Agroforestry Dissemination Pathways: Claveria Landcare Experiences and Some Lessons Learned[1]

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Abstract

There are two broad components of sustainable watershed management: appropriate land management technology, and active people's participation. Appropriate technology calls for a balance between production goals and conservation goals. Farmers are biased toward production goals while most development projects and government agencies promoting watershed management are biased toward conservation goals to benefit people living outside the watershed. Appropriate land management technology centers on this balance between production goals and conservation goals that should be within the socio-economic and bio-physical environments of the resource poor farmers living most in the upland areas in the Philippines.

ICRAF for years has developed various conservation farming and agroforestry technologies that dwell within the balance between farmers' production and conservation goals. Technologies that are simple to establish, easy to maintain and provide a mechanism for farmers to innovate or evolve to depending on their socio-economic and bio-physical environments while enhancing farmers productivity and profitability.

Appropriate land management technology is not enough, but people's active participation to effectively adopt and disseminate the technology is equally essential. Landcare model is an approach to effectively and inexpensively diffuse conservation farming and agroforestry technologies. This is based on farmer's innate interest in adopting and sharing new technologies that enhance farm income and profitability while protecting the environment. Landcare is a consciousness and act of protecting the lands against depletion to attain production sustainability and rural development. The Landcare approach spouses on collaboration, partnership and convergence between stakeholders.

This partnership is expressed in the triangulation between: farmers grassroot organization, government and technologist. The center of which are resource poor farmers who formed themselves into self-help organization – Claveria Landcare Association. The approach has developed into a dynamic voluntary movement called the Landcare 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.

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Introduction

The setting

Claveria is an agricultural town located 42 kilometers northeast of Cagayan de Oro City. It occupies more than 85, 200 hectares of the upland areas of the province of Misamis Oriental, and the only land locked among the 24 towns. Elevation ranges from 450 to 1200 meters above sea level with undulating to steeply slopes predominate the terrain (92%). Maize, cassava and upland rice cropping dominate the lower elevation (<600masl), while vegetable and maize in rotation dominate the upper elevation. It is the vegetable bowl of Misamis Oriental exporting different varieties of vegetable to Cebu and Manila markets.

Claveria landscape is derived from pyroclastic parent materials deposited by two volcanoes, Mts. Balatucan and Mogabon, which are positioned 15-20 km. north and southeast of the town center, respectively. This town is a volcanic plateau ascending abruptly from sea level on the west to about 450 to 1200 meters elevation in the east. Local topography is complex, ranging from flat to steeply hilly and from broad smooth terrain to extremely dissected landscape. The soils are deep, fine mixed isohyperthermic Ultic Haplorthox. Soils are acidic with pH ranges from 4.2 to 5.2. Rainfall is approximately 2500 mm per year well distributed during the 9-month period from May to January.

Farm sizes presently ranges from 0.25 to 5.0 ha, averaging 3.0. Ownership is common among large farmers (more than 3.2 ha.). Tenancy or leasehold is common among small farmers. There is intense pressure on flat lands. Clean cultivated fields tilled with animal power extend to the steepest slopes thus causing severe farm level soil erosion

Why Landcare in Claveria: The problems

Environmental degradation in Claveria is so immense. This is due to rapid growth of population (4.36%) which create pressure on the land, and forced farm families to cultivate in unfavorable and fragile sloping lands. Most farmers grow annual crops for subsistence and to meet other family basic needs. Without soil conservation, soil erosion is exacerbated and estimated to reach 50-300 tons per hectare per year, which attributed to farm production decline to 200-500 kgs per hectare per year. Nutrient loss is estimated to cost P2,500.00 to P12,500.00. Rivers and creeks are severely silted and are severely damaged. In these upland areas, farm households income is at P3,000.00 which is only half of the pegged regional poverty threshold level of P6,000.00 for a household of 5-6. Malnutrition is so rampant that more than 60% among children are moderately or severely malnourished. These problems contributed to the destruction of the upper watershed thus resulting to rapid deforestation and inadequate water supply during dry season due to drying stream flow.

Claveria is a very important upper watershed of 9 eastern municipalities of Misamis Oriental. This is alsl considered key production area for vegetables, cereals, high valued cash crops, and as source of raw materials for nearby cities and municipalities under the Cagayan-Iligan Corridor.

Technical Innovation To Sustainable Conservation Farming

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.

The SALT (Sloping Agricultural Land Technology) technology is based on the conventional contour hedgerow or alleycropping concept. It has been husbanded for the last 2 decades to sustain crop production while maintaining the ecological integrity of the uplands. The SALT technology has created the impression among upland farmers that soil and water conservation are labor-intensive management system only intended for small-sized farms (<1.0 ha), absorbing family labor when off-farm employment is not feasible in densely populated rural areas. However, in the frontier areas, like most areas in the tropics as well as in Claveria, farmers do not face severe land scarcity. Soil and water conservation technology that requires intensive labor and capital (planting materials) are often ignored by the farmers because it is unsuitable to their land-labor circumstances.

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 in Claveria 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.

Traditionally, these farmers have been the escape goat of non-adoption for being inept about the soil degradation that is happening right in their places. However, most of these soil conservation technologies in the past do not consider the production objective of the farmers - that every effort of theirs should relate to a bowl of food or cash to be able to meet their welfare needs. Scientists must consider that most of these farmers are marginal and resource poor that they do not have enough resource to be able to plan or implement labor and capital intensive conservation programs particularly those technologies that do not provide immediate benefits.

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 adapt to the soil physical and chemical environments. Therefore there is a strong need to develop options of upland conservation technologies to address such complexities.

Natural Vegetative Strips as the Foundation for Sustainable Conservation Farming

Through our research works on simple, effective conservation farming systems for upland farmers we have observed widespread adoption of a 'no-cost' contour buffer strip method for soil conservation in Mindanao. The practice has been spontaneously adopted by thousands of farm households. The system is called natural vegetative strips or NVS. Contour lines are laid out on sloping fields and, instead of trying to plant an exotic hedgerow species, the natural vegetation (grasses, shrubs, etc) is allowed to grow in 50-cm wide strips spaced at 6-10 meters apart. The advantage of this simple soil conservation technique is that farmers can establish a very effective erosion control system with no cost at all, with no need to locate planting materials for the hedgerows. The natural grass strips tend to capture 90-95% of the soil moving downslope and enhance water infiltration by 4-5 times compared to open field. The land rapidly forms into natural terraces. Farmers soon begin to plant high-value crops on these terraces, and often grow perennial fruit and timber trees, pineapple, etc. along the upper side of the buffer strips as well as fodder grasses and legumes for livestocks. Our surveys indicate that farmers perceive that these NVS systems typically increase the land values of their sloping fields by about 50%, and increase farm household income 3-5 times when perennial crops producing fruits. We have seen these NVS systems spread rapidly across the landscape in northern and central Mindanao.

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 users 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.

Conventional extension methods

Many definitions of extension exist. Tengnas (1994) describes extension as "a non-formal educational system aimed at improving the livelihood of people ... not necessarily involving heavy subsidies or material support." He points out that it is a two-way educational process where local people and extension workers learn from each other. A comprehensive definition is given by Sim and Hilmi (1987): "Extension should be regarded as a process of integrating indigenous and derived knowledge, attitudes and skills to determine what is needed, how it can be done, what local co-operation and resources can be mobilized and what additional assistance is available and may be necessary to overcome particular obstacles." A recent definition is given by Gross (1996), based on the review of relevant extension literature: "Extension is a professional policy supporting intervention which uses communication as an instrument to induce voluntary change with a presumed public or collective utility." Most definitions of extensions agree that it is basically an educational process aiming at voluntary change, even though the immediate success of an extension activity is usually measured by the number of farmers adopting an innovation or making the change, regardless of whether the adopters are convinced of the technology's / change's benefits or accepted it indiscriminately out of politeness or external (short-term) incentives provided by the change agent.

