Paper submitted to the International Workshop on Farmer Field Schools, Indonesia, 21-25 October 2002

HARNESSING INDIGENOUS KNOWLEDGE AND INNOVATION IN FARMER FIELD SCHOOLS

Deborah Duveskog[1], Charles Mburu[2], Will Critchley[3]

ABSTRACT

Due to the highly diverse farming systems of Africa and the need for context specific solutions, Farmers Field School (FFS) initiatives in East Africa have sometimes faced problems in finding appropriate technologies for testing and dissemination. It has also proved a challenge to integrate indigenous knowledge at all stages of the FFS approach and ensure a dynamic blend of technologies developed by research agents and practices evolved by local farmers. At the same time Africa has an enormous resource of untapped traditional knowledge and promising innovations and initiatives that could bring substantial benefits for other smallholder farmers on a wider application.

The integrated approach for "Promoting farmer innovation in Farmer Field Schools (PFI-FFS)" was evolved by blending and modifying the initial methodology "Promoting Farmer Innovation" developed by an earlier project and the classical FFS methodology widely adopted as an extension approach in East African. PFI-FFS started in 2001 under the management of FAO. The objective of the project is to increase the uptake of improved technology options related to land husbandry by facilitating increased interactions between innovators and FFS groups and thereby stimulate a process of innovation and discovery among farmers. Innovators are identified by FFS extension staff and interaction between innovators and FFS take place by including the innovators as group member, as guest speakers or as resource persons in the FFS, or by bringing FFS groups on study visits to see innovations.

Preliminary findings from the PFI-FFS initiative in Kenya show that there is a real possibility for having a constructive fusion of external and indigenous sources of knowledge in the FFS. Farmers show a higher level of adoption when new technology options are introduced by other farmers. Further, ensuring a focus on locally developed or adapted technologies increases the possibility for farmer-led FFS and sustainable farmer-to-farmer extension. The PFI-FFS methodology has made a positive contribution to furthering the development and sustainability of the FFS approach and has especially improved the adaptation of the approach to the East African, farming conditions which are highly diverse and thereby require solution appropriate to the local context.

[1] Soil and water conservation specialist, FAO Kenya, Box 30470 Nairobi, dduveskog@faonairobi.or.ke
[2] National PFI coordinator, Ministry of Agriculture and Rural Development Kenya, Box 30470 Nairobi
[3] Head Resource Development Unit, CDCS-International Cooperation Centre, Vrije Universiteit Amsterdam, WRS.Critchley@dienst.vu.nl

INTRODUCTION

Teaching specific technologies is easy. However, specific technologies may have a limit to their scope and applicability. As new technologies emerge, they may become techniques of the past, and because of their specific nature they may not have been suitable for the conditions in which they were applied, in the first place. Given the limitation of teaching specific technologies, it is more appropriate, yet more difficult, to stimulate and facilitate an atmosphere of experimentation and innovation where farmers develop their own solutions and answers to problems. By supporting innovation and local technology development farmers will develop skills in adjusting and adapting to a changing environment or socio-economic situation by their own initiative, and thereby be less dependent on service providers and external assistance.

The spinal cord of the Farmers Field School (FFS) approach[1] is farmers' own knowledge and experience expressed though group experimentation and discussion. However, it has often proved a challenge to efficiently integrate indigenous knowledge in all stages of the FFS approach and ensure a dynamic blend of technologies developed by research agents and technologies evolved by local farmers. The success of integrating indigenous knowledge in the FFS depends, to a large extent, on the mindset of the facilitator. When this facilitator is an extension worker who was trained during the era of 'the green revolution' where extension activities were based on the 'transfer of technology' paradigm, ignoring farmer innovations and initiatives, there sometimes tend to be a bias in agricultural extension activities and FFS towards technologies based on "western science" (Chambers, 1990) (Simpson and Owens, 2002).

The need for increased recognition of traditional knowledge in the FFS forms the foundation for integrating the Promoting Farmer Innovation (PFI) approach[2], developed by an earlier UNSO project and the FFS approach, widely adopted in East African extension initiatives. By modifying the classic FFS approach and facilitate increased interactions between innovators in the community and FFS groups, the FFS approach can be more successful in stimulating a process of innovation and discovery among farmers. Further, successful technologies developed locally can be important additions to the "basket of technologies" that FFS groups can test and evaluate before choosing the most appropriate option for their own farming situation. An appropriate technology meets a

[1] The Farmer Field School approach is a participatory methodology of technology development and dissemination, which gives the farmer an opportunity to learn though practical field activities. The farmer field school usually involves about 30 farmers who are facilitated by an extension worker or farmer trainer, to find solutions to their own problems through season-long training and on-farm experimentation. The FFS approach was initially applied among rice farmers in South East Asia in late 1980s and during the 1990s an estimated 2 million farmers were trained through FFS in the region. The approach was first introduced in Africa in 1995 and is now widely applied in a dozen of African countries (Pontius et al., 2000).

