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Abstract

ICRAF has been conducting research on contour hedgerow systems for the past decade in Claveria, Misamis Oriental and Lantapan, Bukidnon in northern and central Mindanao, Philippines. Focus was much on assessing the management strategies that address key technical constraints of the contour hedgerow system. We observed that adoption by farmers was low for many reasons, including, high labor in establishment and maintenance of the hedgerows, resource competition above and below-ground, between the hedgerows and associated crops, limited value-added from the hedgerow pruning, and poor species adaptation. We concluded that low adoption of the conventional hedgerow system was not only due to some technical constraints but, largely, to socio-economic and institutional constraints faced by poor farmers in the uplands.

In view of this, we refocused our efforts towards finding alternative systems that address the technical and institutional issues of conservation farming. We found that natural vegetative filter strips (NVS) provide simple solution to the technical constraints of soil conservation on sloping farms. NVS are buffer strips laid out on the contour in which natural vegetation is allowed to re-grow into thick, protective cover. NVS provides the following advantages: effective in controlling soil erosion by 95%; easy to establish and easy to maintain; and does not compete with the associated alley crops. NVS also provide the foundation for farmers to evolve into complex agroforestry systems with fruit and timber trees and other perennials—thus, improve total farm productivity. We now see a tremendous surge of adoption of this system, enhanced by a dissemination approach, called "Landcare".

Operationally, Landcare is an approach that fosters rapid and inexpensive dissemination of technologies through the group and farmer-to-farmer method. It also refers to a movement of autonomous farmer-led organizations supported by local governments with backstopping from technical service providers-- that share knowledge about sustainable and profitable agriculture on sloping lands while conserving natural resources. The approach itself has developed into a dynamic voluntary movement with now more than 5000 farmers involved in 250 groups from five municipalities in northern, central and eastern Mindanao. Local governments provide support through policy incentives and funding for trainings and projects. Farmers share their knowledge, skills, leadership and experiences, apart from the labor, time and low-cost materials they invest for group activities. On the other hand, technical people provide knowledge, skills and facilitation for group formation and development. Today, Landcare becomes the melting pot for farmers and other community members to discuss issues, share lessons, invest talents, skills and other resources geared towards better land husbandry and protection of the environment from degradation. It threads a path for constructive, long term and practical action at a community level for tackling environment and sustainability issues for the well-being of people and their communities. It encourages participation, cost-sharing and co-management aimed at addressing sustainability concerns in institution-building. The challenge to scale-up Landcare in the Philippines is enormous as NGOs, local governments and national government agencies come to seek support for implementing Landcare in their respective sites. However, we are mindful, that Landcare maintains its culture of a demand-driven process, inclusive to a range of issues that communities aim to tackle. The essential elements in the phenomenal success of Landcare lies heavily in its quest to implement appropriate technologies, promote partnerships and institution-building.

This paper describes our experiences in developing technical and institutional innovations to reverse land degradation problems, in the Philippine uplands and its potential spread in the tropics.

I. Introduction: Challenges in the Uplands

The uplands form a significant portion of most countries in Southeast Asia. They account for 80% of Indonesia's, 70% of China's and 72% of Vietnam's total land area (IIRR, 1995). The Philippines had more than 40% uplands with 20 million people eking out for a living. This account for about 30% of the country's total population, and are farming in areas with slopes greater than 18% (Cruz and Zoza-Feranil, 1988, Mercado A.R. 2000). Biophysical conditions in the uplands vary with soil types, fertility, climate, topography and vegetation within small areas and shorter distances. People in the uplands are experiencing dramatic changes in many areas of their survival as they explore development opportunities, and face the threats of development aggression. Hence, both diversity and change characterized the upland areas. Problems in the uplands are enormous as in the lowlands, but, it is now widely recognized that the uplands serve as the backbone of the lowland economy. Among others, insecure land tenure, limited technical skills, unavailability of alternative livelihood, poor access to market and capital, and other form of public services, flanked the upland communities, leaving them at the dilemma of conservation and destruction of the resource base. These conditions are aggravated by increasing rate of population pressure. The highlands of Java and the midland region of northern Vietnam are densely populated. Natural growth and migration from the lowlands resulted to farmers cultivating in steeper slopes and poorer soils, and leaving lands in shorter fallow periods. Pressure for increased food production for subsistence has led to the transformation of these hilly areas for agricultural production uses (Mercado et.al. 2000). The expansion of production areas has been pushed toward unfavorable sloping lands, and to the forest margins. Besides, lots of prime agricultural lands have been converted to non-agricultural uses to give way to urbanization. Inappropriate farming practices in these fragile areas contributed significantly to the degradation of the resource base such as severe soil erosion, loss of bio-diversity, sedimentation of downstream areas like rivers, creeks, coastal areas. and farm lands.

Upland degradation resulted to a loss of 65.1 million hectares of forests in developing countries, and large land areas of 5 to 8 million hectares have gone out of production each year (FAO, 1995). In the Philippines, 5.2 million hectares of uplands are severely eroded at the rate of 2,046 metric tons per year, with Mindanao having the biggest share of the severely eroded areas.

Sustainable land use is one of the focal issues in the debate about rural development in the uplands. Appropriate technologies, people's active participation and proactive policies are key components to achieve sustainable upland development. The "appropriateness" of technology remains relative to communities with site-specific conditions, but it should be able to address both the production and conservation objectives of the resource poor farmers in the context of their bio-physical and socio-economic environments.

The use of improved technology to increase productivity and intensifying cropping to increase total annual productivity is necessary. Soil erosion is a major

problem in improving and sustaining productivity. In fact declining corn yields as much as 300 to 700 kilograms per hectare per year have been observed in sloping areas where no soil conservation have been practiced (Fujisaka et al, 1989, Mercado, et.al,, 2000).

Land management systems that improve and sustain productivity, while intensifying cropping to increase total annual productivity and at the same time reduce production costs to enhance profitability was indeed a very difficult combination of approaches (Garrity, et.al, 1998). Moreover, farming systems research has become more challenging when it made a shift from Farming-Systems to Land Husbandry Research placing more emphasis on examining the *why* component of understanding the biophysical and socioeconomic factors that contribute to land degradation (IIRR, 1997, Garrity, 1998).

