

EVALUATION REPORT

FARMER FIELD SCHOOL *for* SUSTAINABLE AGRICULTURE DEVELOPMENT IN MYANMAR



Prepared for Metta Development Foundation

by

Debbie Aung Din
Murielle Morisson

December 2003

EVALUATION REPORT

Table of Contents

Executive Summary	5
1. Introduction.....	9
2. Background.....	9
3. EVALUATION OBJECTIVES AND METHODOLOGY	10
4. FINDINGS	12
4.1 FFS ACTIVITIES	12
4.1.1 Direct Benefits to Farm Households.....	12
4.1.2. Roll on effects	17
4.1.3 Cost effectiveness of the FFS Program.....	188
4.2 CAPACITY BUILDING: LOCAL.....	199
4.2.1 Capacity of Facilitators	199
4.2.2 Capacity of Farmers	211
4.3. Capacity Building: Regional.....	255
4.3.1 Capacity of Local coordination team.....	25
4.3.2 Capacity of Central Coordination team (CCT).....	26
4.3.3 Capacity of Partner Organizations	27
5. Key Risks and Challenges for the FFS Program	29
5.1 Program-level Risks and Challenges	29
5.2 Macro-level Risks and Challenges.....	29
6. Recommendations.....	300
BIOGRAPHIES	322

Schedule for Evaluation

17 November to 10 December 2003

Date	Sites and activities	Team
17 November (Mon)	<ul style="list-style-type: none"> ▪ Arrival at Myitkyina ▪ Project orientation ▪ Discussion about the plan and logistics 	Debbie, Murielle, Naw Ja and Gum Sha
Field visit to FFS site		
18 November (Tue)	<ol style="list-style-type: none"> 1. Jam Ga village in Waimaw township <ul style="list-style-type: none"> ▪ Discussion with FFS farmers ▪ Visit FFS activities 2. Mung Na village in Waimaw Township <ul style="list-style-type: none"> ▪ Farmer Field Day 	Debbie, Murielle, Naw Ja, Gum Sha and Yaw Ying
19 November (Wed)	<ol style="list-style-type: none"> 3. Lawa in Mogaung township <ul style="list-style-type: none"> ▪ Discussion with FFS farmers (2 FFS) ▪ Visit FFS study plot 4. Khan La in Mogaung township <ul style="list-style-type: none"> ▪ Discussion with FFS farmers (2 FFS) 	Debbie, Murielle, Naw Ja, Gum Sha and Nawng Lat
20 November (Thu)	<ol style="list-style-type: none"> 5. Nawng Hkyi (graduated FFS) in Waimaw <ul style="list-style-type: none"> ▪ Discussion with graduated farmers and on going FFS (2 FFS) 6. Maw Hpawng in Myitkyina township <ul style="list-style-type: none"> ▪ Discussion with graduated farmers and on going FFS (3 FFS) ▪ 	Debbie, Murielle, Naw Ja, Gum Sha and Yaw Ying Debbie, Murielle, Naw Ja, Gum Sha and Nawng Lat
21 November (Fri)	<ol style="list-style-type: none"> 7. Wa Shawng in Township <ul style="list-style-type: none"> ▪ Discussion with on-going farmers 	Debbie, Murielle, Naw Ja and Gum Sha
22 November (Sat)	<ol style="list-style-type: none"> 8. Nawng Hkying (graduated FFS) in Waimaw township (3 FFS) <p>CARD (Centre for Action Research and Demonstration) at Alam, Myitkyina</p> <ul style="list-style-type: none"> ▪ Visit CARD's ongoing activities ▪ Discussion with staff 	Debbie, Murielle, Naw Ja, Gum Sha and Hka Dau
23 November (Sun)	Discussion with FFS central team	Debbie, Murielle, Naw Ja and Gum Sha
24 November (Mon)	Travel to Bhamaw by car	Debbie, Murielle, Naw Ja and Tu Ja
25 November (Tue)	<ol style="list-style-type: none"> 9. Alen Kawng in Momawk township <ul style="list-style-type: none"> ▪ Discussion with FFS farmers (3 FFS) 10. Non-FFS village in Momawk township <ul style="list-style-type: none"> ▪ Discussion with farmers 	Debbie, Murielle, Naw Ja, Tu Ja and Brang Mai

26 November (Wed)	11. Man Je in Man Je township ▪ Discussion with FFS farmers Afternoon: Discussion with facilitators in the area (6 facilitators)	Debbie, Murielle, Naw Ja, Tu Ja
27 November (Thu)	Return to Myitkyina (by car)	Debbie, Murielle, Naw Ja, Tu Ja
28 November (Fri)	Morning: Discussion with facilitators Myitkyina office (9 persons) Afternoon: Work in office	Debbie, Murielle, Naw Ja
29 November (Sat)	12. Non FFS village – Pyun Thone Lone village in Mogaung township ▪ Discussion with the farmers	Debbie, Murielle, Naw Ja
30 November (Sun)	Work in office	
Discussions, meeting and report writing		
01 December (Mon)	Meeting with Father Gregory Naw Din, Catholic Diocese of Myitkyina Report Writing	Debbie, Murielle, Naw Ja
02 December (Tue)	Report Writing Discussion with Farmers Leaders in Alam Center (20 persons)	Murielle, Naw Ja and Gum Sha
03 December (Wed)	Morning: Report writing Afternoon: Presentation of draft finding at KIO Meeting at Myitkyina	Debbie, Murielle, Naw Ja and Gum Sha
04-05 December (Thu and Fri)	Report writing	Debbie, Murielle
06-08 December (Sat to Mon)	Preparation CCT meeting and final report	Murielle
09 December (Tue)	CCT Meeting	Murielle, Naw Ja, Gum Sha

Executive Summary

This evaluation report is the result of an independent evaluation mission fielded by Metta Development Foundation to assess the impact of the Farmer Field School program in Kachin State. The mission took place from 17 November – 10 December 2003.

Agricultural extension programs and farmer education programs are key to increasing the productivity and incomes of small farms while protecting the environment. In particular, agricultural extension programs based on the Farmer Field School (FFS) approach that disseminate new science-based knowledge and other information to farmers are being implemented in many developing countries.

The farmer field school is a season-long training of farmers involving participatory activities, hands-on analysis and decision-making. The field school trainer plays the role of a facilitator rather than an instructor. The objective of the field schools is to give farmers an opportunity to learn and achieve greater control over the conditions they face daily in their fields. Farmers who participate in field schools learn how to reduce their use of pesticides, improve water management and soil fertility, enhance their yields and increase incomes. From this initial base, farmers can move into other crops and diversify into other activities related to their agro-ecosystems. The ultimate aim of the field school is to improve farmers' knowledge and decision-making abilities so they can build up sustainable agricultural systems and enhance food security in their families and communities.

In Kachin State in Myanmar, the Farmer Field School for Sustainable Agriculture Development program began in January 2001. The three-year program was created in response to the dire food security situation in Kachin State. The farmer field school program was coordinated by Metta Development Foundation and implemented by staff and facilitators from various partner organizations in Kachin State.

Pre-project assessments found that very low rice yields on small plots caused some 2-4 months of food insecurity in village households. To make up for the rice deficit, farmers search for off-farm work in gold panning, logging, jade mining and harvesting of forest products. Over the years, these natural resources have become harder to access. Farmers have been caught in a food-deficit cycle that traps them in a short-term survival mode of decision-making rather than being able to make longer-term investment decisions that can benefit their farms and production.

The objectives of the evaluation of the FFS Program are to:

1. Identify the specific direct and indirect results of the FFS activities on the yields and incomes of farm households in the project area.
2. Assess the progress made in improving the knowledge, management and decision-making capacity of local and regional groups in relation to sustainable agricultural development:

Over the past three years, the program has trained a total of 89 facilitators during an intensive season-long (6 months) training of trainers (TOT) course run by the Center for Action Research and Demonstration in Alam. A total of 258 field schools were conducted by the facilitators where 5,202 farmers were trained. 51 farmer leaders from among them have received Farmer Lead Extension (FLE) training at CARD.

A typical field school consists of 20-30 farmer participants. These participants normally learn about the school from a village meeting where interested persons are invited to register for the season-long course. Almost all participants have learned to grow paddy from their parents and have had no other exposure to new techniques or knowledge of farming. In the villages visited, the number of farmers graduated from FFS represents 10 to 15 percent of households in a village. When implemented for 3 years in the same village (in different sites), the number of farmers trained could reach 30% of a village's households. Coverage in a smaller, remote village could be as high as 85 % of village households in three years.

Many participants valued the chance to learn more technical knowledge, as they have never had a chance to go to this kind of practical school. All the participants interviewed were able to clearly articulate what they learned in school: that they use half the amount of seeds to grow rice; seedlings don't need to be 40 days old; how to produce quality seedlings; young seedlings can produce many tillers; why their soils are poor; how to make compost; and how to use less water.

Based on the visits to FFS sites and discussion with different actors, the main direct impacts observed are:

- The adoption of new cropping methods and their effects on production
- The economic impact of the changes in cropping methods
- The impact on the evolution of farming systems in the project area

The increased yields per farmer (with 3 acres average plot) is estimated to be 30 baskets minimum and 150 baskets when applying the different practices, representing increases of 30-165 percent from pre-FFS yields. On average, the 5,202 farmers reached by the program experienced an increase in incomes valued at about US Dollar (USD) 120 (56 baskets of paddy) per paddy crop.

The overall roll-on effects of the program were significantly higher and estimated to be worth USD 840,100 and impacting about 8,310 farmers. Most of these roll-on effects experienced by non-FFS farmers stem from the adoption of popular, low-cost, high-impact and easy techniques such as seed selection and reduction in the number of seedlings at transplanting time.

Farmers are also making investment decisions gradually and incrementally each year. In the first year, they will normally try the methods on a small plot. After seeing they can raise yields securely on a small plot, farmers will typically apply the methods and increase their acreage to 1-2 acres the following year. Some farmers who rent paddy lands are also calculating that they now will not need to rent and farm as much acreage as before, since they can get the same yields by intensifying production. A few farmers have been able to participate in markets and sell rice for the first time ever.