[2] Promoting Farmer Innovation (PFI) was a three-year project operational during 1997-2000, funded by the Government of the Netherlands, coordinated by UNSO, implemented by national governments in Kenya, Uganda and Tanzania and backstopped by CDCS, Vrije Universiteit Amsterdam. The PFI project aimed at identifying farmer innovators and innovations and then disseminate these through farmer to farmer extension and farmer exchange visits. The programme followed a 10-step guideline of field activities widely referred to as the PFI methodology (Critchley et al., 1999).

felt need, is simple to teach and understand, and uses resources poor people already have (Bunch, 1982). If an innovator can show that the innovation is beneficial, it proves, that the technology is appropriate, and could bring substantial benefits also to other members of the community. The assumption that innovations quickly spread on their own in a community is not always true, especially in cases where the innovator comes from the poorer level of the community or for other reasons have low status in the village (Bunch, 1982). This means that by facilitating dissemination of local innovations in the FFS, the FFS can play a crucial role in speeding up the diffusion of useful innovations at community level.

The PFI-FFS project in Kenya is a learning project that aims to increase interactions between innovators and FFS, and thereby stimulate a process of innovation at community level. To date, the initiative has been operating for one year which means that the final result of this combined approach has not yet been seen. Nevertheless, the project has made rapid progress and this paper aims to bring out the preliminary findings and lessons learned from the PFI-FFS approach.

THE PFI-FFS PROJECT

'Promoting farmer innovation in Farmer Field Schools' (PFI-FFS)[1], is a 2-year UNDP funded initiative, which supports the development of appropriate and local specific technologies, by promoting indigenous knowledge and local innovation in FFS. The project started in 2001 under the management of FAO and the Government of Kenya. The objective of the project is to increase the uptake of improved technology options for sustainable land husbandry in order to fight poverty and improve rural food security. This is achieved through integration of the "Promoting Farmer Innovation" (PFI) methodology, and the FFS approach. There is considerable potential for complementarities between the two approaches, as PFI identifies farmer innovations and initiatives and promotes the role of indigenous knowledge, while FFS activities focus on the spread of new technology options through field based, farmer-driven learning and experimentation. One of the main goals of the project is to test and evaluate the possible synergies between the two approaches and develop an integrated PFI-FFS approach. Currently the project, which has a focus in semi-arid regions, operates in seven districts in Kenya (see Figure 1). Basic information on population, poverty level and climate in these districts can be seen in Table 1.

[1] PFI-FFS is the common title of the UNDP-funded project in Kenya "Farmer Innovation and new technology options for food production, income generation and combating desertification", KEN/99/200.

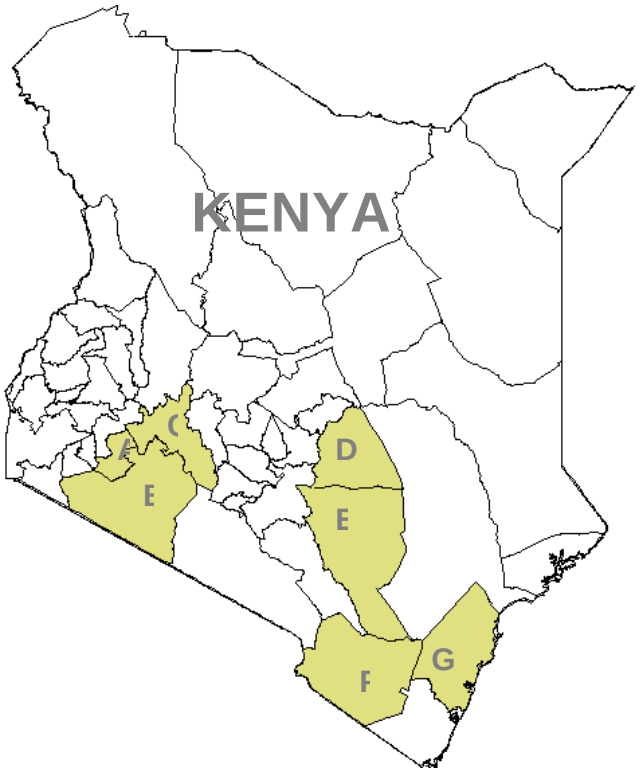

Figure 1: Map of Kenya indicating the location of the seven project districts: Bomet (A), Narok (B), Nakuru (C), Mwingi (D), Kitui (E), Taita-Taveta (F), and Kilifi (G).

District	Pop. density [pers. per sq km][A]	% of rural population living in absolute poverty[B]	Illiteracy level [% of poor population][B]	Subsistence farmer [% of poor pop.][C]	Av. annual rainfall [mm/year][D]
Nakuru	164	29.0	30.5	61.6	600-1400
Narok	24	34.3	43.2	67.8	500-1600
Bomet	203	42.4	27.6	75.4	700-1800
Kitui	25	46.4	37.9	76.7	300-1000
Mwing	30	no data	no data	no data	400-1000
Kilifi	114	49.0	55.4	81.5	500-1100
Taita-Taveta	14	47.9	24.9	74.9	300-1000

[A] (Central Bureau of Statistics & Ministry of Finance and Planning, 1999)
[B] (Ministry of Finance and Planning, 2000)
[C] (Ministry of Planning and National Development, 1998)
[D] (Jaetzold, 1983)

Table 1: Basic information on population, poverty level and climate in the seven project districts.

