

**Fiscal Sustainability of Agricultural Extension: The Case of the Farmer Field School Approach**Jaime Quizon\*, Gershon Feder\*<sup>a</sup>, and Rinku Murgai\*

March 2001

**Abstract**

Agricultural extension programs or pilots based on the Farmer Field School (FFS) approach are being implemented in many developing countries in Asia and Africa. Evidence from the Philippines and Indonesia, two key areas in implementing this extension effort, shows that fiscal unsustainability of the FFS if applied on a large scale is a risk that cannot be ignored. Because of high costs per trained farmer, the amount of funding for extension in the Philippines cannot provide for significant farmer outreach. Farmer-led field schools are viewed by some as a way out of this fiscal dilemma if part of the cost is shifted to the community, but farm survey data from Indonesia indicate that the extent of the takeover of training responsibilities by farmers has been minor. Furthermore, farmer-led schools are still not funded mainly by community resources. The results suggest a need for great selectivity and caution in initiating FFS pilots, with a focus on the fiscal sustainability of the program if the intention is to scale up these activities.

**Keywords:** Agricultural extension, Farmer Field Schools, Fiscal sustainability, Farmer-led training.

\*Development Research Group, The World Bank, 1818 H Street NW, Washington DC 20433.

<sup>a</sup> Corresponding author. Fax: (202) 522-1151; E-mail: gfeder@worldbank.org

# Fiscal Sustainability of Agricultural Extension: The Case of the Farmer Field School Approach

Jaime Quizon, Gershon Feder and Rinku Murgai

**Abstract:** Agricultural extension programs or pilots based on the Farmer Field School (FFS) approach are being implemented in many developing countries in Asia and Africa. Evidence from the Philippines and Indonesia, two key countries in implementing this extension effort, shows that fiscal unsustainability of the FFS approach if applied on a large scale is a risk that cannot be ignored. Because of high costs per trained farmer, the amount of funding for extension in the Philippines cannot provide for significant farmer outreach. Farmer-led field schools are viewed by some as a way out of this fiscal dilemma if part of the cost is shifted to the community. However, farm survey data from Indonesia indicate that the extent of the takeover of training responsibilities by farmers has been minor. Furthermore, even farmer-led schools are still not funded mainly by community resources. The results suggest a need for great selectivity and caution in initiating FFS pilots, with a focus on the fiscal sustainability of the program if the intention is to scale up these activities.

**Keywords:** Agricultural extension, Farmer Field Schools, Fiscal sustainability, Farmer-led training.

## 1. Introduction

Agricultural extension can be described as the process of introducing farmers to knowledge, information, and technologies that can improve their production, income and welfare (Purcell and Anderson, 1997). In many developing countries agricultural extension is considered an important public good that deserves public support. However, fiscal sustainability has been a generic problem for large-scale agricultural extension systems in developing countries (Feder, Willett, and Zijp, 1999). High-cost national systems have been significantly scaled down or discontinued altogether in large part because the fiscal demands they placed on public budgets were not sustainable. In a review of World Bank supported agricultural extension projects in the 1977-1992 period, Purcell and Anderson (1997) found that “Inadequate funds to operate the services properly was a common phenomenon, with a high proportion (76 percent) of free-standing projects having an uncertain or unlikely sustainability rating” (p.4). They added that “... most borrowers encountered serious difficulties in meeting *the recurrent cost expenditures* of national extension services, to the extent that in many cases the sustainability of the instituted systems was in doubt” (p.84). Fiscal sustainability is a concern of public extension systems even in developed countries (Hanson and Just, 2001).

This paper is a two-country analysis that focuses on the issue of fiscal sustainability as experienced when using the farmer field school (FFS) approach as the main agricultural extension method for reaching farmers over a large geographical area. The farmer field school is a season long, non-formal training program for selected farmers within a locality, usually a village. We define fiscal sustainability as the financial ability to maintain the extension effort at a level that can realistically be expected to attain significant coverage (directly or indirectly) of the farming population nation-wide.

The focus on fiscal sustainability is warranted even though a rigorous cost-benefit analysis of the FFS approach at a national level is not yet available. The experience of the high-cost Training and Visit (T&V) extension system provides useful insights justifying such a focus. In the period 1975-1995, the T&V extension approach was adopted in scores of countries, often with the active promotion and support of the World Bank. In most countries where the system was adopted, after several years of operation, the system was scaled back due to fiscal difficulties, and the structure was simplified or abandoned. In many countries where T&V was significantly scaled down or abandoned, no rigorous extension effectiveness or economic impact studies were done, but positive indicators of performance were provided by Monitoring and Evaluation units, extension administrators, and other commentators, based on non-rigorous studies and subjective field observations. An interesting illustration of the point being made here is the case of Kenya. An econometric study conducted in the early nineties suggested very high economic rates of return to T&V extension investments in Kenya (Bindlish and Evenson, 1993). These results were later challenged in another study (Gautam and Anderson, 1999), but the system had already faced serious fiscal strains by 1996 and its operations were adversely affected. These experiences show that funding difficulties can adversely affect national extension operations, even in the face of positive indications on performance. These lessons justify the need for a careful examination of the fiscal dimensions of extension efforts intended as national systems, even in the absence of a complete analysis of the costs and benefits of these extension systems.