The upland situation continues to grow in complexity and sensitivity. They have not grown in numbers only, but also in character. The Philippines as in many other Asian countries has been implementing social forestry and community-based resource management (CBRM) types of programs. Aside from these, there are now agrarian reform communities, and the recent ancestral domain claims of the indigenous peoples. These programs manifest efforts of increasing access by uplanders to resources —and thus, form the new face of upland development. Two million hectares are targeted for Certificate of Ancestral Domain Claim (CADC) for the 12 million indigenous peoples in the Philippines. These different tenurial instruments and projects in the uplands follow different recipes of program intervention. But in most of these projects, difficulties in sustaining specific activities at the local level are not attributed to project funding, but in the weaknesses of peoples' organizations or institutions to sustain group action, and commodity-focused technologies that do not provide options for farmers to diversify their systems. The situation is also worsened by unclear policies and uncooperative outside stakeholders. Clearly, the basic issues are; ***technological appropriateness; grassroots institutional structure; and appropriate policies.***. Upland management in its very essence is situated within the complex and broader system of intertwined networks of social, economic, physical, biological and political linkages that it generates sensitive vested economic and political interests and demands (Elmer Mercado, 1998).

II. The Site

The project sites are located in two adjoining provinces in Northern Mindanao, particularly in Misamis Oriental and Bukidnon. In Misamis Oriental, the focal site is the municipality of Claveria, where ICRAF has been conducting research on conservation farming and agroforestry. In Bukidnon, the central site is in the municipality of Lantapan. Research in Lantapan is focused on conservation farming, tree species evaluation and watershed management. Both sites have similar biophysical conditions. Although, the province of Misamis Oriental is located in the coast of Macajalar Bay, within the stretch of Cagayan-Iligan Economic Development Corridor, Claveria remains the only landlocked and upland municipality of the province. On the other hand, Lantapan is nestled within the heart of the province of Bukidnon, which is entirely a landlocked upland plateau and is a major watershed of central and northern Mindanao.

In Claveria, the perception that soil erosion is a serious problem is widespread (Mercado, et. al. 2000). Most farmers are clearly aware of the reasons for declining crop yields and possible strategies to combat the soil degradation process. Sloping fields in Claveria experience up to 200 t/ha of soil loss (2200 mm/year rainfall). About 95% of the cropping activities (mostly corn and some vegetable) occur on lands of more than 15% slope (Garrity and Mercado 1994, Fujisaka et.al, 1994, Mercado et.al, 2000). As is typical for the majority of cultivated upland areas in Southeast-Asia. Soils in Claveria are generally degraded and acidic (pH 4.5-5.2) with low available P.

In Lantapan, farmers predominantly grow corn throughout the landscape. Sugarcane is also becoming an important industrial crop and high-valued vegetables are also grown in high elevation areas. The municipality covers more than half of the northern portion of the Manupali watershed, which was declared critical and a reserved watershed in 1992. The upper northwest portion are the foothills of the protected national park, "Mt. Kitanglad". The headwaters of the tributaries of the Manupali River on the southern boundary come from Mt. Kitanglad. In turn, the river supports a major irrigation system for low-land rice and a reservoir that runs a big hydroelectric plant for the National Power Corporation. Sixty one (61%) of the area have slopes greater than 40% and elevation increases as one proceeds northwest to its highest elevation, determined to be 2,938 masl. Soil erosion has been identified as one of the major causes of declining productivity in the watershed. In a relatively small area, (31,820 hectares) population growth in Lantapan is high at a rate of 4.18% in the last succeeding census on population. If this trend will continue, the population of Lantapan will double in less than twenty years. In late 1994, we started our research in Lantapan through USAID-funded SANREM CRSP (Sustainable Agriculture and Natural Resource Management-Collaborative Research Support Program research on tree domestication and conservation farming (NVS and Ridge Tillage System).

III. The Technological Challenge: Natural Vegetative Filter Strips (NVS)--component of a system

The concept of contour farming and hedgerow system is widespread among farmers and technologists in the Philippines. This was introduced by the Mindanao Baptist Rural Life Center (MBRLC) in Davao del Sur, as the Sloping Agriculture Land Technology, or more popularly known as, SALT. It has assumed a generic definition of all conservation technologies for sloping lands. SALT is actually a package of soil conservation technologies and food production which involves ten basic steps and four layers of technology packages from SALT 1 to 4 (MBRLC, 1990). MBRLC has successfully spread the technology through extensive farmers training, and SALT has become a flagship extension program of the Agriculture Department. In fact, the Environment and Agrarian Reform Departments have promoted the technology package in their project areas. The adoption of SALT became project-based and were often subsidized by public or private project funds. Positive results have been observed and reported in a number of experimental and demonstration sites and farmers' adoption.

However, we observed that spontaneous adoption by farmers is limited. We reckoned, perhaps, there were a number of constraining factors affecting spontaneous adoption, which could be either technical or socio-economic in nature, or both. After years of implementing on-farm research and working closely with farmers, we identified some key constraints to adoption (Mercado, et. al., 1999,2000). These constraints include

- High labor requirements to establish and maintain the hedgerows
- Limited value added to farm income
- Unanticipated problems in soil fertility due to hedgerow competition
- Irregular width of the alley
- Too dense hedgerows in moderately to steeply sloping farms
- Poor species adaptation and lack of planting materials
- Insecure land tenure

Intensive examination of the many facets of the conventional hedgerow systems was done within more than a decade of ICRAF's on-farm research in Claveria, Misamis Oriental, which was later on, extrapolated in Lantapan, Bukidnon. The study concluded that, 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 pruning. However, increasing labor requirements in establishing and managing the tree hedgerows are not sufficiently compensated by the observed yield increases. Marginal returns to the management are usually low. Likewise, the use of productive forage grass hedgerows were too competitive with the associated crops. Many farmers have no animals to feed the abundant forage grasses and commercial supply was not yet popular in those days. This led farmers to abandon the system after some years of trial (Mercado, et.al., 2000). Our observation was that, the technology package was mostly adopted by farmers with high labor and cash capital to procure the hedgerow materials and maintain farm ruminants, while supporting institutions were draining their resources in providing subsidies to implement the technological package. Sustainability of the system or of the project approach became a major issue.

