

Farm field schools and farmer's empowerment in Mozambique: A pilot study

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Abstract: Empowerment is a key element of popular participation in rural development projects. In this sense, it is crucial to know the different approaches and methodologies capable of or with the potential to generate empowerment. This paper presents the results of a study done in the district of Boane, Mozambique, with the objective of evaluating the impact of the Farm Field Schools (FFS) approach (in Mozambique called “Escolas na Machamba do Camponês”) in terms of farmer, organizational and community empowerment. To collect the data we used semi-structured interviews to both farmers and extension agents involved in the FFS' activities. The results show that this approach has contributed to empowering the participants, strengthening the interactions and relationships among farmers, as well as between farmers and extension agents, to develop farmers' capacities in relation to problem analysis and decision-making, and to promote collective action. However, it was not so successful in promoting the relationships between farmers and researchers. Overall, FFS seem to be more promising in promoting empowerment at the individual and organizational levels.

Keywords: *Farmer Fields Schools, Extension, Adult Education, Empowerment, Mozambique*

Introduction

Mozambique is a Southern African country whose largest part of the population (over 70%) lives in rural areas and is primarily dedicated to subsistence agriculture, “characterized by small farms, low modern input use, and limited commercialization” (Davis et al., 2008: 40). Most of this population is illiterate and shows great difficulties and needs in different domains, including access to education and health. As stressed in the “Report on the Millennium Development Goals” (Republic of Mozambique, 2008: 9), “Over the last few years, Mozambique has experienced average economic growth rates in excess of 7%, with the growth of the agricultural, manufacturing industry, trade and transport sectors all playing an important role”. However, the country is one of the poorest in the world, with about 50% of the population living below the national poverty line, high unemployment, high children mortality rate, and low life expectancy at birth, among other negative development indicators.

After independence, and in recent years, Mozambique has experienced a number of strategies to promote rural development. Programs such as “Socializing the Rural Areas”, the “Economic and Social Plan” and, more recently, the “Action Plan for the Reduction of Absolute Poverty”, are some of the instruments used to achieve the Millennium Goals (Sambo, 2008). Despite this great effort, some of the strategies implemented in the field are not achieving the desired effects. Research and agricultural training institutions have considered technology transfer as the main extension mechanism, but most new technologies recommended have not been adopted by farmers (Groneweg et al., 2006). One reason for the failure of development projects, in Mozambique as in other parts of the world, “respects the fact that they do not reflect the real needs of the areas of implementation, as a result of not incorporating the participatory component” (Chambers, 1995).

With a view to avoiding past mistakes in the design and implementation of rural development, a community participation component is being privileged today. The Farmer Field School (FFS) was one of the approaches adopted in the public policies, considering that farmers should be heard and involved in the choice of technologies that meet their needs and helps them to improve their specific economic situation and livelihoods (Kisha, 2004).

In Mozambique the so-called “Escola na Machamba do Camponês” initiative (translation of Farmer Field School) was launched in 2003, in the districts of Namacurra and Nicoadala, in the Zambezia Province. It is a practice recognized by the Ministry of Agriculture as a crucial model to improve farmers’ training and promote sustainable rural development. In the district of Boane, Maputo province, the FFS projects began in 2004.

In other countries, like Kenya, Tanzania, Indonesia and Bangladesh, among many others, work with the FFS, emphasizing farmers’ experiments and learning, has produced positive results in terms of appropriate technology development and empowerment (Braun and Duveskog, 2008; Owenia and Semlowe, nd; Pontius et al., 2001; van de Fliert, 1993). Van den Berg (2004), in a synthesis of 25 impact evaluations of IPM Farmer Field Schools, referred to the substantial and consistent reductions in pesticide use and the convincing increase in yields due to training. Van de Fliert (2007) stressed that “the effectiveness of FFS as a farmer education model and social learning platform has received ample recognition”, given “its capacity to increase knowledge and enhance critical skills, and to serve as a platform for collective action”.

