Assessing the Benefits of Two Farmer Field Schools Recently-Conducted in Trinidad and Tobago

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Abstract
Following major initiatives, two Farmer Field Schools occurred during the period August 2003 to September 2004 in the Caura Valley in North Trinidad, West Indies. This paper assesses these schools according to six key issues of Owens and Simpson (2001).

A study recorded many observations during the conduct of the schools. The researcher surveyed a population of 24 participants and 16 non-participants. These were a census of active producers who responded during a two week period after the second school. The area had a recorded population of 70 small producers of which 45 were active. The study further conducted focused interviews with six participants.

The school has relevance and responds to local concerns (Key1). The school engaged a useful participatory mechanism which generated new knowledge regarding crop husbandry practice in the area (Key2). Information flows and farmer to farmer participation were usefully productive (Key3). This was despite an observed female gender barrier in communication and an often reluctance of some community members to share information.

There is a new sense to build useful organisational relationships (Key4). Relationships between Scientists, Extension Workers and Farmers improved (Key 5). The FFS can be integrated into existing programmes but would need more administrative support and funding (Key6)

FFS participants had a lower mean average age and farmed in the Caura Valley for a shorter period of time (on average) than non participants. Participants worked less hours on the farm than their non participant counterparts. Reported mean monthly farm incomes and expenditures were higher for the participants than the non-participants.

Most members of both groups did not keep adequate farm records. Likewise the farmers do not generally seek advice from expected sources.

This assessment revealed more qualitative benefits pertaining to improved farmer capacity, more appropriate and environmentally friendly crop production practices, better collective action and an effective support system which integrates many stakeholders.

The study recommends a further assessment of quantitative benefits which could determine adoption and diffusion rates and cost effectiveness. This analysis is possible as more schools are conducted throughout Trinidad and Tobago and the rest of the Caribbean.
Introduction

Since 2000, the Commonwealth Agricultural Bureau International (CABI) began a process to introduce the Farmer Field School (FFS) to the Caribbean region. In 2003 and 2004, both CABI and the Ministry of Agriculture Lands and Marine Resources (MALMR) eventually supported the conduct of two schools in the Caura Valley, Trinidad and Tobago. This paper will assess the benefits of these two events.

Farmer Field School initiatives in the Caribbean region

CABI’s activities began with a training workshop where international experts from the Philippines, Kenya and Nicaragua engaged crop protection specialist, extension and university personnel in relevant training regarding the school. The local experts became familiar with the concept of participatory methodologies, recent approaches to integrated pest management and the practice of a field school.

At this workshop crop protection and extension practitioners from Antigua (Gore, 2000), Belize (Magloire, 2000), Grenada (Phillip, 2000), Haiti (Donis, 2000), Jamaica (Chung, 2000), Saint Vincent and the Grenadines (Edwards, 2000) and Trinidad and Tobago (Ramroop et al, 2000) reflected on pest control practice within their respective agrarian environments. A review of their reports revealed several current situations as follows:

- In most countries there are understaffed, under funded crop protection units unable to cope with all the possible pest control initiatives.
- There is an Extension link with farmers which is still “top down” in its approach despite more recent sensitivity to “bottom up” approaches. Accompanying research is lacking especially due to a shortage of funds.
- Agricultural input suppliers dominate the transfer of pesticide technology.
- Farmers still prefer to use broad-spectrum pesticides, which are readily available but do not easily focus on specific pest targets. Despite this prevailing situation some farmers are becoming aware of newer target specific pesticides and biopesticides.
- There is usually a lack of policy on Integrated Pest Management (IPM) or any type of pesticide control. Where policies exist, much revision is needed.
- Biological control mechanisms have become popular since its successful use in the control of the Hibiscus Mealy Bug (HMB).
- The experts define IPM more in the context of cultural practices, not necessarily thinking about a truly integrated concept.
- Some countries which have poorer farmers, most notably Haiti, have a better record of limited pesticide use.

Given these circumstances the FFS is a welcome introduction to redress current circumstances. The FFS can more easily convey appropriate IPM methodology and can transfer much effective decision making to the farmer. Eventually the FFS would facilitate better Extension–Research linkages albeit at reduced costs.
The objective of IPM is to keep pest populations at levels where they have minimum threats to the environment. Munyua (2003) reports its importance as a pest management strategy. IPM embraces safety and health in agricultural production. It combines cultural, biological, physical and chemical control thereby integrating different pest control methods for effective, environmentally sound and socially acceptable management of disease, insects and weeds.