The role of the rural development extensionist is stated below, and reflects ICRAF's extension attitude in its technology dissemination program at its research site in Claveria. **The role of the extensionist in the context of rural development** is (adapted from Chavangi and Zimermann (1987)):

- helping people identify and communicate their own problems and assisting them in identifying their own solutions, thus avoiding a top-down attitude in technology transfer,
- assembling and transmitting existing (indigenous) knowledge and adding new ideas to provide innovative solutions to existing problems,
- providing not only technical advice but also individual and /or group encouragement,
- creating a forum for exchange of ideas and experiences among farmers as well as among farmers and outsiders (members of research and rural development organizations),
- developing relationships with other organizations involved in rural development, and
- improving the exchange of information between researcher and farmer.

Only a few of the many different extension approaches shall be described in the following to show where ICRAF's technology dissemination program fit in with existing classifications. It should be pointed out, however, that ICRAF never followed standard recipes for effective

technology dissemination in its initial extension program, but rather intuitively applied seemingly best strategies for the site-specific conditions and with the limited available resources.

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 (e.g. post-harvest, public grazing) or if activities will be undertaken (more cheaply) by a group (i.e. group nursery). The group approach is particularly suitable where group work is common, like the Philippine Bayanihan, the farmer work groups based on voluntary work contribution for a common benefit. The pros and cons of these two extension approaches are presented in Table 1 and 2 in relation to the extension activities led by ICRAF in Claveria. Tengnas (1987) further defines the school approach (aiming at changing the behavior and attitudes of the new generation) and mass extension methods (making use of mass media to create awareness), and stresses that in most cases the combination of all available extension methods is more effective than just one method.

In the Philippines, traditional conservation farming technology transfer has been done by extension workers with specific technical expertise, transferring innovations directly to farmer individuals or groups (**transfer of technology**). The Philippine Department of Agriculture (DA) and other line agencies, have applied this cost-effective top-down approach for many years, for example in the conventional training-and-visit manner whereby the field extensionists train selected "contact farmers" who are expected to pass on their knowledge to other farmers and the introduced technologies are thus thought to trickle-down to every farmer. The irrelevance of the extended technologies regarding farmers' real needs, the slow pace of farmer adoption, and the bias towards better-of (more educated and wealthier) farmers have been a common criticism. A variant of technology transfer is the **farmer-to-farmer method**: usually a farmer or a small group of interested farmers are trained on one or a few new technologies and formally extend newly gained knowledge to fellow farmers in the area. The farmer trainers can be either financially compensated for their time inputs or expected to willingly share their knowledge voluntarily with their fellow farmers. Depending on how participatory this approach is being implemented, the approach can improve the two-way flow of information and better ensure that taught technologies are relevant to the needs of farmers because the farmer-extensionists are in many cases users of the technologies themselves and have modified them to fit local circumstances. However, farmer-to-farmer methods of technology transfer also have limitations: It has been difficult to institutionalize this approach, i.e. to incorporate it into the national extension systems to reach a wider impact, and it has been particularly difficult to operationalize ways of effective

collaboration and information-flow between extensionists, researchers and farmer trainers, i.e. to ensure more effective participation. In many cases the lack of thorough technical training for farmer trainers to be able to understand and explain technical detail of innovations has resulted in their myopic recommendation. And not seldom do farmers lack dynamism and the time necessary for effective technology extension, especially if they are not financially compensated.

Some definitions of extensions point out that "... in a **participatory approach**, extension is defined as a two-way communication of knowledge" (Case, 1990). The experience with more participatory ways of technology transfer in the Philippines is very limited. It involves farmers in the whole process of decision-making, from identification of problems, constraints, opportunities and preparation of improvement plans to implementation, monitoring, evaluation and program modification (FAO and IIRR, 1995). The role of the extension worker is to enhance farmers' capabilities for improving their farming situation and to facilitate a two-way exchange of information. Other sources name the participatory approach "**facilitation of learning process**" (Gross, 1996) or "**learning process approach**" as opposed to the "**blue-print approach**" in which all objectives and activities are specifically defined and programmed at the outset of the extension activity (Osborn, 1995). A variant of the facilitation of learning process is the "**organization development**" approach that focuses on people's empowerment through developing human resources via mobilization, organization, training and leadership development (Gross, 1996). Participatory approaches have been implemented by a number of NGOs in the Philippines, but has been difficult to implement on a wide scale.

Technology dissemination in Claveria

Extension activities in Claveria date back to the middle 1980s when under the "Comprehensive Agrarian Reform Program" (CARP) large land areas owned by a few landlords were distributed by parcels of two to three hectares to the landless poor and small-holders in the area. Under CARP, the need to practice soil and water conservation was emphasized, and as a joint activity of the Department of Agriculture and the International Rice Research Institute many farmers in the area and other regions were trained on contour hedgerow farming through farmer-to-farmer extension between 1986 and 1988, followed by moderate farmer adoption. The adoption and technology modification process has been well documented by IRRI staff (Fujisaka, Fujisaka et al., Pandey), but aside from documentation and wider sharing of experiences very little extension follow-up was undertaken thereafter.

When in late 1995, ICRAF had been approached by farmers at the research site in Claveria to assist them in installing contour hedges to prevent soil erosion, the Centre responded by

combining its technical expertise with the extension skills of a technician from the Department of Agriculture and the practical knowledge of a motivated farmer adopter to provide meaningful extension services. ICRAF's extension work since the start of the technology dissemination program has been using an instrument mix, e.g., aspects of the individual as well as the group approach. The ICRAF has basically been adopting a learning process approach because of its new role as an extension agent and because of continuously changing external circumstances and developments within the farmer-client group that made repeated adaptations of the extension strategy necessary. ICRAF's experiences, described below demonstrate the potential roles that research organizations can play in assisting the dissemination of appropriate technologies to the people for which and with whom they have been developing technology innovations.

1. Contour Hedgerow Extension Team Model - the individual or household approach

To try to overcome the constraints imposed by the traditional and farmer-to-farmer models of technology transfer we devised a somewhat different approach. We formulated a "CHET team" (Contour hedgerow extension team). This was composed of a Department of Agriculture-Local Government Unit (DA-LGU) technician, an ICRAF researcher with an expertise on soil conservation and agroforestry, and a farmer adoptor with skills in communicating his experience. The strength of the team, composed of technician, farmer and researcher, was in combining the technical know how, extension skills, practical indigenous experience, and the flexibility and capacity to address arising technological as well as institutional constraints. This new paradigm has been proven effective in transferring the technology to the farmers. However the capability of the conservation team to reach out to larger areas is a question. For example, in municipality-wide activities it is difficult for a single conservation team to reach out. Therefore it would require a number of teams to effectively cover the whole municipality. But what about province wide or nationwide programs? And what if resources to do extension works are very limited, and a large number of conservation teams are not feasible? This was the issue we encountered as we expanded our activities to the municipal level. In the beginning we split the team into an individual person. The team met regularly to discuss the progress and issues arose in the field and come up with a common decision in a participatory manner. Splitting the group into 3 still could not cope with the request of farmers to assist them in NVS establishment. With such increasing pressure we opted to have a group training's to reach more people. We took 5-7 participants from each of the 7 villages we were working on, and conducted a one-day training. Half of the training was devoted for technical aspects and the rest was used in visiting farmers who have earlier established NVS. Before the participants went home they decided to organize themselves into a Claveria Landcare Association (CLCA), and they elected a set of officers among themselves as the municipal wide association of farmers who are dedicated for soil and water conservation.

2. Peoples Organization Model - the group approach

After the CLCA was formed, participants grouped themselves according to villages they represented. The individual village group formed the chapters (sub-group of CLCA), and elected a set of officers among themselves. There were 7 chapters organized. The chapters expanded memberships in their respective villages. The Chapter members spread the NVS technology to other farmers. The subsequent group trainings were organized upon requests from Chapters, and they were done in the village where the requesting chapter is located. The newly trained farmers joined chapter in the village thus increasing the CLCA membership. Conservation team role shifted to assisting the Chapters in disseminating NVS technology, training other farmers, and providing technical backstopping. With funds depleted, the support for the farmer trainor has stopped, and the DA technician was pulled out by his supervisor to fill in the activities vacated by another DA staff who had left. With our commitment to pursue the program we let the ICRAF researcher continue to assist the chapters and assist the formation of other chapters in villages who have strong interest to adopt NVS technology.

