CHAPTER 3

SUMMARY OF THE EVALUATION OF

THE ECOLOGICAL AGRICULTURE TECHNOLOGY PROJECT

MAJOR HEADINGS:

1. Project proposal
2. Evaluation terms of reference and methodology
3. Data on target villages and activities undertaken
4. Summary of environmental agricultural extension activities and analysis of results
5. Recommendations of villagers regarding village development
6. Attitudes of the villagers toward the project
7. Analysis of targets, objectives and activities
8. Review/improvement of the operating plan
9. Targets and directions for future activities

I. ECOLOGICAL AGRICULTURE TECHNOLOGY: EAT

A. BACKGROUND

The McKean Rehabilitation Institute first developed a plan for agricultural development in 1981 with activities in various areas, including livestock, cattle and buffalo banks, revolving funds, in order to rehabilitate patients who came from rural areas. In 1983, the agricultural development section became interested in alternative agriculture as a means to solve problems of farmers. To this end, the On-Farm Demonstration Project was begun with trial and applied activities in the areas of soil and water conservation, crop rotation, crop nutrients with farmers having a role in the project. In operating the OFDP it was found that farmers were interested in crop pest management using alternatives to chemical pesticides. From this was born the natural plant protection project which was undertaken cooperatively between the McKean Rehabilitation Institute and the Appropriate Technology Extension Association. These two organizations worked together with farmers in two areas: (1) collection of applied data regarding use of crops, for example, insecticides, reduced use of chemicals, control of insects in paddy rice fields, soybeans, garlic, ginger, vegetables (2) cooperation with persons working with herbal medicines in Thailand for exchange and assistance in expansion of the technology.

When the appropriate agriculture technology demonstration project and the natural pesticides project ended, it was necessary to have a continuing program to extend the use of the activities from the old project and to gather the information from those two projects.

B. MAIN GOALS

1. To increase the economic security of the small farmers in the lowland and upland areas.

2. To improve the environment by using appropriate ecological agriculture practices.

C. OBJECTIVES OF THE PROJECT

1. To conduct applied testing and modification of appropriate environmental agricultural technology.

2. To allow people joining the project to improve their management skills and improve agricultural production.

3. To have farmers grow enough produce for their own household consumption.

4. To make project participants knowledgeable about ecology in the community and in their agricultural fields and orchards.

D. TARGET GROUPS

The project will deal with individuals and groups which are broader than the village level or groups which have regular contact with McKean Institute. These groups include:

1. Households which have had contact with McKean before.

2. Households in nearby communities and Christian churches which are established in the region. (Households and churches in nearby communities.)

3. Individuals or households which have received rehabilitation assistance from McKean.

4. Households which have had contact with Christian Children's Fund (children's help projects and poor households) (CCF) at McKean Institute.

In each group/ village in the target area it was found that the proportion of women working in agriculture was increasing. This shows a trend that women will increasingly be involved in field work, so a plan was made to increase the number of female village communicators.

In addition, the project will expand to include farmers who are related to other NGOs in the upper north.

E. ENVIRONMENTAL CHARACTERISTICS AND PROBLEMS OF PERSONS JOINING THE PROJECT

Geographic and Climatic Characteristics

Villagers and farmers joining the Environmental Agriculture Project live in valleys and on upland areas in the upper north. Upland areas means areas which are between 100 and 500 meters above sea level along important rivers. Those located along mountain ranges between 500 and 2,500 meters above sea level are considered highland areas.

The climate is tropical. The cold season is dry (December to February).

Rainfall is 1,000 to 2,000 mm. per year (between May and November).

The rainiest months are August and September.

The temperature is not too hot or too cold. The minimum temperature in the cold season is 10-15 degrees Celsius (December-January) and maximum is 35-38 degrees (March-April).

The geographic features of the area are hills, with a slope of 2 to 25%. The soil is sandy loam, Red-Yellow Podzolic, pH 5.5 to 6.5. Most of the area is mixed deciduous forest, new dense forest, natural growth and planted crops.

The main agricultural crop is rainfed rice.

Problems Faced by the Communities

Communities in the north have an on-going problem related to control of land use, tree cutting and forest destruction. These problems have increased because of the government's development policy. This has resulted in the following change in practices which has had an adverse effect on the groups which are connected to the project:

1. Purchasing of land by wealthy persons and maximizing profits.

2. Using more upland areas for agricultural production.

3. Contract agricultural production with businesses.

4. Farmers seek employment as laborers outside the village.

Reduction in Soil Quality and Environmental Problems

Land is being used repeatedly until the quality deteriorates and erosion has occurred to the point that this is considered a major problem. Natural production of vegetables has been reduced. Because it is necessary to continue agricultural production, the reduction in soil quality and erosion of topsoil has resulted in the following problems:

- The quality of the crops has decreased.

- The fertility of the soil is being rapidly reduced. Natural fertilizer in the soil is being rapidly reduced.

- The soil is dry to the point of cracking.

- Crop diseases.

- The water-holding capacity of the soil is decreased.

Other environment-related problems have their root cause in the increased use of chemicals which is, in turn, a result of increased agro-industry.

Land Ownership

The rate of land ownership has recently changed dramatically due to profit maximizers and investors who have purchased land from farmers who have little power in determining prices. The result is that many farmers now must rent land and some don't have sufficient land for agricultural production.

Debts

When farmers are not able to produce enough crops, they get into debt. Farmers try to solve the problem by trying other occupations such as charcoal making, shifting cultivation, illegal tree cutting, etc. The lives of farmers who rent land to farm are controlled by the rich investors or the landowner; they must use excessive amounts of purchased inputs in growing crops.

F. PROJECT ACTIVITIES

The following environmental agriculture and natural vegetable production activities were of considerable interest to farmers from both earlier projects and new farmers from nearby areas.

1. Agro-forestry

   - Intercropping fruit trees and other useful trees with field crops and orchards.

2. Planting bushes along the contour, e.g., pigeon pea.

   - Finding other species of plants other than *Leucaena* such as *Gliricida sepium*, Indonesian *Leucaena* in order to protect against topsoil erosion while providing natural fertilizer and livestock fodder.

3. Using available material as soil cover.

   - Using available material to reduce the degradation of soil quality and soil erosion.

4. Using cover crops and green manure.

   - Planting vines in upland rice and corn fields.

5. Using biological pest control methods.

   - Planting crops to improve soil quality and control weeds as part of an integrated pest management program.

6. Kitchen gardens.

   - Planting many different crops in the same field.

   - Developing plans for planting kitchen gardens.

   - Making compost near the vegetable garden and planting crops in alternating strips.

7. Planting crops which are appropriate for the characteristics of the area.

   - Planting crops which are appropriate for the characteristics of the area and the climate.

8. Intercropping and crop rotation.

   - To maximize usage of available land, including rotation of minerals crops need.

Activities can be divided into four groups as follows:

1. Data administration and dissemination

Objectives

1. To provide knowledge and local and exogenous experience to persons joining the project.

2. Arrange media and information dissemination among target groups.

3. Assist with exchange of technology among target groups and other private sector units.

Activities

1. Create, collect and collate media including documents, movies, photographs, videos and translation of documents.

2. Conduct activities in conjunction with NGOs in planning improvement of documents, printed matter, posters.

3. Subscribe to local and international publications. Purchase videos and books related to agricultural technology.

4. Disseminate media.

5. Prepare and conduct surveys and interviews including expanding networks. Distribute and collect data in the agricultural development section of McKean.

Expected Results

1. Library and documents in the office of the agricultural development section.

2. Target group and persons contacting the project receive the information they desire. This information would be provided or sold as appropriate.

3. Establish a data center at the McKean Institute.

4. Farmer's groups and project staff have opportunities to meet and exchange ideas.

5. Farmers and NGOs have the opportunity to interact and establish networks.

2. Agricultural activities of the Agricultural Development Section

Objectives

1. To provide management assistance to farmers.

2. To conduct agricultural tests and demonstrations at the McKean Institute.

3. To provide training by the staff of the Agricultural Development Section.

Activities

1. Produce tree seedlings including flowers, fruit trees, legumes and plant agro-forestry trees.

2. Plant conservation crops, orchards, vegetables and herbal crops for study and observation and produce seeds.

3. Distribute seeds. Improve nurseries, seed storage facilities, and seed storage methods.

4. Provide small training on technology including plant propagation, growing natural kitchen gardens, and using herbal crops.

5. Conduct trials and demonstrations of the crops of the farmers in the Agricultural Development Section including the production methodologies used at the McKean Institute. Plant crops in rows in valleys and plan orchards.

6. Assist non-project participants to study and observe agricultural activities in the Agricultural Development Section.

Expected Results

1. Project participants and cooperating individuals will receive tree seedlings and seeds.

2. Reduce losses of stored seed. Have good quality seedlings.

3. Project participants will receive training and observe agricultural activities in the Agricultural Development Section.

4. Report results and progress of trials and demonstrations.

3. Extension and Training

Objectives

1. To have farmers and project staff receive sufficient advice to allow them to employ and improve on appropriate agricultural methods.

2. To provide farmers assistance with conservation agriculture.

Activities

1. Survey the existing situation and desires of the farmers. Formulate a detailed methodology plan and schedule.

2. Provide training, subject matter meetings and study tours outside the project area for project participants, visiting and work groups.

3. Conduct crop bank, seed bank and locally produced seedling activities .

4. Construct small nurseries in the villages.

5. Provide assistance with demonstrations and dissemination.

6. Assist with budget and short term loans for individuals for use in purchasing food during the planting season or the harvest season (as many as desire up to the specified limit).

