

## FARMER PARTICIPATORY EXTENSION (FPE) METHODOLOGIES USED IN THE CASSAVA PROJECT IN THAILAND

*Wilawan Vongkasem<sup>1</sup>, Kaival Klakhaeng<sup>1</sup>, Kitti Srakaew<sup>1</sup>, Ratana Sevatasai<sup>1</sup>,  
Watana Watananonta<sup>2</sup> and Reinhardt H. Howeler<sup>3</sup>*

### ABSTRACT

During the first phase (1994-1998) of the Nippon Foundation project on “Improving the Sustainability of Cassava-based Cropping Systems”, two pilot sites were selected, namely Soeng Saang district, Nakhon Ratchasima province, and Wang Sombuun district, Sra Kaew province. FPR trials on methods to reduce soil erosion were conducted for three consecutive years. After narrowing down the number of suitable options, farmers in both sites finally selected and adopted the contour strip cropping of cassava with vetiver grass hedgerows. They also requested further support to extend the vetiver grass hedgerows on a larger scale to their cassava fields. In Soeng Saang district, farmers in Sappongphoot village got together to set up a Soil Conservation group. They agreed to plant vetiver grass hedgerows with a total length of 17 kilometers in the first year of 1998. Similarly, farmers in Wang Sombuun district planted vetiver grass hedgerows with a total length of about 10 kilometers. During the final year of the first phase, DOAE had extended the project to two other sites in Kalasin and Chachoengsao provinces.

In the second phase of the project (1999-2003), a total of 24 villages in 17 districts, in 8 provinces are participating in the project. To be able to scale out to so many new sites, the project used and developed several Farmer Participatory Extension (FPE) methodologies, such as cross-visits, farmer evaluation of demonstration plots, FPR trials, training courses and field days. In addition, DOAE helped farmers in 11 sites to set up “Cassava Development Villages”, i.e. community-based self-help groups that help each other to develop better cassava production practices and protect the natural resources in the community. The final result is that farmers in all villages adopted vetiver grass hedgerows as the most suitable system to reduce erosion. At present, there are 865 farmers participating in the project and the total length of the vetiver grass hedgerows has grown to 130 kilometers, covering 940 ha of cassava fields. In addition, farmers also adopted new cassava varieties, such as Rayong 5, Rayong 72 and Kasetsart 50, and they are using more chemical fertilizers as well as animal manures. Recently, farmers have shown a new interest in trying out the use of green manures in their FPR trials; as a result of these trials they have now adopted the planting of *Canavalia ensiformis* as a green manure between cassava rows.

### INTRODUCTION

Cassava can grow well even in low fertility soils and under relatively dry conditions. However, the rate of soil erosion in cassava fields is quite high, particularly in sloping fields with sandy soils and low organic matter content. This is due to the wide spacing of cassava planting and the slow growth rate for the first three months (Putthacharoen, 1992). The joint research of the Centro Internacional de Agricultura Tropical (CIAT), the Department of Agriculture (DOA), and Kasetsart University (KU) revealed that planting methods or planting system adjustment could reduce soil erosion (Howeler, 1987; 1994). Altogether, 24 methods (treatments) were included in the

---

<sup>1</sup> Rice and Field Crops Promotion Division, Department of Agricultural Extension (DOAE), Chatuchak, Bangkok, 10900 Thailand.

<sup>2</sup> Field Crops Research Institute, Dept. of Agric., Chatuchak, Bangkok 10900, Thailand.

<sup>3</sup> Centro Internacional de Agricultura Tropical (CIAT), Department of Agriculture, Chatuchak, Bangkok, 10900 Thailand.

experiment; for instance, intercropping with some field crops, e.g. maize, groundnut, mungbean, pumpkin, water melon; the use of chemical fertilizer, manure or green manure to stimulate fast early growth; or contour strip cropping with some grasses, e.g. vetiver, ruzie grass, elephant grass and lemon grass. Each method has its own advantages and disadvantages. Some methods give extra income, but some need more management or high investment. The problem still exists on whether or not the farmers would adopt any of these methods. In 1993, CIAT, in cooperation with DOAE and DOA, established a Cassava-based Cropping System Management Project and started the farm trials using a Farmer Participatory Research (FPR) approach (Vongkasem, 1998). This methodology will enhance the farmers' awareness of soil erosion and its consequences. It also encouraged the farmers to decide which method of soil erosion prevention was most suitable and practical for their own communities. The farmers, however, did the trials by themselves under the supervision of DOAE and DOA staff. Eventually, the farmers were the ones who selected the soil conservation method that was most suitable and efficient for them.