The CLCA has a monthly meeting participated by the chairmen from the different chapters. Chapter chairs are encouraged to discuss issues and problems in their respective chapters thus giving regular feedback to the CLCA and the Conservation team. The chapters have regular meetings as well as the sub-chapters (small village level).

One of the key issues emerged in various meetings was the establishment of cash perennials on the NVS. Although, farmers appreciated the role of NVS in controlling soil erosion but most of them feel the hedgerows need to be optimized. Farmers are interested to establish timber and fruit trees on their NVS. Gmelina arborea has been widely planted in the area, and they were looking for other species. They scheduled a visit to the wood processors and tree plantations. After the visit farmers were interested on the Eucalyptus species (deglupta) because of its better market for poles and lumber. The CLCA put up a central nursery. It was agreed that each chapter will contribute the labor required and costs of the establishment and maintenance. ICRAF provided the seeds. Due to lack of technical know how about growing small seeded trees, and the distances of chapters to the centralize nursery the survivals of seedlings were low. The group evaluated that the effort as a failure. Training on nursery establishment and management seemed very necessary and the idea of having a central nursery was eliminated in favor of chapter or decentralized nursery.

ICRAF conducted nursery establishment and management participated by chapter chairs, select members, and barangay councils. The training includes among others lectures and hands-on, and strategic planning.

There are now more than 250 village and household nurseries have been set up. The seedlings raised are of timber trees such as. Eucalyptus spp.(e.g. deglupta, robusta, camaldulensis, and torillana); and fruit trees such as Durian, Rambutan, Mangoes, Lanzones, etc.. ICRAF provided the seeds for these species. The chapter and sub-chapter members provided the nursery shed, fence, and they did all the activities in the nurseries. Members rotated in maintaining the nurseries like watering and cleaning.

The nursery activities did not compete with hedgerow establishment. NVS are established during the land preparation period therefore it is seasonal. The demands for NVS establishment assistance are high during the months of February, March, April, May, September and October.

Currently with the strong support from the barangay council, the Landcare association has spread down to the sitio level which is the sub-group or sub-chapter to the barangay level chapter.

3. Local Government Model - towards self-reliance

The barangay officials were already aware of the ongoing activities and were interested to participate the program. With their interest we conceptualized this local government unit (LGU)-led technology dissemination model (Figure 1).

The decentralization programs of the national government gave increased power to the local government units (LGU's) to manage their natural resources. Many national government programs have been devolved to the municipal level such as: agriculture, health and nutrition, natural resources management, police, etc.. The barangays (barrios/villages) are given funds (called barangay internal revenue allotment (IRA)) to maintain administrative and infrastructure maintenance costs. One of the components of the IRA is for Human and Ecological Sustainability (HES) program. HES programs are skewed toward environmental related projects such as: soil and water conservation, tree planting, wastes management, and others.

The model for LGU led technology transfer is given in figure 2. The conservation team at the municipal level trains or works with the barangay captains and barangay councilors designated as chair of the committee on agriculture, and with the other members of the council (a municipality is composed of 15-30 barangays). Conservation team ensures that these core people understand about the technology and the need to implement it (through providing information such as official village meetings, slide showing, and subsequent small group trainings on NVS establishment in a farmers' field. These core people in return will work with the sitio or zone leaders (a barangay is composed of 5-10 sitios [sitio is a sub-village]), ensuring that these sitio leaders understand and appreciate the technology. These sitio leaders will disseminate it to the farm families within the sitio. A sitio is usually composed of 20-50 households. The sitio leaders ensure that farmers understand, appreciate, and implement the technology.

This structure makes prospective spread of the technology occur on an ever radiating basis. The breakthrough in this new paradigm occurs when the community leaders assume their role in the diffusion of the technology transfer, as is now happening in Claveria.

This new paradigm may be viewed as a structured radiation of the farmer-to-farmer method. In a farming community the leaders are farmers themselves. The conservation team is linked with core people who have resources and influence in the community. In the Claveria experience we found that it is easier and more effective to work in a community where there are core people the conservation team can work with rather than conducting the tasks independently. We have been deeply encouraged to see how proud the farmer leaders turning in lists to us of the names of the

people they have assisted in establishing NVS. Soil and water conservation that include tree plantings are now a common topic during the barangay or sitio assemblies or meetings.

3.1. Benefits of LGU-led model

We found a number of significant benefits of the LGU-led conservation team approach: a.) established social structure and influences. This social structure has been in place for years and the elected officials have the voice in the village that the people are willing to listen. It has been an established fact that the people listen to their leaders. The elected officials in the barangay are respected, influential and have capability to convey messages to the farmers, b.) availability of resources that can be mobilized. The resources are both financial and human. The IRA allotment (HES) can be tapped for the implementation of the programs. For example, a barangay may provide an honorarium to a farmer adopter who assists other farmers to establish NVS (provision of nursery supplies such as seeds, fertilizers, cellophane bags, etc.). The human resources include the barangay officials, sitio leaders, and sectoral representatives within the barangay that can be mobilized to accelerate dissemination of the technology, c.) Committed extension agents, a character that is sometimes absent in extension workers. These people opted to be elected to serve the people in the village. In a farming community these are farmers sharing with other farmers. It is difficult for these farmer leaders to convince other farmers if they themselves are not practicing the technology.

Our efforts were shifted to barangay leaders because of the potential impact on the technology dissemination process. The conservation team attended barangay council meetings, assemblies, and sitio meetings. We were even invited to have slide showing on soil and water conservation technologies in the barangays and sitios. The training efforts were skewed toward this model. The activity is running well in 11 of the barangays (/villages) that the team is working.

3.2. Limitations of the LGU-led model

The brief experience with the LGU-led model of conservation dissemination model has been promising. But we have noted two limitations that may have significant repercussion: 1.) A change in administration in the barangay may hamper continuity of conservation activities. When we started working with this model in late 1996. The intensity of the activity in the villages varied. Some barangays started conducting sitio training without the participation of the conservation team. During the nursery establishment and management training in January 1997 we focused on getting participation of barangay officials. Most of the barangay captains we worked with joined the training. After the training they mapped out their plans about barangay nursery establishment, and other activities. Soil and water conservation campaigns in the barangays were active. The election for the barangay officials was slated in May 1997. About a month prior to the election the conservation team stopped dealing with barangay officials because almost all of them were running for re-election. We noted a perception that the team was siding with the incumbents. To avoid this accusation the team ceased to work with these barangays officials and shifted back the effort with

CLCA chapters. In the election more than half of the barangay officials were not reelected. The installation of the new barangay officials was done in July. The defeated barangay officials were reluctant to pursue the activities because they were not certain whether the new barangay officials will not continue the program, and perhaps out of frustration at not being reelected. It was also difficult to start working with the newly elected officials until they were installed. These new barangay officials required training and exposures that meant the team had to start from scratch; b.) another limitation of this model is when the barangay captain is not farmers himself. He has no strong support in pursuing the program.

4. Building on past experiences: Landcare approach – a triangulation between Landcare associations, local government units and technical facilitators

Both the LGU-led and people's organization (Landcare Association) models have both positive and negative aspects. The LGU model has financial and human resources, and can draw upon that is necessary for effective technology dissemination. But the LGU-led model is affected by political uncertainties (such as the change of administration referred to above). The People's organization is more stable but has limited resources. It is slow but surely.

Figure 2 shows the triangulation between the technical facilitators, Landcare associations – farmers grassroot organization, and local government units. The local government units from municipal level down to the barangay or sitio level provide leadership to conservation farming technology transfer through its mandate and influence in the community particularly on the implementation of the Human and Ecology Security (HES) Programs as well as the Clean and Green Program. HES programs promote sustainable development that does not compromise future generations ensuring that ecosystems are effectively functioning , providing with clean air, safe water, fertile soil and stable climate. Because of this HES program, conservation farming becomes the flagship programs of the municipalities and barangays.

