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AN ASSESSMENT OF THE PERCEPTION OF FACILITATORS OF COTTON INTEGRATED PEST MANAGEMENT PROGRAMME IN SINDH PROVINCE OF PAKISTAN

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ABSTRACT

The purpose of this study conducted in the Sindh province of Pakistan was to assess the performance of facilitator of agriculture extension during implementation of Farmer Field School (FFS) trainings in 2001 to 2004 in the context of FAO-EU-ADB funded National Integrated Pest Management Programme (Nat-IPM) for cotton. The basic principle of Nat-IPM programme was to enable farmers to be self-sufficient, using practices that are agro-ecological friendly. A survey study was carried out in four districts of Sindh province (Hyderabad, Tando Allahyar, Matiari, and Mirpurkhas). The sample size comprised of 48 facilitators who participated in Training of Facilitators (ToF) and ran FFSs. The present study revealed that despite of some constraints, facilitators performed effectively during training activities that shows FFS was a favorable process for learning IPM practices with special reference to cotton crop. Results of present study a confirmation of the adoption and a validation of IPM-FFS as a successful extension approach in Sindh province of Pakistan.

***Key words*:** Integrated Pest Management (IPM), Farmer Field School (FFS), Training of Facilitators (ToF)

INTRODUCTION

Pakistan is the territory of cotton (*Gossypium hirsutum L*) and big source of livelihood to around 1.5million farmers in the rural areas. Cotton is a main source of export capital, accounts for 6.9% of value added in agriculture and 1.4% of GDP. Pakistan is the world's 4th biggest cotton producing country after China, India, and USA. The world cotton production is projected at 24.8million t, during 2010/11 as against 22.01million t recorded in 2009/10, estimating an increase of 12.6%. Production is expected to continue to increase 11% to a record of 27.6 million t in 2011/12 (GoP 2011). Despite of being one of the largest cotton growing countries, the cotton production in Pakistan is low as compared to other countries. Low cotton production is accounted for the weather conditions, pests attack and little awareness of applying scientific and pest management techniques by farmers.

The FAO-EU Regional Project was designed for the capacity building of the extension field workers of Agricultural Extension Department and farmers through IPM-FFS program to grow eco-friendly cotton crop. The FAO-EU funded cotton IPM program suits into the ground realties of the Pakistan and major attempt to introduce agro-eco-logical sound IPM practices. IPM program played key role in mobilizing and strengthening the farming families as FFSs improved the management skills for environment friendly agriculture and rural development. Cotton IPM program officials with other coordinators have substantially benefited many existing methods and future plans to decrease poverty and safeguard the natural resource of the Pakistan (FAO 2004).

Various studies regarding Integrated Pest Management (IPM) programs were agreed in end that Farmer Field School (FFS) strengthens farmers' ecological knowledge (Thiele *et al.* 2001; Rola *et al.* 2002; Feder *et al.* 2004; Reddy and Suryamani 2005; Tripp *et al.* 2005). The information about understanding the crop ecosystem leads reduction in the pesticides use and at the same time increases production and profit, for instance, in the cotton production systems (Godtland *et al.* 2004; Khan *et al.* 2005). The FFS is a training model developed primarily by FAO in which farmers gain the decision making power regarding use of agrochemicals at their field. This unique extension

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approach is action-learning oriented where farmers are allowed to observe, analyze and make alternative decision about their crops (Kingsley 1999).

During the four years 2001 to 2004, Sindh province had embraced IPM-FFS as the dominant interface between facilitators' of agriculture extension and farmers. It was assumed that through this new training approach, facilitators would change the farmers' traditional role from passive learner to active learner. The purpose of this study was to record facilitators perception about their performance and to identify the barriers/constraints faced during IPM-FFS training program in selected districts of Sindh province.

MATERIAL AND METHODS

The literature review indicated that various research designs were used to measure the perception of facilitators including self-report measures, observations, and personal interviews. In view of the proposed study thus featured a descriptive survey research. Descriptive survey research has evolved over the years to become a popular methodology among educational researchers (McMillan 2008).

