The Agro-ecological Village Development Model: Experiences in the Philippines and China

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REAP-Canada is becoming increasingly active internationally, working with several organizations and communities on rural development initiatives including the implementation of the Agro-ecological Village development model. There are several important cornerstone design concepts of the agro-ecological approach that we would like to share, along with the experiences and lessons learned from REAP's efforts over the past 5 years.

In 1998, REAP-Canada initiated its development programming activities on Negros Island in the Philippines with Paghida et sa-Kauswagan Development Group (PDG) and the MAPISAN Farmers Alliance in Southern Negros, along with national support from the MASIPAG Farmer–Scientist Partnership network and the University of the Philippines at Los Banos. The principal funding source for the programming was a CIDA ESDP-Partnership Branch project entitled "The Southern Negros Sustainable Agriculture Development Project, which began in July, 1998 and ended in September, 2002. The goal of the programming in the Philippines was to reduce rural poverty and rehabilitate the natural environment by empowering small farmers to organize themselves through the development of ecological farming systems. One approach of the agro-ecological village programming that evolved to meet these goals was the development of training, education and field-testing infrastructure customized to address the social and ecological needs of rural farmers at the village level. In July 2002, several thousand farmers members of the MAPISAN Farmers Alliance, formed the Negros Center for Ecological Farming (NCEF), a farmer-led and scientist supported organization, as a means for farmers to play a greater role in the development of sustainable farming systems in the region. REAP has subsequently realigned its developing programming partnerships in the Philippines to respect the new farmer-led sustainable agriculture movement that is occurring. In July 2002, REAP also began a new partnership with the Alternative Indigenous Development (AID) Foundation in Bacolod, Negros Occidental. The AID Foundation works in partnership with the NCEF, and is a leading agency in the Philippines in developing appropriate technologies for meeting the basic needs of communities for food, water and energy.

The agroecological village development model is helping empower peasants in China and the Philippines to take a lead role in their own development process.

In 2002, REAP-Canada established a partnership with the Chinese Administrative Center for SeaBuckthorn Development (CACSD), a division of the Ministry of Water Resources, to pilot the agro-ecological village development model in the dryland areas of North Central China. The local project partners are the Bureau of Water Resources in Inner Mongolia and the Bureau of Water Resources in Gansu Province. The primary funding source for the 3 year project entitled "The Western China Agro-ecological Development Project" is the Shell Foundation Sustainable Communities Programme. The project aims to improve the economic and social well being of marginalized farming communities and women, while at the same time protecting and enhancing the natural resource base through the use of participatory development methods and the agro-ecological village development model. This project will also include the development of training networks, farmer education and field-testing infrastructure customized to address the social and ecological needs of the local rural farmers.

I. CONTEXT

New strategies and efforts are required to create effective sustainable rural development approaches that respond to the many challenges facing impoverished small farmers in developing nations with lasting effects. A holistic and integrated approach must be used to address the interrelated challenges facing impoverished households including inadequacies in food, health, nutrition and education, low income and issues

related to living in an environment with degrading natural resources. To reverse this cycle of impoverishment, it is of paramount importance that sustainable methods of development are introduced. Individuals, organizations and support agencies must be sufficiently aware of local conditions (Table 1) and effectively organized to work together to create self reliant, resilient and empowered communities.

Ecological restoration needs to occur as many rural areas in developing countries are becoming severely degraded. Farmers require basic training on the principles of ecology and sustainable farming. Ecological farming systems need to be further developed and seeds for these systems locally adapted and further improved. Appropriate technologies need to be introduced which can further enhance the ecological infrastructure and self-reliance of communities. The social and ecological infrastructures of communities also need to be developed in a synergistic way that creates a positive feedback for continued development and reestablishes the communication and information exchange networks.

It was to sustainably develop the social and ecological infrastructure to create empowered and self-reliant communities that 5 years ago REAP-Canada began working with international organizations and communities to develop the agro-ecological village (AEV) development model.

II. Agro-ecological Village (AEV) Development Programming Activities

An agro-ecological village is described as a community that is largely self reliant through the creation of integrated and ecological food production and energy systems. Central to this approach is the conviction that ecological land management and sound community organizing forms the basis for sustainable community development.

