Appendix I Review of the Farmer Field School Approach to Extension

I.1 Vietnamese experiences with the Farmer Field School approach

The Consultant Team reviewed the DANIDA experience of the FFS approach in Vietnam as it pertained to IPM and Livestock. The Team notes that FAO and other donors have been working in Vietnam in IPM and the FFS for many years, but the short time of the study made it impossible to conduct a through evaluation of all such programs. Nevertheless, the DANIDA IPM program is a follow-on from the FAO IPM program and as such is worthwhile to review.

As mentioned above, there were two FFS programs reviewed, the DANIDA IPM programme which was evaluated in late 2003 (PEM Consult 2004) at it's mid-term point, and the DANIDA Small Livestock Component Farmer Livestock Schools (FLS). This latter programme is currently being evaluated by DANIDA and so while a formal study has not been reviewed, the Consultant Team is able to make some passing comments on the program and its effectiveness.

The FLS conducted by DANIDA trained 400 Trainers of Trainers to run 42 FLS in pig, chicken and duck production. In total 1008 farmers were trained, of whom 879 farmers also received input subsidies for the purchase of improved breeds, feeds, housing and vaccination services. While the impact evaluation of the FLS approach is currently ongoing, a simple observation about the costs of the program can put the scheme into perspective. The total cost of the DANIDA SLC (Small Livestock Component) is $6 million, equating to $5,952 per trained farmer. It will be interesting to see whether the NPV of benefits accruing to farmers exceed this amount.

The other program reviewed was DANIDA's IPM component which utilized the FFS approach as its main extension methodology. PEM Consult (2004) noted that the implementation of the FFS approach was successful and that large numbers of farmers were being successfully trained in IPM methodologies.

However, the purpose of this review is not to evaluate the effectiveness of programs in training farmers in the FFS approach, or the effectiveness of IPM programs. Rather, the purpose is to gauge the effectiveness of the FFS approach in increasing farmer incomes; in this case primarily through the increase in yields. This is not to ignore the role of IPM in reducing chemical pesticide and fertilizer use which is generally accepted in Vietnam to be too high.

PEM Consult (2004, pg. 1) notes in their report that the FFS/IPM model resulted in a slight impact on higher income from rice production. The report does not evaluate the impact on incomes, but cites the project Baseline Impact Study which reported an average profit increase of $117 per hectare, which mirrored the results of a formal economic impact study of rice FFS in Vietnam by Pincus (2000).

There have been other success stories in Vietnam. For example, ADDA's IPM Farmer Training Project which conducted a series of vegetable FFS showed, on average, that the amount of pesticide used on IPM plots of tomatoes, cabbage, and beans was reduced by over 60 percent, while average yields increased at least 18 percent and farmers' profits rose 29-36 percent (FAO 2001).

While these cases have not been subjected to a rigorous analysis as in the case of the FAO IPM FFS in Indonesia (Feder, Murgai et al. 2003), there is no reason to assume that the impact measurements are incorrect. While before and after comparisons of yield can demonstrate what are the effects of FFS and IPM on farmer income, the comparisons should also involve participating and non-participating farmers[36]. In the case of FFS in Vietnam, the overuse of chemical pesticides and fertilizers means that substantive savings in input costs can be made without reducing yield and thereby resulting in improved farmer incomes.

I.2 Bangladesh experiences with the Farmer Field School approach

DANIDA (2003) evaluated the impact of the IPM/FFS approach in Bangladesh under their "Strengthening Plant Protection Services (SPPS)" component. The report indicated a net benefit of $143 per hectare per year for rice production and $593 per hectare for vegetable production (see DANIDA 2003, pg 10-11).

DANIDA (2003) then takes these net benefits and estimates a NPV of $4.55 million with an FIRR of 249 percent. While there are some issues with the underlying assumptions of the financial analysis[37], the analysis is relatively robust to changes in the assumptions and the FIRR only changes by around 100 percent; indicating that indeed there are benefits from the improved yields and therefore income attributed to the IPM/FFS approach in Bangladesh.

However, the problem with the analysis lies not in the financial analysis, but the underlying assumptions of the changes in household income attributed to the IPM/FFS approach. The analysis does not take into account non-random selection and selection bias[36].

