tremendous surge of adoption of this system. Adoption has been enhanced by the Landcare approach.

Landcare is a movement of farmer-led organizations supported by the local government that share knowledge about sustainable and profitable agriculture on sloping lands while conserving natural resources. The approach has developed into a dynamic voluntary movement called the Landcare movement. There are now over 3000 farmers involved in this movement. As the Landcare groups began to grow, the local government units (municipal and barangay) have given enthusiastic support. This has involved the contribution of funds, technical assistance and policy support to the movement. Today, the Landcare movement has grown to over 250 groups in five municipalities in northern, central, eastern, and southern Mindanao.

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## Introduction

Contour hedgerow systems using nitrogen fixing trees have been widely viewed and promoted as important components of soil conservation in Southeast Asia to minimize soil erosion, restore soil fertility, and subsequently improve crop productivity. Although positive results have been observed and reported in a number of experimental and demonstration sites, farmer adoption is poor. This low adoption is associated with constraints of high labor requirements in establishing and managing hedgerows; poor adaptation of leguminous trees in acid upland soils; sources of planting materials are not readily available; and above and below ground competition favors the hedgerows and may reduce crop yields.

ICRAF has been conducting research on contour hedgerow technologies for the past decade in Claveria. Intensive examination of many facets of contour hedgerow systems has led to the following conclusion: Hedgerow systems of leguminous trees consistently increase maize yield by 20-30%, but reasonable yield cannot be maintained without external nutrient supply (particularly P) in addition to the tree prunings. However, the increased labors required in establishing and managing the tree hedgerows are not sufficiently compensated by the yield increase observed. Thus, marginal returns to the management are usually low. The result is that tree hedgerow systems are usually abandoned after several years of trial.

This does not imply that farmers are not concerned about soil erosion. In fact, soil erosion was one of the top concerns among farmers in our surveys. What it does imply is that any adoptable technology must have minimal cost to the farmers as well as to the public institutions supporting the program.

Agroforestry or soil conservation technologies must be within the context of marginal farmers based on their socio-economic environment and bio-physical environment. Socio-economic environment includes among others land, labor and capital. This also considers farmers inability to absorb or digest complex and new information about state-of-the-art conservation measures because they are generally of low literacy compared to their lowland counterparts. The bio-physical environment includes soil, climate and vegetation. Agroforestry or soil conservation technology must consider the bio-physical context of the upland farmers in which soils are marginally poor and vary generally from site to site. The species recommended should be adapted to the soil physical and chemical environments. Therefore there is a strong need to develop more options of upland conservation technologies to address such complexities.

This paper focuses on two issues: 1.) The elements of a low-labor and low-cash-cost contour hedgerow system as an approach to technical solution to conservation farming in the uplands that evolve to complex agroforestry system; and 2.) the institutional innovation that empowers the community and the local government to effectively and inexpensively disseminate conservation farming and agroforestry practices at a sustainable rate.

Among farmers in Claveria, the perception that soil erosion is a serious problem is widespread. Most farmers are clearly aware of the reasons for declining crop yields and possible strategies to combat the soil degradation process. Sloping fields in Claveria experience up to 200 t/ha of soil loss (2200 mm/year rainfall). About 59% of the cropping (mostly corn and some vegetable farming) occur on lands of more than 15 % slope (Garrity and Agustin 1994, Fujisaka et

al., 1994). As is typical for the majority of cultivated upland areas in Southeast-Asia, soils in Claveria are degraded and acidic (pH 4.5 - 5.2) with low available P.

Contour hedgerows of pruned leguminous trees or Sloping Agricultural Land Technology (SALT) had been promoted in Claveria since the early 1980's by the Philippine Department of Agriculture (DA) as a solution to the problems of unsustainable crop production in the uplands. This farming system aimed to provide effective soil erosion control, organic fertilizer to the companion annual food crops, fodder for the ruminants, fuelwoods for the farm families, restores water quality and quantity in the watershed and others. In spite of these benefits, farmers' adoptions were not widespread. After years of ICRAF's on-farm research and working closely with farmers, we identified some key constraints and their solutions.

The constraints include:

- ◆ high labor requirements to establish and maintain the hedgerows,
- ◆ limited value-added to the farm income,
- ◆ unanticipated problems in soil fertility due to hedgerow competition,
- ◆ irregular width of the alley,
- ◆ too dense hedgerows in moderately to steeply sloping farms,
- ◆ poor species adaptation and lack of planting materials, and
- ◆ insecure land tenure.

We were probably very fortunate when we started working in Claveria in 1985 to have had no experiment station upon which we might have conducted our trials on tree legume hedgerows. If we had, we might still be a couple cycles behind in where we are now in our learning experience. Working with farmers on experiments superimposed on contour hedgerows they installed themselves made it clear that pruned tree hedgerows were too labor intensive, and productive forage grass hedgerows were too competitive with the associated crops. Adoption of both technologies was not taking off. However, we saw that the concept of contour hedgerows was a popular idea. We saw that some farmers experimented with the concept by placing their crop residues in lines on the contour to form 'trash bunds'. These rapidly revegetated with native grasses and weeds and soon formed stable hedgerows with natural front-facing terraces. Other farmers tried laying out contour lines but didn't plant anything in them. These lines evolved into natural vegetative strips (NVS), which we later observed were superb in soil erosion control and reduced maintenance labor to a minimum (Garrity, 1993; Agus, 1993).