Farmers who attend the FFS have also become involved in planning new activities. Some farmers are recognizing that with the new SRI and improved methods, their lands are becoming more valuable. As a result, they want to bring back into cultivation some lands that were abandoned. As farmers grow in their competence and knowledge of farming, they are also growing more confident in articulating their needs and preferences. Farmers have also grown confident in interacting with and communicating their achievements to higher authorities.

The FFS program faces two levels of risks and opportunities for the future: at the program level and at a larger, macro-level. The two program-level risks/challenges are its financial sustainability and pace of expansion. The financial commitment involved in continuing activities, particularly on a broader, national scale. If the program is to carry out a significant training program over a long period of time relying on facilitators, a significant financial obligation will be needed – something which is not sustainable. The investment over the past three-year period (excluding the 2nd semester of 2003) was USD 52 per trained farmer. Prospects for significant coverage of the farming population through field schools can be discouraging, without added capacity and funds.

As the news about FFS spreads, the program is creating demand for new schools in other regions. While these requests for new programs represent exciting opportunities in the Myanmar context, there is the danger that the program will expand too quickly, beyond its capacity to manage. Also, once expectations have been built up and expansion occurs too rapidly, the failure to deliver promised services can discourage villages and farmers from participating and continuing with FFS activities.

There are some critical issues at the larger, macro-level affecting the future of sustainable agriculture in Kachin State. These are as follows:

Government's new rice policy: This new government policy states that farmers will no longer be required to sell paddy to the government. If implemented, the policy will benefit farmers and provide them with a greater incentive to grow paddy. However, there are many risks associated with the implementation of the policy. For example, procedures and directions are still very confusing and unclear at the local level which could lead to problems of collusion between traders and government whereby farmers have to sell at low prices.

High levels of deforestation and logging leading to environmental degradation: Such activities in Kachin State can threaten the future base for agriculture by leaving hillsides barren, leading to diminished water run-off in streams and rivers, severe soil erosion and producing erratic rainfall. (Farmers said they have noticed such changes over the last ten years in their environment.)

Growing number of vulnerable households: Shifting cultivation is no longer economic and is creating refugees who move to villages in the lowlands. At the same time, such villages already have significant populations of landless families who rent farmland to grow paddy. If the value of farmland increases with the spread of improved practices and yields, these landless households can have problems accessing farmland.

Lack of affordable credit: This continues to be a big constraint on increasing agricultural productivity. Credit costs are extremely high at about 20-30% per month. Farmers often have to leave their farms to find work after transplanting so they can accumulate cash to pay for harvesting costs. With such high interest rates, many vulnerable farm families are also caught in a vicious cycle of indebtedness.

Lack of protection of land use rights: Communal lands (farmland and forests) seem to be quickly disappearing as richer and more powerful groups claim large swaths of land (without compensation) for plantations, logging and other activities. One village visited by the team is facing the prospect of losing 5,000 acres of surrounding lands to a Chinese company that will plant cashews. Without proper protection of land use rights, small farmers risk being edged out of farming or caught in conflicts over land use.

The Evaluation Team recommends the following actions in the future:

1. Address the issue of financial sustainability upfront before promoting more FFS activities. There should be great selection and caution in initiating new activities, and there should be a focus on financial sustainability if the goal is to scale up activities of these new initiatives. We recommend a careful analysis of the project expenditures over time relative to the likely incomes and support from local partner organizations.

2. Continue to build up technical capacity of the program. The Training Center in Alam should continue to be supported in its research agenda as it has emerged as a regional training center that can provide high-quality training for the FFS program.

3. Add Gender Analysis module to the TOT training. To integrate women and their needs into the FFS program, greater gender awareness will need to be created within the FFS planning and TOT training. A first step would be to survey gender needs and issues more thoroughly and design a gender-analysis training module in the TOT based on the survey.

4. Develop systems for Monitoring and Evaluation throughout the program. While we recognize that development is largely a trial-and-error learning process, a good system of monitoring and evaluation at all levels will help the program to learn more quickly from its mistakes and experience.

5. Provide village infrastructure as a follow-up complement to FFS activities. To accelerate rural development, FFS villages will need small-scale infrastructure that can bring enormous benefits. Examples of such village infrastructure projects that can be funded for USD 2-3,000 are: small check dams to provide irrigation, feeder roads to markets and small bridges. Land reclamation is another good infrastructure project; it is possible to secure and purchase land use rights to help landless families. Community forests may also be possible as Myanmar does have a forest law that provides for ownership of forests by communities.

6. Maintain a common platform as a high priority in the program. Kachin villages are characterized by persistent or increasing poverty due to inequity, exploitation, conflict or neglect. They have tended not to have networks of organizations and have been largely separated and isolated from linkages with each other and other levels of organization. In this context, the connectivity at all levels created by the FFS is extremely valuable and should not be underestimated.

7. Maintain the Central Coordination Team as coordination body of the FFS program and as a platform. In the past three years, the CCT has been able to build up a level of trust and a willingness to share a common platform for development. Partner organizations also expressed their appreciation for this common platform; they valued the opportunity it provided to come together as different organizations around practical issues, particular in the historical context of fragmentation and division. It is recommended that partner organizations discuss and set up appropriate mechanisms for managing FFS activities and for ensuring the progressive hand over of the FFS program to the partner organizations in terms of decision-making processes and responsibilities. Metta Development Foundation could act as a facilitator in this process.

8. Promote the fulltime involvement of the partner organizations in the Central Coordinating Team. It is recommended that each partner organization assign a fulltime staff person to follow up the activities of the FFS program.

1. Introduction

This evaluation report is the result of an independent evaluation mission fielded by Metta Development Foundation to assess the impact of the Farmer Field School program in Kachin State. The mission took place from 17 November – 10 December 2003. The mission members are grateful to all the staff of Metta Development Foundation for facilitating our work and travel. Special thanks are extended to Naw Ja, for his tireless effort in orienting, coordinating and interpreting for us; to Gum Sha for his willing assistance; and to U Tin Shwe for his great care in driving us around.

2. Background

Agricultural extension programs and farmer education programs are key to increasing the productivity and incomes of small farms while protecting the environment. In particular, agricultural extension programs based on the Farmer Field School (FFS) approach that disseminate new science-based knowledge and other information to farmers are being implemented in many developing countries.

The farmer field school is a season-long training of farmers involving participatory activities, hands-on analysis and decision-making. The field school trainer plays the role of a facilitator rather than an instructor. The objective of the field schools is to give farmers an opportunity to learn and achieve greater control over the conditions they face daily in their fields. Farmers who participate in field schools learn how to reduce their use of pesticides, improve water management and soil fertility, enhance their yields and increase incomes. From this initial base, farmers can move into other crops and diversify into other activities related to their agro-ecosystems. The ultimate aim of the field school is to improve farmers' knowledge and decision-making abilities so they can build up sustainable agricultural systems and enhance food security in their families and communities.

In Asia, the first IPM farmer field school was conducted in Indonesia in 1990. Since then, over two million rice farmers have participated in rice IPM farmer field schools. During the last decade, farmers, agriculture extension agents, development workers, agronomists, governments and NGOs conducted over 75,000 farmer field schools throughout Asia and have been learning how to facilitate the FFS approach.¹

In Kachin State in Myanmar, the Farmer Field School for Sustainable Agriculture Development program began in January 2001. The three-year program was created in response to the dire food security situation in Kachin State. The farmer field school program was coordinated by Metta Development Foundation and implemented by staff and facilitators from various partner organizations in Kachin State.

Pre-project assessments found that very low rice yields on small plots caused some 2-4 months of food insecurity in village households. To make up for the rice deficit, farmers search for off-farm work in gold panning, logging, jade mining and harvesting of forest products. Over the years, these natural resources have become harder to access. Farmers have been caught in a food-deficit cycle that traps them in a short-term survival mode of decision-making rather than being able to make longer-term investment decisions that can benefit their farms and production. Thus, the farmer field school program decided to focus first on a rice intensification strategy to ease the burden of immediate food insecurity. The school emphasizes improved rice crop management practices including seed selection, preparation and care of quality seedlings, transplanting methods, water management, compost making and organic pesticides.

¹ "From Farmer Field Schools to Community IPM: Ten Years of IPM Training in Asia", FAO Community IPM Programme, Jakarta, 2000.

The overall goal of the Farmer Field School for Sustainable Agriculture Development in Myanmar is stated as follows:

- To establish and strengthen the process of rural development in the rural communities of Myanmar in general, and in Kachin and Shan States in particular, by establishing the farmer field school as a platform for community development.

The four specific objectives of the program are stated as follows:

1. To enhance and empower the decision-making ability of the rural household communities in 180 villages of Kachin and Shan States in Myanmar, by improving their overall management capacity in a crop-based sustainable and integrated agricultural system.
2. To facilitate and strengthen community efforts and participation in planning, implementing, monitoring and evaluating rural community-based initiatives for sustainable rural development.
3. To create self-reliant capability within local and regional organizations, the local organizations will implement farmer field schools at community levels, and regional organizations will coordinate implementation of FFS at local levels.
4. To encourage broader awareness of the problems facing the rural population and to influence other local, regional, national, and international organizations, creating an interest in supporting, sponsoring and implementing farmer field schools in other parts of Myanmar.

3. EVALUATION OBJECTIVES AND METHODOLOGY

The objectives of the evaluation are to:

1. Identify the specific direct and indirect results of the FFS activities on the yields and incomes of farm households in the project area.
2. Assess the progress made in improving the knowledge, management and decision-making capacity of the following groups in relation to sustainable agricultural development:
 - *Local level:* facilitators, farmers/farmer leaders, and villages
 - *Regional level:* local coordination team, central coordination team, and regional partner organizations

In assessing the capacity of the above groups, we looked broadly at progress made in the following categories of tasks: planning and goal setting; implementation and problem solving; resource mobilization; management of time, financial, organizational resources; communications and linkages; and monitoring and evaluation.