In keeping a focus on fiscal sustainability, this paper does not attempt a cost-benefit analysis or a full cost effectiveness study of the FFS approach, nor does it investigate other attributes which are pertinent to extension effectiveness (e.g., empowerment effects, environmental impact, quality of training). Alternative approaches to extension and their financing are described in Feder, Willett and Zijp (1999) and Van den Ban (2000). Hanson and Just (2001) elaborate on the economic principles and circumstances appropriate for moving from public to paid extension, and outline the potential for mixed public, private, and paid extension.

The paper is organized as follows. Section 2 briefly describes the farmer field school extension approach, while Section 3 discusses the potential of formal and informal farmer-led diffusion mechanisms to enhance the fiscal sustainability of this approach. Sections 4 and 5 present evidence on the fiscal sustainability issue from the Philippines and Indonesian experiences, respectively. We conclude in Section 6 with the implications of our findings for policy.

## **2. The Farmer Field School Extension Approach**

The FFS approach was designed originally as a way to introduce knowledge on integrated pest management (IPM) to irrigated rice farmers in Asia. The Philippines and Indonesia were key areas in implementing this extension effort. Experiences with IPM-FFS in these two countries have since been documented and used to promote and expand FFS and FFS-type activities to other countries and to other crops. Currently, FFS activities are being implemented in many developing countries, although only a few operate FFS as a nationwide system. The World Bank has incorporated the FFS in some of its agricultural projects.

At present, a typical FFS educates farmer participants on agro-ecosystems analysis, or what can be more generally described as integrated pest and crop management (IPCM), as it includes practical aspects of "... plant health, water management, weather, weed density, disease surveillance, plus observation and collection of insect pests and beneficials" (Indonesian National IPM Program Secretariat, 1991, p.5). The FFS approach relies on participatory training methods to convey knowledge to field school participants to make them into "...confident pest experts, self-teaching experimenters, and effective trainers of other farmers" (Wiebers, 1993). An archetypal FFS now entails some 8-12 half-day sessions of hands-on, farmer experimentation and non-formal training to a group of 20-25 farmers during a single crop-growing season. Initially, paid trainers lead this village-level program, focusing on problem-solving approaches in pest management as well as delivering elements and practical solutions for overall good crop management practices. Through group interactions, attendees sharpen their decision-making abilities and are empowered by learning leadership, communication and management skills (van de Fliert, 1993).

### **3. Farmer Field Schools and Fiscal Sustainability**

A major issue with promoting FFS as an agricultural extension approach is the financial commitment entailed in the continued operation of such an effort, particularly on a national scale. If government is to carry out a significant training program over a long period of time relying on official trainers, a significant fiscal obligation is implied. The experience of other extension systems has proven this to be a non-sustainable proposition.

One approach to reducing the fiscal burden, thus enhancing sustainability, has been the principle of farmer-trainers.<sup>1</sup> The concept is to encourage FFS graduates to train other farmers and thereby reduce the dependence of FFS on significant official funding support. For this purpose, selected and interested FFS alumni are invited to attend special training-of-farmer-trainer (TOFT) sessions so they themselves become schooled in experience-based learning methods and can organize and facilitate their own field schools using local resources. Farmer-to-farmer field school training is viewed as a promising route to multiplying FFS coverage, with the sustainability of the overall field-school approach resting on the spread and effectiveness of farmer-led schools.

In addition to farmer-led schools, which may be considered as a formal diffusion mechanism, one needs to consider the potential for transmission of the knowledge acquired in FFS through informal communication among farmers. In the case of specific technological innovations (e.g., high-yielding grain varieties), key aspects of the technology are the primary subjects of diffusion, and these have been observed in many studies to diffuse mainly through informal farmer-to-farmer communications (Rogers, 1983). However, the knowledge imparted in the course of an FFS is of a very different nature, as the objective of the training is "to help farmers develop their analytical skills, critical thinking, and creativity, and to help them learn to make better decisions" (Kenmore, 1998). "Farmers do not master a specific set of contents or 'messages', rather they master a process of learning that can be applied continuously" (Dilts, 1999). Accordingly, the curriculum of FFS includes complex agro-ecosystem concepts and decision making principles that, if conveyed casually through oral communications, are not likely to appeal to a farmer's day-to-day interest. Furthermore, the casual transmission of specific components of technologies and practices, if done away from the field, is likely to be less effective and the receiving farmers may not obtain sufficient knowledge to enable them to develop useful adaptations to their particular conditions.

This paper will demonstrate that in the Philippines and Indonesia, where experiences with FFS as an extension approach are the longest, the extent of formal farmer-led school coverage is small, the impact of informal exchange is limited, the reliance on official financing is heavy and consequently, the sustainability issue remains unsettled.

#### **4. The Philippines Case**

In the Philippines, nationwide IPM-FFS activities, more formally known as the KASAKALIKASAN program, were first instituted as a five-year program (1993-1997) under the Department of Agriculture. Presently, the program remains financed mainly from the national budget. Annual funding levels are determined by what the central government can afford. Only limited program resources come from local governments, the private sector and some NGO's. The central government's goal is to increase support from these latter sources because farmer coverage by the national effort is still limited.

