Farmer Field Schools to promote Integrated Pest Management in Asia: the FAO Experience[1]

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Summary

The Farmer Field School (FFS) is a group-based learning process that has been used by a number of governments, NGOs and international agencies to promote integrated pest management (IPM). The first FFS were designed and managed by the UN Food and Agriculture Organisation in Indonesia in 1989 since when more than two million farmers across Asia have participated in this type of learning.

This case examines some of the human – as opposed to technological – factors that have influenced the scaling up of the FFS. Organisational issues such as leadership, policy, human resources and competition help to explain why the IPM field school has taken off in some places and not in others. Examples are taken from a number of countries, with a particular focus on Nepal.

There are conceptual and methodological reasons why it is difficult to assess the broad impact of the IPM field school. The author suggests that the notion of *utility* may be just as useful as calculations of costs an benefits in explaining why farmers join FFS and why governments and donors have chosen to fund them. The author also suggests that the utility of the FFS to farmers is self-evident from the fact that so many have chosen to participate.

1. Introduction to organisational aspects of scaling up

Farmer Field Schools in Asia have involved over two million farmers in more than a dozen countries, supported by a wide range of government departments, NGOs, and international agencies. There are many lessons that can be learned from this experience. This case study will focus on organisational issues. In order to appreciate the importance of these issues, it is useful to start with a few basic ideas regarding interventions in agricultural development:

a) Agricultural development comes about through two general processes: spontaneous change and planned interventions. These processes are

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often driven by a desire to solve certain problems (eg. poor nutrition, low yields, pests and diseases, labour shortages etc). Equally important, however, is the desire to respond to new opportunities and changes in the farming environment (eg. new policies and markets, changes in agro-ecological conditions, fluctuations in prices, conflict and migration etc).

b) Planned interventions usually focus on solving particular problems; this is how development projects are designed. But the large-scale impact of these interventions depends to a great extent on their relevance and effectiveness in the face of diverse and dynamic conditions.

c) Most large-scale interventions can be described in terms of three sets of issues: technology, extension methodology, and organisational setting. Emphasis is given to these different issues at different stages in the intervention process: technology is usually identified and developed during the research stage, extension methods are tested and adapted during piloting, while organisational issues come into play during expansion.

d) The major organisational issues that affect the scaling-up of agricultural interventions include:
   - *Leadership.* Two types of leadership should be considered - political and professional. If an intervention has high-level political backing, other issues should fall into place. A strong vision, commitment and communication skills at the professional level will also make things happen.
   - *Policy.* Donor support often means that pilot activities are 'immune' to policy considerations. In the expansion phase, however, certain questions need to be considered: does the government have clear ownership of the intervention? is it consistent with established goals, priorities and targets? are appropriate regulations and incentives in place?
   - *Human Resources.* Scaling up places demands on managers and field workers. Are staff available? Do they have relevant experience and the required skills? How much disruption will the intervention cause to existing organisation structures, programmes and methods?
   - *Competition*. Farmers and government officials are faced with a wide range options. Intervention can fail because they are 'squeezed out' by alternative technologies or approaches that have a stronger backing.

e) The issues listed above cannot be adequately tested during the research and piloting phases. Furthermore, these issues are often highly variable: the organisational context varies from place to place, and it changes over time. This variability is – to a large extent – outside of the control of the development agencies that manage the research and piloting phases of the intervention process.

f) The chaotic nature of the organisational context helps to explain some of our experience relating to the impact of agricultural interventions, particularly:

- why some technologies and extension methods are highly beneficial on a pilot basis but are never successfully scaled up;
- why expansion takes place in some countries – or some provinces - and not in others;
- why – after a long period of waiting – an agricultural programme in a particular country can suddenly take off and - equally suddenly - grind to a halt.