In Mozambique, however, in spite of the wide acceptance of the FFS, there are no studies to assess its impacts. As such, the overall objective of the study was to evaluate the impacts of FFS in the district of Boane. The specific objectives were: to analyze the subject matter issues addressed in the Schools and the roles of farmers in its definition; and to understand the Schools’ impacts in terms of individual, organizational and community empowerment. The study was developed in 2009 and involved observation of 8 FFS, and interviews with 80 farmers and 5 extension agents.

Farm Field Schools, Group-Based Extension and Empowerment

Farmer Field Schools were first developed in Indonesia and other South East Asian countries in the late 80’s early 90’s, focusing particularly on Integrated Pest Management, and can be considered as part of “farmer-led” and “group-based” extension approaches (Gallagher, 1999; Scarborough et al., 1997). The term comes from the Indonesian words “Sekolah Lapangan”, which simply mean “Field School” (Groeneweg et al., 2006). Pontius et al. (2001) mention that between 1990 and end of 1999 over two million rice farmers from Asia participated in Farmer Field Schools. In Africa this movement was introduced in 1995, in Ghana, through the efforts of the FAO Global IPM Facility, and after that in Mali (1997) and other countries in the Eastern and Southern parts of the continent (Simpson and Owens, 2002).

Many FFS were created in countries of different continents with FAO support, according to a major principle: to involve farmers in learning and discovery, through experimentation and the exchange of knowledge with extension agents and researchers. The Schools follow a participatory training methodology based on the philosophy of adult non-formal education in which farmers learn by doing, observing, analyzing, sharing experiences and making decisions to solve their individual and community problems (Braun and Duveskog, 2008).

Khisa (2004) describes FFS as a learning program based on practice in the community, involving a group of farmers supported by extension facilitators or agricultural teachers, and van de Fliert et al. (2007, 247) stresses its emphasis on “group learning as the basis for local problem solving – building on farmers’ own experiences and experimentation – and further collective decision-making and action”.

The success of these schools depends a lot on farmers’ initiative and extension agents’ capacity to facilitate learning: “Farmer field schools also require that professional researchers and extension officers become experts in farming and in facilitating farmers to undertake their own research” (Scarborough et al., 1997: 91). (See also Box 1.) Each School involves a group of 25-30 farmers from a given village and is governed by a set of clear principles, such as (Braun and Duveskog, 2008; Gallagher, 1999): the FFS is a process, not a goal; the training topics are selected by the peasants; the farm is a place of experimentation; the extension agents or animators are facilitators, not teachers; the key concern is it to facilitate learning, not to teach; learning by doing and learning to learn are

crucial; the problems raised should be solved; decision making should be part of the learning process; unity is strength.

Box 1. Roles of Field-Level Extension Agents in Farmer-Led Extension*

- Encourage the preparation of farmers to become farmer-extensionists;
- Organize and conduct farmer learning opportunities, e.g., training, study tours and farmer cross visits;
- Facilitate research support for farmers on specific technical areas, e.g., integrated pest management, ecological agriculture;
- Initiate links between communities or farmers and public or private sector institutions;
- Channel feedback so that farmers can influence the setting of government priorities;
- Input material, human, technical and financial resources toward the establishment, maintenance and management of farmer-led extension;
- Help reorientate extension services to be more responsive to farmers' needs;
- Analyze and prioritize community and agricultural problems with farmers.

* Adapted from Scarborough et al., 1997, 7.

Farmer empowerment is a major concern in this extension and training approach, as farmers have the opportunity to learn and apply ecological principles, master and apply critical thinking skills, acquire leadership skills, and master applied discovery approaches that allow them to gather, systematize, and expand local knowledge (Pontius et al., 2001). In Bangladesh, for instance, School participants spontaneously created peasant organizations and took an active role in experimentation, innovation and technology adaptation (Bartlett, 2004). Besides, as underlined by van de Fliert et al. (2007, 247), “empowerment has become increasingly crucial for farmers who face a variety of contending forces related to technology, politics, world markets, and society, which can marginalize them if they are not proactive”.

