IMPACT OF FARMER FIELD SCHOOLS ON SKILL DEVELOPMENT OF FARMING COMMUNITY IN KHYBER PAKHTUNKHWA PROVINCE, PAKISTAN

AMIR KHATAM[1], SHER MUHAMMAD[2], KHALID MEHMOOD CHAUDHRY[3] and MUMTAZ KHAN[3]

1. *Dept. of Agri. Extension education and Communication, The University of Agriculture Peshawar - Pakistan*
2. *Agriculture Department (Ext.), Khyber Pakhtunkhwa - Pakistan*
3. *Bacha Khan University Charasadda - Pakistan*

ABSTRACT

Farmer Field School (FFS) is an adult educational approach. It provides an opportunity of learning to a group of 25 farmers regarding various skills and crop management practices. It also builds up their decision making capacity through discovery based learning. Government of Khyber Pakhtunkhwa introduced this approach in 2001 by the Project for Horticultural Promotion (PHP) in the province. Keeping success of the project in view, this approach was replicated in 2004 in all the 24 districts of the province through Agriculture Department (Extension). This paper therefore, seeks to analyze the impact of FFS on skill development of farming community in the Khyber Pakhtunkhwa province. The data collected were analyzed using a paired t-test for comparison of pre and post FFS scenarios. The results show that group learning was ranked 1st with mean values 3.29, 3.74 closely followed by decision making capacity and community organization which were ranked 2nd and 3rd with mean values 3.34, 3.84 and 3.32 and 3.80 in the pre and post-FFS scenarios, respectively. Likewise, identification of pest and predator was ranked 1st with mean values 3.27 and 3.91, control of pests by local recipes was ranked 2nd with mean values 3.22, 3.78 and rational use of pesticides was ranked 3rd with mean values 3.31 and 4.04 in pre and post-FFS scenarios, respectively. This situation shows a highly significant difference between the pre and post FFS scenarios. Hence, it can be concluded from the study that FFS has not only improved farmers' skills in managing their crops but also developed various aspects of human resource as a result of various project activities.

***Key words*: Farmer Field School Impact, Skill development, Khyber Pakhtunkhwa.**

Citation: Khatam. A., S. Muhammad., K. M. Chaudhry and M. Khan. 2014. Impact of farmer field schools on skill development of farming community in khyber pakhtunkhwa province, Pakistan. Sarhad J. Agric. 30(2):291-295

INTRODUCTION

Arrangement of food for rapidly growing population of Pakistan is a challenge for agricultural scientists of the country. This needs to plan effective program that goes beyond dissemination of technologies among farmers, to help small farmers organize themselves for sharing production and protection technologies, marketing and advocacy in such a way that empowers the farming community in problem solving and developing innovative skills (David, 2007). These objectives can be obtained through FFS approach which promotes group learning optimally from field observation and experimentations based on the principles of adult education and training of farmers (van den Berg, 2007). FFS is described as a platform and "school without walls" for improving decision making capacity of farming communities and stimulating local innovation for sustainable agriculture. It is a group extension method, which teaches basic agro-ecology and management skills that make farmers experts in their own farms. In this approach farmers meet regularly during the course of the growing seasons to experiment as a group with new production options. Typically FFS groups have 25-30 farmers. After the training period, farmers continue to meet and share information, with less contact with extension workers. FFS aims to increase the capacity of groups of farmers to test new technologies in their own fields, assess results and their relevance to their particular circumstances, and interact on a more demand driven basis with the researchers and extension workers looking to them for help where they are unable to solve a specific problem by themselves (Khisa, 2004). However, David, (2007) concluded some social benefits from FFS on the basis of farmers' perception which were: ability to arrive at group consensus, making observations before making farm management decisions, ability to make confident public speech, better at working in a group, and experiment more with cocoa and other crops as reported by respondents. He further stated that FFS can be a starting point for social change by improving farmers' ability to make observations, apply new knowledge to solve their problems, communicate better, have increased self confidence, and form group to support cocoa production activities as well as other livelihood initiatives. But it would be unrealistic to expect these outcomes to be sustainable without developing the appropriate local and national level institutions, support systems and policies related to agricultural extension and research. Likewise, Simpson and Owens (2002) who stated that FFS approach had a significant role in providing the opportunity for farmers to