An evaluation of KASAKALIKASAN by the SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEARCA, 1997) notes that from 1993-1997, the program trained 183,829 farmers in 7202 farmer field schools. The web-site of the community IPM program for the Philippines (<http://communityipm.org/philippines>) indicates that by October, 2000 the program had trained almost 200,000 farmers. The budget allocated to the program for the 1993-1997 five-year period totaled PhP 235 million (US\$ 8.75 million), or an investment of PhP 1280 (US\$ 47.6) per trained farmer. Of this, 87.3% came from the Department of Agriculture and other central government agencies, whereas only 9.4% was paid for by local government units.<sup>2</sup>

With continued reliance on public resources at current spending levels, it would take over 15 years to have one million Filipino farmers attend at least one FFS at a total cost of about US\$ 47.6 million.<sup>3</sup> This amounts to 20% of the estimated 5.0 million farm households nationwide. Given this slow pace, the prospects for significant coverage of the farming population through field schools are discouraging.

It is also important to note that the actual costs are likely to be higher than those reported in the SEARCA 1997 evaluation. The reported budget estimates consist of direct program appropriations only, i.e., costs that have been charged to and paid for by funds allocated for the program. They do not include indirect expenses, including expenditures for administrative and other personnel resources of central, provincial, and municipal levels, not directly paid for from allocated program funds.

As argued in section 3, for it to be a sustainable national agricultural extension program, the FFS approach depends on the diffusion of FFS-acquired knowledge and skills either through informal farmer channels or through more formal farmer-led FFS efforts. However, the empirical evidence from the Philippines, on both counts, indicates that these channels of diffusion are not significant. First, a recent Philippine study by Rola, et al. (2000) affirms that like most farmers, FFS graduates share information informally, largely on a one-to-one basis and mainly with other farmers residing within the village. This study (based on a sample of 307 farmers) tested and scored the knowledge of three types of farmers: (a) FFS graduates, (b) non-FFS farmers identified as "FFS-knowledge-recipients" by FFS graduates and (c) farmers who had never been directly exposed to FFS. The knowledge tests consisted of crop and pest management questions on topics typically covered by field schools in the surveyed province. The results

indicate some significant differences in knowledge scores between FFS graduates and non-graduates, but no significant differences between “FFS-knowledge recipients” and other non-FFS farmers. The study indicates that there appears to be no significant transfer of FFS-acquired knowledge from FFS graduates to other farmers.<sup>4</sup> An earlier study by Rola, et al. (1998) explains why this is perhaps not too surprising. In the focus group discussions it conducted, this earlier study notes that “FFS graduates mentioned their willingness to share their notes, although it was not clear whether they were willing to spend time in teaching in the field” (p.20).

Second, there has been little reliance on farmer TOFT graduates in the Philippine FFS program. The SEARCA (1997) evaluation reports that between 1994-1997, only six TOFT sessions were conducted under KASAKALIKASAN, with each having about 25 selected FFS graduates in attendance. In this context, unless there is an organized effort at farmer-to-farmer knowledge dissemination and official or NGO support of follow-up activities, the FFS approach in the Philippines will achieve very limited coverage. In the absence of such support, the maintenance of large-scale official involvement raises the problem of fiscal sustainability that has always dogged large extension systems.

## **5. The Indonesian Case**

Farmer field schools focusing on IPM training were introduced in Indonesia through Food and Agriculture Organization (FAO) and United States Agency for International Development (USAID) assistance on a pilot basis in 1989. The World Bank-funded National IPM Training Project supported Indonesia’s nationwide IPM-FFS activities from 1994-99. To a greater degree than in the Philippines, the Indonesian national program aims at disseminating IPM and other knowledge through the encouragement and promotion of farmer-initiated and farmer-led FFS activities. All farmer graduates are encouraged to communicate information to their non-FFS counterparts, and specially trained farmer-trainers are expected to become the dominant element in organizing and facilitating FFS’s (Braun, 1997). Farmer-led FFS initiatives are important for raising program coverage and allowing FFS knowledge to diffuse more rapidly. Moreover, if some of the costs of farmer-led FFS’s (such as trainer honoraria, rents for experimental plots, food expenses and compensation provided to participants) are eventually borne by local communities, then there is not only more local ownership but also lower fiscal burden to be associated with publicly-funded investments in field schools.

With the end of the World Bank’s loan to the IPM Training Project in 1999, there are conflicting conclusions about the sustainability of the program. On the one hand, concerns have been raised about whether continuation of field school training by farmer-trainers is likely to take place on a significant scale.<sup>5</sup> The World Bank’s internal operations evaluation process has raised doubts about the project’s sustainability. On the other hand, there are reports that argue that official trainer-led FFS’s have already been succeeded by networks of farmer-trainers who carry out the majority of training in Indonesia (Kenmore, 1997; FAO, 1999).<sup>6</sup> We examine empirical data on the nature and incidence of FFS training from two different farm-level surveys to assess the validity of these claims.