Empowerment is a polysemic concept that has emerged in the 60's, with the idea that it is possible to act in order to increase the individuals' power and enable them to reveal their potential (Romano and Antunes, 2002). In recent years there has been a widespread use of this concept in many fields - management, economics, health, community development, politics -, and in many different areas of social work (Horochovki and Meirelles, 2007). According to Vasconcelos (2004), empowerment refers to the increase in the personal and collective autonomy of individuals and social groups in their interpersonal and institutional relationships.

Bartlett (2004), citing Chambers (1993), stresses that empowerment refers to the development of skills so that individuals can make informed choices in their lives, especially in areas where difficulties are most felt. For Antunes and Romano (2002), empowerment is a stimulus to the process of development and poverty eradication, a continuous process in constant renewal that can allow for the sustainability of local development in the long-term. Moreover, Vasconcelos (2004) emphasizes the importance of empowerment as a fundamental basis for the effective participation of communities in their development process. Bartlett (2004) states that only when people are doing their own analysis and are taking their decisions autonomously they can be considered empowered. The same author points out that the inclusion of human rights in development involves the empowerment of people, so that they make their own decisions instead of being merely spectators.

Empowerment can be observed at three interconnected different levels, namely the individual, the organizational and the community ones (Perkins and Zimmerman, 1995). Empowerment at each level can be distinguished by specific observable results: individual autonomy and participation in collective action (individual level); collective decision making and sharing leadership (organizational level); and collective action at the community level (community level) (Horochovski and Meirelles, 2007). Box 2 provides additional elements about the observable evidences at each level of empowerment.

Box 2. Evidences at Each Level of Empowerment*

- Individual level: improved crop management capacity; experimentation skills; communication skills; negotiation skills; capacity to analyse situations; motivation to participate; participation in decision making; autonomous problem solving; sense of control over life situations and decisions.
- Organizational level: group building capacity; formation of networks; free participation in groups and organizations; involvement in organizational decision making; assuming leadership positions and roles.
- Community level: setting the community agenda; collective participation in the construction and implementation of strategies to achieve collectively defined objectives; individuals and organizations applying their resources and capacities in collective efforts to solve community problems.

* Adapted from Horochovki and Meireles, 2007, Perkins and Zimmerman, 1995, Spreitzer, 1995, and van den Berg, 2004.

Research Methodology

The study followed a qualitative approach and semi-structured interviews were the main research technique used. Being a pilot and exploratory work in the context of Mozambique, it was decided to select just one district with relevant experience and a relatively small number of peasants and extension agents to interview.

The research involved an initial period of document analysis, followed by three visits to the district of Boane, particularly to the District Economic Development Services, to obtain preliminary information about the FFS projects, and culminated with data collection at the field level.

The fieldwork was done in 2009 and prepared in four steps (see also Table 1): (1) five communities were randomly selected in the district of Boane, namely Manguiza, Massaca, Chinonanquila, 25 de Setembro and Mahanhane; (2) eight Schools were chosen in the selected communities, all with at least two years of field experience; (3) from each School, 10 farmers were selected for interview, using a simple random sampling technique, representing a total of 80 interviews; (4) five extension agents working in the communities were also interviewed and involved in the research process.

Table 1. Studied Communities, Schools and Research Interviews.

Community	School	Year of Implementation	Nº of Members	Nº of Interviews
Manguiza	Khindi-murrimi	2004	30	10
	Koma switia	2004	23	10
Massaca	Massacas	2005	24	10
	*	2004	26	10
Chinonanquila	1(*)	2004	30	10
	2(*)	2005	30	10
25 de Setembro	25 De Setembro	2004	20	10
Mahanhane	Mahanhane	2005	15	10

(*) School without a specific name.

The key issues addressed in the fieldwork were basically three: subject matter discussed in the FFS; who defined such subject matter; and levels of empowerment observed (individual, organizational, and community). Additionally, with the extension agents other matters were discussed, such as the history of each School and details of the field activities.

To analyse the impacts in terms of empowerment the following elements were observed: (1) farmer participation in local experimentation and decision-making concerning technology adaptation and use, development of interpersonal relationships and networking (individual level); (2) farmer participation in local organizations and organization initiatives within the FFS (organizational level); and (3) farmer involvement in community-wide projects and activities (community level).