acquire an understanding of important, concepts and relationships. FFS graduates have proven to be willing and able to communicate viable, new plant protection and production technologies to others in their immediate localities and beyond, and in some cases had made significant contributions to local social development. Similarly, Buyu *et al.* (2003) concluded that FFS facilitates understanding regarding local structures especially the social affiliations that act as a form of social capita. Participatory technology development activities rely on willingness of individuals to mobilize resources and share information. Such a collective effort would facilitate comparison of new and existing practices in the communities. Mutandwa and Mpangwa (2004) assessed the impact of FFS on integrated pest management (IPM) dissemination and its usefulness which indicated that yield of crops, income of cotton and technical knowledge scores for FFS participants were greater than for non-FFS participants. Kwarteng *et al.* (2004) concluded that FFS approach had a significant impact on extension work by improving competencies of farmers and extension workers through activities in team building, technical trainings, trainings of PTD&E, demonstration of plots, development of organizations, financing, supervision by drawing and disbursing officers, participation at varied levels of programming, comprehending various principles of IPM and the application of IPM technological options. Similarly, Braun *et al.* (2005) concluded that information obtained from FFS education is often not expected to diffuse but to generate social and economic multiplier effects that deliver positive public and private benefits. Preliminary data suggest that information, and simple practices that can be observed by non-participating farmers, do diffuse from FFS participants, to some extent, but not the self-confident knowledge and skills in problem-solving required for the kinds of purposes for which FFS seems best suited. Empowerment outcomes reported from FFS include changes in perspectives with boosted self-confidence and pride, as well as social change and action being triggered following participation in FFS. Farmers have gained agency in terms of taking a greater control over their lives. Duveskog and Friis-Hansen, (2008) stated that in Mwingi district of Kenya a local stockist selling agro-inputs explained that farmers often blankly used to come and ask dealer to tell them which seed to buy without ever questioning experts' advice. However among FFS graduates he had noticed a fundamental change in that they often confidently would come and ask for a specific variety, and when the stockiest would enquire why the farmers were able to specify reasons in detail, referring to reflections upon actual field experience for why they demanded the particular item. This indicates an increase in self confidence and changes in how farmers perceive their role vs. the role of expert outsiders. Furthermore, they concluded that FFS play an important role in serving as a platform for human capacity building and empowerment, which in turn can ensure the success of services provided for the community. Asiabaka et al. (2003) stated that in FFS farmers become researchers and test various technologies and make decision about the best option for specific conditions. In the process of technology development, farmers occupy the central position and extension worker acts as a facilitator. FFS stress the need that training should be designed in such a way that conclusions can be easily drawn by the farmers. This process will ultimately empower them in improving the socio-economic environment. Equally important were the results of Khatam A *et al.* (2010) who concluded from their studies that FFS approach improves knowledge of farmers, helps farmers in learning by doing, discourages the use of pesticides, promotes local plant protection recipes, provides systematic training and learning process, helps farmers in problems identification themselves, encourages balanced use of fertilizers, reduces cost of production, promotes community organization, introduces better leadership, inculcate communication and management skills, serves as a demand driven extension approach, improves linkages among research, extension and farming community, fills gaps in local knowledge, assists farmers in implementing their decisions, provides systematic evaluation of different technologies, facilitates farmers in situation analysis, builds confidence in farming community, changes farmers' attitude, improves the overall socio-economic conditions, and increases per capita income. Keeping the aforementioned importance of FFS approach in view the present study was designed with the following objectives:

1. To determine the impact of FFS on skill development of farming community in Khyber Pakhtunkhwa province, Pakistan.
2. To formulate policy recommendations regarding skill development under FFS approach.