The adoption of this approach will improve a communities understanding of agro-ecological processes. Over time, this will:

Table 1. Examples of problem factors contributing to the impoverishment of farmers and the environment in which they live

Philippines-Negros Occidental	North Central China
FACTORS CONTRIBUTING TO POVERTY OF FARMERS	
• Struggles to gain land through the agrarian land reform program • Serious risk of crop loss from drought • Government corruption • Lack of affordable government services for education and health care • Lack of capital and training to develop their farms • Harassment by powerful landlords • Growing population and large families • Typhoons and droughts • Natural resource degradation • Lack of clean drinking water and food • Spending on alcohol, gambling, and fiestas • Lack of off farm income opportunities • Non existent to poor farm to market roads, overloaded road network	• Loss of livelihood from new grazing restrictions on sloping areas • Quantity and quality of water for households and farm operations • Lack of training and capital to develop farms • Small production area in a harsh climate • Poor farm to market roads. • Lack of off farm income opportunities • Regional and global environmental degradation
ENVIRONMENTAL DEGRADATION	
Loss of forest cover and biodiversity- 95% of the island of Negros has lost its primary forest	Severe erosion (levels of 200 tonne/ha/yr) from grazing of denuded sloping upland areas and intensive cropping of an nual crops on the highly erodable loess soils
Monoculture production systems: approximately 50% of agricultural land area is used to produce sugar cane	Loss of soil organic matter as all crop residues are completely removed from the fields (roots included) for cooking, house hold heating and livestock feeding
Woodfuel gathering and charcoal production are used for household energy at unsustainable levels	Complete absence of tree cover from wood gathering and overgrazing
Crop residue burning: approximately 90% of the rice lands and 2/3rds of the sugar cane lands are burnt each year	Vulnerability of the environment to desertification and global warming
	Loss of water from aquifers and groundwater reserves due to excessive drought and water harvesting
Erosion: Large amounts of sloping land are under unsustainable annual cropping systems.	Overuse of chemical fertilizers and pesticides
Overuse of chemical fertilizers and pesticides	Excessive and increasing of salinization of soil and water

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Table 2. An agro-ecological approach to rural development in the Philippines

Activity	Agro-ecological system	Conventional approach
Approach	• Emphasizes self-reliance and empowerment through optimal use of on-farm resources • Orientates market development towards local markets and import displacement • Minimizes human impact on local environment and biosphere • Low cost participatory development approaches such as farmer to farmer training emphasized. Focus on long term project sustainability and lasting effects.	• Emphasizes development of export markets to pay for imported goods • Communities are vulnerable to external forces and loan-dependent • Degrades local natural resources and biosphere • Top down training and development approaches
Food	Food security and improved nutrition achieved through diversified ecological farming of rice, corn, root crops (sweet potato, cassava and taro) grain legumes (peanuts, and mungbeans), seasonal fruits (bananas, papaya) and vegetables (sweet potato leaves, water spinach,eggplant, squash), eggs and fish.	Much food imported, including rice, canned and dried fish, processed foods, livestock feeds, farm land dedicated to sugar cane
Soil tillage	Carabaos (water buffalo) used, tillage reduced through use of perennial crops and ratooning of rice and sugar cane	Tractors and fossil fuels, heavy reliance on annual crops
Seeds	Community seed banking of open pollinated seeds, new seeds assessed in trial farms, farmer driven participatory plant improvement	No local adaptation trials, plant improvement or seed saving. Imported hybrid seeds dominate plantings
Soil Fertility	Maintained through minimizing soil erosion, decomposition of crop residues, introduction of N fixing sugar cane and rice cultivars, crop rotation, nitrogen fixing legumes, azolla, mudpress (byproduct of sugar cane milling), carabao dung, rice hull ash.	Urea, phosphorus and potassium fertilizer
Insect and disease control	Biological control strategies, resistant cultivars, balancing soil fertility with the crop, planting rice in an east-west orientation and wider row spacing,	Insecticides and fungicides
Weed control	Mechanical weeding devices, crop rotation, balanced soil fertility management, crop residue mulching	Herbicides and tillage
Irrigation	Use of ram, treadle and bush pumps for irrigation	Gasoline and diesel powered irrigation pumps
Household cooking	Use of rice hull cookers, efficient wood stoves, biogas, all fuels farm-derived	LPG fuel stove, open fire cooking, kerosene as fire starter
Marketing	Emphasis of internal self-reliance and import displacement with value-added processing	Monoculture production, products sold to distant markets
Finances	Indebtedness minimized because food security is achieved, low input use from ecological farming Several cash crops are sold through various periods in the year	Heavy debt load at usury rates for high input requirements of monoculture cropping of sugar cane
Training	Participatory Approaches emphasizing Farmer to Farmer training on ecological farming systems	Limited training of farmers using top down government trainers teaching high input farming methods.

• Increase the capacity of local communities to manage their resource base in a sustainable manner
• Provide farming families with food security, improved health and increased income with a reduced dependence on outside assistance
• Enable more active participation of women in decision making on farms and in communities
• Reduce soil erosion and ensure the long-term capacity of the land for food production
• Improve surface and ground water quality and quantity
• Minimize the use of synthetic pesticides and reduce health risks to food producers and consumers
• Help protect and restore biodiversity
• Decrease greenhouse gas emissions through reduced fossil fuel use and minimized crop residue burning

The general characteristics of an agro-ecological village in the Philippines are outlined and compared to conventional approaches in Table 2. (Note: A similar chart is available for the dryland areas of China)

Filipino women working in the sugarcane fields in Negros Occidental.

