

LANDCARE APPROACH: ENHANCING PARTNERSHIP FOR SUSTAINABLE UPLAND DEVELOPMENT¹

Agustin R. Mercado, Jr.², Ma. Aurora C. Laotoco³, Manuel Bertomeu⁴,
Georg Cadisch⁵, Rodel D. Lasco⁶, and Ma. Regina N. Banaticla⁷

Abstract

Sustainable upland development is one of the focal issues in the Philippines, where more than 18 million people live. This paper relates our experiences in participatory approach to develop technology and institutions for conservation farming and agroforestry practices conducted by the International Centre for Research in Agroforestry (ICRAF), in collaboration with the Australian Centre for International Agricultural Research (ACIAR), and Agencia Espanola Cooperacion Internacional (AECI) in Claveria, northern Mindanao, Philippines.

Contour hedgerow farming with leguminous trees had been viewed as an important agroforestry technology to insure food security, alleviate poverty, and protect the environment. For several years we focused our efforts in assessing the management strategies to address key technical constraints of this system. We observed that adoption by farmers was low. We therefore refocused our efforts towards finding alternative systems that would address the technical and institutional issues of conservation farming.

Landcare is a movement of farmer-led organisations supported by local government. Landcare believes that the key to effective natural resources management is partnership where local people, local government, and concerned agencies work together to address common issues and concerns. The organisations share knowledge about sustainable and profitable agriculture on sloping lands while conserving natural resources.

Today, the Landcare movement has grown to over 600 groups in Mindanao and in the Visayan islands. There are now over 8000 farmers involved in this movement. Our studies indicate that Landcare is an affordable undertaking at the local level. Local government units could begin with meager investment for training and facilitating group activities.

¹Paper presented at the Philippine Extension Network (PEN) Congress, Los Banos, Laguna. 2 December 2004. This paper was adapted from the poster presented during the First National Agroforestry Congress held at Leyte State University (LSU) on 19-20 November 2003 at VISCA, Baybay, Leyte.

² Research Fellow (Imperial College at Wye), ICRAF Claveria Research Site, MOSCAT Campus, Claveria, Misamis Oriental. Email: junm@cdo.webling.com.

³ Acting site coordinator, ICRAF Claveria Research Site, MOSCAT Campus, Claveria, Misamis Oriental, Philippines.

⁴ Project Leader, Support for Decentralized Tree Seed Systems and Improved Community-based Forest Management in Central Visayas and Mindanao. World Agroforestry Centre (ICRAF)- Philippines.

⁵ Senior Lecturer, Agricultural Sciences Department, Imperial College-London, Wye Campus, Wye, Ashford, Kent, UK.

⁶ Philippine Programme Coordinator. World Agroforestry Centre (ICRAF)-Philippines. (rlasco@cgiar.org)

⁷ Research Associate. World Agroforestry Centre (ICRAF)-Philippines

1. INTRODUCTION

Upland environments are the most complex, diverse, and risk-prone agricultural ecosystems. Soil erosion is a major environmental hazard associated with agricultural production in these ecosystems. Rapid population growth and economic needs push farmers to cultivate steeper and more fragile lands contributing to erosion of 50 - 200 tons of topsoil annually (Garrity, 1995). The loss of soil fertility consequently reduces productivity to 200 - 500 kilograms per hectare per year (Fujisaka et al, 1995), and income levels of farm households to less than 50% of the poverty threshold level. As a result, more than 60% of the children in rural areas are malnourished (Mercado et al, 2000). Offsite, Asian river systems carry 10 times more sediments than any other river systems throughout the world, reducing the service life of infrastructures, destroying marine resources, and reducing the quality of water supplies for domestic use as well as for agriculture (Milliman and Meade, 1988). These sediments undergo anaerobic decomposition, increasing emissions of methane (CH₄), which is 23 times more potent as a greenhouse gas compared with carbon dioxide over a 100- year time horizon (IPCC WG1, 2001).

These dark pictures of upland environments require a holistic approach to address complexities, diversities and risks. This holistic approach has to address technical, social and political elements of upland development and natural resources management. This requires appropriate upland technologies, strong community institutions, and proactive government support.

We test Landcare as an approach encompassing these important pillars for sustainable agriculture and natural resources management in the context of resource-poor upland farmers of northern and central Mindanao and central Visayas. Bringing these pillars together needs a strong unifying base- education. Education, through training and workshops, allowed us to develop farmers' capacity to share knowledge and skills with other farmers, hone their leadership potentials and organizational development skills.

This paper describes our experiences in enhancing adoption of conservation farming and agroforestry in the uplands of northern Mindanao through the Landcare approach, and in developing technical and institutional innovations to reverse land degradation problems and its potential spread in other upland areas in the Philippines.

2. WHAT IS LANDCARE APPROACH

Landcare is a set of appropriate land management practices. It is also an ethic and a principle used to describe the judicious utilization of natural resources. It can also be viewed in two ways: as a development approach and as community-led movement.