The efforts of the FFS are highly participatory and could better encourage farmers to use pesticides and other inputs in a more cost effective manner while not disrupting the agro ecological system in which farmers operate. The school can reduce the cost of managing extension systems for vegetable and other producers. Since there are under funded and overburdened services within the Caribbean region, the FFS may potentially generate more self help leadership among farmers.

In the tropical world, Farmer Field Schools are impressive advances of the last decade (Ter Wheel and Van Der Wulp, 1999). In the rice and vegetable production systems in Asia, the schools introduced small producers to techniques of Integrated Pest Management (IPM), which reduced pesticide applications, and increased crop yields (Kairo 2000). For instance in Indonesia, rice farmers were able to reduce pesticide applications by 60% with an accompanying yield increase of 13%. Similarly in the Philippines there was a recorded 80% decrease in the use of insecticide among vegetable growers. There are many success stories from Central America.

Following the initial workshop in August 2000, the Commonwealth Agricultural Bureau International (CABI) and the Food and Agricultural Organisation (FAO) with funding from the European Union (EU) conducted a Training of Training workshop among the region’s representatives. The Ministry of Agriculture, Lands and Marine Resources (MALMR) of Trinidad and Tobago hosted the event and facilitated a farmer field school during the period August to December 2002. This FFS occurred in a major vegetable growing community, Aranguez which is located in the north west of the island of Trinidad. Trainers were expected to return to their respective national locations and implement field schools.

Graduate trainers of the MALMR subsequently initiated an FFS in Caura Valley, Trinidad during the period August to December 2003. So impressed were the farmers, they initiated a second school during the period May to September 2004.

Caura Valley Farmers

There are approximately 70 agricultural allotments in the Caura Valley of about 5 acres each. (Caura Valley Farmers Association, 2004). Farmers cultivate short, medium and long term vegetable and fruit crops throughout the year in a mainly rain-fed system of irrigation. The farmers engage routine crop production practices. Although they may use pesticide and fertilizers in more limited quantities than other vegetable producers throughout Trinidad, they tend to use more than is required. This is especially because they have changed to high yielding varieties which demand high fertilizer requirements and which are occasioned by severe diseases. Very often the farmers resort to excessive pesticide application which has questionable use and which presents a severe threat to the agro ecological environment.
The farmers are becoming very conscious of this dilemma and their local Caura Valley Farmers Association (CVFA) is recognising the need to minimise pesticide and other inputs. Hence the association has shown keen interest in the FFS approach.

The valley is a lush relatively undisturbed rainforest environment. It is a major watershed for the Northern Range Forest reserve of Trinidad. Growers cultivate food crops in approximately twenty percent of the valley. Yet Caura has value as a recreational area given its scenic respite and the large quantity of bathing streams and hiking trails which pervade the area. The CVFA intends to develop the area into an ecopark and is actively seeking the help of the Global Environment Fund of the United Nations Development Programme (UNDP) Small Grants Development Programme to support the organisation’s initiatives.

Generally small vegetable producers in Trinidad and Tobago are wont to use “cocktails” which often contain up to 4 or 5 different pesticides in unwarranted application routines (Dolly 2000). The FFS presents the opportunity for farmers to reassess this practice with the use of IPM.

The FFS engaged farmers, extension workers, scientists and agri-input suppliers as stakeholders. They became part of an informal instructional process involving experiential learning. Together they experienced current crop husbandry practices for tomatoes and cabbages and compared them to the practice of Integrated Pest Management. The ‘students’ emerged with decisions regarding natural enemies of pests and other environmental friendly practices.

Experiential Learning is learner-centered by providing opportunities for a person to engage in an activity, review it critically, draw some useful insight from an analysis and apply the result to a practical situation (University of Wisconsin, Madison 1989). The FFS in Caura used Experiential Learning in order to provide an effective Integrated Pest Management Strategy. The process renewed a facilitating Extension environment in which the farmer, extension worker and researcher understood critical technologies for vegetable crop production.

Purpose of Paper and Objectives

The purpose of this study is assess the two schools from the perspectives of six challenges which Owens and Simpson (2001) recognises as facing Extension Programmes and exemplified through Farmer Field Schools. These are:

- Systems learning and the generation of new knowledge;
- Relevancy and responsiveness of FFS to local concerns;
- Information flow and farmer to farmer communication;
- Institutionalisation and local organisational development;
- Changes in relationships;
- The integration of the FFS into existing programmes.

