

FARMERS PERCEPTION OF EXTENSION METHODS USED BY EXTENSION PERSONNEL FOR DISSEMINATION OF NEW AGRICULTURAL TECHNOLOGIES IN KHYBER PAKHTUNKHWA: PAKISTAN

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ABSTRACT

This research article is based on primary data collected through well designed and structured interview schedule for PhD dissertation. Agricultural extension services are mainly responsible to create awareness among farming communities and to help uplift the living standards of rural people through educational procedures. To determine the effectiveness of extension services and different extension methods used by extension personnel, the research study was conducted in 2011. The universe for this study was Khyber Pakhtunkhwa, where 4 districts were randomly selected namely Bannu, Mansehra, Mardan and Swat, using multistage sampling technique. The total number of sample respondents was 240 i.e. 60 farmers from each district. The data, thus collected, were analyzed with the help of SPSS using descriptive statistics, Likert scale and logistic regression. The results of the study revealed that younger respondents were more critical about extension services as compared to old ones. Results further reveal that literate respondents perception about extension staff activities and extension methods were very clear. They showed their concern about poor extension services and emphasized to improve these. Vast majority of 138 sample respondents were having educational level from primary to intermediate while only 6 were graduate and above. Majority of the sample respondents had experience up to 40 years as against 6 with more than 40 years experience. Extension personnel contact with sample respondents was very poor as reported by 174 farmers. The data revealed that majority of sample respondents i.e. 151 perceived extension services as not effective. Regression analysis showed that contact with extension personnel influenced the effectiveness of extension services. The extension activities and methods used also remained dim and poor as reported by the respondents. The ranking of extension methods undertaken by extension personnel revealed that farm/home visit was perceived as very good and best method having rank '1', followed by field days at '2' and demonstration plots at '3' on the basis of their weighted score. It was concluded that respondents below 40 years were more responsive and alert. Majority of the sample respondents termed extension services as ineffective and the methods used for dissemination were also not effective. It is recommended that activities of extension personnel should be properly supervised for regular contact with the farmers.

Key Words: *Extension services, extension methods, dissemination, agricultural technology, logistic regression.*

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INTRODUCTION

Agricultural development has a vivid effect on rural livelihood not only by increasing income but also by providing labour and capital to other non-agricultural avenues (Johnson, 2000; Lanjouw and Lanjouw, 2001; Haq, 2003). Better utilization of skill and knowledge depends on smooth movement of market information, serving as an important tier of agricultural and rural development process. The entire process of agricultural development showed weak linkages among its different components (Sharma, 2003; Mubangizi *et al.*, 2004). And necessary action should be taken to revive the downtrodden agricultural education, research and extension system (Khan, 2002). Agricultural extension is one of the main institutional components as it promotes the transfer and exchange of information that can be useful to the end-user. Unfortunately in most of the developing countries, agricultural extension has failed in diffusion of new technologies to the farmers (Government of Malawi, 2000) and the situation is further deteriorating day by day (Eicher, 2001). This failure is responsible for the constant pressure of ever-growing challenges of food production and has less ability to cope with the dynamic demands of modern agriculture (World Bank, 2002; Obaa *et al.*, 2005). Agriculture has emerged, with expanding potentials, as the backbone of the global economy. It serves as the means of earning of almost 50% of the world population (Abdullah *et al.*, 2005). Agriculture is the leading activity, directly and indirectly, of overwhelming population forming the base for overall development and progress.

