Research Article

Perceptions of Extension Field Staff Regarding Technology Transfer through Different Extension Approaches

Ejaz Ashraf[1]*, Hafiz Khuram Sharjeel[1], Raheel Babar[2], Muhammad Junaid[1], Qamar Iqbal[3], Rabia Rasheed[1] and Nosheen Fatima[1]

[1]College of Agriculture, University of Sargodha, Punjab-Pakistan; [2]Balochistan Agricultural College, Beleli, Quetta, Balochistan-Pakistan; [3]Department of Deputy District Officer Agriculture Extension, Sahiwal, Punjab-Pakistan.

Abstract | The study was conducted in district Sargodha, Punjab-Pakistan in 2016 to record and evaluate the performance of extension approaches and Extension Field Staff (EFS) in order to identify the weaknesses or failures behind extension system and to suggest recommendations for improvement in extension approaches and performance of EFS through census study. The total EFS population consists of 155 people and 121 respondents appeared for interview. The non response rate was 21.94%. The analysis showed that training and visit program and demonstration methods were dominant approaches used in technology transfer. The mean of the results showed that low allocation of budget, massive operational area to give satisfactory coverage, less use of multimedia, unavailability of training facilities to EFS, manifold duties assigned to extension officers and top-down dimension of planning of implementation of extension approaches were main weaknesses. The steps like effective evaluation of extension system, use of democratic nature extension approaches, and training facilities to EFS could improve working efficiency of Extension Field Staff and extension approaches thereby.

Received | January 05, 2017; **Accepted** | March 05, 2018; **Published** | April 19, 2018
***Correspondence** | Ejaz Ashraf, College of Agriculture, University of Sargodha, Punjab-Pakistan; **Email:** ejazashraf60@hotmail.com
Citation | Ashraf. E, H.K. Sharjeel, R. Babar, M. Junaid, Q. Iqbal, R. Rasheed and N. Fatima 2018. Perceptions of extension field staff regarding technology transfer through different extension approaches. *Sarhad Journal of Agriculture,* 34(2): 291-300.
DOI | http://dx.doi.org/10.17582/journal.sja/2018/34.2.291.300
Keywords | Extension field Staff, Training and visit program, Demonstration methods, Extension approaches, Effective evaluation

Introduction

National economies of number of countries in the world overwhelmingly depend on agricultural sector. Almost 62% of total population belongs to rural areas and 70% of urban population has direct or indirect linkage to rural areas. Agriculture is not only tagged to production of crops but also contributes in industrial growth of Pakistan by providing employment to 45% of people. Agriculture has significant contribution in reshaping the livelihood standards of the societies (Pickering, 1983). The present and future of developing countries including Pakistan is totally associated with agricultural sector. Therefore, development of agricultural sector can be said as the development of the country without any question. At present, agriculture sector in Pakistan is facing many challenges and problems towards sustainable agriculture development such as lacking in cultivable area, salinity and water logging, value addition and slow growth of agricultural products as per international standards, per hectare yield, poor agricultural infrastructure, uneconomic agricultural lands, conventional agricultural production practices, high cost of agricultural inputs and their inadequate supply, lack of adaptation of modern agricultural technologies like precision agriculture. In Pakistan, total yield of all crops is far less than the potential yield. In addition, average annual yield of crops is low as compared to average annual yield of other countries (Govt. of Pak, 2006). This is all because of farmers are not ready to adopt new technologies and recommen-

dations and neither EFS has developed any linkage among extension, research and farmers. The gap between current and potential yields can be minimized through conducting research at farmer's field, transfer of economically viable technologies, utilization of effective methods at right time for technology transfer and implementation of research recommendations (Kerkhof, 1990).

According to the literature the developed countries have argued that key to the increase per hectare yield lies in the adoption of modern agricultural technologies (FAO, 1985). Agriculture extension always contributes to improve socio-economic living standard of farmers as extension services deliver new information to the farmers for capacity building to adopt recommended information and technology. According to a report of United States Agency for International Development (2013) the sole purpose of Extension services is to help farmers to adopt ever changing production technologies for given environmental conditions to bring positive change in socioeconomic status.