During 2001-2003, 630 FFS are implemented within the project. Extension workers facilitate 40 % of the groups, while 60 % are under farmer leadership. The learning focus of these groups is wide; ranging from crop production to animal husbandry and agricultural marketing (see Figure 2). The gender distribution among the members of the FFS groups is 65 % women and 35 % men.

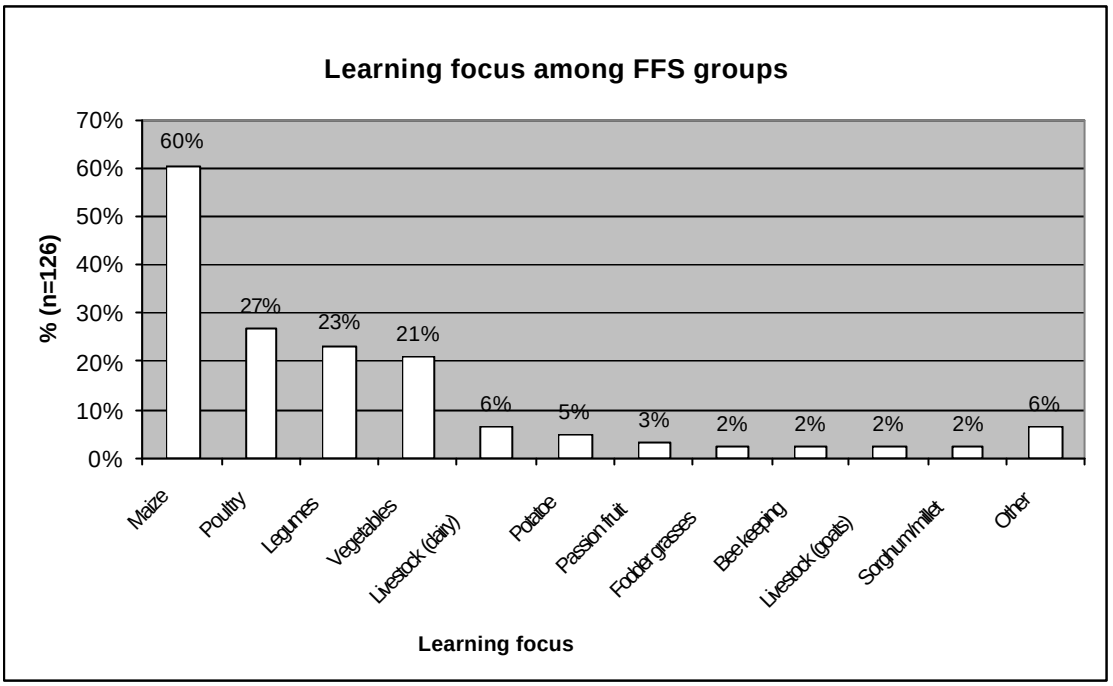

Figure 2: Learning focus of FFS groups in the PFI-FFS project.

THE PFI-FFS METHODOLOGY

The integrated approach for "Promoting farmer innovation in Farmer Field Schools" was evolved by blending and modifying the initial PFI methodology and the classical FFS approach. The steps for implementation of these two approaches can be seen in Table 2.

10.FI as outside trainers	
9. Farmer visit FI	9. Farmer-run FFS
8. FI develop new technologies and experiments	8. Graduation
7. Study tours for FI	7. Field days
6. FI-FI networking visits	6. Follow up by TOT graduates
5. Set-up M & E systems	5. Establishment of FFS
4. Formation of clustered networks of FI	4. Training of trainers (TOT)
3. Characterisation & analysis of FI and innovations	3. Identification of the FFS site
2. Recruitment of FI and verification of innovations &	2. Identification of FFS participants
1. Identification of FI and innovations	1. Groundworking
The steps of the PFI-process (Critchley et al., 1999)	**The classical FFS approach** (FAO-IPM Secretariat, 1993)

Table 2: The steps of the PFI process and the classical FFS approach. FI =farmer innovators

The idea behind combining the two approaches was to strengthen the positive aspects of both approaches. The PFI approach was highly successful in capturing local knowledge, but was sometimes weak in spreading the identified innovations effectively to the rest of the farming community. The FFS approach, on the other hand, has proved highly effective in disseminating technologies while it sometimes is weak in sufficiently integrating indigenous knowledge in technology development and dissemination.