Pakistan, like many developing countries, have inherited a vast rural socio-economic sector blessed with rich natural resources (Mallah, 2005) awaiting judicious utilization. Vast majority of its population is engaged, directly or indirectly, in farming and related operations. The process of agriculture development has continued to use efficiently the available resources. Agriculture plays a crucial role and remains in many ways the most dominant economic activity. It absorbs about 45% of civilian labour force, contributes 60-70% of export and foreign exchange earnings, and accounts for 21% of GDP (MINFAL, 2010-11). However, per unit yields are much lower than attained in many other countries of the world, specially the neighboring countries like India, Iran, and China except Afghanistan due to continuous war (FAO, 2008). These are also below the potentials displayed by selected progressive farmers, local as well as attained in other developing countries. The low yields in Pakistan are attributable inter alia to factors like: non-adoption of latest agricultural technologies and poor farm management by farmers (Farooq *et al.*, 2007), and lack of information adapted to local needs and lack of technical knowledge at farm level (Abbas *et al.*, 2008). Also agricultural sector performance remains low and constrained due to weak institutional linkages in disseminating modern technology to the farmers (Farooq and Ishaq, 2005). An efficient and smooth process of information communication affects the two-way channel of interaction and flow of useful information from the researchers needed by farmers and of farmer's issues and concerns to the researchers for resolution, through the extension personnel.

Agricultural research stations develop new ideas and technologies while extension personnel convey these to farmers and facilitate them in their adoption. The innovations are useless unless put to practical use. And these can reach farmers and farmers' problems to the researchers for solution, speedily through extension (Agricultural Extension Manual, 2005). The third component i.e. agricultural extension responsible for technology transfer plays significant role in increasing productivity, income and profit, remained very weak and poor (Luqman *et al.*, 2004; Farooq and Ishaq, 2005). A number of factors are responsible for this failure: weak research-extension linkages, lack of resources, unavailability of mobility, no training opportunities for updating extension personnel knowledge (Sandhu, 1993). Inefficient and isolated agricultural extension system is responsible for low production of major crops (ADB, 1999; NRSP, 1999; Butt *et al.*, 2005; Khan, 2005).

Agricultural extension service, mainly responsible to create awareness among farmers across the country, has a strong reliance to exchange information among farmers (Hedjazi *et al.*, 2006). Agricultural education, information and skill development are the main concerns of agricultural extension agencies (Farooq *et al.*, 2007). Thus agricultural extension organizations are entrusted with the primary task of educating and disseminating the latest agricultural technologies to the farmers, using various extension teaching methods like: individual, group and mass contact methods, have thus wider coverage.

According to FAO report (1985), in many developing countries wide adoption of research results by majority of farmers remains quite limited. This situation calls for smooth flow of information from farmers to researchers and from researchers to farmers passage is provided by agricultural extension services. But unfortunately extension services have failed in performing its role efficiently and effectively. This study was, thus conducted to find out the effectiveness of different extension methods used by extension personnel for dissemination of research findings to farmers.

Objectives

These include the following:

- i. To elicit general information relating to farmers.
- ii. Determine farmers' perception regarding:
 - a. Extension services by extension personnel.
 - b. Effectiveness of extension methods used by extension personnel.
- iii. To suggest recommendations for improvement

MATERIALS AND METHODS

The methodology of research study provides a path to researchers how to complete the process of collection, analysis and interpretation of data (Nachmias and Nachmias, 1992). This study was conducted in Khyber Pakhtunkhwa province consisting of 24 districts. A multi stage sampling technique was used to select the required sample (Cochran, 1977). In the 1st stage, four agro-ecological zones were purposively selected, followed by selection of one district from each selected agro-ecological zone namely, Bannu, Mansehra, Mardan and Swat. One tehsil was randomly selected from each selected district (stage 3), two Union Councils from each tehsil, were randomly selected (stage 4). In the 5th stage, one village from each selected Union Council was randomly selected and in the last stage (6th) from each selected village a sample of 30 farmers were selected for

data collection. Therefore the total sample size for this study was 240 famers. The data were collected during June-August, 2011. For collection of primary data, a well structured interview schedule was developed and pre-tested in the field (Cho, 2002; Wingenbach *et al.*, 2003). A 5 point Likert scale was used to find out the perceived effectiveness of extension services and extension methods used by extension personnel (Chizari *et al.*, 1999; Lindner *et al.*, 2003). The collected data was analyzed using SPSS (Bonne *et al.*, 2002; Davis *et al.*, 2004). Descriptive Statistics like frequencies, mean and standard deviation were used for the analysis of data (Eck and Torres, 1996; Lodhi *et al.*, 2006). In order to test the association between contact with extension personnel and literacy level a chi-square test was applied. Logistic regression was used to measure the effect of age, education level, farming experience and contact with extension personnel on effectiveness of extension services. The logistic regression model used is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$$