The first dataset we analyze was collected by the SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEARCA) for an evaluation of the Indonesian national IPM-FFS training project. In 1999, SEARCA administered a farm-level survey to 1192 FFS participant and non-participant households in six Indonesian provinces that were key beneficiaries of the National IPM Training

program. Evidence from this survey is reported in Tables 1-A to 4-A. The second dataset is a World Bank-funded 1999 farm-household survey that was administered to 454 households in the three main provinces on Java. This 1999 World Bank FFS Survey revisited the same respondents as were in a 1991 IPM-FFS survey conducted by the Center for Agro-Socio-Economic Research (CASER). Tables 1-B to 4-B from the 1999 FFS Survey provide additional evidence on the incidence of FFS training that has taken place over the years.<sup>7</sup>

Tables 1-A and 1-B report the distribution of FFS graduates, by provider of FFS training, for the two surveys. Both surveys indicate that the vast majority of FFS graduates received their training from official (government of Indonesia staff) full-time trainers who were either PHP (Pengamat Hama dan Penyakit or pest observers) and/or PPL (extension agents). Of the 769 FFS graduates in the SEARCA survey, only 9.9 percent attended FFS's where trained farmers (i.e., participants in TOFT) were the facilitators.<sup>8</sup> In the World Bank survey (Table 1-B), only 4.9 percent of 225 FFS graduates attended farmer-led schools.

These data indicate that the IPM-FFS initiative has so far been largely a government-funded effort dependent on government trainers. In the post-World Bank project era, in the absence of significant government allocations, it is unlikely that there will be large-scale FFS activity; as evidently, there has not been an effective transfer of training responsibilities to farmers even during the project period when public funds to provide for farmer-trainer honoraria, farmer compensation, food and other supplementary assistance to farmer-led activities were more readily available.<sup>9</sup> In this context, it is worth noting that the budgeted cost of a farmer-led school during the project period was actually higher than the cost of an official-led school, because two farmer-trainers with paid honoraria were needed to facilitate each farmer-led school (Braun, et al., 2000). As pointed out earlier, for farmer-led training to be less dependent on public funds in the post-project period, the communities will need to absorb a significant portion of the direct cost of schools.

While Table 1-A indicates an increased percentage of farmer-led FFS's over time (from 2.7 percent before 1994 to 12.1 percent in 1994-99, complementary information (Table 2-A and 2-B) suggests that it is doubtful that graduates can take over the IPM-FFS movement on their own and spearhead FFS training on a wide scale. As Table 2-A shows, the number and percentage of FFS alumni who attended TOFT sessions have decreased among recent graduates. Whereas 14.1 percent of all FFS graduates before 1994 were TOFT participants, only 10.6 percent of the 1994-99 graduates were. The decline in participation in TOFT by FFS graduates is likely to have been even higher in the population. As explained in the annex, the SEARCA sample overstates the actual proportion of FFS graduates who were trained by other farmers. It is likely too that the SEARCA sample overstates the proportion of FFS alumni who eventually become FFS trainers. This is because the survey purposely selected villages where farmer-led FFS were held and these are also the villages more likely to have TOFT-trained facilitators. The bias is evident from national statistics of the IPM program (Community IPM web-site of December, 2000) which indicate that between 1993/94 and 1998/99, only 2.6 percent of FFS graduates also attended TOFT (as compared to 11.4 percent in the SEARCA sample). In addition, from the 1999 World Bank FFS Survey, Table 2-B shows that only 1 of 53 (or 1.9 percent of) FFS graduates in the 1994-99 period attended TOFT.

Table 2-A also shows that not all attendees of TOFT actually organize or facilitate a field school. Only 68.2 percent of farmer-trainers actually organized FFS activities. Furthermore, the level of training activity conducted by farmer-trainers is rather small. On average, each farmer-trainer organized or

facilitated 1.1 FFS's over the several years since they received the training (Table 3-A), but this figure overstates the extent of training led by farmers as it does not take into account the fact that typically two farmer-trainers join to facilitate a school (Braun, et al., 2000; van de Fliert, et al., 1995). The figures from the World Bank survey, Tables 2-B and 3-B are higher but the TOFT numbers in this survey are small making it difficult to draw reliable conclusions.<sup>10</sup>

Tables 4-A and 4-B show that government budgets (central, provincial and district) were the main source of funds of schools facilitated by farmer-trainers. From the SEARCA survey, 37.7 percent of farmer-led FFS's relied on central government (APBN) funds for support and 45.9 percent on provincial and district-level (APBD I/II) government budgets. For the training effort as a whole (i.e., all field schools, whether farmer-led or official-led), central funding amounted to 84 percent, while 13 percent came from provincial or district budgets. The apparent dependence on public resources for the farmer-led initiative, particularly after completion of the pilot phase, reinforces concerns regarding the sustainability of the effort.