The sources of information on empowerment, besides farmers, were the extension workers, mainly through interviews and informal conversations. The researchers also observed a number of School activities and field experiences. Finally, pattern matching, consisting of the junction of similar

responses and attempt to explain the observed differences, was the method used to analyze data and draw conclusions (Matakala, 2001).

Major Results

As said before, in Mozambique the first “Escolas na Machamba do Camponês” were created in 2003, first in the province of Zambezia, where 124 Schools were implemented, involving 400 peasants who produced rye and vegetables (Groeneweg et al., 2006). In 2004 the experience was expanded to the provinces of Maputo, Manica, and Sofala, in the frame of an international project to support small and vulnerable agricultural producers (Singh, 2007).

In Boane district, Maputo, where this pilot study was carried out, the FFS initiatives began in 2004. Currently there are 38 Schools in this district, involving and benefiting about 800 families from 12 communities (SDAE, 2009). In this part of the paper a summary of the results is presented, particularly with regard to two major questions: What is the major focus of School activities and who selects it? What are the School impacts in terms of empowerment?

Boane is an important agricultural district, with 43.000 ha of arable land, of which 9.500 irrigated, but less than 50% of it is actually productive. It has about 13.000 peasant families who manage an area of 7.500 ha. The average area of a family farm (“machamba”) is 1,48 ha and the main crops are maize, cassava, sweet potatoes, peanuts and “nhemba” beans (www.iid.mz).

All 80 interviewed farmers are dedicated both to crop (77,5%) or crop and animal production (22,5%). The major crop is maize (for 67,5%), followed by beans (25%) and tomatoes (7,5%). About 90% have at least two “machambas” and the remaining just one. For all of them the FFS was the first agricultural training opportunity and their objectives were to learn more about farming (74%) and to share experiences with others (26%).

Priority crops, farm practices and experimentation

Overall, we found that crops prioritized by farmers in the studied communities, to be addressed in the Farmer Field Schools, were maize, beans and tomatoes, with some variations from School to School. These options may be due to the fact that these crops have greater demand in the town of Boane and the nearby capital city of Maputo, where prices are attractive to sellers. Moreover, some producers prefer to sell these products directly to some hotels and restaurants.

In relation to the major content issues debated in the Schools, they essentially have to do with pest control, organic fertilization, distance between plants and densities of seedling. For farmers these issues are a matter of priority, given the critical role they play in terms of crop yields and therefore to their profits and incomes, which tend to be the major concern. Besides these topics, most FFS also dedicated time to the study of medicinal plants and animal production, especially animal health.

Different sowing densities and distances between plants were tested in the farms, to identify the most suitable for specific crops. With regard to pest control techniques, in the case of corn borer, a mix of sand and cypermethrin was tested, with the application made through a common bottle. As for sucking insects of beans, a mixture of ash, tobacco, sugar and water was tested in the field. These are local initiatives that apparently have shown some signs of easing of crop pests and diseases.

The use of organic fertilizers was another issued addressed. Several organic fertilizers made out of locally available materials were tested, such as a mixture of stubble of legumes, animal manure, bread, water and sugar, which was applied in corn and vegetables fields. Other materials have been applied as fertilizer, like a mixture of cattle manure, field stubble, ashes, earth and sand. This material was especially used in vegetable fields.

Farmers made the choice of crops and issues object of attention in each FFS, through participatory diagnostic methods. In terms of learning, the interviewed farmers stressed, for instance, a better understanding of the symptom, causes and possible solutions for different pests and diseases,

resulting from shared knowledge and field trials. Besides, they also provided attention and learned about the impacts of new practices on yields and family income.

School impacts in terms of farming practices are quite significant. For instance, most farmers changed the distance between plants and sowing densities in the cases of maize (85% of producers), tomatoes (77,5%) and beans (79%). As for organic manuring, 69% of the interviewed are using the new manures produced and tested in the Schools. The control of pests and diseases is now more agronomic than chemical (for 80% of the interviewed farmers). These options were particularly influenced by the field trials and observations, as well as by the recognition of its effects in terms of yields, savings and family income.