Four districts of Sindh province were selected as study area viz., Hyderabad, Tando Allahyar, Matiari and Mirpurkhas, where IPM-FFSs were established during 2001 to 2004 for cotton through Nat-IPM program. List of the facilitators who were participated in Training of Facilitators (ToFs) and involved in IPM-FFS trainings obtained from Nat. IPM program coordinator, Director General, Agricultural Extension Wing, Hyderabad, Sindh and total sample of 48 was taken. The study revolved around facilitators and intended to collect self reported information of facilitators with regard to IPM-FFS training program. Questionnaire was developed in consultation with the subject specialists and help of available literature. The concepts or ideas were usually measured through different statements on a continuum ranging from negative to positive. IBM-SPSS version 19 was used for data analysis. Frequency, mean, percentage, and standard deviation were calculated. Survey was conducted for this study during the period March to September 2009.

RESULTS AND DISCUSSION

Most of the facilitators (87%) were falling into the age group of 41 - 50 years (table 1). Majority of facilitators had MSc degree (91%) and were Agriculture Officers (70%). Large number of facilitators (95) had professional experience in the range between 11 - 20 years and most of them involved in IPM-FFS training program in the interest of their self development.

Site/Plot selection criteria: The facilitators were asked to disclose on plot/site selection criterion considered for the establishment of IPM-FFS and the responses (table 2) indicated that 80% of the respondents established the IPM-FFS in cotton areas; while 83% considered the area with irrigation water availability. About 80% considered and established FFSs in areas of transport availability while some 61% facilitators considered areas having serious pest problem. However, 57% of the facilitators did not consider land fertility as the criteria for establishment of FFS training.

Table 1: Demographic characteristics of facilitators

Characteristics	Category	F	P
Age Group (in years)	20 to 30	00	0.0
	31 to 40	4	8.5
	41 to 50	41	87.2
	51 to 60	2	4.3
Educational Qualification (in years)	Diploma	4	8.5
	B.Sc.	00	0.0
	M.Sc.	43	91.5
	M. Phil.	00	0.0
	Ph.D.	00	0.0
Designation	Field Assistant	4	8.5
	Agriculture Officer	33	70.2
	Deputy District Officer	6	12.8
	District Officer	3	6.4
	Executive District Officer	1	2.1
Professional Experience (in years)	Less than 10	00	0.0
	11 to 20	45	95.7
	21 to 30	2	4.3
	31 to 40	00	0.0
Intention to Involve in IPM-FFS	Self Development	32	68.1
	Government Interest	7	14.9
	Incentives Attraction	4	8.5
	Colleagues Motivation	4	8.5

F = Frequency, **P** = Percentage

Selection criteria of IPM-FFS participants: For obtaining the perception on participants selection criterion considered by facilitators for

Table 2: Site/Plot selection criteria

Site Selection Criteria	Yes		No	
	F	P	F	P
1 Cotton Area	38	80.9	9	19.1
2 Land Fertility	20	42.6	27	57.4
3 Irrigation Availability	39	83.0	8	17.0
4 Pest Management Problem	29	61.7	18	38.3
5 Excessive Use of Inputs	26	55.3	21	44.7
6 Transportation Availability	38	80.9	9	19.1

F = Frequency, **P** = Percentage

IPM-FFS training, 13 options were offered and more than 90% of the respondents disagreed the options that participants for IPM-FFS training considered on the basis of same age group, wealth status, marital status, language basis, religion basis, political affiliation and relationship with the facilitators. Selection of participants by more than 80 percent respondents was disagreed the criterion of qualification/ education level, farm size ownership and status in community; while more than 60% disagreed the criterion supposed to be on farming experience and extent of knowledge on cotton. However, majority of respondents (97.9%) advocated that the selection of participants for IPM-FFS training considered on the basis of farmers' own interest (table 3). Similar results have been reviewed from the study of Praneetvatakul and Waibel (2006) that investigated the economic efficiency of investment in FFS trainings and reported that IPM programmes are successful because the farmers intentionally participate in the IPM programmes and their own interest is the real cause of their association with the programmes.