Finally, we note that even if individual farmer trainers were to rely mostly on their own or local funds, farmer-led schools will be insufficient for covering a significant share of farmers in Indonesia based on the level of activity they have shown so far. Some 26,500 farmer-trainers (graduates of TOFTs), or about three percent of all FFS graduates, are estimated to have graduated from the Indonesia IPM Training Program between 1993-2000.<sup>11</sup> If, as suggested by Table 3-A, each pair of TOFT graduates organizes 1.1 FFS's over a period of six years,<sup>12</sup> and if each of these farmer-organized FFS's trains 20 new farmers on average, about 291,500 farmers will have been trained by all existing farmer-trainers over the course of the next six years. In other words, each FFS graduate would have given rise to only 0.33 ( $= 0.3 \times 20.0 \times 0.5 \times 1.1$ ) further graduates. The calculation selects six years as the reference period, noting (from Table 3-A) that there is no difference between "older" farmer-trainers (pre-1994) and more recent farmer-trainers in the intensity of their training effort over time. This calculation assumes that appropriate back-up technical support and supplies of teaching materials funded by public sources will be available, an uncertain proposition by itself. The extrapolation also ignores the impact of trainer honoraria as a source of incentives during the project period.

As for informal diffusion of FFS-acquired knowledge by field school graduates, we already noted that compared with specific technological innovations, it is much more difficult for the key FFS concepts (agro-ecosystem concepts and decision-making principles) to diffuse well in informal exchange. This is because these are complex ideas that are difficult to convey outside specific field experiences, such as the hands-on learning provided by the farmer field school. The observations by E. van de Fliert (1993, pp.202, 230) suggest that ineffectiveness of informal "horizontal communications" was an issue that was indeed encountered at the early phase of the Indonesian field school effort.<sup>13</sup>

Our estimates of farmer-led FFS efforts call into question the significance of the likely coverage by the farmer-led extension approach in Indonesia where the Agricultural Census reports over 21 million agricultural households nationwide. If a farmer-led effort cannot be relied upon for large-scale diffusion, the issue turns back to dependence on officially funded extension efforts and to the problem of fiscal unsustainability associated with it, given the relatively high costs of the FFS training approach with a conservative estimate of \$62 per farmer.<sup>14</sup>

## 6. Conclusions

This paper examined the issue of fiscal sustainability of the farmer field school extension approach to reaching farmers over a large geographical area. Our focus is motivated by the fact that fiscal unsustainability is a generic problem that affects many large-scale public agricultural extension systems. The sustainability issue must be addressed up front before promoting activities (including pilots) intended to set up any publicly-assisted, large-scale extension approach.

Our review of the IPM-FFS experiences in the Philippines and Indonesia suggests that the FFS approach to delivering new knowledge to farmers on a large scale is subject to the same risks of fiscal unsustainability as other large scale extension efforts where actual experience has so far been disappointing. As in the Philippines, FFS may be the mainstay of a national agricultural extension system and may rely on public funds for sustainability. However, because the per-farmer cost is high, the limited available budget for extension in the Philippines allows the training of only a modest number of farmers under the FFS approach. Farmer-led field schools are viewed by some as a way out of this fiscal dilemma, because they shift part of the cost to the farming community. However, the experience in Indonesia suggests that farmer-led field-school activity cannot be relied upon to maintain a significant training effort under the FFS approach.

In assessing the general pertinence of the results presented here, it is worth noting that the situation in the Philippines and Indonesia in terms of the low political power of farmer groups and farmer lobbies, the long tradition of largely top-down and non-transparent governance systems and the level of day-to-day interactions among farmers is not that dissimilar to many other developing countries in Asia and Africa where FFS is already being actively promoted. Therefore, the insights from this study are quite relevant for the discussion of similar extension activities in these areas.

Our two country studies suggest a need for great selectivity and caution in initiating FFS activities, with a focus on the fiscal sustainability of the program if the intention is to scale up these activities on the basis of the pilots. The same caution applies to any extension program with large recurrent costs that are expected to be government funded. The Philippine and Indonesian experiences with field schools cast doubts on the fiscal viability of the FFS approach for disseminating knowledge-intensive technologies such as IPM to large farmer populations. While several village-level studies and limited-size pilot experiences may attest to the viability of field schools in specific local circumstances, overall national-level experiences indicate that the fiscal sustainability issue can be difficult to surmount at “scaled-up” levels. A careful analysis of the projected public expenditures over time relative to the likely budgets of the relevant public agencies and local governments would be useful when evaluating the merits of proposed projects.

## Appendix

The SEARCA evaluation was commissioned and assisted by Indonesia's National IPM Program Secretariat. For this evaluation, in 1999, SEARCA administered a farm-level survey in six Indonesian provinces that were key beneficiaries of the National IPM training program. Both FFS participants and non-participants were included in the sample. In all, there are 769 FFS graduates and 423 non-FFS farmers in the SEARCA sample. In order to ensure that the survey covered a reasonable number of FFS farmers with certain characteristics, i.e., women FFS participants and non-rice FFS graduates, some villages and/or respondents were purposively selected.

One other criterion used for selecting FFS villages and respondents for the survey was the nature of the FFS's conducted in the village, i.e., whether a village field school was led by full-time project trainers (PHP), by farmer-FFS graduates especially trained as trainers, or by others (e.g., NGO). This selection mechanism was necessary to ensure a sufficient number of respondents in these last two "who-was-your-trainer" categories.