Building empowerment

The FFS became a centre of interpersonal relationships and exchanges, i.e. of crucial factors for the development of social capital and empowerment. In fact, the interviewed farmers revealed that with the School implementation the frequency of contacts with extension agents and peers increased, as new meeting opportunities were created, allowing for more open and active communication (Table 2). Contacts with researchers, however, did not change, and for most farmers are quite rare or inexistent

Table 2. Frequency and Nature of Interpersonal contacts and Exchanges Before and After the FFS (%)

Type of Contact and Period	Weekly	Monthly	Annual	Vertical	Horizontal
Farmer-Farmer Before FFS	85	15	-	-	100
Farmer-Farmer After FFS	100	-	-	-	100
Farmer-Extension Before FFS	-	68	32	77	23
Farmer-Extension After FFS	100	-	-	35	65

With peers, the major subjects of exchange were the farm practices, individual experiences and farmer-to-farmer counselling, with the contacts increasingly tending to assume a group format. In the case of extension, the frequency of contacts changed from monthly (mentioned by 68% of farmers) or even annual (mentioned by 32%) to a weekly one. The focus and nature of these contacts also changed: most farmers stressed that the emphasis now is on sharing experiences and discovering and analysing new farm practices, through more horizontal forms of communication; the agents mentioned that they are concerned with the facilitation of discovery, not with the diffusion of “technological packages” in a top-down manner (Table 2).

In general terms, it can be said that individual empowerment was manifested in solving real farm problems, through an independent analysis and integration of the knowledge and skills developed in the FFS. In fact, 65% of the farmers participating in the FFS activities have shown to be more prone to solve their problems through their own means and autonomously, namely choosing the farm practices they feel more appropriate and advantageous. This capacity was developed through field experiments, observation and continuous discussion with peers and facilitators. However, only 5% of them have taken the initiative to try out new crop management practices and for 80% the contact with extension agents continues to be crucial.

In terms of organizational empowerment, the study showed that the FFS reinforced some of the existing mutual help organizations, including the self-help groups and the local micro-credit schemes (in Portuguese, “banco solidário” or, in the local language, “xitique”). The “xitique”, for example, was created by School members in order to stimulate savings and make possible small investments, and the self-help groups supports their members in situations of need, such as a wedding, a funeral, or a farm labour pick. On the other hand, the Schools are seen as grounds to debate other questions beyond agriculture. For instance, most of those surveyed believed that Schools are an opportunity to discuss issues like HIV/AIDS, which constitutes a major public health problem in the country.

Concerning community empowerment, the study revealed that the Farmer Field Schools led to greater sharing of knowledge among farmers and created conditions that allowed the participants of

the first Schools, the pioneers, to work with and train other farmers. Given the social recognition and the relevance of the Farmer Field Schools for peasants, the number of members has been growing year after year. However, the evidence in this respect is not very conclusive, as only 25% participate regularly in community-wide initiatives, such as opening new roads or raising money to build a system of water provision. This lack of community empowerment may be related with some deficit in terms of community organizations.

Conclusions and Recommendations

In Mozambique, Farmer Field Schools were launched by the public extension services, using an open, democratic and participatory approach, a fact that, to a good extent, explains its adoption, expansion, and success in the studied communities.

The FFS became centres of interpersonal relationships, information exchanges and networking. New opportunities of encounter were created and farmers are communicating more actively and openly. The nature and focus of extension-farmer contacts changed from top-down and technology-oriented to horizontal and sharing/discovery/learning-oriented ones.

Participant farmers chose the School content, and study activities are developed in their own field plots. In general, farmers prioritized crops with more market demand and practice issues crucial to yield and, consequently, to family income. In terms of individual empowerment, the study showed that 65% of the farmers participating in Farmer Field Schools have tried to solve their problems autonomously, but only 5% have taken the initiative to try out new practices.