Operationally, we look at Landcare as an extension approach for rapid and inexpensive diffusion of conservation farming, agroforestry practices and other natural resource management systems among upland farmers, based on their innate interest in learning and sharing knowledge about new technologies that give them more income and provide more environmental services (Garrity and Mercado, 1998, Mercado et al, 2000). It also refers to a group of people who are concerned about land degradation problems and interested in working together to do something positive for the long-term health of the land. It evolved as a community-based approach designed to effect

change in complex and diverse situations (Swete-Kelly, 1998, Mercado et al, 2000). According to Campbell (1994), effective local community groups and partnership with local government units is the core of the Landcare model.

The grassroots approach is now recognized as a key to success in all community development endeavors. Groups respond to issues that affect them and are more likely committed to find and implement solutions on their own ways, than those imposed by external agencies. It is about people and the key to success is based on a mature social capital and a close bond between- and among farmers, communities, and governments.

The Landcare as a partnership in triad consists of: grassroots Landcare groups, local government units (LGU) and technical service providers and facilitators (ICRAF, NGO's Government line agencies/NGA's). The success of Landcare as an approach is dependent on how these 3 key actors interact and work together (**Figure 1**).

There are 5 types of Landcare groups that ICRAF has been facilitating such as:

- Landcare in farms – deals with farmers and landowners
- Landcare in schools – deals with elementary pupils and high school students. Landcare concept is now integrated into the school curriculum, specifically in *Edukasyong Pangtahanan at Pangkabuhayan* (EPP) and in Technology on Home Economics (THE)
- Landcare in forest margins – deals with indigenous people and migrants
- Landcare in church – integrates Landcare concept into church activities enabling church members to tackle both their spiritual and physical needs
- Landcare for out-of-school youth – deals with young people who are out of school due to various reasons.

3. THE INTERWOVEN ELEMENTS OF LANDCARE

Landcare is an extension approach for rapid and inexpensive transfer of conservation farming and agroforestry practices. In this approach, there are three interrelated elements or facets that are interdependent to each other. These are *appropriate technologies*, *community institution development*, and *partnership building*. In each element or facet there are tools or techniques that are used to enhance the impacts of that particular element.

Element 1: Appropriate technology dissemination, adoption and adaptation- Enhancing productive and protective functions of upland farming systems.

In the complex, diverse and risk-prone upland environments, appropriate farming technologies are those that can be easily *adapted* by resource-poor farmers to specific bio-physical and socio-economic contexts, and are also easily *adopted*, i.e., profitable, feasible (established and maintained with farmers' available resources and skills), and acceptable (compatible with farmers' values and farmers' valuation of benefits) (Franzel et al., 2002). These technologies provide short- and long term benefits and are superior to the ones they superseded. Since sloping uplands are complex, diverse, and risk-prone, technology basket is more appropriate than technology packages.

The triadic approach in Landcare enhances participation

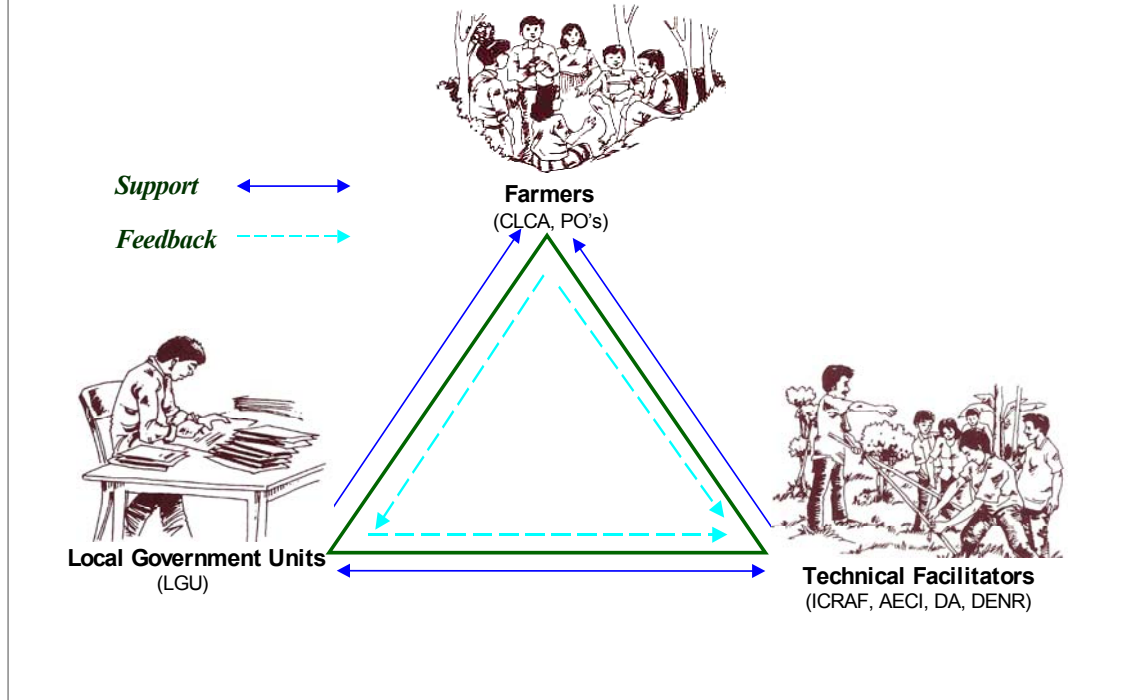


Figure 1. The interdependent of the different stakeholders in a triad doing respective complementing roles in the Landcare approach