Facilitators perception of IPM-FFS training program: Performance related to the self assessment of facilitators was examined using five points Likert scale and responses of the facilitators on the basis of mean and standard deviation are reported in (table 4). The facilitators were asked whether their facilitation skills improved during ToF, they were 'strongly agree' (4.17±0.78) over this assessment; while similar ranking was offered by the facilitators (4.13±0.85) when they were asked whether IPM-FFS helped them to interact with farmers regularly and timely basis. The facilitators also strongly agreed (4.21±0.93) that extension utilized its manpower and played a vital role in IPM-FFS. Ranking of responses of facilitators on different statements about IPM-FFS further indicates that they 'strongly agreed' on impacts of IPM-FFS environment on establishment of relationship with the farmers (3.98±0.96); reliability of IPM-FFS training method for extension as well as acceptable to a common farmer (3.89±1.14); resources and funds availability play key role in success of IPM-FFS (3.74±1.18); IPM-FFS being more appropriate method to disseminate production technologies than existing measures (3.72±1.03); participatory approach of IPM-FFS eliminated the gap between facilitators and farmer (3.70±1.14); while statement i.e. 'appreciation of IPM-FFS officials encourage facilitators to perform more efficiently' 'agreed' (3.47±1.31); monitoring and evaluation may be the factor in success of IPM-FFS program (3.43±1.22); facilitators identified real problems with farmers through IPM-FFS (3.19±1.15) and incentives would increase the interest of facilitators to IPM-FFS (3.04±1.26). Although, some of the facilitators responded on statements about of IPM-FFS as strongly disagree, disagree or some did not respond on these statements; but the majority of the facilitators either 'agreed' or 'strongly agreed' on statements related to their performance performed during IPM-FFS training program. Kenmore (2002) concluded that FFS is a training approach that trains farmers to compare new techniques in systematic field assessment and it prepares extension agents for their new roles as facilitator and representatives of public problems and difficulties such as environmental conservation, health, social involvement and organization. Agricultural extension executes IPM-FFS programm to assist farmers build up their analytical skills, critical observation, and creativity and create confidence to take better decisions. Once farmers understand what they have to do in the field, the extension

Table 3: Selection criteria of IPM-FFS participants

Selection Criteria	Yes		No	
	F	P	F	P
1 Same Age Group	3	6.4	44	93.6
2 Qualification/Education	7	14.9	40	85.1
3 Farming Experience	15	31.9	32	68.1
4 Knowledge of Cotton	17	36.2	30	63.8
5 Farmers Own Interest	46	97.9	1	2.1
6 Farm Size Ownership	5	10.6	42	89.4
7 Wealth Status	3	6.4	44	93.6
8 Status in Community	6	12.8	41	87.2
9 Marital Status	1	2.1	46	97.9
10 Language Basis	2	4.3	45	95.7
11 Religion Basis	1	2.1	46	97.9
12 Political Affiliation	1	2.1	46	97.9
13 Facilitators Relationship	1	2.1	46	97.9

F = Frequency, **P** = Percentage

Table 4: Perceptions of facilitators with regard to IPM-FFS

	Performance Related Statements	Strongly Disagree	Dis agree	Un-decided	Agree	Strongly Agree	M	SD
		P	P	P	P	P		
1	Training of Facilitators (ToF) improved facilitation skills of facilitators.	2.1	2.1	4.3	59.6	31.9	4.17	0.78
2	IPM-FFS helped facilitators to interact with farmers timely and on regular basis.	2.1	4.3	4.3	57.4	31.9	4.13	0.85
3	IPM-FFS environment helped facilitators to establish working relationship with farmers.	2.1	8.5	8.5	51.1	29.8	3.98	0.96
4	Participatory approach of IPM-FFS eliminated the gap between facilitators and farmers.	8.5	6.4	12.8	51.1	21.3	3.70	1.14
5	Incentives increased the interest of facilitators to involve in IPM-FFS programme.	12.8	25.5	19.1	29.8	12.8	3.04	1.26
6	Facilitators identified real problems of farmers' during IPM-FFS programme.	8.5	21.3	23.4	36.2	10.6	3.19	1.15
7	Appreciation by the officials encouraged facilitators to perform more efficiently.	12.8	14.9	4.3	48.9	19.1	3.47	1.31
8	Availability of operational funds was main reason in the success of IPM-FFS.	6.4	12.8	8.5	44.7	27.7	3.74	1.18
9	Monitoring and evaluation was key factor in the success of IPM-FFS programme.	8.5	17.0	17.0	38.3	19.1	3.43	1.22
10	Extension utilized its manpower and played a vital role in IPM-FFS programme.	2.1	6.4	2.1	46.8	42.6	4.21	0.93
11	FFS is appropriate methodology to disseminate IPM knowledge.	4.3	8.5	19.1	46.8	21.3	3.72	1.03
12	IPM-FFS is reliable extension method & acceptable to a common farmer.	4.3	14.9	0.0	48.9	31.9	3.89	1.14