Ashraf (2012) argues that extension system in Pakistan is the most significant wing of agriculture department and is the focal point of all agricultural activities. It is also a major source of learning of advanced agricultural technologies needs to be transferred to the farmers. The extension services still have some limitations like top-down dimension of policies, autocratic services system, huge land holdings by large scale farmers, lack of gender equality, and lack of youth involvement as partners in agricultural sector (Farooq & Ishaq, 2005).

Bajwa (2004) reported that public sector extension system has certain strengths and weaknesses. Over the years, several extension approaches have been implemented time to time in different parts of the world such as training and visit (T & V) program, demonstration method, individual and group contact methods, participatory extension approach, farm and home visit, field days, public sector extension approach, farming system research, farmer filed school, and model farms. The common objective of all approaches is to guide and educate farmers regarding exploitation of improved agricultural technologies to increase in farm productivity.

The overall focus of these approaches is to disseminate research based knowledge and technologies with participation of farmers in research activities and technology dissemination. These extension approaches involve face to face contact with farmers in group or as individually. Almost in all extension activities, field assistants are front-line workers who always in contact with farmers to educate and motivate them to understand their own issues and their solutions in the light of research results and applications.

This means that adoption of recommended research based information and technology depends upon effectiveness of extension approaches as well as performance of field staff. Therefore the present study has been conducted to identify effective extension methods for technology transfer that improved the pace of agricultural development.

Purpose and objectives of the study

The purpose of the study is to assess the perceptions of Extension Field Staff in dealing with different extension approaches as a tool for technology transfer.

To identify the demographic characteristics of Extension Field Staff.

- To assess the perceptions of EFS regarding competency to understand working of different extension approaches in technology transfer.
- To identify the level of effectiveness of different extension approaches.
- To assess the perceptions of EFS about weaknesses/failures of different extension approaches.
- To assess the perceptions of EFS regarding participation of farmers in activities at different steps of technology transfer process.
- To compile suggestions in view of the perceptions of EFS regarding improvement in different extension approaches and performance of Extension Field Staff.

Materials and Methods

Research Design

A descriptive survey method was used in the study. It is said that survey research determines the interest, behavior, perceptions, current status and many more characteristics of the participants. The study was conducted in district Sargodha, Punjab (Pakistan). Sargodha district comprised of six tehsils that are Sargodha, Sahiwal, Shahpur, Sillanwali, Bhalwal and Kot-momin. The dependent variables (responses) were related to the extension field staff knowledge,

their competency and extension approaches. The independent variables were demographic characteristics of extension field staff.

It was a perception recording survey, which is a recommended way of eliciting subjects' reflections regarding their past and present opinions of a phenomenon (Rivera et al., 1983). This type of survey research defines the competency, characteristics, behavior, and interest of respondents.

Population and Sample

There was only 155 field Staff of extension services those participated in the survey such as one Executive District Officer, one Horticultural Officer, six Deputy District Officers Agriculture, 20 Agricultural Officers, 10 Agricultural Inspectors, and 117 Field Assistants. All available employees of Agricultural Extension Department in District Sargodha served as population for the study. The complete count was taken as census instead of sample study which was accessible. The results of the study are generalize-able to other districts for the same population.

Instrumentation

A well defined questionnaire or survey instrument having pre-determined questions was designed based on nature of the research topic. Dichotomous and five point Likert type scales were used to record the perceptions of respondents. Content and face validity were checked by panel of experts. Reliability of the instrument was checked by computing Cronbach's alpha which was 0.85 and found satisfactory. Huck and Cormier (1996) described that Cronbach's alpha is the most suitable statistic for computation of reliability index for the factors to be measured on Likert type scale. In addition, test-retest technique was also applied for computing intraclass correlation coefficients for the datasets of pilot and full length surveys and found good correlation on the items asked individually between the two surveys.

