Journal of Rural Development, Vol. 31, No. (1) pp. 85 - 94
NIRD, Hyderabad.

IMPACT OF FARMERS' PARTICIPATION IN FARMER FIELD SCHOOLS

Gopala .Y.M[1], B. Krishnamurthy[2], K.P. Raghuprasad[3], K.Nagabhushanam[4] and K. Shivaramu[5]

ABSTRACT

The Farmers' Field School (FFS) is a non-formal learner-centered education process. It seeks to empower people to solve their field problems actively by fostering participation, interaction, dialogue, joint decision making etc. The present investigation was carried out in Chickaballapur district of Karnataka State. The three taluks viz. Shidlaghatta, Bagepalli and Chinthamani were purposively selected for the study where FFS has been organised in the year 2004-05. The study revealed that there was a significant difference in the overall knowledge level of participants and non-participants of FFS. More number of participants (41.67 per cent) belonged to high level of knowledge, whereas, more number of non-participants (45.00 per cent) belonged to low level of knowledge. Variables like age, education, extension participation and extension contact, mass media exposure and achievement motivation of the farmers were found to have significant association with knowledge level of participants.

Introduction

The traditional *"transfer of technology model"* in research-extension services in many developing countries has increasingly come under considerable pressure. Imperfections in agricultural information flow among research, extension and farmers have led to high transaction costs, which in turn have lowered the pace of agricultural production. Currently, one of the practical dilemmas is to improve the performance of agricultural extension service, which is currently facing resource, logistical and methodological constraints (Hagmann *et al*., 1998). In order to develop farmers' capacity to learn and to exploit opportunities in their local specific situation, it is essential that the learning materials be developed by farmers themselves through personal involvement from field experiments. Since the learners themselves develop the materials, they can relate to them and even explain their contents. These conditions are satisfied by the farmer field schools' approach making it a springboard for enhancing learning among farmers.

1. Research Scholar, UAS, GKVK, Bangalore
2. Prof. of Agril. Extension, Department of Agril. Extension, UAS, GKVK, Bangalore.
3. Assoc. Professor, Directorate of Extension, Hebbal, Bangalore
4. Prof. AC&ABC, Hebbal, Bangalore.
5. Assoc. Professor of Agril. Extension, VC Farm, Mandya.UAS, Bangalore.

Farmer Field Schools (FFS) are platforms and "schools without walls" for improving decision-making capacity of farming communities and stimulating local innovation for sustainable agriculture (Braun *et al*., 2000). Farmers learn by carrying out for themselves various activities related to selected farming technologies and through constant observation of the technology performance in the field. It always promotes healthy and quality discussions and decisions. The continuous learning occurs throughout crop season and facilitates farmer to farmer communication. Some of the special features of FFS are, learning is field based and acts as a primary venue for learning, encourages group activity involving about 30 farmers and farm women who learn constantly during the crop period. Participants work in small sub-groups, collect and analyse data and take decisions based on the results obtained which promotes healthy discussions and quality decision making and continue learning until a crop season is over.

FFS has got its history witnessed during the end of the eighties of the last century where farmers in Indonesia were putting their crops, their health and their environment at severe risk through indiscriminate use of highly toxic pesticides promoted aggressively by the private industry and government. Pest species were becoming resistant and in some cases resurgent. This called for a large-scale decentralised programme of education for farmers wherein they become "experts" in managing the ecology of their fields – bringing better yields, fewer problems, increased profits and less risk to their health and environment. With this it can be said that the FFS approach emerged out of a concrete, immediate problem (Dilts, 2001).

The first wave of FFS was conducted in 1989 in the rice fields of Indonesia. This involved 200 FFSs in four districts of Yogyakarta initiated by the Indonesian National IPM Programme with funds from the Government of Indonesia – United States Agency for International Development (GoI-USAID) and technical assistance from Food and Agriculture Organisation of the United Nations (FAO). By 1990, the Indonesian National IPM Programme scaled up and launched 1,800 FFSs for rice IPM in six provinces in Java, Sumatra and South Sulawesi. Around 1991, the pilot FFSs in IPM for rotation crops (mainly soybeans) was initiated while the FFS Programme spread out to different countries in Asia (CIP-UPWARD, 2003).