I.3 Cambodian experiences with the Farmer Field School approach

SAWAC (2003) reviewed the PRASAC II FFS schemes in a selection of provinces around the Tonle Sap and Plains area. Some 1,227 farmers participated in the FFS program under PRASAC II. The conclusions of the study were that:

> *"Farmers who participated in the IPM/s FFS have experienced an increase in their rice yield, amounting to some 850kg/ha on the average. In relative terms this increase of 60% is considered rather high if we take into account the average increase for all respondents amounted to some 35% and for those who participated in the SRI [System of Rice Intensification] it amounted to some 110%.*
>
> *Given IPM's approach to train farmers in general practices for environmentally friendly production, it is likely that FFS function as a kind platform of knowledge and attitudes on which other programmes could build further and change farmers' behaviour." (SAWAC 2003, pg. 77)*

[36] Any empirical analysis assessing the impact of FFS must take account of the special aspects of FFS program implementation. Non-random program placement and participant selection means that single difference comparisons of outcome measures (e.g., between participants and non-participants) can give severely biased estimates of impact. A popular approach for addressing this problem is to compare the change in performance before and after the program for a treatment group (i.e., graduates or exposed households) to the change in performance over the same time period for a control group that is unaffected by the program Glewwe, P. and H. Jacoby (2000). Recommendations for Collecting Panel Data. Designing Household Survey Questionnaires for Developing Countries: Lessons from 15 Years of the Living Standards Measurement Study. M. Grosh and P. Glewwe. Washington DC, World Bank**:** 275-314..

[37] For example, why a Leontief Input-Output Income Multiplier would only apply to IPM/FFS farmers and not the whole population, the assumptions of 95 and 80 percent adoption rates during and post intervention, and the lateral spread coefficients.

It is of interest to reproduce the relevant tables in the SAWAC (2003) report detailing the analysis of this purportedly successful FFS programme; see Table 31, Table 32 and Table 33[38].

As Table 31 shows, there is a significant difference between rice yields before and after the FFS intervention. This indicates that for those farmers who participated in the FFS program, their yields were significantly greater than their yields were before the program started.

However, while the yields of the participating farmers have increased, it is of course of interest to see how the yields of the non-participating farmers have gone. If the non-participating farmers' yields have also increased over the same time period, then obviously there are external factors (such as a good season, increased used of fertilizer, etc.) which explain the changes in yields, rather than purely an FFS intervention effect.

As Table 32 shows, the effect of the FFS intervention does not explain the differences between participating and non-participating farmers. There is no statistical difference between the changes in yield between the different farmer groups who participated in the FFS program and those that did not. Interestingly, the only factor which explained the differences in yields were those farmers who participated in SRI activities.

As SRI activities were often associated with FFS activities, it is of course interesting to investigate whether FFS combined with SRI had any effect on farmer yields. Table 33 indicates that this is not the case. Whether or not farmers participated in SRI had no significant effect on differences in yields between participants and non-participants in FFS; indicating that the yield effect of SRI is independent of that of FFS.

In summary, while it is true that those farmers who participated in PRASAC II FFS activities had a higher yield than before they attended the courses, there was no significant differences between their yields and non-participating farmers. While advocates of the FFS approach in Cambodia highlight the before-after yield comparison as a justification of adopting a FFS approach to extension, they appear to conveniently ignore the comparison between adopters and non-adopters in arguing their case.

Ngin Chhay (2004) evaluated the impact of the National IPM Programme in Cambodia, comprising the Danida IPM project, the APIP/IPM sub-component and the FAO IPM vegetable project. The FFS approach was adopted by all of these projects as the preferred extension methodology. Ngin Chhay (2004, pp. 3-4) outlines some of the impact of IPM/FFS on farmer yields; see Table 34. In all cases, participation in the IPM and FFS programs had a significant benefit on farmer yields and incomes.

While the Consultant Team was unable to identify other FFS impact assessment material for Cambodia within the short time allowed for the study, informal discussions with DAE staff and other government staff within MAFF indicate that the broader experience of FFS in Cambodia is not as upbeat as the general project impact assessment reports. In a DAE evaluation of the FFS approach in Battambang (pers. comm.), it was concluded that the FFS approach was fundamentally unsustainable and most of the farmers who had participated in the Schools had reverted back to their old practices. DAE was critical of the approach saying that the training courses under the FFS improved the knowledge of

[38] See Footnote 36 of why this is not an ideal measure.

participating farmers, but left them nothing substantive with which to improve their livelihoods.