The Landcare associations provide the mass based support to the LGU in the municipalities, barangays down to the sitio. They can provide manpower support to the village leaders (LGU's) in the implementation of the conservation farming and the vehicle of technology transfer through farmer-to-farmer. This is also provides an avenue where farmers can share, interact and dialogue about their success and failures in farming and other social or emotional needs. They can sort good from bad experiences and farmers will not be repeating the same mistakes but learning from good experience from other farmers.

The technical facilitators which are mainly ICRAF staff with support from line agencies (e.g. DENR, DAR, etc), and municipal agriculture office provide facilitating roles to the different activities such as meetings, cross site visits, trainings to the LGU's and Landcare groups and provide technical backstopping to the organized conservation teams from municipal, barangay down to the sitio level. Conservation teams are core people at different levels who are actively involved in conservation farming and are capable of sharing or extending the technology to other farmers. The members of the team have the mandate, political influence and experience on

conservation farming. It is necessary that each sitio must have its own conservation team so that any farmer from that particularly sitio seeking technical assistance about conservation farming will not somewhere else but right in his sitio.

There is now strong complementation between the Landcare association and the LGU at all levels. The municipal council has provided funds to the Landcare activities such as establishment of nurseries, training of farmers, etc. from the municipal HES fund (20% of the development fund). Claveria municipal government has allotted P50,000.00 for each barangay. Likewise, the barangays have also allotted 20% of its development fund to compliment what has been given by the municipality.

This model ensures sustainability because the LGUs can provide the necessary political leadership and influence, and can also allocate funds from the regular internal revenue allotment (IRA) which is more stable over time. Since they are mandated to have HES program, conservation farming activities become their flagship program. The Landcare association provides the necessary mass based support to the program, and will ensure sustainability and stability when there is a change in LGU administration. At the municipal level, Landcare associations provide a forum where various other people organizations can meet, interact and share experiences.

There are now other 14 people's organization including cooperative joined the Claveria Landcare Associatio(CLCA). Each group is considered as one chapter. The interest of these organizations in joining the Landcare is for their members to know better about natural resource conservation through soil and water conservation, nursery establishment and and tree planting. The interest of CTGA to join the CLCA is for members to know better about tree planting and its silvicultural practices, and also to share their experiences in tree growing. The participation of CTGA to the association is beneficial to the CLCA because CTGA members are mostly professional who have strong interest in tree planting and they can share their managerial and leadership skills to the CLCA members who are taking the leadership at sitio level. However, the main reason is to have these different people's organization a forum where they can share their ideas and experiences and perhaps resources to better achieve the common goal of uplifting farmer lives while conservation the resource base and the environment.

The Landcare Approach

It is a method to rapidly and ineffectively disseminate and enhance adoption of appropriate land management practices based on farmers' innate interest in learning and sharing knowledge about new technologies that enhance farm productivity and profitability while protecting the land and the environment. This approach integrates grassroots community groups, institutional networks and strong government support so that learning of new technologies, policies and other (financial) resources can be facilitated to achieve ecologically sustainable practices. Landcare is a consciousness and act of protecting the land against depletion to sustain land productivity for the present and future generation.

Landcare groups are people in the farming community who are concerned about land degradation problem and are interested in working together to do something collectively for the long-term health of the land. It is a participatory community-based approach and grounded model designed to effect change in complex and diverse situation.

The Landcare movement is not exclusive to the Philippines. In the last decade, similar approaches has been evolving in other developing and developed countries. In Australia, what started as a farmers voluntary movement in different parts of the country, has now become a national program, the National Landcare Program (NLP) under the Department of Primary Industries and Energy. The overall goal of the NLP is to achieve efficient, sustainable and equitable management of natural resources in the country. In 1989, the Landcare Foundation was established to seek corporate sponsorship and private donations to complement government funding in various education and awareness raising projects. Today there are 4500 rural Landcare groups in Australia providing to the people involved with support, training, knowledge and skills to implement projects of substantial community benefit.

The main objective of Landcare in Claveria is to develop a Landcare approach model in the context of developing country where farmers are generally resource poor and marginal. Specifically, 1) to develop a mechanism for upland farmers to think, initiate and sustain collective and individual efforts to enhance farm productivity and profitability while enhancing environmental integrity; 2) to provide a mechanism where local governments can relevant/effective in their policy and financial supports to the community needs and aspiration as well or in soliciting supports for the community to achieve mutual benefits; and 3) to bridge the gap between research, extension and adoption of appropriate land management practices that are relevant to the bio-physical and socio-economic conditions of the farmers.

Steps involved in scaling up Landcare approach:

1. Look for interested people (site selection)
    - Farmers – have indicated the problem of soil erosion, interested to learn and adopt solution to their problems, willing to share his experiences to other farmers, and they potential leaders in their community. Get critical number of 3-5 core farmers from each village.
    - Local Government Unit (LGU-Municipal/Barangay)- have shown interest about the approach, and have planned environmental programs ((e.g. Clean and Green, HES, NRMDP), and committed to support.
    - Extension service (MOA, ENRO) – having indicated interest, have existing or planned relevant program, and committed support
2. Expose them to the right technology and organizational method
    - Conduct training and cross site visit with strong emphasis on hands-on

- Ensure the 3 groups of people are present (LGU, farmers, extension service)
- LGU people who holding relevant position (e.g. Mayor, Chair of Environment protection/agriculture (Municipal), Barangay Captain, Chair of Environmental protection (barangay level).
- Bring them to farmer's field.
- Provide enough time for interactions

3. Evolve Landcare organization
   - Ensure good mix of LGU people and farmers (in the village LGU's are farmers themselves)
   - Make sure that the officers are all farmers (particularly those holding key positions)
   - Create/facilitate group activities (e.g. nursery establishment, workgroup or pahina, exchange labor or bayanihan, raffle, solidarity fund for burial and wedding, income generating project)
4. Organize conservation team (extension service, experienced farmer, etc)
   - Provide technical backstopping
   - Follow up or nurturing of the newly organized LG's (facilitation)
   - Link LG's to other service providers
5. Attract government support
   - Financial support
   - Policy
   - Technical

Landcare approach caselets

There are now 145 Landcare groups existing in Claveria. Each group is unique have varied experiences that are worth learning.

Caselet #1. Tunggol estate Landcare group

Sitio Tunggol is one of the 8 sitios (sub-village) of Patrocenio 2.8 km south of village proper. It occupies 128-hectare of land owned by Mr. Royden Tunggol. This was used a ranch until 1985 during the height of communist insurgency problem in Claveria. The land was offered for sale (VOS) to the Department of Agrarian Reform (DAR) in 1991. The DAR subsequently distributed the lands to farmers. The farm sizes range from 1.0-5.0 hectares. The earlier occupants were able to get bigger slice.

Soil erosion was identified by the farmers a major constraints to sustainable production of their sloping farms. There were couple of spontaneous adoptions as an offshoot to IRRI and ICRAF conservation farming research activities. Farmers requested ICRAF assistance in installing contour buffer strips to prevent soil erosion and in the propagation of cash perennials: fruit and timber trees. Requests were many thus prompted ICRAF to organize the contour hedgerow extension (CHET) team. CHET team was composed of extension technician from

municipal agriculture office, ICRAF field staff (part-time basis), and inspirational farmer-adoptor.

When Landcare group was organized in late 1996, farmers formed themselves into Tunggol Estate Landcare group. They elected their set of officers. In the beginning there were 5 members. Later on, the memberships have expanded. When the municipal federation was formed with 6 original Landcare groups, a member of this Landcare was elected as President. This Landcare group was the first to establish communal nursery in early 1997. They were able to raise seedlings of timber trees particularly Eucalyptus spp. The seedlings were distributed farmer- members. The communal nursery provided a venue for the members to learn the nursery establishment and management. After they learned the process, they opted to have their own nurseries at their backyards. They observed that they can produce better quality seedlings and with less labor because they don't have to walk to the communal nursery, and besides nursery management is part of the household activities. They can decide on what species to raise and the quantity.

