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RECOMMENDATIONS ON USING A FARMER-TO-FARMER VISIT PROGRAM

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Background information on the status of Farmer Field Schools was gathered through the works of Arnoud Braun, Janice Jiggins, Niels Röling, Henk van den Berg and Paul Snijders who wrote "A Global Survey and Review of Farmer Field School Experiences" in 2006. Information regarding the approach used in Farmer Fields Schools was gained from Godrick Khisa's FARMERS FIELD SCHOOL METHODOLOGY written in 2004.

Junior Paul, Patrick Telemaque, Edy Toutpuissant and Lochard Narcisse in collaboration with Government of Haiti Ministry of Agriculture staff conducted research with the goal of identifying examples of sustainable agricultural production in Haiti. These sites represent potential farmer to farmer visits for DEED partner producer groups.

INTRODUCTION - THE ORIGINS AND EVOLUTION OF FARMER FIELD SCHOOLS

The DEED project (Développement Economique pour un Environnement Durable), a project financed by USAID, started in Haiti in mid-February 2008. DEED aims to both develop and preserve the watershed zones of Limbé and Montrouis by working with local producer groups to reinforce and strengthen sustainable commercial agriculture in ways that protect the environment and improve the management of natural resources. The DEED project is implemented by Development Alternatives Incorporated (DAI).

A key expected result for the DEED project is that agricultural production is increased while at the same time the natural resources base is protected. In practice, the focus is primarily on introducing new cropping systems on steeply sloped land in the upper parts of the watershed that are currently highly susceptible to erosion. The aim is to replace annual crops with perennial crops and other forms of non-erosive ground cover.

An increase in agricultural production will depend on the development of farmers' organizations in terms of institutional strengthening, access to improved technologies and capital to further invest in production. Many farmers groups have had to operate independently of government structures due to the lack of resources available to the latter, for the provision of technical assistance and support. In response to this lack of support, farmers can explore the use of alternative institutional support mechanisms like the Farmer Field School approach which builds farmers learning from one another.

The FFS approach emerged out of a concrete, immediate problem. Farmers in Indonesia were putting their crops, their health and their environment at severe risk through massive abuse of highly toxic pesticides promoted aggressively by private industry and government. Pest species were becoming resistant and in some cases resurgent. What was called for was a large-scale decentralized program of education for farmers wherein they become "experts" in managing the ecology of their fields – bringing better yields, fewer problems, increased profits and less risk to their health and environment. The Integrated Pest Management Farmer Field School (IPM-FFS) and a corresponding large-scale Indonesian program were developed in response to these conditions. The genesis of integrated pest management (IPM) was a response to the emergence of problems associated with the reliance on chemical controls for insect pests by governments, extension systems and farmers.

The search for solutions to these problems led to the development of a more holistic view of what constituted an agro-ecosystem and how human interventions could either enhance or disrupt one. FFS alumni are able to not only apply IPM principles in their fields, but also to master a process enabling them to help others learn and apply IPM principles, and organize collaborative activities in their communities to institutionalize IPM principles. A good field school process ensures these outcomes. The educational concepts underpinning the FFS

approach are drawn from adult non-formal education. These concepts have been found to be relevant across the many countries and cultures in which the FFS approach has been used, and have proven to be empowering for farmers.

One of the biggest problems with many of the developments in IPM over the years has been the tendency to generalize and make recommendations for farmers across large and highly heterogeneous areas. This has been true for all manner of input recommendations including fertilizers, pesticides and rice varieties. This problem, ecological heterogeneity, has also severely limited the effectiveness of government monitoring and forecasting systems. All of these practical issues vary on a small spatial scale. This local specificity requires that farmers become (IPM) experts. The recommendations or decision criteria of each approach reveal a steady progression in the accommodation of ecological heterogeneity and farmer control of agro-ecosystem management.[1]

Table 1 below provide a list of countries using the Farmer Field School approach from its inception through 2005. Table 2 provides information regarding the size of the Farmer Field Schools for Latin America and the Caribbean.