With this background, the present study was undertaken to assess the knowledge level of participant and non-participant maize growers of Farmers' Field Schools (FFSs) and its association with socio-economic characteristics.

Methodology

The present investigation was carried out in Chickaballapur district of Karnataka State. Three taluks viz, Shidlaghatta, Bagepalli and Chinthamani were purposively selected for the study where FFS was organised in the year 2004-05 by UAS Bangalore and other NGOs. List of villages where FFS was organised was collected from Karnataka Community Based Tank Management Project (KCBTMP) headquarters located at UAS, Bangalore. Six FFS were selected randomly for the study and a total of 120 respondents were selected from the villages, out of which, 60 respondents were participants and 60 were non-participants. To know the impact of farmer field schools on knowledge level of cultivation practices 10 participants and 10 non-participants from each FFS were selected randomly. The present study was concentrated on cultivation practices of maize. However, KCBTMP established FFS for different crops like vegetables, cereals etc.

Ex-post facto research design was employed for conducting the study. Thirty one major improved cultivation practices of maize were selected for the study. Data were collected by using a detailed pretested interview schedule and PRA technique was employed whereever necessary. The information regarding knowledge about production technologies were gathered, scored, quantified, categorised, tabulated and interpreted using statistical methods like mean, standard deviation and chi-square.

Results and Discussion

To study the impact of Farmers' Field Schools on knowledge level of cultivation practices of maize farmers, sample consisting of 10 farmers each from 6 FFS which accounts to a total of 60 respondents in participant category and equal number of non-participant category respondents were selected and they are compared in their overall knowledge level and the results obtained are indicated in the Table as follows.

Table 1 : Overall Knowledge Level of Participant and Non-participant Maize Growers of Farmer Field School Regarding Cultivation Practices of Maize

Knowledge level	Respondents					
	Participants (N=60)		Non-participants (N=60)		Total (N=120)	
	Number	Per cent	Number	Per cent	Number	Per cent
Low	18	30.00	27	45.00	41	34.17
Medium	17	28.33	15	25.00	30	25.00
High	25	41.67	18	30.00	49	40.83
Total	60	100.00	60	100.00	120	100.00

The overall knowledge level of respondents regarding cultivation practices of maize presented in Table 1 indicated that there existed difference between participants and non-participants in their overall knowledge level with respect to cultivation practices of maize. More number of participants (41.67 per cent) belonged to high level of knowledge whereas more number of non-participants (45.00 per cent) belonged to low level of knowledge. The farmer field school is non-formal education process where farmers will be trained on various aspects like how to select a seed, suitable varieties for the area, Agro-Ecosystem Analysis (AESA), IPM, field observation, observation of pests and natural enemies, important features of the crop environment and so on. Hence, the participant farmers will be having the required knowledge about all these practices. The low knowledge level among non-participants may be due low exposure to new technology, lack of participation in training programmes, lack of participation in FFS, low mass media exposure and low extension contact when compared to participants who are in constant touch with day-to-day developments. The findings are in agreement with findings of Parthasarathi and Govind (2001) and Godtland *et al.* (2003).

Table 2: Knowledge Level of Participant and Non-participant Maize Growers of Farmer Field Schools Regarding Specific Cultivation Practices of Maize