Continuous crop production on steep slopes in Mindanao induces annual rates of soil loss often exceeding 100-300 t/ha (Garrity et al, 1993, Mercado, 2000). The installation of contour buffer strips reduces these losses by 50-99% and creates natural terraces that stabilize the landscape and facilitate further management intensification. These advantages have led to the wide promotion of contour hedgerow systems by the government line agencies such as DENR, DAR, DA and other non-government organizations operating in the villages. But adoption has been poor, and installed hedgerows were usually abandoned because it took too much labor to manage the tree hedgerows (ICRAF, 1997).

In the early 1990s, we observed that some farmers in Claveria began to experiment with contour grass strips of natural vegetation or *natural vegetative filter strips (NVS)*. These are made by laying out the contour lines on sloping fields, and then allowing natural vegetation to re-vegetate naturally on the laid out contour strips (Garrity, 1996). We studied the system and found that NVS are exceptionally effective in soil conservation with minimal maintenance, and require no outside source of planting materials. Nelson et al (1998) modeled the long-term trends in maize yields, and found that the yield advantage of NVS increased annually to about 0.5 t ha⁻¹. The NVS system

did not originate just in Claveria. We learned that in Matalom, Leyte and other areas of Bohol, the NVS system is an indigenous technology that has been independently practiced by farmers without any outside support. Since 1996, more than 6000 farmers have now adopted the NVS practice on their farms in the upper watershed areas in many parts of Mindanao and Visayas.

Farmers who adopted NVS would like to maximize the benefits from their contour grass strips by planting fruit and timber trees, fodder grasses and other cash perennials on or just above the grass strips. This practice enhances the productive, protective and aesthetic functions of their farming systems. The interests in planting trees have become widespread. We facilitated technical backstopping to Landcare groups who would like to establish nurseries for fruits and timber trees. Later on, Landcare groups evolved to other technical issues outside conservation farming and agroforestry technologies, such as backyard gardening on vegetables, flowers and herbals, solid waste management and composting, and other livelihood activities, such as back yard animal raising, apiculture, sericulture, animal dispersal program, water watch, fund raising, micro-savings mobilization, local competition, and participatory monitoring and evaluation (PME).

To enhance these adoption and adaptation of the different conservation farming and agroforestry practices and community and domestic activities, a number of tools or techniques were employed. These techniques were the following:

- Information, education and communication (IEC) through slide shows, using clear book presentation, and discussion during farmer meetings, barangay assemblies, and individual farmer visits;
- Cross- farm visits
- Farmer- to -farmer knowledge sharing is strongly practiced among Landcare groups; and
- Conservation team approach was implemented in new areas.

Some lessons learned in promoting conservation farming and agroforestry practices in the uplands of northern Mindanao:

- Stepwise technology dissemination was more effective than introducing complex technology packages (e.g., promotion of soil conservation and then, staggering planting of trees instead of just promoting tree planting). Technologies must be simple and testable, based on key principles (e.g., contour farming). They should provide opportunities for innovation or adaptation based on farmers' biophysical and socio-economic resources
- A flexible set of practices from which the farmer can choose and adapt must be promoted.
- Technologies must fit to the bio-physical and socio-economic environments. Blanket technology recommendation was not appropriate as appropriate technologies are generally site-specific;
- Technologies must be profitable and low-risk;
- Technologies must have short- and long-term impacts. Farmers would like to see immediate results, but also look at long term impacts;
- Technologies must be low-cost and culturally acceptable;

- Farmers should be involved in technology generation, verification or adaptation trials;
- Farmers should be involved in technology dissemination and role-modeling. This creates a mechanism for changing local agricultural norms towards appropriate ones; and
- The formation of more technological learning sites and knowledge-sharing venues and opportunities should be encouraged. However, project-funded or supported model farms should be avoided. These model farms will create an impression among would-be adopters that the technologies promoted cannot be adopted or extended without external subsidies or support. Appropriate model farms are those that evolve from farmers' adoption and adaptation of technologies based on their own land and household resources. External facilitators should provide technical backstopping and link farmers to information and other resources and networks.

Element 2: Community institution building – enhancing leadership and participation in conservation farming and agroforestry dissemination and adoption.

In 1996, we started our technology dissemination program in response to farmers' request for technical assistance in conservation farming. Twenty five (25) farmers requested for training on the establishment of NVS. After the training, they decided to organize themselves into a group, the Claveria Landcare Association (CLCA). The group's name captures the concept of "care for the land". The members use the organization as a mechanism for learning, information dissemination and scaling-up conservation practices. CLCA has also become a venue for addressing issues and solving problems that farmers encounter. It became the arena for articulating needs and mobilizing resources from the local government and other support agencies. The farmers now occupy a "driver's seat", steering the wheel of extension and learning according to their desired direction.