[1] **Arnoud Braun, Janice Jiggins, Niels Röling, Henk van den Berg and Paul Snijders "A Global Survey and Review of Farmer Field School Experiences" , 2006**

Table 1. Cumulative number of countries that use the Farmer Field School approach

Year	No.	Cumulative	Countries
1989	1	1	Indonesia
1992	1	2	Vietnam
1993	3	5	China; Philippines; Sudan
1994	2	7	Bangladesh; India
1995	1	8	Sri Lanka
1996	4	12	Cambodia; Egypt; Ghana; Kenya
1997	6	18	Laos PDR; Mali; Pakistan; Peru; Tanzania; Zimbabwe
1998	2	20	Nepal; Thailand
1999	6	26	Brazil; Bolivia; Ecuador; Ethiopia; Uganda; Zambia
2000	5	31	Colombia; El Salvador; Honduras; Nicaragua; Senegal
2001	7	38	Benin; Burkina Faso; Malawi; Mexico; Mozambique; Niger; Nigeria
2002	7	45	Dominica; Dominican Republic; DR Congo; Haiti; Jamaica; Suriname; Trinidad and Tobago
2003	15	60	Bosnia-Herzegovina; Bulgaria; Cameroon; Croatia; Guyana; Hungary; Iran; Kyrgyzstan; Romania; Serbia and Montenegro; Sierra Leone; Slovak Republic; Syria; Turkey
2004	12	72	Algeria, Armenia; Bhutan; Gambia; Guatemala; Jordan; Lebanon; Morocco; Namibia; Palestine Territory; Togo; Tunisia; Uzbekistan
2005	3	75	Angola; Rwanda; USA

Table 2. Summary data of FFS implementation in Latin America and the Caribbean (1997-2005)

Country	Start Year	Facilitators/Trainers	Farmers trained	FFS
Bolivia	1999	175	~5,000	~100
Brazil	1999	160	~1,614	89
Colombia	2000	20	nda	>25
Dominica	2002	12	67	6
Dominican Republic	2002	8	10	1
Ecuador	1999	nda	nda	nda
El Salvador	2000	127	2,387	127
Guatemala	2004	53	136	29
Guyana	2003	>12	nda	6
Haiti	2002	24	55	2
Honduras	2000	nda	nda	nda
Jamaica	2002	12	25	1
Mexico	2001	>70	>2,500	>250
Nicaragua	2000	136	2,390	108
Peru	1997	nda	nda	nda
Suriname	2002	>13	>5	>1
Trinidad and Tobago	2002	16	19	2

FARMER FIELD SCHOOLS IN THE CARIBBEAN

In the Caribbean an IPM-FFS project was started with EU funding in 2002 with support from CABI(Centre for Agricultural Bioscience International) and FAO in six countries, namely Dominica, Dominican Republic, Haiti, Jamaica, Suriname and Trinidad and Tobago. The project consisted of three phases: I) Training of Master Trainers (MT), II) Training of Facilitators, and III) Planning and Implementation of Farmer Field Schools. Phases I and II were successfully completed in the participating countries. Phase III was not funded through the EU-sponsored program that ended in December 2003. As a consequence the implementation of FFS has only started in a few of the participating countries. Dominica was one of two countries that forged ahead with FFSs after the completion of the ToT, which has trained extension officers in all agricultural regions except the west. In Trinidad and Tobago the two MTs have been providing technical and logistical support to the 14 extension facilitators who participated in the ToT in

Trinidad. In Haiti the political upheaval took its toll on planned FFS activities, which never got off the ground after completion of the ToT due to unavailability of funds for FFS implementation (pers. comm. Rodnez Pierre). However, since early 2005 the FAO-supported/CIDA-funded Marmelade Rural Development Project has started one FFS (pers. comm. Rodnez Pierre). The Dominican Republic also underwent another kind of political upheaval with a change of party during Presidential elections and replacement of top officials in Government. While there continues to be a lot of interest in Farmer Participatory approaches, there was no follow up with FFS.[2]

CABI who introduced FFSs to the Caribbean, supports activities in a diverse region: one that extends from Mexico to Chile and includes islands of the Caribbean, and comprises some of the largest and smallest countries in the developing world. Nearly a third of the half a billion people in the region live in poverty. The region is rich in natural resources and agriculture is very important. However, there are still enormous challenges to develop these sectors in a sustainable way, one that addresses inequalities in wealth.

