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FARMERS' FIELD SCHOOLS: A STRATEGY FOR BENIFITING RESOURCE POOR FARMERS IN KHYBER PAKHTUNKHWA, PAKISTAN

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ABSTRACT

The present paper is based on the study conducted in 2010 to analyze farmers' field schools (FFS) as a strategy for benefiting resource poor farmers from agricultural technologies in Khyber Pakhtunkhwa, Pakistan. For this purpose, seven districts from Khyber Pakhtunkhwa including Peshawar, Charsadda, Nowshera, Mardan, Swabi, Kohat and Hangu were selected. Data were obtained from 280 randomly selected farmers through "survey" method and were analyzed using statistical package for social sciences (SPSS). The results show that under crop production technologies, the highest benefit was obtained from nursery raising which was ranked 1st with mean value 3.40 followed by timely and balanced use of fertilizers and use of recommended seed rate which were ranked 2nd and 3rd with mean values 3.08 and 3.05, respectively. Under crop protection farmers got maximum benefits from iidentification of insects/ pests which was ranked 1st with mean value 3.22 followed by insects/ pests control by local recipes and mass killing of insect/ pests which were ranked 2nd and 3rd with mean values 3.03 and 2.84, respectively. The farmers obtained the highest benefits from chemical and manual weed control measures which were ranked 1st and 2nd with mean values 2.99 and 2.97, respectively. Furrow irrigation was ranked at the top followed by flood and border irrigation techniques based on the benefits. It can be concluded from the study that FFS proved highly beneficial to the farming community due to its capacity building functions.

Key words: Farmers' field schools, benefits, resource-poor-farmers

INTRODUCTION

Agriculture is the backbone of Pakistan's economy. It accounts for over 21% of gross domestic product and employs 45% of the total work force. Agriculture contributes to growth as supplier of raw materials to industry besides serving as market for industrial products and contributes substantially to Pakistan's exports earnings. Nearly 62% of the country's population lives in rural areas and is directly or indirectly linked with agriculture (GOP, 2009-10). However, crop production in Pakistan is among the lowest as compared to the world's averages (Khan, 2004) which can be increased reasonably by using improved crop management practices by the farmers. For achieving this goal many extension strategies have so far been tried from time to time in Pakistan but none of them seems to be fully effective in serving the farmers by increasing farm productivity and improving their income. Therefore, Government of Khyber Pakhtunkhwa introduced a new extension approach known as farmers' field schools (FFS) in 2004 to benefit the farming community by building their capacity through discovery based learning techniques (Khatam *et al.,* 2010).

FFS is a season-long, field oriented and discovery-based learning opportunity. It comprises a group of farmers who are facilitated by extension field staff in conducting various integrated crop management practices. The group consists of approximately 25 to 30 farmers who attend the field school weekly or fortnightly to learn through discoveries and simple experimentations. The participants of the group work in sub groups of 4 or 5 farmers who learn how to make and record detailed observations regarding the growth stages of crop, insect/ pests and their thresh hold level, weeds, weather conditions, soil conditions and overall plant health (Habib *et al.* 2007). FFS provides a chance to its participants to learn together, test and adopt various practices, using practical ways of learning through observation, discovery, critical thinking and group decision making process. This process improves the farmers' skills, builds self-confidence and thus makes them capable of effective decision making. The basic aim of FFS is to build the capacity of farmers to analyze their crop production and protection systems, identify and prioritize problems, test possible solutions and finally apply the most suitable one. The skills and knowledge gained from the participatory learning process of FFS enables farmers to adopt existing technologies to be more productive, profitable, and responsive to their varying agro-ecological situations (Khisa, 2003).

FFS creates conformity between conventional and scientific knowledge thus making farmers better decision makers in their respective agro-ecology. FFS approach develops as well as modifies technologies that

actually work and are acceptable to farmers (Nederlof and Odonkor, 2004; Röling, 2002; Röling *et al*, 2004). FFS develops farmers' skills and knowledge thus makes them empowered in choosing appropriate crop management practices. Sherwood *et al.* (2000) reported that FFS approach was based on the principles of growing a healthy crop, preserving predators, regularly observing the crop and help farmers becoming experts at their farms. This approach mainly aims at empowering the farmers through completing various tasks themselves. In this regard Kenmore (2002) stated that FFS characterizes a changed model in agricultural extension involving participatory methods are used in order to help farmers develop their diagnostic skills, critical thinking and inculcating creativity and decision making.