7. Project staff and village communicators are established as disseminators, advisors to non-project participants.

Expected Results

1. Reports on the characteristics of farmers.

2. Village level plan and evaluation meetings.

3. Extension activities employing farmers' methods for farmers.

4. Subject matter meetings, training and study-tours.

5. Farmers consolidate advice from the project and their own experience and use this conservation agriculture technology.

6. Have demonstration plots and demonstration signs which are of good quality.

7. Established small nurseries in the villages.

4. Research and Trials

Objectives

1. To research and test work methods and steps to apply biological pest controls.

2. To compare and apply conservation crops as cover crops and to improve soils.

3. To improve environmental agricultural methods as appropriate.

4. To improve the technology of producing small household gardens.

Activities

1. Testing and trials will be an on-going activity to allow the activities of the project to demonstrate appropriate agriculture/control of plant pests using natural methods. The activities will be satisfactory or will be modified according to new advice from the concerned project unit. Research and testing may be conducted within the grounds of McKean and application testing may be conducted elsewhere, with farmers joining in the tests in their own fields outside the McKean facility. When necessary and appropriate, this will be done inside McKean or if it is appropriate and fits with the section, it is possible to conduct application testing in the McKean area.

2. Obtaining herbal crops and propagating crops in the villages and in the McKean Institute.

3. Making plans and study tours.

4. Gathering data on soil quality and fresh weight of soil-improving crops.

5. Arranging cooperation with farmers to do tests and application trials.

6. Selection of target crops. Preparation and use of herbal crops.

7. Making plans about kitchen vegetable gardens.

Expected Results

1. Report on progress and results of research trials.

2. Have demonstration plots and demonstration plot signs of good quality.

3. Have advice and provide information for dissemination and extension.

4. Farmers have the ability to conduct tests in small plots.

G. THE TARGET AREAS

The target areas can be divided into two categories. The first is the eight main project target villages:

1. Ban Taendokmai, Mu 2, Tambon Chiang Dao, Amphur Chiang Dao, Chiang Mai Province.

2. Ban Maelod (Nua - Tai), Mu 10, Tambon Sobping, Amphur Mae Taeng, Chiang Mai Province.

3. Ban Salok, Mu 9, Tambon Maepak, Amphur Wangchin, Phrae Province.

4. Ban Den, Mu 14, Tambon Maepak, Amphur Wangchin, Phrae Province.

5. Ban Chiwitmai, Mu 5, Tambon Papai, Amphur Li, Lampoon Province.

6. Ban Maewaen, Mu 8, Tambon Jaechon, Amphur Muangpan, Lampang Province.

7. Ban Traisapawakham, Tambon Chiang Dao, Amphur Chiang Dao, Chiang Mai Province.

The second is the three research villages which will be main target villages in the future (1994-1997):

1. Ban Sanpapo (Chokechaipattana), Mu 9, Tambon Sansli, Amphur Wiang Pa Pao, Chiang Rai Province.

2. Ban Daenmuang, Mu 6, Tambon Sribunruang, Amphur Chiang Khong, Chiang Rai Province.

3. Ban Sriwichiar (Kodpawai), Mu 13, Tambon Nanglae, Amphur Muang, Chiang Rai Province.

H. IMPLEMENTATION METHODOLOLOGY

As mentioned previously, this is a project which brings together activities and is a follow-up to two projects as noted, i.e., OFDP/ACPP and joined in the activities of

OFDP/ACPP. The general structure of the project in improving and disseminating agricultural technology shows the importance of the following four steps:

Step 1

Selection of target areas/ assessing the capabilities of the farmers

Step 2

Planning the method for applying the technology

Step 3

Proving the technology by trials in farmers' own fields

Step 4

Testing the technology in many fields and dissemination of the information

Under the central focus of the project, environmental technology, the main thrust will be on dissemination and extension activities. However, if the evaluation results dictate or if new groups join the project, it is possible to return to Steps 1 and 2 as appropriate.

II. EVALUATION FRAMEWORK AND METHODOLOGY

Evaluation Objectives

1. To review the results of project environmental agriculture activities.
2. To provide a summary of evaluation recommendations to act as a guide for improvement of the project in the future.
3. To establish the methodology for joint acquisition of knowledge with villagers as the central point.

Evaluation Methodology

The evaluation of the environmental agriculture technology project was a participatory evaluation between the villagers in the target communities, project staff

and the Agriculture Development Section and the team of external evaluators learning together. The emphasis was on villagers having a role in summarizing the results and in providing directions for cooperative action in the future. The evaluation had three phases as follows:

Phase One. Project officials and the external evaluation team together reevaluated the project objectives, established measurement indicators and developed the evaluation framework and the steps involved in the evaluation procedure.

Phase Two. Data gathering with the community leaders and villagers in the target communities by providing three village forums.

Phase 2.1. Focused on leaders and representatives of 11 villages. The cooperative forums were at two central points spread over the area.

Phase 2.2. Data gathering in the 11 target communities.

Phase 2.3. Providing a forum for implementation staff focusing on project operating methodology. Attitudes and ideas of the staff on all aspects of the project were sought.

Phase Three. Summarizing, checking and analyzing information received from the various forums for preparing a project evaluation report.

Note: When the evaluation is completed, a forum will be provided for village communicators in the target communities to present the evaluation results. This forum will be to specify the cooperative work plan following the directions provided later in this report.

From the evaluation procedure it can be seen that it was a tri-partite effort, with each party involved in every step, with emphasis on the different roles as follows:

Role of villagers in the target communities

Joined in the evaluation of the project regarding skills of the villagers through village forms established for the purpose of:

- Summarizing the results of project activities
- Jointly determining future directions

Role of the project

Jointly evaluating the project.

- Facilitating the evaluation in all areas for all concerned.
- Establishing forums for villagers and project staff in the data gathering process and presenting the evaluation results.
- Reviewing, summarizing and analyzing the evaluation results.
- Preparing the evaluation report in the English language.

Role of the external evaluation team

Jointly evaluate the project in the following roles:

- Facilitate the implementation of the evaluation according to the jointly prepared evaluation plan.

- Jointly establishing forums for the villagers and project staff.

- Writing the evaluation report.

III. BAN TRISAPHAWAKAM

Mu 5, Tambon Pingkong, Amphur Chiang Dao
Chiang Mai Province

A. GENERAL SITUATION

This village was in the past a leprosy village, established in 1955. At present it is under the support of the New Life Foundation. There are 217 households and 618 residents of which about 60% of the households include a former leprosy patient, another 24% include children and grandchildren of former leprosy patients. The remaining 16% are households with no leprosy connection. The majority are Christian, followed by Buddhist and Muslim.

The village is located 400 meters above sea level about 78 kilometers from Chiang Mai Province on the Chiang Mai-Fang road. The area of the village is 965 rai, broken down into living area - 40 rai, agricultural area - 875 rai, and unused land - 50 rai. The majority of the land is upland and has only the Saw Thaw Kaw (land use rights).

The major occupation is agriculture, growing corn, cotton, peanuts, mangos and oranges. Other occupations include hired labor work.

B. ACTIVITIES

The entry point into this village was that an official knew a farmer, Samran Nipiththa, there who was interested in conservation agriculture. He had contacted the project and had attended training on a regular basis. In addition, coordination was accomplished with the teacher of the Chiang Dao Welfare School in the area. In this village the fruit tree growers group and the fruit tree cooperative group were strong. This is an area where the project had taken people for study-tours. This village, a main village of the project, was confident in its agricultural production, planting mangos. As a result, there was not enough land for ecological agriculture or for planting field crops and project activities were limited.

1. Ecological Agriculture Projects

1. One farmer used cover crops and green manure for soil improvement in his mango orchard on one rai of land. The result was improved soil quality. Traditionally, farmers have planted lab-lab beans as a cover crop.

2. Planting crops in conservation strips. Making contour strips then planting fruit trees in between field crops was done at the Old Age Rest Home on one rai with children practicing marking contour strips and broadcasting field crops.

- Crops planted in strips: *Leucaena spp.*, pigeon peas, *Cassia spp.*
- Field crops planted: corn, cotton
- Fruit crops interplanted sweet tamarind

It was found that aphids attacked the *Leucaena*. The person caring for the fields cut down the contour strips as the aphids were destroying field crops. This activity was not undertaken in subsequent years.

3. The use of natural pesticides in place of chemical pesticides was begun before the project started in fruit tree orchards in the year 1989. At first five people used this method, but only one has continued to use the method regularly on five rai. The project introduced fragrant lemon grass from this village into other areas.

2. Training/Study-tours

- 30 people attended training on the use of herbs in fruit orchards.
- Study tour of conservation agriculture/integrated agriculture attended by village representatives and other interested persons.
- Training for village communicators.

C. PROBLEMS/OBSTACLES

1. Villagers show little interest. Most still prefer to use chemicals. It is difficult to change villagers' attitudes in a short time.

2. The project has not operated at full capacity and few farmers are interested, so they don't join in activities very much.

IV. BAN MAELOD NUA

Mu 10, Tambon Sobpherng, Amphur Mae Taeng
Chiang Mai Province

A. GENERAL SITUATION

Ban Maelod Nua (Christians United for Development) was established in 1934, and is now 60 years old. The leaders of the first group leaders were Elder Huen Kwangkhwang, Elder Chuen Upnanth, Elder Pan Thahan, Elder Thur Kanchuay and Elder Nuan Phahan who moved from Ban Nong Wua (Christian Nong Bua) in order to find fertile land to cultivate. It is a small village of northern Thai people with some hilltribes as well.

There are 30 houses and 35 households, for a total of 116 people.

The majority are Buddhist, with some Christians as well.

B. PHYSICAL FEATURES

Location. Ban Maelod Nua is located on level land, about 600 meters above sea level in the boundary of Doi Suthep-Pui National Park. Houses are located in a group. The total area is 870 rai, with 40 rai for living area, 800 rai for agriculture, 10 rai of public land and 20 rai of unused land.