S.No.	Particulars	Participants (N=60)		Non-participants (N=60)	
		Number	Per cent	Number	Per cent
1	Seed rate	38	63.33	29	48.33
2	Spacing (Rows)	47	78.33	38	63.33
3	Spacing (Plants)	49	81.67	29	48.33
4	Suitable month for sowing	45	75.00	31	51.67
5	Recommended varieties	50	83.33	31	51.67
6	Chemicals for seed treatment	36	60.00	23	38.33
7	Farm yard manure recommended	40	66.67	25	41.67
8	Nitrogen fertiliser recommended	47	78.33	31	51.67
9	Phosphorous fertiliser recommended	49	81.67	33	55.00
10	Potassic fertiliser recommended	44	73.33	30	50.00
11	Dose fertilisers at sowing time	43	71.61	32	61.67
12	Irrigation requirement for kharif maize	45	75.00	37	61.67
13	Irrigation requirement for rabi maize	48	80.00	31	51.67
14	Difference between beneficial and harmful insects	46	76.67	23	38.33
15	Difference between pest and disease	53	88.33	32	53.33
16	Difference between fungicide and insecticide	47	78.33	31	51.67
17	Name of the insect pest attacked	40	66.67	28	46.67
18	Name of the diseases attacked	39	65.00	28	46.67
19	Chemical used for controlling pest attacked	38	63.33	21	35.00
20	Chemical used for controlling disease	37	61.67	22	36.67
21	Knowledge about trap crop	37	61.67	28	46.67
22	Knowledge about NSKE	35	58.33	26	43.33
23	Knowledge about panchagavya	30	50.00	21	35.00
24	Knowledge about pheromone trap	34	56.67	22	36.67
25	Suitable time for inter-cultural operations	47	78.33	34	56.67
26	Knowledge about tank silt	51	85.00	40	66.67
27	FYM/compost	56	93.33	43	71.67
28	Vermicompost	37	61.67	21	35.00
29	Green leaf manure	38	63.33	19	31.67
30	Neem cake	46	76.67	14	23.33
31	Azotobacter	8	13.33	5	8.33

The knowledge level of respondents regarding specific cultivation practices of maize is presented in Table 2. The analysis of knowledge level of 60 participants is compared with 60 non-participants on 31 specific cultivation practices of maize.

The knowledge level of respondents regarding specific cultivation practices of maize is presented in Table 2. The result shows that majority of participants (63.33 per cent) had correct knowledge about seed rate compared to non-participants of whom only 48.33 per cent had correct knowledge. Regarding spacing between the rows majority of both participants (63.33 per cent) and non-participants (78.33 per cent) had correct knowledge and when it comes to spacing between the plants, majority of participants (81.67 per cent) had correct knowledge whereas 48.33 per cent of non-participants had correct knowledge. Further, majority of participants had knowledge about suitable month for sowing (75.00 per cent), recommended varieties (83.33 per cent) and chemicals for seed treatment (60.00 per cent) when compared to non-participants. It is quite evident that Farmer Field Schools train the farmers on all aspects related to cultivation practices in a participatory mode, farmers know about appropriate cultivation practices. Where it is not so in case of non-participants since they did not have the required knowledge due to their non-participation in FFS and less exposure to other source of information.

Regarding fertilisers, majority of the participants had correct knowledge about recommended quantity of farm yard manure (66.67 per cent), nitrogen fertiliser (78.33 per cent), phosphorous fertiliser (81.67 per cent), potassic fertiliser (73.33 per cent) and dosage of fertilisers at the time of sowing (71.61 per cent) whereas less number of non-participants (41.67 per cent) knew the recommended quantity of farm yard manure, nitrogen fertiliser (51.67 per cent), phosphorous fertiliser (55.00 per cent), potassic fertiliser (50.00 per cent) and dosage of fertilisers at sowing time (61.67 per cent). In farmer field schools, IPM and INM are given prime importance, as a result most of the participants had required knowledge about the organic and inorganic fertilisers as they are exposed to it and gave more importance to conservational agriculture as their prime motto in this method. Hence, the participants of farmer field schools are influenced to use organic manures extensively in their field along with the chemical fertilisers wherever required.