Today, there are more than 600 Landcare groups in northern Mindanao and Visayas, Philippines. Most of these Landcare groups are organized as sub-chapters at the *sitio* or *purok* level (a community of 20 - 30 households). This encourages more participation as the organization is decentralized down to the level where farmers can frequently meet and discuss farming issues and ideas that promote camaraderie and knowledge-sharing, enhancing knowledge, awareness, skills and appreciation (KASA), thus building human capital as well as synergy (social capital) in the process. Decentralization is a key to participation in natural resource management particularly when it involves resource-poor farmers.

Each Landcare group is self-governing, with its own set of officers. These officers initiate and provide leadership in the different Landcare activities. The groups plan and implement their activities, enabling leadership development and participation in the efforts towards sustainable agriculture and natural resource management

Subchapters are federated into chapters at the village (*barangay*) level, each chapter consisting of 8-12 *sitio*-level Landcare groups. Similarly, the chapters are federated at the municipal level (**Figure 2**). This creates the information machinery to bring up issues from the household to the municipal level and vice versa. This innovative organizational set-up provides vertical and horizontal information mechanisms for dissemination,

sharing and learning. In Claveria, more than 5,000 farming families are involved and have successfully extended conservation farming technologies to more than 2,000 farmers. They have also established more than 300 communal and individual tree nurseries (Mercado et.al., 2000). Hundreds of thousands of fruit and timber tree seedlings were planted on NVS, on farm boundaries, on the buffer zone of protected areas, and on riparian areas.

The following were the approaches and activities implemented with the objective of building an active and coherent organization for technology dissemination and adoption:

- Small-group formation (*sitio*-based groups)
- Promotion and support of networks for broader knowledge-sharing (federation at the *barangay* and municipal level)
- Facilitation of Landcare groups in order to have a clear objective, direction and understanding of their problems
- Promotion of collective planning and action in activities such as communal nursery, exchange labor, fund raising, savings mobilization, emergency funds, etc in order to build human and social capital along the process.
- Training on organizational development and strengthening, e.g. leadership skills, and team building.
- Promoting transparent leadership and fiscal management
- Livelihood projects and roll-over schemes, e.g. animal and seed dispersal, apiculture, and cut flowers
- Participatory monitoring and evaluation (PME) through the use of community designed leader boards placed in Landcare groups' meeting houses and other methods agreed upon by the groups to monitor progress and assess issues and concerns.

Element 3: Partnership building - the triadic approach

The collaboration among actors of the Landcare triad emanated from performing their respective non-duplicating, but complementary roles (**Figure 1**). Such supportive roles were what the other stakeholders need. The Landcare group's role was primarily the adoption or adaptation of technologies being promoted to combat soil depletion and erosion, sustainable agriculture and natural resource management. LGUs extended financial, policy, and moral support to Landcare groups generating internal responsibility and accountability to monitor and supervise the projects and activities of the latter. On the other hand, the latter had to report and justify utilization of the LGU inputs by doing what was necessary to make the soil and water conservation work successfully. Thus, mutual expectations and obligations emerged from the interaction. The gains and shortcomings of one stakeholder became a shared indicator of performance by the other party. Furthermore, the extension and technical assistance by ICRAF and other service providers, as technologists, were also reflected in the success or failure of the Landcare groups. The relationship turns out to be a 'triangle in a balance' such that when one party does not perform its role, the triangle will tilt to one side. Therefore, the efforts of the three stakeholders were geared toward attaining a certain degree of balance. A balanced triangle depicted a partnership that was working harmoniously with reciprocity in actions and outcomes.

There is significant evidence that the integrated approach we implemented has created an effective linkage between development and conservation. Through the efforts

of the grassroots Landcare farmer groups, local government entities, and technologists, a conservation ethic has evolved and natural resource management is now viewed as a local responsibility. The partnership provided a mechanism for convergence of ideas, shared decision-making perception of risks, and pooling of common and private resources to achieve greater impacts and more benefits to the community.

Some approaches involved in partnership building included:

- Landcare groups lobbied for support from service providers such as line agencies (DAR, DENR, etc), local government units (LGU's), academe and research institutions (ICRAF, MOSCAT), etc.
- The Landcare approach was integrated in the development plans of *barangays* and municipal governments, because Landcare members became a sectoral member of the municipal development council.
- Clarification of roles and responsibilities of farmers, LGUs and other organizations with regards to natural resources management and development.
- Involvement of service providers and policy makers in Landcare groups' meetings and planning sessions
- Promotion of local achievement competition (*paligsahan sa barangay*) at the village level

4. STEPS INVOLVED IN THE LANDCARE APPROACH

Based on the evolution of Landcare during the past several years in Claveria, we have identified the major principles and steps in developing this approach at the local level (Garrity and Mercado 1998) and they are summarised as follows:

a) Selecting appropriate sites. This is to bring conservation farming technologies to where they are needed most—on sloping lands where soils are subject 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 needs to be addressed, as well as their willingness to support and complement the program, are crucial to the success or failure of Landcare. Site selection should be demand-driven that stakeholders are willing to do their respective complementing roles in the Landcare process.