The combined PFI-FFS methodology, as seen in Figure 3, was developed by integrating the two approaches. The methodology includes most of the steps and activities of the normal FFS process, but with added elements of PFI. Some of the extension related steps of PFI have been omitted or basically taken over by FFS. Hence, the PFI process can be seen to have been integrated into the FFS approach rather than vice versa. The approach has also been expanded to capture a wider range of innovations and initiatives within land and animal husbandry. The initial PFI project was focusing on mainly soil, water, and land management.

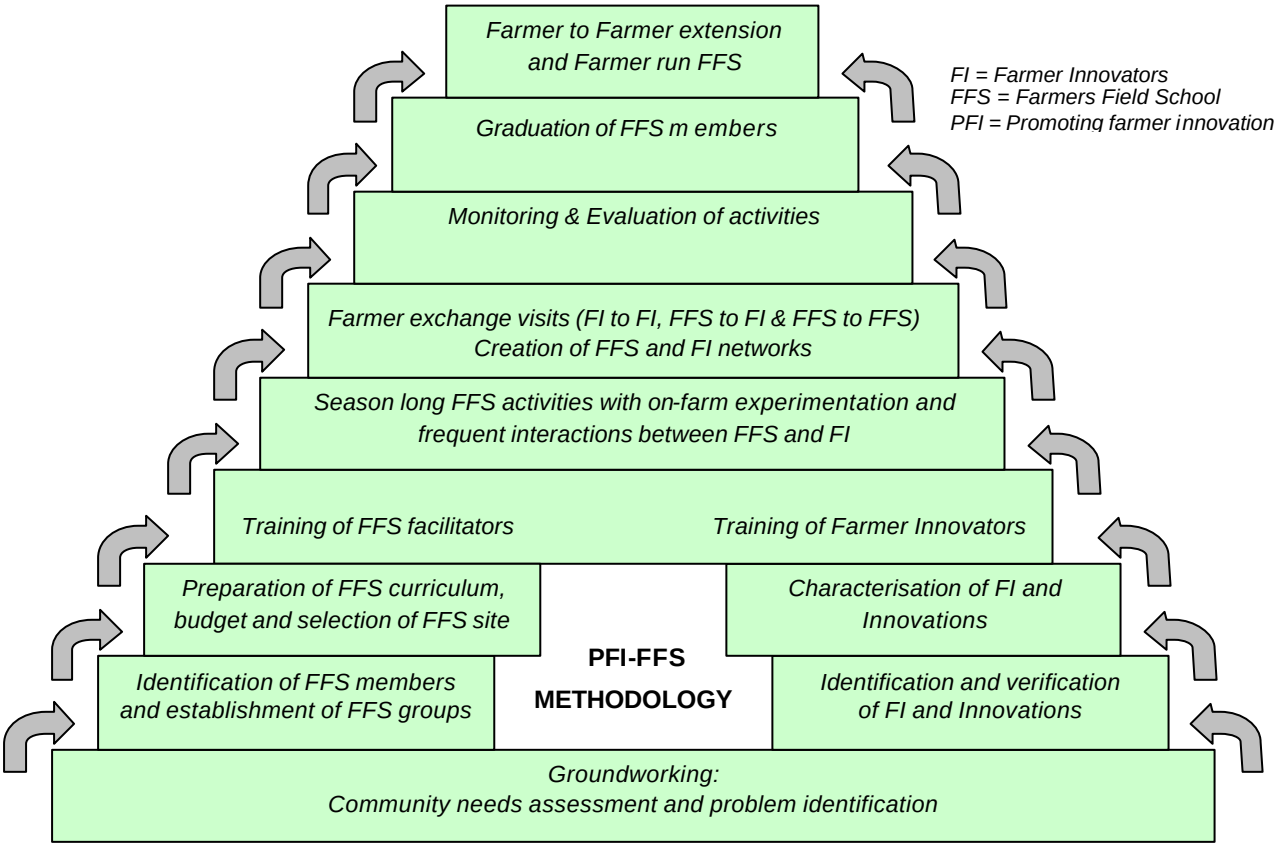

Figure 3: The "Promoting farmer innovation in Farmer Field Schools" methodology

The Key-activities in the PFI-FFS methodology are:

- Groundworking – The objective of groundworking is to determine the actual needs of the community/farmer groups, which will eventually form the basis for developing the FFS curriculum and the field trials of the FFS. This is done by reviewing secondary data and carrying out participatory assessments such as PRA.
- Identification of FFS members and establishment of FFS groups – FFS groups are identified by holding community meetings, during which common interest groups are identified. The groups may be either new or existing groups, as long as the groups have a common interest, and have been explained the purpose of coming together as a learning group.
- Identification and verification of farmer innovators and innovations - The identification of innovators is done by screening for potential innovators by collecting information from various stakeholder such as farmers, extension staff and NGOs. Verification is then done by following up on this information during visits to the potential innovators for confirmation on whether the innovation is genuine and important in terms of its potential for bringing benefits to other smallholder farmers. When an innovation is discovered, it is vital to trace the innovation back to its roots, and find the original innovator. It is also necessary to determine if the innovator would be willing to engage in the training of other farmers through FFS.
- Preparation of FFS curricula, budget and selection of FFS site - When the FFS group has been identified, the preparing of a FFS curricula, a budget for the proposed activities and the selection of a host farmer takes place.
- Characterisation of farmer innovators and innovations – Characterisation means recording and documenting some basic information about the innovator and the innovation. This information can then be used to analyse "who" the innovator is and in which ways the innovation can be beneficial for other farmers.
- Training of FFS facilitators – The TOT (training of trainers) is a short training course for the FFS facilitators held to introduce them to the FFS approach and some key technical aspects. During the TOT, the information gathered during the groundworking is used by the participants to formulate intervention trial to address the problems raised by the farmers.
- Training of farmer innovators – A short, 1-2 day training is held for the farmer innovators in order to enhance their presentation skills, so that they can be more effective when training other farmers. It is also important for the innovators to meet and interact with each other in order to stimulate and inspire each others experimentation.
- Season long FFS activities with on-farm experimentation and frequent interactions between FFS and FI – Throughout the regular FFS activities, which includes learning sessions, on-farm trials, experimentation and discussions, farmer innovators can interact with FFS groups in a variety of ways, e.g. as members of the groups, as guest trainers, through FFS study visits to the innovators farm etc.
- Farmer exchange visits – Farmer exchange visits is a highly effective mean of facilitating sharing of ideas and improved practices among farmers or 'releasing creativity' among community members. These visits can be done between

innovators, between different FFS groups or between FFS and innovators. Exchange visits are also where the foundation for farmer networks are created when individuals or groups interact with each other.

- Monitoring and evaluation – M & E is a continued process where all relevant data and information about activities undertaken are gathered and analyzed. The M & E is carried out jointly between farmers and extension workers and based on parameters that the farmers or community members feel are important to measure.
- Graduation of FFS members – Graduation is a ceremony or event of celebration where the FFS groups are recognized for their achievements and the individual members receive a certificate of learning. Farmer innovators who have been active may also be individually recognized for their achievements.
- Farmer to farmer extension and farmer run FFS – Through the PFI-FFS process farmers have been equipped with skills, knowledge and ideas that now can be carried over from farmer to farmer which speeds up the process of innovation and development in a community. FFS graduates also continue carrying over the knowledge gained in the FFS by facilitating new FFS groups.

WHO ARE THE INNOVATORS AND WHAT ARE THEIR INNOVATIONS?

In order to understand the possibilities, potentials and constraints to interactions between innovators and Farmer Field Schools, it is important to establish what kind of persons the innovators are and what types of innovations they practice. The definition adopted by the PFI-FFS project for defining innovators is the following; *"Farmer innovators are farmers or "land users" who innovate, test and try new methods of conservation or production, on their own initiative, often using ideas from various sources."* Innovators tend to be curious, creative, proud of their innovations, willing to take risks and are skilful in blending their own ideas with ideas picked up elsewhere (CDCS, 1997) (Critchley et al, 1999).

At the start of the process of identifying innovators a set of guidelines was set up for the initial screening of potential innovators and these criteria serve as a rough description of "who" the innovators are that the program tries to capture. According to the project guidelines innovators should demonstrate the following qualities;

- Practice effective (or potentially effective) innovations in the area of land or animal husbandry.
- Use own initiative, but may also bring in ideas from various other sources.
- Demonstrate a willingness to experiment, develop, monitor and disseminate.
- Should be more or less a full-time farmer or "land-user"
- Should not be outsiders in the community, i.e. very rich, hobby farmers, "model farmers" or farmers that have received continuous project support.

Through the PFI-FFS project a total of 195 innovators have been identified (as per September 2002). Basic information about these innovators can be seen in Table 3.

Region	District	No. of Innovators (female)	Average age
Rift Valley	Nakuru	42 (6)	57
	Narok	24 (3)	42
	Bomet	31 (6)	52
Coast	Kilifi	26 (9)	47
	Taita-Taveta	32 (13)	40
Eastern	Kitui	23 (6)	42
	Mwingi	17 (7)	no data
	Total:	**195 (50)**	**47**

Table 3: Number and age of innovators identified in the seven project districts.

The general definition of an "innovation" adopted by the project is: *"Better or modified traditional or introduced systems or initiatives – or something new, tried and tested or currently under experimentation."* By September 2002, 239 innovations had been identified and verified in the PFI-FFS project. Some innovators have developed several innovations, which is the reason why the number of innovations supersedes the number of innovators. There is a very wide diversity in the types of innovations identified, ranging from crop production to animal health and agro processing. In Table 4 and Figure 4 the number and types of innovations identified can be seen.

