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Alternative Extension Approaches to Technology Utilization for Sustainable Agriculture in the Punjab, Pakistan

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ABSTRACT

Technology utilization by farmers is an important factor, which can boost the agricultural production. For this purpose extension agencies need to put more efforts in creating awareness and facilitating the farmers for the utilization of agricultural technology. Presently three extension approaches are mainly working in the Punjab province i.e., Public Sector Extension Approach (PSEA), Participatory Extension Approach (PEA) and Commodity Specialized Extension Approach (CSEA). The present paper is based on a study conducted to analyze these extension approaches in the context of technology utilization by farmers. District Faisalabad was selected as study. Out of the five tehsils of district Faisalabad Chak Jhumra was randomly selected. Ten villages from this tehsil were taken at random, where all the three approaches were in operation and 12 farmers under each approach were randomly selected from each selected village thereby making a sample of 360 respondents. The data were collected with the help of a pre-tested, interview schedule. The analysis of the data show that PSEA was at the top followed by PEA and CSEA with regard to the utilization of agricultural technologies as perceived by the respondents. PSEA was significantly different from rest of the two approaches, whereas PEA and CSEA were non-significantly different from each other when compared in respect of technology utilization by the farmers. As indicated by the weighted scores, PEA was more effective than the other two approaches in helping the farmers and providing them technical assistance regarding technology utilization for crop production. PSEA and PEA were non-significantly different from each other when compared for providing facilitation in the utilization technologies to their registered growers, whereas CSEA was significantly different from rest of the two approaches.

Key Words: Technology utilization; Sustainable agriculture; Extension approach

INTRODUCTION

Agricultural productivity in the developing countries continues to be low and it is generally believed that non-adoption of research results by majority of farmers is the main reason for this situation. The adoption of technology by the farmers can be influenced by educating them about the improved farm practices, optimal use of inputs, prices and market conditions, methods of production management and storage of agricultural produce through an effective extension approach (Anderson & Greshon, 2003). In addition, there are many other and issues, which require attention of the experts in the field of agricultural extension, if extension is to perform its function adequately and effectively. The extension services are an important element with the array of market and non-market, entities and agents that provide human capital enhancing inputs, as well as flows of information that can improve farmers' and rural people's welfare and crop production (Garthforth, 1982; Jarret, 1985; Roberts, 1989). There is a need for such an extension strategy in which the concepts of shared vision, knowledge about sustainability, teamwork, gross-root involvement and systems thinking in research and problem solving, can be introduced (Minarovic & Mueller, 2000). Mainly there are three extension approaches, which are working in the study area for the education and motivation of farmers. These approaches are public sector extension approach (PSEA), participatory extension approach (PEA) and commodity specialized extension approach (CSEA). PSEA is working under the umbrella of Department of Agriculture (Extension Wing), Government of the Punjab and is mainly concerned with the crop sector and is responsible for the motivation and education of farmers through various extension techniques; whereas, PEA is working under the Punjab Rural Support Programme (PRSP). This approach is primarily engaged in the organization of people, while educating them regarding crop production, animal health, rural infrastructure development, capital formation through savings and disbursement of loans for agricultural and rural development activities (PRSP, 2005). The CSEA deals with the guidance and education of its registered growers regarding the quality production of sugarcane in the study area. The procurement of the sugarcane from the farmers is its main concern. Besides this the EFS of this approach provide technical assistance to their farmers for production of bumper crop so that the commodity organization may get sufficient sugarcane for their mills (Chauhdary, 2006). It is evident from the above

discussion that all the approaches are making efforts to one or the other way to help and guide the farmers to make best use of the technologies being advocated by their staff. The present paper is based on a study conducted analyze these three extension approaches with its main focus on the technology utilization by the farmers under the said approaches.