RESULTS AND DISCUSSION

Age

Age is an important factor which determines the response of a person during various activities in his life. Rational discussion making process also depends on age. The younger a person the more rapid will be his adoptability and responsiveness to any activity, particularly, in communication and understanding (Basant, 1988; Tsur *et al.*, 1990). The data depicted in Table I is supportive to this statement. The data revealed that in the study area 38 farmers were in the age bracket of 36 – 45 years. This age group represents mature and healthy thinking people and higher acceptability rates. On the other hand only 10 respondents constituting 4% of the sample were up to 25 years of age. Of these only three were in Bannu and seven in Mansehra. In age group 26 to 35 there were 52 respondents constituting 22% of the total sample, followed by 50 respondents in age group of 46 to 55 constituting 21% of the total sample. Most of these respondents were in Mardan and Swat. The last age group is '56 plus' which had 35 respondents were reported who constituted 15% of the total sample. From the above discussion it could be concluded that as farming activities need strength and maturity thus young and energetic respondents usually shoulder these activities and majority of respondents i.e. 143 belonged to age range of 36-55 years. Similar results were obtained by Oladosu and Okunade (2006). They reported that 60% of the respondents belonged to age range of 36-55 years.

Table I Age-wise distribution of respondents

Location	Respondents Age (in years)										Total
	Up to 25		26-35		36-45		46-55		56 and above		
	No.	%	No.	%	No.	%	No.	%	No.	%	
Bannu	3	5	18	30	18	30	8	13	13	22	60
Mansehra	7	12	19	32	20	33	9	15	5	8	60
Mardan	0	0	13	22	11	18	19	32	17	28	60
Swat	0	0	2	3	44	73	14	23	0	0	60
Total	10	4	52	22	93	38	50	21	35	15	240

Source: Field survey

Level of Education

The importance of education cannot be over emphasized. Education and communication moves hand in hand. The economically developed nations show that their economic development and advancement in communication is positively correlated with education. The data analyzed in Table II showed that 60% of the total sample respondents were literate while only 40% illiterate. However, within the districts illiterate respondents were more in Mansehra and Mardan compared to literate respondents. The analyses of data further revealed that majority of the respondents were matriculate who constituted 34% of the total literate sample. There were 40 respondents, being 20 %, having primary education followed by 27 respondents, constituting 19%, with middle education. There were only 21 respondents who constituted 15 % with FA, F.Sc. qualification followed by only six respondents who were graduates and above. These results are similar to Ajayi and Gunn (2009) who reported that 43% of respondents had up to secondary education and the rest had only Quranic education.

Table II *Distribution of respondents according to literacy status*

Location	Illiterate		Literate		Total	Level of Education					Total
	No.	%	No.	%		Primary	Middle	Matric	Inter.	Graduate & above	
Bannu	17	28	43	72	60	22 (51)	8 (19)	8 (19)	3 (7)	2 (4)	43
Mansehra	30	50	30	50	60	4 (13)	6 (20)	13 (43)	5 (17)	2 (7)	30
Mardan	32	53	28	47	60	-	4 (14)	17 (61)	7 (25)	-	28
Swat	18	30	42	70	60	14 (34)	9 (21)	11 (26)	6 (14)	2 (5)	42
Total	97	40	143	60	240	40 (28)	27 (19)	49 (34)	21 (15)	6 (4)	143