Quizon *et al.* (2001) affirmed that the main aspects determining the cost-effectiveness of the FFS training and the benefits gained from this approach is participation of farmers in planning various activities. Besides offering opportunities of learning by doing, FFS is also used as a tool of benefiting farmers by transferring technologies to them. In this context, Asiabaka (2003) reported that FFS approach was adopted to scale up the agricultural technologies having greater potential for improving livelihood. In the same way, Feder *et al.* (2004) stated that FFS is a rigorous training approach, introduced in many developing countries in the last decade to encourage uptake of knowledge and production approaches which are ecologically sensible, and in particular those IPM practices rationalized the use of pesticides. The findings of their study confirmed that better knowledge resulted in reduced use of pesticides, and trained farmers at FFS had sufficiently improved knowledge levels. Other positive evidence regarding benefits of FFS approach was reported by Tripp *et al.* (2005) who determined the outcomes of FFS programme for IPM in rice in Sri Lanka. The outcome of the study showed that FFS farmers had minimized the use of insecticides than other farmers during the previous season, as well as in different seasons and at all locations. There was also evidence that FFS farmers had improved their knowledge as they could name more predators, apply insecticides after recognizing various insects, as they were less caring for controlling leaf-feeding insects in the early times of its growth before attending FFS. Although, the main aim of FFS approach was to minimize the use of pesticides, but numerous other subjects were also highlighted including management of soil fertility. David (2007) conducted a case study of farmers who participated in the cocoa Integrated Crop and Pest Management (ICPM)-FFS and those who did not participate in Cameroon. He concluded that FFS graduates got higher test scores than the non-FFS participants, in the aspects of tree physiology and rational use of pesticide. In the same way, Van den Berg and Jiggins (2007) found that FFS has significantly impacted in two main areas 1. direct achievements in the reduction of pesticides and 2. in several cases, yield has substantially increased rather being consistent in various Asian countries, but success in other continents is yet to be established, because FFS efforts were more recent over there.

Keeping in view the importance of FFS as mentioned above, this study was designed to analyze FFS as a strategy for benefiting resource poor farmers in Khyber Pakhtunkhwa, Pakistan.

MATERIALS AND METHODS

The population for the study consisted of FFS farmers in the study area, which comprises 7 districts of Khyber Pakhtunkhwa i.e Peshawar, Charsadda, Nowshera, Mardan, Swabi, Kohat and Hangu. Four FFS out of 16 from each district were selected at random. Ten farmers out of 25 were randomly selected from each FFS of each district, thereby making a total of 280 respondents. The data were collected by the researchers themselves using "survey" method. The validity of the data collection instrument was got checked by the experts in the Department of Agricultural Extension, University of Agriculture Faisalabad. After making minor amendments, the research instrument was pre-tested for its reliability. The data were analyzed through computer software called statistical package for social sciences (SPSS) and results were drawn.

RESULTS AND DISCUSSION

Table 1. Mean, standard deviation and rank order of crop production technologies introduced through FFS based on the benefits obtained by respondent farmers

Crop production technology	Rank order	Score	Mean	SD
Nursery raising	1	951	3.40	1.18
Timely and balanced use of fertilizers	2	862	3.08	1.16
Recommended seed rate	3	853	3.05	1.14
Sowing methods	4	835	2.98	1.19
FYM decomposition	5	824	2.94	1.17
High yielding varieties	6	817	2.92	1.13
Soil analysis	7	788	2.81	1.15
Seed bed preparation	8	749	2.68	1.08

Source: Field data n=280

Table 1 shows that the highest benefit was obtained by farmers from nursery raising which was ranked 1st with mean value 3.40 followed by timely and balanced use of fertilizers and use of recommended seed rate which were ranked 2nd and 3rd with mean values

3.08, 3.05, respectively. However, comparatively less benefits were obtained by adopting different crop production technologies like sowing methods, decomposition of FYM, sowing high yielding varieties, soil analysis and seed bed preparation by the respondents.

The rating shows that nursery raising techniques, timely and balanced use of fertilizers and seed rate ranged from medium to high but tended towards medium as far as benefits obtained by farmer respondents were concerned. However, the benefits obtained from all other aspects of crop production technology by farmer respondents fell between low and medium but tended towards medium categories.

From results of the present study, it can be concluded that due to small landholdings and hilly terraces, respondent farmers were mostly involved in raising nurseries of both the trees and crops. However, with the efforts of EFS, respondent farmers were trained in the skill of timely and balanced use of fertilizers as it had more influence on obtaining better yields as compared to other aspects.