The 1999 World Bank survey revisited the same respondents who participated in a 1991 IPM-FFS survey conducted by the Center for Agro-Socio-Economic Research (CASER) in Bogor. In 1991, CASER was commissioned to assess the impact of IPM-FFS program activities then in its pilot phase. Because program coverage was still limited, CASER's household survey sampled the program's pilot villages and graduates purposely. Non-FFS villages and households were selected randomly from the population of rice-growing areas and households, respectively. The total number of survey respondents was 454, of which 225 were FFS graduates at the time of the 1999 survey. Of these 454 respondents, 347 were randomly selected non-FFS households in 1991.

Owing then to the baseline 1991 survey from which it is derived, the World Bank's 1999 FFS Survey contains a disproportional number of PHP-trained FFS graduates from the IPM-FFS pilot phase (i.e., before 1994). Compared to the SEARCA survey however, this follow-up survey provides a less biased picture of the extent and kind of FFS coverage during the key program years (i.e., after 1994).

## References

Bindlish, Vishva and Robert Evenson. 1993. "Evaluation of the Performance of T&V Extension in Kenya." World Bank Technical Paper No. 208, Africa Technical Department Series, World Bank, Washington D.C.

Braun, Ann R. 1997. "An Analysis of Quality in the Indonesian Integrated Pest Management Training Project." Report of a technical audit conducted for the World Bank of the Indonesia Integrated Pest Management Training Project, World Bank, Washington D.C.

Braun, Ann R., Graham Thiele, and Maria Fernandez. 2000. "Farmer Field Schools and Local Agricultural Research Committees: Complementary Platforms for Integrated Decision-Making in Sustainable Agriculture." Agriculture Research and Extension Network Paper No. 105, Overseas Development Institute, London.

Feder, Gershon, Andrew Willett and Willem Zijp. 1999. "Agricultural Extension: Generic Challenges and the Ingredients for Solutions." Policy Research Working Paper No. 2129, World Bank, Washington D.C.

Food and Agriculture Organization of the United Nations. 1999. "Technical Assistance to the Integrated Pest Management Training Project: Indonesia Project Findings and Recommendations." FAO, Rome.

Gautam, Madhur and Jock Anderson. 1999. "Reconsidering the Evidence on Returns to T&V Extension in Kenya." Policy Research Working Paper 2098, World Bank, Washington D.C.

Hanson, James and Richard Just. 2001. "The Potential for Transition to Paid Extension: Some Guiding Economic Principles." Paper presented in the AAEA Session on Complements and Substitutes for Traditional Extension Services: Experiments and Experiences, Allied Social Science Association Annual Meetings, New Orleans, LA. January 5-7, 2001.

Indonesian National IPM Program Secretariat. 1991. "Farmers as Experts: The Indonesian National IPM Program." Indonesian National IPM Program, Jakarta, Indonesia.

International Fund for Agriculture and Development. 1998. Report and Recommendation of the President on the Technical Assistance Grant to the FAO for the East African Subregional Pilot Project for FFS in Kenya, Republic of Tanzania and Uganda, IFAD, Rome, December 1998.

Kenmore, Peter. 1997. "A Perspective on IPM." Center for Information on Low External-Input and Sustainable Agriculture Newsletter, 13(4).

Purcell, Dennis L. and Jock R. Anderson. 1997. "Agricultural Extension and Research: Achievements and Problems in National Systems." Operations Evaluation Department, World Bank, Washington D.C.

Rogers, Everett. 1983. *Diffusion of Innovations*. New York: Free Press.

Rola, Agnes C. 1998. "Farmer Field School, IPM Knowledge, and Insecticide Use: The Iloilo (Philippines) Case Study." *Asian Journal of Sustainable Agriculture* 1(2)

Rola, A.C., Z.S. Provido, and M.O. Olanday. 1998. "Making Farmers Better Decision-Makers Through the Farmer Field School." Technical Bulletin. SEAMEO-SEARCA, College, Laguna, Philippines.

Rola, A.C., J.B. Quizon and S.B. Jamias, M.M. Paunlagui, and Z.S. Provido. 2000. "An Evaluation of the IPM-FFS Knowledge Diffusion: Case Study in Iloilo." World Bank/UP Los Baños Foundation, Inc. Final Report. Los Baños: College, Laguna, Philippines.

SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEARCA). 1997. "KASAKALIKASAN Program Pre-Project Completion Impact Evaluation Project." Final Report, Los Baños, Laguna, Philippines.

SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEARCA). 1999. "Integrated Pest Management Training Program: Impact Evaluation Study." Final Report, Vols. 1 and 2, Jakarta, Indonesia.

van de Fliert, Elske. 1993. "Integrated Pest Management: Farmer Field Schools Generate Sustainable Practices. A Case Study in Central Java Evaluating IPM Training." Agricultural University Wageningen, The Netherlands.

van de Fliert, Elske, J. Pontius and N. Roling. 1995. "Searching for Strategies to Replicate a Successful Extension Approach: Training of IPM Trainees in Indonesia." *Journal of Agricultural Education and Extension* 1:41-63.

van den Ban, Anne W. 2000. "Different Ways of Financing Agricultural Extension." Agriculture Research and Extension Network Paper No. 106, Overseas Development Institute, London.