Note: Figures in parenthesis show percentages

Farming Experience

Experience is very important in any field of life to gain benefits and quality. The data analyzed in Table III showed that majority of the sample respondents 106 (44%), had experience of about 20 years. These were followed by 36 sample respondents who possessed 30 years experience in the field of farming followed by 29 respondents having 40 years experience whereas only 6 respondents reported their experience more than 50 years being oldest respondents of the sample. However, 63 sample respondents reported up to 10 years experience in farming. This does not signify that these farmers were expert in farming activities rather they possessed traditional farming experience learned through informal education. Such experiences are usually derived from ancestors. Ajayi and Gunn (2009) reported that majority i.e. 84% of respondents had up to 30 years farming experience.

Table III *Distribution of respondents according to farming experience*

Location	Farming Experience (years)										Total
	1-10		11-20		21-30		31-40		41-50 & above		
	No.	%	No.	%	No.	%	No.	%	No.	%	
Bannu	28	47	17	28	9	15	5	8	1	2	60
Mansehra	16	27	27	45	8	13	7	12	2	3	60
Mardan	8	13	18	30	14	12	17	28	3	4	60
Swat	11	18	44	73	5	8	-	-	-	-	60
Total	63	26	106	44	36	15	29	12	6	3	240

Extension Services

Extension services are very important for agricultural development. Extension services are supposed to work as a bridge between farmers, researchers, extension and teaching institutions. The collected data regarding respondents contact with extension personnel is depicted in Table IV. Sarcasically enough, only 90 sample respondents constituting 37% of the total sample knew about extension personnel, 54 of them belonged to Mansehra. In Swat, being hilly and remote area, only two sample respondents reported that they knew about the extension personnel. On the other hand, a vast majority of the sample respondents (150) reported that they had no contact with extension personnel. They constituted 63% of the total sample. Although Pakistan is passing through the era of IT, unfortunately an overwhelming majority of farmers did not know about extension personnel not to speak of their responsibilities and duties. Almost opposite results were obtained by Pervaiz (2009) who reported that 54% of respondents had contact with extension worker as against 46%.

Table IV *Respondents contact with extension personnel*

Location	Contact with Extension Personnel				Total
	Yes		No		
	No.	%	No.	%	
Bannu	19	32	41	68	60
Mansehra	54	90	6	10	60
Mardan	15	25	45	75	60
Swat	2	3	58	97	60
Total	90	37	150	63	240

Source: Field survey

Association between Contact with Extension Personnel and Literacy Level

Table V indicates association between contact with extension personnel and literacy level of the farmers. The non-significant chi-sq suggests that no significant association could be developed between the two attributes. This means that there is no evidence that extension personnel deviated more towards educated or literate farmers as compared to illiterate farmers. However, usually it is thought that extension personnel contact literate farmers as they are easy to convince them to adopt new agricultural technologies as compared to illiterate farmers.

Table V Association between contact with extension personnel and literacy level

Contact with extension Personnel	Literacy Level		Total
	Illiterate	Literate	
No	61	89	150
Yes	36	54	90
Total	97	143	240

Chi-Square value= 0.010 with P-value= 0.919

Extension Personnel Field Visit

Field visits are necessary for farmers to gain practical know-how through demonstration and discussion by extension workers in local language. These provide an opportunity to learn by doing. The data presented in Table VI showed that extension personnel's visit frequency was not only poor and irregular but majority of the respondents i.e. 174 were ignorant. The response to the frequency of extension personnel's visit to their fields, only one sample respondent from district Mansehra, reported that extension staff visited him on daily basis. Only nine sample respondents, constituting 4% of the total sample reported that extension personnel visited them on weekly basis. These nine belonged to, eight in Mardan and one in Swat. Visit on monthly basis was reported by 24 sample respondents. Again an overwhelming majority (19) of these respondents were in Mansehra followed by 5 in Mardan. Visit on yearly basis was reported by 32 sample respondents in the study area. Out of these 32 respondents, 24 were in district Mansehra, four in Bannu, three in Mardan and the remaining one in district Swat. Similar results were obtained by Pervaiz (2009). This frequency distribution showed that extension staff visits remained very limited. Moreover, it was also reported during the field survey that extension personnel usually gravitate around the big and influential farmers.