Geographic position.

On the north	bounded by reserved forest boundary
On the south	bounded by Ban Maelod Tai
On the east	bounded by Ban Bang Hang
On the west	bounded by Ban Pha Taek

Geographic features. The village is in an upland area surrounded by mountains. The agricultural areas are in highland areas with an average slope of 15%.

Water sources. The Maelod Stream, located to the east of the village is the natural water source and has water the entire year. Villagers can make full use of the stream. In addition, the villagers have a mountain pipe system which provides water for household use and for agriculture. Drinking water comes from four shallow dug wells.

Land tenure. The majority of the land is homesteaded land with Saw Thaw Kaw land use rights.

Mountains and forests. Most of the forest is in good condition. Forest to the north and west is used as a source of wood for local use, fuelwood and of food.

Communication. Ban Maelod Nua is located 53 kilometers from Chiang Mai City along the Chiang Mai-Fang road, Mae Malai-Pai branch. The road to the village is soft dirt. Transportation is difficult in the rainy season which has an effect on villagers' opportunity to send crops to market.

C. COMMUNITY FACILITIES

Churches. The Christian Development Church was established on 11 December B.E 2520, with villagers constructing the building with support from the local Christian Region. The church was built to serve as a central place not only for religious activities but also for traditional activities and village development such as Sunday worship, traditional festivals, meetings and training/seminars.

In addition, there is a village temple which is located 800 meters from the village. It is not a real temple, but rather a place for Buddhist monks to teach and to rest temporarily.

The village does not have electricity.

D. OCCUPATION

The major occupation is farming. The main crops grown include tea, coffee, banana, lychee, peanuts and rice. Secondary occupations are working as laborers

outside the village, working for the King's Initiative Project which is located in the village and canning bamboo shoots.

E. GROUPS AND VILLAGE LEADERS

1. **Women's groups and housewife groups.** These groups were established by Christian Region 1 Chiang Mai-Lampoon. The chairperson of the group is Mrs. Somsri Yawa. Group activities are not yet continuing on a regular basis. Activities of the group are mostly related to religion rather than occupation.

2. **Young people's groups and young men/young women groups.** These groups were established in 1991 by Christian Region 1. There are 38 members. The chairpersons are Mr. Chanchai Nadam (young people's groups) and Mr. Winai Upanan (young men/young women group). Most of the group activities are related to traditional activities.

3. **Medicine and medical supplies fund.** Operated by the Young People's Group.

4. **Savings Group.**

5. **Conservation Farmers' Group.** This is an informal group which began in 1991 and has 25 families as members. There is a coordinator and a village communicator who are group leaders. Interests include contour planting, conservation cropping, and trees.

6. **Mountain Water System Group.** This group was begun in the middle of 1993 and has 18 members. The reason for the formation of the group was that farmers wanted to grow vegetable crops year round and there is a stream not far from the planted area. The group asked for budgetary assistance from the German embassy with and agricultural technology project assisting with coordination. At present, farmers plant field crops and vegetable crops as well as fruit trees, emphasizing chemical-free production and selling through alternative markets in the north. Crops are transported to the Muang Mai Market in Chiang Mai Province by individual farmers. In the future, the group will manage a revolving fund which was provided in order to purchase materials for the establishment of a mountain water system.

V. *BAN MAELOD TAI*

Mu 10, Tambon Sobpueng, Amphur Mae Taeng, Chiang Mai Province

A. GENERAL SITUATION

Maelod Tai Village is located next to Maelod Nua and is under the same administrative jurisdiction. Villagers are Pwo Karen, a total of 30 houses, 31 households, and 137 residents. The majority are Buddhist, with only a few Christians.

The village covers an area of 120 rai, of which 30 rai is residential area, 79 rai is agricultural area, and 11 rai is unused-public land. Land use rights is under Saw Thaw Kaw.

The village is 77 kilometers from the provincial capital city.

The major occupation is agriculture. Major crops include: rice, corn, coffee. Supplementary occupation is hired laborer.

B. GROUPS

1. **Rice Bank Group.** This group was formed in 1982 as a joint effort between the Christian Church and Christian villagers. It ceased operation after three years.

2. **Conservation Farmers Group.** Four members join with the Maelod Nua group.

C. ADMINISTRATION

The village headman is Mr. Prayun Thahan, who is responsible for both Maelod Nua and Maelod Tai. There is a ten-person village committee including three representatives of Maelod Tai. There is a religious activities committee of 8 people.

D. EXTENSION ACTIVITIES UNDERTAKEN

The project stressed conservation farming groups in both villages at the same time, not separating the two village groups. All participants in the activity are Christian. At first, Uncle Un was the focal point as he is a villager who had connections with the institute before.

1. Environmental Farming Activities

Technology	Number of farmers	Area	Year activity begun	Results
1. Crop Rotation - rice, corn, beans	8 total 6 from Nua, 2 from Tai	8	1993	
2. Intercropping fruit trees in field crops	18	15	1993	Newly opened lands for field crops. Project provided fruit tree seedlings
3. Contour planting strips. Plants include: pigeon pea, *Leucaena spp.* which are planted between crop strips	4	20	1992	Uncle Un had planted 1 rai already before the project started. Project added a 5 rai demonstration plot. Members help protect topsoil.
4. Covering soil with branches and leaves along the contour		8	1992	Started by Uncle Un on 2 rai. Now expanded to a field on one side.
5. Using Neem for pest control - in paddy rice - in vegetables (chili) - in fruit trees (lychee, mango)	 8 2 3	40	1992	Begun with two people, 10 rai. At first there were many people interested, but due to limits of inputs only two could participate. Now expanded to 40 rai.

2. Villager Groups

- Mountain Pipe Water System group. This group began with the Maelod Nua group in the middle of 1993 with 18 members. Members were farmers who had problems with lack of water for agriculture. The group received budgetary assistance for materials from the German Embassy. The farmers can now grow field crops, vegetable crops and fruit tree crops in the dry season.

- Conservation Farmers Group. This group includes farmers interested in conservation farming from both villages. Mr. Prakob Prahan is the group coordinator of the project.

3. Education, Study-tours, Training

- Propagating fruit trees training allowed farmers to propagate their own fruit trees.

- Soil and Water Conservation Farming increased the knowledge and improved attitudes toward soil improvement.

- Canning and Bottling Bamboo Shoots focused on provision of food for the family. Mostly bottling was more successful as it required less input of cost than canning.

4. Administration/Extension and Support

- Seeds. (Conservation crops / field crops / bean crops). Farmers were able to plant these in a timely manner.

- Tree Seedlings (Lychee, Sweet Tamarind, Pommelo, Lemon, Mango, Neem and Fragrant Lemon Grass)

- Publications (Information on various subjects). Two issues were prepared and distributed to villages, but the activity has been halted due to lack of readiness.
- Funds. The funds were money for making small loans to groups and households without interest

E. PROBLEMS AND OBSTACLES

1. The former village coordinator and villagers did not get along and interested villagers did not want to join the project. Now a new election has been held, choosing Mr. Prakob Prahan.

2. In the rainy season communication and coordination is difficult.

3. Materials are difficult to obtain. Transport of goods is slow and they do not arrive in time for activities.

4. Many tree seedlings died.

5. The project revolving funds available are less than the amount desired by the villagers.

VI. BAN DEN

Mu 14, Tambon Mae Pak, Amphur Wangchin,
Phrae Province

A. HISTORY OF THE VILLAGE

This village has two streams passing by: Huai Salok Stream and Huai Panjaen. It was established by a former leprosy patient, Mr. Fuey Saisamphan, who was treated at McKean before World War II. When Mr. Fuey Saisamphan was cured by McKean Hospital in Chiang Mai, he returned to a paddy field far from his village as his family and friends despised him. At that rice paddy location, Mr. Fuey thought to establish the location as a village for patients who had been cured of leprosy. The director of McKean Hospital agreed with this idea and provided staff, medicines and equipment.

When more leprosy patients arrived, a church building was erected to worship God and also to spread the name of Jesus to nearby villages. The new village received leprosy patients from villages throughout Amphur Long and King Amphur Wang Chin who were given such treatment for their disease as was possible with continuing assistance from McKean Hospital. The hospital sent missionaries and religious teachers to help. After a time, it developed into a Christian community. After World War II, more patients were received and the institute was a Christian Church named "Mae Salok Christian Relations Church." At present, it is the "Ban Den Christian Relations Church" with 74 households, 140 males and 130 females, one church for worship, a primary public school, and a child development center.

B. PHYSICAL CHARACTERISTICS

Location

Village 14 of Ban Den is located in the uplands, 400 meters above sea level. Houses are located close together in a group. The area around the village is used for agricultural production, with both paddy fields and forest. Total area is 1,398 rai of which 70 rai is living area, 640 rai is agricultural land and 588 rai is unused public land.

Geographic Position

North	- bounded by Ban Panjaen and Ban Khangjai Mu 7, Tambon Mae Pak
South	- bounded by Ban Na Woey Mu 8, Tambon Mae Pak
East	- bounded by Ban Sopking Mu 12 Tambon Mae Pak
West	- bounded by Ban Salok Mu 9, Tambon Mae Pak

Water Sources. There is a stream passing the village with sufficient flow for the entire year, except in the dry season. There are four wells which the villagers helped dig themselves which provide enough water for household use the whole year.

Forest. The forests near the village are mixed deciduous which are in good condition and which are very important to the daily lives of the villagers.

Communication. The district town is five kilometers from the village, and the provincial capital is 72 kilometers away.

Community facilities. There is a Ruam Pattana Christian Church which was established in 1957 jointly by the Christian Church in Thailand and the villagers to be a center for village activities including religious functions, traditions, cultural functions and village development. There is a government primary school.