Data collection and analysis

Data were collected as per designed interview schedule through face-to-face meetings by Extension Field Staff for the study. The Staff list was provided by Department of Agriculture Extension wing, Sargodha. Agriculture Extension tehsils offices were individually visited to conduct interviews. Out of 155 respondents, 70 respondents answered the questions asked and fulfilled all requirements of the interview schedule. Other 85 respondents contact through Mobile phone and informed them about interview schedule however, only 51 respondents appeared for interview and 34 showed non-responsive behaviors till the end of data collection. Eventually, 45% quick response, 33% late response and approximately 22% no response rate of the respondents was recorded in the data collection process in the study area. Data were tabulated on Microsoft Excel sheet and then transferred to Statistical Package for Social Sciences (SPSS version 2) for further analysis.

Results and Discussion

The first objective of research study was to describe the demographic characteristics of extension field staff. The demographic characteristics of extension field staff were age, residential area, education, area of specialization, job designation and experience in the department of extension.

Table 1: *Frequency distribution for the age of respondents*

Sr. No	Age Group	Frequency	Percent (%)
1	21-30	10	8.27
2	31-40	22	18.18
3	41-50	36	29.75
4	51-60	53	43.80
Total		**121**	**100.0**

Age is an important factor, which determines the responsive rate of a person toward any activity in his/her life. Adoptability and response to an activity, of an individual depends on age of the individual. Table 1 showed that mean age of respondents was 46 years with a minimum age was 24 and maximum age of 59 years. Further, 10 respondents were those who were above 21 and below 30 years and 22 respondents were those who were in between 31-40 years. Thirty six respondents were above 41 and below 50 years and maximum respondents' age varied from 51-60 years which was 43.80%. No respondent was above 60 years of age since all members of EFS staff population belong to government job. They serve the nation at the age of 60, after that they were retired from their post to give a chance to new ones. Similar results were obtained by Lee (2010) in his study where he recorded the roles of demographic factors on the perceptions of electronic commerce adoption and found that respondents have equally positive attitude towards elec-

tronic commerce and its adoption regardless of demographic factors.

Table 2: *Frequency table for the educational level of the respondents*

Educational Level	Frequency	Percent
Diploma	98	81.0
B.Sc (Hons)	1	0.8
M.Sc	20	16.5
Ph.D.	2	1.7
Total	**121**	**100.0**

Table 2 showed that 121 Extension field staff responded to the survey. According to the results 81% of the respondents were diploma-holder who performed their duties as field assistant. There was only one respondent who held bachelor degree in the field of agriculture. Twenty respondents hold Masters in specialized field of agriculture. From 121 respondents only 2 respondents hold Ph.D. degree in agricultural sciences. These results indicated that all EFS staff has required qualification and skills to understand the agricultural issues and problems of agricultural sector as well as farming community.

Table 3 revealed results that out of 121 respondents, 98 respondents were those who hold the diploma of Agriculture that constitute 94 Field Assistants and 4 Agriculture Inspectors. There was only one Executive District Officer of Agriculture in District Sargodha, who holds the degree of Masters in Agronomy and District Officer of Agriculture holds the Master degree in Horticulture. There were total 6 D.D.OAs in district Sargodha from which only one D.D.O.A holds Ph.D. in Agriculture Extension, 3 hold Master degrees in agronomy, followed by 1 in Soil Science and 1 in Horticulture.

There were total 15 agriculture officers from which seven hold Master degree in majored agronomy, followed 2 in soil science,1 in Entomology, 3 in P.B.G and 2 in agricultural Economics. These results also indicated that Extension job's responsibilities are mostly performed by other subject officials or experts. This is one of the major constraints in achievement of Extension objectives, changing the behavior of farmers and meeting the needs of farming community. More than 90% Extension staff focused on crop related activities and transfer of new technologies rather than the education of farmers.