The evaluation team collected data for its study by reviewing written reports and information recorded by the program. Interviews were also conducted for obtaining individual opinions or perceptions about various issues and for gathering information from sources far away. In these interviews the team was able to explore topics in depth and probe for more information on critical issues.

The team also relied on focus groups or structured group meetings to obtain feedback and solicit ideas on specific topics. The focus groups involved a small number of participants, usually 6-12 persons, and explored a limited number of questions during a two-hour session.

The team conducted the following activities:

- Visited a total of 19 farmer field schools in 12 villages located in Myitkyina, Waimaw, Mogaung, Momauk and Man Je townships. 5 field school plots were visited.
- Held 19 focus groups with a total of 209 FFS farmers.
- Visited 2 non-FFS villages and held focus groups with 36 non-FFS farmers.
- Interviewed 10 village leaders (chairman, pastors etc.)
- Held focus groups/interviews with 49 women farmers.
- Held 2 focus groups with 15 facilitators.
- Visited the Center for Action Research and Demonstration (CARD) at Alam
- Visited the KIO Agricultural Training Center in Laiza
- Held discussions with central coordinators, project consultant and partner organizations.



Alen Kawng, Momauk, 25 November 2003

4. FINDINGS

4.1 FFS ACTIVITIES

4.1.1 Direct Benefits to Farm Households

One of the main objectives of the FFS was to improve rural livelihoods by increasing the productivity of rice cultivation leading to more food security and by increasing income from agriculture through cultivation of locally suitable cash crops. Two dimensions are important when implementing the IPM/FFS program: the technical and social.

In terms of technical results, the FFS aims to make farmers proficient in crop management with the main following principles:

- To grow a healthy crop by understanding the entire production system
- To emphasize field learning methods over a full season crop and field studies
- To promote FFS activities based on participatory and learned centered methods

Based on the visits to FFS sites and discussion with different actors, the main direct impacts observed are:

- The adoption of new cropping methods and their effects on production
- The economic impact of the changes in cropping methods
- The impact on the evolution of farming systems in the project area

After three years of implementation, the FFS program has trained 5,202 farmers and 51 farmer leaders at the Center for Action Research and Demonstration (CARD) in Alam. A total of 258 field schools were conducted. In the villages visited, the number of farmers graduated from FFS represents 10 to 15 percent of households in a village. When implemented for 3 years in the same village (in different sites), the number of farmers trained could reach 30% of a village's households. Coverage in a smaller, remote village could be as high as 85 % of village households in three years.

Degree of adoption of new methods and effects on the production

FFS farmers decide to adopt new methods according to their labor capacity, the level of inputs and the level of risk involved. The comparison of the improved methods and conventional method is shown in Appendix 1. The main practices adopted by FFS farmers are: 1) the seed selection method, 2) the production of quality seedlings, 3) the fertilization methods and 4) SRI (System of Rice Intensification).

The main direct results of adopting the improved methods are enhanced crop growth and increased yields. The immediate effects of the methods applied are the increase of tillers per seedling, the growth of a healthier crop and the production of higher quality of seeds.

Table 1: Rates of adoption by FFS farmers and non-FFS farmers (roll-on effect)

Methods	% of FFS farmers adopting method	Roll on effects: % of non-FFS farmers	Observations
1. Quality Seeds selection	1 year after: 100%,	2 years after: 100% of non-FFS farmers (see note below)	Easy to implement Effect: + 10 baskets/acre or 51.6 kgs/ha
2. Production of quality seedlings	1 year after: 100% on _ of plot area 2 years after: 100% on full area	2 years after: 100% on _ of plot area	1 st year, farmers limit the risk by trying only _ of their plot. Effect on yield: + 10 baskets/acre Effect on seeds quantity: + 1 basket/acre
3. SRI method or full package of improved method	2 and 3 years after: 10% of farmers on 2 acres (over 3 acres total)		Adoption depends on local conditions (field location, water availability) Effect on yield: + 50 baskets/acre
4. Compost/ Dochakin	1 and 2 years after: 5% of farmers on _ of total area		Effect on yield: + 10 baskets/acre

Note : To calculate the roll on effect, we assume that 5 non-FFS farmers observed one FFS farmer's plot.

One basket of paddy = 20.86 kgs

Considering an average farm size of 3 acres, the increase in production ranged from 30 baskets minimum to a maximum of 150 baskets with the adoption of the full package of methods.

Most FFS farmers prefer to adopt low external inputs and low-risk methods. The pace of adoption is slow as the farmers undertake the changes only as they are able to undertake more investment and risks. During the FFS season, motivated and innovative FFS farmers have experimented in part of their own fields some of the methods with priority given to methods requiring low external inputs and low risks. Other FFS farmers who choose not to adopt right away typically observe and follow the results of the study plot and try to learn the necessary skills before applying in their own fields.

The subsequent year following an FFS, it was found that virtually all of the FFS farmers choose to apply the low-risk method of seed selection. On the other hand, the methods of reducing seedlings and transplanting are typically adopted on a small scale or on half of the FFS farmer's area for the purpose of observing the results under the farmer's specific conditions. For technologies requiring higher labor input such as compost making, most farmers have hesitated to invest on a larger scale.

After observing results from the previous year, FFS farmers typically apply the selected new cropping practices on the entire sown area of their farms.

The main factors influencing the adoption of new methods can be linked to the region's historical development and socio-economic context as follows:

Historical background

The historical background of the region has shaped the current attitudes of farmers as well as the evolution of their farming systems. For thirty years, villagers were not stable and had to migrate from place to place. Farmers did not feel secure enough to build up more intensified farming systems. As a result, they managed their farms in extensive ways with low-input methods.

Over the last ten years, resettlement programs and migration waves have led to an increase of population in some areas and the extension of farming into the villages in low land areas. As a result, farms tend to be scattered and there is no specific management of the use of natural resources (land, water, forest). This makes it especially difficult to implement FFS and disseminate technologies geographically.

Dynamics at the village level

The existence of innovative/motivated farmers in a group is a key factor in more rapid adoption of new technologies. In some villages, the more motivated farmers had visited CARD to observe the results for themselves. Some of these farmers returned to their villages and had directly tried some of the methods or the full package on their own farm or small plot during the FFS training. They would then share their experience and findings and motivate other farmers. We also observed that in villages where there were local initiatives, the implementation of the FFS and the adoption of methods were smoother and faster than other villagers. In villages that have strong leadership and initiative, the adoption of new FFS methods through direct and roll-on effects is quite high.

Economic context

In villages facing land pressure due to recent migrations, farmers were more receptive to approaches leading to intensification of paddy farming. Farmers who could not access more than one acre of land tended to be the most innovative persons in securing food production.

The main economic constraints to intensify production are the needs for investment capital and the lack of income generating activities. Farmers estimate the costs of production at Myanmar Kyat (MMK) 30,000 to 40,000 per acre (excluding paddy sales to government), which translates to MMK 90,000 to 120,000 for an average three-acre farm plot. To cover production costs, farmers typically borrow money from local moneylenders at high interest rates (from 10% to 30% per month). To repay their debt, they would leave their village after transplanting time and search for off-farm income (mining, teak logging, labor works and etc). Even though the outside income could be profitable, villagers often encounter difficulties like health problems during the off farm activities. After harvest, part of the production is used to repay the moneylenders. Also, farmers were required to sell 8 to 12 baskets per acre at a lower price to the government. As a result, most families are facing rice deficits and are very risk-averse when it comes to making farm investments. When farmers have to travel far away to find employment and income opportunities, it limits their ability to adopt new methods such as water management, weeding and the SRI method since these methods require the farmers' presence after transplanting.

Economic impact of the new methods

The increased yield per farmer (with 3 acres average) is estimated to be 30 baskets minimum and 150 baskets when applying the different practices. The application of new methods has also induced changes in the costs of production. Most FFS farmers have observed an increase in labor costs for transplanting due to the need for careful management of seedlings. On the other hand, some farmers explained that the increased production by adopting improved methods allows them to reduce their farm size and the costs of production per unit. It would be important to follow within the FFS program the changing costs of production in the future. This can be done through proper monitoring and evaluation.

The direct economic impact of the total FFS program has been estimated based on the interviews conducted during the evaluation mission and is detailed in Appendix 2. During the monitoring-evaluation process of the FFS program, these assumptions could be readjusted.

Table 2: Summary of direct economic impact

Year	No of FFS and farmers	Increase in Yield	Value in USD	Total increase per farm (3 acres plot)
2001		non significant	non significant	
2002	29 FFS – 476 farmers	22,491 baskets of paddy (470mt)	USD 71,430	48 baskets
2003	95 FFS – 1662 farmers	90,477 baskets (1890 mt)	USD 196,700	55 baskets
Projections for 2004	258 FFS – 5202 farmers	287,511 baskets (6,009 mt)	USD 625,000	56 baskets USD 120

The economic impact is quite significant from the second year just from the application of low-input and low-risk practices. Therefore, the interest of farmers could be developed rapidly. However, after farmers adopt these initial more low-cost improved methods, their marginal increases in yields appear to drop off in subsequent years because farmers are not able to nor do they have the capital to make larger investments required by the more complete package of methods.

Impact on the evolution of farming systems

Impact on the intensification of the farming systems

In some villages, the minimum size required previously for conducting paddy cultivation was at least 3 acres. Families renting the paddy land would need to cultivate at least 4 to 5 acres to secure a minimum net income. Therefore, the new practices learned would have a direct impact in intensifying farming systems. To generate the same level of production, some FFS farmers have already decided to decrease the size of their paddy farm. As a result, they could mostly rely on their family labor and decrease their hired labor costs. Thanks to the selection of seeds and the production of quality seedlings, FFS farmers have also observed a significant decrease in the seed and labor costs during seedbed preparation. As a result of these practices, the costs of production per unit are reduced.