Some of the main AEV project activities that have been undertaken (or are planned) in the Philippines and China include:

1. Baseline data gathering and surveys/case studies: This information provides the background for measuring progress in a community and provides an initial assessment of the local situation. Data is gathered from approximately 30 households per community and includes information related to income sources, food systems, farm production, schooling, housing, family health and gender issues.

Indicators that measure progress in communities are key components assessed during the baseline date gathering. They can be developed with the community through a Participatory Rural Appraisal (PRA) process. Ideally a participatory monitoring and evaluation system can be established where communities identify and track key indicators for measuring community progress.

2. Institutional Building Process: A number of approaches can be taken to enhance community awareness and organization.

Sensitization: Communities can become more aware and understanding of their local situation through a process of sensitization and exposure by community organizers. This process enables community members to share their historic situation and present-day concerns. They then can begin the process of identifying barriers for their development and ways to overcome them. Beneficiaries can also be made more aware of outside factors that may affect them such as international trading practices and climate change.

Participatory Rural Appraisal (PRA): To begin a more systematic understanding of the development needs of communities, a process of community self-examination can be undertaken by people with experience in group facilitation. PRA facilitators can use tools such as resource mapping, seasonal calendars, Venn diagrams, transect walks and mobility maps to deepen the beneficiaries understanding of their villages and individual farm situation. The PRA also furthers the process of building trust and understanding and improves communi-

cation between project staff and beneficiaries.

Community Organizers: Local people with effective interpersonal skills need to groundwork the project with beneficiaries. This may involve the investment of significant energy in the community and working with key community leaders who can collectively break apathetic attitudes that may exist. The organizers can work with beneficiaries to identify the various tasks to be managed by the community and work to gradually increase responsibilities of beneficiaries as they gain confidence, experience and capacity in managing their own affairs.

Villagers from Dingxi Community, Gansu Province, China

3. Farmer to Farmer Training: Locally adapted ecological farming training modules need to be developed. An introductory course can cover subjects such as principles of ecology, soil fertility, soil and water conservation, cropping systems (crop rotations, multiple cropping, intercropping etc), forage management, weed management, pest and disease management. More advanced courses on crop and livestock production and other subjects can follow based on feedback from the PRA and following assessments of the introductory training programs. The courses are delivered using participatory methods and using farmer trainers through a peer education approach. Typically, several first liners (experienced farmer trainers) can be used for faciliating the training along with support from a second liner (farmer trainer in training). In this way, an ongoing process of trainer development and mentorship is encouraged.

4. Farm Planning: Following the introductory training in ecological farming the farmers go through a basic farm planning process. It provides them an opportunity to better assess their goals and objectives and to do a more systematic planning to achieve their targets. During this exercise, farmers have peer support from other farmers in the community and the farmer trainers. The goal is not to make a complex fixed farm plan, but for farmers to begin the process of planning to better utilize and organize their on-farm resources and management skills. The basic overall plan can evolve through experience and be adjusted to local climatic and market conditions.

Introducing appropriate technology tools like rice weeders can help enable peasants to convert to ecological farming practices.

5. Farm Development:

Crop improvement programs: An important strategy for creating self reliant communities and advancing ecological farming is to introduce plant material improvement programs with local farmers groups. A common approach is to use farmer-run adaptability trials to test a large number of plant materials for their suitability to the local environemnt and growing conditions in different areas. Farmers can then share the results of these trials through their farmer to farmer training network and can also provide on the job coaching with mentoring of farmers to follow up on training ac-

tivities. Farmer-led plant breeding programs have evolved in the Philippines with rice and corn. REAP has been successful in Negros in working with farmers organizations to identify cultivars of nitrogen fixing sugar cane and helping support development of ratooning rice varieties managed under SRI (System of Rice Intensification) that are more nitrogen use efficient. These eco-technologies can have significant long term impacts on reducing farm expenses and increasing productivity levels while enhancing soil fertility and mitigating greenhouse gases.

REAP-Canada Western China Agroecological Village Development Officer Claudia Ho Lem (left) conducting survey of villagers in China.