This does not imply that farmers are not interested in erosion control. Survey results revealed that soil erosion was among the top concerns of farmers in the area. This implies that technologies should require minimal costs to the farmers as well as, to the institutions supporting the program. It is very difficult to apply a single solution or unified technological packages to address the biophysical and socio-economic conditions in the uplands. Rather than trying to design and promote a whole-farm systems, experience has shown that it is more useful to develop and promote components of systems (IIRR, 1997). Farmers can then handpick from a suite of technologies that could be adopted or adapted on their farm.

We observed that the concept of contour hedgerow systems remains a popular idea despite farmers' complains on their complexity. Some farmers experimented the concept by starting with crop residues placed along the contour lines to form "trash bunds". These bunds allow rapid revegetation of native grasses and weeds and soon formed hedgerows with natural front-facing terraces. Some farmers tried laying out the contour lines but didn't plant anything on them. These lines developed into natural

vegetative strips (NVS), which we later observed superb in soil erosion control and reduced maintenance labor to a minimum (Garrity, 1993, Agus, 1993, Mercado, et.al., 2000).

The NVS has caught the attention of many more farmers in Claveria. By 1994, it was estimated that over 150 farmers have adopted contour hedgerow systems while the number of pruned tree hedgerow fields decreased after 1990. This time, the hedgerows were predominantly NVS. There was also an observed change in the farming norm, from plowing up-down the slopes to contour plowing.

NVS: Evolving the components of a conservation farming system

Farmers' interest on NVS spread like wildfire. We noted that perhaps, we were witnessing a spontaneous transition in the agricultural norm in these communities, since it was not common for technologies to be widely appreciated and adopted without project nomenclatures. We began to examine the evolution process of NVS by conducting verification trials and found out that the establishment of NVS requires only a fraction of the needed labor compared to the conventional contour hedgerow of tree legumes. The only labor required is the laying out of contour lines which is just around 2 person-days per hectare, and in pruning for maintenance of the NVS. The NVS are narrow contour strips of naturally-growing grasses that are developed by deliberately leaving 50 cms-wide of unplowed field area and allowed to vegetate naturally. The amount of labor required to prune or maintain the NVS is proportionate to the spacing of hedgerows. Mercado et. al. (1997) found out that NVS spaced at 6 meters apart dominated by *Chromolaena adorata* required 15 person-days per cropping per hectare or 30 person-days per year. This was less than a quarter of the time required for conventional tree-legume based contour hedgerow systems (Garrity, 1998).

We also found out that farmers who have not practiced contour farming are finding difficulty in laying out the contour lines more accurately. The use of A-frame in laying out the contour lines was becoming popular, however, farmers are still searching for more easy-ways of doing things. We had uncovered an extremely simple and practical means of laying out the contour lines through the cow's back method. The cow's back method involves plowing across the slope during land preparation, and maintaining the angle of the cow's back on the level. When the animal is heading upslope, its head should be higher than its back; when it is off-course downslope, the rear part of the animal is elevated compared to the front. Stark (2000), found out that the cow's back method was on the average less than 2% accurate compared to A-frame and the hose-level method. This is acceptable for practical purposes; particularly in the light, that farmers sometimes, simply eyeball the contour lines. Recently, we also tried the use of a small "Triangular Frame" as a gadget for laying out the contour lines. This is used by placing a pole at a particular point where to start laying out the contour line. The pole is marked at man's eye level. The triangular frame is positioned perpendicular to the elbow while citing the marker on the pole. The method follows the principle of an Engineer's transit. The advantage of using the triangular frame, is that, contour lines can be layed out even if the grasses are taller than usual, and can be done by the farmer alone.

Total crop area loss (proportionate to the number of hedgerows) was also cited as a factor constraining the installation of contour farming. Conventional recommendation requires that hedgerows should be separated by only 1 to 1.5 meter drop in elevation. This will result to a crop area loss of about 15-20 percent of the total farm area. This problem is aggravated with more labor required to establish a number of contour hedgerows. We conducted trials to determine the effect of reducing the density of hedgerows with that of the expected control of soil loss, and found out that hedgerows spaced at 4 meters vertical drop are still effective in reducing soil loss (Mercado et. al. 1997). Even a single NVS placed on the contour halfway down a 60-meter long slope reduces soil loss by 40%. We concluded that farmers could space their hedgerows at much wider intervals than, what the conventional rule-of-thumb suggests, even up to 8-12 meters apart on such slopes. Now, farmers have open options for the hedgerow density depending upon their future plans. More hedgerows can be added in between the old ones, when farmers gain confidence on the effectiveness of the practice. The wider intervals of NVS is particularly appropriate when farmers decide to convert or enrich the NVS with fruit and timber trees. This stage starts the evolution of an agroforestry system. We encourage farmers to enrich the system by planting fruit or timber trees, annuals or perennials on or above the NVS, to compensate for the opportunity loss associated with the crop area loss, and to improve total farm productivity. After establishing their NVS, farmers begin to raise seedlings of fruit and timber trees and started planting them on the NVS. Again, the spacing of trees depends upon their farm plans. Tree canopies start to close 3-4 years after planting, this time, it is no longer feasible to plant crops on the alleys, except when farmers opt for shed-tolerant plants. But, farmers can also introduce ruminants under the trees. Those with wider alleys can still plant annual food crops between the rows of the trees and grow fodder grasses between trees along the row. A wider spacing of NVS is very useful for farmers where it is desired to continue growing food crops as the fruit and timber trees mature. However, farmers with larger farm sizes tend to opt for somewhat closer hedgerow spacing, and move food crop cultivation to other parcels once the tree canopies shade the annual crops. The fast growing trees have a 6-8 year cycle. Some farmers also established cash perennial hedgerows like pineapple, banana, guava and coffee. With this, farmers tend to have closer hedgerows in order to have more rows for cash crops. Some farmers revealed, that they earn more from cash crops, than from the maize or annuals planted on the alleys. Farmers also planted forage legumes including *Flamingia congesta* and *Desmodium rhinzonii*. Timber species planted include the *eucalpytus species, acasias and Gmelina arborea*. The fruit tree species are mangoes, rambutan, durian, jackfruit and citrus. We summarized the following benefits of using the NVS as a foundation for farmers to evolve into complex agroforestry systems:

- Controls soil erosion by more than 90%,
- Low-labor and low-cost requirement for establishment and maintenance
- Competition effects on adjacent field crops are minimal
- Foundation for agroforestry development