The rapid effect of the new practices on improving production and costs has created greater incentives for landless families to start renting or opening new land on small plots of only 2 acres. One woman interviewed was very enthusiastic about the new practices. As a widow, she has not been able to start farming in the low land area in the last five years due to the lack of family labor and capital to undertake a 4-acre plot. After participating in the FFS and observing the results, she has decided to farm a 2-acre plot and intensify production with the FFS methods.

Based on average data from the different villages, the comparison of the net income generated by the conventional and the new practices is detailed in table 3 and 4. We could observe that the intensification of the farming system results in the increase in the farmer's net income. Being able to generate the same production on two acres, the farmers are also able to decrease their costs of production per unit produced.

Based on interviews of farmers and groups of farmers conducted during the evaluation mission, the economic impact of the adoption of new practices could be estimated at the farm's level.

Table 3: Costs of production (farm gate) before the adoption of new practices

	for 2 acres (in baskets)	for 4 acres (in baskets)
1. Total Production		
Average 40 baskets per acre	80	160
2. Costs of production		
Seeds	3	6
Buffalo renting charges	30	30
Fertilizer bag	8	8
Sub Total	41	44
Land Renting charges	20	30
Labor charges	14	28
Total costs of production	75	102
3. Net Income	5 baskets	+ 55 baskets

Source: Field interviews, Evaluation mission, November 2003

Table 4: Costs of production (farm gate) after the adoption of practices

	2 acres (in baskets)
1. Total Production	
Average 80 baskets per acre	160
2. Costs of production	
Seeds	1
Buffalo renting charges	30
Sub total	31
Land Renting charges	20
Labor charges (if doubled)	28
Total costs	79
3. Net Income	+ 81 baskets

Source: Field interviews, Evaluation mission, November 2003

The above table shows how a farmer can increase significantly her/his consumption and yields (at least 2.5 to 3 times) to the point where some farmers have already started to sell their surplus rice. These data should be further confirmed through monitoring evaluation as currently most of the farmers are experimenting with the new practices on part of their fields and have difficulty estimating their labor costs. Also, the adoption of new methods needs 1 to 2 years practice before labor can become efficient in the new practices such as transplanting.

Impact on the value of farmland

The application of organic fertilization practices results in improved soil fertility and an increase in overall crop production leading to higher land values. Many FFS farmers mentioned the benefit of these practices in increasing the value of their lands. Such an impact on land value could lead to rapid changes in the demand for land. In fact, some farmers already face difficulties in accessing rental lands. For example, in 2002, one farmer leader had produced 300 baskets on the three-acre plot he rented as a result of applying improved methods. The following year in 2003, when trying to again rent the same land, the farmer could not get access to it as another farmer who had seen the increased production had already negotiated with the owner for renting it. With such increases in land values, landless and poorer families can be excluded from accessing land resources in the near future.

4.1.2. Roll on effects

Adoption of FFS technologies by non-FFS farmers

One year after an FFS, the FFS farmers would typically experiment with the new practices in their own fields. Then, through individual visits or group visits organized by FFS farmers, non-FFS farmers would learn the new practices and their effects on the crop growth and production. The roll-on effect could then be observed two years after the FFS implementation. Most non-FFS-farmers would adopt the easiest and low-cost techniques: seeds selection in salt solution and use of fewer seedlings planted per hill at transplanting time. These techniques don't require extra labor and even allow farmers to save seeds and labor at seedbed preparation time. Such roll-on effects can be measured in terms of increased yields. For other techniques, the adoption will depend on the training of non-FFS farmers by other FFS farmers.

The main factors influencing the adoption of technologies by non-FFS farmers are mostly the communication methods and the initiation of training by the FFS farmers themselves (through farmer leaders or individual farmers).

Economic impact of roll on effects

Based on our field interviews, we assume that 5 farmers visited one FFS farmer's plot during the 1st year experimentation in his/her plot. The next year, he/she will then experiment in his/her own plot. As a result, we can observe the roll-on effect two years after the implementation of the FFS.

Table 5: Estimate of economic impact of roll-on effects of FFS – Year 2003

Technologies adopted	% of adoption	No of farmers	Per farm Acreage	Per acre Gain in baskets	Baskets gained by Total No. of farmers	Unit price Per basket	Total market value Myanmar Kyat /US dollars
Seeds selection	100%	2,380	3	10	71,400	2,000	MMK 142,8 Millions USD 155,220
Quality seedlings	20%	2,380	1.5	10	35,700	2,000	MMK 71,4 millions USD 77,600
Savings of seeds	20%	2,380	1.5	1	3,570	2,000	MMK 7,14 Millions USD 7,760
Total					110,670		MMK 221.3 Millions USD 240,580

Source: Field interviews, Evaluation mission, November 2003

Table 6: Estimate of economic impact of roll-on effects of FFS – Year 2004

Technologies adopted	% of adoption	No of farmers	Per farm Acreage	Per acre Gain in baskets	Baskets gained by Total No. of Farmers	Unit price Per basket	Total market value MMK/US Dollars
Seeds selection	100%	8,310	3	10	249,300	2,000	MMK 498,6 Millions USD 542,000
Quality seedlings	20%	8,310	1.5	10	124,650	2,000	MMK 249,3 Millions USD 271,000
Savings of seeds	20%	8,310	1.5	1	12,465	2,000	MMK 24,9 Millions USD 27,100
Total roll on effect					386,415		MMK 772,8 Millions USD 840,100

Source: Field interviews, Evaluation mission, November 2003

When comparing the direct impact with the roll-on effects in 2003, we can see that the roll-on effect's economic impact (USD 240,580) is higher than the direct economic impact (USD 196,700). More importantly, the total roll on effects grow exponentially (almost four fold) to over USD 840,000 in the third year as the effects spread and the high paddy yields can be seen by a greater number of non-FFS farmers. The program should therefore focus on ensuring the success of the roll on effect through greater and improved communication.

Awareness of non FFS farmers about the FFS concept, practices and results and Emergence of new demand for FFS The Alam Center (CARD) has been an important focal point for farmers around Myitkyina to learn about the FFS concept, the new practices and the results. The center is receiving regular visits by individuals or groups of farmers who come to see the demonstration plots. High demand for new FFS exists and the demonstration effect appears to have been created through the farmer field days, cross visits, and visits conducted among villagers. The success of the strategy of the FFS in sharing information varies from one FFS to another and depends greatly on the FFS farmers and facilitators in organizing the dissemination of results.

Access to quality seeds

One of the objectives of the Farmer Field Day is to diffuse good quality seeds to non-FFS farmers. According to the experience of facilitators, during the Farmer Field Day, quality seeds are not specifically distributed to visitors. Non-FFS farmers are not sufficiently convinced of the importance and quality of seeds. Quality seeds were mostly distributed between fellow FFS participants as the participants can appreciate the improved quality of the seeds.

4.1.3 Cost effectiveness of the FFS Program

The FFS program budget includes salaries/compensation, travel expenses, equipment/materials, general operational expenses and evaluation costs. The budget from 2001 to 2003 has been increasing due to the growth of the network of facilitators and FFS. Nevertheless, the increase in expenses is not significant compared to the growth of the network of FFS conducted yearly. For the year 2003, only the 1st semester budget is available.

Table 7: Total expenses of the FFS program – January 2001 to June 2003

	2001	2002	1 st semester 2003	Total
Total without initial capital investment	USD 75,689	USD 80,024	USD 57,824	USD 213,537
Total with initial capital investment	USD 93,823	USD 93,572	USD 83,132	USD 270,528

Note: Initial Capital investments include vehicles and buildings.

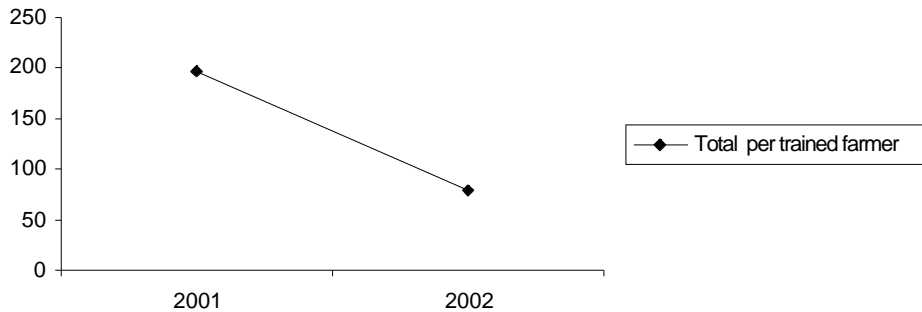
The cost of the FFS program per trained farmer has decreased significantly during the period and has reached USD 23 per farmer for the first semester of 2003. If we include the roll on effects and the non-FFS farmers reached, the costs would decrease in 2003 to USD 14 per farmer for the first semester.

Table 8: Total expenses of the FFS program – Jan 2001 to June 2003

	2001	2002	Total
Cost per trained farmer	USD 197	USD 79	USD 52
Cost per farmer including roll-on effect	USD 197	USD 79	USD 36

For the year 2003, the yearly expenses are not yet available.

Cost of FFS program per trained farmer (in US\$)



For the year 2003, the yearly expenses are not yet available.

Key issues related to the direct and indirect impacts of the FFS program

Follow up of the rate of adoption and farm results through a participatory monitoring evaluation system

The direct and indirect impacts of the FFS activities need to be better documented and monitored closely and regularly by involving the FFS participants/graduated in the process. Better monitoring would allow the farmers and the program to quantify and qualify the direct benefits of the FFS practices on the production, the importance of the roll-on effect, the impact on the evolution of the farming systems and equity issues (including effects on the exclusion of landless families).

Ensuring the follow up of the adoption of practices at the farmer level

Farmers have expressed the need for experimenting with practices in their own field in the next season following the FFS. To support them in implementing new methodologies, the FFS program would have to develop regular follow up at the field level in the second year following an FFS. The potential roll on effects of the program is very significant and should be maximized through proper follow-up after the initial year of an FFS.