MATERIALS AND METHODS

The population for the study consisted of the farmers in the study area comprising 7 districts of Khyber Pakhtunkhwa i.e. Peshawar, Charsadda, Nowshera, Mardan, Swabi, Kohat and Hangu. Using the table for sample size (Fitzgibbon and Lynn, 1987) a random sample of 40 farmer respondents was selected from each district from the list of FFS farmers provided by Agriculture Dept. (Extension) thereby making a total of 280 farmer respondents, respectively. The data were collected by the researchers using "survey" method. An interview schedule was constructed, checked for its validity and reliability and was pre-tested. For ranking of various aspects a five point scale (Likert scale) was used. The data were analyzed using computer software SPSS. Weighted scores were

computed by multiplying the score value allotted to each category of the scale with the frequency counts. Means and standard deviation were computed for different variables. However, researchers also applied the t-test to determine the difference between pre and post FFS scenarios based on the perceptions of farmers regarding different variables.

RESULTS AND DISCUSSION

Table 1 reveals that there is a highly significant difference between pre and post FFS scenarios. All aspects of human resource have improved as a result of learning under farmer field schools. However, group learning was ranked 1st with mean values 3.29, 3.74 closely followed by decision making capacity and community organization which were ranked 2nd and 3rd with mean values 3.34, 3.84 and 3.32 and 3.80 in the pre and post-FFS scenarios, respectively. The highest difference in the aspect of group learning was due to the opportunity of learning by doing as well as discussing various phenomenon under FFS in the project area.

Table 1 ***Comparison of FFS' impact on human resource development of farmers in pre and post-FFS scenarios based on the perceptions of farmer respondents***

General aspects of human resource development	Pre	Post	t-value	P-value
	Mean ± SD	Mean ± SD		
Group learning	3.29 ± 0.53	3.74 ± 0.63	-11.39	<0.001**
Decision making capacity	3.34 ± 0.54	3.84 ± 0.59	-11.13	<0.001**
Community organization	3.32 ± 0.55	3.80 ± 0.60	-10.77	<0.001**
Management of resources	3.37 ± 0.49	3.87 ± 0.63	-10.51	<0.001**
Innovative thinking	3.28 ± 0.50	3.70 ± 0.61	-10.48	<0.001**
Willingness for conflict resolution	3.35 ± 0.56	3.86 ± 0.61	-10.42	<0.001**
Health conditions	3.36 ± 0.62	3.85 ± 0.68	-10.40	<0.001**
Communication	3.36 ± 0.61	3.92 ± 0.65	-10.20	<0.001**
Spirit of cooperation	3.39 ± 0.63	3.91 ± 0.67	-9.94	<0.001**
Living conditions	3.40 ± 0.58	3.93 ± 0.67	-9.37	<0.001**
Tendency towards education	3.37 ±0.61	3.89 ± 0.64	-9.35	<0.001**

Source: Survey data; * = Significant (P<0.05); ** = Highly significant (P<0.01)

The mean values indicate that perception of farmer respondents regarding group learning in the pre and post-FFS scenarios ranged from medium to high but tended towards medium in case of pre-FFS and tended towards high in case of post-FFS scenario.

The results of the present study are supported by those of van den Berg, 2004 who stated that FFS approach promotes group learning optimally from field observation and experimentation based on principles of adult education and training to farmers is seen as the single approach of agricultural extension that can meet these goals similarly, Pontius, 2002 also conclude that FFS is a type of education that uses experience based learning methods to build up the expertise of farmers and Braun *et al.* (2008) stated that as noted by the facilitator and one other person in the group after making observations in the fields FFS farmers returned to the shade and started analyzing the drawings of agro-ecosystem and made various management decisions. Similarly, Khatam B *et al.* (2010) concluded that FFS built up farmers' confidence in making and implementing their decisions regarding reducing pesticides use and promoting of local plant protection recipes. It improved their leadership qualities, communication and management skills as well as elevated the overall socio-economic conditions of farming community.