Table 3: *Frequency distribution of area of specialization of Extension Field Staff*

Specialization & EFS	Agro	SES	Horti.	Ento.	P.B.G	AE	AEE	Diploma	Total
EDO	1								1
D.O.A			1						6
D.D.O.A	3	1	1				1		1
A.O	7	2		1	3	2			15
A.I								4	4
F.A								94	94
Total	11	3	2	1	3	2	1	98	121

Note: EDO=Executive District Officer, D.O.A=District Officer Agriculture, D.D.O.A=Deputy District Officer Agriculture, A.O=Agriculture Officer, A.I=Agriculture Inspector, F.A=Field Assistant

Agro= *Agronomy,* **SES**= *Soil & Environmental Sciences,* **Horti**.= *Horticulture,* **Ento**.=*Entomology,* **P.B.G**= *Plant Breeding & Genetics,* **AE**= *Agricultural Economics, and* **AEE**= *Agriculture Extension & Education.*

Table 4: *Frequency distribution of response and non response rate in according to job location*

Job location	Total Population	Response frequency	Percent	Non-response frequency	Percent of the pop. from each tehsil
Sillanwali	15	14	93.33	1	6.67
Sahiwal	22	20	90.90	2	9.10
Kotmomin	24	20	83.33	4	16.67
Shahpur	25	19	76.0	6	24.0
Sargodha	44	31	70.45	13	29.55
Bhalwal	25	17	68.0	8	32.0
Total	155	121	78.06	34	**21.94**

Table 4 indicates that response rate of the respondents towards questionnaire. These results imply that respondents in Sillanwali and Sahiwal showed much high response to the questions that is 93.33% and 90.90% respectively, Kotmomin (83.33%), Shahpur 76%. The largely uncooperative and non-response behavior showed by population of Sagrodha such as 29.55% and Bhalwal 32%. These finding indicated that there were total 155 respondents and non response rate of the total population was 21.94%.

Different strategies were employed to record the perceptions of the respondents again and again and ensured their confidentiality of data to reduce the non-response rate. However, respondents were not showed positive behavior due to their busy work schedule and engagements in other areas of the routine work which restrict them to go to the field and to keep in touch with farmers in the field and hence non-response rate was restricted up to 21.94%.

Table 5: *Frequency distribution of experience of respondents.*

Sr. No	Experience Group	Frequency	Percent
1	0-------9	17	14.05
2	10------19	23	19.01
3	20------29	43	35.54
4	30------39	38	31.40
Total		121	**100.0**

Experience is also an important factor in determining the competency of respondents in any field of life. The results from Table 5 above imply that maximum experience of respondents in field activities was varied from 20-29 years. The mean experience of the population was 22 years. The maximum experience of the respondents in the population was 38 years and minimum experienced respondents were few fresh extension officers who were performing their duties for four to five months. These finding indicated that most of the extension field staff had much experience in extension activities in transfer of technologies and crop related activities.

Competency of extension field staff was analyzed in two different aspects. The first aspect was about working of different extension approaches for technology transfer and second aspect was regarding characteristics of EFS in transfer of technology. The results from Table 6(A) showed that highest mean was 4.33 for "demonstration methods" and lowest mean was 2.69 for farming system and research. These findings indicated that most of the extension field staff were highly competent in "demonstration methods" with mean of 4.33, training and visit program with mean

of 4.23, individual contact method with mean of 4.20, group contact method with mean of 4.10, and farmer field school approach with mean of 4.06. Field staff was also competent enough in some other concepts like field days with mean of 3.96, and farm and home visits with mean of 3.79. Extension field staff has medium understanding with their working of other 3 approaches but with farming system research, staff has low comprehension.

Table 6(A): *Competency of Extension Field Staff regarding working of different Extension approaches*

Extension Approaches	N	Mean	SD	Rank
Demonstration Method	121	4.33	0.65	1
Training and visit program	121	4.23	0.69	2
Individual Contact Method	121	4.20	0.56	3
Group Contact Method	121	4.10	0.61	4
Farmer Field School	121	4.06	0.58	5
Field Days	121	3.96	0.76	6
Farm and Home visit	121	3.79	0.71	7
Participatory Extension Approach	121	3.56	0.74	8
Public Sector Extension Approach	121	3.35	0.88	9
Model Farms	121	3.25	0.96	10
Farming System Research/ Extension	121	2.69	1.11	11

**Mean: 1=Poor, 2=Fair, 3=Satisfactory, 4=Good, 5=Excellent*

These results indicated that almost all extension field staff used all approaches in their field activities in conveying messages and dissemination of technologies expect farming system research. However, adoption of technology and information mainly depend on the selection of appropriate method at right time. It was observed that the validity of message has no long term effects; therefore focus of extension should not only in visiting farmers, its significant focus should be on to communicate message through effective extension approach.