Regarding irrigation requirement, more than half of both the participants and non-participants had correct knowledge. Regarding pest and diseases, sufficient number of participants had correct knowledge when compared to non-participants viz., difference between beneficial and harmful insects (76.67 per cent), difference between pest and disease (88.33 per cent), difference between fungicide and insecticide (78.33 per cent), name of the insect pest attacked (66.67 per cent) and name of the diseases attacked (65.00 per cent). In case of integrated pest management, majority of participants had correct knowledge on aspects like trap crop (61.67 per cent), NSKE (58.33 per cent), pheromone trap (56.67 per cent), panchagavya (50.00 per cent). Regarding suitable time for inter-cultural operations, majority of both the respondents had correct knowledge (78.33 per cent and 56.67 per cent). Participants influenced by FFS carry out regular experiments in the field since farmers are regularly exposed to different IPM practices and educating themselves regarding pest and disease management.

With respect to integrated nutrient management (INM), majority of participants had correct knowledge about application of tank silt (85.00 per cent), FYM/compost (93.33

per cent), vermicompost (61.67 per cent), green leaf manure (63.33 per cent) and neem cake (76.67 per cent) when compared to non-participants who have knowledge on tank silt (66.67 per cent), FYM/compost (71.67 per cent), vermicompost (35.00 per cent), green leaf manure (31.67 per cent) and neem cake (23.33 per cent). Since conservation agriculture is a part of FFS where farmers will be trained on these practices which involve the way of growing crops that conserve the soil and maintain soil fertility. Participant farmers know about the importance of the FYM, vermicompost and other organic manures in the field to maintain soil structure and fertility. Hence, most of the participant farmers have knowledge about these.

Regarding bio-fertilisers, more than ninety per cent of both participants and non-participants did not have correct knowledge. Further, majority of both the respondents had correct knowledge about optimum time of harvesting. The reason for low knowledge regarding bio-fertilisers may be due to complex technology of biological practices, non-availability of bio-fertilisers, cost of the technology and lack of desired risk involved. The reason for low knowledge level of non-participants about cultivation practices may be due to lack of participation in FFS, low mass media exposure, medium cosmopoliteness and low extension contact as revealed in the study. Also, the complexity involved, understanding of the above practices and cost involved might be the reasons for low knowledge level of non-participants. The findings of the study are in conformity with Sakharkar (1992), Intodia and Sharma (1993), Krishnamurthy and Veerabhadraiah (1999) and Parthasarathi and Govind (2001).

Association Between Knowledge Level and Independent Variables

The association between dependent and independent variables was studied by using statistical test chi-square test. The contingency coefficient (c) of participants and their knowledge presented in Table 3 shows that among eleven variables taken up for the study, variables like age, education, extension participation and extension contact are highly significantly associated with knowledge. variables like mass media exposure and achievement motivation had significant association with knowledge level of the respondents whereas, variables like landholding, organisational participation, cosmopoliteness, economic orientation, innovative proneness were not significantly associated with knowledge level of participants of farmer field schools.

Contingency Coefficient (c) of non-participants and their knowledge level showed that among eleven variables, variables like education, mass media exposure, extension contact, cosmopoliteness had highly significant association with knowledge. Age, landholding, extension participation and innovative proneness are significantly associated with knowledge level of the respondents. Whereas, variables like organisational participation, economic orientation and achievement motivation are not significantly associated with knowledge level of non-participants of farmer field schools.

Table 3: Association Between Knowledge Level of Participants and Non-participants of Farmer Field Schools and Independent Variables

S.No.	Independent variables	Participants (N=60)		Non-Participants (N=60)	
		Chi-square	Contingency coefficient	Chi-square (c)	Contingency coefficient
1.	Age	15.957**	0.901	11.285*	0.398
2.	Education	18.473**	0.927	18.398 **	0.484
3.	Landholding	3.059 NS	0.625	10.274*	0.382
4.	Mass media exposure	11.846*	0.848	18.537**	0.486
5.	Extension participation	16.362**	0.906	11.846*	0.406
6.	Extension contact	20.647**	0.947	19.453**	0.495
7.	Organisational participation	3.683 NS	0.653	8.2784NS	0.348
8.	Cosmopoliteness	6.353 NS	0.741	16.374**	0.463
9.	Economic orientation	5.893 NS	0.728	6.2739NS	0.307
10.	Achievement motivation	12.594*	0.859	8.263NS	0.348
11.	Innovative proneness	6.538NS	0.745	11.284*	0.398

**-significant at 1% level,*-significant at 5% level, NS-Non-significant.

There was a highly significant association between age and knowledge level of FFS participant maize growers since the young farmers are more receptive to new ideas and make efforts to gain higher knowledge. In case of non-participant maize growers of FFS there was a significant association between age and knowledge level. The results of the study are supported by the findings of Krishnamurthy and Veerabhadraiah (1999).