F = Frequency: P = Percentage: M = Mean: SD = Standard deviation

agent takes back seat and guides them when asked to do so.

Ranking of barriers faced by facilitators during IPM-FFS training: The barriers faced by the facilitators during IPM-FFS activities were also ranked. Perceptions of the facilitators (table 5) indicated that 'Non-availability of IPM items for agro-ecological sound farming' has been the top ranking barrier; while 'lack of participatory approach between farmers' ranked 2nd and 'lack of resources and timely availability of funds' ranked as 3rd most important constraint as perceived by the facilitators at IPM-FFS activities. Late coming of the participants at IPM-FFS training was a barrier with facilitators ranked 4th, while 5th ranking barrier was that the farmers consider that pesticides application is easy and no need to go for agro-ecological sound IPM practices. Similarly, the polite dealing of the facilitators with IPM-FFS participants developed ignorance and lack of enthusiasm among participants, this barrier for facilitators ranked 6th, while regularity of the facilitators in IPM-FFS activities is linked with extra benefits of the facilitators by the participants is also a constraint and was

Table 5: Rank wise barriers/constraints faced by facilitators while IPM-FFS training programme

Barriers/Constraints	Rank Order
Non-availability of IPM items for agro-ecological sound farming.	1st
Lack of participatory approach between farmers was one of the problems during IPM-FFS activities.	2nd
IPM-FFS was appropriate methodology to disseminate agro-ecological sound practices but lack of resources and timely availability of funds were constraints.	3rd
Participants usually came late in IPM-FFS training so that group formation was not formed properly till group members completed.	4th
Farmers considered that pesticides are easy to apply so they felt that it's useless to go for agro-ecological sound IPM practices.	5th
As facilitators dealt politely with IPM-FFS participants so some participants ignored and not participated enthusiastically.	6th
Facilitators run IPM-FFS regularly so some participants thought that facilitator is compelled and they expected extra benefit to attend the IPM-FFS training.	7th
All farmers were not practicing cotton farmers so difficult to make them understand the difference between harmful and beneficial insect pests.	8th
All farmers were not decision makers himself so participants were compelled to follow instruction by manager/landlord.	9th
Some farmers were not interested in all IPM-FFS activities i.e. CESA, Sheet preparation and presentation.	10th

ranked 7th. The problem that is a barrier and ranked 8th was that not all farmers cultivate cotton and difficult to make them understand the difference between harmful and beneficial insect pests; while most farmers do not make farming decisions by themselves and participants were compelled to follow instruction by manager/landlord received 9th ranking. The 10th ranking was developed for the barrier that some farmers were not interested in all IPM-FFS activities i.e. CESA, sheet preparation and presentation. Somewhat similar findings were found by Chukwuone *et al*. (2006) who described that major constraints that affect technology transfer process are extension system lapses, lack of cooperation by farmers, uncertainties experienced in agriculture, and conflicts among farmers.

CONCLUSION

IPM-FFS were established in those areas where easy accessibility and facilities available, not in the areas infested with pests, excessive use of pesticides and less cotton production. With regard to selection of farmers for IPM-FFS training, wealth, farm-size ownership, and caliber in society have not been considered. The paper recommends that facilitators should not select site plot and participants by their choice but on the basis of need of farming communities. Despite the problems facilitators had to face during IPM-FFS training program; this study revealed, that the facilitators showed positive attitude in relation to overall IPM-FFS training program that is confirmation of the adoption and a validation of FFS as a successful extension training method to disseminate IPM knowledge among farmers.

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