Individual empowerment was the major impact of FFS. It was facilitated by the FFS approach and methods, emphasizing experimentation and group discussion, as well as by farmer participation in all stages of the process. In fact, the interviewed farmers mentioned their involvement in the planning and implementation of experimental plots, and stressed the importance of observing and discussing the crop evolution with the peers and “teachers”.

Considering the observable evidences referred to in Box 2, we can say that FFS farmers developed their crop management capacities and experimentation skills, as well their capacities to communicate, analyse situations, participate in decision making and solve problems, and we can expect that they have now a better sense of control over their life situations and decisions.

At the organizational level, farmers have continued and reinforced collective actions and mutual-help efforts, particularly through self-help groups and micro-credit schemes. Finally, at community level farmers have come to share their knowledge through farmer to farmer training and the organization of new Farmer Field Schools, which signals a certain empowerment of participants in these projects. However, community wide involvement tends to be weak, and the growth of community empowerment was not so evident.

As a general conclusion, we would say that there were encouraging developments and impacts derived from the FFS projects in the district of Boane. In terms of empowerment, the positive effects at the individual level, if sustained and strengthened, can lead to higher impacts at the organizational and community levels, as each one reinforces the others.

Studies in African and Asian countries about the impacts of FFS (Davis, 2008; Owenya and Semlowe, nd; Pontius et al, 2001; Simpson and Owens, 2002; van den Berg, 2004; van den Berg and Jiggins, 2007; van der Fliert, 1993), have shown an overall encouraging performance: farmers improved their knowledge and skills (technical and socio-political), changed crop management behaviours, developed higher self-confidence, improved the linkages and networking with other people, services and organizations, acquired leadership skills, and got more involved in group activities and community matters.

Some authors, however, also argued that FFS effects are generally confined to the most directly engaged farmers and questioned its overall impact and financial sustainability (Davis, 2008), while others pointed out additional critiques, such as: “its vulnerability to inappropriate curriculum; too

poor facilitator skills; and elite capture” (van den Berg and Jiggins, 2008). Referring specifically to the African case, Simpson and Owens (2002, 35) called attention to other possible weaknesses, like the reversal in the improved interpersonal farmer-extensionist relations, under the influence of a decade or more of the T&V System, and the “elite” bias, favouring those who are literate and numerate, and leaving out the majority of farmers. Based upon a study in the Philippines, Rola and Jamias (2002) also demonstrate that non-FFS farmers do not appear to have benefited from the national field school program, showing that knowledge and information is not flowing through the informal farmer-to-farmer interactions.

Overall, the present study revealed comparable positive results and demonstrated that the Farmer Field School model seems to provide a good basis for farmer education and sustainable rural development with farmer and community participation. However, more research needs to be done in order to deepen the analysis of empowerment and to better understand aspects like the roles and practices of School facilitators, training needs of these facilitators, farmer-to-farmer communication and learning processes, communication with and effects in the surrounding communities, and the sustainability of impacts, namely in terms of crop yields, incomes, community social capital, and collective action.

The comparison between Schools in different districts is strongly recommended, once this pilot study was focused on a single district and a relatively small number of School cases and interviews. It will be important to compare the results of FFS in different types of districts, for instance in terms of agroecological systems, major crops/productions, distance to markets, and past experiences with other extension and farmer education practices. Following van de Fliert et al. (2007, 254), the comparison of FFS with other extension approaches, “taking into consideration both direct and indirect costs and benefits and long-term economic and social impacts” is also deemed necessary. Additionally, it is crucial to estimate FFS operational costs and evaluate its financial sustainability, often questioned given its labour-intensive character and the number of farmers directly involved (Feder et al, 2003, cited by van de Fliert, 2007; Swanson and Rajalahti, 2010).

Finally, it is important that future studies in Mozambique value the recommendations provided by van den Berg (2004, 19), namely: to consider different perspectives of impact and long-term effects, in order to increase the scope and rigor of results; to improve the design (measurement of sustainability of immediate results, interdisciplinary character); and to emphasize the developmental impacts through participatory approaches and qualitative methods.

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