Categories of innovations	Rift Valley	Coast	Eastern	Total
Water harvesting	20	8	16	**44**
Livestock health / ethnoveterinary	13	8		**21**
Irrigation	13	4	3	**20**
Soil & Water conservation	10		9	**19**
Biological pest control	3	15	1	**19**
Soil fertility management	13	3	2	**18**
Livestock management/feed/breeding	9	4	3	**16**
Agroforestry	9	3		**12**
Farm tools/machinery	8	1	2	**11**
Poultry management	5	5		**10**
Bee keeping	6	2	1	**9**
Crop management	1	4	1	**6**
Water storage	6			**6**
Tree crop farming	3	2		**5**
Seed/crop storage and preservation		4		**4**
Production of niche products for export		4		**4**
Crop breeding and seed production	3			**3**
Agro-processing		3		**3**
Other	3	5	1	**9**
Total	**125**	**75**	**39**	**239**

Table 4: Number and categories of innovations identified and verified in the three project regions.

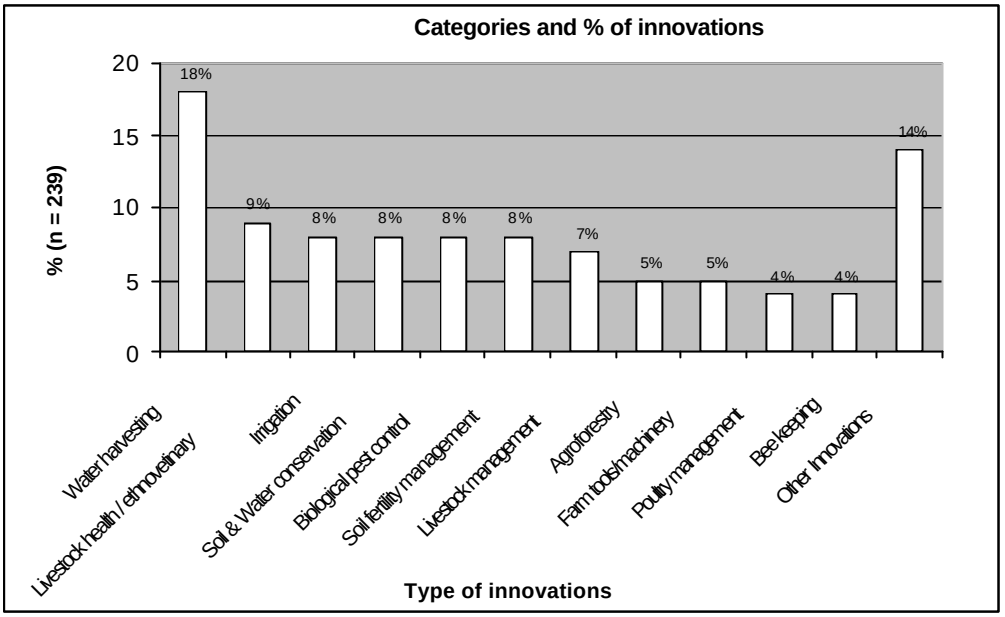

Figure 4: Percentage of major categories of innovations identified and verified in the PFI-FFS project.

A big proportion of the innovations (37%) relate in some way to efficient use of water resources. The obvious explanation for this is that most of the projects' activities takes place semi-arid regions where water scarcity is a major constraint for rural livelihoods and rainfed agriculture. The same situation, with a large number of innovations relating to water and runoff management, has been reported by other similar initiatives focusing in dryland areas (Critchley and Mosenene, 1996), (Critchley et al, 1999) (Reij and Waters-Bayer, 2001).

WAYS OF INTEGRATING FARMER INNOVATORS AND INNOVATIONS IN THE FFS PROCESS

The integration of farmer innovators or innovations in the FFS process can take place in many different ways. Different options for interactions between Innovators and FFS groups are being tested and evaluated in the PFI-FFS project. Preliminary results show that there is much excitement both from the innovators and the FFS members about these interactions. The main ways in which interaction can happen are:

1. Innovators as members of the FFS groups – The innovators are regular members of the FFS and take part in all activities through out the season just as any of the other members. In the groups the innovators will be important resource persons on their specific area of expertise and on the ideas and procedures of on-farm experimentation and local technology development. If the innovators in addition to being members also are the host of a field school these interactions can be even more effective.

2. Innovators as guest trainers – The innovators are invited once or several times to the FFS as guest trainers to facilitate on their innovation, as part of the regular FFS curriculum or as facilitators during special topic sessions.
3. Study visits to the innovators' farms - The FFS groups are taught and showed the innovation during study visits to the innovators' farms.
4. Documentation and dissemination of innovations – By documenting the innovations they can be spread in the FFS without necessarily require personal interaction between the innovator and the FFS members.

Many innovations have to be taught on the site of the innovation for the technology diffusion to be effective, where the visitors can see the innovation in its right context. This is especially true for innovations related to soil and water conservation, land management and livestock. Other innovations, such as herbal concoctions used for pest control can be disseminated by documentation of the innovation. Even though documented innovations can be an important addition to the learning process, it should not be seen as a replacement of the personal interaction between innovators and farmers.