Table 6(B) showed the mean score for characteristics of extension field staff. Field staff was evaluated in accordance with the characteristics used in technology

transfer process. According to results, based on means the highest means was 4.34 for technical knowledge, and lowest mean was 3.49 for creative mind.

Table 6(B): *Competency of Extension Field Staff regarding their own characteristics followed in process of technology transfer*

Characteristics	N	Mean	SD	Rank
Technical knowledge	*121*	4.34	0.56	1
Ability to motivate others	121	4.27	0.67	2
Experience in agriculture field activities	121	4.20	0.87	3
Believe in yourself	121	4.19	0.61	4
Communication skills	121	4.06	0.61	5
Ambitious	121	4.04	0.71	6
Decision making power	*121*	3.99	0.54	7
Punctuality	121	3.93	0.62	8
Coaching skills	121	3.89	0.62	9
Program planning skills	121	3.80	0.64	10
Evaluation skills	121	3.55	0.95	11
Creative mind	121	3.49	0.71	12

**Mean: 1=Not at all, 2=To some extent, 3=Moderate, 4=High, 5=Extremely high*

These results indicated that EFS possessed all characteristics and used them in transfer of technologies but they don't know about the better utilization of these skills. Better utilization of skills and movement of knowledge results in the effective dissemination of knowledge and its adoption. Therefore pre-service and in-service training sessions should be arranged to train field staff even though EFS has technical knowledge and skills in farming practices. The need is to convey that knowledge and skills to the farmers to improve their agricultural practices.

Iqbal (1989) reported that more efficient the extension worker, the more inclined are the farmers towards adoption of modern techniques. The researchers examine that agriculture officers have more authentic knowledge and skills for transfer of technology and delivery of extension methods. It is deemed appropriate to involve agriculture officers as front line worker rather than field assistants to improve the pace of development. Ahmed (1992) observed that agriculture officers were competent enough to perform their responsibilities in the field but the lack of transportation facilities were the main restriction found in this survey study.

Table 7(A): *Mean, standard deviation and ranking of effective approaches for technology transfer as perceived by extension field staff*

Extension Approaches	N	Mean	SD	Rank
Training and visit program	121	4.29	0.57	1
Demonstration method	121	4.27	0.67	2
Individual contact method	121	3.99	0.49	3
Group contact method	121	3.93	0.55	4
Farmer field school	121	3.91	0.78	5
Field days	121	3.81	0.58	6
Farm and home visits	121	3.61	0.61	7
Participatory extension	121	3.51	0.67	8
Public sector extension	121	3.35	0.59	9
Model farms	121	3.29	0.85	10
Farming system research/extension	121	2.84	0.74	11

**Mean: 1=Not at all, 2=Poor, 3=Fair, 4=Good, 5=Excellent*

The third objective of the research study was to identify the level of effectiveness of different extension approaches. Table 7(A) results based on means and ranking of different extension approaches. The highest mean was 4.29 for "training and visit program" and lowest means was 2.84 for farming system research/extension. All approaches have some strength and weaknesses over time with their application.

These findings indicated that most effective methods for transfer of technology were training and visit program, demonstration methods, individual contact method, and group contact. Most of field staff pointed that other approaches were ineffective in transfer of technology and have less long term effects. These approaches needed modifications in their method of application during communication process. This means that extent of adoption of recommended information and technology directly depends upon working efficiency and effectiveness of extension approaches as well as field staff.

All public and private extension work followed some pre-requites to achieve goal of program. Table 7(B) represents the response of EFS for use of technology transfer pre-requisite. Almost all extension workers followed the basic pre-requites for technology transfer. Extension field staff argued that they have all suitable pre-requisites before addressing technology transfer process. Almost 10% farmers suggested

that active participation of small scale farmers should not compulsory. They suggested that technology was developed for farmer, if small farmers are not interested, then approach to big landowners for technology dissemination. 23.1% farmers argued that loans and other funds should not be allocated to small farmers, because at returning time most of the farmers were unable to return the loans. Almost7% farmers argued that after technology transfer process, give a chance to farmer to think about technology for adoption to minimize the associated risk.