CABI focuses its efforts on complementing national capacities and providing leadership in the following key thematic areas:

- Sustainable pest management strategies
- Prevention and management of invasive alien species
- Conservation and utilization of biodiversity
- Support for small holder commodity chains

CABI clients benefit from:

- well-equipped temperature controlled laboratories
- outdoor plant and insect rearing facilities, all geared towards sustainable pest management
- an extensive library
- a well-maintained insect collection encompassing pests of agricultural importance and their natural enemies, social insects such as bees and wasps, and an impressive collection of Lepidoptera.
- a current consultancy and project portfolio covering most countries in the Caribbean and Central and Latin American region. 3

[2] Arnoud Braun, Janice Jiggins, Niels Röling, Henk van den Berg and Paul Snijders "A Global Survey and Review of Farmer Field School Experiences" , 2006

[3] http://www.cabi.org/home.asp

THE TRADITIONAL FFS APPROACH

In general, Farmer Field Schools (FFS) consist of groups of people with a common interest, who get together on a regular basis to study the "how and why" of a particular topic. The topics covered can vary considerably - from IPM, organic agriculture, animal husbandry, and soil husbandry, to income-generating activities such as handicrafts. The FFS, however, are particularly suited for field studies, where specific hands-on management skills and conceptual understanding (based on non-formal adult education principles) is required. Below is a list of elements that commonly appear in successful FFS programs:

The group. A group of people with a common interest form the core of the FFS. The group may be mixed with men and women together, or separated, depending on culture and topic. The group could be an established one, such as a self-help, women's, or youth group. Participatory technology groups, for example, sometimes undertake a season of study in FFSs before starting their research. The FFS tends to strengthen existing groups or may lead to the formation of new groups. Some FFS groups do not continue after the study period. The FFS is not developed with the intention of creating a long-term organization - although it often becomes one.

The field. FFSs are about practical, hands-on topics. In the FFS, the field is the teacher, and it provides most of the training materials like plants, pests, soil particles and real problems. Any new "language" learned in the course of study can be applied directly to real objects, and local names can be used and agreed on. Farmers are usually much more comfortable in field situations than in classrooms. In most cases, communities can provide a study site with a shaded area for follow-up discussions.

The facilitator. Each FFS needs a technically competent facilitator to lead members through the hands-on exercises. There is no lecturing involved, so the facilitator can be an extension officer or a Farmer Field School graduate. Extension officers with different organizational backgrounds, for example government, NGOs and private companies, have all been involved in FFS. In most programs, a key objective is to move towards farmer facilitators, because they are often better facilitators than outside extension staff - they know the community and its members, speak a similar language, are recognized by members as colleagues, and know the area well. From a financial perspective, farmer facilitators require less transport and other financial support than formal extensionists. They can also operate more independently (and therefore cheaply), outside formal hierarchical structures.

All facilitators need training. Extension facilitators need season-long training to (re)learn facilitation skills, learn to grow crops with their own hands, and develop management skills such as fund-raising and development of local programs. Computer literacy is often included in the training of facilitators, especially for preparing local training materials, budgets and project proposals. Email is also becoming more widely available. Once the facilitators have completed their training and are leading the FFS process, it is easy to identify capable farmers who are

interested in becoming facilitators. Farmer Field School graduates are usually given special farmer facilitator training (10-14 days) to improve technical, facilitation and organizational skills.

The curriculum. The FFS curriculum follows the natural cycle of its subject, be it crop, animal, soil, or handicrafts. For example, the cycle may be "seed to seed" or "egg to egg". This approach allows all aspects of the subject to be covered, in parallel with what is happening in the FFS member's field. For example, rice transplanting in the FFS takes place at the same time as farmers are transplanting their own crops - the lessons learned can be applied directly. One key factor in the success of the FFS has been that there are no lectures – all activities are based on experiential (learning-by-doing), participatory, hands-on work. This builds on adult learning theory and practice. Each activity has a procedure for action, observation, analysis and decision making. The emphasis is not only on "how" but also on "why". Experience has shown that structured, hands-on activities provide a sound basis for continued innovation and local adaptation, after the FFS itself has been completed. It is also one of the main reasons that farmer facilitators can easily run FFSs - once they know how to facilitate an activity, the outcomes become obvious from the exercise itself. Activities are sometimes season-long experiments – especially those related to soils or plant physiology (for example soil or variety trials, plant compensation trials). Other activities in the curriculum include 30-120 minutes for specific topics. Icebreakers, energizers, and team/organization building exercises are also included in each session. The curriculum of many FFSs is combined with other topics. In Kenya, for example, the FFSs follow a one-year cycle including cash crops, food crops, chickens or goats and special topics on nutrition, HIV/AIDS, water sanitation and marketing. FFSs for literacy are also promoted where there is a need.