Occupation. The major occupation is farmer: paddy rice, corn, peanuts, tapioca, banana, orange groves, mangos, field crops. In addition, villagers work as laborers both within and outside the village. The entire area for agricultural production is 640 rai. Villagers have Naw Saw 3, title deed level of land tenure and Saw Thaw Kaw or tax receipt level of land use rights as follows:

- Naw Saw 3 — 25 households, 33.3%
- Saw Thaw Kaw — 14 households, 19.0%
- Title Deed — 35 households, 47.7%

Livestock are raised for food, for sale and for labor. Animals include ducks, chickens, cattle and water buffalo.

C. GROUPS AND LEADERSHIP

1. Christian Women's Group/Housewife's Group. These groups were established by the government and the Christian Church in the Lampang Province region in 1985. The leader of the group is Mrs. Wilai Kaeofu.

2. Young People's Group/Young Men and Young Women Group. These groups were established in 1991 by the Lampang area Christian Church. Activities are centered around religion and include conducting traditional activities. The current group leader is Miss Kanyarat Kankhan.

3. Rice Bank Project. This activity was established in 1981 by the Agricultural Development Division assistance from McKean. Each member provided 200 liters of rice, with an interest rate for loans of 20% (borrow 5 liters, repay 6 liters). There was no maximum amount which could be borrowed. If, at the end of the year, there was still rice remaining, it would be sold and the profits distributed among the members.

4. Medicine and Medical Supplies Group. This activity is operated by two village health volunteers.

5. Cattle-Water Buffalo Bank.. This bank was established in 1981 by a group of villagers who were interested in raising cattle and water buffalo. The McKean Agricultural Division provided an initial revolving fund budget of 25,000 baht. There are five members and a total of five improved breed cattle.

D. POLITICAL AND ADMINISTRATIVE SITUATION

The district chief is Mr. Phan Saengkaew
The village headman is Mr. Samran Manowon
Administration is done by seven individuals through various committees
There is a village religious activities committee

E. EXTENSION ACTIVITIES

1. Environmental Farming Activities

Technology	Results	Remarks
1. Rotation of crops: rice, beans	Kidney beans and soybeans gave poor yields. In addition, there are market problems as the market for these beans is not sure like that for peanuts	Villagers planted this system already. We provided seeds such as kidney beans, soybeans and purchased seed peanuts.
2. Using cover crops, green manure crops - Green manure in rice paddies such as different bean crops - Using thornless *Mimosa invisa* with fruit trees (oranges)	Gave results in older fields which used fertilizer. Reduced fertilizer costs. Started by one person. Now every household has an orange grove. This keeps the soil moist in the dry season, provides fertilizer for the soil	Tried African pines as green manure in paddy fields, but had problems with seed germination. The *Mimosa invisa* increased yields as it controlled the Emperata Grass. There was some problem with the vine growing up the trees, but this was solved by planting the vine far enough from the base of the tree.
3. Contour planting on sloping land. Strips of beans, field crops and fruit crops	Extended as a demonstration plot beginning in 1992. Villagers who are ready will have land already, receive training along with application of concepts. Two farmers with six rai of land. In 1993, this was expanded by four farmers and four rai.	- Contour strip crops included pigeon pea, "bird" pigeon pea, *Leucaena*, and *Cassia* - Field crops included upland rice, pineapple, corn, peanuts - Fruit trees included mango, longan, sweet tamarind There is a significant problem with management. Budget is needed to improve the land. As to the four people who started later, the project provided half the cost.
4. Raising fish in rice paddies	One person started raising carp. The rice grew well with little use of fertilizer. The fish were eaten. This activity is continuing. After a study-tour to the Payao Trial Station, two more joined.	- Two farmers will raise frogs in a small tank near the rice field which is located near the field where fish are raised - Most farmers raise fish in rice paddies or in ponds located in fruit tree orchards.

5. Using biological control in paddy fields, mostly using neem	When research started, few farmers were interested. Later, more became interested so training was held for villagers. Now there are 19 people, average five rai per person. Research results show an average increase of 160 liters per rai.	

2. Villagers' Organization

- The Conservation Farmers' Group. The coordinator between interested farmers and the project is Mr. Sawang Kankhan.

- The Women's Group (Weaving). This group coordinates with a school in Lampang concerning weaving (designs, methods of increasing speed of production, budgets). This activity began in 1993. There are 11 members; non-members still use traditional methods. The income of the group at present is 1,729 baht, with a trend toward increasing this amount. The group has a major problem with accounting and marketing.

3. Administration, Extension and Support

- Seeds (beans, rice)
- Seedlings (mango, longan, pommolo, sweet tamarind and lychee)
- Fish (tilapia, pla nai, carp, pla nualjan, catfish, etc.)
- Revolving fund (small loans) and small scale financial assistance

4. Study-tours/Training

- Training on fruit tree propagation, weaving cloth, using biological pesticides in paddy rice, topsoil conservation and various optional agricultural seminars.
- Study tours on using biological pesticides in paddy rice and soil and water conservation agriculture and natural agriculture.

5. Nursery. One nursery was built as a joint activity for growing tree seedlings. After this, two farmers were interested in building their own small nurseries for keeping rattan shoots and tree seedlings. Farmers who are able to propagate trees were interested to do so but there was no supporting budget for every person.

VII. BAN SALOK

Mu 9, Tambon Mae Pak, Amphur Wang Chin,
Phrae Province

A. HISTORY OF THE VILLAGE

Salok Village, Tambon Mae Pak, Amphur Wang Chin, Phrae Province, is a Karen village which moved from Amphur Theung, Chiang Rai Province to avoid the

conflict in Burma. It was established in 1895, 100 years ago. Today, the village has 1,004 people and 216 houses.

B. PHYSICAL FEATURES

Location. The houses are located in a group. The area surrounding the village is used for agricultural production by the villagers. The entire village is located in a valley which used to be a watercourse, which can be seen from the characteristics of the soil and rocks which are scattered around. The entire area of the village is 2,878 rai, of which 87 rai is living area and 2,789 rai is agricultural area.

Geographic location.

North	bounded by Ban Panjen
South	bounded by Ban Wangkhon
East	bounded by Ban Mai
West	bounded by mountains

Land use.

Living space	87 rai	216 households own this type of land
Paddy fields	1,090 rai	180 households own this type of land
Upland fields	200 rai	
Pubic orchard	74 rai	
Reserved fores	1,410 rai	
Water source	17 rai	
Total	2,878 rai	

Land ownership

- 170 households own land with Nor Sor 3 Kor land title, a total of about 150 plots
- 120 plots with Nor Sor 3 or Sor Khor 1 land title
- Of the remainder, 1,410 rai is reserved forest and 74 rai is communal land

Communication. Ban Salok is located about 86 kilometers from the Phrae provincial capital and 6 kilometers from Amphur Wangchin. Roads in the village are unimproved dirt or gravel, not very convenient for driving.

Community facilities.

There is a temple which is the center for activities of Buddhists. There is a school going through grade six which was built by a private agency. There are five stores selling daily needs. Christianity was brought to the village in 1993.

Water sources. There are two streams located about 3 kilometers from the village which are used for household use and drinking. There are 12 shallow wells and one artesian well located 200 meters from the village. There is sufficient water all year. In addition, there are three large tanks and one large urn used to store drinking water.

Condition of the forest.

The forest surrounding the village is mixed deciduous. There is a bamboo forest and a grass area on the side of the mountains. The forests are in good condition; the villagers did not encroach on the forest for agricultural production.

C. EXTENSION ACTIVITIES

1. Ecological agriculture

Technology	Results	Problems
1. Rotating crops by season (paddy rice, beans)	Makes full use of land. Yields are up due to bean residue which is used as fertilizer	
2. Planting cover crops; green manure crops; thornless *Mimosa invisa*	Started with one household. At present, has expanded to every household with an orange grove	
3. Contour strips	One household did this on five rai of orange grove. Strip crops included pigeon pea. Fruit trees included oranges which were planted on a trial basis intercropped on land already in use. After two years this activity has not expanded.	
4. Biological pest control in rice paddies.	This activity started in 1992, expanding rapidly from Ban Den. At first, this was done on one rai by one person because it was not known if there would be any ill effects. The first year there were 17 people on 17 rai; the second year there were 19 people on 95 rai. The villagers were satisfied with the increase in yield of 40 liters per rai.	There is sufficient biological pest control solution, but it cannot be manufactured locally. It must be purchased.
5. Biological pest control in paddy fields	This activity was begun in 1993 with five farmers. Some had good results.	The biological pesticide was received late.
6. Natural paddy rice	Tested broadcasting five rai in 1992, but had no yield. In 1993 there was some yield.	IN 1992, after the rice germinated there was a drought. In 1993, the rice was not broadcast evenly. There was some yield.

2. **Village tree nursery.** This was constructed in 1993 to grow seedlings. It was located too far from the village, so was not very useful.

3. **Villagers' Organizations.**

- Rice bank. There was a rice bank with 10 members before the project. Now all households are members. The problem is that there is too much rice.
- Conservation farmers' group

4. **Study-tours/Training.**

- Training was given on using biological pesticides in rice paddies, propagating trees, conservation farming.
- Study tours on using biological pesticides in rice paddies, conservation farming, natural rice paddies, raising fish in rice paddies, etc.