There are now about 53 NVS adoptors out 58 farmers. They enriched the NVS by planting fodder grasses and legumes, timber and fruit, and cash perennials. Fodder grasses include Napier grass (*Pennisetum purpureum*), Setaria (*Setaria splendida*), Guinea grass (*Panicum maximum*), etc. Forage legumes include Flemingia (*Flemingia congesta*), Rensoni (*Desmodium rensonii*), etc. Timber trees are: Bagras (*Eucalyptus deglupta*), Mahogany (*Sweitinia macrophylla*), Yemane (*Gmelina arborea*), Ipil-ipil (*Leucaena leucocephala*), Cassia mangium, etc. Fruit trees are: Durian (*Durio zibeththenus*), Rambutan (*Nephelium appaceum*), Marang (*Artocarpus odoratissima*), Jackfruit (*Artocarpus heterophyllus*), Guavas (*Psidium guavaja*), Mango (*Mangifera indica*), etc. Cash perennials are: coffee (*Coffea spp.*), Cacao (*Theobroma cacao*), Pineapple (*Ananas comosus*), Bamboo (*Bambusa arundinacea*), Rubber (*Hevea brasilienses*), Bananas (*Musa sapientum*) etc..

These different species are interplanted to ensure diversity and stability in income. Most of the farmers who adopted the system felt the value of their lands have increased because of the established soil conservation measures and cash perennials. They are now confident that they have the long term productivity and increased income. They felt that food has been secured, and can send their children to school. Their income will increase 3-5 times once they harvest the produce of the cash perennials.

Caselet #2. Mahayahay Landcare group.

Mahayahay is one of the 8 sitios of barangay Ani-e. This sitio consist of households. Most of these farm families are beneficiaries of the comprehensive agrarian reform program (CARP) of DAR. The land is degraded grasslands formerly owned by Geronimo Gerin who used these lands as grazing. Mr. Gerin removed his stocks during the height of NPA fighting in 1985, and offered for sale (VOS) to the DAR. The DAR subsequently distributed to the farmers. In these acid and degraded sloping lands, farmers faced several problems in producing crops from these lands. Soil erosion is one of the major problems in sustaining crop production.

The Mahayahay Landcare group was organized when 3 out of 42 household members joined the one-day cross visit and short training conducted by ICRAF in late 1996. The 3 participants established the NVS on part of their farms. These 3 were the core people who initiated and invited other farmers to join the Landcare group. After few months the membership rose to 8. Since they were excited to plant timber trees, they established their communal nursery in middle of 1997. They produced substantial number of seedlings, and most of the seedling were planted on the NVS. But unfortunately, during the El Niño (almost 6 months of drought) most of these seedlings died.

When the barangay captain saw the exciting development which is also in line with the Human and Ecological Security (HES) and Clean and Green programs of the local government, he Mr. Matugas (Mr. Virgilio Matugas -president) to facilitate the formation of Landcare group to the other 7 sitios in the barangay Ani-e. Mr. Matugas was later on chosen as the chairperson of the federated Landcare groups. The organization of Landcare was preluded with the slide showing on conservation farming conducted by ICRAF in response to the request of the barangay officials.

There are now 14 members of the Landcare group and 22 adoptors. They continue to grow seedlings in their nursery which also include fruit trees. They plan to reach out more farmers in the sitio until the 42 households will adopt soil and water conservation and agroforestry practices. They are getting support from the local government. The Landcare groups now are more interested in planting fruit trees after they have done enough for timber trees.

The Landcare group is also working cooperatively in fixing the feeder road that goes into this sitio. Other social functions are also done by the Landcare groups. The Landcare groups does not only provide a mechanism to address issues related to farming but also provide a forum where they can discuss other social issues.

Mahayahay Landcare group has been frequently visited by farmers within and outside Claveria where they can see and do hands-on in NVS establishment, nursery establishment and management, and asexual propagation of fruit trees. The Landcare members are unselfishly sharing their time and talent to these farmers.

Caselet #3. Laculac Landcare group

Laculac is one of the 8 sitios of Ani-e. Before the Landcare was organized in 1997, spontaneous adoption was observed to few sloping farmers. One of these farmers is Mr. Judito Juban. Mr. Juban migrated from Bukidnon in early 1980's and was also a sloping farmer. When he came to Claveria he bought a hectare of sloping farm at very low price (P6,000). He confessed that he won't come to his farm after a heavy downpour because the rills and gullies were formed, and seed or plants and fertilizer were washed down to the downslope. He saw IRRI's field trial, and tried to apply the system to his farm by his own. He never planted the contour with leguminous trees as what he saw in the experiment but he used natural grasses in which later he changed to *Setaria splendida* and timber trees particularly *Gmelina arborea*.

When the barangay initiated the formation of Landcare in barangay Ani-e in 1997, Mr, Juban was the obvious person to be requested to further promote the adoption of soil and water conservation. Besides, the neighbor farmers observed the benefit of soil conservation in Mr. Juban's farm more than his words to convince them. The landowners also became a member of the Landcare, and one of them is Mr. Casiño. He asked his tenants to adopt soil conservation measures, and he even reached to a point of telling his tenants: "no adoption; no farming in my land". This encouraged his tenant-farmers and other farmers to adopt soil conservation measures. Mr. Juban was the resource person to assist them in laying out contour lines or establishing NVS.

Mr. Juban became the president of the Laculac Landcare group in which all his 17 members have already adopted soil conservation measures by having NVS or fodder grasses laid out in contour. The member opted to plant bananas, fodder grasses, fruit and timber trees as they enriched their NVS. They worked together to establish their Landcare nurseries where they raised seedlings of fruit and timber trees. They are also getting free seedlings from other Landcare groups. The barangay government is also providing nursery materials for their nursery.

Caselet #4. Sta. Cruz Landcare group

Sta. Cruz is located in the forest margin. Most of the area is still public lands, and classified as timber lands. Farmers occupants are mostly beneficiaries of the integrated social forestry program (ISFP) of the Philippine Department of Environment and Natural Resources (DENR), and holder of the Certificate of Stewardship Contract (CSC). The DENR has distributed CSC contract but has not provided the technical and financial supports needed for the farmer occupants to be more productive and sustainable in their farmer activities. Provision of technical supports and germplasms for the occupants to be able to plant trees on their occupied lots as mandated in their CSC were not met by the DENR.

Sta. Cruz area is composed of 7 sitios (sub-village or hamlet). The soils are characterized by low to moderate fertility, moderate to steeply sloping and acidic which have low in P. Farming is generally subsistence. They grow maize, upland rice and vegetables such as tomatoes, sweet pepper, eggplant and beans. Perennial cash crops such as coffee and cacao still exist but in decline. Fruits such as Marang, Mangosteen, Lanzones and Durian are also marketed but in very low quantity.

Crop productivity is low and declining due to soil erosion and lack of cash to be able to buy the fertilizer and other soil ameliorants. Farmers are moving toward the forest to get new and fertile land but population pressure and government restriction limit occupation to these new areas.

The Sta. Cruz Landcare group (Sta. Landcare Association) was organized last March 10, 1997 to address the problem of low and declining yield due to soil erosion, and to be able to plant fruits and timber trees to ameliorate and sustain their family income. Members are helping one another in laying out the contour line and the establishment of NVS. Workgroup was organized to establish and manage nursery for fruits and timber trees. Timber trees are Bagras, Mahogany and native species (*Shorea* spp).

There are now 38 household members of the Landcare, and 25 of them have already established soil and water conservation measure (NVS). Members are moving away from communal to individual nurseries after they have gained the knowledge and experience from the communal nursery. There are now 24 household nurseries that are producing seedlings of fruits and timber trees. Aside from their domestic use, these household nurseries are giving out seedling to other members for free or for a fee. This Landcare was able to get grant from Philippine-German Foundation Fund (PhilGer Fund) for working animal dispersal project to be given out to members which do not have working animal. The group also developed a model farm, and served as income generating project. They also conducted pocket training on soil and water conservation, nursery establishment and management, and asexual propagation of fruit trees to different sitios to reach more farmers.