These latter innovations caught the imagination of many more farmers. By about 1994 it was estimated that over 150 farmers had adopted contour hedgerow systems while the number of pruned tree hedgerow fields decreased after 1990. The new wave of hedgerow system was predominantly natural vegetative strips. We also observed a broad-based change in tillage systems: When research had first begun in Claveria in 1985 virtually all farmers plowed up and down the slopes. Contour plowing was unheard of. By 1995 it was evident that nearly all farmers had converted to the idea of contour plowing, or were at least attempting to do so.

### **Evolving the components of a successful conservation farming system**

Interest in NVS continued to increase. Since it is quite uncommon for an effective soil conservation structure to be adopted by large numbers of farmers spontaneously, and without public subsidies, we took note that perhaps we were witnessing the kind of low-labor, zero-cash-cost alternative that might have widespread applicability. We began to examine each component of the process of establishing and maintaining low labor hedgerow practices. The establishment

of natural vegetative strips (NVS) requires only a fraction of the needed labor compared to the conventional contour hedgerow of tree legumes. The only labor required is the laying out of contour lines (about 2 person-days per hectare). NVS are narrow contour strips of field area left unplowed and allowed to vegetate naturally. The total amount of time required to plow is reduced accordingly to the proportion of the unplowed strips thus offsetting the labor spent for laying out these contour strips. The amount of labor required to prune or maintain the NVS is proportionate to the spacing of hedgerows. Mercado et al 1997 found out that NVS spaced at 6 meters apart dominated by *Chromolaena odorata* required 15 person-days per cropping per hectare or 30 person-days per year. This was less than a quarter of the time required for conventional tree-legume based contour hedgerow systems (ICRAF 1996). For low-statured NVS like *Paspalum spp* or *Digitaria spp*, they require even less (3 to 10 days per cropping season) (Mercado et al, 1997; Stark, 1997, unpublished data).

Our surveys of those farmers who had not yet installed contour hedgerow systems but desired to do so, indicated that their over-riding reason for not contouring was that they lacked the technical know-how to do it right. We had recently uncovered an extremely simple and practical means of laying out contours without equipment even as sophisticated as an A-frame: The cow's back method (ICRAF, 1997). The cow's back method involves plowing across the slope and maintaining the angle of the cow's back on the level. When the animal is heading upslope its head is higher than its back; when it is off-course downslope, the rear part of the animal is elevated compared to the front. Stark et al (1996, unpublished data) found that this cow's back method was on the average less than 2 % off the real contour compared to either A-frame method or hose level method. This is acceptable for practical purposes; particularly in light of the fact that most farmers don't bother with A-frames at all, but simply eyeball their contours (which is much less accurate).

Feedback from farmers isolated another factor that causes many smallholders to hesitate in installing contour hedgerow systems: conventional recommendations that hedgerows be separated by only 1 to 1.5 meter drop in elevation. On steep slopes the crop area lost may be 15 to 20 percent or more. Crop yields cannot be expected to increase enough to counter balance this much lost area. This is compounded by the increased labor in establishing and maintaining many hedgerows in each field. We therefore conducted trials to determine how reducing the density of hedgerows affects the expected control of soil loss. We found out that hedgerows spaced at 4 meters vertical drop are still effective in reducing soil loss (Mercado et al 1997). Even a single NVS strip placed on the contour halfway down a 60-meter long slope reduces soil loss to 40% of soil loss on the open slope. We conclude that farmers could space their hedgerows at much wider intervals than the conventional rule-of-thumb recommendation suggests, even up to 8 to 12 meters apart on such slopes. Erosion control will not be quite as good, but the adoptability of the practice is greatly increased. More hedgerows can always be added in-between the original ones after the farmer has gained more confidence in the effectiveness of the practice. This wider spacing is also particularly appropriate when the farmer intends to convert his or her NVS strips into fruit or timber trees. There is now great interest in Claveria in establishing fruit and timber trees on NVS. In a sloping cultivated field, farmers established soil conservation using the natural vegetative filter strips on their farms. After they have established contours, they raised seedlings of timber trees or fruit trees. Introduction of trees come during the 2nd or 3rd year after the establishment of NVS. Tree canopies start to close 3-4 years after planting of trees. By this time it is no longer feasible to plant annual crops at the alley because it is already too shady for them. But farmers introduced ruminants under the trees. Farmers having wider alley (8-12 meters wide) can still plant annual food crops between the rows of the trees, and grow fodder grass between trees along the row. A wider spacing of NVS is very useful for farms where it is desired to

continue growing food crops as the fruit and timber trees mature. However, farmers with larger farm sizes tend to opt for somewhat closer hedgerow spacing, and move food crop cultivation to other parcels once the tree canopies shade the annual crops. These fast growing timber tree systems have a 6-8 year cycle.