IV. The Institutional Challenge: Landcare

The greater challenge lies much on how promising technologies can be widely shared to farmers and the development of an institutional framework that allows a space for social capital enhancement towards improving the net natural assets. Adoption and technology modification process has been well-documented by IRRI staff (Fujisaka et al. 1998), but little attention for extension follow-up was given. In 1996, 25 farmers have come to ICRAF and requested for a training on conservation farming. At the end of the day, the farmers have become committed and decided to organize themselves, in order to share the technology. Since then, we have become committed to ensure that knowledge derived from research will reach the user groups. However, we were concern about how a dissemination process of promising technologies can be implemented at minimal cost without compromising the desired impacts. We also recognized that the social dynamics involved in upland development is equally, if not more, complex than the technical aspects. We summarized the following challenges in institutional development:

- ***Forming and norming***. Group formation is critical when it is imposed and driven by conditions and limitations. It is also difficult when the expectations become too high and are no longer attainable. Therefore it is important, that the formation process is demand-driven, voluntary and evolutionary. In this process, the norming stage is part of the formation of groups.
- ***Enhancing participation***. Participation is now a by-word in community development, but in reality, it incurs high social costs. The elements of quality participation often go beyond the matrix and are difficult to account or quantify. In most cases, drawing participation and enhancing it, requires more than what a project's budget can support. It therefore, requires high level of facilitation and social relations.
- ***Sustaining groups***. Once the groups are already formed, the next headache is on how they can sustain their activities. The groups' Facilitator will need to work hard to provide the kind of facilitation needed for the groups to be able to journey into the different stages of group development. The Facilitator need to exert a conscious effort of following through the periods of rise and fall of the groups and implement mid-course actions with the groups.
- ***Socio-cultural, political and economic contexts***. Communities generally have common contexts, however, there are still tiny and detailed context specific issues that need to be surfaced in order that better understanding of differences will be achieved.

Today, in addition to conducting applied research resulting in the development of appropriate technologies, we initiated a technology dissemination program to ensure that derived innovations will reach to user groups (Mercado et.al. 2000). In the context of participatory action research (PAR) we developed and implemented, an approach that rapidly and inexpensively diffuses conservation farming and agroforestry technologies. The approach was found effective in speeding-up the dissemination process and in strengthening government extension programs. It also encourages local governments to provide technical, leadership, logistics and policy support. This approach resulted in an unexpected boost in farmers' adoption of soil conservation technologies and agroforestry

practices, and an unanticipated formation of an institution that is now emerging as a dynamic Landcare movement of farmer-led groups in the Philippines.

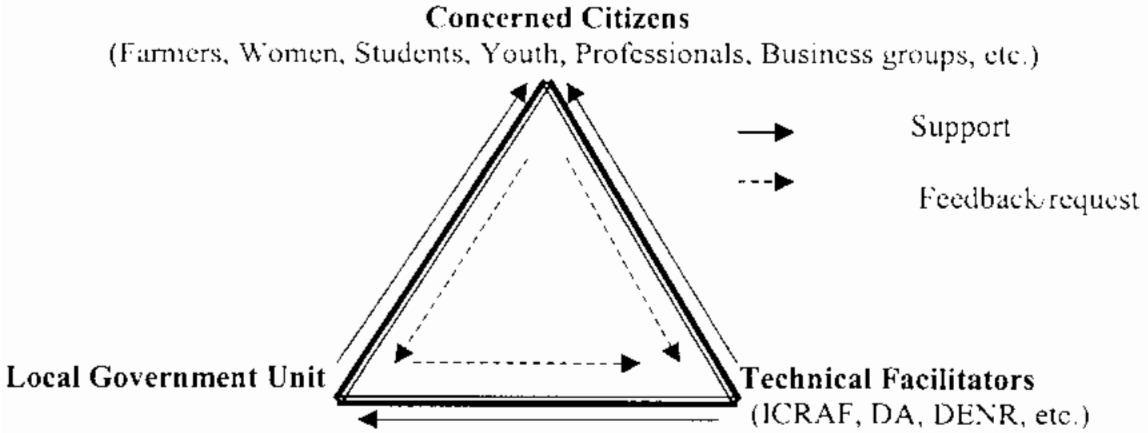
IV. a What is Landcare?

Landcare means the conscious act of caring for and protecting the land from degradation, through the practice of appropriate land management systems. It is also an ethic used to describe the judicious utilization of natural resources.

Operationally, Landcare is an approach that fosters rapid and inexpensive dissemination of conservation farming technologies, agroforestry practices and other natural resource management systems. It is founded on knowledge-sharing, skills enhancement and appropriate education-- hence, the main strategy used is Information, Education, and Communication (IEC). It relies on the active participation of participants in building networks and harnessing support for communal activities. Based on a convergence of common agenda, it enhances the development of a social capital among three key actors; the *farmers*, the *Local Government Units*, and the *Technical facilitators and other service providers.*

As a movement, it refers to groups of individuals who are concern about the long-term health of the land. The members share knowledge and resources, and practice appropriate land management systems that earn more money and conserve natural resources. Effective local community groups and partnership with local government units is the core of the Landcare model (Campbell, 1996). 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. The figure below illustrates the tripartite relationship of key actors in Landcare.

Fig.1: The triangle of Landcare: grassroots Landcare groups, local government units (LGU) and technical service providers and facilitators (ICRAF, DA, DENR, others). The success of Landcare as an approach is dependent on how these 3 key actors interact and work together.



IV. b Landcare Approach: A convergence model of development

The Landcare approach represents a convergence model of institutional development. It emulates that social capital formation is triggered, when there is convergence of interests and desired goals are common among participating communities, institutions and individuals. In Landcare, the key actors share the costs and benefits of the program. Farmers share their knowledge, skills, experiences and exhibit leadership, and also share labor and low-cost materials for group activities and projects, apart from the actual cost of their participation. On the other hand, Local Governments provide leadership, financial, technical and policy support to Landcare. In Claveria, the Local Government has allocated through a local law, an annual budget to support Landcare-related activities and projects. Technical facilitators and service providers, provide the necessary technical support and facilitation for group formation. The key actors may have their own context-specific agenda, but their complimentary mix, and the sharing of resources provide the opportunity towards meeting broader goals common to the key actors—thus, share the benefits perceived from producing private, quasi-public and pure-public natural resource goods.