b) Exposing key farmers to successful technologies and organizational methods. This 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 new technologies. The success of the activities can be measured by how much enthusiasm is being developed among farmers and the community to adopt the technologies. Exposure activities include:

- organising cross visits to the fields of farmers who have already adopted and adapted the technologies successfully into their farming systems;
- providing training for farmers in the target communities to learn about the practices through hands-on training and seminars in their own barangays;
- providing opportunities for farmers to try out technologies on their land through unsubsidised trials, and to convince themselves that these technologies work for

them as expected. If so, these farmers become the core of the 'conservation team' diffusing upland technologies in the community or the whole municipality.

c) Organising a local conservation team. 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 barangays (villages) of a municipality, these conditions are in place to implement a municipal conservation team. The team is composed of an extension technician from the Department of Agriculture or from the Department of Environment and Natural Resources, an articulate experienced farmer experienced in the application of the technology, and an outside technical facilitator. The team initially helps individual farmers implement their desired conservation farming practices. Later, they can give seminars and training sessions in the barangay if sufficient interest arises. During these events they respond if there is interest in organising more formally Landcare groups to accelerate the spread of agroforestry and conservation practices.

d) Facilitating Landcare farmers' organisation. When the preconditions are in place to form a Landcare farmers' organisation, the facilitator may help the community develop a more formal organisation. A key ingredient of success is identifying and nurturing leadership skills among prospective farmers leaders. This may involve arranging for special training in leadership and management for the farmer leaders, and exposing them to other successful Landcare organisations. Each barangay may decide to set up its own Landcare Association chapter and barangay conservation team. A barangay may organise Landcare Association subchapters on their *sitios* (sub-barangays). A *sitio* conservation team usually includes a local farmer-technologist, the *sitio* leaders, and the district *kagawads* (councilors). The *sitio* teams are the frontliners in conservation efforts, providing direct technical assistance, training and field demonstration to farmer households. Then they will be backed up by the barangay and municipal conservation teams.

In the municipality, 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 organisations that can assist the chapters (for example, the Department of Agriculture, the Department of the Environment and Natural Resources, and NGOs). **Figure 2** presents the organizational set-up of the Claveria Landcare Association (CLCA). It is a people's organisation, registered as an association with the Philippine Securities and Exchange Commission (SEC) in 1996.