During the first phase (1994-98), two pilot project sites were selected, namely, Soeng Saang district, Nakhon Ratchasima province, and Wang Sombuun district, Sra Kaew province. FPR trials on soil erosion control methods were conducted continuously for three years. Finally, farmers in both sites selected and adopted contour strip cropping with vetiver grass. They also requested further support to extend these vetiver hedgerows to their larger cassava fields. In Soeng Saang district, the farmers organized a group for Soil and Environmental Conservation. They agreed to plant 17 km of vetiver grass hedgerows in 1998. Similarly, farmers in Wang Sombuun district planted about 10 kilometers of vetiver grass hedgerows.

In the final year of Phase I, DOAE extended the project sites to Kalasin and Chachoengsao provinces. In Phase II (1999-present), 18 villages, in 14 districts in 8 provinces have participated in the Project. In order to extend the knowledge and understanding of soil and water conservation to more and more farmers and to achieve widespread adoption of soil erosion control practices, the project started to combine FPR trials with various Farmer Participatory Extension (FPE) activities.

## **FARMER PARTICIPATORY RESEARCH AND EXTENSION**

### **Project Objectives**

1. To show cassava growers the importance of soil conservation and the need to reduce soil erosion. The emphasis is placed on farmer participation in decision making and method selection.
2. To develop simple soil erosion control practices that are suitable for particular regions by conducting FPR erosion control trials with farmers.
3. To encourage and help farmers to adopt the selected practices in their cassava fields.
4. To scale-up the selected erosion control practices to more farmers and achieve widespread adoption.

### Responsible Organizations

Organization	Responsibility/Activity
1. Centro Internacional de Agricultura Tropical (CIAT)	-Provide budget -Train staff and organize workshops -Monitoring and Evaluation
2. Department of Agricultural Extension (DOAE)	-Facilitate project's activities in the villages -Organize farmers meetings (using farmer participatory method) and cooperate with concerning agencies in both central and regional offices. -Provide budget -Hold farmer training sessions -Monitoring and evaluation
3. Department of Agriculture (DOA)	-Experiment to develop new options -Take part in field trials and demonstration trials -Take part in monitoring and evaluation -Take part in farmer training courses
4. Land Development Department (LDD)	-Support knowledge on vetiver grass growing and the use of green manures -Provide vetiver tillers and green manure seeds -Set out contour lines in farmers fields for vetiver strips -Take part in monitoring and evaluation
5. Thai Tapioca Development Institute (TTDI)	-Conduct demonstration trials -Take part in training courses -Provide training facilities -Take part in monitoring and evaluation

### Farmer Participatory Research (FPR) and Extension (FPE) Methodologies

This process consists of the following steps:

1. Select pilot sites by conducting Rapid Rural Appraisals (RRAs)
2. Plant and manage demonstration plots
3. Hold farmers' meetings and organize cross-site visits
4. Conduct various types of FPR trials to increase cassava yields and/or income, such as varieties, fertilization, intercropping and erosion control
5. Training of staff
6. Extension of selected practices from farmer-to-farmer
7. Organize field days
8. Write articles in news papers; radio and TV programs
9. Print pamphlets, booklets etc.

#### *1. Select pilot sites by conducting RRAs*

The main criteria for selection of project sites are:

- Cassava is the main crop in the area and is grown on slopes with serious problems of

soil erosion.

- Farmers and extensionists must be eager to work together to solve various problems.

After the pilot sites (villages) were selected, a Rapid Rural Appraisal (RRA) was conducted with the farmers to learn about the agro- and socio-economic conditions. The problems farmers encountered in cassava production were also studied.

## ***2. Establish demonstration plots***

Every year demonstration plots were laid out, usually at the TTDI Research and Training Center in Huai Bong, Nakhon Ratchasima. These demonstrations had many different treatments about ways to increase yields or reduce erosion. Farmers from new sites would visit these plots, observe the treatments and discuss and select the most suitable treatments for their own conditions. In many cases they selected vetiver grass contour hedgerows as the most suitable practice to control erosion.