IV. c Who are involved in Landcare and what are their goals?

Landcare is a voluntary group that is currently represented by a large portion of farmers. However, interests from other sectors, like women, students, youth and the rofessionals are emerging. This implies a wider applicability of Landcare for a range of community stakeholders in varying situations. They are:

1 Concerned citizens in the community who are:

- Willing to share their talents, skills and other resources
- Usually resource poor
- Want to improve their livelihood
- Willing to learn, share experiences and employ new sustainable farming techniques
- Committed to resource conservation and protection
- Committed to the creation of workgroups that implement sustainable agriculture and natural resource management strategies
- Tillers, non-tillers, owners, tenants of the land

2 Local Government Units (LGUs) can provide

- Policy support for the institutionalization of conservation farming, agoroforestry practices, other practices for sound environment and natural resource management, and budget allocations through creation of local ordinances.
- Leadership in facilitating the formation of Landcare Groups and their related-activities
- Capacity-building program for the over-all development of Landcare
- Financial support for Landcare activities and projects

3 Technical Facilitators (ICRAF and other line-agencies who can provide)

- Appropriate Technologies for sustainable agriculture and natural resource management
- Facilitation for Landcare formation and their activities

- Information, Communication and Education programs
- Network-support for Landcare groups

The issues in Landcare are varied and usually location-specific, and they respond and define their goals on these basis. Generally however, they aim to:

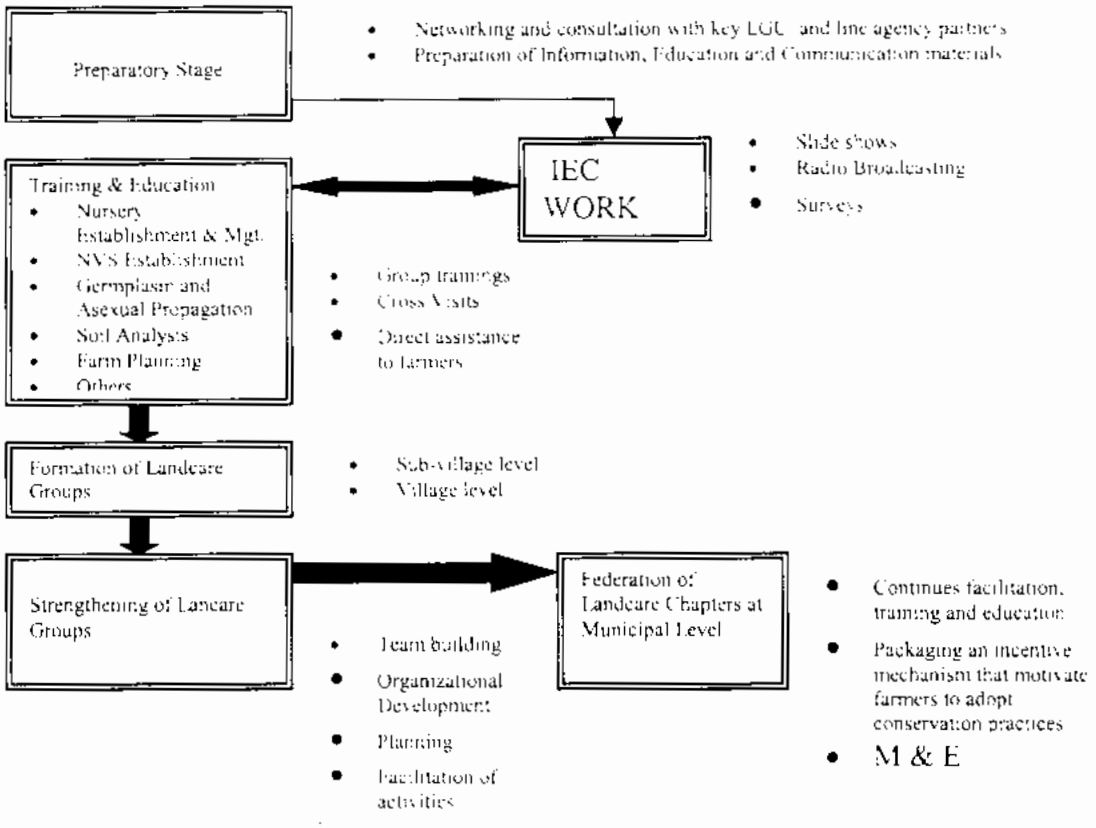
- Protect, conserve and restore the resource-base: soil fertility by controlling soil erosion and employing other conservation technologies that increase and sustain farm productivity.
- Engage in field level action research that address other issues on sustainable agriculture and natural resource management.
- Develop marketing strategies for agroforestry and environment-friendly farm products
- Strengthen and empower local people to think, create and initiate activities that improve livelihood as well as protect the environment from degradation.
- Share technical knowledge among researchers, extension agents, local officials, farmers, students, women, professionals, business sector, civic groups and other members of the community about sustainable agriculture and natural resource management.
- Seek technical and other forms of assistance from government and non-government agencies as well as private companies.
- Draw support from all sectors for the common interest of land care.
- Foster and safeguard the welfare and interest of its members.

IV. d Facilitation: the core of Landcare formation and development

Landcare develops through a fashion of facilitation. It is concerned with empowering groups and the institutions that work with them, to create and respond to changes that ultimately affect their well-being. A Landcare facilitator is usually assigned to facilitate group education and training, formation and networking. He/she enables the group to harness outside support, and to draw local action. He/she also conducts participatory monitoring and evaluation of the stages of group maturity and the progress of activities and projects. The Facilitator can be anybody from the local government, NGO or any service provider who may served either on a voluntary basis or as commissioned staff from a project or institution. The approach gives value to the creation of a learning environment for all key actors to understand with more depth on the why's and how's of the development process. Normally, the Facilitator begins with implementing a broad and open-ended awareness and education program. Farmers' interests are developed as they gain knowledge and skills from trainings. Changes in attitudes and practices become evident in their application of the training skills into their own farms. Through constant interaction and facilitation, groups can grow more cohesively with shared goals and aspirations.

When initiating the development of Landcare, we outline the following start-up activities, although, there are always room for improvement and creativity in developing the program.