Table 7(B): *Percentage of response of EFS for use of following pre-requisites in technology transfer process*

Technology Transfer Pre-requisites for Extension Approaches	N	Yes (%)	No (%)
Select suitable place for technology transfer	121	100.0	0.0
Select suitable time for technology transfer	121	100.0	0.0
Arrangement of suitable instruments/equipments	121	100.0	0.0
Briefly introduce technology before transfer	121	100.0	0.0
Active participation of small farmers	121	90.1	9.9
Use of local language and simple words	121	100.0	0.0
Distribution of printed material to each farmers	121	100.0	0.0
Interest of farmers/participants	121	100.0	0.0
Awareness of small famers about technology transfer	121	100.0	0.0
Loans/other funds allocation to small farmers	121	76.9	23.1
EFS should be competent and be prepared	121	100.0	0.0
Technology should base on needs and demands of farmers	121	100.0	0.0
Adoption of technology just after technology transfer process	121	92.6	7.4

There was no extension approach which has completely achieved its objectives and potential profits. Every extension approach has few constraints in achievements of desired objectives and application in the field. Table 8 represents some weaknesses of extension approaches as perceived by extension field staff during technology transfer. The basic weaknesses in extension system as perceived by extension field staff with highest mean was low allocation of budget to extension departments, and lowest mean was 2.36 for fruitless and unorganized structure of extension system. This means that governments don't pay attention to the structure of agriculture extension departments and extension activities for developments have no vivid effect on rural areas to develop.

Table 8: *Mean, Standard deviations and ranks for weaknesses of different extension approaches as perceived by extension field staff*

Weaknesses of extension approaches	N	Mean	SD	Rank
Low allocation of budgets	121	4.71	0.49	1
Massive operational area to give satisfactory coverage	121	4.43	0.72	2
Less use of multi- media	121	4.14	0.56	3
Unavailability of training facilities to EFS	121	4.12	0.76	4
Manifold duties assigned to EFS	121	4.00	1.18	5
Top down dimensions of extension approaches	121	3.86	1.18	6
Weak and ineffective linkages between extension and research	121	3.83	1.17	7
EFS failed to evaluate work of extension approaches	121	3.61	1.26	8
Lack of wide and regular demonstrations of field technologies	121	3.20	1.17	9
Cultural norms of EFS hinders working of extension approaches	121	3.10	1.27	10
EFS failed to disseminate agricultural markets information to farmers	121	3.06	1.33	11
Lack of contact between EFS and farmers	121	2.97	1.21	12
Less long term effects of extension approaches	121	2.93	1.22	13
EFS are not so much trained	121	2.90	1.33	14.5
Careless and ineffective visits to farmers	121	2.90	1.31	14.5
Special favored treatment to big landowners	121	2.89	1.28	15
EFS are unaware about marketing system	121	2.77	1.30	16
Lack of interest of EFS in technology transfer process	121	2.56	1.20	17
Fruitless and unorganized structure of extension system	121	2.36	1.19	18

**Mean: 1=Strongly disagree, 2=disagree, 3=Not at all, 4=Agree, 5=Strongly Agree*

Massive operational area to give satisfactory coverage

attains an average mean of 4.43. The number of extension field staff are less and coverage of area under each extension agent was high, therefore the contact with each individual was low that is also a negative points in extension approaches. Less use of multimedia with mean of 4.14, unavailability of training facilities to EFS with mean of 4.12 and manifold duties assigned to extension agent attain a average mean of 4.00. These findings imply that extension workers/ agents were not efficiently utilizing mass media in technology dissemination and its application.

Extension agents was not facilitated with the latest training regarding any technology therefore at field during demonstration of technology, field staff confused to demonstrate the technology. Regrettably, it is found that the focus of Extension officers were on other responsibilities rather than technology transfer and other associated activities related to growth and development of the farmers of the area. It is therefore emphasized that focus need to be diverted to the real assigned job for which they were hired as a public servant. Weak and ineffective linkage between extension and research was ranked at 8th according to mean score 3.83. It means that research and extension has lack of co-ordination and co-operation with each other.