Caselet #5. Lanise Landcare group

Lanise is one of the 17 barangays that Landcare is adopted. This barangay is situated in high elevation of 900-1200 masl where vegetable growing is favorable. There are 417 farm families, and these are divided into 9 zones or sitios. Farmers are rotating vegetables and maize. They put premium inputs to the vegetable and the maize is benefiting from residual fertilizer. Tomatoes is the main vegetable crop. Cabbage, sweet pepper, beans, carrots and raddish are also cultivated. Coffee, cacao and rubber are also cultivated.

Vegetable growers traditionally believed that the soil should be well drained to avoid rotting, diseases infestation and early senescence. This is the obvious reason why vegetable farmers orient the rows up and down the slope. This practice cause severe soil erosion and loss of fertilizer inputs.

The Landcare was adopted in April 2, 1997. This aims at addressing severe soil erosion in vegetable production and planting of fruit and timber trees to improve and diversify farm income. The local government (barangay) facilitated the formation of Landcare group to all of the 9 sitios. Besides the political will, it also provides funds for training and establishment of communal nursery at the each sitio.

The Landcare movement faced a serious challenge in Lanise. This is due to the traditional concept about vegetable growing, the difficulty in putting trellis to the vegetable in contour curvature, and hauling of vegetable harvests particularly if the contour is oriented perpendicular to the road (tomato production).

Inspite of these drawbacks, there are now 176 vegetable farmers who adopted NVS. They observed that adoption of NVS has no effect on diseases infestation, rotting and on senescence. Few of them modified their trellising method to address contour curvature. These farmers are sharing to other vegetable farmers about their experiences, and encourage other non-adoptors to also adopt conservation farming based on NVS. There are now communal nurseries established by the Landcare group with financial assistance from the local fund. These seedlings are planted on the NVS and along farm boundaries. Fruit trees are Durian, Rambutan and Mangoes. Timber trees are Bagras, Mahogany, Cassia mangium, and Gmelina arborea.

Why people get involved in Landcare?

There are now more than 3000 farmers who are involved in Landcare in northern and central Mindanao. These people have varied motivations for joining the Landcare group. Motivation includes extrinsic and intrinsic. Some farmers join Landcare because they are expecting external financial and material support as subsidies for their adoption of suggested technologies e.g. NVS, nurseries and agroforestry. Most of the farmers are intrinsically motivated to join Landcare groups because they really see the need. Their reasons are:

At household level:

- Farm development due to technologies they learn
- Increase income and food and nutritional security
- Soil and water conservation
- Biodiversity – to ensure income and productivity stability; deterrence to pest and diseases

At community level (sitio/barangay level):

- Sharing of new knowledge and information
- Lobby block for support from LGU and other service providers
- Getting new information
- Social integration (camaraderie or belongingness)
- Personal recognition
- Tackle problems beyond individual capacity to solve (e.g. burial, marriage, communal nurseries, larger farm works which require group work)
- Water conservation at sub-watershed level
- Bio-diversity at community level

At municipality or watershed scale:

- Water quality and quantity (stream flow sustainability during dry season streamflow)
- Forest fires
- Lobby blocks (provincial, regional, national)
- Reduce sedimentation problems in creeks, rivers and coastal areas

Why LGUs support Landcare activities?

- Enhance participation by the community
- Implementation of government programs are more easier
- Unity of purpose
- Bringing government closer to the people
- Effective partners in planning and development works
- Potential political/information machinery

Unique features of Landcare approach

1. Landcare provides a mechanisms for partnership or complimentation between stakeholders to enhance adoption of conservation farming and agroforestry practices, and other community needs as they see as important.
2. Landcare groups based at the village can change the agricultural norms of the community toward resource conservation, and provides a forum to interact, learn and adopt the new technology that can earn more money and conserve natural resources
3. Landcare groups can easily lobby supports from the government (LGU's, NGA's), and other service providers (NGO's, donors, etc.)
4. Landcare provides a network that ideas and initiatives are shared and disseminated within and outside the group or community.
5. Landcare provides a mechanism for local government to interact and support community needs and initiatives, and makes their programs and policies more relevant to the community needs as well as generate participation and support from the community as the Landcare groups are members local special bodies (municipal and barangay planning and development councils, agriculture and fisheries councils, etc.)
6. Landcare provides a vehicle for participatory research and technical intervention, and ensure that the new technologies are relevant to the community (farmers) needs and fit their bio-physical and socio-economic environments
7. Supports from the local government and technical facilitators on group activities such as regular meetings, competition, nurseries activities, workgroups, etc. motivate Landcare groups to work together to achieve common goals and aspirations.
8. Landcare groups interests and needs are evolving (does not end with NVS and nursery) that glue people together as a group. They evolve to different kind of issues as warranted by needs and conditions, and some evolved beyond technical such as social issues like wedding, burials and other community concerns.
9. Backed-up by research-based information and technical assistance from local, regional, national, and international stakeholders.
10. Landcare member farms provide showcases of appropriate technologies on sustainable agriculture and natural resources management encourage others to adopt the same practices on their own farms.
11. Decentralized fiscal management and operation enable the different Landcare groups to be creative in resource generation and allocation, and enhance creative and active participation among members.
12. Enactment of policies and provision of financial support by the local government ensure Landcare activities are performed and successful.

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Some issues and concerns about Landcare:

1. Some Landcare leaders lack leadership and organizational skills that unable to project themselves as leaders, and unable to guide the group into a cohesive and dynamic organization.
2. Some farmers expect "dole-out" from ICRAF or LGU's that they join the Landcare group thinking they will receive grants or loans.
3. Some LGU's are overly concerned about political patronage that causes discouragement among some Landcare leaders and members.
4. Over reliance to ICRAF on technical innovation.
5. Landcare facilitators are technical people and some lack skills in group facilitation.
6. Some LGU's are not pragmatic in resource allocation thus creating conflict and discouragement among Landcare groups.

Implication for scaling up

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 is 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.

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Recommended materials for further readings

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2. Department of Environment and Natural Resources (DENR). 1998. The Philippines Strategy for Improved Watershed Resources Management.

3. Garrity P. D., Mercado A. 1998. The Landcare Approach: A Two-Pronged Method to Rapidly Disseminate Agroforestry Practices in Upland Watersheds.

SWOT matrices for the different technology dissemination approaches used in Claveria

Table 1: Individual or household approach: the CIET model

Strengths	Opportunities
• Individual needs and problems can be addressed. • Unclear messages can be clarified. • Co-operation with farmer can be easily secured and confidence with whole household established through personal contact.	• The extension focus can be easily directed towards farmers' needs and changing external situations. • Every person in the household can be reached and can participate.
Weaknesses	**Threats**
• Expensive in terms of time and transportation. • Only a small number of farmers can be visited. • Area covered is small.	• Bias towards easily reachable and open-minded farmers in near-by villages. • More educated, out-spoken or influential farmers can skew the extension activity towards their needs.

(with additions from Tengnas, 1994 [adapted])

Table 2: Group approach: the peoples organization model

Strengths	Opportunities
• More people can be reached faster. • Usually cheaper than the individual/ household approach. • Rich information exchange (ideas and experiences) among group members. • People can express their needs more confidently. • Easy to monitor.	• Well-informed and motivated group members can act as multipliers of innovations, speeding up the dissemination process. • Local government support can be sought or other organizations (NGOs) requested for financial or technical help. • In combination with the organization development approach there can be a high degree of people's empowerment and program sustainability.
Weaknesses	**Threats**
• People who are not group members will not be reached. • Individual problems cannot be addressed well. • It takes a long time to derive at a decision (slow decision-making process). • It can be difficult to get people to agree and to make them work together. • Extensionists are agricultural experts, i.e. lack special skills in community organizing.	• Influential people in the community can dominate the discussions. • Technology delivery style and content might be biased to most innovative and out-spoken farmers. • This technology dissemination strategy might not be used to its full potential if no (outside) expertise on community organizing.