VIII. BAN CHIWITMAI

Mu 5, Tambon Pa Phai, Amphur Li,
Lampoon Province

A. HISTORY OF THE VILLAGE

The village was established on 18 September 1963 under the patronage of the New Life Foundation of the King's Mother. At first there were five households from Lampang. The Foundation provided rice and dry foods for two or three years until in 1965-1966 when the Foundation received a concession from the Royal Forest Department to use that area. The Foundation had the villagers clear the forest to make agricultural land, a total of about 3,800 rai for upland crops and tree crops. Later, the villagers contacted the Department of Land Development which, in about 1985-87, provided villagers a Bai Chong land title to five rai for agriculture and half a rai for a house to each person, with 20% remaining forest. Mu 8 was included, too, and villagers from many villages came to participate in the development.

At present there are 145 households and 462 people.

B. PHYSICAL FEATURES

Location. Located 280 meters above sea level, the village covers a total of 985 rai. Of this 300 rai is living area, 685 is agricultural area. 80% of the people have a Land Title and 20% have a Bai Chong certificate.

Boundaries.

North	bounded by Ban Mae Pa Pai, Lai Tha
South	bounded by Huai Hong/Reserved forest next to Huai Hong
East	bounded by Kok Chang housing development
West	bounded by the Li River.

Communication. The village is about 160 kilometers from Chiang Mai city.
Village resources.

Forest. Around the village there is no forest; it is all agricultural land. The 1,000 rai forest used for daily needs is located far from the village. The area around the crematorium is about 10 rai. In the past, it was a large teak forest. Now there is little left. Some villagers cut wood for sale from the Thung Huai Chang forest.

Water. The Paen and Li Rivers pass the village. There is a problem with the Paen River because a rich person who has land near the river pumps all the water. The Li River is used to water the longan trees. Farmers primarily rely on rain. Water for drinking and household use comes from an 18 meter deep artesian well.

C. OCCUPATION

About 12-13 years ago, wood carving was a major occupation. Later, planting corn became the main occupation. There is still a little making of parquet wood floors. Additional daily labor work pays 60-70 baht/day. There are a few longan orchards. Less than 5% work as laborers in Lampoon.

D. VILLAGE RESOURCES

There is a temple located on 10 rai of land. There is a church on one rai which was built in 1967.

The Foundation supported establishment of a child care center on two rai of land in 1972.

A rest home for the aged was established on two and a half rai of land. The New Life Foundation supported old people to live at the home in 1991-1992.

There is a school which was established in 1985.

The Rural Employment Project provided funds for a village water system at Suan Mon in 1985.

E. GROUPS

1. **Savings Group (Sacha Group).** This group was established in 1991 by Uncle Kongkham Wongwalthep. There are now 92 members of the group and the group is registered. Members deposit a minimum of ten and a maximum of 100 baht per month. This money must be deposited for three years before it can be borrowed. Interest is reinvested and the committee receives 20% of the interest. At present there 31,000 baht in the fund. Money is borrowed in this fashion: at the annual major meeting loans are applied for. Mostly members borrow for agricultural production or for selling things. Interest rates on loans are 2% per month.

2. **Agriculture Group.** This group was established because farmers were having to sell their crops in the field before they were ripe for harvest and having to borrow money at high interest rates from rich people. Uncle Kongkham Wongwalthep contacted the district office and received 20,000 baht support and

equipment for the villagers. The villagers then planted the seeds and afterward established the agriculture fund. At present there are 81 members and nine committee members. They began with 9,000 baht. Shares were sold at 100 baht to 1,000 baht per share. The Foundation provided an additional 15,000 baht. At present the fund has 90,000 baht. Interest on loans is 1% per month for members, 2% per month for others. The maximum loan is 10,000 baht for one year.

In addition, there is a housewife group, a water system group, a funeral group, a supplemental food group, a medical supplies group, and a conservation farmers' group.

F. AGRICULTURAL PROBLEMS

1. Longan has not born fruit for many years in a row.
2. Agricultural prices are not certain.
3. Disease and insects are widespread.
4. Lack funds for agricultural production.
5. Lack knowledge, experience.
6. Drought, rains don't come at the proper season.

G. EXTENSION ACTIVITIES

The project began operating in this village in 1992.

1. Environmental Agriculture Activities

Technology	Results	Problems
1. Rotating crops	Started with one person; expanded to 10 at present	Weeds including *Mimosa invisa* with thorns and "Communist" grass. Solutions include using mung beans and pigeon pea as ground cover.
2. Planting several crops together in rows (corn, beans, pumpkin)	Three people using this method on three rai.	
3. Planting "Ruci" grass on unused areas to feed livestock	Two people doing this on two rai.	
4. Planting cover crops, green manure - in squares - planting cover crops in fruit orchards	 Three farmers on three rai. Three farmers on three rai.	
5. Using biological pest control in longan orchards		

2. **Nurseries.** Established to grow biological pest control plants. The problem is that it is not clear who should care for the seedlings, but the nursery is still there.

3. Administration/Extension/Support

- Seeds (beans, corn, contour strip crops) Allows farmers to plant the crops they want in their orchards in a timely manner.

- Seedlings (tamarind, pommolo, etc.) Planted in unused areas of orchards.

- Funds in the form of money available for small loans.

4. Study-tours/Training

- Study tours to see conservation farming, natural farming, using biological pesticides in paddy fields
- Training on propagating fruit trees, using biological pesticides in rice paddies.

IX. *BAN MAEWAEN*

Mu 8, Tambon Jaeson, Amphur Muangpan, Lampang Province

This village was newly located here as it had been located in the Jaeson National Park. The Royal Forest Department arranged for the new land. The project's entry into this Hmong village started with an individual who went to McKean for narcotics addiction rehabilitation.

A. EXTENSION ACTIVITIES

1. Conservation Farming Activities

Technology	Results	Problems
1. Crop rotation of paddy rice and beans	Increased yields	Major problem is lack of rain
2. Planting village woodlot	Villagers have been planting woodlot trees for some time	
3. Planting cover crops. Not burning residue of weeding	One person did this on two rai	
4. Planting bean crops on the contour on sloping land (field crops, fruit trees, contour strip crops)	Contour strip crops include *Leucaena spp.*, pigeon pea. Field crops include upland rice, beans, chili. Fruit trees include tamarind, mango. This activity was started at the end of 1992 with one person on one-half rai who planted pigeon peas to eat and to feed chickens.	
5. Using biological pest control in rice paddies.	Activity begun in 1994 with five people, 25 rai.	

2. Study tours/Training

- Training on contour planting, use of biological pest control.
- Study-tours on conservation farming, integrated agriculture, rotation of crops. Farmers are interested in conservation farming and using biological pest control in paddy fields as well as methods for propagating fruit trees.

3. Administration/Extension/Support

- Seeds (conservation crops, beans)

X. BAN DAENMUANG

Mu 6, Tambon Boonruang, Amphur Chiang Khong, Chiang Mai Province

A. EXTENSION ACTIVITIES

1. Environmental Agriculture (This is a target village for the second phase of the project)

Technology	Results	Problems
1. Contour farming	Uncle Inkham Kahmya, who started and has continued this activity is capable of being a teacher	This type of agriculture requires extra labor. Some households lack sufficient labor and must leave their contour farming fields to return to forest
2. Integrated upland, paddy, orchard	This activity has been done since 1989. In 1991 there were 11 people, 11 rai. Now there is 10 rai.	
3. Biological pest control in rice fields.	Gave good results. Being extended to fruit orchards and vegetable plots	Problems with inputs (neem)

2. Administration/Extension/Support Seeds, seedlings, budget. There is a revolving fund for activities in the village.

3. Villager groups, organizations.

- Biological pest control group
- Soil and water conservation group
- Income supplementing occupation group

XI. BAN SANPAPO

Mu 9, Tambon Sansai, Amphur Wiangpapao, Chiang Rai Province

A. HISTORY OF THE VILLAGE

The village started with ten households who started the village after they had been cured of leprosy by the McKean Rehabilitation Institute. Ajan Di Sriwong was

the religious leader and assisted with leprosy. Later, others moved in from many locations in the north and northeast regions including relatives of former leprosy patients. The village grew to 130 households, at which time request was made to the district office to separate as a new village. Before, the village was part of Mu 1, Ban Pongnua. The new village was called Ban Chokchaipattana, and was officially established in 1991. There are three hamlets, santonjoke, Santonpao and Sanpapo.

B. PHYSICAL FEATURES

Location

North	bounded by	Ban Pong Nua
South	bounded by	Ban Santonjoke
East	bounded by	Conservation Forest Doi Mok
West	bounded by	Lao River, forest and agricultural area

C. VILLAGE RESOURCES

Water sources. For household water, rainwater and shallow wells are used. Agriculture uses rainfall and water from the Lao River. In addition, the village takes care of the community forest.

Land. The land in the village is loose soil. Agricultural land is divided between level land (rice paddies) and sloping fields. Most have Nor Sor 3 Kor and Land Title Deed to their land; however, land to the west of the village has no land title at all.

Total village area	1,900 rai
Living area	60 rai
Agricultural area	1,800 rai
Reservoir	10 rai
Crematorium	5 rai
Paddy land belonging to the McKean Institute	21 rai

D. OCCUPATION

In the past, upland rice was the main crop. For the past 3-4 years, rice production has been insufficient for domestic consumption, so corn for livestock feed has been grown instead because a middleman comes to the village to buy the crop. Villagers have started to purchase rice to eat with the exception of households with paddy land who plant rice, but even these households can only grow enough for their own consumption. People who have no rice paddy land hire out to work in other people's paddies. Three people rent paddy land, eight own their own paddy, with an average of 4-6 rai per household. There is much upland area. Villagers plant corn only there. Evaluation of the project found that villagers restore land destroyed by planting corn by using contour planting with legumes and planting fruit trees, expanding a little at a time until they can cease planting corn.

E. COMMUNITY FACILITIES

Church. This facility is used for Christian ceremonies and it is the central point for Christian families. It is also used for meetings or training in the village. (about 20 households).