## ***3. Hold farmer's meeting and organize cross-site visits***

Farmers' meetings were held in the selected villages to discuss the objectives, principles and procedures of the project. The beneficial effects of using green manures or chemical fertilizers were also discussed. The farmers then discussed and decided for themselves whether or not they wanted to participate in the project. In case farmers were not interested, the project would look for other sites.

Farmers who wanted to participate in the project were invited to join the study tour to observe the demonstration plots on soil erosion control methods. In addition, farmers from a new site would visit an "older" site. In these older sites farmers had already adopted vetiver grass hedgerows to control erosion. This was an opportunity to exchange experiences between the visitors and the hosts. The concepts of establishing a village credit fund and the administration of this fund were also discussed.

At the end of the study tour, farmers were asked whether they were interested in either conducting their own FPR trials on some selected treatments of soil erosion control, or to adopt any of the observed soil erosion control practices right away. In most cases, farmers preferred to adopt the planting of vetiver hedgerows, because they had already observed the efficiency of these hedgerows for soil erosion control under farming conditions similar to their own.

## ***4 Conduct FPR trials on ways to increase productivity***

In case farmers wanted to conduct their own FPR trails, they were provided with the necessary inputs, such as seeds of intercrops, seeds or tillers of hedgerow species, plastic sheets to cover the sediment collection ditches, and they were reimbursed for the cost of digging the sediment collection ditches. Officials from DOA and DOAE helped farmers lay out the field trials. Alternatively, if farmers wanted to adopt the planting of vetiver grass hedgerows, they would receive the necessary vetiver tillers and help from LDD in setting out contour lines.

Usually, DOAE staff would suggest farmers to conduct additional trials on new cassava varieties, chemical and organic fertilizers, and green manures. These trials provided farmers with information on how to increase cassava production efficiency and helped to attract their interest in participating in the project.

### **5. Training of staff**

Training workshops were organized by CIAT to train the collaborating project staff of the three departments, namely DOA, DOAE, and LDD. Officials in both the central and regional offices were trained in the use of farmer participatory methodologies. Furthermore, CIAT provided additional training for the principal collaborators by sending them overseas to learn more about farmer participatory approaches and techniques.

### **6. Technology transfer through Farmer Participatory Extension (FPE)**

In order to transfer technologies with farmers' participation, a budget was allocated to support 4-6 farmers' meetings annually. The topics included discussion on project implementation and the possible solutions for both project management and crop production. Local extension agents acted as coordinators of these discussions and could invite experts or lecturers from outside according to the farmers' needs or problems.

### **7. Field days**

The project organized three levels of farmer field days:

*7.1 Village level.* This field day was held at the time of harvesting the FPR trials. After the trial plots were harvested, all data were recorded and the results were presented and discussed with the farmers. In this way, the farmers learned and obtained information to make decisions about which technologies might be suitable for their village conditions. They then discussed and planned for action in the following year.

*7.2 District level.* The objective of this type of field day was to disseminate technologies to nearby villages and sub-districts. On the field day, the farmers who had already conducted FPR trials shared their knowledge with other farmers. Officials from DOA, DOAE, and LDD also discussed how to increase cassava production efficiency, improving soil fertility by planting green manures, and to control erosion in various ways, including the growing of vetiver hedgerows. These field days took place in the project sites so that farmers would be able to study the real situation. This technique was quite effective as the visiting farmers were often interested in trying out the practices of soil erosion control in their own areas.

*7.3 Provincial level.* At this level, approximately 1,000-1,500 farmers and officials from nearby provinces were invited to visit the field day. Reporters from newspapers and television stations were also invited in order to report the project activities through the wider mass media.

### **8. Media production**

In order to promote the project and provide information and its implementation to a wider audience, a video was made showing how to operate development work through farmers' participation. The video was distributed to many provincial offices and agencies. The Office of the Royal Development Projects Board also supported the Project by providing a booklet series, "The Factual Tips about Vetiver", for distribution to the farmers who participated in the project.

### **9. Additional Activities**

The following additional activities were performed:

*9.1 Training course for making handicrafts from vetiver leaves:* The training course was aimed at offering a choice to generate income from vetiver leaves. So far, the farmers from three villages: Saphongphoot village in Soeng Saang district, Kut Dook village in Daan Khun Thot district of Nakhon Ratchasima province, and Huai Suea Ten village in Sahatsakhan district of Kalasin province received training in the making of various handicrafts from vetiver grass. The trainers of the course were provided by the Department of Industrial Promotion.