Table 2 clearly shows that there existed a highly significant difference between pre and post FFS scenarios with respect to human resource development of farming community. All aspects of social wellbeing of farmers improved as a result of FFS activities as perceived by farmer respondents. However, identification of pest and predator was ranked 1st with mean values 3.27 and 3.91, control of pests by local recipes was ranked 2nd with mean values 3.22, 3.78 and rational use of pesticides was ranked 3rd with mean values 3.31 and 4.04 in pre and post-FFS scenarios, respectively. The highest difference in the feature of identification of pest and predator in the pre and post FFS scenarios was due to making comparisons while maintaining insect zoo in various sessions of FFS.The mean values indicate that perception of farmer respondents regarding identification of pest and predator in the pre and post-FFS scenarios ranged from medium to high but tended towards medium in case of pre-FFS and tended towards high in case of post-FFS scenario.

Table 2. ***Comparison of FFS' impact on human resource development of farmers in pre and post-FFS scenarios based on the perceptions of farmer respondents***

Human resource development regarding	Pre	Post	t-value	P-value
	Mean ± SD	Mean ± SD		
Identification of pest and predator	3.27 ± 0.54	3.91 ± 0.62	-7.89	<0.001**
Control of pests by local recipes	3.22 ± 0.57	3.78 ± 0.63	-6.95	<0.001**
Rational use of pesticides	3.31 ± 0.61	4.04 ± 0.64	-6.93	<0.001**
Decomposition of FYM	3.37 ± 0.65	3.91 ± 0.63	-6.28	<0.001**
Green manuring	3.39 ± 0.61	3.97 ± 0.74	-5.58	<0.001**
Reducing environmental risks	3.29 ± 0.55	3.86 ± 0.79	-5.58	<0.001**
Marketing produce jointly	3.33 ± 0.58	3.69 ± 0.67	-5.07	<0.001**
Quality of irrigation water	3.44 ± 0.66	3.92 ± 0.70	-4.85	<0.001**
Effects of pesticides	3.24 ± 0.53	3.58 ± 0.75	-4.27	<0.001**
Drainage of excess water	3.36 ± 0.65	3.71 ± 0.79	-3.62	<0.001**
Control field pollution	3.30 ± 0.70	3.52 ± 0.67	-2.34	<0.05*

**** = Significant (P<0.05); ** = Highly significant (P<0.01)***

The results of the present study are supported by those of Khatam A *et al.* (2010) who concluded that participation of farmers in FFS enable them to identify pests and hence control them efficiently especially through local recipes and Braun and Deborah (2008) who stated that FFS made a significant reduction in environmental risks, augmented agricultural biodiversity, and improved social and decision-making skills and organizational capacity of FFS farmers. An increase of 23% was estimated on FFS farms due to the use of technical knowledge, along with significant increase in recognition of pest and predators, the decision making capacity and field experimentation. Winarto (2004, Tripp *et al.* (2005) who stated that FFS can be effective in reducing the excessive use of chemical pesticides, lowering the cost of production, improving community health, increasing farmers' knowledge and preserving agro-eco-system. Rola *et al.* (2002) who stated that FFS was a season long training of farmers that provides opportunities of participatory activities, experimentation and decision making regarding field based issues.

CONCLUSIONS AND RECOMMENDATIONS

FFS activities have improved all aspects of human activities in the project area and the role played by FFS initiated by Government of Khyber Pakhtunkhwa is of significant importance. Farmers participating opportunities are provided by FFS for building their capacities through group learning and innovative thinking to undertake timely decisions regarding management of resources. Major conflicts can be resolved by organizing community and their health conditions can be improved by the rational use of pesticides and to control pests through local recipes and ultimately improving their living condition.

FFS has improved their communicative skills by putting the spirit of cooperation among them along with other farmers and make them able able to differentiate between pest and predator and their control. Furthermore, FFS enhanced their skill in decomposition of farm yard manure, green manuring and marketing produce jointly, using quality irrigation water, awareness regarding hazardous effects of pesticides, drainage of excess water from the fields by reducing field Pollution which ultimately reduce the environmental risks. Keeping these achievements in view the network of Farmer Field Schools may be extended to other parts of the province rather whole of the country.