g) An important lesson to be drawn from this experience is that *responsiveness* is as important as *planning* in the management of agricultural interventions. Responsiveness can be achieved if programmes are designed with the following interrelated features:
   - A *document/agreement* that focuses on broad goals and processes rather than details of outputs and activities, thereby allowing the programme to adapt to evolving needs and opportunities.
   - A *programme manager* who is outward looking, keeping track of changes in the environment of the programme, not just internal factors such as quantitative targets.
   - *Operational decision-making* that is decentralised and participatory, resulting in decisions being made as close as possible to the real action and thereby taking account of local conditions.
   - *Supervisory and monitoring systems* that encourage critical thinking and creativity among staff, not following the rules and ticking boxes.
   - *Efforts to build networks* among stakeholders, in particular channels for the horizontal flows of information at the field level, which will support and sustain self-directed action.
   - Humility, patience and flexibility are also very useful. It should be possible to call a halt to unproductive efforts, wait until the time is right, change approach and/or redirect attention to places where the window of opportunity is open.

2. Problems and opportunities relating to IPM and field schools[3]

Almost one third of the world's population are members of farming households in Asia. Most of these farming families are small holders. Forty years ago, the Green Revolution was launched with the aim of improving the productivity of small farmers. By improving access the water, improved varieties, and other inputs, the Green Revolution helped to double average rice yields between the 1960's and the 1990's.

During the 1970s it became increasingly apparent that pest resistance and resurgence caused by the indiscriminate use of insecticides posed an immediate threat to the gains of the Green Revolution. At the same time, research was being conducted that demonstrated the viability of biological control of major rice pests. However, gaps still existed between the science generated in research institutions such as IRRI and common farmer practice conditioned by years of aggressive promotion of pesticide use. Over the

[3] This section draws on a number of FAO project documents prepared by Bartlett and others.

ensuing years, a number of approaches were tried to bring integrated pest management (IPM) to small farmers - particularly rice farmers - in Asia, with mixed results. Some experts claimed that the principles of IPM were too complex for small farmers to master, and that centrally-designed messages were still the only way to convince farmers to change their practices.

By the end of the 1980s, a new approach to farmer training emerged in Indonesia based on Farmer Field Schools (FFS). The broad problem which these field schools were designed to address was a lack of knowledge among Asian farmers relating to agricultural ecology, particularly the relationship between insect pests and their natural enemies. A description of the IPM field school is given in the next section.

The implementation of projects using the FFS approach led to a deeper understanding of the problem and its causes. It was recognised that sustainable agricultural development required more than just the acquisition of ecological knowledge by individual farmers. It also required the development of a capability for generating, adapting and extending this knowledge *within* farming communities. The weakness of this capability in most farming communities is itself an important problem; one which has often been exacerbated by earlier agricultural development programmes that fostered a dependency on external sources of expertise.

This underlying problem cannot be addressed by training alone. The experiential training which takes place in an IPM Field School was an immense improvement over the didactic approach used in earlier extension programmes; the FFS is not a channel for sending messages to farmers, instead it is a means for providing farmers with concepts and skills which they can use to discover and create knowledge. But other efforts are also required if this knowledge was to be retained by the community and used in a sustained, creative and democratic manner to address evolving needs.

This deeper understanding of the problem was first recognised by farmers in Indonesia who graduated from FFS but realised there was more they could do to improve rural livelihoods. They started to organise new groups, alliances, networks and associations, and became involved in planning and implementing *their own interventions*. These interventions were highly diverse, ranging from research and training, to marketing and advocacy work. In response to the activities of these groups, IPM projects started to support the idea of ‘Community IPM’, which gave considerable attention to organisational issues rather than focussing solely on technological and educational aspects of IPM.

The FFS was designed to put IPM into a human context, by recognising that farming practices could not be separated from the practitioners and, consequently, by addressing the issue of IPM knowledge rather than IPM technology *per se*. Community IPM took this process a step further and put IPM into its social context, recognising that farmers cannot be separated from the communities in which they live. The assumption was that community ownership of agro-ecological knowledge, as demonstrated by self-directed

action by groups of farmers who promote and protect the use of that knowledge, would help to ensure the continued relevance and application of IPM practices and thereby contribute to sustained agricultural development.