*9.2 Cassava Development Village:* Since the year 2000, DOAE has adjusted the project implementation by setting up the so-called ‘Cassava Development Villages’. Farmers in the target villages received training to have more knowledge and develop a clear understanding about the need to conserve soil resources in order to obtain higher yields. The construction of vetiver hedgerows across the slope and the use of green manures to increase soil fertility were demonstrated. DOAE provided the farmers with planting material of good varieties of cassava, chemical fertilizer, and vetiver plantlets on condition that they return the value of these materials to the village revolving fund after the cassava harvest. A low interest rate was agreed upon by the villagers. Furthermore, the members voted to elect the ‘Fund Administration Committee’, which comprised a chairman, a vice-chairman, a treasurer, and a secretary as the minimum number. Rules and regulations were discussed and voted on by the members’ resolution.

## RESULTS AND DISCUSSION

The implementation of the Project, “Enhancing the Adoption of Soil Erosion Control Practices in Cassava Fields” for the past eight years in an ever increasing number of sites has had a great impact on the farmers’ awareness of the importance of soil erosion prevention. After testing various options to reduce soil loss, practically all farmers selected the planting of vetiver grass hedgerows across the slopes as the most suitable and effective erosion control practice. Presently, this practice has been adopted in 21 villages located in eight provinces (**Table 1**). Altogether, 865 farmers participated in the planting of vetiver hedgerows which now has a total length of 130 km in their cassava fields, planting a total of 1.3 million vetiver slips. Furthermore, farmers in a few villages adopted the planting of *Canavalia ensiformis* (sword bean) as a green manure. In addition, 21 ‘Cassava Development Villages’ were established. At present, members of these farmers’ groups have access to a revolving fund, which range in size from baht 40,000 to 380,000 per group, with a total of baht 1,475,868, to be used for the development of these communities (**Table 1**). The establishment of these groups is a way to strengthen rural communities to face new challenges in the future. Besides, DOAE tries to make use of the project sites for field visits of the farmers from nearby villages, sub-districts, districts and provinces in order to encourage further scaling-up of the project results.

**Table 1. Location of pilot sites for the project “Enhancing the Adoption of Soil Erosion Control Practices in Cassava Fields”, the extent of adoption of vetiver grass hedgerows, and the status of the village revolving credit funds in 2002.**

Province	District <sup>1)</sup>	Sub-district	Village	No. of farmers	Area planted with		Length of vetiver strip (km)	Village fund (baht)	
					Cassava (rai) <sup>2)</sup>	Vetiver (plantlets)			
Kalasin	Mueang	Phu Po	Noon Sawan	61	306	85,500	8.6	40,000	
		Kamin	Kham Pla						
	Nong Kung Si	Nong Bua	Kham Si	67	690	111,600	11.2	85,850	
		Sahatsakhan	Non Buri	Noon Sawat	63	370	86,170	8.6	75,000
			Non Nam	Huai Suea Ten	42	254	128,330	12.8	114,220
	Namon	Kliang	Pa Kluai						
			Noon Thiang	50	24	16,000	1.6	-	
		Don Chan	Dong Phayung	Noon Kokchik	50	24	16,000	1.6	-
		Huay Phueng	Nikhom	Huai Fa	50	24	16,000	1.6	-
		Kamphaeng Phet	Khanu Waralaksaburi	Bo Tham	Si Yaek Ton Sai	42	170	68,000	3.0
Kanchanaburi	Lao Khwan	Thung Krabam	Nong Kae	42	170	80,000	3.0	60,000	
Chaiyaphum	Thep Sathit	Na Yang Klak	Kook Anu	42	170	68,000	4.0	86,000	
Chachoengsao	Sanaam Chai Khet	Thung Phraya	Tha Chiwit Mai	6	45	50,000	2.0	101,080	
		Tha Takiap	Khlung Takrao	Nong Yai	42	170	100,000	5.3	83,550
Prachinburi	Na Di	Kaeng Dinso	Ang Thong	34	170	60,000	4.5	84,800	
Nakhon Ratchasima	Daan Khun Thot	Baan Khao	Kut Dook	53	309	130,000	15.0	132,000	
Sra Kaew	Thepharak	Bueng Prue	village 3, 6	26	214	80,000	11.0	54,000	
		Soeng Saang*	Noon Sombuun	Sappongphoot	60	828	80,000	20.0	54,848
	Khon Buri*	Sa Takhian	Sra Takhian	-	30	20,000	2.0	0	
		Map Tako En	Lam Phiak	27	24	50,000	0.0	0	
Sra Kaew	Wang Sombuun	Wang Sombuun	Khlung Ruam	42	-	90,000	-	22,500	
Total: 8	17	20	21	865	5,876	1,335,600	129.8	1,475,868	

<sup>1)</sup> \* Additional new sites for implementation of the project in 2002.