REFERENCES

Asiabaka, C.C., J.G. Mureithi and M.E. Owens. 2003. Participatory Monitoring and Evaluation Methodology Development of Farmer Field Schools (FFS) for Scaling up the Adoption of Integrated Nutrient Management Technologies and Information. Paper presented at 19th Annual Association for Int. Agric. and Ext. Edu. Conference, Raleigh, North Carolina, USA, April 8-12, 2003.

Braun, AR., J. Jiggins, N. Röling, H. van den Berg and P. Snijders. 2005. A Global Survey and Review of Farmer Field School Experiences. International Livestock Research Institute, Nairobi

Braun, A. and D. Deborah. 2008. The Farmer Field School Approach – History, Global Assessment and Success Stories. Background Paper for the IFAD Rural Poverty Report 2011

Buyu, G., N. Mango, N. Ndiwa, D. Romney and B. Minjauw. 2003. The Concept and Application of Farmer Field Schools for Livestock Research and Development. Working paper of International Livestock Research Institute (ILRI), Addis Ababa Ethiopia.

David, S. 2007. Learning to think for ourselves: knowledge improvement and social benefits among farmer field school participants in Cameroon. J. Int. Agri. and Ext. Edu., 14(02): 35-49.

Duveskog, D. and E. Friis-Hansen. 2008. Farmer Field Schools: a platform for transformative learning in rural Africa. In "Transformative Learning in Action: Handbook of Practice", edited by Mezirow, J. and Taylor, E., Jossey-Bass Press.

Fitzgibbon, C. T and Lynn, L, M. 1987. Table for determination of sample size from the given population. How to design a programme evaluation. Newbury Park CA: Sage publications.

Khatam, A., S. Muhammad., K.M. Chaudhry., A. H. Mann., I. Haq., Z.U. Khan., M. Idrees and H. Amin. 2010 A. Strengths and weaknesses of Farmers' Field Schools approach as perceived by farmers. Sarhad J. Agric. 26 (26): 685-688.

Khatam, A., S. Muhammad., K.M.Chaudhry and A. A. Maann. 2010 B. Farmers' Field Schools: An alternative extension strategy to benefit resource poor farmers in KP. Sarhad J. Agric. 26 (5): 689-692.

Khisa, G. (2004). Farmers Field School Methodology. Training of Trainers Manual (First Ed), FAO Kenya. pp 1-108.

Kwarteng, J.A., A. Kuehn, M. Braun, and A. Gerken. 2004. Assessment of Participatory Technology Development and Extension (PTD&E) in Ghana. J. Ext. Syst, 20 (01): 1-17.

Mutandwa, E. and J. F. Mpangwa. 2004. an assessment of the impact of Farmer Field Schools on integrated pest management dissemination and use: Evidence from smallholder cotton farmers in the lowveld area of Zimbabwe. J. of Sust. Dev. in Africa, 6 (2): 245-253.

Rola, A.C., S.B. Jamias, and J.B. Quizon, 2002. Do farmer field school graduates retain and share what they learn: an investigation in Iloilo, Philippines. J Intl. Agric. and Ext. Edu., 9: 65-76.

Simpson, B. and M. Owens. 2002. Farmer Field Schools and the Future of Agricultural Extension in Africa. J. Int. Agric. Ext. Edu, 9(02): 29-36.

Tripp, R., M. Wijeratne and V. H. Piyadasa. 2005. What should we expect from farmer field schools? A Sri Lanka case study, World Dev., 33(10):1705-1720.

van den Berg, H., and J. Jiggins. 2007. Investing in Farmers. The Impacts of Farmer Field Schools in Relation to Integrated Pest Management. World Dev., 35(04):663-686.

Winarto, Y.T. 2004. Seeds of knowledge - The beginning of integrated pest management in Java, New Haven, CT: Yale Southeast Asia Studies, 2004.