3. Description of the Farmer Field School

The Farmer Field School (FFS) is a group-based learning process. During the FFS, farmers carried out *experiential learning* activities that helped them understand the ecology of their rice fields. These activities involve simple experiments, regular field observations and group analysis. The knowledge gained from these activities enables participants to make their own locally-specific decisions about crop management practices. This approach represents a radical departure from earlier extension programmes, in which farmers were expected to adopt generalized recommendations that had been formulated by specialists from outside the community.

The basic features of a typical rice IPM Farmer Field School are as follows[4]:

- The IPM Field School is field based and lasts for a full cropping season.
- A rice FFS meets once a week with a total number of meetings that might range from at least 10 up to 16 meetings.
- The primary learning material at a Farmers Field School is the rice field.
- The Field School meeting place is close to the learning plots often in a farmer's home and sometimes beneath a convenient tree.
- FFS educational methods are experiential, participatory, and learner centred.
- Each FFS meeting includes at least three activities: the agro-ecosystem analysis, a "special topic", and a group dynamics activity.
- In every FFS participants conduct a study comparing IPM with non-IPM treated plots.
- An FFS often includes several additional field studies depending on local field problems.
- Between 25 and 30 farmers participate in a FFS. Participants learn together in small groups of five to maximise participation.
- All FFS's include a Field Day in which farmers make presentations about IPM and the results of their studies.
- A pre- and post-test is conducted as part of every Field School for diagnostic purposes and for determining follow-up activities.
- The facilitators of FFS's undergo intensive season long residential training to prepare them for organising and conducting Field Schools.
- Preparation meetings precede an FFS to determine needs, recruit participants, and develop a learning contract.
- Final meetings of the FFS often include planning for follow-up activities.

[4] Pontius, J, Dilts, D and Bartlett, A. 2002. 'From farmer field schools to community IPM: Ten Years of IPM training in Asia' (p.16). FAO Regional Office for Asia and Pacific, Bangkok. www.communityipm.org/docs/10%20Years%20of%20IPM/10Years-Main.htm

Although Farmer Field Schools were designed to promote IPM, empowerment was an essential feature right from the beginning. The curriculum of the FFS was built on the assumption that farmers could only implement IPM once they had acquired the ability to carry out their own analysis, make their own decisions and organise their own activities. The empowerment process, rather than the adoption of specific IPM techniques, is what produces many of the developmental benefits of the FFS[5]

4. The experience of the FAO Intercountry Programme[6]

The first IPM field schools were designed and managed in 1989 by experts working for the UN Food and Agriculture Organisation (FAO) in Indonesia. This was not, however, the first attempt made by FAO to extend IPM techniques to farmers in South East Asia.

The FAO 'Intercountry Programme for the Development and Application of Integrated Pest Control in Rice in South and South-East Asia' started in 1980, building on the experience of IRRI and Bureau of Plant Industry in the Philippines. Over the following two decades the Intercountry Programme (ICP) played a leading role in the promotion of rice IPM in Asia, giving rise to numerous other projects and programmes. The following table gives an idea of the scope of the ICP[7].

Period	Phase I 1980-1986	Phase II 1987-1993	Phase III 1993-1997	Phase IV 1998-2002
Emphasis	Applied research in farmers' fields, and piloting extension approaches	Consolidating the approach: the emergence of the FFS in Indonesia	Scaling up the FFS through regional exchanges and training of trainers	'Community IPM', promoting local ownership and building alliances
Participating Countries	Bangladesh, India, Indonesia, Malaysia, Philippines, Sri Lanka, Thailand	+ China, Vietnam	+ Cambodia, Laos	+ Nepal
Programme Donors	Australia Netherlands	Arab Gulf Fund Australia Netherlands	Australia Netherlands Switzerland	Australia Norway
Budget (cumulative)	$ 3 million	$ 8 million ($ 11 million)	$ 14 million ($ 25 million)	$ 20 million ($ 45 million)

The ICP was not the only IPM programme supported by FAO during this period. Essential to the development of the FFS was a National IPM Programme in Indonesia, which ran between 1989 and 2000, funded by the United States ($ 25 million grant), World Bank ($ 37 million loan) and the Government ($ 14 million)[8]. FAO provided technical assistance to the National IPM Programme through a team of experts based in Indonesia, with back-

[5] This issue is explored in detail in Bartlett, A. P. 2004. "Entry Points for Empowerment", a report for CARE Bangladesh, www.careinternational.org.uk/resource_centre/rba.php?sid=12

[6] An archive of information generated by the FAO IPM programme, including research papers, training manuals and case studies is maintained by the author at www.communityIPM.org

[7] The figures in the table are taken from a number of FAO-ICP project documents.