Table VI Farmers stating frequency of extension personnel's field visits

Location	Frequency of Field Visit					Total
	No Visit	Daily	Weekly	Monthly	Once A Year	
Bannu	56 (93)	-	-	-	4 (7)	60
Mansehra	8 (13)	1 (2)	8 (13)	19 (32)	24 (40)	60
Mardan	52 (87)	-	-	5 (8)	3 (5)	60
Swat	58 (96)	-	1 (2)	-	1 (2)	60
Total	174 (72)	1(1)	9 (4)	24 (10)	32 (13)	60

Source: Field Survey

Note: Figures in parenthesis are percentages

Perception of Extension Services

The data given in Table VII showed the perceived effectiveness of extension services. Only 40 respondents reported that extension services were effective as against vast majority of 200 respondents who reported that extension services were of no use. One can conclude from the data given below that the role of extension services in enhancing agricultural productivity remained very poor across the country. Extension services are very important for adoption and diffusion of the new agricultural technologies across the country. These services play a pivotal role in creating awareness among the farming community generally and illiterate farmers specifically. Extension services and productivity enhancement are positively correlated. During the field survey questions were asked regarding extension service and effectiveness of these services as perceived by the sample respondents. The data depicted in Table VII showed that out of 240, only 18 respondents reported that extension services as very effective. These 18 comprised of 1, 11 and 6 respectively from Bannu, Mansehra and Mardan districts and none from Swat. It is also very strange that only 22 respondents constituting 9% of the sample reported that extension services were effective. Out of these 22 respondents 11 were in Bannu, 10 in Mansehra and only one in Swat and none from Mardan. On the other hand over whelming majority of 151

sample respondents constituting 63% of the total sample, termed extension services as ineffective followed by 49, as very ineffective. In both cases, ineffective and very ineffective, the frequencies varied in the districts.

Muhammad and Chris (1999) also reported that amongst various information sources of the respondents Extension Field Staff was regarded as least effective. Similar results were reported by Pervaiz (2009), Khan (2008), and Ahmad (1992). It is clear from the data given in Table VII that extension services remained very poor inter alia, due to communication gap. This situation is calling for early attention otherwise; this could pose serious threat to agricultural productivity. Consequently upon which Pakistan would not be in a position to cope with the demand of increasing population regarding food.

Table VII *Perceived effectiveness and level of effectiveness of extension services*

Location	Effectiveness of Extension Services		Perceived Level of Effectiveness			
	Yes	No	V. Effective	Effective	Ineffective	V. Ineffective
Bannu	12 (20)	48 (80)	1 (2)	11 (18)	43 (72)	5 (8)
Mansehra	21 (35)	39 (65)	11 (18)	10 (71)	30 (50)	9 (15)
Mardan	6 (10)	54 (90)	6 (10)	0 (0)	27 (45)	27 (45)
Swat	1 (2)	59 (98)	-	1 (2)	51 (85)	8 (13)
Total	40 (17)	200 (83)	18 (8)	22 (9)	151 (63)	49 (20)

Source: Field survey

Note: Figures in parenthesis are percentages

Logistic Regression Analysis

The results of logistic regression of factors influencing effectiveness of extension services is given in Table VIII. There are four factors included in the model i.e. age, education level, farming experience and contact with extension personnel. Of these four, only the contact with extension personnel is important factor as it is significant at 1% ($P < 0.05$) which indicates that it affects the effectiveness of extension services. In addition age, education and farming experience of farmers had no significant affect on the effectiveness of extension services.