Wiebers, Uwe-Carsten. 1993. "Integrated Pest Management and Pesticide Regulation in Developing Asia." World Bank Technical Paper Number 211. Asia Technical Department Series, World Bank, Washington D.C.

**Table 1-A**  
**Number & Percentage Distribution of FFS Graduates by Source of FFS Training**

Year attended FFS	7. Who was the trainer in the FFS you attended							
	PHP/PPL <sup>a</sup>		TOFT <sup>b</sup>		Others		Total	
	N	%	N	%	N	%	N	%
Before 1994	174	94.6	5	2.7	5	2.7	184	100
1994 – 1999	498	85.1	71	12.1	16	2.7	585	100
Total	672	87.4	76	9.9	21	2.7	769	100

Source: 1999 SEARCA Survey

Notes: <sup>a</sup>PHP/PPL = pest observer/extension agent; <sup>b</sup>TOFT = participant of “Training of Farmer Trainers” Program

**Table 1-B**  
**Number & Percentage Distribution of FFS Graduates by Source of FFS Training**

Year attended FFS	8. Who was the trainer in the FFS you attended							
	PHP/PPL <sup>a</sup>		TOFT <sup>b</sup>		Others		Total	
	N	%	N	%	N	%	N	%
Before 1994	167	97.1	2	1.2	3	1.7	172	100
1994/95 – 1998/99	42	79.2	9	17.0	2	3.8	53	100
Total	209	92.9	11	4.9	5	2.2	225	100

Source: 1999 World Bank FFS Survey

Notes: <sup>a</sup>PHP/PPL = pest observer/extension agent; <sup>b</sup>TOFT = participant of “Training of Farmer Trainers” Program

**Table 2-A**  
**Participation in “Training of Farmer Trainers” (TOFT) and Execution of FFS Training by TOFT Graduates**

<b>9.</b> <b>10. Year attended FFS</b>	Total FFS graduates (1)	FFS graduates who attended TOFT (2)	% of Total FFS graduates (3)=[(2)/(1)]*100	FFS graduates who facilitated FFS training (4)	% of Total TOFT attendees (5)= [(4)/(2)]*100
Before 1994	184	26	14.1	18	69.2
1994 - 1999	585	62	10.6	42	67.7
Total	769	88	11.4	60	68.2

Source: 1999 SEARCA Survey

**Table 2-B**  
**Participation in “Training of Farmer Trainers” (TOFT) and Execution of FFS Training by TOFT Graduates**

<b>11.</b> <b>12. Year attended FFS</b>	Total FFS graduates (1)	FFS graduates who attended TOFT (2)	% of Total FFS graduates (3)=[(2)/(1)]*100	FFS graduates who facilitated FFS training (4)	% of Total TOFT attendees (5)= [(4)/(2)]*100
Before 1994	172	10	5.8	10	100
1994/95 – 1998/99	53	1	1.9	1	100
Total	225	11	4.9	11	100

Source: 1999 World Bank FFS Survey



**Table 3-A**  
**Average Number of FFS Conducted**

<b>Year attended FFS</b>	Average number for all TOFT <sup>a</sup> (N=88)	Average number for all who conducted FFS (N=60)
Before 1994	1.2	1.8
1994 – 1999	1.1	1.7
<b>Total</b>	<b>1.1</b>	<b>1.7</b>

*Source:* 1999 SEARCA Survey

*Notes:* <sup>a</sup>TOFT = participant of “Training of Farmer Trainers” Program. Difference in number of FFS conducted by pre-1994 and post-1994 TOFT is not significant. Typically two farmers are responsible for facilitating a farmer-directed FFS (see Braun et al., 2000, p.4; van de Fliert et al., 1995)

**Table 3-B**  
**Average Number of FFS Conducted**

<b>Year attended FFS</b>	Average number for all TOFT <sup>a</sup> (N=11)	Average number for all who conducted FFS (N=11)
Before 1994/95	2.9	2.9
1994/95 – 1998/99	1.0	1.0
<b>Total</b>	<b>2.7</b>	<b>2.7</b>

*Source:* 1999 World Bank FFS Survey

*Notes:* <sup>a</sup>TOFT = participant of “Training of Farmer Trainers” Program. Difference in number of FFS conducted by pre-1994/95 and post-1994/95 TOFT is not significant.

**Table 4-A**  
**Source of Funding for FFS Organized by Farmer-Trainers**

Year attended FFS	Village		Government budgets		Others (NGOs, farmers, and others)		Total	
	N	%	N	%	N	%	N	%
Before 1994	1	5.3	15	78.9	3	15.8	19	100
1994-1998	1	2.4	36	85.7	5	11.9	42	100
Total	2	3.3	51	83.6	8	13.1	61*	100

Source: 1999 SEARCA Survey

Notes: <sup>a</sup>One reported having received funding from 2 sources

**Table 4-B**  
**Source of Funding for FFS Organized by Farmer Trainers**

Year attended FFS	Village		Government budgets		Others (NGO's, farmers, and others)		Total	
	N	%	N	%	N	%	N	%
Before 1994	1	10.0	5	50.0	4	40.0	10	100
1994-95 - 1998/99	0	0.0	1	100	0	0.0	1	100
Total	1	10.0	6	54.5	4	36.4	11	100

Source: 1999 World Bank FFS Survey

## Endnotes

<sup>1</sup> It is also possible to rely on NGOs to enhance sustainability, but some NGO's may themselves depend on public funds. In the Philippines and Indonesia, several NGO's have FFS activities focused on small selected areas. As discussed in the Indonesian case, these remain a small percentage of total FFS efforts. We have not investigated these NGO activities because they are not representative of a national, widespread initiative.