METHODOLOGY

Faisalabad being an important agricultural district in the central mix cropping zone of the Punjab province was selected as the study area. The extension approaches PSEA, PEA and CSEA are simultaneously in operation in the study area. Out of five tehsils, Chak Jhumra was selected randomly. Ten villages from this tehsil were taken at random and 12 farmers under each approach were randomly selected from the 10 selected villages making a sample of 360 respondents. The data were collected with the help of an interview schedule, which was pre-tested for its validity and reliability before data collection. The data thus collected were analyzed through the computer software (SPSS). Frequencies, standard deviation mean, analysis of variance and LSD values were computed to draw the conclusions.

RESULTS AND DISCUSSION

The data concerning farmers' perceptions with regard to technology utilization presented in Table I revealed that the role of PSEA in the utilization of crop production/protection practices by farmers was rated as good with regard to the practices such as land preparation, improved varieties and seed rate/plant population, which reflected that the extension field staff (EFS) of PSEA had exerted a lot in educating and motivating farmers regarding the utilization of these recommendations. The utilization of the practices such as sowing methods, irrigation methods and fertilizer application were rated as satisfactory tending towards good, which indicated that these practices were emphasized by the EFS, making the farmers to use them up to above average level. The respondents rated the utilization of the production/protection practices as fair tending towards satisfactory: such practices included application of weedicides, chemical control of insects/pests and mechanical control of insects/pests. The rating of the respondents was poor, tending towards fair, about the practices such as integrated pest management, harvesting practices, post harvest technology and marketing of produce. The result indicate that the EFS of PSEA were not putting in serious efforts in motivating the farmers regarding the utilization of these practices.

In case of PEA, the utilization of sustainable agricultural practices by the farmers was rated as fair, tending towards satisfactory; these practices were land preparation, improved varieties, seed rate/plant population and sowing methods. This fair rating by the respondents meant that these practices were focused to an average level by EFS of PEA. The practices like irrigation methods and fertilizer application were also rated as fair with regard to their adoption by the respondents. The utilization of the practices like cultural methods for weed eradication, application of weedicicdes, mechanical control of insects/pests, biological control of insects/pests and chemical control of insects/pests was rated as poor, tending towards fair, which tended to show that these practices were less focused by the EFS of PEA. The practices, which were rated as poor by the respondents were integrated pest management, harvesting practices, post harvest technology and marketing of produce.

In case of CSEA improved varieties, land preparation, seed rate/plant population, sowing methods and irrigation methods were the practices, which were rated fair tending towards satisfactory. This could mean that these practices were focused by the staff of CSEA. The respondents rated the practices such as cultural methods for weeds eradication, application of weedicides, mechanical control of insect/pests, biological control of insect/pests and chemical control of insect/pests as poor tending towards satisfactory with regard to their utilization.

The practices, which were almost ignored by the CSEA included integrated pest management, harvesting practices, post harvest technology and marketing of the produce. This means that the EFS of CSEA did not pay due attention to these practices.

When all the three approaches were compared with each other with regard to their role in the technology utilization regarding sustainable agricultural development, PSEA was found significantly different from rest of the two approaches (PEA & CSEA), whereas PEA and CSEA were non-significantly different from one another.

The PSEA appeared to be the best among all the three approaches. This shows that the EFS of PSEA made serious efforts for introducing the agricultural technologies among the farmers and had properly motivated them for their adoption.

Agricultural technology utilization is the key to success towards an increased agricultural production. There are certain pre-requisites through, which the process of technology utilization can be enhanced and the farmers may be in a better position to adopt the new and improved agricultural recommendations. These pre-requisites may include the technical assistance, provision of credit and quality inputs and proper marketing for the disposal of agricultural commodities, because non-availability of these factors may lead to non-adoption of improved agricultural technologies by the farmers (Feder *et al*,. 1986; Kalarathy & Antithakumari, 1998). It is usually not enough for an extension approach to tell farmers to use a farm input, extension must assist its clients to obtain financial resources to purchase the input. It means that extension must go beyond information dissemination to breaking bottlenecks inhibiting small farmers in the utilization of that information