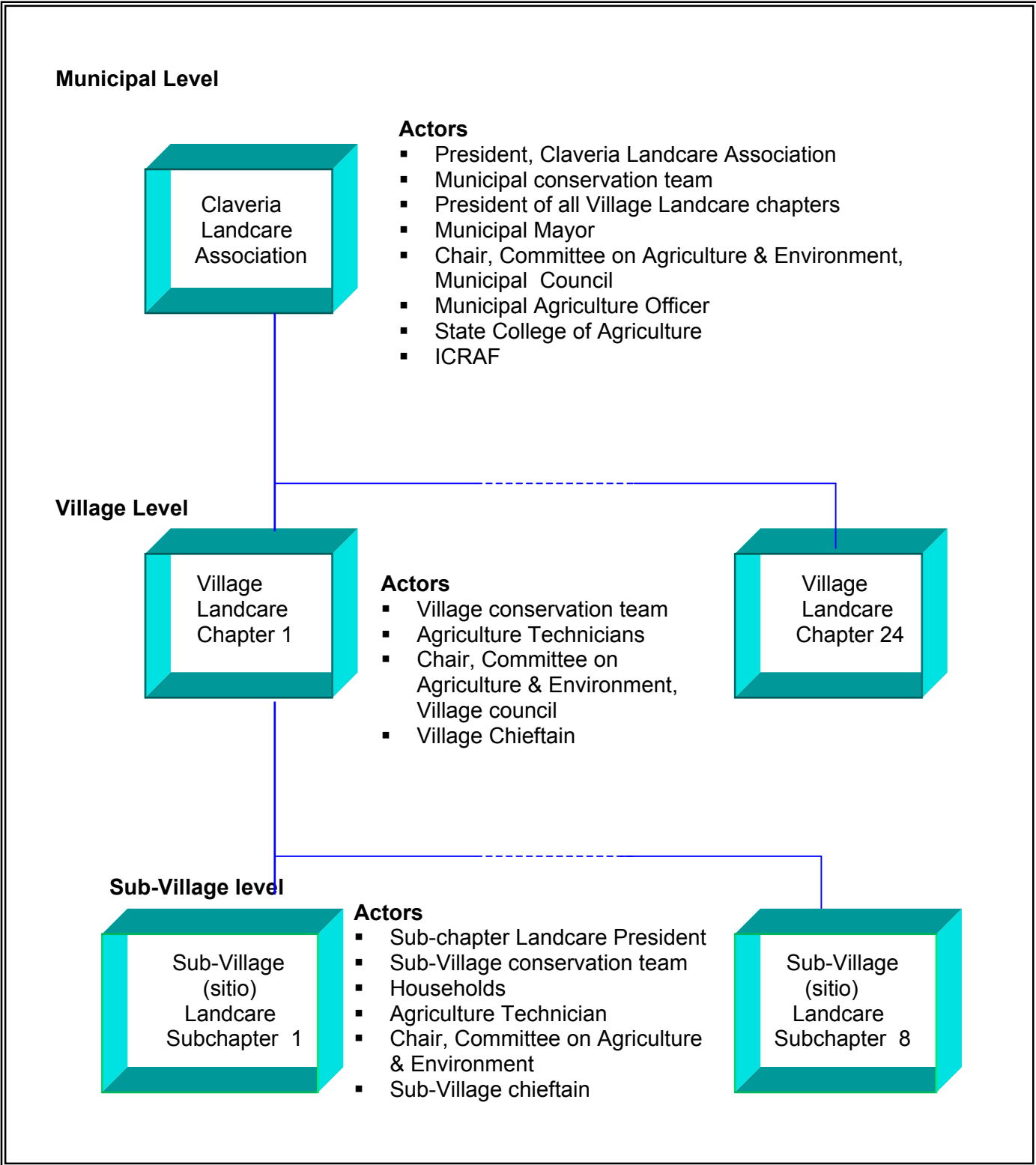


Figure 2. Innovative organizational structure of Landcare association in Claveria which encourages participation at all levels

e) Attracting local government support. Local government can provide crucial political and sustained financial support to the Landcare Associations to help these groups meet their objectives. The municipality has its own funds earmarked for environmental programs and can be targeted to Landcare activities. The municipality can be encouraged to develop a formal natural resource management plan which can help guide the allocation of environmental funds.

The barangays can allocate financial resources from their regular internal revenue allotment (IRA) through the Human Ecological Security (HES) program, which represents one-fifth or 20% of the total development funds for the barangay. These funds can be used to organise the conservation teams and assist Landcare Association activities in the barangays and support training activities and honoraria for resource persons if the time required for these activities is more than what volunteer time can cover. The municipality can also allocate HES funds to complement the barangay budget. For example in 1998, the Claveria municipal government committed 50,000 pesos (about US\$ 1000) to each barangay to support Landcare activities (see **Box 1**).

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

f) Monitoring and evaluation. Monitoring is needed to assess progress and make the program more dynamic and relevant to the needs of the target community. For monitoring purposes, ICRAF has been keeping records of all financial resources spent in the project, and the different activities, impacts and outcomes of the Landcare approach, which include human and social capital formation. We also conducted regular action-learning processes to make the approach more dynamic to the evolving needs of the community. We also monitored adoption rates of conservation farming and agroforestry practices, and farmers' adaptation of technologies. Details on farming and conservation practices, training activities and follow-up needs are recorded on a *diagnostic card*, which is updated on regular follow-up visits by technical facilitators. The leaders of the CLCA chapters or subchapters have been supporting this activity by facilitating the distribution and collection of the diagnostic cards to and from the villages and new CLCA members.

A participatory monitoring and evaluation (PME) system is being developed that enables Landcare groups to self-evaluate their performances against their objectives. The Landcare facilitators will assist the groups to conduct these exercises, to reflect on group accomplishments and help groups achieve future goals. Landcare groups have also established leader boards on their respective meetings houses to reflect accomplishments and participation of the different Landcare activities among members.

Box 1**AN ORDINANCE SUPPORTING LANDCARE RELATED ACTIVITIES AND ESTABLISHING BOTANICAL NURSERY WITHIN THE TWENTY-FOUR (24) BARANGAYS OF THE MUNICIPALITY OF CLAVERIA, MISAMIS ORIENTAL.**

Section I. All Barangay Officials within the Municipality of Claveria, Misamis Oriental are hereby ordered to support Landcare related activities and establish their own botanical nursery;

Section II. As an impact to a municipal ordinance ordering all farmer tillers and farm owners to adopt contour farming and or sloping agricultural land technology many farmers have already adopted natural vegetative filter strips (NVS) technology, which engendered demand for fruit and timber tree seedlings to be planted along the NVS.

Section III All species to be grown in the nursery shall be fruit and timber trees both exotic and indigenous species, and ornamental trees;

Section IV. All seedlings shall be given to qualified and interested barangay residents for free;

Section VI. The funding for the establishment of a botanical nursery shall come from the 20% of the 20% Development Fund of the Barangay of the HES Program;

Section VII. The Municipal Government shall allocate an amount of P50,000.00 per barangay and the funding shall be taken from the 20% of the 20% Development Fund of the HES Program which is mandatory appropriation based on the guidelines for the utilization of the 20% Development Fund;

Section VII. Supervision of the Barangay Nursery shall be the responsibility of the respective barangays and the consultation with the office of the Municipal Agricultural Officer (MAO);

Section VIII. This ordinance shall take effect upon its approval.