[8] Indonesian Country Report to the Programme Advisory Committee Meeting, FAO-ICP 1999

stopping from the ICP. National projects were also developed and supported by FAO on a smaller scale in Bangladesh, Cambodia, China and Nepal. Additionally, the ICP launched 'spin-off' regional programmes focusing on IPM in cotton and vegetables. In total, during the 15 year period between 1989 and 2004, approximately $100 million in grants were allocated to IPM projects in Asia that used the FFS approach under the guidance of FAO.

Looking at these figures, it is tempting to assume that scaling up the IPM field school to a level involving two million farmers was simply a matter of time and money. But that was far from the case. The experience of the ICP showed that the speed of FFS expansion varied greatly from place to place. In one participating country (Malaysia) the intervention never got started, while in another case (Nepal) it expanded rapidly despite the initial reluctance of FAO to provide any support.

The duration and scope of the FAO Intercountry Programme provides a rare opportunity to study the factors affecting the scaling up of agricultural interventions. Unfortunately, there has not been any systematic attempt to study this issue. General observations have been made in a number of papers[9,10,11] but there has not been a thorough assessment of why the FFS succeeded in some places and not in others.

Some of the observations made by this author, which illustrate the importance of the organisational issues mentioned in Section 1, are as follows:

a) The FFS came into existence in Indonesia after a gestation period of 10 years. IPM training using an experiential approach was taking place as early as 1978 in parts of the Philippines. By the mid 80s, more than 50,000 Filipino farmers had been trained by attending weekly hands-on sessions. Meanwhile, in Thailand, the use of 'strategic extension campaigns' was being tested. At the time, both approaches were considered to be successful, but they lacked the visibility and management systems that would permit scaling up across Asia.

b) Visibility for IPM training rose rapidly after 1986 when the President of Indonesia decided to ban 57 pesticides and launch the National IPM Programme. This decision forced FAO to consolidate what it had learnt in the Philippines and Thailand, and to create management systems that would work at a large scale. Equally important, the high-level commitment of the Indonesian Government convinced donors to provide the necessary funding, and forced the Ministry of Agriculture to provide the necessary manpower.

[9] Dilts, D.R.; Hate, S., 1995. 'IPM Farmer Field Schools: Changing Paradigms and Scaling-up to Make a Difference', published in ITDG, 1997, 'Farmer-Led Extension'

[10] Roling, Niels. G. and Elske van de Fliert, 1998, "Introducing integrated pest management in rice in Indonesia: a pioneering attempt to facilitate large-scale change", in Facilitating Sustainable Agriculture, N.G.Roling, and M.A.E. Wagemakers editors, Cambridge University Press, 1998.

[11] Dilts, R. 2001, 'From farmers field schools to community IPM: scaling up the IPM movement', LEISA magazine. 17/3, (p18-21)

c) When Vietnam joined the ICP in 1987, it lacked the experience of the Philippines and the leadership that existed in Indonesia. There were other reasons, however, why rapid expansion of the FFS took place throughout the 90's. Firstly, Vietnam was in the process of de-collectivising agriculture, allowing farmers to make their own decisions about crop production practices. Secondly, there was a vacuum in terms of agricultural advice; the country did not have an extension service and it would be some years before donors stepped in to build one. Thirdly, the collapse of the Soviet Union, which had been a major source of agro-chemicals, meant that farmers were forced to find ways of managing their crops without pesticides. This policy environment meant that FFS were in great demand: farmers wanted to learn about IPM, and the training process created a new role for government staff.