The program leader. Most FFS programs exist within a larger program, run by government or a civil society organization. It is essential to have a good program leader who can support the training of facilitators, get materials organized for the field, solve problems in participatory ways and nurture field staff facilitators. This person needs to keep a close watch on the FFSs for potential technical or human relations problems. They are also the person likely to be responsible for monitoring and evaluation. The program leader must be a good leader and an empowering person. He or she is the key to successful program development and needs support and training to develop the necessary skills.

Financing. FFSs can be expensive or low-cost, depending on who implements them and how they are conducted. Due to high allowances, transportation costs and several layers of supervision programs can end up being expensive. Obviously, the greater the distance that facilitators need to travel to get to the field, the higher the cost of transport. Transport is one of the biggest costs in any extension program. However, in FFS programs training is a key recurrent component, which takes up a large portion of the budget. When the FFS is carried out by local organizations and farmer facilitators, initial start-up costs may be moderate, but the running costs will be much lower. A trend in East Africa is to manage small commercial plots alongside the

FFS study plots, so that the FFS can actually raise more funds than it uses for inputs and stationery. In some cases in East Africa farmers have also cost-shared training expenses by buying their own exercise books, offering training sites and other locally available training materials (e.g. planting materials and labor).[4]

FARMER TO FARMER PROGRAMS WITHIN THE DEED FRAMEWORK

The DEED program offers the kind of localized community based structures conducive to supporting farmer to farmer programs in each of its target watersheds. The integrated spatial planning model is well suited to bring together stakeholders and important resource persons including facilitators and government extension workers to producer groups in need of additional technical information. The following outlines the methodology that DEED will implement in integrating farmers and their respective groups with both private sector facilitators and government extensionists.

The common theme that links all DEED activities into one overarching framework is the establishment first of local community watershed management units with the goal of integrating them into a larger watershed management committee for each of the two watershed. It is therefore important to coordinate activities with the GOH throughout the process. The steps that are planned are as follows:

1. Community mapping – Stakeholders from community based organizations including interested private sector actors, farmers' groups and local authorities from commune offices, Ministry of agriculture field agents and mayor office staff are all invited to participate in practical mapping and zoning of critical areas in their communities. Training in the development of watershed management and natural resource management plans in Quarters 5 and 7 will greatly complement these activities

2. Activity implementation - As grants are awarded to producer groups and Public Private Alliances are formed, the GOH will be consulted for potential areas of collaboration and GOH support to the activities. This coordination aims to facilitate private sector initiatives by promoting an enabling environment for doing business. The Facilitator training in Quarter 5 and the entrepreneur and SME training sessions planned for Quarters 6, 8 and 12 will provide the setting to invite appropriate GOH staff to learn more about private sector initiatives in the watershed while also providing the opportunity to engage in constructive dialogue regarding potential economically viable solutions to unsustainable natural resource use.

[4] Godrick Khisa, FARMERS FIELD SCHOOL METHODOLOGY, 2004

3. Steps 1 and 2 are necessary precursors to the formation of the overarching watershed management committee. As community mapping exercises are implemented representatives will be identified by each community to participate in first sub-watershed fora and later in the larger watershed management committee. This approach ensures that participants are contributing with practical experience resulting in plans that reflect the reality on the ground. The training for GOH personnel in watershed management and co-management in Quarter 7 is a good time to begin preparing for the establishment of each of the watershed management committees in Montrouis and Limbe.

The second step in the process, "Activity implementation" above cannot be carried out without identifying competent facilitators for the producer groups in each watershed. These facilitators can help organize the farmer to farmer visits in a coordinated and meaningful manner. Given the diverse nature of agricultural activities in each of the watersheds a number of specialty areas were identified for the recruitment of facilitators as listed below in Table 3.

Both Ministry of Agriculture and private facilitators will be identified in an effort to provide the institutional backbone necessary to keep Farmer Field Schools operational. Private facilitators will provide technical assistance on a fee-for-service basis. In order to keep the cost of such services low, it is important that facilitators be identified and recruited from within or close to the farmers groups they will be working with. The facilitator's proximity to the farmers group is imperative given the lack of resources that the GOH have at their disposal, making it extremely difficult for them to visit farmers on a regular basis.