Farmers that establish cash perennial hedgerows (like pineapple) tend to want to have closer-spaced hedgerows in order to have more rows of these cash crops, as they often earn more from the hedgerow component than from the maize or other annuals planted in the alleys. NVS can evolve into many forms of agroforestry systems. Farmers in Claveria are planting fodder grasses and legumes, timber trees and fruit trees, and other cash perennials on their NVS fields. The fodder grasses used include *Setaria* spp, *Pennisetum purpureum*, and *Panicum maximum*. The forage legumes include *Flamingia congesta*, and *Desmodium rhinizonii*. Timber species cultivated include *Gmelina arborea*, *Eucalyptus* spp, *Sweetenia* spp, *Ptericarpus indicus*, and others. The fruit species include mangoes, rambutan, durian. Other perennial crops grown in or just above the strips include pineapples, bananas, and coffee.

The groundswell of enthusiasm among hundreds of Claveria farmers, and the rich store of farmer experiences with a wide range of prospective contour hedgerow management options, stimulated consideration of how the public sector research and extension institutions might evolve more effective techniques to diffuse NVS technology rapidly to much larger numbers of interested farmers within the municipality and elsewhere. The adoption and technology modification process has been well-documented by IRRI staff (Fujisaka et al.1988, Cenas and Pandey, 1995), but aside from documentation and wider sharing of experiences very little extension follow-up was undertaken thereafter. Extension methods can be basically classified as either the individual / household approach or the group approach. The individual approach is most effective for activities to be undertaken within the full control of the individual farmer or household (e.g. establishing contour hedges), while working with groups or the community at large is more suitable concerning matters related to the whole community (e.g. post-harvest public grazing ) or if activities will be undertaken (more cheaply) by a group (e.g. group nursery). The group approach is particularly suitable where group work is common, like the Philippine *Bayanihan*, which are farmer work groups based on voluntary work contribution for a common benefit.

### **Towards effective technology dissemination: the evolution of an innovative extension strategy**

In addition to conducting applied research resulting in the development of appropriate technologies for the area and for sites of similar bio-physical and socio-economic conditions, ICRAF has recently initiated a technology dissemination program to ensure that derived innovations will reach to the user group. Although not its explicit mandate, ICRAF has undertaken the commitment to develop an effective extension program to strengthen existing government programs and to help technology dissemination develop into a self-perpetuating farmer movement in the area towards highly productive, resources-conserving agroforestry-based farming systems.

ICRAF has been instrumental in developing a farmer-led approach to technology development and dissemination, which has resulted in an unexpected boost in farmer adoption of soil conservation technology and agroforestry practices. The key institutional innovation for effective conservation farming technology dissemination is the Landcare approach: a process that is led by farmers and community groups, with support by the local government and technical backstopping from ICRAF or Department of Agriculture (Figure 1).

### ***What is Landcare?***

Landcare is a method to rapidly and inexpensively diffuse agroforestry practices among upland farmers, based on the farmers' innate interest in learning and sharing knowledge about new technologies that earn more money and conserve natural resources (Garrity and Mercado, 1998). It is a group of people, concerned about land degradation problems, who are interested in working together to do something positive for the long-term health of the land. It is evolved as a participatory community-based approach designed to effect change in complex and diverse situations (Sweet-Kelly, 1998).

The core of the Landcare model is two fold: effective local community groups and partnership with government (Campbell and Siepen, 1996). This grassroots approach is generally recognized as a key to success in all community development activities. Groups are to respond to the issues that they consider as locally important, solving problems in their own way. In other words, Landcare depends on self-motivated communities responding to community issues, rather than to issues imposed by any external agency. Approaches that use well-grounded theory (where participants determine the key issues rather than these being pre-determined) are more likely to effect permanent and positive change.

Landcare groups are supported by government and are networked to ensure that ideas and initiatives are shared and disseminated. This is a partnership between local communities and the government – working together to change the way the land is used is an important feature of Landcare.

In 1996, ICRAF supported dissemination activities in Claveria as a direct response to the farmers' request for technical assistance in conservation farming. The technical and institutional innovations led to the formation of the Claveria Landcare Association. Today, there are 250 Landcare groups in the municipalities of Claveria, Malitbog and Lantapan. These municipalities are located in northern and central Mindanao. Most of these Landcare groups are based in the purok or sitio (sub-villages) where farmers can interact with each other more frequently. There are now more than 3000 farming families involved.

These Landcare groups have successfully extended conservation farming based on NVS to more than 2000 farmers, and established more than 300 communal and individual nurseries that produce hundreds of thousands of fruit and timber tree seedlings that are planted on the NVS or along farm boundaries. They were also able to link to other service providers get funding for livelihood projects.

### ***Steps involved in Landcare approach***

Based on the gestation and evolution of Landcare during the past several years in Claveria, the major principles and steps in developing this approach have been identified (Garrity and Mercado, 1998) and are summarized below.