There were some rare weaknesses in extension approaches. EFS examine that the most of extension approaches were autocratic in nature, therefore the farmer's participation in policies of extension approaches was ignored which indicated that extension approaches was not according to farmers needs and demands. The other weaknesses have no significant impact on developmental work of different extension approaches.

Table 9 revealed the results regarding participation of farmers in different activities or steps of technology transfer. According to the ranks of mean, the highest mean score was 3.87 for "farmer's spirit of self-help in learning process" and lowest mean was 1.70 for "management of funds for running of extension approaches". These findings indicate that most of farmers don't take interest in new modern techniques of farming; they don't want to replace their traditional method of farming with modern methods. The second highest mean activity of participation was sharing knowledge about technologies with other farmers and EFS, which shows that famers have high extent of contact with others and medium extent of contact with EFS. Few EFS also satisfied with farmers' participation in problem identification and prioritization of problems. Somehow in others activities farmers don't take any interest and step in extension work.

Table 9: *Satisfaction level of EFS with farmers' participation in technology transfer*

Farmers participation activities	N	Mean	SD	Rank
Farmers spirit of self help in learning process	121	3.87	0.94	1
Sharing knowledge of technologies with EFS and other farmers	121	3.86	0.85	2
Identification of problems faced by farmers regarding technologies	121	3.38	0.87	3
Prioritization of problems	121	3.36	0.93	4
Giving feedback to EFS in technology transfer process	121	2.83	1.29	5
Contribution of land for demonstration plots	121	2.82	0.90	6
Provision of site for transfer of new technologies	121	2.75	1.11	7
Resource management	121	2.30	1.02	8
Farmers rate of adoption of new technology	121	1.94	1.12	9
Management of funds for running of extension approaches	121	1.70	1.06	10

**Mean: 1=Unsatisfactory, 2=Fair, 3=Satisfactory, 4=Good, 5=Excellent*

Table 10: *Level of satisfaction of EFS with suggestions regarding extension approaches and extension system*

Suggestions	N	Mean	SD	Rank
Effective evaluation of extension approaches	121	4.47	0.55	1
Dimension of extension should be down-top ward	121	4.46	0.61	2
Pre-service and in-service training of EFS	121	4.32	0.54	3
Approaches should pay attention to agricultural markets	121	4.22	0.60	4
Employ more EFS to improve ratio of contact with farmers	121	4.18	0.98	5
Efficient use of mass media in technology demonstrations	121	4.17	0.89	6
Extension approaches should flexible in nature	121	3.96	0.96	7
Recruitment of female staff in extension department	121	2.75	1.23	8

**Mean: 1=Strongly disagree, 2=Disagree, 3=Not at all, 4=Agree, 5=Strongly Agree*

Table 10 shows the results for the last objective of the study which was related to compile suggestions regarding the improvement in extension approaches and extension field staff. The highest mean score was 4.47 for "effective evaluation of extension approaches" and lowest mean score was 2.75 for "recruitment of female staff in extension department. These findings imply that effective evaluation of extension approaches will have leading role in the future of extension approachs, and effectiveness of any work can be identified through evaluation of staff as well as extension approaches. Many of the EFS suggested that extension approaches should be democratic in nature and should be down-top ward, which means that policy makers should ensure the participation of local farmer-leaders in policy formation of any program or approach.

Conclusions and Recommendations

The Extension Field Staff in district Sargodha was motivated to be a part of the research study. They had basic understanding of the working of different extension approaches. Most of the field activities were performed by field assistants and they possessed almost all characteristics but they have no understanding how to make better use of these characteristics and skills. Therefore pre-service and in-service training sessions should be arranged for education and training of the field assistants.

Many of the agriculture officers in district Sargodha were from other subject areas like Agronomy, Horticulture, Entomology, Plant-Breeding and Genetics etc. while only few were found who had studied Agricultural Extension as a major area of specialization and had assigned responsibilities according to their major subject area in the field. It is also important to mention that extension oriented field duties and their related aspects can more associated with extension graduates rather than other subject areas and they also know how to manage a critical situation. Therefore extension graduates should provide a chance to utilize their skills and knowledge.