Table I. Weighted scores (WS), rank order and mean ± S.D with LSD-value for the extension approaches with regard to their role in the utilization of agricultural technologies

Crop production / protection practices	PSEA			PEA			CSEA			LSD-value	
	WS	Rank	Mean ± S.D	WS	Rank	Mean ± S.D	WS	Rank	Mean ± S.D		
1) Land preparation	492	2	4.10 ± 0.73 A	345	1	2.88 ± 1.21 B	344	2	2.87 ± 0.93 B	0.248	**
2) Improved varieties	498	1	4.15 ± 0.73 A	343	2	2.86 ± 1.21 B	346	1	2.88 ± 0.92 B	0.247	**
3) Seed rate / plant population	482	3	4.02 ± 0.84 A	324	3	2.70 ± 1.13 B	331	3	2.76 ± 0.88 B	0.243	**
4) Sowing methods	458	4	3.82 ± 0.82 A	305	4	2.54 ± 1.04 B	312	4	2.60 ± 0.89 B	0.234	**
5) Irrigation methods	433	5	3.61 ± 0.92 A	282	5	2.35 ± 0.96 B	305	5	2.54 ± 0.92 B	0.237	**
6) Fertilizer application	419	6	3.49 ± 0.90 A	268	6	2.23 ± 0.90 B	278	6	2.32 ± 0.93 B	0.231	**
7) Cultural methods for weed eradication	298	10	2.48 ± 0.93 A	226	8	1.88 ± 0.79 B	215	8	1.79 ± 0.79 B	0.213	**
8) Application of weedicides	340	7	2.83 ± 0.77 A	229	7	1.91 ± 0.79 B	230	7	1.92 ± 0.75 B	0.195	**
9) Mechanical control of insects/pests	303	9	2.11 ± 0.82 A	207	10	1.73 ± 0.70 B	201	11	1.68 ± 0.68 B	0.186	**
10) Biological control of insects/pests	254	11	2.12 ± 0.85 A	202	11	1.68 ± 0.70 B	203	10	1.69 ± 0.75 B	0.195	**
11) Chemical control of insects/pests	316	8	2.63 ± 0.93 A	223	9	1.86 ± 0.83 B	213	9	1.78 ± 0.83 B	0.220	**
12) Integrated pest management	209	12	1.74 ± 0.70 A	178	12	1.48 ± 0.59 B	164	12	1.37 ± 0.53 B	0.156	**
13) Harvesting practices	190	13	1.58 ± 0.64 A	162	13	1.35 ± 0.53 B	146	13	1.22 ± 0.43 B	0.138	**
14) Post harvest technology	184	14	1.53 ± 0.65 A	159	15	1.33 ± 0.54 B	143	15	1.19 ± 0.42 C	0.138	**
15) Marketing of the produce	183	15	1.53 ± 0.66 A	160	14	1.33 ± 0.57 B	144	14	1.20 ± 0.42 B	0.142	**
Overall mean	5059	-	2.78 ± 0.51 A	3613	-	2.01 ± 0.65 B	3575	-	1.99 ± 0.51 B	0.201	**

** = Highly significant (P<0.01), * = Significant (P<0.05), NS = Non-significant (P>0.05).
Means sharing similar letters in a row are statistically non-significant (P>0.05).

Table II. Weighted scores (WS), rank order and mean ± S.D with LSD-value for the extension approaches with regard to facilitating the utilization of agricultural technologies