#### **1. Select sites with good potential**

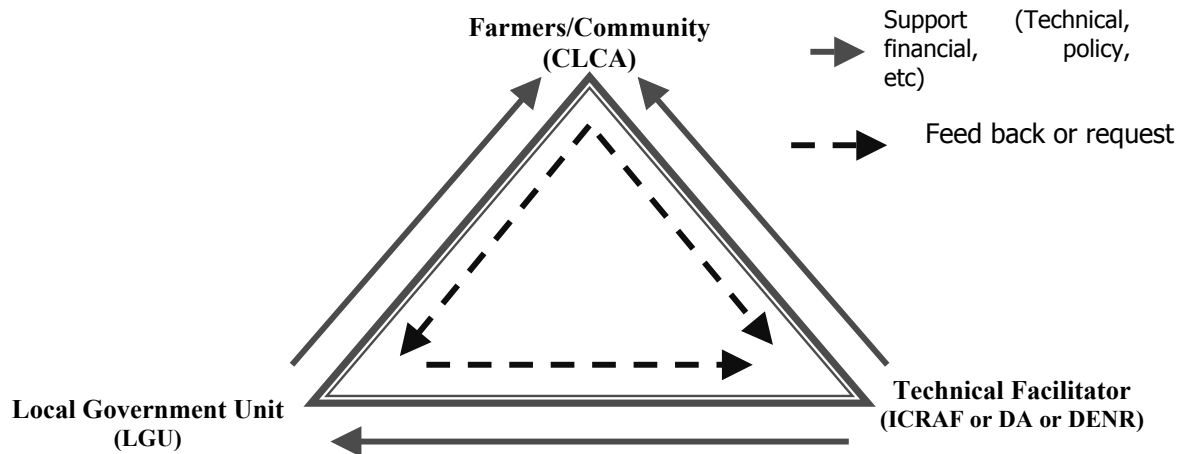
This is to bring conservation farming technologies to where it is needed most – on sloping lands where soils are prone to erosion and degradation. This initial step also involves meeting with key leaders in the local government units (municipal or province), interested farmers, and other stakeholders. Their understanding of the issues that need to be addressed,

as well as their willingness to support and complement the program are very crucial to the success or failure of Landcare at a given site.

## 2. Expose key farmers to successful technologies and organizational methods.

The aim is to develop strong awareness among prospective key actors – especially innovative farmers and farmer leaders-of the opportunities to effectively address production and resource conservation objectives through the new technologies. The success of the activities can be measured through the development of enthusiasm to adopt the technologies within the community. Exposure activities include:

- Organize cross visits to the fields of farmers who have already adopted and adapted the technology successfully into their farming systems.
- Provide training experience for farmers in the target communities to learn about the practices through seminars in their Barangays.
- Provide opportunities for farmers to try out the technologies on their land through unsubsidized trials to convince themselves that it works as expected. If so, these farmers become the core of a ‘conservation team’ to diffuse the technology in the municipality.



**Figure 1. The triangle of Landcare approach: grass organization (CLCA), local government unit (LGU), and technical facilitator (ICRAF/DA). The success of Landcare as an approach is dependent on how these 3 groups interact and work together**

### 1. Farmers or community (CLCA) -

- farmers (owner operator, tenants, etc)
- usually resource poor
- want to improve their livelihood
- want to employ new farming techniques
- would like to acquire ,and share knowledge and experience with other farmers
- committed for resource conservation
- create workgroup for nurserying, establishment of conservation farms. Etc.

2. **Local government unit (LGU)**
    - Provide policy support (institutionalization of conservation farming and agroforestry, creation of Municipal and Barangay ordinances)
    - Leadership (facilitating formation of Landcare groups and Landcare activities)
    - Capacity building (initiate various trainings)
    - Financial supports (HES fund from municipal - P50,000.00/barangay/year (\$1,250) and HES funds from Barangay =20% of the development fund)
  3. **Technical facilitators (ICRAF and line agencies)**
    - Technology : soil and water conservation, agroforestry, nurserying, etc
    - Facilitation (facilitate formation of Landcare and Landcare related activities)
    - Germplasm
    - Information and education campaign
- 

### 3. **Organize conservation team at the local level**

Once it is clear that there is a critical threshold of local interest in adopting the technologies and a spirit of self-help to share the knowledge within and among the villages (barangays) of a municipality, then the conditions are in place to support the implementation of a municipal conservation team. The team is composed of an extension technician from Department of Agriculture (DA) and DENR, an articulate farmer experienced in the application of the technology, and an outside technical facilitator (Figure 2).

The team will initially assist individual farmers in implementing their desired conservation farming practices. Later, they will give seminars and trainings at the barangay level if sufficient interest arises. During these events they will respond if there is interest in organizing more formally so as to accelerate the spread of agroforestry and conservation practices.

### 4. **Evolve Landcare farmers organization**

If and when the preconditions are in place for a Landcare farmers organization, then the facilitator may assist the community in developing a more formal organization. A key ingredient of success is identifying and nurturing leadership skills among prospective farmers in vision and organization. This may involve arranging for special training in leadership and management for the farmer leaders, exposing them to other successful Landcare organizations.