Table VIII *Regression analysis of factors influencing effectiveness of extension services*

Variables	Coefficient	S.E.	Wald	P- value	Exp(B)
Age	0.251	0.255	0.971 ^{NS}	0.324	1.285
Education	-0.054	0.135	0.160 ^{NS}	0.689	0.948
Farming experience	0.053	0.251	0.044 ^{NS}	0.834	1.054
Know extension personnel	4.852	1.035	21.992 ^{***}	0.000	128.015
Constant	-5.864	1.270	21.333 ^{***}	0.000	0.003

Source: Calculation by Author

Note: *** indicates significant at 1 % level of probability. NS shows non-significant.

Farmers' Perception of Effectiveness of Extension Activities

Extension personnel use a variety of activities and methods for effective dissemination of new agricultural technology to the farmers. These methods increase the credibility of extension personnel in the eyes of farmers. The respondents were asked about the effectiveness of seven activities done by extension personnel. The data depicted in Table IX showed perceptions of sample respondents in the 4 districts about each of the seven activities of extension personnel. A majority of sample respondents varying from 175 to 220, with varying frequencies in the four districts, reported that none of the seven activities was performed by the extension personnel. The remaining sample farmers, varying between 20 to 65, perceived performance of the seven activities by extension personnel into five levels i.e. very poor, poor, average, good and very good. The number of respondents varied under each level in Bannu, Mansehra and Mardan for the seven activities. In district Swat all 60 sample respondents reported that no activities were performed except farm/home visit where one regarded it as very poor and another as good. Again in district Mardan only one sample respondent reported that farm/home visit, office calls and demonstration plots were very poorly performed.

In Bannu district sample respondents varying from three to 18, graded farm/home visit, office calls and demonstration plots either very poor or poor: while one to six sample respondents graded local agriculture fairs, workshop/open discussion, farmers training, field days, demonstration plots and office calls as average; and in district Mansehra more sample respondents varying from 18 to 50, graded each of the seven activities under 3-5 level of effectiveness compared to the other 3 districts. In other words sample respondents from Mansehra

district had greater and better exposure to the activities of extension personnel and therefore, more richly embedded with the know-how and do-how of practical knowledge. This is also indicative of better performance of extension personnel. The data given in Table IX showed that majority of the sample respondents in the study area were not satisfied with the activities of extension personnel. Majority of these termed their activities as very poor, poor and average.

Ranking of Extension Methods used by Extension Personnel

The rating of various extension methods used by extension personnel for the dissemination of new agricultural technologies among the farmers was made by using a 5 point Likert scale namely 'v. poor', 'poor', 'average', 'good' and 'v. good' which were assigned scores of 1,2,3,4 and 5 respectively. The ranking of different extension methods was done on the basis of their weighted score, calculated by multiplying the frequency of responses from each of the 5 columns of a specific activity or method and was tabulated in Table X. The data analyzed in Table X showed that farm/home visit was ranked as '1', with M= 0.73 with highest value of standard deviation (SD= 1.364), followed by group discussion (M= 0.51) and SD= 1.14. Demonstration plots were ranked as '3' with M= 0.48 and SD=1.01, followed by office calls ranked as '4' with M= 0.42 and SD=0.893. Workshop/discussion was ranked as '5' with Mean and SD of 0.26 and 0.893 respectively. Farmers' trainings were ranked as '6' with M= 0.25 and SD= 0.722, followed by local agriculture fair as '7' having M= 0.18 and SD= 0.676. Similar results were reported by Toheed *et al.*, (2006).