d) Unlike in Vietnam, the authorities in Thailand were slow to embrace the FFS. The reasons are complex, but one factor was a reluctance to adopt the 'Indonesian model'. Thailand had been using its own approach in the 1980's and FAO had initially applauded the success of these IPM campaigns. When FAO decided to drop campaigns and promote the FFS, the UN agency failed to convince officials in the Thai Ministry of Agriculture that a change in approach was necessary. However, this disagreement did not affect the Ministry of Education who started to use the FFS approach in the mid 90's as part of vocational training, primary education and in agricultural colleges. Only at the end of the 90's, when His Majesty the King took an interest in IPM, did the Ministry of Agriculture decide to launch a programme using a modified version of the farmer field school.

e) The Indian authorities, like those in Thailand, never adopted the 'original' FFS on a large scale, not because it was a foreign approach, but for other organisational reasons. The federal structure of the Indian Government meant that it was inherently difficult to create capacity for a National IPM Programme. FAO worked closely with the central crop protection agency, which organised a number of 'Training of Trainers' courses, but decisions about field activities were made by Ministry officials at the State level who were – to a large extent - left out of the loop. Those Ministries had spent many years building T&V extension systems, and the FFS did not fit into the system. Added to this situation was the fact that IPM activities in India were, for the most part, funded from the Government budget, not grants or loans from foreign donors. Consequently, State officials decided they could not afford the cost of season-long training for farmers who – after all – could simply be told what to do.

5. A specific case: IPM field schools in Nepal

Perhaps the most spectacular example of scaling up IPM field schools, certainly the most unexpected case, occurred in Nepal between 1997 and 2001[12].

[12] Bartlett, A. 2002, 'Farmers in Action: How IPM training is transforming the role of farmers in Nepal's agricultural development'. FAO Programme for Community IPM in Asia.

At the start of this period, Nepal was not a member of the ICP, funds were not available for activities in the country, and the ICP's donors had advised FAO not to expand into new countries. With one exception, the senior experts working for ICP were in agreement with the donors, partly because they were busy in other countries and partly because they were unconvinced about the likelihood of success in Nepal in light of the experience elsewhere in South Asia.

The exception among the ICP staff was Peter Ooi, the Senior IPM Scientific Officer. Dr. Ooi had met the new Director of Plant Protection in the Nepalese Department of Agriculture, Mr Bharat Uphadhay, and was convinced that here was a person who had the vision, the technical expertise, and the political connections needed to lead an IPM programme. It was also relevant that Mr Uphadhay had a Deputy (Mrs Nalini Uphadhay, no relation) who had the management skills and creativity required to organise training courses under difficult circumstances.

Between them, Ooi and Uphadhay lobbied for funds and started field studies. Within months, the ICP was forced to respond to the interest that these initial activities had generated in Nepal. What happened over the next four years is summarised in the following table.

Year	**Key Activities**	**No. of FFS participants**
1997	• Field studies to collect information about rice production practices and problems	0
1998	• First 'Training of Trainers' course for 35 staff of Dept of Agric, with facilitators on loan from Philippines • Graduates of the TOT conduct the first 30 FFS • Nepal joins FAO Intercountry Programme • Strategy development workshop	875
1999	• Policy maker visit Indonesia and subsequently decide to launch National IPM Programme • Second TOT is conducted, facilitators from Philippines and Indonesia, assisted by Nepalese. • Total of 63 FFs conducted in two cropping seasons	1,700
2000	• Participatory planning workshops are carried out with 12 farmer groups who previously attended FFS • A series of five TOTs are carried out for 156 farmers • FFS are now being conducted by both Government staff *and* farmers.	3,635
2001	• Third rice TOT, this time managed by an NGO using Nepalese facilitators. • Fourth TOT, focussing for the first time on vegetable IPM in response to farmers demands. • More than 50% of FFS are now being conducted by farmer trainers • By the end of the year, IPM farmers had formed their own organisations in 26 Districts. • Government decides to increase allocation for IPM Programme as part of the next 5-Year Plan.	8,600

The story of the Nepalese IPM programme did not stop in 2001. The following year saw the launch of The IPM Trainers Association of Nepal (TITAN) with government officials, NGO staff and farmers as members. By 2003, TITAN was being contracted by CARE International to provide consultants for a large rural development programe in Bangladesh.