Each barangay may decide to set up its own Landcare Association chapter and barangay conservation team. A barangay may organize Landcare Association sub-chapters in their puroks or sitios (sub-barangays). A purok conservation team usually includes a local farmer-technologist, the purok leaders, and the district kagawads (councilors). The purok-level teams are the front-liners in conservation efforts, providing direct technical assistance, training, and demonstration to farmer households. They are backstopped by conservation teams at the barangay and municipal levels.

At the municipal level, the Landcare Association is a federation of all of the barangay Landcare chapters. The municipal conservation team is part of the support structure, which also includes other organizations that can assist the chapters (e.g. DA, DENR, and NGOs). See figure 3 for the organizational setup of the Claveria Landcare Association (CLCA). It is a People's Organization (PO) registered as an association with the Philippine Securities and Exchange Commissions (SEC) in 1996.

### 5. Attract local government support

Local government can provide crucial political and sustained financial support to the Landcare Association to assist it to meet its objectives. The municipality has its own funds that are earmarked to be spent on environmental conservation. These can be targeted to Landcare activities that enhance natural resource conservation. The municipality can be encouraged to develop to a formal natural resource management plan – such as the one in Lantapan described in the proceedings case study – which can help guide the allocation of conservation funds.

### Conservation Team Approach

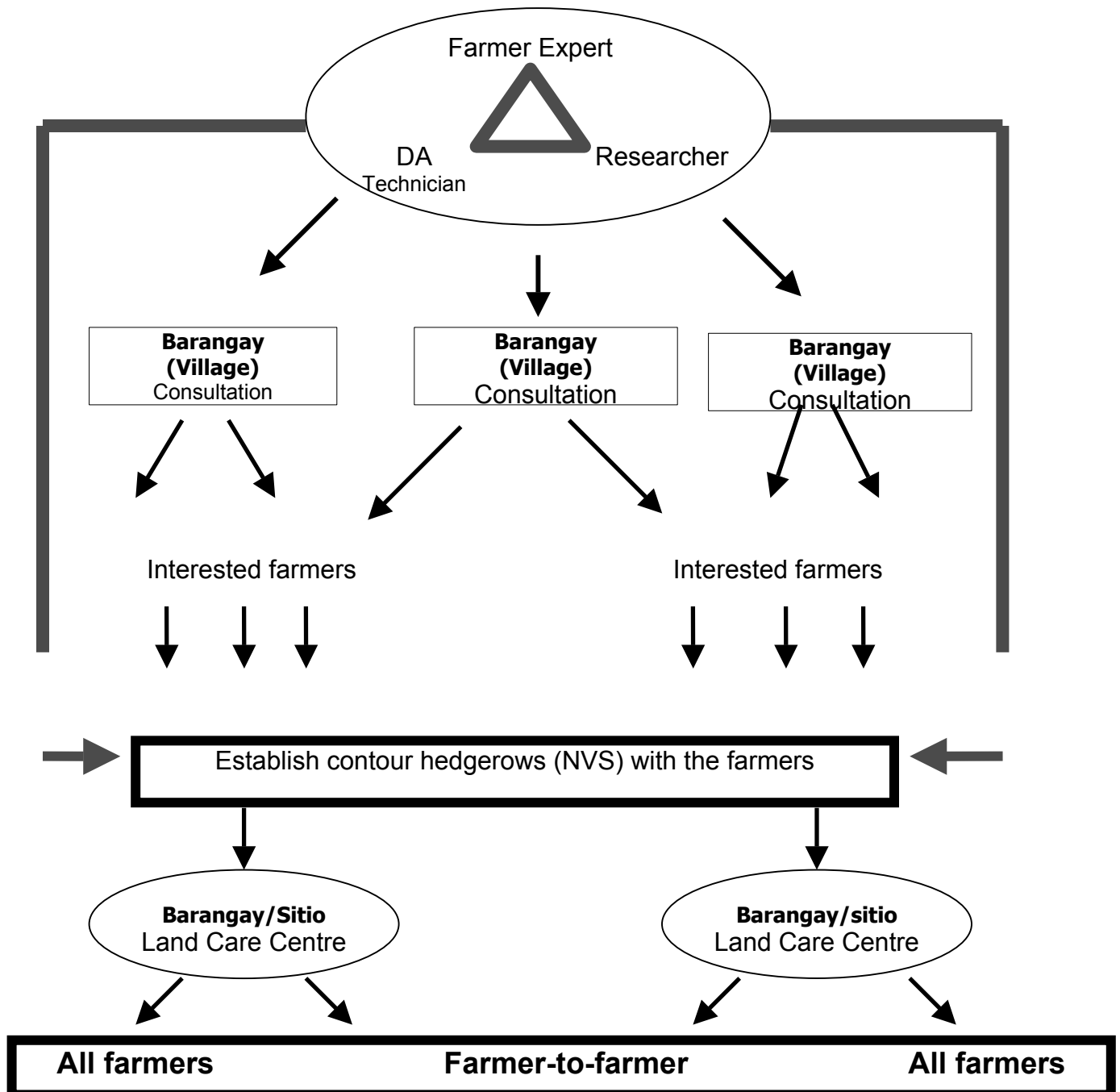


Figure 2. Conservation team as key component of Landcare approach.