Temple. This facility is the focal point for Buddhist households, but for meetings and training, the church is usually used as it is larger. (about 30 households)

Note: In conducting activities in the village, there is no separation of groups.

Artesian Well. Construction of one well was supported by the Mineral Resources Department and another well for the child care center was supported by the Health Department.

Child Care Center

F. GROUPS AND COMMUNITY LEADERS

1. There are seven sections of the village committee as established by the government. The current village headman is Mr. Boonchu Kerdmoli.

2. The mission group is a group of Christian households. Some members are also village committee members. The chairman is Mr. Appol Buayen.

3. The Rice Bank Group was established in 1985. All villagers are members. At first, each household put in 100 to 200 liters of rice. Later, financial assistance of 20,000 baht was received from the Community Development Section of the Christian Church of that area. The total amount of rice was 1,200 liters. The bank has ceased to operate due to problems with the borrowing and lending of rice, i.e., repaying loans with low quality rice, repaying with rice of a quality different from that agreed to, and not repaying loans on time.

4. A savings group was established two years ago. The group has 20 members and 3,000 baht in assets. Members save 10 baht per month. They can borrow 500 baht at an interest rate of 3% per month. There are few members perhaps because the villagers do not understand the concepts or because the amount of money available to borrow is small.

5. Medicinal supplies group. This group was supported by the district Public Welfare Office with villagers purchasing shares as well at 5 baht per share. It has been established about six years. There is still little profit. Some times there is not enough supplies or the supplies are not those needed, but villagers are able to buy medicinal supplies at a low price.

6. Housewife's Group. This group was established by the district and the district provides training on making desserts and making flowers. The problem is that when villagers undertake an activity, there is no room for expansion. At present they receive flowers from middlemen in the city to make at low wages.

7. The Chicken Raising Group has 30 members. This group was supported by the district with training on care of chickens.

In addition to these, the project and McKean also supports other activities including the biological pest control in rice paddies group and the cattle raising group.

G. AGRICULTURAL PROBLEMS

1. Soil quality is degraded.

2. Insufficient water for agriculture.

3. Disease and insect pests are widespread, e.g., worms in the paddy rice.

4. Improved rice, rice seed is expensive. It must be purchased from outside. It is not possible to select seeds from their own harvest.

5. The cost of production is high.

6. The price of produce is low.

H. EXTENSION ACTIVITIES

This village was not a target village during the first three years of the project. However, as the villagers were interested in biological pest control, the project provided support from ACPP and OFDP.

1. **Using biological pest control in rice paddies.** Tests began in 1989 with Uncle Nuan using *Tinospora spp.* soaked in water with rice seeds which will be broadcast. It was desired not to use chemicals, as when chemicals were used the fish died. Results were good. The project began to promote neem seeds extensively in 1991. This also was successful, expanding to 12 people and about 50 rai at present.

Method of use

- Soak the neem seeds in water with the rice seeds to be planted.
- Sprinkle the neem seeds on the rice seedlings about one week after planting.
- If the leaves of transplanted rice become yellow, sprinkle neem seeds in the field. The rice will improve.
- If there is not enough neem seed to sprinkle on the crop, put the seed in the canal where water enters the rice paddy.

Summary of results

1. Neem deters insects from coming to the fields.
2. Neem protects against grubs.
3. Neem protects against some plant diseases.

4. Protects against insects in the soil such as moths, *Cirphis unipuncta* (a species of paddy cutting worm), leaf worm.

5. Biological control methods also act as fertilizer. This can be seen by the increase in rice yields.

Problems

1. It was not possible to protect against crabs and cherry clams.

2. Insufficient supply of inputs (neem seed).

2. Cattle raising group has eight members. McKean has supported this project with eight head of cattle. At present, there are 20 head of cattle.

Problems

1. Breeding.

2. Lack of understanding about distributing offspring.

3. Raising animals is becoming more difficult because it is no longer possible to allow animals to roam free.

4. The animals are not used very much for labor.

XII. BAN STIWICHIAR (KODPAWAY)

Mu 13, Tambon Nanglae, Amphur Muang, Chiang Rai Province

A. OVERALL SITUATION

This is a village of former patients. 30-40 years ago the village was in good condition. There were many trees, many forest animals. When McKean patients came to live, rice paddies were purchased and rented to these villagers. During the Chatchai administration, the people sold all the land, leaving only the rice paddy belonging to McKean. Villagers didn't have land to farm, so they rotated working in the McKean rice paddies.

Main Occupations. Working as a laborer followed by working in the McKean paddies.

B. EXTENSION ACTIVITIES

There was only one activity: using biological control in rice paddies, which was done by four people starting in 1989.

Results

Only one person is still doing this activity because all the rice paddy was sold but there are seven new people doing this activity.

XIII. OPINIONS OF VILLAGERS ABOUT THE PROJECT AND DIRECTIONS FOR VILLAGE DEVELOPMENT

Village	Attitude toward the project	Directions for village development
1. Ban Taendokmai	1. Wants the project to continue support in the future 2. Wants the project to establish a new operating methodology which is good and appropriate 3. Wants the project to assist with funds and budget for investing in agriculture 4. Should establish administrative points for coordination and delivery of seeds to the villages to make it possible for the seeds to be distributed in all areas. 5. Extend new cash crops and provide knowledge about agriculture 6. Provide funds free to repair a water pump and put in pipe to the center of the village and a faucet to provide water. The project might coordinate receipt of additional budget from other projects.	1. Develop the efficiency of use of land resources. 2. Develop water sources 3. Develop the funds/ committee members of groups to solve problems 4. Separate the village from Mu 2 in order to better coordinate work and ask for development support from government agencies. 5. Extend and develop sustainable agricultural development.
2. Ban Traisapawakham	1. From the experiments of the first adopting farmers, the young people's group want the project to provide additional extension on conservation farming 2. It is desired that officials communicate and coordinate on a regular and continuing basis.	1. Extend conservation farming practices to groups, especially young people's groups which is very interested in alternatives to chemicals in fruit orchards. In addition, the project has a plan to provide extension assistance with thornless *Mimosa invisa* in place of pigeon pea in

		fruit orchards. 2. The planned applied activity is biogas production.
3. Ban Maelod (Nua-Tai)	1. Wants the officials to provide extension services on a regular and continuing basis. 2. Wants support with budget.	1. Group development 2. Expansion of use of biological pest control in rice paddies and growing crops without dangerous chemicals.
4. Ban Den	1. Have officials spend a long time in the area. 2. Want future support and extension help to be on a regular and continuing basis. 3. Want officials to carry out activities which are certain (villagers are unable to prepare themselves in time)	1. Focus on sustainable agriculture. 2. Develop groups interested in conservation agriculture and general village development according to the abilities of the project and the cooperating villagers.
5. Ban Mae Salok	1. Want the project to provide extension service to the villagers in the future. 2. Want project officials to stay in the village for a long time each visit and to come to the villages on a regular basis.	1. Group development and development of conservation agriculture in the form of group action. 2. Provide extension services to income generating activities for women and the village.
6. Ban Chiwitmai	1. Have project officials conduct research in the village on longan. 2. Want the project officials to provide extension service with supplemental income generating activities. 3. Want project officials to come to the village often and on a continuing basis.	1. Develop the village in the area of supplemental income generating activities. 2. Working as a fund/group 3. Focus on use of biological pest control in fruit orchards. 4. Solve the problem of longan trees not bearing fruit.
7. Ban Daenmuang	1. Have project officials visit the village more often. 2. Have a demonstration plot(s) 3. Undertake projects on a continuing basis.	1. Expand the results of conservation agriculture. 2. Solve the problem of insufficient inputs (neem).
8. Ban Sonpapoi	1. Support the improvement of the upland areas. 2. Supplemental occupations/	1. Strengthen existing village groups. 2. Develop vocations/ opportunities for choice. 3. Develop integrated

	supplemental income 3. Develop the use of biological pest controls. Increase the amount of inputs and assist with the propagation of biological pest control plants. 4. Assist the planting of fruit trees. 5. Provide budget support for agriculture in the areas specified by the villagers in coordination with project officials: allow each separate group to have a representative and village level coordinator to coordinate with project officials.	agriculture. 4. Strengthen young people's groups.
9. Ban Sriwichiar	1. Funds 2. Agricultural knowledge with the exception of information on pineapples.	

XIV. SUMMARY OF VILLAGER'S RECOMMENDATIONS FOR VILLAGE DEVELOPMENT DIRECTIONS

1. Strengthen village groups.
2. Provide extension and skills assistance with agriculture.
3. Provide extension assistance and support for alternative occupations or supplemental income, especially for housewife's groups.
4. Provide budgetary assistance for various activities.

XV. ATTITUDES OF VILLAGERS TOWARD THE PROJECT

From discussions with villagers it was found that most villagers are not able to differentiate between the Institute and development and extension of agricultural technology of the project. That is, traditional development work of the Institute , e.g., establishing communities and providing welfare services to strengthen the community. As a result, of both the villagers who participate in environmental agriculture activities and those who do not, many do not understand the auspices and the meaning of the environmental agriculture activities which are extended by the project. There are still people who feel the work is the same welfare services as before.

In addition, the characteristics of the methods which must be used and the methods of coordination provide little time for each target community due to the distance between communities. The result is that provision of understanding and establishing a basis for education at the community level is limited.

As a result, almost every village has the same observations and a recommendations about the role and method of operation of the project officials: they want the project officials to coordinate with the villagers more frequently and more consistently than before.

One important idea about project operation is that it should provide extension assistance to groups and strengthen the groups.