The study will also seek to identify changes in Knowledge, Attitude and Practice among the food producers.

Theoretical Base
The successes of Agricultural Extension efforts continue to be elusive. There is much concern that the functions of Extension are becoming impossible. Notably, the poorly funded state run systems which cater to the needs of large numbers of important small scale producers in the Tropical world are unable to provide suitable and appropriate services to clients. Yet alternative options in the use of nongovernmental agencies and producer organisations have not provided results. Owens and Simpson (2001) notes renewed backing for state run agricultural extension programmes after alternatives have not improved the welfare of small farmers.

A consequence of the failure of Extension programmes lies in the farmer making uninformed decisions which affect his/her economic viability in the long run. Invariably these decisions lead to the use of inputs which also harm the agro ecological systems in which the small farmer operates. The Farmer Field School presents itself as a potential template to guide state agencies in building concrete participatory approaches (Owen and Simpson, 2001). In this context the six key issues which guide this study’s evaluation is justified.

The FFS can serve a functional mechanism to impact on successful Extension result in the three areas identified by Zip (2000) namely: Transferring Technology to and from farmers; Mobilising farmers and helping them to organise themselves; and Educating farmers to build their capacity. In the case of vegetable producers in Caura, the technology transfer mechanisms concern those of cultivation practices regarding integrated pest management. The questions then arise: Have farmers mobilised themselves as a result of the FFS? and Are the farmers now better educated and better able to build capacity?

Methods and data sources

The schools were conducted during the periods August to November 2003 and May to September 2004. The researcher recorded many observations while the participants conducted Agro-ecological assessments (AESA’s) among different regimes of crop production practices regarding Tomato and Cabbage. These regimes related to current farmer practices, varietal trials, fertiliser trials and IPM practices. Different cultivation environments became bases for comparisons from which appropriate and low cost practices could be derived by consensus.

The researcher observed the emerging group dynamics. After the second school, the researcher surveyed a population of 24 participants and 16 non-participants. These were a census of active producers who responded during a two week period after the second school. The area has a recorded population of 70 small producers of which 45 were active. Hence the total number of interviewees represented 57% of all growers in the valley and the census of active growers had an 88% response rate. Both populations were questioned about their knowledge of IPM production practices, impressions about the FFS and related issues. The researcher conducted focused interviews with six participating farmers.
Results and Discussion

Relevancy and responsiveness FFS to local concerns.

There was general consensus that the FFS could help engage an understanding of current pest and nutrition problems and the ways to resolve them in the local environment. Participating farmers felt they acquired skills to help identify pest and natural enemies. They understood how pest continued their invasions as the crop matured. They realised that there were natural pest enemies in the local environment which could replace costly pesticide applications. Some felt more confident to discuss pest invasions with local pesticide agencies. They began to understand alternative pesticides which were made of biological material and which could even be manufactured by them from indigenous material in the local environment. Generally the farmers appreciated the need for environmentally friendly approaches. They began to implement such approaches during the second school.

The farmers became more mindful of detailed field inspections and have begun to put in place superior daily inspection regimes instead of the cursory glances they usually make. They accepted the need for soil test in order to “know what you are dealing with”

Systems Learning and the Generation of new Knowledge.

The farmers became more aware of an agro-ecological system in which pest could be differently defined especially within the context of harmful and beneficial insects and weeds. They better understood how an agricultural environment could be tinkered with in order to obtain a healthier crop.

Some farmers began to conduct experiments which could generate the desired intelligence for their own subsystem within the valley. Some tried their own methods of Biological control. Others tested cultivations without applying chemical fertilizers and pesticides. They became confident in their own investigative abilities. All stakeholders began to share a common vocabulary with regard to crop husbandry technique. The farmers were now willing to use language which once seemed to only emanate from a seasoned academic. Likewise the scientists and extension officers were prepared to adopt indigenous terminology which would mutually benefit higher standards of crop husbandry. A more useful participatory mechanism was beginning to generate the knowledge needed to care for the crops.

Information flow and farmer-to-farmer communication.

Farmers felt more confident to share information with the input suppliers, IPM specialists and Extension workers. The information shared was through a ‘to and from’ process rather than the typical ‘top down’ scenarios to which all were accustomed. The farmers specially noted that they were occasionally told about the ‘bad’ products they
used but only now knew appropriate replacements which they learnt about during the school.