(with additions from Tengnas, 1994 [adapted])

Table 3: **Local government driven extension model: making technology dissemination part of the system**

Strengths	Opportunities
• The influence of local leaders, usually well-respected farmer colleagues will increase the acceptability of introduced technologies. • Often high commitment of local officials towards serving the people (who elected them). • Same as group approach.	• Extension can become part of the village program directed towards the preservation of the environment and enhancing farmers' livelihood. • Once village council support is being achieved, local government funds intended for environmental projects can be tapped.
Weaknesses	**Threats**
• People of different political orientation than village leaders will be skeptical about introduced ideas and organizations involved. • Same as group approach.	• People of different political orientation might try to discredit extension activities and people involved. • The gap between better-of farmers and influential people and poorer and disadvantaged people in the village can become wider. • Political changes during election can make starting from scratch necessary. • Same as group approach.

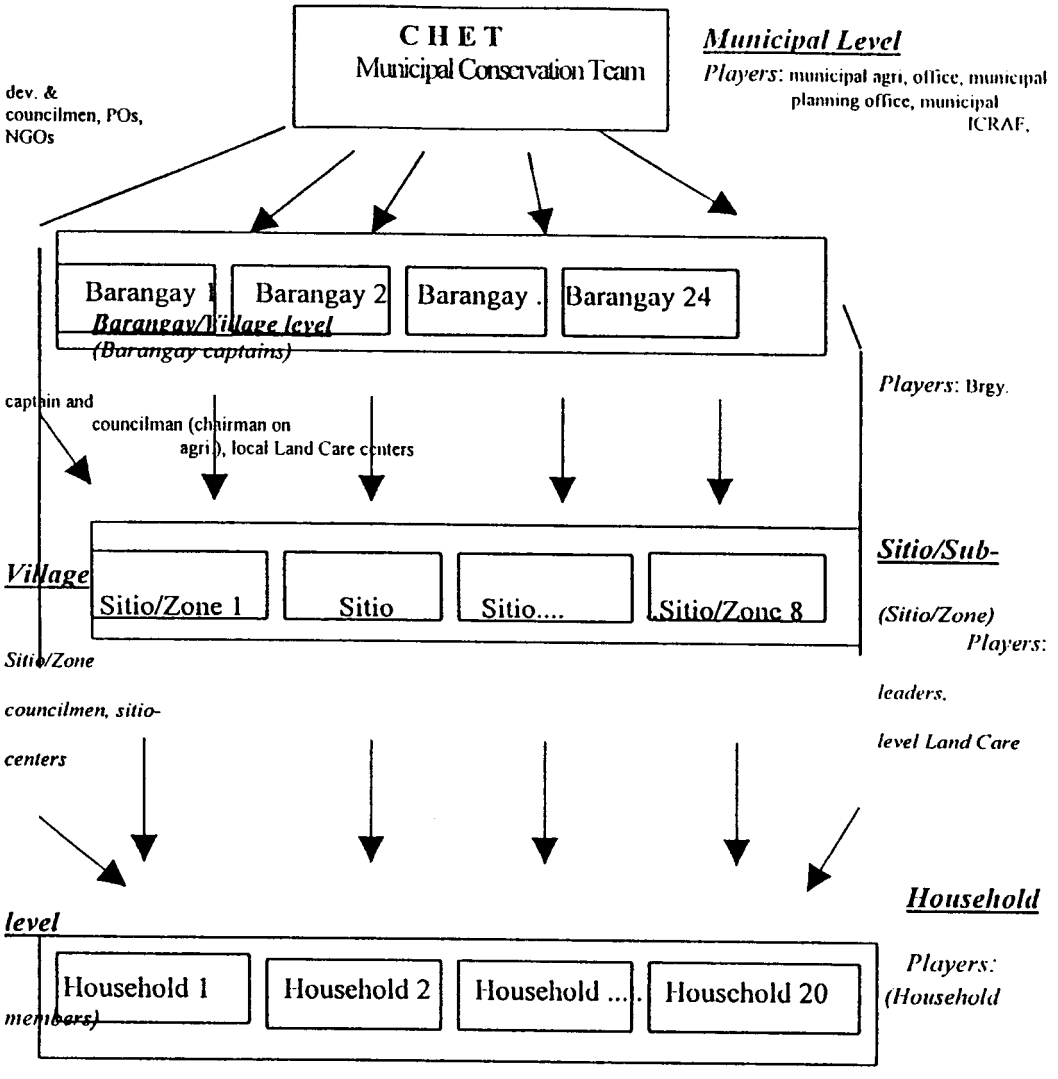


Figure 1: The local government extension model: towards making the dissemination of technologies to conserve natural resources and improving farmers' livelihood part of the existing village program. Conservation team only works on request directly with individual farmers and sub-village leaders.