The geographical distance between the innovators and the FFS determine to a high extent in what way and to what frequency farmers and innovators can interact with each other, since it has big implications on the time and travel costs associated with the interactions.

In order to "market" the innovations among the farmer groups 'farmer innovator catalogues' are prepared in each district. In these catalogues the innovators are presented and the innovations described, together with contact details of the innovator. Through the catalogues the farmer groups can choose the innovators they would like to interact with or the innovations they want more information on.

PROGRAM IMPLEMENTATION: CHALLENGES AND RECOMMENDATIONS

Establishment of FFS groups is much quicker than the development of a sufficiently big community pool of innovators and innovations. This means that if these activities commence at the same time a constructive integration of innovators and innovations in the FFS can not take place until later in the project and the first set of FFS might miss out on these interactions. In the PFI-FFS project, it took nearly a year to identify the innovators and document the innovations. Even though innovators were to some extent involved in FFS activities even during this process, full integration could not effectively take place until the second year. Ideally the process of identifying innovators should be initiated in good time before the establishment of FFS, in order to ensure fruitful interactions throughout the whole FFS process.

Implementation of FFS is very involving and time consuming for the field staff (extension staff and farmer trainers), who operate under a strong, but positive, pressure from their FFS to live up to the expectations of the groups. If these same staffs are the ones responsible for identification and documentation of innovations they tend to

prioritise FFS activities, due to high workloads. This means that activities related to identification and documentation of innovations easily get left on the side, causing delays in the development of a community pool of innovators.

Innovators tend to be very busy individuals that are highly involved in their own farm activities. This means that they sometimes find it hard to get the time to be involved in the training of other farmers or to be a member of a FFS. Further, some innovators easily become very popular among the FFS and thereby tend to be over-visited, or over-used as facilitators. In the PFI-FFS project there have been cases where innovators, even when they highly enjoy the interactions with the FFS, feel that it is too time-consuming and thereby decide to withdraw from the training activities. This problem can be avoided by detailed monitoring of the FFS-FI interactions and based on that information restrict the number of visits to "popular" innovators. The time an innovator is willing to dedicate to this kind of work is usually limited to two days per month. To avoid over-use of certain innovators there has to be a critical mass of innovators available for interactions with FFS.

In general farmer innovators are happy to train other farmers without requesting for payment. However, in cases when the training events are more frequent than the innovators feel they can afford, they usually request for some financial compensation for the lost working time on their own farm. The level of payment is a matter of "demand and supply", since the groups being trained are the ones who pay for it. In most cases innovators coming to the FFS groups as guest trainers have been paid the same amount as the farmer facilitators of the FFS, which is approximately twice the going rate paid by small farmers to agricultural day labourers. However, when groups visit an innovators' farm during a study tour or exchange visit the innovator has not been paid and usually has not requested for any payment, since the general cultural norm among farmers is that visitors are a blessing and charging money for it would be inappropriate.

Due to the organizational structure and funding of the PFI-FFS project it tends to be skewed towards FFS. The project document was developed as a regular FFS project with a component of PFI. However, not all activities in a combined PFI-FFS approach can be combined and integrated. Some of the preparatory activities, such as identifying innovators and characterizing innovations, require more time and funding than a regular FFS project will allow.

Some of the local innovations identified are outside the technical knowledge of the field staff, which makes it is difficult for them to evaluate the potential contribution these innovations could have for other smallholder farmers. Further, some innovations might include unapproved substances or of other reasons be questionable as to if the project want to support a diffusion of them. For this reason it is important that researchers and subject matter specialists are involved in the verification of the innovations to make sure that the innovations truly have a positive contribution to the FFS.

The highly divers farming systems found in Kenya mean that most innovations are relevant for most of the farmers and the anticipated problem of not having the "right

kind" of innovations available for the FFS groups have not proved to be an issue. The popularity of an innovation seems to be attributed more to the quality of the innovation than its type. Further, the success of the interaction does not depend so much on the mode of interaction as on the characteristics of the innovation and the mindset of the individuals involved.

CASE STUDY – Agnes Mughi, a Farmer Innovator in Mwingi

Agnes Mughi is a farmer in a very dry zone of Mwingi district. The area is often affected by drought and the soil is compacted and eroded. However, Agnes' farm appears green and productive all year round and stands out in sharp contrast to the surrounding area. By using her own creative ideas, Agnes tamed the floods from a nearby seasonal stream by digging a series of earth banks across the direction of flow in the valley bottom above her plot. This resulted in increased soil moisture on her farm and raised water level in a well that Agnes dug in the centre of her plot and uses for irrigation of vegetables.

A second innovation that Agnes has developed is a local bio-pesticide. It is a concoction of dried chilli peppers, *Neem* tree leaves and local *Aloe*. Agnes knew that each of these ingredients had either medicinal or (mildly) toxic properties. The combination mixed with water and left to soak is a powerful deterrent to insects and other pests. It also cheap and doesn't harm the user.