This comment is indicative of the FFS approach to IPM; the generic form of FFS to be found throughout much of S.E. Asia. Unfortunately, FFS and IPM have been developed hand-in-hand and it is often quite difficult to separate the two approaches. In the Cambodian context the use of IPM has met with some resistance, as IPM's main extension message has been to reduce chemical pesticide and fertilizer use. Whether this is the pedagogical message of IPM is irrelevant – this is the actual message being transmitted to farmer participants by their FFS trainers. In the Cambodian context of extremely low fertilizer and pesticide use the relevance of a program that teaches farmers to use even less pesticide and fertilizer has to be questioned.

The Consultant Team met with several farmers involved in the FFS approach and IPM, as well as several of the field teams training farmers participating in FFS. There are two main comments to be made:

1. Those farmers involved in FFS and IPM were quite positive about their experiences and were certainly advocates of the approach. Clearly, improved knowledge (and empowerment) was greatly appreciated. However, serious concerns have to be raised from a productivity and marketing point of view about the production and quality of IPM grown crops. In all cases the Consultant Team observed that the crops grown by the farmers were stunted and extremely damaged because of insects. In one case the farmer could only harvest her leafy vegetables for pig feed as the market would not accept them. In other cases a large majority of the crop could not be sold because of the same problems. This raises the point that key message of IPM – the balanced use of fertilizer and pesticides – has been corrupted to be one of zero chemical inputs (organic production).

2. Several key informants involved in the FFS and IPM approaches from a training perspective told the Consultant Team that in a few cases their FFS trainers have been telling farmers to apply higher levels of chemical pesticides and fertilizers than has been advocated by the respective programs (again, most of these respective programs have been using the FFS and IPM approach in an organic agriculture setting). This has been done by those trainers out of a fear of the consequences on yield of a zero chemical input regime. In other words, those trainers were afraid that they would have been blamed by the farmers for a reduction in yield if the farmers had followed the program recommendations. This raises the point that at least at the implementation level there is a lack of confidence in the trainers themselves as to the effectiveness of the FFS and IPM approach. If the trainers themselves are not full advocates of the FFS and IPM approach then it is unlikely that farmers will be advocates, and it is also unlikely that any assessment of the effectiveness of the FFS and IPM approach will get the true picture of what is happening at the farmer level.

Table 31 Rice Yields Before and After Participating in PRASAC II FFS Program

Intervention	Average Yield (kg/ha)	90% Confidence Interval	
		Lower	Upper
After FFS	2,252	1,816	2,688
Before FFS	1,402	1,085	1,718
Difference	850 (60%)		

Source: SAWAC (2003, pg. 47)

Table 32 Comparison of Changes in Rice Yields by Explanatory Variables

Explanatory Indicator		Average Yield Change (kg/ha)	90% Confidence Interval	
			Lower	Upper
Gender	Male	744	600	888
	Female	578	338	819
FFS participation	No	662	517	807
	Yes	841	593	1090
SRI participation	No	428	274	581
	Yes	998	808	1188
Vegetable Program participation	Yes	703	544	863
	No	724	521	928

Source: SAWAC (2003, Appendix Table 8)

Table 33 Comparison of Changes in Rice Yields Due to Farmer Field Schools

Explanatory Indicator		Average Yield Change (kg/ha)	90% Confidence Interval	
			Lower	Upper
Gender	Male	1369	1082	1656
	Female	1139	535	1743
SRI participation	No	1220	779	1661
	Yes	1391	1072	1709
Vegetable Program participation	Yes	1225	912	1539
	No	1478	1032	1924

Source: SAWAC (2003, Appendix Table 14)

Table 34 Yields and Farmer Returns Under IPM and FFS in Cambodia

Program	Crop	Yields (kg/ha)			Income ($/ha)		
		IPM / FFS	Non-Participating	Change	IPM / FFS	Non-Participating	Change
Rice Production, Kandal and Takeo Provinces	Wet Season	2473	2083	390	$186.04	$108.23	$77.81
	Dry Season	3789	3099	690	$154.54	$91.17	$63.37
Oxfam-GB Kampong Speu	Rice			586			
Danida IPM	Wet Season	3226	2089	1137	$216.07	$102.20	$113.88
	Dry Season	4507	3110	1397	$241.94	$106.77	$135.16
APIP/IPM	Wet Season	3308	2536	772			
	Dry Season	4124	3278	846			
National IPM	Wet Season	2747	2014	733			
	Dry Season	3114	2450	664			
FAO Vegetable	Yard Long Bean	9798	8307	1491	$712.94	$393.77	$319.17
	Tomato	15425	13096	2329	$2,900.97	$1,816.00	$1,084.97

Source: Adapted From (Ngin Chhay 2004)