Ensuring the quality of FFS to preserve the existing impact of the FFS

The program has developed an important network of FFS (258) and field staff (59). In 2003, the demand for new FFS continues to grow. To enable the diffusion and adoption of FFS concept and practices, extension to new villages would be important. As well, the future planning would have to take in account the needs for regular follow up of farmers. To ensure the quality of the FFS, a compromise between growth and follow up of graduated FFS has to be considered.

4.2 CAPACITY BUILDING: LOCAL

4.2.1 Capacity of Facilitators

The facilitator plays a key role in a farmer field school by organizing the village community and enlisting 20 to 30 participants; preparing for meetings; procuring local supplies for the school sessions; facilitating the activities for each of the 12-20 weekly sessions of the school; handling basic administrative issues; and maintaining communications and linkages with local leaders, the program's coordinating team and partner organizations.

A farmer field school usually meets for 4 hours in the morning, for one day per week during the growing season, beginning from pre-planting time in May/June to harvest time in November. During each weekly session, the facilitator will introduce an activity, clarify the process, put participants to work in teams, ask open-ended discussion questions as teams present their findings, and summarizes important points learned during the session.

Each FFS meeting might include at least three activities: an agro-ecosystem analysis, a special topic, and a team-building exercise. Participants also study and compare the improved farming practices learned in school with their normal practices.

Progress Made in Building Capacity of Facilitators

Over the past three years, the program has trained a total of 89 facilitators during an intensive season-long (6 months) training of trainers (TOT) course run by the Center for Action Research and Demonstration in Alam. Fifty-nine of these facilitators are currently working; others have dropped out due to illness, family obligations and etc. The first batch of facilitators had a higher dropout rate than subsequent ones. The program addressed this problem after the first TOT by communicating clearer selection criteria to the partner organizations as well as expectations for the future role of facilitators after their training. Stipends have also been given in recognition of the fact that facilitators spend full-time in their duties during the FFS season. Since the initial year, the quality of facilitators and their rate of retention have greatly improved.

Planning and goal setting: In general, we found that facilitators have been well trained in the area of planning FFS. However, in organizing the village during the first year, it was difficult for facilitators to conduct needs assessments as farmers could not articulate their specific needs and were unsure of what the facilitator's capabilities were in teaching various topics. As a result, priority was often given to paddy farming as the main focus of the field schools.

Implementation and Problem Solving: Facilitators have been able to conduct a growing number of FFS with each progressive year as shown in the previous section of this report. The fact that FFS implementation has spread rapidly shows that, despite their relatively young age, most facilitators have the self-confidence and capacity to provide an important and valued service to communities. This is also supported by the fact that many villages are now initiating and requesting to start field schools.

Five out of the 59 facilitators are considered by management to be "weak, i.e. they have not been regular in conducting field school sessions. Some FFS also started late in the growing season, so farmers could not spend much time on compost making. In some cases, the meeting times selected were not convenient, for e.g. on a Saturday afternoon. Often, the school plot was 2-3 miles away and farmers had trouble attending. In one village that was separated by a river, villagers on the one side of the river mistakenly thought only people from the opposite side could attend the FFS. We found that in a number of FFS, facilitators conducted field days at or after harvest, instead of before which resulted in low attendance and not being able to show community their results.

Monitoring and Evaluation

The benefits of monitoring and evaluation are numerous. In such participatory monitoring and evaluation session, participants are able to evaluate their own progress, discuss their problems and achievements and conduct group problem solving. Most facilitators do not give post-ballot box tests after the FFS season. Participatory monitoring and evaluation was also not conducted. Follow-up of alumni was done very informally and not systematically, citing that individual follow-up of farmers is very time-consuming and difficult. Group follow-up was also not followed in general.

The evaluation team's focus groups with farmers can be viewed as an exercise in participatory evaluation. In our focus group sessions, farmer participants had suggestions for how to improve the FFS the following year. For example, some participants suggested that the owner of the study plot be responsible for threshing and harvesting the plot, since most participants will be busy harvesting their own fields. Another suggestion was to have multiple short demonstration days where the entire village is invited to see seed selection, transplanting or compost making methods.

One of the few facilitators who did conduct a participatory M&E exercise with alumni found it to be very helpful. The group of alumni compared methods and yields from before and after the FFS and shared ideas for future improvements. Out of that follow-up evaluation session, the FFS alumni decided to initiate three more sites, which are now on-going field schools.

Good follow-up by a facilitator can also lead to follow-on activities. For example, in Nam Hti village a dynamic facilitator has helped villagers to start growing vegetables such as gourd, mustard greens as well as started credit groups. In Maw Hpawng, a facilitator helped develop three credit and savings groups; one of these groups has started a bicycle repair business.

Key Issues in Building Capacity of Facilitators

Supervision and Support:

Facilitation is a difficult art, especially when local circumstances are often changing and unpredictable. If effective and flexible facilitators are key to facilitating helpful interactions and linkages between farmers, villages and outside knowledge and resources, the quality of the facilitators must be maintained. To do this, it is important to recognize the needs of facilitators.

FFS facilitators represent important "human capital" that needs to be developed and nurtured. They are primarily a younger generation of people that have needs for professional satisfaction, stable employment and some sort of career advancement. If the FFS program can help satisfy these needs in some way, then it will be able to attract and retain good people, motivate their activity and channel their energies to help communities. To do this will require new supervision and support arrangements.

Transportation: This was also cited as a serious constraint in the work of facilitators. While it is true that without effective transportation, communication cannot occur, the extent of the problem for the program is not clear without further study.

4.2.2 Capacity of Farmers

A typical field school consists of 20-30 farmer participants. These participants normally learn about the school from a village meeting where interested persons are invited to register for the season-long course. Almost all participants have learned to grow paddy from their parents and have had no other exposure to new techniques or knowledge of farming.

Progress Made in Building Capacity of Farmers

Many participants valued the chance to learn more technical knowledge, as they have never had a chance to go to this kind of practical school. All the participants interviewed were able to clearly articulate what they learned in school: that they use half the amount of seeds to grow rice; seedlings don't need to be 40 days old; how to produce quality seedlings; young seedlings can produce many tillers; why their soils are poor; how to make compost; and how to use less water.

Farmers are also making Investment decisions gradually and incrementally each year. In the first year, they will normally try the methods on a small plot. After seeing they can raise yields securely on a small plot, farmers will typically apply the methods and increase their acreage to 1-2 acres the following year. Some farmers who rent paddy lands are also calculating that they now will not need to rent and farm as much acreage as before, since they can get the same yields by intensifying production. A few farmers have been able to participate in markets and sell rice for the first time ever. One farmer in Nawng Hkying village sold 30 baskets at MMK 3,500 in July of this year. Previously, he had bought rice to cover two months of shortfall.

Profile of an FFS Farmer: Becoming an Expert

Sayaw Hkawng Lum served as a KIO soldier for many years. After leaving the army, he settled down, was married and started a family. He first started working in the jade mines nearby but the work soon dried up as larger, mechanized companies took over the operations.

With three children to feed, Hkawng Lum decided to try his hand at farming three years ago. At age 25, he had never farmed before and never had a chance to learn. He found three acres of fallow land with soils that had been previously depleted from inappropriate use of fertilizer. Hkawng Lum convinced the owner to allow him to farm the land at a cheap price of a total 35 baskets. After clearing the land, Hkawng Lum had to often ask an older farmer nearby what to do since it was his first time growing rice. He was fairly satisfied with his yields of 50 baskets per acre during the first year.

The following year, Hkawng Lum heard about a school for farmers in his village and enrolled right away. He adopted many improved methods on all 3 acres during the field school season and almost doubled his yields with over 90 baskets per acre. His older neighbor to whom Hkawng Lum used to run for advice was soon coming to ask Hkawng Lum to show him these new methods of seed selection and compost making. Three to four other farmers in the village have also seen Hkawng Lum's plots and have come asking for advice. Despite this year's severe drought, Hkawng Lum is able to harvest about 60 baskets per acre, while other farmers are experiencing drastically low yields of 20 to 30 baskets per acre.

Two years after attending FFS, Hkawng Lum continues to grow and experiment with his plots. He has since tested the performance of 3 rice varieties and improved his seedbed preparation. He also tested the transplanting of rice seedlings at different ages and discovered on his own that seedlings as young as 7 days old can be used. In only three years, Hkawng Lum has grown from being a beginner farmer to becoming an expert farmer.

Farmers who attend the FFS have also become involved in planning new activities. Some farmers are recognizing that with the new SRI and improved methods, their lands are becoming more valuable. As a result, they want to bring back into cultivation some lands that were abandoned. For example, in Hmaw Hpawng village, farmers are thinking of ways to repair a broken dam. They estimate it will cost about USD1000 to repair and it could open up 300 acres that were previously unusable.

As farmers grow in their competence and knowledge of farming, they are also growing more confident in articulating their needs and preferences. For example, every year farmers have been required to buy a sack of fertilizer from the authorities at MMK 12,500 a sack, regardless of whether they wanted it or could use it. Many villagers simply paid the fee and kept the unused sack sitting in their homes. After attending the FFS this year, the villagers of Hmaw Hpawng village felt more confident to refuse the purchases and told the authorities they can increase paddy yields without fertilizer. The authorities were not altogether happy with the villagers' refusal to buy their fertilizer and criticized the FFS for causing such problems.

Farmers have also grown confident in interacting with and communicating their achievements to higher authorities. In Man Je Township, the FFS initiated and invited numerous township officials to their Field Day. Local officials from the Myanmar Agriculture Service, Education, Immigration and Land Records departments were all invited and attended, including the Military Intelligence and Police. The officials were so impressed with the increased yields and improved paddy crop that they promised to open up new farmlands for the farmers.