Farmers became even more aware of how community members generally do not share information among themselves. Yet the participatory experiences during the school made them more confident to illustrate the value of sharing information. There became an unwritten and valuable feeling that ‘information locked is information wasted’. The gestures of sharing and critiquing one another’s viewpoint during the exercise influenced a new prowess to share knowledge more freely and to be secure about one’s feeling about any approach to crop husbandry. All participants felt confident to listen to their farming colleagues, if these were trained as facilitators.

Participants felt that non-participants missed an excellent opportunity to begin to share information more freely. The participants intended to pass on to non-participants what was learnt at the school. Some recommended that researchers specially investigate why farmers are not always beneficially interacting with one another. The non participants still reported a willingness to listen to their colleagues with regard to IPM methodologies.

There were gender barriers which inhibited sharing information between the males and female members. A male view still dominated the school’s proceedings. Yet the females were becoming very confident about sharing their ideas on matters which they would have normally kept to themselves. More information sharing would still take place among family members who participated in the school. Some intended to take information back to household members who did not attend. Some participants and non-participants reported that they usually share cultivation methodologies with community members.

The participants felt the school did not generate convincing factual information about reduced cost of production in relation to profitable yield. They felt this would be a major conduit for information sharing among community members as farmers are still in farming as a business occupation.

**Institutionalisation and local organisational development**

There was a general feeling that it would be difficult to institutionalise the process and develop structures to further the interest. Participants felt the need to encourage more schools among more community members. These schools will be expected to conduct agro-ecological assessments for other vegetable and fruit crops. This is still a Herculean task for Extension administrators.

Much impetus in the valley is derived from the presence of an active farmers group which seeks the interest of all members of the community. The group has a special women’s arm which serves the interest of women. The group actively seeks funds to continue numerous self help projects which are of benefit to the valley. The CVFA jointly participated (with Extension workers and Scientists) in a visit to another part of the country where the school was being introduced. There CVFA’s members demonstrated remarkable leadership regarding the conduct of the FFS and the relevant topics of mutual interest. The group intends to conduct more schools.

This is not a typical circumstance throughout the country. Hence the CVFA’s initiatives must serve as a demonstration model to the wider national and regional situation. All stakeholders must join in the CVFA’s effort to convince the principals that
increased investment funding for the FFS will have long-term benefits from a macro and microeconomic viewpoint. There is adequate interaction between stakeholders and the community to begin a strategy. There is a new sense of need to build a useful organisational relationship with the environment.

Changes in relationships

Farmers felt more at ease dealing with University personnel, input suppliers and the Extension Officer. They felt more confident to interact with their own colleagues even those who did not participate in the schools. They attribute changes in relationship to the type of “counseling” they engaged during the group dynamic sessions. They lauded the efforts of facilitators in helping to develop the type of confidence they now have in dealing with personnel who had much formal education. To quote one male farmer, “I feel confident to explain to a person on any level with big words or small words”

Many farmers noted that they have never spent such relatively high percentages of time with the Extension workers and other stakeholders. They appreciated the feedback they were receiving about current field problems. For instance pests and disease pathogens were immediately cultured and studied. Then scientist encouraged and trained farmers to establish ‘insect zoos’. From these they would advise each other about the behaviour of insects within the agro-ecological system.

The integration of FFS into existing programmes

Farmers felt the process provided a new opportunity to create direct linkages between themselves and researchers, resulting in increased awareness and collaboration. They agreed that the process improves field visiting and the conduct of the traditional Result Demonstrations. They believed that the process also provides an opportunity for joint ownership of discoveries and ‘publications’. The school provided a conduit for emphasising the new requirements for marketing as set out by local and international trading. It could also develop niche markets for products of the FFS. There were suggested constraints regarding integration into current activity.

Permanent funding is lacking, especially because farmers are not used to empowering themselves without a financial incentive. The CVFA and the local Extension services were able to financially support some of the current activities. The principals of other stakeholders also provided support. However neither of these funding mechanisms were long term commitments. There is currently a weak or absent policy from government officials which could facilitate this type of work in the Caribbean. There is questionably still too much traditional behaviour among Researchers, Farmers, Extension Workers and Administrators.