Education had highly significant association with knowledge level of maize growers who are the participants of FFS. The possible reason could be that education was found to have significant influence on the rational decision making. Also, educated farmers were having better opportunities to acquire more scientific information by the way of mass media contact, printed materials, interaction with the scientists and extension workers to clarify doubts in scientific practices. The study reveals that among the respondents selected, majority of them were young and middle aged. As these categories of farmers are more receptive to new technology, education had significant influence on knowledge. The findings are in line with the findings of Subashini and Thyagarajan (2000).

Landholding had significant association with knowledge level of non-participant maize growers of FFS and not so in case of participants. The possible reason could be that

the large landholdings might have necessitated the farmers to acquire more knowledge.

There was a significant association between knowledge level of participants of FFS and their extent of exposure to mass media. It is logicaly true that educated farmers with more exposure to mass media will have more knowledge. Mass media exposure had highly significant association with knowledge level of non-participant maize growers of FFS. This is because mass media provides ample opportunity for the farmers for exposure to new technology.

The extension participation and the knowledge level of participants of FFS was found to have highly significant association. Extension activities conducted as a part of FFS in the area have direct effect on gain in knowledge level about cultivation practices of maize. It is essential to increase their participation so that their knowledge level would be increased. Extension participation had significant association with knowledge level of non-participants of FFS maize growers as well. The possible reason could be that extension activities conducted in and around the area have direct and indirect effect on gain in knowledge.

There was a highly significant association between extension contact of participants of FFS and their knowledge level. This may be due to the reason that the contact of extension worker and his suggestions would help to increase the knowledge of the farmers. There was a highly significant association between extension contact of non-participants and their knowledge level. This may be due to the reason that the contact of extension worker and his suggestions would help to increase the knowledge of the farmer. The findings of the study are in conformity with results of Anasuya (1997) and Nirmala Devi and Manoharan (1999)

The association between organisational participation and knowledge was found to have been non-significant in both the cases of participants and non-participants. The possible reason may be, mere participation in gram panchayat, taluk panchayat and zilla panchayat might not have helped them to acquire knowledge. Further, FFS involves any farmers irrespective of their participation in any organisation.

Cosmopoliteness and knowledge was found to have non-significant association. It was well accepted that the cosmopoliteness of the farmers increases the contact with outside world so that individual may expose to the new ideas but here in this case FFS farmers obtain all the necessary knowledge in their fields itself and minimum knowledge from outside. In case of non-participants, the association between cosmopoliteness and knowledge was found to be highly significant.

There was no significant association between farmers' economic orientation and their knowledge level. This may be due to the fact that the participants are not ready to take the risk in case of the high returns and tried to gain more returns within their existing farming systems through better technologies. The findings are in line with the results obtained by Anasuya (1997).

The achievement motivation and the knowledge level of participant maize growers was found to be significantly associated. It may be due to the fact that respondents with higher achievement orientation would actively participate in extension methods like FFS and acquire more knowledge. There was a non-significant association between achievement motivation and the knowledge level of non-participant maize growers. It must be owing to the fact that, most of the non-participants have not participated in FFS due to low and medium achievement motivation.

There was a non-significant association between participants' innovative proneness and their knowledge level. It may be due to the reason that high innovative proneness might have not helped the farmers to enhance their knowledge. There was a significant association between non-participants' innovative proneness and their knowledge level. This may be due to the reason that a farmer who is highly proned to new technology would try to know more about them to satisfy his needs. The findings of the study support the results obtained by Anasuya (1997).