As FFS farmers intensify their production, they have also become aware of and have begun to articulate their constraints and needs. Some of the constraints and needs identified by farmers in our focus groups were: lack of draft animals for plowing; lack of water for crops; lack of capital to cover paddy production costs; degradation of forests and the environment; and diversification of farm production.

Key Issues in Building Capacity of Farmers

Inclusion of Women Participants: Women are generally involved in every task of paddy farming except for plowing. In the remote, upland areas, they are often in charge of the entire paddy growing process including plowing, since many of the men are gone for months, logging or working far away. Despite their integral role, the number of women participants in FFS has been very low. This year (2003), only 22 percent of the total participants were women. There are no women facilitators.

The women who did participate in the field schools found it difficult to attend regular field school sessions and said they were busy with household chores, looking after children, growing vegetables or taking care of small livestock. Yet those who did attend were extremely motivated. For example, in one FFS, the women said they were able to attend by planning ahead and finishing their household chores on Saturdays so they could be free to attend FFS on Monday mornings. In another village, participants had to pay MMK 100 round trip weekly to cross a toll bridge, plus walk across a stream in chest-high water during the rainy season.

We found that women were especially interested in teaching their children or grandchildren new methods like compost making and etc. Women also were able to use their networks to teach other non-participants. For example, a participant said she was asked by her friend and women from a nearby village to teach them how to transplant and make compost. As a result, fifteen women got together and organized their own teaching session in the non-FFS village.

Women who were widows and the heads of their households were especially motivated to learn from field schools, even if they did not own land. For example, a young widow from the FFS in Jam Ga village had 3 children and was a petty trader. She had no land but was very motivated and attended the FFS regularly. Although she doesn't farm, she wanted to teach her children some skills. She also expressed that by attending the FFS weekly, she felt encouraged and supported in her difficult personal circumstances.

Women participants often cited compost making as the most useful skill they learned from FFS. Most women grow vegetables for home consumption and apply the composting methods right away on their gardens. They noticed their vegetable plants are healthier, grow faster and they can harvest earlier. Women were also interested in small animal husbandry and especially appreciated learning how to fatten their pigs. Women also indicated that they preferred the practical demonstrations rather than the theoretical knowledge from classes. Because they had trouble attending regularly due to domestic responsibilities, the women said they would prefer shorter courses that did not last the entire season.

Capacity of Villages

Farmer field schools are not an end in themselves. Beyond the field school, they are becoming a starting point for the development of a sustainable agricultural system in their village. The field school sets in motion a longer-term process, in which opportunities are created for the village to create new approaches for development.

Progress Made in Building Capacity of Villages

To assess the progress made in building the capacity of FFS villages, it is helpful to compare and look at the following profile of a non-FFS village visited by the team:

Profile of a Non-FFS Village: Pyun Thone Lone, Mogaung Township

Pyun Thone Lone is a relatively well-endowed village: it is in an irrigated area (in the command area of Sa Maw Dam) and there is abundant land available for extending cultivation. Paddy farmers in this village own an average of seven acres, higher than the five-acre average for Kachin State. The village is relatively new, established in 1990 with newly opened lands. Farmers report average yields of 50 baskets with high yielding varieties. Very little fertilizer or manure is used, mainly in seedbed preparation. Farmers select seeds the traditional way, by collecting seeds from a "good" plot. Seedlings are normally transplanted at around 30 days, with 4 seedlings per hill. The village has a shortage of draft animals (last year 30 cattle were lost to a big disease outbreak.) Cultivation costs are high due to the shortage of animals and labor. Most farm families have remained at subsistence level. The only option farmers have for increasing their production and incomes is by extending their acreage, which they try to do each year. However, extending cultivation means incurring more costs; the families extend their lands, but they are not advancing out of their subsistence mode. Farmers in Pyun Thone Lone recognize this but feel they have no other options. They have not gotten together to organize any group activities, because they are all too busy working on their extended acreages. Farmers say they heard some villages had farmer field schools where farmers were raising their yields to 80 baskets/acre. The farmers of Pyun Thone Lone village expressed that, "If someone can lead us and teach us these new methods, we want to learn how to intensify our cultivation."

In graduated FFS villages, the team found that FFS alumni and other villagers were motivated to plan other group activities to develop their communities. FFS villages are growing in their capacity to organize in some of the following ways:

- During the season, some field schools have had to turn away 30-40 farmers who wanted to attend mid-season upon seeing the study plot. Many FFS villages also were aware of at least two to three other villages nearby who wanted to start a school. Villages with FFS alumni have been instrumental in organizing new field schools so other farmers can benefit.
- Some FFS villages have Kachin, Shan and Burmese ethnic groups. In these villages, the alumni and FFS leaders have decided to reach out to the Shan and Burmese farmers and help organize an FFS for them in Burmese language.
- In Momauk Township, the farmer field school has been integrated into the statewide carpentry school in the village. Young men are not only learning carpentry skills, they are also learning how to grow healthy crops.
- Some FFS alumni have continued to organize their own research activities, such as doing a common 1-acre study plot or growing a common banana plantation plot.
- During the FFS season, villages have also pooled together to organize joint Field Days, which involve 4 to 5 FFS and 600 people attending.

Key Issue in Building Capacity of Villages

Follow-up of Graduate FFS villages

Important momentum has been built in FFS villages and there's a danger of losing this valuable momentum if the village is not followed up. Once a village has experienced a farmer field school, the roll-on effects can be quite high. It is felt that the roll-on effects of the program in Myanmar are likely to be much higher than in other Asian countries. The incremental gains made by farmers are more dramatic since farmers in Myanmar are starting from such a low base of productivity and there is such a large vacuum of technical knowledge at the village level. However, graduated FFS villages are not confident to conduct an FFS themselves, after the first or second year. Farmers generally feel they can show the practical methods to others but do not feel they can communicate the theoretical knowledge.

4.3. Capacity Building: Regional

4.3.1 Capacity of Local coordination team

The Local Coordinator plays a key role in the coordination process by overseeing the activities of the facilitators in a geographic area; proposing and supervising the implementation of the FFS planning; ensuring the quality of the FFS activities; providing support to the facilitators; preparing reporting for coordination meetings; implementing FFS himself/herself. In the FFS program, there are 5 Local Coordinators overseeing 5 to 11 facilitators, depending on area covered. The Local Coordinators have been selected among the core group of facilitators based upon their performances.

Depending on the number of FFS conducted and the number of facilitators supervised, the Local Coordinator was able to visit his facilitators once a month or once every two months. The facilitators and local coordinator do not meet on a regular basis. Discussions and problem-solving occurred during the visit to field schools and during informal meetings. All facilitators and local coordinators participate yearly in a review workshop held at CARD, Alam after the FFS season. It is an important time for reporting results, discussing the main issues/problems, sharing experiences and designing future planning. To enhance their capacities in technical fields and monitoring evaluation, the coordination team organized special courses or a refresher course designed for facilitators and local coordinators .

Progress made in Building Capacity of Local Coordinators

Ability of the Local coordinators in supervising the activities in their area

The local coordinators are actively involved in the coordination of the facilitators' activities, in direct collaboration with the central coordinator. By visiting regularly the FFS, they play an important role in supporting problem-solving at the FFS level. They are also the key person for building the motivation and commitment of facilitators. Some facilitators, supported by the local coordinator have built good collaboration among themselves in organising Farmer Field Days and Cross visits. Further training on team building processes and PAR methods would allow facilitators to enhance the capacities of the facilitators in those fields.

Expertise of the Local Coordinators

The Local Coordinators have developed expertise in the various FFS topics. Some of them are directly applying the SRI or improved cropping methods in their own fields and have practical experience in paddy farming.

Key issues in Building Capacity of Local Coordinators

Maintaining the quality of follow up by local coordinators

When overseeing a span of nine to eleven facilitators, the local coordinator faces major time constraints and transport/communication difficulties. In the rainy season, local coordinators are unable to reach some villages in areas where streams/rivers could not be easily crossed. In such cases, the support and follow up of their facilitators is compromised. The program should review the maximum number of facilitators to be supervised by each local coordinator if the priority is to ensure good follow up and quality of FFS. In addition, to motivate and retain facilitators, the program will need to review the compensation structure of local coordinators as there appears to be significant disparities between local coordinator stipends and those of facilitators.

4.3.2 Capacity of Central Coordination team (CCT)

The Central Coordination Team is composed of representatives from Metta, the partner organisations, local technical experts, Local Facilitators and the external consultant. The CCT members are responsible for coordinating the program activities and act as a decision-making body for the program. In the evaluation team's interviews with the different representatives, it appears the representatives of the various did not always have the necessary authority to make decisions on behalf of their organizations.

Progress made in Building Capacity of the CCT

The CCT meetings were held twice a year in 2001 and once a year in 2002 and 2003. The agenda of the meeting revolved around the following topics:

- The review of activities for the current year
- The main issues and proposal of improvements for implementing activities
- The yearly planning of the FFS program concerning the selection of facilitators, the extension of FFS and the training organisation
- The role and responsibilities of CCT

Under the supervision of Metta Development Foundation, the Coordination team is taking charge of local monitoring of activities, the financial management, administrative tasks, the development of communication tools, the coordination of the training at Alam Center and the supervision of CARD's activities. The coordinator and his colleagues have been able to receive some training in the country and make some exposure visits to other countries in the region. Also, they have participated in international workshops and presented their activities to various partners and donors. They have developed some communication tools (project presentation, calendar, technical pamphlets) and have coordinated well the different TOT in collaboration with the external consultant.

Linkages with other partners and authorities have been mostly built through CARD in Alam (through the visits of UNDP, Karuna Foundation, MAS, regional authorities and etc.) as a demonstration center. The program has also presented to the Ministry of Agriculture its activities with the support of the external expert. To enhance the understanding and knowledge of other organizations in FFS concepts and methods, the coordination team should organize specific visits to FFS field sites and demonstrate the effects of the FFS locally.