XVI. ANALYSIS OF OBJECTIVES AND DEVELOPMENT PROCEDURES

A. OBJECTIVES OF THE PROJECT

1. To conduct applied research and improve environmental agricultural technology.
2. To enable farmers to develop the management skills to improve agricultural methods.
3. To insure farmers have sufficient agricultural production for home consumption.
4. To insure farmers have knowledge of environmental problems of the community and in their fields and orchards.

Following these objectives, the project wants to have farmers use environmental agriculture in their communities; to accomplish model activities with farmers themselves testing the activities; applying the results of these activities; and have the ability to improve technology appropriately. As to the project itself, it should be the facilitator and source of support in providing knowledge, theoretical training, training on skills, provision of data, and various aspects of management. It is hoped that farmers will be able to help themselves in terms of ingesting the results and have knowledge and ability to work in their own fields.

As was stated before, the EAT1 Project is a continuing development project which evolved from the OFDP and the Natural Pest Control Project. It focuses on testing and demonstrating soil and water conservation farming and reducing the use of chemical pesticides. During the EAT1 Project (1992-1994), the methodology employed was joint demonstrations with the villagers, most of whom had joined with the project in previous demonstrations, and use of training to extend the results to the community. The methodology used can be summarized as follows:

1. Follow up on demonstration plots and farmers who had joined in activities with the project before the start of the EAT1 project.
2. Follow up on demonstration plots with both old and new farmers.
3. Provide training on environmental agriculture.
4. Support provision of legume seeds, cover crops, and tree seedlings including inputs for biological control of crop pests.
5. Support provision of revolving funds for conservation farming.

B. TABLE SHOWING SUPPORT PROVIDED FOR ACTIVITIES IN TARGET COMMUNITIES

Village	Training (number)	Study-tour (number)	Support Funds (baht)	Speaker Payment (baht)
1. Ban Thaendokmai*	5	4	5,430	10,491
2. Ban Maelod*	10	5	4,800	6,666
3. Ban Mae Salok*	7	3	1,214	700
4. Ban Den*	13	5	2,190	5,720
5. Ban Chiwitmai*	8	2	3,350	3,020
6. Ban Sanpapo	6	1	900	2,230
7. Ban Daenmuang	5	0	1,150	1,630
8. Ban Maewaen*	3	2	0	100
9. Ban Traispawakham*	3	4	0	965
10. Ban Sriwichiar	2	0	1,050	1,015

*__Note:__ An area of the EAT1 Project

Village	No. of house-holds helped	Seeds Given (kg.)				Biolog Pest Control. Given		Tree Seedlings Given (no. of trees)							Funds Borrowed
		Legumes	Cover Crops	Field Crops	Contour Crops	Neem (kg.)	(seedlings)	Mango	Pommolo	Lychee	Longan	Tamarind	Lemon	Other	
Ban Thaen-dokmai	40	148		163	15						40	127			12,000
Ban Maelod (Nua/ Tai)	44	103	5	174	40	96	10	249	125	250	100		67	360 orange	
Trai-sapa-kham	1	50		93	10										
Ban Den	52	115	10	70	31	264	30	154	50	271	125	15		3,400 pine-apple; 65 thorn-less *Acacia insua-vis*	
Ban Salok	21	32	10		18	420	85	24						10 *Acacia insua-vis*	
Ban Chiwitmai	17	48	7	25	18	biosafe 5 bottles		25			22				
Mae-waen	5	15		20	44			50		10	2				
Daen muang	20	j50	32												
Sanpa po	15		40		376 biosafe 5 bottles	55									
Sriwi chiar	21				5	228	25	71		75	10	20			
Total	**236**	**561**	**64**	**585**	**181**			**573**	**175**	**596**	**325**	**164**	**67**	**3835**	**12,000**

C. ENVIRONMENTAL AGRICULTURE EXTENSION ACTIVITIES

The following environmental agriculture technology trials were undertaken in cooperation with the target groups.

1. **Rotation of crops.** (annual and seasonal)
   - 1.1 Upland rice, corn followed by legumes
   - 1.2 Paddy rice followed by legumes
   - 1.3 Legumes, followed by corn, followed by legumes

2. **Intercropping**
   - 2.1 In rows, such as corn and beans and pumpkin, etc.
   - 2.2 Planted in conservation strips such as upland rice, corn, legumes, etc.

3. **Using cover crops and green manure**
   - 3.1 Planting field crops overlapping or following
   - 3.2 Planting crops to control weeds in upland fields
   - 3.3 Crops to control and improve soil in fruit orchards
   - 3.4 Placing branches and leaves of crops along the contour
   - 3.5 Not burning weeds which have been pulled up
   - 3.6 Placing crop residue after harvest along the contour

4. **Legume bushes as contour fence lines**
   - 4.1 Planting as a fence around the fields
   - 4.2 Planting as a fence along the contour on sloping fields

5. **Using biological control rather than chemicals to control pests (neem)**
   - 5.1 In rice paddies
   - 5.2 In fruit orchards
   - 5.3 In vegetable gardens

6. **Agro-forestry**
   - 6.1 Village nurseries
   - 6.2 Inter-cropping fruit trees with field crops
   - 6.3 Planting village woodlots

7. **Planting pasture grass**
   - 7.1 Planting pasture grass in fruit orchards
   - 7.2 Planting pasture grass on unused land

D. TABLE SHOWING DEMONSTRATIONS AND TRIALS OF THE EAT1 PROJECT (1993)

Environmental Technology	TRV	TDM	ML [N,S]	BCM	BD	MSL	MV
1. Crop rotation							
1.1 Upland rice, corn followed by legumes (annual)		3/3	8/8				
1.2 Paddy rice, legumes (seasonal)			7/12		3/5	5/10	2/2
1.3 Upland rice, corn	8/6	10/8		10/10	3/3		

followed by legumes (seasonal)							
1.4 Legumes followed by corn and legumes (seasonal)		3/			10/10		
2. Intercropping							
2.1 In rows such as corn with legumes and pumpkin		3/3		3/3			
2.2 Conservation strips such as upland rice, corn, legumes		5/3	15/7				
3. Using cover crops and green manure							
3.1 Planting field crops overlapping or following	10/6	10/6	6/6	3/3			
3.2 Planting crops to control weeds in upland fields		3/3					
3.3 Crops to control and improve soil in fruit orchards	1/1	2/1		3/	15/10		
3.4 Placing branches and leaves of crops along the contour		4/2	2/1				
3.5 Not burning weeds which have been pulled up		3/4	3/1				2/1
3.6 Placing crop residue after harvest along the contour		2/1					
4. Legume bushes as contour fence lines on sloping land		8/5	15/8		5/2		
5. Using biological control rather than chemicals to control pests (neem)							
5.1 In rice paddies						10/10	
5.2 In fruit tree orchards	5/5			10/10		4/4	
5.3 In vegetable gardens			2/2				
6. Agro-forestry							
6.1 Village nurseries				*	*	*	
6.2 Inter-cropping fruit trees with field crops		20	29				
6.3Planting village woodlots		*	*	*		*	*
7. Planting pasture grass							
7.1 Planting pasture grass in fruit orchards				4/	2/		
7.2 Planting pasture grass on unused land				2/2	1/1		

Notes: *** Activity has been undertaken, but quantitative data not available**
Cells show *area/number of farmers*

E. TABLE SUMMARIZING RESULTS OF EXTENSION ACTIVITIES FOLLOWING PROJECT OBJECTIVES

Project Objectives	Benefits to the community/ household	Main Activities	Combined Results
1. Farmers conduct applied trials and improve environmental agriculture technology	*Farmers in each community use environmental agriculture *Minimum of 1, maximum of 10 households	*Rotation of crops *Cover crops *Integrated farming *Biological pest control in rice paddies *Project provides inputs (funds, seeds, etc.)	*Most farmers who used environmental agriculture had good results and were satisfied with the activity. However, some reported that in upland fields and orchards the project did not follow up on a regular basis *Activities with good results which can be expanded include cover crops and biological pest control in rice paddies
2. Farmers improve management skills	*Communities with good managerial ability included: -Ban Daennua - Ban Thaendokmai -Ban Sanpapo -Ban Den *Each village has a village communicator	*Project provided training on planning and management to farmer leaders *Provided advice and counsel to at the community level	*Farmer leaders in 4 communities have ability in management in upland fields and orchards and are a study-tour resource for other interested farmers
3. Farmers have enough production for home consumption	*Data seems to show that farmers using environmental agriculture (biological pest control in rice paddies) have increased yields but data is not available to allow clear comparison		*Due to lack of comparative data, it is not possible to evaluate this activity *From interviews with farmers, yields have increased
4. The target group have knowledge of	*Interested farmers groups	*Training *Provision of	*Having a village communicator in

environmental problems in the community and in agriculture	have good knowledge of techniques *Farmers in the community have seen tests and have spread the knowledge to nearby communities, e.g., Ban Den spread to Ban Salok *There is a village communicator in each community	information *Provision of advice	each village resulted in much spread of knowledge * Village communicators spread knowledge to other interested communities and are an important resource for study-tours