To resolve these concerns, initial recommendations are suggested. The FFS laboratory must continuously demonstrate successful output. The cost effectiveness of the school must be assessed. There must be a formula for funding in which all stakeholders contribute. There must be a way to involve more technical agencies in the process in order to share personnel cost. There are an above average number of agencies, which provide technical expertise and leadership in the region, and these could make incremental contributions to conduct the school.
General Findings and Discussion

The school readily engaged 24 of 45 active producers in the valley (approximately 53%). Participants were similar to their non-participant counterparts in several ways. Neither group kept appropriate farm records. There were less than 50% (range 12-38%) who sought advice from expected sources such as the area’s extension officer, the agribusiness shop, neighbours and relatives. Yet those who participated, reported an ability to speak more easily with the Extension Officer, the Agribusiness shopkeeper and University personnel following the conduct of the schools. On a True/False quiz about IPM, participants and non-participants respectively had mean scores of 7 and 6.92 out of 10. The FFS can therefore influence required improvements among the valley’s small producers with respect to these and similar parameters.

There were more females among participants than among non-participants. The participants had a mean age of 44.75 years, which was ten years younger than the non-participants. The mean lengths of time which participants and non-participants farmed in the valley were respectively 19.46 and 27 years. The FFS attracted a generally younger participant who may understand more long term implications in vegetable production. Females will tend to accept strategic and practical opportunity like the FFS more readily than males.

Reported mean monthly farm family incomes for both groups were $TT 3,409.52 (participant) and $TT 3,197.52 (non-participant). Yet mean monthly expenditures were respectively $TT 2,516.27 and $TT 1,883.33. These are early indications that cost effectiveness will attract the farmer to an FFS.

Non participants had 4.4 score out of 5 with regard to ‘own and use’ communication facilities. Participants had a lower score of 3.63. These scores will need further assessment to derive conclusive results. However in the circumstances of the study they lead to initial suggestions that those with more communication facilities may be inclined not to want to participate in the FFS.

Those who did not attend the school reported the following reasons:

- They were not prepared to afford the time especially the daily period of 8-12 noon during three months of cultivation.
- They don’t think they need this type of training.
- They did not know about the activity.

A competent campaign strategy can successfully respond. If the school can show long-term benefit for the investment of the farmers’ time this would further enhance participation. If the school can show the possibilities to cut production cost while producing a product which consumers demand at premium prices, surely these non participants would join. These are suggested future enquiries.

According to Braun and van de Fliert (1997) the achievement of impact in any Extension Technology transfer endeavour requires qualitative and quantitative changes. Qualitative change concerns, farmer capacities, practices, collective action and support systems. Quantitative changes concerns reaching a considerable number of people and generating income.

Much qualitative change has occurred during the conduct of these schools. There is an increase in the capacity of the farmer to better understand the agro-ecological environment. A consequence is a better chance to use less costly chemical pesticides and
other inputs. Collective action has improved and support systems more easily complement and facilitate the decision making among producers with regard to production techniques.

More schools would need to be conducted in order to assess quantitative changes regarding adoption, diffusion and cost effectiveness. A study in Indonesia and the Philippines indicated that the FFS approach did not shift the cost of the exercise from the customary public purse to the farming community (Quizon et al, 2001). Another study of Quizon et al (2002) indicated that while there is very little diffusion of FFS knowledge from school graduates to other community members, graduates were retaining their FFS acquired knowledge. Gershon et al (2004) in yet another study concluded that there were useful qualitative changes like in this study. Yet there were no significant diffusion of knowledge to other farmers who reside in the same village. The researcher recommends studies regarding quantitative changes as a result of the FFS in the Caribbean. These could be accomplished as more schools are conducted in the ongoing initiatives to introduce the methodology to the region.

Educational importance, implications, and applications

The Farmer Field School is a justified educational and training activity. It has the ability to inform intelligence, which producers can apply to newer and better technologies. It has successfully facilitated learning so that a population of vegetable producers from Trinidad and Tobago understands and practices Integrated Pest Management. The school’s philosophy and method can be encouraged among communities of small producers in other parts of the country and in the rest of the Caribbean where there are similar types of producers.

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End Notes

1. The Hibiscus Mealy Bug (HMB) became a highly invasive pest species after an alleged introduction from Asia during the period 1997-2000. In many Caribbean islands, HMB threatened food security by initially destroying many food crops which small farmers cultivated and which the majority of consumers relied upon. It also threatened tree crops and the forest resources of some islands. The region’s crop protection services were unable to control the spread of the HMB with routine reliance on pesticide applications. Eventually the services introduced biological parasites of the HMB. This contained its spread and restored food crop cultivations. The episode underscored the importance of better pest management systems which may not use chemical pesticides.

2. $TT6.19=$US1.00 (Approximate Buying rate January 2005)
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