Key issues in building capacity of the CCT

The strategy for the next phase of the program

To ensure the follow up of the present network of FFS and the possible extension in the existing geographical areas, the CCT would have to define the objectives and the strategic planning of the FFS program for the next three to five years. The main issue would be in setting up appropriate mechanisms for managing program activities and for ensuring the progressive hand over of the FFS program to the partner organizations in decision-making processes and responsibilities. Metta Development Foundation could act as a facilitator in that process.

Allocating sufficient human resources to the current size of the program

The growth of the FFS activities, based on the demand, has been supported by the building of a team of 59 facilitators and local coordinators. As well, CARD has further developed its activities in terms of training and experimentation with satisfactory results. To supervise the activities, the central coordinator and the persons assisting him are involved in new areas of intervention (management of team, coordination work, financial management, communication, capacity building). As a result, the workload has significantly increased leading to new human resources needs. To support their work and ensure good management of the activities, there are needs for involving new persons, especially in training them for management and financial and administrative operations. As well, the coordination team needs to develop new skills as managerial skills, financial management, monitoring evaluation and etc.

4.3.3 Capacity of Partner Organizations

One of the main objectives of the program is to develop the capacity of the partner organizations to manage the process of FFS through their own organizational structures and with their own resources. Each partner organization has assigned a representative to the CCT meeting.

Progress made in Building Capacity of Partner Organizations

Growth of the network of facilitators and FFS and situation in 2003

The partner organizations have yearly selected participants to the TOT training and the situation of the network in 2003 is as follows.

Table 9: Distribution of facilitators and FFS in 2003

Partners Organization	Number of facilitators	Number of FFS
Diocese	14	30
KBC	17	55
KIO	7	18
Others	21	60
Total	59	163

At the village level, during the initial phase, some local partner organizations had supported the facilitators in organizing villagers. It has not always been the case for all facilitators.

Selection of facilitators

In 2001, the CCT set up the following criteria for the selection for the TOT candidates:

- Candidates must be farmers
- They must commit themselves for at least two years in the activities of the FFS program

The current 59 facilitators demonstrated strong interest and a high degree of commitment to their work.

Visit to FFS sites

The CCT representatives of the partner organizations make regular visits to the FFS in collaboration with the local coordinator and program coordinator. These visits are important for building the awareness of the partner organization in FFS concepts, for overseeing the impact of the FFS activities and for encouraging facilitators and FFS farmers.

Review of activities in CCT meeting

During the CCT review workshop, the partner organizations have actively participated in reviewing activities, proposing improvements, defining the roles and responsibilities of the CCT, and planning activities for the next year.

Initiation of the FFS program within the partner organizations

The KIO has been the only partner organization out of the four partner organizations to fully incorporate the FFS program into its organization. It implemented its first TOT course in 2003 with 22 participants at the Agricultural Research Center in Laiza. The participants were selected by each of the four administrative/geographic divisions of the KIO's Agriculture Department. The age of participants ranged from 20 to 35 years old. The training curriculum was similar to the one developed at CARD in Alam and also included courses on upland agriculture. The training center covers 11 acres, with 2 acres of paddy land. The KIO center's main research areas are the demonstration of SRI and improved methods and the experimentation of new varieties for paddy, fruit trees and vegetable. Upland technologies will be developed further. In 2004, the alumni will begin implementing FFS in the four Divisions, with the support of the local KIO authorities. The Center will provide technical support to the facilitators. There will be coordination mechanisms with the current FFS program to avoid overlapping and to ensure the quality and standards of the FFS.

The Diocese has begun to work on integrating the facilitators into their own organization. However, the Diocese expressed its reluctance to spin off its own FFS program due to the importance of maintaining the CCT as a common platform for the coordination of FFS at this time.

Key Issues in Building Capacity of Partner Organizations

Management of FFS programs by the respective structures of the partner organizations

Most of the partner organizations have ongoing development activities within their respective organizations. However, few of them have specific agricultural expertise. Therefore, the hand-over of the FFS activities to each organization can be problematic and certain issues need to be considered:

- The building of internal capacity to follow up activities of FFS program especially in terms of technical and organizational capacity building.
- The integration of the team of facilitators as there could be differences of compensation within the partner organizations' structures.
- Ensuring standard, quality services through coordination mechanisms among partner organizations.
- Maintaining the role of FFS as a platform for all representative groups in the village (religious, ethnic).

A significant number of facilitators (at least 12) were selected by local organizations, i.e. those who are neither KIO, Diocese nor KBC. These local bodies are smaller and more resource-constrained. Their ability to incorporate FFS activities in the future will present a unique challenge.

5. Key Risks and Challenges for the FFS Program

The FFS program faces two levels of risks and opportunities for the future: at the program level and at a larger, macro-level.

5.1 Program-level Risks and Challenges

Financial Sustainability:

A major issue for the future of the FFS program is the financial commitment involved in continuing activities, particularly on a broader, national scale. If the program is to carry out a significant training program over a long period of time relying on facilitators, a significant financial obligation will be needed – something which is not sustainable. The analysis of costs in the previous section of the report shows that it will take about seven years at the current level of facilitator capacity to reach the estimated 139,000 total farmers in Kachin State. The investment over the past three-year period (excluding the 2nd semester of 2003) was USD 52 per trained farmer. Prospects for significant coverage of the farming population through field schools can be discouraging, without added capacity and funds.

While the use of farmer-leaders reduces the financial burden and enhances the sustainability of the program, the extent to which farmer-leaders can take over training responsibilities is in question. The kind of knowledge-transfer done by farmer-leaders is more casual and not systematic like the field schools. Their impact and coverage will be likely minimal, which again raises the question of program sustainability.

In two FFS, the participants decided to charge a MMK 500 fee to attend the school. It would be helpful to explore further how many FFS are doing this and the extent to which communities are willing to absorb the costs of the field school.

Pace of Program Expansion

As the news about FFS spreads, the program is creating demand for new schools in other regions. While these requests for new programs represent exciting opportunities in the Myanmar context, there is the danger that the program will expand too quickly, beyond its capacity to manage. Also, once expectations have been built up and expansion occurs too rapidly, the failure to deliver promised services can discourage villages and farmers from participating and continuing with FFS activities.

5.2 Macro-level Risks and Challenges

There are some critical issues at the larger, macro-level affecting the future of sustainable agriculture in Kachin State. These are as follows:

Government's new rice policy: This new government policy states that farmers will no longer be required to sell paddy to the government. If implemented, the policy will benefit farmers and provide them with a greater incentive to grow paddy. However, there are many risks associated with the implementation of the policy. For example, procedures and directions are still very confusing and unclear at the local level which could lead to problems of collusion between traders and government whereby farmers have to sell at low prices.

High levels of deforestation and logging leading to environmental degradation: Such activities in Kachin State can threaten the future base for agriculture by leaving hillsides barren, leading to diminished water run-off in streams and rivers, severe soil erosion and producing erratic rainfall. (Farmers said they have noticed such changes over the last ten years in their environment.)

Growing number of vulnerable households: Shifting cultivation is no longer economic and is creating refugees who move to villages in the lowlands. At the same time, such villages already have significant populations of landless families who rent farmland to grow paddy. If the value of farmland increases with the spread of improved practices and yields, these landless households can have problems accessing farmland. In some villages that have had FFS experience for 2-3 years, landowners are already beginning to ask for higher rents for their land or deciding to farm the lands themselves now.

Lack of affordable credit: This continues to be a big constraint on increasing agricultural productivity. Credit costs are extremely high at about 20-30% per month. Farmers often have to leave their farms to find work after transplanting so they can accumulate cash to pay for harvesting costs. In fact, the attendance of participants in FFS can diminish significantly after transplanting when some farmers have to leave their farms to look for jobs and cash. With such high interest rates, many vulnerable farm families are also caught in a vicious cycle of indebtedness.

Lack of protection of land use rights: Communal lands (farmland and forests) seem to be quickly disappearing as richer and more powerful groups claim large swaths of land (without compensation) for plantations, logging and other activities. One village visited by the team is facing the prospect of losing 5,000 acres of surrounding lands to a Chinese company that will plant cashews. Without proper protection of land use rights, small farmers risk being edged out of farming or caught in conflicts over land use.

6. Recommendations

6.1 Address the issue of financial sustainability upfront before promoting more FFS activities. There should be great selection and caution in initiating new activities, and there should be a focus on financial sustainability if the goal is to scale up activities of these new initiatives. Perhaps field schools will be viable only in specific local circumstances and are not meant to be scaled up to national levels. We recommend a careful analysis of the project expenditures over time relative to the likely incomes and support from local partner organizations.

6.2 Continue to build up technical capacity of the program.

The Training Center in Alam should continue to be supported in its research agenda as it has emerged as a regional training center that can provide high-quality training for the FFS program. The center is starting to attract more people from various parts of the country as a result of its reputation. The FFS program should continue to have close links with the Training Center so facilitators and farmers can benefit from new technologies and research produced by the center. Specific research topics that would be of value to the field schools are: diversifying production into vegetable and fruit crops, knowledge of dry season crops, solutions to the problems of open grazing and livestock raising.

Similarly, the KIO Agricultural Training Center in Laiza should be supported as it is developing expertise and focusing on problems faced by upland farmers. Through the Laiza Training Center, the FFS can be quickly integrated into the KIO's governance and administration. Its FFS program will have the advantage of having a supportive administrative structure down to the local level, for initiating and follow-up of field schools. They will also be able to reach isolated areas where other partner organizations are not working.

6.3 Add Gender Analysis module to the TOT training. To integrate women and their needs into the FFS program, greater gender awareness will need to be created within the FFS planning and TOT training. A first step would be to survey gender needs and issues more thoroughly and design a gender-analysis training module in the TOT based on the survey.

6.4 Develop systems for Monitoring and Evaluation throughout the program. While we recognize that development is largely a trial-and-error learning process, a good system of monitoring and evaluation at all levels will help the program to learn more quickly from its mistakes and experience. One of the difficulties in doing an impact assessment was the lack of baseline data on villages and farmers. Base-line data is needed that documents the total number of villages, village profiles, number of owner and tenant farmers, and pre-program practices and yields. It would also be helpful to have township maps to track the geographic spread of the program.