The barangays can also allocate financial resources from their regular internal revenue allotment (IRA) through the Human Ecological Security (HES) Program, which represent one-fifth of the total development funds of the barangay. These funds can be used to organize the conservation teams and Landcare Association activities at the barangay and purok levels and support trainings and honoraria for resource person if the required time commitment exceeds voluntary efforts. The municipality can also allocate HES funds to compliment the Barangay budget. For 1998, the Claveria municipal government committed 50,000 pesos (about US\$1,250) to each Barangay to support Landcare activities.

External donor agencies can best support Landcare development by allocating resources for leadership and human resources development, communications equipment (e.g., handheld radio sets), and transportation (e.g., motorcycles) to enable the Landcare leaders to make maximum use of their time.

## **6. Monitor and evaluate**

Monitoring is a necessary tool to assess the ongoing activities, and the use outputs for strategizing activities or planning actions to make the program more dynamic and relevant to the need of the target community.

For monitoring purposes ICRAF has been keeping records of all those who have attended a training or had been assisted with establishing NVS on their farms, as well as of farmers who requested assistance. Details on farming and conservation practices, training and follow-up needs are recorded on a *diagnostic card*, which is updated on regular follow-up visits by ICRAF staff. The leaders of the CLCA chapters or sub-chapters have been supporting this activity by facilitating the distribution and collection of the diagnostic cards to and from the villages and new CLCA members.

As a preliminary evaluation, a survey on the adoption and dissemination progress is now being conducted, with an emphasis on farmers' technology modification and the reasons behind their decision-making.

### ***Conservation farming technologies adopted by Landcare members***

The specific activities of the Landcare Association members will vary to their needs and interest, as well as their biophysical and socioeconomic situations. Some of the many activities that have been or are being developed as focal areas for Landcare Association work include:

- Establishing natural vegetative strips (NVS) along the contour reduce field or farm-level soil erosion. This was the initial farmer-generated technology that launched the organization of Landcare in Claveria.
- Planting perennial crops on or just above the NVS to increase the farmers' cash income and enhance soil and water conservation.
- Planting trees to increase family income through production of timber, fuel wood, and other tree products in farm forests, boundary planting or other arrangements,
- Planting high-quality fruit trees to provide income and better nutrition for the household while enhancing the environment.
- Adopting minimum-tillage or ridge tillage farming systems. Ridge tillage has been successfully adopted with the existing draft-animal cultivation practices, and is being further tested on farms.
- Establishment of nurseries for fruit and timber trees
- Promotion and adoption of backyard gardening. This is to address the problem of malnutrition, which is rampant among children.

- Other activities:
  - Planting of herbal medicines
  - Solid wastes management by segregating bio-degradable and making them into compost
  - Local competition to promote awareness and adoption of various resource conservation measures. This includes Landcare song composition, slogan making
  - Exchange labor
  - Helping one another during sickness, deaths and other community problems.

## Structure of the Claveria Landcare Association

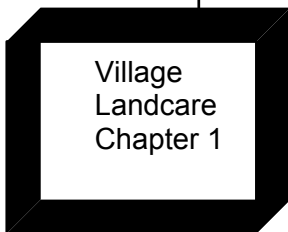
### Municipal Level



#### Actors

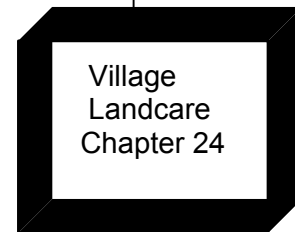
- President, Claveria Landcare Association
- Municipal conservation team
- President of all Village Landcare chapters
- Municipal mayor
- Chairman, committee on agriculture & environmental, municipal Council
- Municipal agriculture officer
- State College of Agriculture
- ICRAF

### Village Level

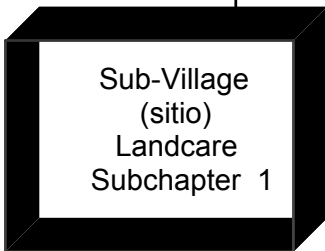


#### Actors

- Village conservation team
- Agriculture technicians
- Chr, Agric. & Env. Comm., Village council
- Village Chieftain



### Sub-Village level



#### Actors

- Sub-chapter Landcare president
- Sub-Village conservation team
- Households
- Agriculture technician
- Chr, Agric. & Env. Comm.
- Sub-Village chieftain

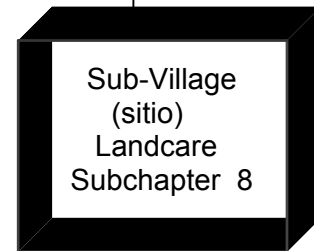


Figure 3. Organizational structure of Landcare in Claveria

The evolution from simple soil conservation practices to more complex agroforestry systems occurs over time as farmers continually experiment and innovate technologies that are suitable to their conditions. Generally, farmers start with the establishment of natural vegetative filter strips. Next, they establish communal or individual nurseries, and plant perennials on or above the NVS. Farmers may cultivate annual cereal crops up to the fourth year, particularly if the strips are not too close to each other. When tree canopies shade out the crops, and it is no longer profitable to grow annuals, farmers graze livestock beneath the tree. The trees (mostly *Gmelina arborea*) can be harvested 8-12 years after planting, and farmers then resume annual cropping and begin the next cycle. This system earns more than the traditional practice of monocultural cropping (Magcale-Macandong *et al.* 1997).