- data not available

<sup>2)</sup> 1 ha = 6.25 rai

## LESSONS LEARNED

The following lessons have been learned from the Project:

1. The implementation of a project that has as its objective to enhance the conservation of soil, water and the environment, must involve the people of the whole community, or at least, it must start with some parts of the community that participate in the Project. The villagers must be aware of the seriousness of the problems that need to be solved by sharing their opinions and by making decisions together.
2. The technologies offered to the farmers must have a direct positive effect on yield and must be adapted to their way of life. For example, the adoption of vetiver grass hedgerow planting and intercropping with sword bean as a green manure is likely to improve soil fertility, which in turn may result in increased cassava yields.

3. The duration of a project is also another significant factor for its success, because the soil erosion problem does not have an immediate impact on the daily life of the farmers. Thus, farmers need some time to become aware of the problem, to test several possible solutions and to confirm the results before they decide to adopt soil conservation practices. In this case, the project should continue for at least ten years.
4. Agricultural extensionists need to change their role, from recommending certain practices to being a facilitator, to encourage members of the community to participate in analyzing their problems and search together for solutions. In many cases, they can act as the coordinator to seek help and knowledge from outside. Nevertheless, the needs must be identified by the community.
5. Various incentives or subsidies of some production inputs are necessary, particularly for the conducting of field trials, to provide vetiver slips and to help set out contour lines after farmers have decided to adopt the planting of vetiver grass contour hedgerows.
6. Farmers should be given freedom to select and modify the soil erosion prevention treatments to be tried on their own field. For example, they can test the use of other grasses or other crops as contour hedgerows, such as sugarcane or upland rice.
7. The forming of farmers' self-help groups will provide opportunities for members of the community to express their opinions and find the best ways for future development. Support from outsiders in terms of supplying planting materials, fertilizer, seeds, etc., with the condition that the users of the inputs return these to start the village revolving funds, may be a way of strengthening the development of the community and empower its members to solve their own problems.

## REFERENCES

- Howeler, R.H. 1987. Soil conservation practices in cassava-based cropping system. *In*: T.H. Tay; A.M. Mokhtaruddin and A.B. Zahari (Eds.). Proc. Int. Conf. on Steepland Agriculture in the Humid Tropics, held in Kuala Lumpur, Malaysia. Aug. 17-21, 1987. pp. 490-517.
- Howeler, R.H. 1994. Integrated soil and crop management to prevent environmental degradation in cassava-based cropping systems in Asia. *In*: I.W.T. Bottema and D.R. Stoltz (Eds.). Proc. Workshop on Upland Agriculture in Asia, held in Bogor, Indonesia. April. 6-8, 1993. pp. 195-224.
- Putthacharoen, S. 1992. The loss of plant nutrients in cassava fields compared with those of other field crops. MSc thesis, Kasetsart Univ., Bangkok. (in Thai)
- Vongkasem, W. 1998. Report on the Result of the Project on the Improvement of Cassava Yield through Soil Improvement. Field Crops Section, Rice and Field Crops Promotion Division, Department of Agricultural Extension, Bangkok. (in Thai)
- Vongkasem, W. 2000. A project on the adjustment of cassava production systems to reduce soil erosion. Proc. 2<sup>nd</sup> Conf. on Agric. Extension, held in Khon Kaen, Thailand. Aug 16-18, 1998. pp. 213-226. (in Thai)
- Vongkasem, W., K. Klakhaeng, S. Hemvijit, A. Tongglum, S. Katang, D. Suparhan and R.H. Howeler. 2001. Reducing soil erosion in cassava production systems in Thailand: A farmer participatory approach. *In*: R.H. Howeler and S.L. Tan (Eds.). Cassava's Potential in Asia in the 21<sup>st</sup> Century: Present Situation and Future Research and Development Needs. Proc. 6<sup>th</sup> Regional Workshop, held in Ho Chi Minh city, Vietnam. Feb 21-25, 2000. pp. 402-412.