Fig. 2 . Schematic diagram of Landcare Development



IV. e How does Landcare work?

In the beginning, groups are usually formed informally with unstructured planning and group management styles. They start with smaller goals of: acquiring knowledge and information on conservation farming, getting trainings and applying their knowledge and skills on their farms. As the groups mature, they begin to share their skills with other farmers and start to engage in community-level activities, such as, the establishment of tree nursery and implementing tree- growing programs in their community. They continue to grow in looking at broader personal and community goals, such as; farm and non-farm livelihood alternatives, river rehabilitation and community cleaning and greening programs. At this stage, some groups developed from informal to formal groups, but are still operating informally. What is encouraging is that, they come together voluntarily with more intrinsic motives, although extrinsic benefits are also highly perceived.

Most of these Landcare groups are based in the sub-villages (sitio or purok) and are federated at the village (barangay) and municipal levels. More than 6,000 farming families are involved and have successfully shared conservation farming technologies by themselves, with facilitators, or with technical resource persons. They have established more than 350 communal and individual tree nurseries. Hundreds of thousands of fruit and timber tree seedlings have been planted on the NVS, on farm boundaries, on

bufferzone of protected areas, on riparian areas, and some were planted on small-scale tree plantations. Some groups have also initiated community-based projects such as: stream rehabilitation, bufferzone reforestation, water quality monitoring and advocated for policy-reforms that support natural resource management. Some of them have also linked with other service providers, including the business sector for funding their activities. Landcare is becoming sectoral and industry-based, as more and more other sectors are getting involved. We have also initiated a program for Landcare in schools, while religious groups, indigenous peoples, professional groups and other people's organizations are affiliating to Landcare.

Local governments provide crucial political and sustained financial support to the Landcare Association, as part of their mandates and public accountabilities. The municipality has its own funds that are earmarked for activities on environmental conservation. A sizable fraction of these funds are, or can be targeted to Landcare activities that enhance natural resource conservation. The Local Government can be encouraged to develop to a formal natural resource management plan—such as the one in Lantapan which can help guide the allocation of funds. The Municipal Agriculture Office usually heads the coordination and facilitation of Landcare activities. This can be mainstreamed in their extension programs and elevated to the municipal development agenda.

The villages can also allocate financial resource from their regular internal revenue allotment (IRA) through the Human Ecological Security (HES) Program, which represents one fifth of the total development funds of the village. These funds can be used to organize the conservation teams and Landcare Association activities at the village level. The municipality of Claveria allocated 50,000 pesos (about 1,000 US$) to each village to support Landcare activities. External donor agencies can best support the development of Landcare by allocating resources for leadership and human resource development, communications equipment and transportation to enable the Landcare leaders to make maximum use of their time, and perhaps livelihood kickstarter.

IV.f The Essentials and Fundamentals of Landcare

The ability of farmers and communities, and the opportunities to work with Local Government Units and Technical Facilitators constitute the fundamental elements in the development of Landcare.

The fundamentals of Landcare are therefore represented, by the key three actors; the Farmers, Local Governments and Technical Facilitators. In particular, we refer to the "***ability to work together***" and the "***opportunity or space for working together***" as indispensable in Landcare, least it cannot exist. The ability of the key actors to work together refers to a social capital. It is significantly important in the development of any "development systems". No amount of financial or physical capital can supercede the value of relationships, trust and reciprocity—without them, programs can easily fall apart.

While working with groups, we underscore the importance of understanding the essential elements that underpin the success of Landcare. Earlier, we identified them as the facets of Landcare.

- ***Components of appropriate technological packages.*** Simple and low-cost technologies appropriate to the socio-economic conditions of the upland dwellers in relation to their biophysical environments are more readily accepted by farmers, than sophisticated and expensive technological packages. The NVS is a very basic technology where farmers can easily adopt or adapt, and evolve to more complex systems when they gain more confidence on the efficiency of the technology. Upland farmers usually lack the kind of education obtained by their lowland counterparts, therefore, they need technologies where they could easily cope to understand and implement on their farms without necessarily needing public subsidies.

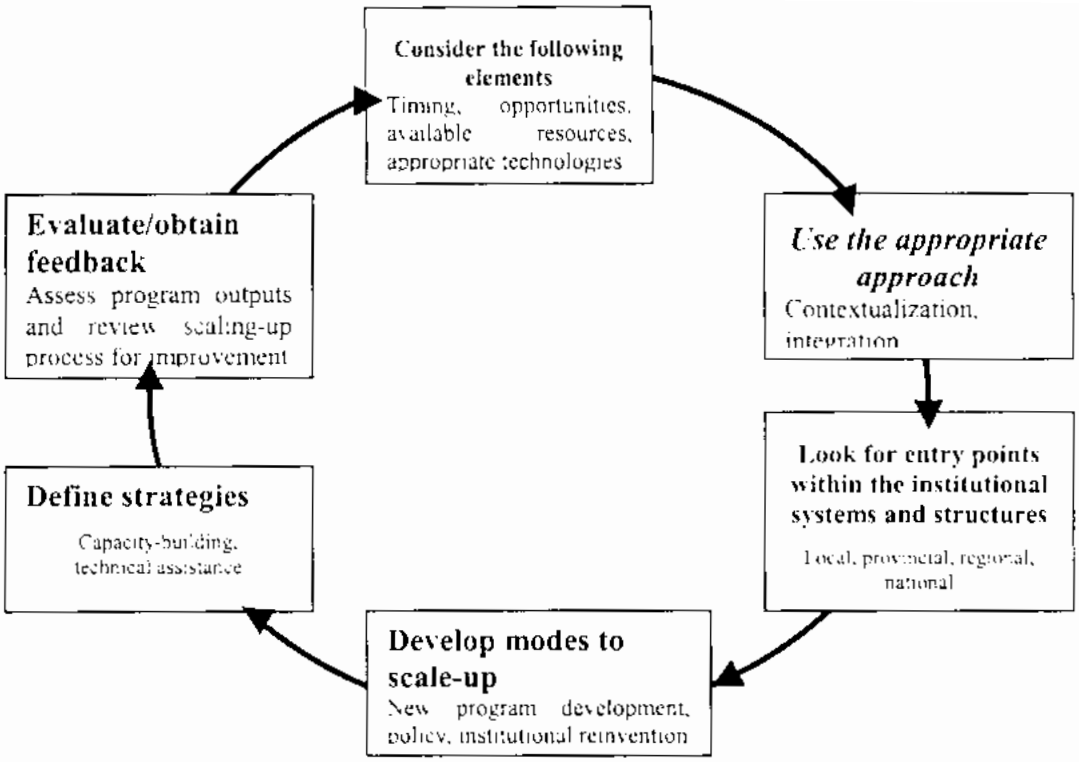
- ***Partnership-Building.*** The humble beginning of Landcare as a program with very modest funding necessitates partnership-building. The key actors recognized their own limited resources against their enormous tasks. But, they have also recognized their respective potential towards meeting common goals. The tasks are recognized to be best achieved only through resource-sharing, knowledge-exchange and or complementation of available expertise.