### ***Impacts and scaling-up***

The greatest success of Landcare is changing the attitudes of farmers, policymakers, local government units, and landowners about how to use the land and protect the environment. It is not simply about the total length of NVS laid out, the number of nurseries established, or the number of Landcare members. The Landcare movement is renovating the attitudes, and practices of the farmers, policymakers, and local government officials on using the land to meet their current needs while conserving resources for future generations. There are now farmers who voluntarily share their time and efforts. There are also policymakers who urge farmers to adopt conservation farming practices, and support these efforts by allocating local government funds and enacting local ordinances. These are the important success indicators of the Landcare approach that enable local people to conceive, initiate and implement plans and programs that will lead to the adoption of profitable and resource-conserving technologies. The Landcare approach provides:

- A vehicle for interested farmer to learn, adopt and share knowledge about new technologies that can earn more money and conserve natural resources;
- A forum for the community to respond to issues that they see as important;
- A mechanism for local government to support; and
- A network for ensuring that ideas and initiatives are shared and disseminated.

Landcare is emerging as a method to empower local government and communities to effectively and inexpensively disseminate conservation farming and agroforestry practices. The experiences and lessons learned in Claveria provide a strong basis to scale-up to the regional and national levels, and to scale-out to other municipalities (see the vision for the national Landcare movements in Figure 4).

The adjacent Municipality of Malitbog, Bukidnon Province has approached the Claveria team to assist them in developing Landcare activities. Farmer cross-site visits and trainings were arranged. ICRAF field extension staff has recently been posted to Malitbog, and local government has formed a conservation team to help start-up Landcare activities in 4 pilot Barangays (Saguinhon, 1998), and provided municipal funds to assist Landcare chapters establish their nurseries, fund training and cross-site visits, and transport and allowance to the participants who are participating in monthly meetings. Based on specific request, various study tours and trainings have been organized for farmers, NGOs and LGUs interested in the Landcare approach. The ICRAF-Lantapan team has also started applying the Landcare principles and approach to its work on decentralized NRM planning and implementation, as well as with the farmer agroforestry tree seed association in Lantapan.

The new *Philippines Strategy for Improved Watershed Resources Management* has incorporated the Claveria Landcare and the Lantapan NRM planning approaches into its key institutional elements and operational framework. As the strategy moves into the implementation phase, this provides a good opportunity to scale-up useful Landcare principles and experiences in other parts of the Philippines. However, this scaling up process must respect and adhere to the critical, underlying elements—such as farmer voluntary action and local government partnership—that made Landcare successful in Claveria. The experiences and lessons learned in Claveria provided us a basis to scale-out to other municipalities and scale-up to the regional and national levels (Figure 4).

We are only beginning to exploit the opportunities that Landcare provides for enabling major innovations in the way on-farm participatory research development are done. We see the prospect for research and development to be carried out through, and managed by, Landcare groups. This would multiply the amount of work, and the diversity of trials, that can be accomplished, ensuring more a robust understanding of the performance and recommendation domain of technical innovations. Currently, we are conducting surveys through the Landcare groups to get a grassroots feedback on the priorities for research, from the farmers' perspective. In Australia, public sector research institutions such as CSIRO are adjusting to the new reality that through Landcare, farmers sit on, and may even dominate, the boards that decide on research project funding. This is having a galvanizing effect on focusing researchers on problems that farmers are concerned about.

We may summarize by listing four hypothesized functions of farmer-led knowledge-sharing landcare organizations:

- Enhanced efficiency of extension or diffusion of improved practices (more cost-effective than “conventional” extension functions)
- Community-scale searching process for new solutions or adaptations, suited to the diverse and complex environments of smallholder farming (a unique aspect of landcare)
- Enhanced research through engagement by large numbers of smallholders in formal and informal tests of new practices
- Mobilization process at the community level to understand and address landscape-level environmental problems related to water quality, forest and biodiversity protection, soil conservation, and others

There are three significant concerns about the sustainability of the Landcare movement. One is that the Landcare concept is sufficiently popular that there is a definite risk of 'projectizing' the movement, i.e. attracting support projects that do not understand the concept, and provide funds in a top-down, target-driven mode that defeats the whole basis of a farmer-led movement. The second is the issue of how do such movements sustain themselves in the long run. Networking, and the stimulation from outside contacts, is widely considered to be crucial in the long-term success of such institutions. This can be provided through Landcare Federations, as has evolved locally in Claveria, and through provincial and national federations, which are currently being explored in the Philippines. Third, group leadership is a time-consuming and exhausting task, particularly when it is done on a voluntary basis. Landcare is still very young in both the Philippines and Australia, but increasingly leadership 'burn-out' is discussed as a concern.