During the final recruitment process for the facilitator program scheduled for Quarter 5, DEED will select facilitators not only on the basis of technical qualifications but also on their proximity to the groups they will be asked to work with in each of the watersheds.

Table 3

CATEGORY	LEVEL A	LEVEL B
Agent for agricultural extension	▪ Improving the quality of produce ▪ Increasing productivity ▪ Introducing improved techniques and sustainable practice ▪ Improving efficiency ▪ Setting up and managing seedling nurseries ▪ Training and demonstration in grafting techniques	▪ Establishing production plans ▪ Calculating the cost of production ▪ Developing and disseminating improved technical packages
Agent for institutional development	▪ Establishing the legality of the PG ▪ Improving the management and operation of the PG ▪ Improving accounting practice and financial management ▪ Improving record keeping and management of stock ▪ Assisting with access to agricultural credit	▪ Evaluating institutional strengths and weaknesses, and developing a plan for institutional development ▪ Analyzing business plans and advising on financial services
Manager	Not applicable	▪ Managing the Producer Group on a day-to-day basis ▪ Coaching and mentoring future PG managers
Agent for commercialization	▪ Establishing supply contracts ▪ Training in negotiation techniques ▪ Improving post harvest management and packaging ▪ Identifying new clients ▪ Ensuring client satisfaction ▪ Ensuring logistical arrangements and transportation of produce	▪ Identifying opportunities for exports, developing business plans, and facilitating exports ▪ Identifying opportunities for Fair Trade and/or Organic status and organizing this status if appropriate
Agent for irrigation system management	▪ Assisting with the management of water user associations	▪ Drafting proposals for the rehabilitation of irrigation systems including mapping the systems and estimating the cost of the engineering work

POTENTIAL FARMER TO FARMER VISITS

After extensive assessment of producer groups in each of the watersheds of Montrouis and Limbé a short-list of more promising groups has emerged. These groups have experience in a number of productive activities and have expressed interest in further development. Although, as shown above, Haiti's formal Farmer Field School experience is limited, there are a number of informational exchange opportunities between farmers that DEED can assist in organizing while trying to re-energize the Farmer Field School approach.

The first step is to organize a series of targeted visits, allowing farmers and group facilitators to visit other farmer sites where improved techniques are being used under similar conditions. Once this new knowledge is acquired, farmers and facilitators can return to their fields to establish Farmer Field Schools based on the techniques learned.

Productive sectors demonstrating potential for farmer to farmer visits and development of Farmer Field Schools are as follows:

VEGETABLE GARDENING

Farmers groups APWOLEM and CODAJ in Limbé; CUPEC, COLUC and APDDL in Montrouis are interested in increasing vegetable production targeting the local markets and particularly restaurants and hotels. Intensive vegetable production techniques are being used successfully in a number of locations in Haiti. Soil conservation techniques on steep mountainous slopes can be studied in the Kenscoff area where farmers have learned to efficiently manage limited surface areas while maximizing production. The Centre de Formation pour l'Aménagement Intégré des Mornes and the Université Chrétienne du Nord d'Haiti in Limbé are also good sources of potential information on soil conservation techniques.

Effective use of green manure and other organic fertilizers in vegetable production is being carried out in several areas in the North including Caris, Mont Organisé and Dupré

APICULTURE

Honey production is of great interest to several groups in each of the DEED watersheds. AJTAP, ATAIB and APDR in Montrouis; and MAKOUTI in Cap Haitien are interested in further developing apiculture in their respective areas. Successful apiculture systems can be visited in several locations in Haiti. The Sainte Therese mission in Trouin offers a potential site visit for honey producers. MAKOUTI's partner honey producers offers an interesting perspective on apiculture as well. Apiculture cooperatives in Plaisance and Ouanaminthe are already structured to provide honey to MAKOUTI in exchange for transport and marketing services for their product. MAKOUTI offers a range of technical services including improved hive construction, information on high yielding nectar producing plan species, and disease prevention and treatment techniques.