4. LANDCARE IMPACTS AND MODALITIES OF SCALING UP

The greatest success of Landcare was changing the attitudes of farmers, policymakers, local government units, and landowners about how to use the land to meet their current needs while conserving resources for future generations. There are now farmers who voluntarily share their time and efforts, and policymakers who urge farmers to adopt conservation farming practices, and support these efforts by allocating local government funds and enacting local ordinances to provide incentives. Parents, school teachers, out-of-school youths, church leaders are now preaching the need for conservation farming and natural resources management. 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 such as conservation farming and agroforestry practices. The Landcare approach provides:

- A vehicle for interested farmers 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 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 an approach that empowers local government and communities to effectively and inexpensively disseminate and implement conservation farming and agroforestry practices. In Claveria, Philippines, we experienced an exponential rate of adoption of conservation farming technologies and production of tree seedlings (**Figure 3**). About three-quarters of these adoptions were done by the Landcare member themselves at the different levels of the organization. This approach promoted rapid and inexpensive dissemination and adoption of conservation farming, agroforestry and other resource- conserving practices. The experiences and lessons learned in Claveria provided a strong basis to scale-up to the regional and national levels, and to scale-out to other municipalities.

The new *Philippines Strategy for Improved Watershed Resources Management* of the Department of Environment and Natural Resources (DENR, 1998) had incorporated the Claveria Landcare approach 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.

We are only beginning to exploit the opportunities that Landcare provides for enabling major innovations in the way on-farm participatory research and 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 a more robust understanding of the performance and recommendation domain of technical innovations.

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 carbon sequestration.

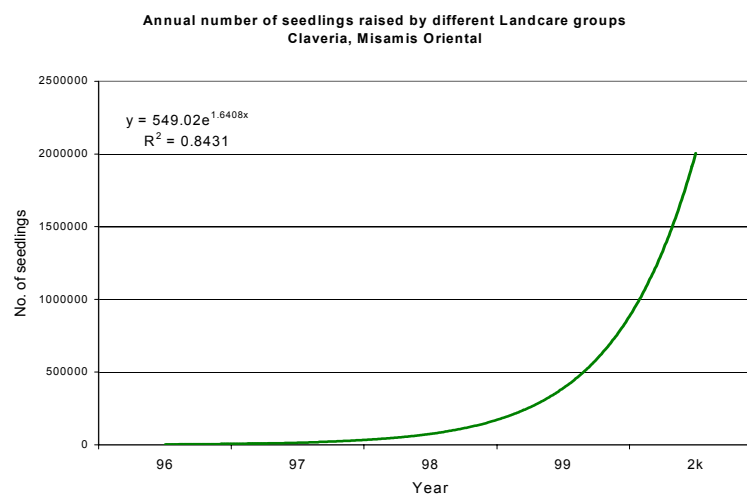
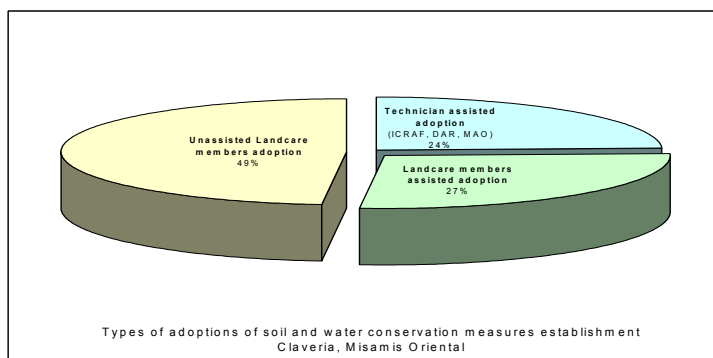
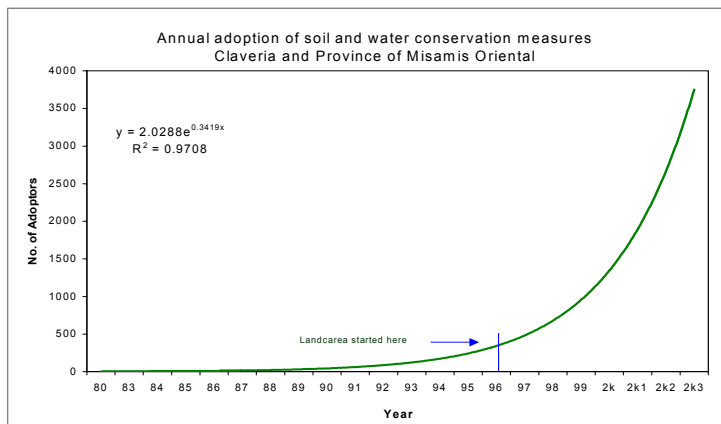


Figure 3. Various impacts of Landcare on adoption of conservation farming and production of fruit and timber tree seedlings, Claveria, Misamis Oriental, Philippines

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 of different activities from external sources 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 local government support.