Table 2. Mean, standard deviation and rank order of various crop protection technologies introduced through FFS based on the benefits obtained by respondent farmers

Crop protection technology	Rank order	Score	Mean	SD
Insect/ pests identification	1	901	3.22	1.14
Insect/ pests control by local recipes	2	847	3.03	1.31
Mass killing of insect pests	3	795	2.84	1.23
Manual pest control	4	764	2.73	1.25
Seed treatment	5	740	2.64	1.14
Insect/ pests management with Bio-Control	6	726	2.59	1.21

Source: Field data n=280

Table 2 indicates that benefits obtained, from the identification of insect/pests' was ranked 1st with mean value 3.22 followed by insect/pest control by local recipes and mass killing of insect pests which were ranked 2nd and 3rd with mean values 3.03 and 2.84, respectively. However, manual pest control, seed treatment and biological insect/pests management were relatively less beneficial technologies as perceived by the respondent farmers.

The mean values indicate that benefits obtained from insect/pests' identification and their control by local recipes ranged from medium to high but tended towards medium. However, benefits obtained from all other categories of crop protection technology fell between low and medium but tended towards medium categories.

The highest rating of insect/ pests' identification was due to the fact that farmer respondents wanted to gain knowledge about selecting the right pesticide and to know pests' life cycle to control them right at the larval stage that would certainly lower the cost of production. Similarly, availability, effectiveness and environment friendly nature of local recipes may be the reasons for higher ranking by respondent farmers.

The present research findings are in line with those of Tripp *et al*. (2005) who found that FFS approach could enhance farmers' knowledge in the identification of pests and their timely management and also improve their understanding about AESA.

Table 3. Mean, standard deviation and rank order of weed control measures introduced through FFS based on the benefits obtained by respondent farmers

Weed control measures	Rank order	Score	Mean	SD
Chemical	1	837	2.99	1.13
Manual	2	832	2.97	1.07
Cultural	3	740	2.64	1.08

Source: Field data n=280

Table 3 shows that farmers rated chemical weed control measures 1st, closely followed by manual and cultural weed control which were ranked 2nd and 3rd with mean values 2.99, 2.97 and 2.64, respectively based on the benefits obtained from them.

The rating also shows that benefits of all the weed control measures ranged from low to medium with a tendency towards medium category.

The low rating of benefits of all the weed control measures could be attributed to hard terrain, stony soil condition, less use of pesticides and high prices of weedicides.

The present study results are in accordance with those of Chizari *et al*. (1999) who stated that weed control was the only farming practice where extension agents preferred chemical weeding over mechanical weeding, and also with those of Hamidullah *et al*. (2006) who pointed out that weeds were to be controlled with the use of proper chemicals whenever needed.

The highest rating of chemical weed control measures by farmers may be due to the fact that it saves time that otherwise can be utilized in performing other activities, less laborious and more or less fully eradicates weeds from the field.

Table 4 depicts that furrow irrigation was ranked at the top by the respondent farmers with mean value 3.32 followed by flood and boarder irrigation techniques which stood 2nd and 3rd with mean values 2.98 and 2.85, respectively. The drip irrigation technique was however,

rated as the lowest based on the benefits obtained by the respondent farmers.

Table 4. Mean, standard deviation and rank order of irrigation techniques introduced through FFS based on the benefits obtained by respondent farmers

Irrigation techniques	Rank order	Score	Mean	SD
Furrow	1	930	3.32	1.20
Flood	2	835	2.98	1.31
Boarder	3	799	2.85	1.29
Basin	4	772	2.76	1.24
Drip	5	468	1.67	0.76

Source: Field data n=280

The rating clearly indicates that only furrow irrigation technique fell between medium and high with a tendency towards medium and all other techniques ranged from low to medium but tended towards medium except drip irrigation which was at the lowest level i.e. between very low to low category.

The highest ranking of furrow irrigation may be due to the even distribution of water, low percolation losses and easy to control water in the field. However, ranking of drip irrigation at the lowest level may be due to two reasons; one may be its high installation cost and allied problems like blockades and non-availability of local technicians, the other may be the hard rocky nature of soils prevailed in most of the study area that doesn't allow underground spreading of pipes.

Conclusions and Recommendations: It is concluded from the results that majority of the respondent farmers realized benefits from the self-learing process of FFS that ultimately improved their knowledge and skills regarding crop production and protection technologies including nursery raising, timely and balanced use of fertilizers using recommended seed rate, sowing methods, FYM decomposition, high yielding varieties, identification of insect/ pests and their control by local recipes, chemical and manual weed control measures and adopting furrow irrigation technique. However, less benefits were obtained from soil analysis, seed bed preparation, mass killing of insect/ pests, seed treatment, insect/ pests management with biological control, cultural weed control measures, flood, boarder, basin and drip irrigation techniques. Therefore, the government, NGOs, farming community and facilitators of FFS should lay more emphasis on the indentified less beneficial aspects to make them more beneficial.

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