Our analysis indicates that the following needs to be done to further release the power of the Landcare concept. The public sector and non-government sector can assist in facilitating group formation and networking among groups, enabling them to grow, developing their managerial capabilities, and enhancing their ability to capture new information from the outside world. They

can also provide leadership training to farmer leaders, helping ensure the sustainability of the organizations. Cost-sharing external assistance can also be provided. For this, the use of trust funds should be emphasized, where farmer groups can compete for small grants to implement their own local landcare projects. This has been remarkably successful in the Australian Landcare movement. We envision that the Landcare approach may be suited to other locations in the Philippines and elsewhere, providing a national focus for the sustained management of resources by farmers with (minimal) local government support.

# A Vision for a National Natural Resources Conservation System

based on public – private partnerships

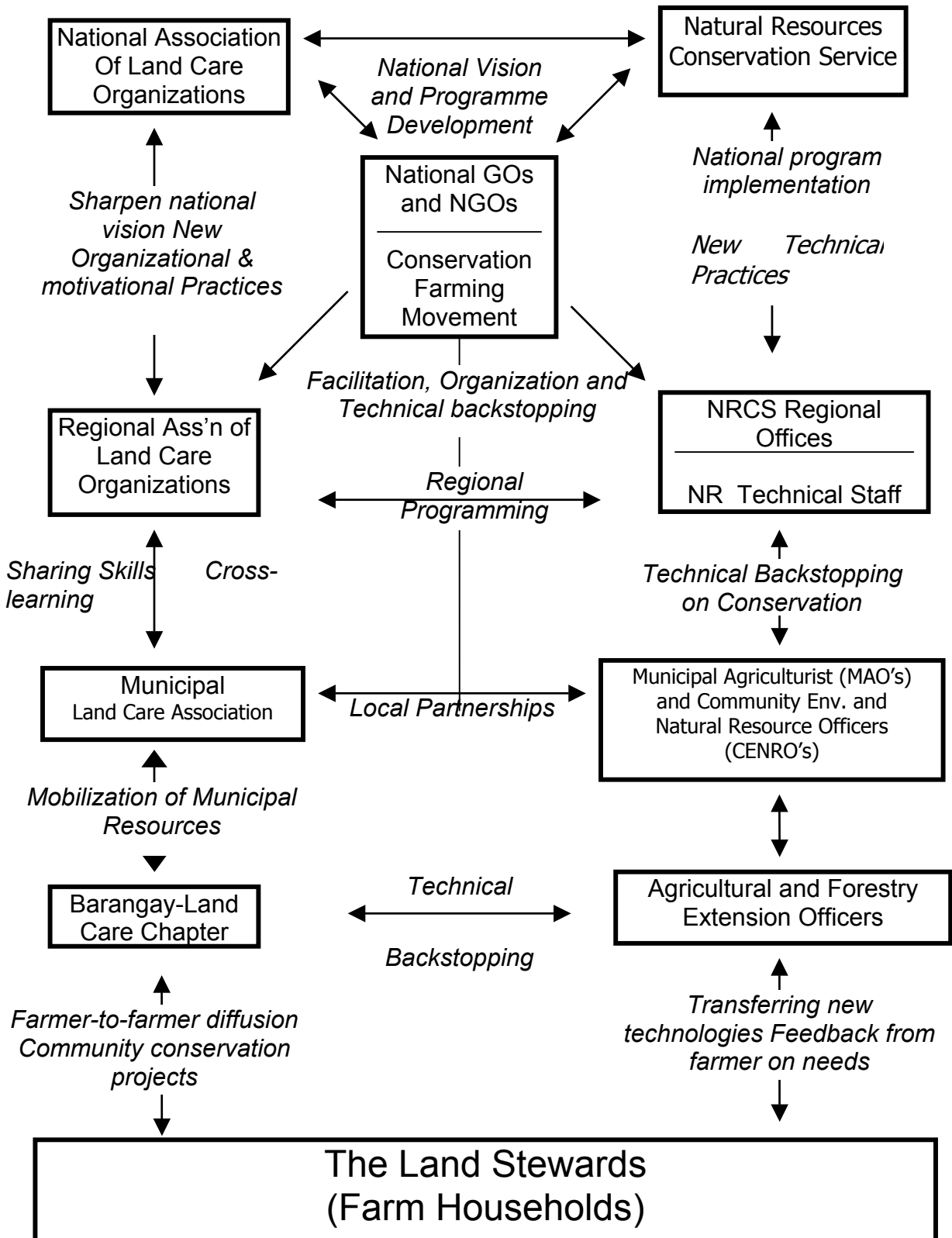


Figure 4. Conceptual framework of vertical scaling up of Landcare approach.

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