Why did the IPM programme grow so fast in Nepal? Strong leadership and creative management explain much of the success. Another important factor was that, as a result of reorganisation within the Department of Agriculture, the Plant Protection Section had recruited a new batch of staff. Young and recently qualified, they were eager to learn; the first assignment for many of these plant protection officers was to attend a Training of Trainers course, after which they had to prove themselves by conducting FFS. The Nepalese Programme also benefited from an interesting combination of local ownership *and* the demonstration effect from other countries. A foreign model was not being forced onto the Nepalese, rather they were demanding the assistance that would allow them to catch up with developments in other parts of the region.

Other factors played a role in Nepal. The concept of 'Community IPM', with an emphasis on decentralisation and networking, was highly relevant to the geographical and social conditions in the country. Farmers needed very little encouragement from the national level to start training each other, forming their own associations and seeking funding for IPM activities from local government. Consequently, IPM Farmer Field Schools were one of the few nominally-Government activities being carried out in areas controlled by Maoist rebels.

Finally, it must be mentioned that, despite initial reluctance, the FAO Intercountry Programme was willing and able to respond to the rapidly evolving situation in Nepal. Staff were re-assigned, budgets were juggled, facilitators were mobilised. But there was never any attempt to take over the National IPM Programme. The programme clearly belonged to the Government – and the farmers – of Nepal.

6. Costs, benefits and utility

There are two major reasons why it is difficult to make generalisations about the costs and benefits of IPM field schools.

Firstly, there is a lack of agreement about what factors should be taken into account on both sides of the cost-benefit equation. Regarding benefits, should we limit ourselves to measuring yields and pesticide savings, or should we also take account of improvements in public health and the consequences of farmers becoming better organised? Regarding costs, should we limit ourselves to the expenses involved in running field schools, or should we also take account of the wider costs of training extension staff and managing IPM programmes.

Secondly, there is a high degree of variation in the value of individual factors. The cost of conducting a season-long field school for 25 farmers has ranged from $150 to $1,000 depending on the country and the organisation. In some cases, the graduates of FFS have saved $40 per hectare per season by eliminating pesticides without any loss of yield. In other cases, graduates did not experience any savings because they were not previously using any pesticides, but yields increased by as much as 25% as a result of adopting other practices learnt during the FFS, such as improved varieties, better water management and enhanced plant nutrition.

The conceptual and methodological problems associated with assessing the impact of IPM field schools have resulted in disagreements among experts about the advantages of this intervention[13]. One widely circulated paper written by World Bank economists has questioned the benefit of 'sending farmers back to school'[14]. By contrast, a meta-analysis of 25 impact studies commissioned by FAO concluded:

"The majority of studies ... reported substantial and consistent reductions in pesticide use attributable to the effect of training. In a number of cases, there was also a convincing increase in yield due to training....

A number of studies described broader, developmental impacts of training.... Results demonstrated remarkable, widespread and lasting developmental impacts. It was found that the FFS stimulated continued learning, and that it strengthened social and political skills, which apparently prompted a range of local activities, relationships and policies related to improved agro-ecosystem management.".[15]

Due to differences in motivation, scope of analysis and methodology, it is unlikely that experts from the World Bank and FAO will reach agreement on the advantages and disadvantages of the IPM field school in the near future. The current author does not intend to re-examine the data or the interpretations presented by the two sides. Instead, some additional figures and observations relating to FFS in Nepal have been Annexed to this case study, to complement the information provided in section 5 above.

The author would also like to suggest that farmers, governments and donors do not make decisions based solely on general calculations about costs and benefits. Instead, judgements are made about the *utility* of attending, organising and funding IPM field schools. These judgements are time-bound and location-specific. The variable determinants of utility include things like felt

[13] A good introduction to the academic debate is Waibel, H., Fleischer, G., Kenmore P.E., and Feder, G. (eds.). 1998. 'Evaluation of IPM Programs', University of Hannover, www.ifgb.uni-hannover.de/ppp/

[14] Feder, G, Murgai, R and Quizon, J.B. 2004. 'Sending Farmers Back to School: The impact of Farmer Field Schools in Indonesia'. *Review of Agricultural Economics*, 26(1), 45-62

[15] van den Berg, H. 2004. 'IPM Farmer Field Schools: A synthesis of 25 impact evaluations', Wageningen University and FAO Global IPM Facility

needs and priorities, past experience with similar interventions, awareness of alternatives, trends among peers etc[16].