Appropriate technology equipment: Through the PRA process, communities can largely identify their most urgent and basic technological needs. They can also be slowly exposed to new technologies from outside the region. An assessment can be made of various options that are available to meet their needs and to gradually work with communities to assess the more promising options and further improve them. Facilities can also be constructed enabling communities to control their own production of new or local technologies. In Negros, REAP tested solar cookers, biogas systems, improved wood stoves, hay boxes (heat retaining devices) and rice hull cookers to help resolve the fuelwood crisis. Based on feedback from communities, rice hull stoves were chosen for further development. REAP subsequently produced the Mayon Turbo stove, a low cost, advanced combustion rice hull stove. Approximately 5000 rice hull stoves have now been introduced at a cost of $11 CDN/each in the Western Visayas region of the Philippines.

Microcredit Programs: Farmers in both the Philippines and China lack access to credit. However credit should be of the last things introduced during the project timeline and the least emphasized componet of a development orientation towards greater self reliance. After a community is sufficiently organized, credit programs can be provided to members based on their farm plans. Emphasis can be made on providing loans for tangible assests such as basic farm tools and animals for draft power. These loans are less risky than loans for inputs such as seed or fertilizer which are quickly utilized. In some instances, it may be necessary to provide loans for farm work during non-harvest periods if food security problems impair the ability of community members to develop their farms because of malnourishment.

III. Challenges and Lessons Learned:

Philippines: Overall, the implementing agencies and farmer beneficiaries and organizations have appreciated the developmental impact of the AEV programming. Aside from the loss of one key staff in the Philippines (who left the project because his family was facing harassment problems in his home area), the project was implemented relatively smoothly and no major barriers were experienced. One obstacle encountered in the Philippines was the slow loan repayment when the impoverished farmers had minimal income during the lean months of non-harvest or when poor weather conditions occurred.

The choice of community and staffing appeared to play key roles in the successful implementation of the project, along with the initial selection of the local project partner. It has been observed that it is essential for staff to create strong relationships with the community, gain their trust and understand their needs. The AEV project was particularly successful in the Mabuhi-pa community in the Philippines. Some of the reasons for this appear to be:

- Mabuhi-pa organization had sufficient background organizing to begin the project implementation
- A strong local community organizer lived in the community
- Strong support from the local NGO partner who had several staff with significant experience in community organizing and a similar developmental orientation

- A highly experienced farmer trainer (who has a model farm) that worked with the community and lived adjacent to it
- Strong project coordination from several staff with gregarious and enthusiastic personalities, good facilitation skills, and positive and focused energy for empowering and team building in the communities.
- The project was implemented in an area of Southern Negros where significant capacity already existed amongst local farmers and organizations in sustainable agriculture systems and farmer-to-farmer training.

China: In China the AEV model is at an early stage of implementation. Our main concern in the first year has been to strengthen capacity of local partners and farmers in participatory development processes and to develop appropriate training modules. However there is limited experience in working with farmers groups in farmer-to-farmer training networks and participatory methods. Some of the farmer groups are also somewhat passive recipients of development assistance as the government has been providing them with relatively strong support services and they have been following the government's lead. Most farmers have received limited education and training but are eagerly seeking out new information. Both the government staff and farmers recognize farmer-to-farmer training as an efficient means for information to reach larger numbers of farmers. They also recognize the increasing role of farmer leaders in community development. Our experience to date in working with the Chinese government staff is that it is relatively easy to get things done when the government decides it wants to do something. There appears to be a great sense of pride and accomplishment in making a successful project that can contribute to positive change in the region and subsequently for China. The local partners have been diligently working to implement soil and water conservation measures in the highly eroded dryland environment of north central China and the results achieved to date are impressive with large areas now under field contouring. The sloping lands are being revegetated with nitrogen fixing shrubs and naturally regenerating grasses. Technological interventions that have been successfully introduced include soil contouring, passively heated greenhouses (with night covers), biogas systems, solar cookers, and underground water cisterns. The main challenge of the project is to integrate this technical experience into a larger developmental framework. A new level of effort needs to be made in China to develop staff with expertise, experience and interest in working with communities to develop their farming systems ecologically and to develop the social infrastructure of the communities through community organizing.

The agroecological village development approach facilitates the development of diversifed and self reliant farms that enable impoverished households to improve their quality of life and the environment in which they live.

IV Conclusions:

Overall, the AEV approach is a logical evolution for rural development programming that provides a more holistic and comprehensive approach for nurturing sustainable community development. Communities (rather than land areas), need to be used as the basis for sustainable rural development. Communities need to be ground worked before project implementation can begin. Village groups can be highly engaged in participatory processes through the PRA, farmer to farmer training and advisory networks for plant improvement. Through a step by step process, communities can be empowered to take ownership of their own development. Technological innovations can be introduced through both ecological farming systems development and innovations in appropriate technology. Development workers need to facilitate the strengthening of both the social & ecological infrastructure needs of communities. A positive feedback cycle can be created for social and ecological infrastructure development that can create genuine sustainable community development and the full empowerment of farmers and their support organizations.