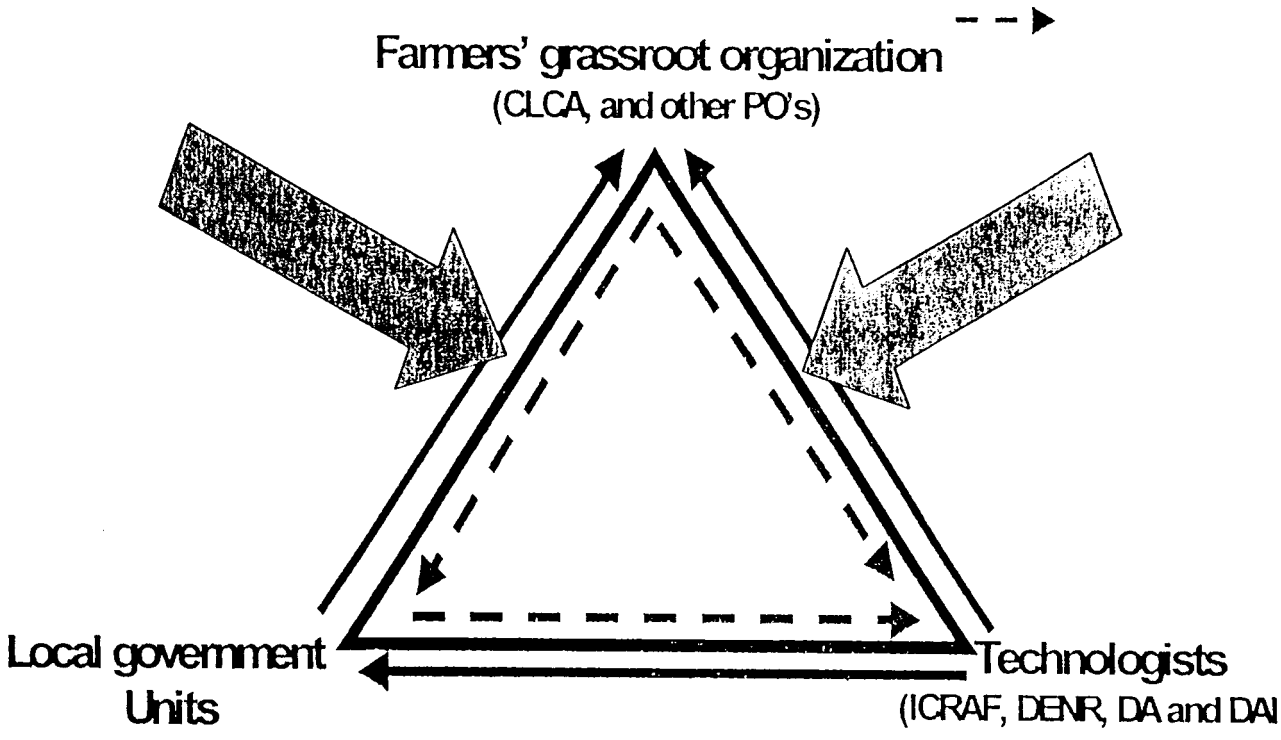
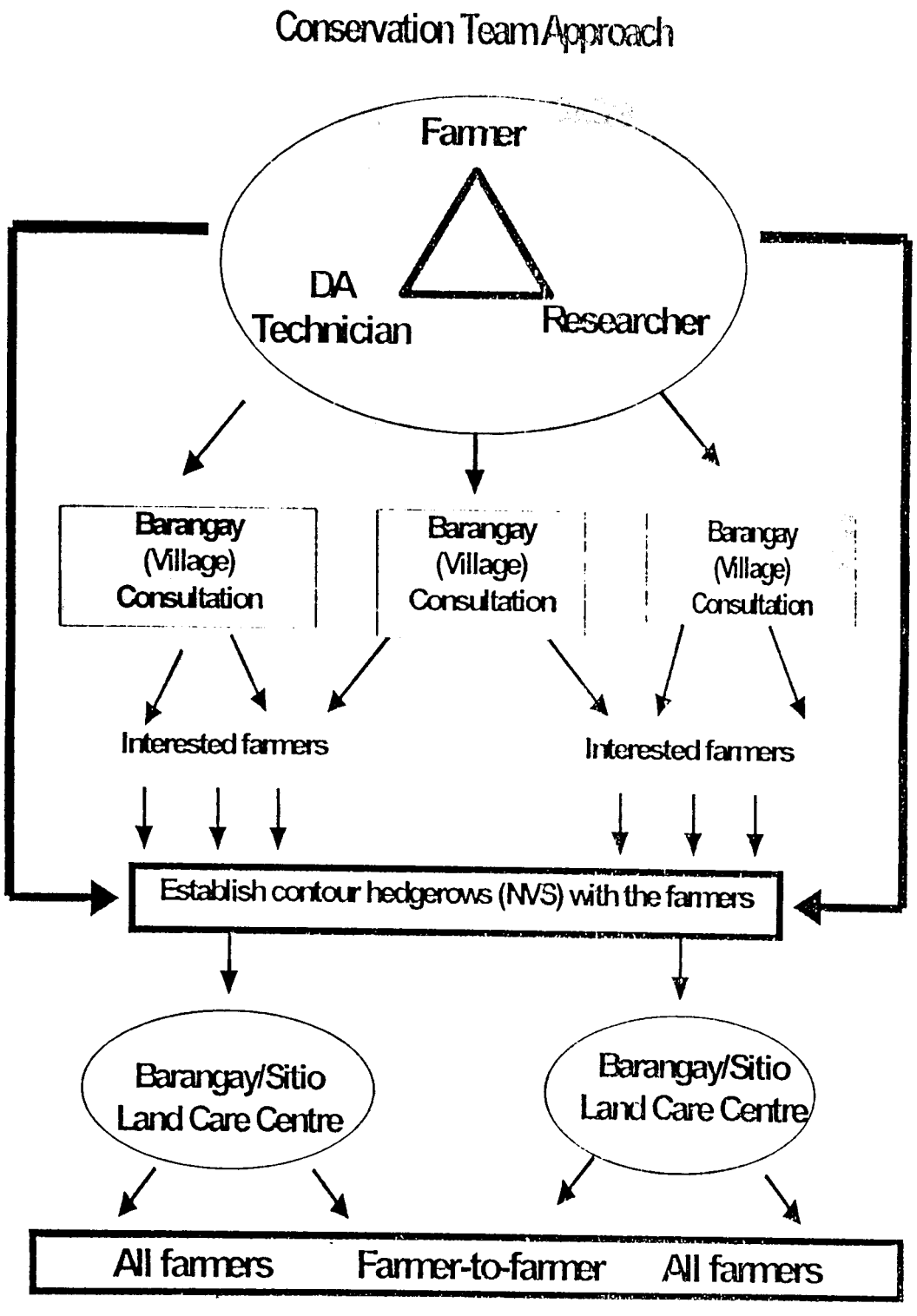


Figure 2. The triangulation of Landcare approach



igure 3. Conservation team as important component in Landcare approach.

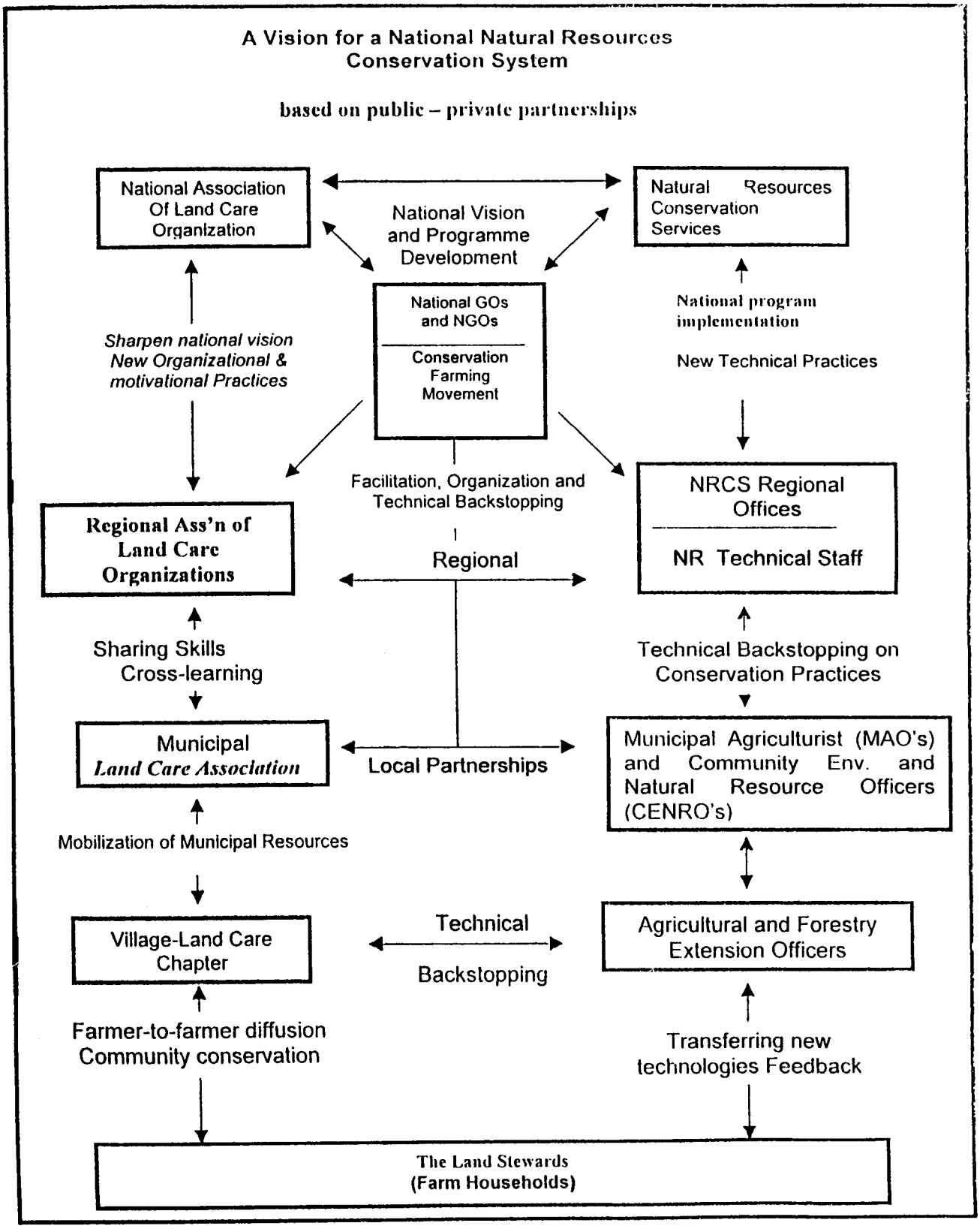


Figure 4. Conceptual frameworks of vertical scaling up of Landcare approach.