The utility of an agricultural intervention varies from person to person, and some people play a far greater role than others in influencing the spread of the intervention. In trying to understand why and how the scaling-up of IPM field schools took place we need to consider its utility to the general population of farmers *and* its utility to key players in the organisational system.

All of us recognise that the opinions of a few people can be critical to the progress of our work: a village elder, a Director of a Department, a Task Manager from the donor agency, a charismatic expert. These people have the ability to make things happen, or to block them. We also know that the opinions of these people are based on value judgement and personal interests as often as they are based on economic calculations. The utility of a particular intervention to these people may have little to do with gross-margins and internal rates of return.

If we want key decision makers to promote a particular intervention we need to be armed with technical and financial information *plus* and understanding of what makes these people tick. We need to understand their fears and motivations, their affiliations and obligations, their past experience and aspirations.

This is not the time or place to examine the psychological profile of the key players in the story of IPM field schools, but anybody who was closely involved with the FAO Intercountry Programme could draw up a list of between 10 and 20 people without whom the intervention would not have reached the other two million. The same can said about other interventions in rural development that have been scaled up across Asia: IR36, the T&V system, micro-credit, PRA etc. Each of these interventions have names attached to them, the names of people who made it happen.

Nevertheless, it would have been impossible to scale up any of these interventions if they did not have widespread utility to the farmers or development workers who were on the receiving end. From this perspective the utility of the IPM field school is self-evident. Participation in FFS has always been voluntary, and none of the IPM projects and programmes supported by FAO provided financial incentives to participants. On the contrary, participation in FFS has always involved a considerable cost in terms of time and effort. Despite these costs, two million farmers decided to participate. In most countries, the demand for places on a field school has

[16] The concept of utility is not new to the study of agricultural interventions, having played a role in some of the adoption studies that were synthesised by Everett Rogers in 'Diffusion of Innovations" (1962, Free Press). Although diffusion theory subsequently lost its position as the dominant paradigm, the field of agricultural extension has not managed to find any alternative ideas to explain what works and what doesn't with the same kind of academic rigour applied by Rogers. Perhaps recent developments in the study of networks offers some possibilities. The notion of utility has some echoes in the concept of 'fitness' described by Albert-Laszlo Barabasi while key decision makers can be seen as 'hubs' in the organisational network.

been ahead of supply, and drop-out rates have been very low. Furthermore, there are many examples of farmers who decided to train other members of their community and continue working as a group after the training came to an end. Whether or not they calculated the precise financial benefits, it is clear that these farmers thought that the IPM learning process was worthwhile.

7. Conclusions

The field school has helped hundreds of thousands of rice farmers across Asia to learn agro-ecological concepts, apply IPM practices, reduce the use of pesticides and improve crop yields. The FFS has produced other developmental benefits that are broadly described as 'empowerment': IPM alumni in a number of countries are involved in a wide-range of self-directed activities including research, training, marketing and advocacy.

It is clear that the IPM field school fits the needs and resources of a large number of rice farmers. Equally important, however, is the fact that the FFS fitted the needs and resources of the organisations that are responsible for managing agricultural interventions: government departments, NGOs, and donor agencies.

The IPM field school is a success story that has been mentioned in hundreds of scientific papers, text books, TV documentaries and newspaper articles. The agro-ecological content and the experiential methodology of the FFS have influenced extension programmes in dozens of countries. Despite this success, the enthusiasm for funding large IPM-FFS projects is now waning in Asia. Two of the three regional programmes managed by FAO have come to an end, and Government support for national programmes has – in effect - been wrapped up in a number of countries.