It is clear from the results that age, education, extension contact and extension participation contributed significantly towards knowledge level of participants of FFS which needs attention from different agencies to design programmes/activities accordingly.

Conclusion

The results of this study showed that an extension service to the people through the farmer field school is a better option to the changing scenario. As a participatory approach, it could produce some striking features on the basis of which one can conclude that the process of technology development has always been the same, but the difference between these two categories of respondents indicates that the FFS has proved its effectiveness. The findings of the study on knowledge level of participants and non-participants regarding cultivation practices of maize have shown that the FFS has proved its worth in enhancing the knowledge of the maize growers with respect to recommended cultivation practices of maize which shows that the farmer field schools have significantly influenced the farmers to gain the knowledge related to the improved technologies. On the basis of this, it is recommended that the FFS approach should be encouraged as an intensive teaching method to enhance adoption of critical technologies. Efforts should be made to extend it to different states of the country on a wide range of crops with well trained facilitators for an effective take-off. Further, FFS on food crops would further enhance food production to meet the food crisis of the country. New and vigorous drive should be made to set up small groups where the FFS farmers can become trainers or facilitators of other farmers. Therefore, the planners and administrators can make policy to promote the FFS concept as one of the extension tools for effective transfer of technology through the development departments.

References

1. Godtland Erin., Elisabeth Sadoulet., Alain De Janvry., Rinku Murgai., and Oscar Ortiz., (2003), The Impact of Farmer Field Schools on Knowledge and Productivity : A Study of Potato Farmers in the Peruvian Andes, Department of Agricultural & Resource Economics, *UCB*, Paper 963 :1-27.

2. Anasuya, A., (1997), Impact of Farmer Field School on Farming Community, M.Sc. (Agric.) Thesis, (Unpub.), Tamil Nadu Agricultural University, Madurai.

3. Braun Ann, R., Thiele, G. and Fernandez, M., (2000), Farmer Field Schools and Local Agricultural Research Committees : Complimentary Platforms for Integrated Decision Making in Sustainable Agriculture, Agricultural Research and Extension Network, Network Paper No. 105, Overseas Development Institute.

4. CIP-UPWARD, (2003), Farmer Field Schools : From IPM to Platforms for Learning and Empowerment, International Potato Center – Users' Perspectives with Agricultural Research and Development, Los Banos, Laguna, Phillippines, 87 pp.

5. Dilts, (2001), Scaling up the IPM Movement, LEISA Magazine, 17-3: 18-21.

6. Intodia, S. L. and Sharma, F.L., (1993), Technological Knowledge of Tribal Farmers, *Indian Journal of Extension Education*, 29(3&4) : 84-86.

7. Hagmann, J., Chuma, E., Connoly, M. and Murwira, K., (1998), Client Driven Change and Institutional Reform in Agricultural Extension : An Action Learning Experience from Zimbabwe, *Agricultural Research and Extension Network,* Network Paper No. 78.

8. Krishnamurthy, B. and Veerabhadraiah, V., (1999), Impact of IPM Farmer Field Schools Training Programme on Knowledge Level of Rice Farmers, Cur. Res., 28:125-127.

9. Nirmala Devi, M. and Manoharan, M., (1997), Adoption Level of Guava Cultivators - An Analytical Study, *Indian Journal of Extension Education*, 8(2):2723-2726.

10. Parthasarathi, S. and Govind, S., (2001), Knowledge of Trained and Untrained Farmers on IPM Practices, *Journal of Extension Education*, 13(1): 3293-3297.

11. Sakharkar, V.S., Nikhade, M.D and Bhople, S.R., (1992), Correlates of Knowledge and Adoption Behaviour of Soyabean Growers, *Maharashtra Journal of Extension Education,* 11: 212-217.

12. Subhashini, D. and Thyagarajan, S., (2000), Socio-Personal Characteristics of Tapioca Growers, *Journal of Extension Education,* 11 (1): 2723-2726.