All extension approaches have strengths and weaknesses and these weaknesses should be minimized through implementations of the recommendations of the research studies. Farmers' participation should be increased through involvement of farmer-leaders in planning and implementation of different extension programs.

Pre-service and in-service training of EFS will ensure the satisfaction in the field by taking quick decisions at farm level to transfer knowledge to the farmers at their door steps. By using different approaches attention must be paid to agricultural market because all inputs and output products of farm are deliverable by agricultural markets, the price monitoring system need to be implemented at market level on daily basis to give better opportunities to the farmers and to save them from the role of middle man. It therefore further suggested in the context of this study that a team of experts need to be formed to visit agricultural markets for control of prices and other issues on sustainable basis.

Contact ratio between EFS and farmer remains huge problem due to less numbers of field staff in every department. To increase the contact ratio government should hire more EFS in order to improve the contact ratio between EFS and farmer. Mass media play a significant role in the transfer of technology. Many of the farmers argued that EFS should be trained to efficiently use mass media in communication process or technology transfer.

Females are more competent in office work as compared to males. However, the need is to encourage the females to participate in the field jobs of extension department as well. This would bring a positive change in the job performance of the Extension Department as well as create job opportunities for females.

Author's Contribution

Ejaz Ashraf: supervised the whole research work and prepared this manuscript.
Hafiz Khuram Sharjeel: contributed in statistical analysis and interpretation of the results.
Muhammad Junaid and Qamar Iqbal: supported in preparation of the manuscript.
Raheel Babar: helped in revision of the manuscript.
Muhammad Junaid, Rabia Rasheed and Nosheen Fatima: contributed in data collection.

References

Ahmed, M.Z. 1992. Determination of credibility of training and visit Extension program among farmers of Lahore District. M.Sc (Agri. Ext.) Thesis, University of Agriculture, Faisalabad,

Pakistan.

Ashraf, E., G.B. Jackson and A. Afzal. 2012. In service educational needs of agricultural officers for adaptation of remote sensing technology for precision agriculture in Blaochistan – Pakistan. Sarhad J. Agri. 28(2): 353-360.

Ayaz, M. 1993. Extension Methods. National Book Foundation, Islamabad. 121 - 154.

Bajwa, R. 2004. Agricultural extension and the role of the private sector in Pakistan. Fourth Int. Crop Sci. Cong., Brisbane, Australia. www.cropscience.org.au/icsc2004

Farooq, A. and M. Ishaq. 2005. Devolving the farm extension system. Econ. & Business Rev. Daily Dawn, Karachi. p: 3.

Farooq, S., S. Muhammad, K. M. Chaudhary, and I. Ashraf. 2007. Role of print media in the dissemination of agricultural information among farmers. Pak. J. Agri. Sci. 44 (2): 378-380.

FAO. 1985. Report of an expert consultation on agricultural extension and research linkages in the near East-Aman, Jordan.

Govt. of Pak. 2006. Economic Survey of Pakistan. Economic Wing, Finance Division, Islamabad.

Huck, S.W. and W.H. Cormier. 1996. Reading Statistics and Research. 2nd ed. Harper Collins College Publishers, New York.

Iqbal, M.A. 1989. Study of credibility developed by Extension Field staff among the farming community of Tehsil Bori, Loralai District, Balochistan. M.Sc (Agri. Ext.) Thesis, University of Agriculture, Faisalabad, Pakistan.

Kerkhof, P. 1990. Agroforestry in Africa: A survey of project experience. Panos Institute,London.

Lee, J. W. 2010. The Roles of Demographics on the Perceptions of Electronic Commerce Adoption. Academy of Marketing Studies Journal. 14(1):71-89.

Pickering, D. D. 1983. Agricultural extension: A tool for rural development and the Asian experience. The World Bank, Washington, D.C. USA 3-13.

Rivera, W. M., Bennett, F. Claude and S. M. Walker. 1983. Introduction to designs. Designing Studies of Extension Program Results: A Resource for Program Leaders and Specialists. 1: 33-41.

USAID. 2013. Report of an evaluation of extension services of Colombian Coffee Growers Federation.