Being confronted with scaling-up issues in different sites provided us the challenge to test new approaches and modalities for scaling-up Landcare. These include:

- a) **Scaling up through the local development planning process.** This mode requires an engagement with LGUs in their local development planning process, resulting in the institutionalization of Landcare at the planning stage. Eventually, Landcare becomes embedded in the natural resource management and development plan (NRMDP) of the municipality.
- b) **Scaling up through “integration” within the extension program of local government units (MAO) and line agencies (DA, DENR, DAR).** This is to integrate Landcare concepts, contents and processes into the agencies’ extension programs, providing human and financial resources.
- c) **Scaling up through the local development planning process and integration in existing local programs.** This modality also requires consistent interaction with local champions and engagement in the LGUs’ development planning process. Simply put, this modality is a marriage of the first two modes cited above.
- d) **Scaling up through integration of Landcare into the programs implemented by government-line agencies and special local warm bodies at the provincial level.** This mode requires a review of the different line- agencies and special warm bodies operating within a provincial scale and involves an understanding of their mandated programs and identifying committed local champions who can mobilize programs on a provincial scale. We realized that the best we can do is to try to enhance the awareness level of these agencies of the things we are doing.
- e) **Scaling-up through networking, collaboration and integration in existing special projects implemented by both public and private sectors (for provincial, regional to national levels).** This mode requires networking and engagement with provincial, regional or national warm bodies such as the following: Provincial and Regional Development Councils, Watershed Management Councils, Coalitions and Non-government Organizations which are by nature, composed of multi-sectoral groups and non-government organizations.

5. CONCLUSION

Landcare, in a broad context, is a set of practices for appropriate land management systems. It is also an ethic and a principle used to describe the judicious utilization of natural resources. It can be viewed in two ways: as a development approach and as a farmer-led movement. Operationally, Landcare is an approach for rapid and inexpensive diffusion of conservation farming and agroforestry practices, and other natural resource management systems among upland farmers. 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.

Appropriate technologies are needed to enhance the productive function and environmental services in a sustainable manner in the upland areas. These technologies should be simple, affordable and adaptable to the diverse conditions of resource-poor upland farmers and should provide them with short- and long-term benefits. Formation of local institutions, such as Landcare groups, is encouraged. These institutions provide the venues where local people collectively learn and improve their knowledge and skills for sustainable natural resource management. Through these institutions, people think, plan and act together to address community and natural resources management issues and problems. Landcare encourages partnership among different stakeholders in the community. Through this, local Landcare groups are able to establish links and networks to resources and service providers, such as government line agencies, local governments units, policy makers and potential markets who can provide enabling environment, support mechanism, resources and the information that farmers need. Through these elements, Landcare can be a rapid and inexpensive way of extension of conservation farming and agroforestry technologies in the diverse upland environments.

References:

- Campbell, A. 1994. Landcare: Communities Shaping the Land and the Future. Sydney: Allen and Unwin.
- DENR.1998. The Philippines Strategy for Improved Watershed Resources Management. Forest Management Bureau, Dept of Environment and Natural Resources, Quezon City, Philippines. 102 p.
- Franzel, S., Scherr, S. J., Coe, R., Cooper, P. J. M. and Place, F. 2002. Methods for assessing agroforestry adoption potential. In: Franzel, S. and Scherr, S. J. (eds.): Trees on the Farm: Assessing the Adoption Potential of Agroforestry Practices in Africa. Nairobi, Kenya: CAB International. pp. 11-35.
- Fujisaka, S., Mercado, A. and Garrity, D. 1995. Farmer adaptation and adoption of contour hedgerows for soil conservation. Social Science Department, International Rice Research Institute, PO Box 33, Manila, Philippines.
- Garrity, D.P. 1995. Improved agroforestry technologies for conservation farming: Pathways toward sustainability. In: Proc International Workshop on Conservation

Farming for Sloping Uplands in Southeast Asia: Challenges, Opportunities and Prospects. IBSRAM, Bangkok, Thailand. Proceedings No 14, pp 145-168.

Garrity, D.P. 1996. Conservation tillage: Southeast Asian perspective. Paper presented at the Conservation Tillage Workshop, Los Banos, Philippines, November 11-12, 1996.

Garrity, D.P. and Mercado, A. Jr. 1998. The Landcare approach: A two-pronged method to rapidly disseminate agroforestry practices in the upland watersheds, International Center for Research in Agroforestry Southeast Asian Regional Research Programme, Bogor, Indonesia.

ICRAF. 1997. Annual Report for 1996. International Centre for Research in Agroforestry, Nairobi, Kenya.

IPCC Working Group I (IPCC WG1). 2001. Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change. [J.T. Houghton, Y. Ding, D.J. Griggs, M. Noguer, P.J. van der Linden, X. Dai, K. Maskell and C.A. Johnson (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 881pp.

Mercado, A. Jr. Garrity, D.P. and Patindol, M. 2000. The Landcare experience in the Philippines: Technical and institutional innovations for conservation farming. Paper presented at the Landcare International Conference, Melbourne Convention Centre, Melbourne, Australia, March 2-4, 2000.

Milliman, J. D., and Meade. 1983. World-wide delivery of river sediment to the oceans. *Journal of Geology* 91:1-21.

Nelson, R. A., Cramb, R. A., and Mamicpic, M. A. 1998. Erosion/productivity modelling of maize farming in the Philippine uplands. Part III: Economic analysis of alternative farming methods. *Agricultural Systems* 58(2):165-183.

Swete Kelly, D.E. 1997. Systems for steep lands bean production. In: Hanna J. (ed) *Landcare: Best practice*. Natural Heritage Trust, Australia.