Facilitation in		PSEA			PEA			CSEA			LSD-value	
		WS	Rank	Mean ± S.D	WS	Rank	Mean ± S.D	WS	Rank	Mean ± S.D		
1) Technical assistance		428	1	3.57 ± 0.72 A	370	2	3.08 ± 0.98 B	287	1	2.39 ± 0.73 C	0.207	**
2) Inputs:	a) Seeds	313	2	2.61 ± 0.63 A	270	4	2.25 ± 0.91 B	204	4	1.70 ± 0.66 C	0.188	**
	b) Fertilizers	289	4	2.41 ± 0.65 A	268	5	2.23 ± 0.90 A	183	5	1.53 ± 0.69 B	0.191	**
	c) Pesticides	287	5	2.39 ± 0.70 A	251	6	2.09 ± 0.90 B	181	6	1.51 ± 0.66 C	0.193	**
	d) Credit	259	6	2.16 ± 0.93 B	469	1	3.91 ± 1.43 A	218	3	1.82 ± 0.84 C	0.279	**
3) Marketing		312	3	2.60 ± 0.78 A	293	3	2.44 ± 0.82 A	236	2	1.97 ± 0.62 B	0.189	**
Overall mean		1888	-	2.62 ± 0.51 A	1921	-	2.67 ± 0.84 A	1309	-	1.82 ± 0.57 B	0.207	**

** = Highly significant (P<0.01), * = Significant (P<0.05), NS = Non-significant (P>0.05).
Means sharing similar letters in a row are statistically non-significant (P>0.05).

(Ntifo-Siaw & Agunga, 1984). For a successful and an appropriate extension approach it seems necessary to facilitate the farmers in the effective utilization of agricultural technologies and to help them to meet the requirements essential for technology utilization. Keeping in view these facts it was thought necessary to ask the farmers about this important aspect. The data regarding this aspect are presented in Table II indicate that the facilitations in the form of technical assistance to the respondents with regard to the utilization of agricultural technologies provided by the EFS of PSEA were rated as satisfactory tending towards good. It implies that EFS of PSEA made above average efforts in providing help to the farmers for the utilization of sustainable agricultural technologies. The help, which the EFS of PSEA had rendered with regard to the acquisition of inputs like fertilizers, pesticides and credit were rated as fair, whereas the facilitation regarding the acquisition of seed and marketing of agricultural produce was rated as fair tending towards satisfactory. This again reflects that the EFS of PSEA had made below average level efforts in providing help/facilitation to the farmers in acquiring agricultural inputs for their crops.

The technical assistance provided by the EFS of PEA regarding the utilization of agricultural technologies was satisfactory as reported by the respondents, which means that the EFS under PEA made average level efforts in guiding their registered growers about the recommended agricultural practices. The help rendered by the EFS of PEA in facilitating the availability of inputs like fertilizers, pesticides and marketing of agricultural produce was rated as fair, whereas the facilitations provided under PEA with regard to credit was rated as satisfactory tending towards good. This indicates that more emphasis was laid on the credit facilities for the utilization of agricultural technologies. The facilitation regarding other inputs had not been provided properly.

The technical assistance provided by the EFS of CSEA for the utilization of agricultural technologies to its growers was rated as fair by the respondents. The help provided by the EFS of CSEA with regard to the availability of inputs was however rated as poor tending towards fair. This shows that proper attention was not given under CSEA in facilitating their registered growers regarding the utilization of agricultural technologies.

PSEA and PEA were not significantly different from each other when compared for facilitation in utilization of agricultural technologies by their farmers but were significantly different from CSEA. As evident from the weighted scores, PEA was more effective than the other two approaches (PSEA & CSEA) in helping the farmers and providing them technical assistance regarding technology utilization for crop production. From the above discussion it may be concluded that with all the three approaches, the farmers were not facilitated up to their entire satisfaction.

CONCLUSIONS

PSEA was at the top followed by PEA and CSEA with regard to the utilization of agricultural technologies as perceived by the respondents. PSEA was significantly different from rest of the two approaches, whereas PEA and CSEA were non-significantly different from each other when compared in respect of technology utilization by the farmers. PEA was more effective than the other two approaches in helping the farmers and providing them technical assistance regarding technology utilization for crop production. PSEA and PEA were non-significantly different from each other when compared for providing facilitation in the utilization technologies to their registered growers, whereas CSEA was significantly different from rest of the two approaches.

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