Agnes is a part-time social worker, and a role model for other women locally. She has evident strength of character and believes strongly in what she has to offer to others. In Mwingi district she has been frequently invited by Farmer Field Schools to facilitate on her innovations. The message of the bio-pesticide is particularly easy to get across since it is very 'visual' and can be demonstrated on the spot to a group of local farmers.

Agnes Mughi facilitating Wikwatyo FFS in Kyusoon the use of bio-pesticides. (Photo: W. Critchley)

CONCLUSIONS

Experience from the PFI-FFS initiative show that there is a real possibility for having a constructive fusion of external and indigenous sources of knowledge in the FFS. Many of the innovations identified are highly impressive and can even get scientists or subject matter specialists to raise their eyebrows in surprise. There is no doubt that local innovations can be as effective, if not more, as research generated technologies, in improving livelihoods of rural poor. Local innovations are thereby a valuable contribution to the basket of technologies to be tested, evaluated and disseminated in the FFS and the process of harnessing innovation should be seen as supplement to the FFS approach to boost its relevance and potency.

By recognizing innovators as teachers they receive increased status in their communities. This increased status results in an enhanced interest in the community for the process of innovation and discovery, and leads to an increased respect for indigenous knowledge among both community members and service providers.

There are indications of higher level of adoption when new technology options are introduced by fellow rather than by external agents. Often when technologies are thought or demonstrated in a community by external agent, the focus is on the actual technology and even if the farmer appreciates the benefits of the new practice she/he might be too worried about risks such as not finding a market for the product or storage etc. Since the innovators are ordinary community members who most likely is benefiting from the innovation, other farmers can easily follow the whole chain of actions and consequences, from technology to money in the farmer's pocket and are thereby more likely to adopt the technology.

The PFI-FFS methodology has made a positive contribution to furthering the development and sustainability of the FFS approach and has especially improved the adaptation of the approach to East African farming conditions where the diversity in the farming system result in a need for context specific solutions. Ensuring a focus on locally developed/adapted technologies increases the possibility for successful farmer-led FFS and sustainable farmer-to-farmer extension.

Indications show that individual farmers or FFS groups have continued seeking assistance from local innovators introduced to them through the FFS, even outside project activities. This gives hope for a sustainable farmer-to-farmer continuation of the interaction between farmer innovators and other community members. The PFI-FFS initiative has not created these interactions, but can be seen to have 'speeded up' the natural diffusion of ideas and creativity that since beginning of manhood always has been the backbone of survival and livelihood.

The PFI-FFS project in Kenya has made rapid progress and laid a firm foundation. However it is important to remember that the final results of the initiative have not been seen. There is yet no final data on the adoption of innovations, or of the number of interactions, or information on to what extent the innovators and the FFS member feel the

interactions are beneficial to development of the area. These aspects are being carefully monitored and will be the subject of a final review and assessment by the end of the initiative and the lessons learned from the PFI-FFS project will be important for the development of similar initiatives in the future.

REFERENCES

Bunch, R., 1982. Two Ears on Corn: A guide to People-Cantered Agricultural Development. World Neighbors, Oklahoma.

Central Bureau of Statistics & Ministry of Finance and Planning, 1999. 1999 Population and Housing census, Vol II: Socio-economic profile of the population. Government of Kenya.

Chambers, R., 1990. Microenvironments Unobserved. Gatekeeper series no 22 IIED, London.

Critchley, W. and Mosenene, l., 1996. Individuals with initiative: network farmers in Lesotho. In: centre for Development Cooperation services, Vrije Universiteit Amsterdam (ed) 1996: Successful natural resource management in southern Africa, pp 71-81. Gamsberg Macmillan Publishers Ltd, Windhoek, Namibia.

Critchley, W.et al., 1999. Promoting Farmer Innovation: Harnessing local environmental knowledge in East Africa. RELMA Workshop Report Series No.2. Nairobi.

FAO-IPM Secretariat, 1993. IPM Farmer training: The Indonesian case. Jogyakarta, Indonesia.

Jaetzold, R., Schmidt, H., 1983. Farm Management Handbook of Kenya, Vol. 2, Natural conditions and farm management information. Ministry of Agriculture, Nairobi.

Ministry of Finance and Planning, 2000. Second report on poverty in Kenya, Vol. II; Poverty and Social Indicators. Nairobi.

Ministry of Planning and National Development, 1998. First report on poverty in Kenya, Vol. II; Poverty and Social Indicators. Kenya.

Pontius, J., R. Dilts, and A. Bartlett (eds), 2000. A note on the sustainability of the Farmer Field School Approach to Agricultural Extension. Development Economics Group. The World Bank: Washington.

Reij, C and Waters-Bayer, A., 2001. Farmer innovation in Africa; A source of inspiration for agricultural development. Earthscan Publications Ltd, London.

Simpson, B. and Owens, M., 2002. Farmer field schools and the future of agricultural extension in Africa. SDdimensions, Sustainable Development Department, FAO.