Table IX Perceived effectiveness of methods used by extension personnel

Location	Activities	Perceived Effectiveness of Extension Methods						Total
		No Activity	V. Poor (1)	Poor (2)	Average (3)	Good (4)	V. Good (5)	
Bannu	Farm/Home visit	57 (95)	2 (4)	1 (2)	-	-	-	60
Mansehra		7 (11)	11 (18)	9 (15)	25 (42)	6 (10)	2 (4)	60
Mardan		53 (88)	1 (2)	-	-	2 (4)	4 (6)	60
Swat		58 (96)	1 (2)	-	-	1 (2)	-	60
Bannu	Office calls	51 (85)	2 (3)	-	6 (10)	1 (2)	-	60
Mansehra		11 (18)	36 (60)	5 (8)	7 (12)	1 (2)	-	60
Mardan		58 (96)	1 (2)	-	-	-	1 (2)	60
Swat		60 (100)	-	-	-	-	-	60
Bannu	Demonstration plots	42 (70)	1 (2)	3 (5)	5 (8)	9 (15)	-	60
Mansehra		18 (30)	32 (53)	5 (8)	5 (8)	-	-	60
Mardan		59 (98)	1 (2)	-	-	-	-	60
Swat		60 (100)	-	-	-	-	-	60
Bannu	Field days	55 (92)	-	-	3 (5)	2 (3)	-	60
Mansehra		14 (23)	25 (42)	7 (12)	10 (16)	3 (5)	1 (2)	60
Mardan		56 (93)	-	-	-	-	4 (7)	60
Swat		60 (100)	-	-	-	-	-	60
Bannu	Farmers Trainings	56 (93)	-	1 (2)	2 (3)	1 (2)	-	60
Mansehra		31 (52)	21 (35)	3 (5)	3 (5)	2 (3)	-	60
Mardan		59 (98)	-	-	1 (2)	-	-	60
Swat		60 (100)	-	-	-	-	-	60
Bannu	Local Agriculture Fair	58 (96)	-	-	1 (2)	1 (2)	-	60
Mansehra		42 (70)	8 (13)	4 (7)	4 (7)	2 (3)	-	60
Mardan		60 (100)	-	-	-	-	-	60
Swat		60 (100)	-	-	-	-	-	60
Bannu	Workshop/ Open Discussion	57 (95)	-	-	2 (3)	1 (2)	-	60
Mansehra		41 (68)	7 (11)	4 (7)	4 (7)	4 (7)	-	60
Mardan		58 (96)	-	-	-	-	2 (4)	60
Swat		60 (100)	-	-	-	-	-	60

Source: Field survey

Note: Figures in parenthesis are percentages

Table X *Ranking of extension methods used by extension personnel*

Extension Methods	Weighted Score	Rank Order	Mean	Standard Deviation
Farm/Home visit	176	1	0.73	1.364
Office calls	101	4	0.42	0.893
Demonstration plots	116	3	0.48	1.01
Field days	123	2	0.51	1.14
Farmers Trainings	59	6	0.25	0.722
Local Agriculture Fair	43	7	0.18	0.676
Workshop/Discussion	63	5	0.26	0.893

Source: Calculation by Author

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are based on the preceding discussion.

It is concluded that the sample respondents who were below 40 years were more responsive and alert. Moreover, they were concerned about their farming activities and the role played by the extension worker. They perceived that extension services not only remained slow and sluggish but also were confined to big and influential farmers.

It could also be concluded that insignificant number of sample respondents were contacted at their fields that is why majority of the sample respondents perceived that extension services remained ineffective. Results of regression analysis showed that effectiveness of extension services is affected by farmers contact with extension personnel. The extension methods used by extension personnel for dissemination of knowledge and information among the farming community were also not effective. The methods used were ranked. The farm/home visit was found the best method for delivering agricultural information, followed by field days, demonstration plots, office calls, workshops/discussion, farmers' trainings and the last was local agriculture fairs.

Based on this research study, the following are recommended for necessary action by all concerned like the policy makers, administration, researchers and politicians.

- i. Extension personnel should make their contacts regular with farmers for rapid adoption and diffusion of improved agricultural technologies.
- ii. Extension services should be provided to all farmers without any bias and prejudices.
- iii. Extension workers activities should be supervised periodically on regular basis so that they could perform their duties properly for agricultural development.

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