This case study has focussed on organisational factors affecting the 'scaling up' of agricultural interventions. The author would like to suggest that the same factors can help to explain 'scaling down'. There are still millions of farmers who could benefit from attending IPM field schools, but many of them will not get the chance because of changes in policies, priorities and personalities. In Asia, the FFS benefited from - and is now a victim of - being part of development fashion. In some places there is no longer a need for large-scale IPM training programmes because the concepts and practices behind the FFS have been mainstreamed into research, extension and farmer practice. In other places, however, training programmes may still be needed but organisational resources are no longer available because decision makers are turning their attention towards other interventions. The wheel turns, and the dialectic of development moves on.

Annex: Costs and Benefits of IPM field schools in Nepal[17]

How do we know if IPM training is beneficial? This is a question that has created a lot of debate in academic circles. In the field, however, the answer is usually quite simple: we can ask farmers if they thought IPM training was useful. In Nepal the answer is a unanimous and enthusiastic 'yes'. And if we ask Nepali farmers *how* they benefited, most of them can quickly provide figures about changes in their inputs and yields.

Here is an example from Parsa district. The table shows the inputs used by a farmer on a landholding of 0.5 ha, before and after taking part in a season-long IPM Field School.

NB. data for 0.5 ha	Farmer's Practice	IPM
inputs	***Costs (NRs)***	***Costs (NRs)***
seeds	800	1200
fertiliser and manure	900	3000
pesticide	1600	0
Pesticide application (labour)	200	0
weeding	500	900
total costs	4000	5100
yield (kg)	2,250	2,900
income @ 6.5 Rs/kg	14,625	18,850
Margin	10,625	13,750
Benefit of training = NRs 3,125 (~ US$ 40)		

This example is consistent with the information provided by the rice farmers interviewed during the preparation of the [Nepalese IPM] case studies: they used better seeds and more organic manure; they completely eliminated the use of pesticides; and they got a yield increase of 30%.

Not all farmers get this same level of benefits. In some locations, farmers only get a yield increase of 20% and they reduce their pesticide use by 40%. In this case the benefit is approximately NRs 2,500 (US$ 33) per season on a 0.5 ha rice farm.

Project planners and managers also want to know if this type of training is worthwhile. After all, it takes a lot of effort to run a Farmer Field School. Economists have various ways of making this calculation. In the field, IPM trainers compare the costs and the benefits of running the training. The cost of a season-long Field School (16-18 weekly sessions) managed by a farmer trainer in Nepal, with back-stopping from a Government officer, is US$ 250. There are usually 25 participants, so the cost per participant is US$10. In the case of an FFS which is run entirely by Government officers, the cost per participant is US$ 18. Consequently, the benefits to participants in a single cropping season are considerably greater than the cost of conducting the

[17] This section taken from Bartlett. 2002, 'Farmers in Action' *op cit*

training. For FFS run by the farmer trainers who were interviewed in the case studies, the benefits in a single season are four times the cost of organising the training.

Additional costs can be built into the calculation, in particular the cost of organising Training of Trainers courses. On the other hand, we can assume that farmers continue to implement what they have learned for many seasons after completing a Farmer Field School, thereby multiplying the benefits.

Changes in inputs and yields are relatively easy to calculate, but anybody who has been closely involved with IPM training will know that there are a wide range of other benefits which are difficult to quantify. Firstly there are the health benefits which come from reducing or eliminating the use of pesticides; these benefits are important for all members of farming families and, in the case of vegetables which are frequently sprayed, IPM is also beneficial to the health of consumers. Secondly, there are benefits to the environment; protecting biodiversity often has a practical value, for example in areas where honey bees are important, or where there are opportunities for rice-fish production. Then there are improvements in food security which arise when farmers start doing their own experiments, diversify their cropping patterns, and becoming less reliant on external inputs; these farmers are less vulnerable to changes in the environment and market conditions.

Finally, there are a number of important social outcomes from IPM training. Farmers gain self-confidence, they start to work together to solve community problems, and they develop a different relationship with local government. The term ‘empowerment’ is often used to describe these changes. Empowerment is hard to define, but it can be illustrated through examples, such as those given in the case studies.