<sup>2</sup> To our knowledge, there was very little, if any, direct farmer contribution to the funding of this program. The Community IPM web-site indicates that beginning with year 2000, government allocation has been US\$ 3 million per year.

<sup>3</sup> These estimates assume that (a) annual program spending remains constant at US\$ 3.0 million and (b) training costs remain at US\$ 47.6 per trained farmer. If the cost of training of trainers was regarded as a fixed cost, then annual training costs will fall to US\$ 43.5 per FFS farmer. These computed costs per farmer are within the range of what has been budgeted by FFS promoters for other mainstream prototype FFS projects intended for eventual scaling-up and are expected to rely mainly on public budget and external donor financing. In Africa, for instance, an International Fund for Agricultural Development (IFAD) pilot project (Kenya, Tanzania, Uganda) indicates estimated FFS costs of about \$ 53/FFS trained farmer, excluding the costs of trainers salaries (IFAD, 1998).

<sup>4</sup> A study of an FFS pilot in Kenya (Loevinsohn, et al., 1998) suggests that there has been some sharing of information by FFS graduates with other farmers ("diffused" farmers) who have shown "real interest" in these discourses and adopted some of the practices discussed. However, the understanding of the information shared and its field impact were not assessed, and the "diffused" farmers were not compared to a control group. The study was conducted one season after field schools had been completed. Consequently, the study does not provide conclusive evidence that the FFS pilot in Kenya led to a massive process of informal diffusion of information from FFS graduates to their non-FFS counterparts.

<sup>5</sup> The government is still expected to allocate resources for FFS activities in the post-project phase, but at a lower level of intensity and hence, at a lower budgetary requirement. With farmer trainers, the expectation is for the government to provide some back up assistance only, like specialists' services and learning materials.

<sup>6</sup> "Full time IPM trainers facilitating and then following up Farmers Field Schools have been succeeded naturally by networks of farmer trainers who can call upon specialists for specific advice. These farmer IPM trainers now carry out **the majority** of training in Indonesia." (Kenmore, 1997; p.2; emphasis added) "Farmer trainers were a major success of the project. They became capable trainers, able leaders and skilled researchers, facilitating **50 percent** of the FFS's conducted during the project." (FAO, 1999; p.26; emphasis added).

<sup>7</sup> The Appendix describes the sample design of both surveys in detail.

<sup>8</sup> The percentage of farmer-trained FFS graduates in the overall population is likely to be lower than 10 percent since the SEARCA survey purposively included alumni from non-government (farmer-led and NGO-led) schools.

<sup>9</sup> While the percentage of farmer-led FFS's increased during the project period, coverage remained limited. The SEARCA survey indicates that only 18 percent of FFS graduates in the last two years of the project had attended farmer-led FFS's.

<sup>10</sup> The 1999 World Bank Survey found few TOFT graduates, except among pilot phase graduates which it purposively sampled. As shown, Table 2-B contains few observations of TOFT graduates, particularly after 1994.

<sup>11</sup> Based on the web-site of Community IPM for Indonesia (online as of January, 2001).

<sup>12</sup> Although there is no statistically significant difference in the intensity of training by pre-1994 and post-1994 farmer-trainers in either the SEARCA or World Bank survey, we use the estimate of 1.1 FFS conducted by each TOFT graduate from the SEARCA survey since it includes a much larger sample (88 TOFT graduates) than the World Bank survey (11 TOFT graduates).

<sup>13</sup> Van de Fliert's (1993) in-depth, qualitative evaluation of FFS experiences covers a limited area during the first cycle of the Indonesia FFS-IPM program in the early 1990's.

<sup>14</sup> This cost-per-farmer figure is calculated from (a) actual project costs for training, management information systems, and technical assistance of the Indonesian IPM Training Project and (b) an estimate of 626,235 farmers trained by the program. If the cost of technical assistance were removed, the cost would amount to \$ 53 per farmer. The figures are compiled from SEARCA and World Bank project documents. These costs per FFS farmer are underestimates since they exclude the base salaries of employees at all levels of government who are employed in the program. The per-school costs indicated by Braun, et al. (2000) are lower, as these exclude all of the program overhead costs such as the cost of training-of-trainers. In general, these estimates of training cost per farmer are close to the \$ 47.6/FFS farmer that we had calculated earlier for the Philippine national FFS effort and the \$ 53/FFS farmer (excluding the costs of trainers' salaries) budgeted by an IFAD-sponsored FFS pilot program for Africa (IFAD, 1998).