- ***Institution-building.*** The process-oriented approach in Landcare supports the formation of Landcare groups as "Institutions". Central to Landcare is not just the material or financial elements of running projects, but the learning experience in an environment that allows them to emerge as Institutions.

In practice, Landcare Approach adheres to basic development principles of participation, demand driven and step-wise support which forms the working values and culture of Landcare.

- **Participation.** Quality participation is an important factor in the success of Landcare. It is critical, because it hastens the building of trust and commitment, that in turn, shapes their formation, maturity and sustainability. It is recognized however, that participation has limits and may come in different forms. It also allows some delays and fatigue, but it provides the foundation for long-term sustainability, when consciously and appropriately nurtured. We are more than concern with the quality of group participation in Landcare, than the number itself. The caveat however, is that, the more you try to increase the degree of participation, the more challenging it becomes, to gain and and maintain high quality participation. Thus, when we test the different modes of scaling-up Landcare in other locations, we remain mindful on the process of formation, and spend more time in educating and norming our partners with the Landcare culture.

- Demand-driven. With limited resources though, we try to cater requests coming from different organizations for the development of Landcare. But, we encourage self-selection by our partner organizations rather than, we selecting the sites.



VI. Conclusion

Landcare as an approach provides more space to accommodate context specific conditions while maintaining the elements where it has been successful.

The development cost is efficient and effective, because it is shared by all those involved in the program. However, it is a critical challenge to uphold the basic culture of Landcare where it has made a distinct contribution to this part in the uplands. The ultimate resolution, is to maintain, if not enhance, the quality of the process and content, as it aims to reach out more farming communities that have context- specific issues under differing biophysical and socio-economic conditions. Governments and supporting private institutions can channel their investments to Landcare in a way that enhances their ability to increase their network and harness wider support.

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- Step-wise. The technogies adopted by Landcare groups come by components rather than packages, where farmers find it difficult to implement. The activities are evolving and the minimal support also comes in a drip-feeding type. This approach proves to entice more investments from the participants, and builds-up stronger commitments. Landcare invites participants and treat each other as equal partners, rather than, project beneficiaries at the receiving end.

V. Impacts, Sustainability Indicators, and Challenges

V.a Impacts so far

Landcare resulted in an unprecedented boost in the adoption of soil and water conservation technologies by farmers. Adoption of these technologies provided both short and long-term benefits toward improving farm productivity, increasing income and protecting resource degradation. Collective action of farmers at farm level have impacts on natural resource management at a landscape and community level. Beginning with shared-labor and knowledge sharing activities, farmers' interests continue to develop with wider community environmental issues and livelihood-generating initiatives. In less than two years of Landcare in Lantapan, farmers have propagated more than 80,000 seedlings of fruit and timber trees and outplanted more than 70,000 on farms, riverbanks, roads and in the bufferzone of the protected area. More than 800 farmers have adopted agroforestry systems and soil and water conservation technologies. They have also extended community development services by revegetating streams and advocated policy reforms for appropriate riverine management. The Lantapan Landcare Association has instituted long-term plans with their government accreditation as seedling producer and supplier and have bigger plans of establishing a mini-sawmill to supply a local demand of wooden boxes. In Claveria, more than 2000 farmers have successfully adopted the technologies and have also successfully reoriented the policy direction of the Local Government Unit through local ordinances that provide annual allocations for Landcare-related activities. Landcare groups were able to produce over half a million of seedlings in 36 different species of fruit and timber trees.

New municipalities that are starting to develop a Landcare Program, have clearly mainstreamed the program into their extension and development agenda. This indicates a promise of sustainability of Landcare. However, Landcare should not be expected to be a "Be-All and End-All" approach, nor should be expected to completely replace the conventional extension system. Our experience however, provided robust insights on how the potential of Landcare Approach can be widely adapted in Philippine uplands and elsewhere in the tropics as we continue to find ways to address basic issues confronting the sustainability of conventional projects and programs.

One of our major work in Landcare is to monitor and evaluate the social and biophysical impacts of the program. We therefore, develop an iterative plan for participatory monitoring and evaluation (PME). This is currently implemented and our

early observations indicate some remarkable impacts in the social and institutional dimensions of Landcare:

- Transformed norms in agricultural and natural resource management
- Influenced and challenged policies
- Improved decision-making
- Harnessed private sector support
- Drawn other local PO support (People's Organization)
- Effected the reorientation of the local extension program
- Effected the reorientation of local budgetting
- Regenerated strengths and revitalized energies which radiated to communal action

V.b Indicators to Sustainability

Sustainability is a major concern of Landcare. The success of Landcare groups is overwhelming and has exceeded beyond our expectations, but we remain mindful on the issues confronting their sustainability. We recognized that, while there are known factors attributing to the success of Landcare, there are also unrecognized and unknown issues that might defer the development of Landcare. Early on, we recognized some indicators that may sustain Landcare, as we continue to understand the loose ends to fill-in the gaps.