F. NAMES OF VILLAGE COMMUNICATORS

Village	Village Communicator	Areas of Expertise
1. Ban Thaendokmai	1. Mr. Wan Lanlawong	Rotation of crops
	2. Mr. Ban Butrata	Rotation of crops
	3. Mr. Kul Nathad	Rotation of crops, contour cropping
	4. Mr. Phakdi Bunyang	Conservation crops, chemical-free vegetables, tree propagation
2. Ban Maelod	1. Mr. Jaroen Tessay	Biological control in rice paddies, conservation farming, chemical-free vegetables
	2. Mr. Somboon Dongyen	Biological control in rice paddies/ vegetables, conservation farming
3. Ban Mae Salok	1. Mr. Bud Khamwan	Neem in rice paddies
	2. Mr. Ai Pangkha	Integrated farming, neem in rice paddies
4. Ban Den	1. Mr. Sawaeng Kankhan	Neem in rice paddies
	2. Mr. Samran Manowon	Biological pest control, agro-forestry
5. Ban Chiwitmai	1. Mr. Kongkham Wongwanthep	Herbal crops
	2. Mr. Prawit Maethiniwaes	Herbal crops
6. Ban Sanpapo	1. Mr. Nuan Tawong	Agro-forestry, neem in rice paddies
	2. Mr. Yang Thaminthri	Neem in rice paddies
	3. Mr. Sangwon	Neem in rice paddies
7. Ban Daen Muang	1. Mr. Inkham Khamya	Biological pest control in rice paddies, orchards and crops
	2. Mr. Kong Khamya	Conservation
8. Ban Mae Waen	1. Mr. Taem	Contour cropping
	2. Mr. Log Lilasiltham	Contour cropping
	3. Mr. Pao Saeli	Herbal crops
9. Ban Traisapawakhom	1. Mr. Samran Winitha	Biological pest control in rice paddies
10. Ban Sriwichiar	1. Mr. Noy Nojachai	Neem in rice paddies
	2. Mr. Jay Khamrang	Conservation farming,
	3. Mr. Nikor Nuaoun	contour cropping
	4. Mr. Won	

G. CAPABILITIES AND LIMITATIONS OF PROJECT OPERATIONS

It is clear that the objective of the project has been provision of extension assistance or support in testing environmental agricultural activities together with farmer's leaders in project target areas, most of which were previously connected in some way with McKean. The main target has been testing and applying environmental agricultural technology which is appropriate for the community and the various target groups. The project was successful in this during Phase 1.

From interviews and evaluation of opinions of villagers it can be said that the capabilities of the project target groups are as follows:

1) Farmers did conduct true tests and are able to apply and improve on the results of the environmental agriculture activities satisfactorily. In 3-4 of the communities this information was spread not only in the community but to other communities as well.

2) Village communicators have a capability which comes from actually doing the activities to the point that they are technical experts in the areas they themselves have practiced. They are satisfied and confident with environmental agriculture.

In the area of testing environmental agriculture technology, the technologies which were successful and which were spread to others included use of biological pest control in rice paddies and use of cover crops to protect the soil and suppress weeds (thornless *Mimosa invisa*). It was found that both these technologies were successful due to a combination of having farmers do their own testing and the project providing extension and support.

However, the project still has many weak areas including the following.

1) The project areas are far apart, there are few project staff their supporting role is not clear. As a result, it is not possible to follow up on activities and provide advice and support to the extent desired by the villagers.

2) The project was successful in extending technology and knowledge in specific areas, but provides too little knowledge in the area of management and analysis of problems and provision of appropriate information which is needed by the farmers.

3) Confusion regarding the role of project staff who visit communities periodically regarding whether they are primarily providing welfare from McKean or are Project staff whose role is provision of knowledge and community development.

4) The project still lacks clear procedures for assisting farmer leaders and village communicators regarding their role in spreading environmental knowledge and experience with environmental agriculture, and their capabilities to analyze data and the related problems.

The project should thus solve the problems of these internal weak areas and pull in the capabilities of the communities to support development efforts. This will increase the impact of development in the future and make it more responsive to the desires of the farmers.

H. RECOMMENDATIONS REGARDING PROJECT DIRECTIONS

From data from the various communities and analysis with project staff, it can be summarized that farmers practicing environmental agriculture should form a village organization and work together to exchange lessons learned, experiences and resources which would result in the improvement of the environment and expansion of the efficiency and breadth of environmental agriculture by the communities themselves.

The project will have an important role in extending proven environmental agriculture technology both within and between communities.

The direction the project should take should therefore focus on connections for provision of knowledge to and strengthening of community level development organizations. The central focus of establishing self-sufficiency at the household level and forming groups to help each other should be expanded to include a network for exchange of information.

That means that the project will have to change its working role from extension workers of specific techniques or knowledge on a specific subject to be increasing or encouraging the exchange of knowledge among villagers themselves.

I. PROJECT OPERATING PROCEDURES AND RECOMMENDATIONS FOR THE FUTURE

The project should consider the capabilities which the farmers already have and try to reduce the limitations and weak areas of the project. At the same time, reorganizing the structure of the organization to insure a more definitively delineated role in development is very important for future activities.

The past activities of the project can be summarized as follows:

1) The project picked target groups from farmers who were connected with McKean.

2) The extension project sent staff to coordinate, publicize and search for farmers interested in environmental agriculture.

3) Supported acquisition of knowledge through training, study-tours, seminars and data.

4) Provided support in the form of funds, inputs, tree seedlings, seeds, etc.

5) Select and train village communicators.

In order that project operations will be clear and accurate, the following activity structure is submitted.

1) Change the operating structure from being focused more on the household to being focused on village organizations, including truly preparing plans together with these organizations.

2) Rank order the strength of the farmers and farmers' organizations and their provision of a role in preparing work plans as the strength of the individuals and groups will be an important factor in the expansion of the project.

3) Farmer and community self-development in old areas is important. As the project has as target groups village communicators and farmers who have demonstration projects in every community, there should be connections establish to allow them to help themselves at the individual, community and network levels as much as possible.

4) In expanding new areas, dissemination of knowledge, experience and techniques of village leaders should be considered including the appropriate conditions for use of environmental agriculture and the desires of the community. This should be done through establishing opportunities for education both in the community and between communities. The local leaders or village communicators should have the main role in provision of knowledge by themselves.

5) There should be additional emphasis on data and analysis of problems for farmers on a continuing basis, especially in old project areas.

6) There should be an initial revision of the project structure to make it appropriate for the method of working as a team, an increase in manpower, and development of project staff in order that the problems of the farmers in their fields and orchards can be solved and so that the method of information dissemination including improving self-help capability at the household, group, community and network levels.

XVII. MANAGEMENT STRUCTURE OF THE EAT PROJECT

A. PROBLEMS AND RECOMMENDATIONS

The EAT project is one of the agricultural development section projects of McKean for rehabilitation but it has a separate budget from the main Institute budget. Within the agricultural development section there are various projects and activities. Basic activities have been conducted on a continuing basis for a long time, both agricultural work within the Institute including pig raising, fish ponds, fruit trees, vegetable crops, and work outside the Institute including cattle raising groups, supplementary employment groups, revolving funds, and basic community development.

Even though the EAT project has a separate budget, management of the project is under the Institute.

B. STRUCTURE OF THE MCKEAN REHABILITATION INSTITUTE

(During the EAT1 Project)

Christian Church in Thailand
|
Medical Administrative Committee, Ministry of Public Health
|
Administrative Department of the McKean Rehabilitation Institute
|
Assistant Director ---------- Director
|
| ---------- Administrative Committee
|
Sections
|

Medical Section	Vocation Section	Development Section	Management Section	Office
1. Medical Committee	1. Handicrafts	1. Agricultural Development Section - EAT	1.Administrative Section	1. Registration and Secretary
2. Nurses	2. Stationery	2. Education Section	2. Guards	2.Administrative Business
3. Rehabilitation Section	3. Furniture	3. Social Welfare Section	3. Kitchen	3. Planning and Development
4. Handicapped Equipment Section	4. Mai Ngam Store	4. Religion Section	4. Maintenance	4. Public Relations
5. Community Rehabilitation Section	5. Gift Shop		5. Vehicles	5. Finances and Accounting
6. Medical Techniques and Autopsy			6. Sanitation	
7. Medical Supplies and Medicines Section			7. Laundry	

C. THE PROBLEMS OF THE MANAGEMENT STRUCTURE

1. The four project officials are considered to be staff of the Agricultural Development Section as well and thus are responsible for various activities in that Section, both internally and outside the Institute. This has an impact on their

availability for and their role in working with the project target communities and problems with an overload of work.

2. The project activities unit of the agricultural sections which operate within the Institute are mostly people with experience who have worked with the Institute for a long time. The EAT project team focus primarily on community work, have an opportunity to exchange knowledge and learn from the communities and the networks of NGOs. However, within the Section there is no mechanism or platform or person who will facilitate the exchange of information among officials in the section or between sections. There is also a continuing lack of communication of information within the section. The result is an inability to see the target, direction and the structure to work together. This leads to a lack of understanding of each person's role and lack of appropriate levels of helping each other.

3. The administrative management structure at the project level of EAT is divided into five sections. Decision-making is done by teams; however, in the case of a problem which cannot be solved by an orderly system through the project coordinator as each team member has his own ideas and is sure of himself and is independent. In addition, it could be caused by the fact that the head of the agriculture unit is also the head of another level.

4. The administrative structure comes from the fact that the EAT project is under the Agriculture Unit which is, in turn, under the Development Section and on up to the Director of the Institute. This results in the decision-making process being confused and difficult. Activities in the project areas are not as effective as they should be.

5. Within the unit there is a problem with establishing or denoting where there will be working together due to the different roles and responsibilities of the individuals. Those who are responsible for activities within the Institute feel they should focus on internal activities. As to those who work in the project areas, they must focus on development of the target communities. Both of these groups do not yet see eye to eye regarding internal and external activities and to working together.

D. RECOMMENDATIONS

1. The administrative management structure of the project which includes making decisions as a team is necessary for a small project to be able to make decisions effectively and quickly change direction to provide support for villagers.

2. Establishment of a methodology for exchange of information among project staff, especially within the agricultural development unit, will improve teamwork and the ability to provide assistance.

3. Establishment of an on-going information system and an internal communication system will improve project effectiveness.

4. The focus of the project is testing and developing environmental agriculture. In this regard, the agricultural activities within the Institute can help very much with the extension work, especially the demonstration plots.