6.5 Provide village infrastructure as a follow-up complement to FFS activities. To accelerate rural development, FFS villages will need small-scale infrastructure that can bring enormous benefits.² Examples of such village infrastructure projects that can be funded for USD 2-3,000 are: small check dams to provide irrigation, feeder roads to markets and small bridges. Land reclamation is another good infrastructure project; it is possible to secure and purchase land use rights to help landless families. Community forests may also be possible as Myanmar does have a forest law that provides for ownership of forests by communities.

6.6 Maintain a common platform as a high priority in the program. Kachin villages are characterized by persistent or increasing poverty due to inequity, exploitation, conflict or neglect. They have tended not to have networks of organizations and have been largely separated and isolated from linkages with each other and other levels of organization. In this context, the connectivity at all levels created by the FFS is extremely valuable and should not be underestimated. At the village level, farmers feel encouraged by meeting together and solving problems practically as well as when people visit them from higher levels especially who take an interest and support them. Farmers expressed they want to be part of a larger network to see what's going on in other farms and villages.

6.7 Maintain the Central Coordination Team as coordination body of the FFS program and as a platform. In the past three years, the CCT has been able to build up a level of trust and a willingness to share a common platform for development. Partner organizations also expressed their appreciation for this common platform; they valued the opportunity it provided to come together as different organizations around practical issues, particular in the historical context of fragmentation and division. It is recommended that partner organizations discuss and set up appropriate mechanisms for managing FFS activities and for ensuring the progressive hand over of the FFS program to the partner organizations in terms of decision-making processes and responsibilities. Metta Development Foundation could act as a facilitator in this process.

6.8 Promote the fulltime involvement of the partner organizations in the Central Coordinating Team. The CCT currently meets only once a year. It is recommended that each partner organization assign a fulltime staff person to follow up the activities of the FFS program. Therefore, the staff would be able to overview and understand all aspects of the activities: technical, management, financial issues, methodology and monitoring evaluation. The partner organizations should also meet more frequently (3 to 4 times a year) and assign representatives with decision making authority as members of the CCT.

² World Bank studies in other countries have found that village facilities were maintained better over time when villagers not only participated in making decisions about projects but also contributed their own resources toward construction and operation.

BIOGRAPHIES

Debbie Aung Din Taylor, a consultant and native of Myanmar, has been on several UNDP missions to Myanmar since 1995. She co-authored a report for the UN Country Team on Food Security in Myanmar in 2000, served as Deputy Team Leader for independent assessment and evaluation missions in 2001 and 2002, and was a member of the 1999 World Bank mission to assess socio-economic conditions in Myanmar. Prior to 1995, she worked on development issues in post-war Cambodia and lived there for four years. She lived in Indonesia for seven years, first working with the Harvard Institute for International Development and later as a consultant for USAID. Taylor holds an M.A. from Harvard University where she studied development economics and public policy.

Murielle Morisson, native of France, has been working for GRET, French NGO, since 1995 in Myanmar. She has been responsible for the building of local organizations providing micro finance services and supporting the development of sustainable agriculture in Northern Chin State. She is also acting as the Country Coordinator of GRET in Myanmar. In 1999, she has conducted a feasibility study on Micro finance program in Namibia, for the French Ministry of Cooperation and GRET. In 2003, she has been consultant for UNODC for supporting the initiation of local organizations responsible for water management activities in Wa Special Region No 2. She holds a Master Degree on Agriculture Sciences, specialization on rural development in developing countries.



Appendix 1 Impact of the technologies adopted on the conduct of the farm

Methods	Before	After	Impact
Quality Seeds selection	At least 1.5 baskets of seeds per acre No selection of quality seeds	Selection of seeds with the salt solution method decrease of seeds rate in seedbed	Reduce seeds quantity Better quality of seedlings Increase of yield = + 10 baskets per acre
Production of quality seedlings	3-5 seedlings per hill 5-10 tillers per hill No good management practices during seedbed and transplanting periods Age of seedlings 30 to 45 days old seedlings Yield: 30 to 50 baskets/acre	1-3 seedlings per hill 20-35 tillers per hill Improvement of management practices during seedbed and transplanting periods 10 to 20 days old seedlings Yield: 70 to 100 baskets/acre	Improve crop growth, especially panicle Higher rate of tillers (20 to 30 tillers per hill) Better sized grains Higher productivity: + 10 baskets per acre at least Reduction of at least _ of the seeds quantity Reduction of labor costs for seedbed preparation Needs skillful labors Increase the labor needs for transplanting
Transplantation method	Random method	Transplanting in line Transplanting in shallow level	Control of spacing Facilitate weeding and cultivation Improve the tillering and growth
Compost/ Dochakin	Use of fertilizer or no fertilizer at all Result: decrease of yield and soil quality	Application on seedbed and on small paddy area after transplanting Application on vegetable in most of the cases	Vegetable: improve the growth of the plants Paddy: time consuming and difficult to prepare for large plot Improve the soil fertility
Charcoal acid		Tried for goat breeding or human medicine	Protection from disease
Plant juice		Used on vegetable	Improve significantly the growth of plants To be careful on dosage
SRI method	Old seedlings (25 to 45 days according to variety) Field flooded the whole season 4 to 5 seedlings/hill No weeding Fertilizer sometimes used Transplanting in random way	Early transplanting Single seedlings Wider space Alternate drainage and irrigation Regular cultivation of the soil Application of compost	Higher yield: 80 to 120 baskets per acre with SRI (+ 50-100% of previous yield) Needs drainage and irrigation system More labor for transplanting and weeding/cultivation Higher grains quality and weight

Appendix 2

ECONOMIC IMPACT OF FFS PROGRAM

Year 2002 29 FFS 476 farmers from 2001 FFS

Technologies adopted	% of adoption	No of farmers	Average Acre	Gain in baskets	Total baskets	Unit price baskets	Total MMK	Total USD
Seeds selection	100%	476	3	10	14,280	2,000	28,560,000	80,000
Quality seedlings	100%	476	1.5	10	7,140	2,000	14,280,000	40,000
Compost	5%	476	1.5	10	357	2,000	714,000	2,000
Savings of seeds	100%	476	1.5	1	714	2,000	1,428,000	4,000
Total impact					22,491		44,982,000	126,000

Year 2003 29 FFS 476 farmers from 2001 FFS
 66 FFS 1186 farmers from 2002 FFS

Methods adopted	% of adoption	No of farmers	Average Acre	Gain in baskets	Total baskets	Unit price baskets	Total MMK	Total USD
Seeds selection								
2001 FFS	100%	476	3	10	14,280	2,000	28,560,000	45,261
2002 FFS	100%	1186	3	10	35,580	2,000	71,160,000	112,773
Sub-total		1662			49,860		99,720,000	158,035
Quality seedlings								
2001 FFS	100%	476	3	10	14,280	2,000	28,560,000	45,261
2002 FFS	100%	1186	1.5	10	17,790	2,000	35,580,000	56,387
Sub-total					32,070		64,140,000	101,648
Compost								
2001 FFS	5%	476	1.5	10	357	2,000	714,000	1,132
2002 FFS	5%	1186	1.5	10	890	2,000	1,779,000	2,819
Sub-total					1,247		2,493,000	3,951
Full package								
2001 FFS	10%	476	2	50	4,760	2,000	9,520,000	15,087
- cost increase	10%	476	2	7	666	2,000	1,332,800	2,112
Sub-total					4,094		8,187,200	12,975
Savings seeds								
2001 FFS	100%	476	3	1	1,428	2,000	2,856,000	4,526
2002 FFS	100%	1186	1.5	1	1,779	2,000	3,558,000	5,639
Sub-total					3,207		6,414,000	10,165
Total impact					90,477		180,954,200	286,774

YEAR 2004 29 FFS 476 farmers from 2001 FFS
 66 FFS 1186 farmers from 2002 FFS
 163 FFS 3540 farmers from 2003 FFS

Technologies adopted	% of adoption	No of farmers	Average Acre	Gain in baskets	Total baskets	Unit price baskets	Total MMK	Total US USD
Seeds selection								
2001 FFS	100%	476	3	10	14,280	2,000	28,560,000	31,043
2002 FFS	100%	1186	3	10	35,580	2,000	71,160,000	77,348
2003 FFS	100%	3540	3	10	106,200	2,000	212,400,000	230,870
Sub-total		5202			156,060		312,120,000	339,261
Quality seedlings								
2001 FFS	100%	476	3	10	14,280	2,000	28,560,000	31,043
2002 FFS	100%	1186	3	10	35,580	2,000	71,160,000	77,348
2003 FFS	100%	3540	1.5	10	53,100	2,000	106,200,000	115,435
Sub-total					102,960		205,920,000	223,826
Compost								
2001 FFS	5%	476	1.5	10	357	2,000	714,000	776
2002 FFS	5%	1186	1.5	10	890	2,000	1,779,000	1,934
2003 FFS	5%	3540	1.5	10	2,655	2,000	5,310,000	5,772
Sub-total					3,902		7,803,000	8,482
Full package								
2001 FFS	10%	476	2	50	4,760	2,000	9,520,000	10,348
- cost increase	10%	476	2	7	666	2,000	1,332,800	1,449
2002 FFS	10%	1186	2	50	11,860	2,000	23,720,000	25,783
- cost increase	10%	1186	2	7	1,660	2,000	3,320,800	3,610
Sub-total					14,293		28,586,400	31,072
Savings of seeds								
2001 FFS	100%	476	3	1	1,428	2,000	2,856,000	3,104
2002 FFS	100%	1186	3	1	3,558	2,000	7,116,000	7,735
2003 FFS	100%	3540	1.5	1	5,310	2,000	10,620,000	11,543
Sub-total					10,296		20,592,000	22,383
Total impact					287,511		575,021,400	625,023