- *Local.* Landcare groups exist at the very local level, the "sub-village". It is more convenient for members to participate in activities at the sub-village than at the village or municipal levels. There is more interaction of members and common issues are easily identified and addressed when the members are not too spatially scattered.
- *Multi-sectoral participation.* Landcare is a farmer-led process, but its flexibility allows other sectors to participate. It is open for other sectors to directly involve or support Landcare activities. Today, students, religious groups, the business sector and professional sector are getting involve in Landcare.
- *Grounded on information, knowledge and appropriate education.* The main strategy that supported the formation of Landcare is the implementation of a broad Information, Education and Communication program. It is founded on knowledge as a basic resource in effecting lasting changes in attitudes, skills and aspirations.
- *Existing policy support.* There are now local policies promulgated to support the sustainable implementation of Landcare. Eg. A local policy promulgated in Claveria that provides incentives to farmers adopting soil and water conservation technologies and the annual allocation of local funds to support Landcare related activities.
- *Mainstreaming in the local development agenda.* The recent scaling-up efforts paved the way to mainstreaming Landcare in the local development agenda, that it brings landcare culture at the fold of the conventional extension system.
- *Central to the long-term and universal agenda of development.* Undoubtedly, Landcare forms the realization and localization of the global agenda for sustainable development.

V.c Challenges to sustainability

While these exciting developments are underway, however, the sustainability of the Landcare movement gives rise to six significant concerns (Van-Noordwicjk, 2001):

- First, given its growing popularity, the movement runs the risk of "projectising", that is, attracting the support of projects that do not understand the concept, and that provide funds in a top-down, target-driven mode defeating the whole basis of a farmer-led movement.
- Second is the issue of long-term sustainability. Networking and the stimulation from outside contacts are considered to be crucial for long-term success. This can be achieved through Landcare Federations, as has evolved locally in Claveria, and through provincial and national federations, which are currently being explored in the Philippines.
- Third, group leadership is a time-consuming and exhausting task, particularly when undertaken on a voluntary basis. Landcare is still young in both the Philippines and Australia but leadership "burn-out" has already raised concerns.
- Fourth, local initiative to achieve 'Landcare' targets can lead to less-democratic forms being used, or to pure coercion. At one stage a school in Claveria proposed that children could only graduate from primary school if their parents had adopted a soil conservation practice promoted by Landcare.
- Fifth, local government may perceive the Landcare formula as a way of achieving its targets that are not necessarily in the best interest of all farmers; where conflicts over land tenure and the presence of recent migrant farmers dominate the local agenda, a different type of organization may be better in channeling local aspirations.
- Sixth, the application of Landcare in differing conditions and in wider geographic scales , may corrupt the process, thereby losing the basic elements where it has been successful The challenge to scale-up Landcare remains in the maintenance of its voluntary-nature and therefore, mainstreaming Landcare in the government programs should be taken with a grain of salt.

V.d Challenges in Scaling-up

The challenge to scale up Landcare is enormous as it face the dilemma of diluting the strength of the triadic approach once it is introduced on a large scale. As a supporting institution, we also face the challenge of keeping our own balance sheet. This means that, when we scale-up, we should reach-out to more people, more quickly at the least cost. Scaling-up means, more resources needed, more stakeholders involved and more partnerships—and more complexities. While we are testing a variety of modalities to scale-up Landcare, we also find ourselves under the complex context roof of scaling-up. These are institutional, political, technological and methodological in nature. Being able to overcome these context roof will determine if the highest potential level of scale is achieved (Gonsalves, J., 2001). To scale-up efficiently is to build strategic partnerships with strategic allies, in which case, can not happen overnight. To overcome, the context roof, we outline the process when scaling-up Landcare (Catacutan, et. al, 2000):

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Acaylar, Glo

From: icraf [icraf@mozcom.com]
Sent: Saturday, December 22, 2001 12:25 PM
To: Gladys Buenavista
Cc: g.acaylar@cgiar.org
Subject: Re: First revision due date - 20 December

Dear Glads,

I really regret, that I am late for one day in submitting the revision. I was catching up the remaining working days before xmas break for a Research Feedbacking Session in the municipalities, and these activities really made me sick the last few days. I was incapable of doing my evening writing routine. I am not still feeling well until now. I was able to cut the paper from 21 to 19 pages including references. So, sorry. I hope, this can still catch up.

to GLO: i shall forward a final copy of this paper for your file and circulation, as soon as, Gladys is done with editing and the final version is accepted by SANREM.

best, del

At 05:19 delia 12/17/01 -0600, you wrote:

>>>>

Del,

Greetings! Just a gentle reminder that the first revision of your paper is due on 20 December 2001. I hope that you are able to meet this deadline.

Happy holidays!

Gladys Buenavista

-------- Original Message -------- Subject: conference proceedings Date: Tue, 13 Nov 2001 14:17:49 -0600 From: Gladys Buenavista <ggbuenavista@facstaff.wisc.edu> To: "Delia C. Catacutan" <icraf@mozcom.com> CC: Ian Coxhead <coxhead@madmail.aae.wisc.edu>

Dear Delia:

Greetings!

This note is in connection with the proceedings of the SANREM conference, *Sustaining upland development in Southeast Asia: Issues, tools & institutions for local natural resource management* We are pleased to inform that we are moving ahead with the production of proceedings as planned. In the past couple of months, we have submitted all papers for review. Based on the results of this process, we ask that you consider the following suggestions to improve the quality of your paper:

Title: Technical Innovations and Institution-Building for Sustainable Upland Development: Landcare in the Philippines

Comments:

1. This paper needs considerable shortening - at present is reflects thoughts running loose. The main difficulty is determining whether the success of Landcare has been due to the approach, or to the simple technologies that were crying out for implementation at the farm level. This question is not addressed, and it is assured that Landcare is responsible for the success of adoption. At one point, it is indicated that "we developed and tested a program that rapidly and inexpensively diffuses..." -- there is no evidence of testing.

2. The crucial step in terms of setting up groups is not well discussed - how does it take place:- bottom up or top down? Also, what happens along the boundaries of groups, and how are issues resolved if groups do not agree to common boundaries and have to feed into larger scale policy issues?

3. The paper sets out a number of lists of requirements for success (eg conditions and principles, essential and fundamentals, facets). The interconnectiveness of these is not discussed.

Your paper will be an important contribution to this document and more broadly to the ongoing discussion on upland sustainable development in the Southeast Asian region. May we kindly ask you to submit your revised draft on or before 20 December 2001 to Gladys Buenavista (ggbuenavista@facstaff.wisc.edu). Your prompt response would be greatly appreciated.

Thank you.

ICRAF

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The **Sustainable Agriculture and Natural Resources Management** (SANREM)
The **International Centre for Research in Agroforestry** (ICRAF)