DAIRY PRODUCTION

OPD8 in Montrouis and APWOLEM in Limbé have both expressed an interest in increasing milk production through improved pasture and dairy cow management. APWOLEM is already advanced in dairy production with the largest production of milk in the VETERIMED sponsored ***Let Agogo*** chain of milk producers in Haiti. APWOLEM could field visits from other groups interested in establishing and/or improving milk production units in their respective areas. VETERIMED staff can also provide assistance in visiting areas where controlled pasture techniques are being used in efforts to reduce soil loss while improving pasture for grazing. Potential visit sites include Verrette and Chritian ville.

AQUACULTURE

Groups in both watersheds have expressed interest in developing and expanding aquaculture in their respective areas. The Marmelade area already has a history of aquaculture through a FAO sponsored project. Several fish farmers are successfully producing tilapia and carp for the local market. Dr. Valentin Abe and several of his fresh water fisheries students have established a number of ponds in Haiti which could serve as learning sites for farmer to farmer visits. Sites include Gonaives and Terrier Rouge. The two fish farmers in the Marmelade area have also agreed to participating in a pond visit program whereby prospective fish farmers can learn techniques from these already experienced farmers. The more experienced farmers can take on the role of facilitators offering services to new fish farmers on a fee basis. The CODEP fish culture center in TiBois is also a good source of information for farmer visits.

YAM PRODUCTION

The most active production area for yams in both watersheds is Camp Coq in the Limbé watershed. The producer groups KOREPA, APG and UFOK have all expressed great interest in improving yam production in their respective areas. Several techniques are used in Haiti in the improvement of yam production including the "yanm gran bwa" or forest yam production model which capitalizes on a permaculture model and the use of mini-set to increase seed production. Farmer visits to the Plaisance/Pilate areas in the North can provide examples of permaculture production models while trips to the Jacmel valley in the South of Haiti can provide technical information on the use of the miniset technique.

FERMENTED ORGANIC CACAO

The farmers groups of CML and CAPUP in the North have expressed great interest in exploring the possibilities of both certifying their production as organic and using fermentation techniques to increase the value of their cacao. Some techniques have already been implemented in Grande Riviere du Nord and in Borgne including grafting of more productive cacao varieties to the ones in current production and fermentation of traditional cacao. These sites could provide additional technical support to groups in the Limbé watershed. Another interesting opportunity would be to visit fermented cacao producers in the Dominican Republic where fermented organic cacao

production is on the rise. A visit to the organic mango producers of APWOMOPA would be interesting in understanding the organic produce certification process and the management issues involved in assuring organic, storage and transportation systems.

FRUIT JUICE AND BAMBOO PROCESSING

The FACN center in Marmelade is worth visiting by groups interested in fruit juice production. A shadek and orange processing facility produces fruit juice on contract with the National School Feeding Program. The production unit serves as a potential model for other groups interested in juice processing.

FACN also has a bamboo processing facility for the construction of bamboo furniture. The furniture is made in Marmelade and sold primarily in Port-au-Prince. The facility demonstrates the potential for handmade goods and offers a good model for producer groups to study. The same center has recently started producing fine bamboo baskets that could well enter the international market.

In conclusion, there are a number of opportunities for farmer to farmer visits that support DEED objectives. The work DEED is carrying out in strengthening the links between farmers groups, local facilitators and enterprises is conducive to organizing visits between farmers and the development of Farmer Field Schools. In addition, the sub-watershed management committees offer a networking platform for producer groups to relay important agricultural and natural resource related information. That said, there are a number of challenges that must be addressed before an effective and sustainable farmer-to-farmer system can be envisaged. While the DEED mechanism can promote specific product based, value-chain oriented support to producer groups and facilitators, higher level institutional support must be provided. The entity best positioned for this kind of support is the Ministry of Agriculture. Although some agricultural production will continue to be purely private sector driven, a certain level of technical assistance will be required from the Ministry to maintain a strong Farmer Field School approach. DEED staff will work closely with Ministry agents and staff to address this issue.

DEED can also explore regional mechanisms designed to provide support to the agriculture sector. Given the Centre for Agricultural Bioscience International in Trinidad and Tobago already has experience in starting a Farmer Field School in Haiti, DEED can contact them to see about the potential of renewing technical assistance programs. In addition, Haiti and Trinidad and Tobago's membership in CARICOM allows for free exchange of professionals between the two member states. This is another opportunity that DEED will explore in developing a sustainable farmer based agricultural development program.