

Research Article



Analysing the Effectiveness of Agricultural Extension Activities in District Muzaffarabad-AJK-Pakistan

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Abstract | Extension services in district Muzaffarabad Azad Jumu and Kashmir (AJK) was analyzed in the present study. Multistage Sampling technique was used to select the required sample, 80 farmers were randomly selected from five villages and data were collected through interview schedule. It was found that majority farmers were literate up to middle; young farmers showed more positive attitude towards extension recommendations, 93% farmers knew extension workers both by name and face and also knew extension recommendations, but they faced problems like small land holding, high prices of inputs, poor financial position and lack of labour in adoption of these recommendations. Half of the sample respondents reported satisfaction from different extension activities/facilities like location of extension office, availability of extension personal, result and method demonstration, farm/home visit and personal meetings. Whereas, the rest were not satisfied with radio programs, television programs, exhibitions, pamphlets, and farmer day. It was concluded that production of maize in the study area was increased up to 910 kg/acre after extension recommendations. In case of wheat production was increased from 1177.50 kg/acre after extension recommendations to 1806.25 kg/acre.

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Introduction

Agricultural development is a continuous process that requires need based, improved, and timely technology (Sanaullah and Pervaiz, 2019; Ahmed, 2005). Agricultural production should be increased at least double to fulfill the basic needs of growing population. This goal can be achieved by reducing the gap between the potential and actual yield (Pervaiz et al., 2018; Chaudhry and Siddique, 1987). Pakistan is one of the developing countries, where current agricultural growth is stagnant; due to huge gaps between actual and potential crop productivity. Crop productivity may be enhanced by better access to agricultural

advisory and financial services (Elahi et al., 2018). The extension personals need to be in contact with farmers of their areas and provide guidance in various agricultural techniques. Agricultural extension is the two way communication channel between farmers and research (Khan et al., 2019; Sulaiman and Hall, 2003). On one hand it identifies farmers' problems and brings them to the research station for solution, and on the other hand it carry new research findings back to the farmers to improve their production and farm efficiency (Sanaullah and Pervaiz, 2019; Anon, 2002). Through the proper application of modern techniques agricultural production can be improved manifold (Khan et al., 2019; Gibson and Brown,

2003; Patanothai, 1997).

Adoption of improved farming techniques and farm machinery is vital to achieve maximum agricultural production i.e. yield per acre. The diffusion of technology has been a powerful source of economic change for generations (Gul et al., 2019). Improved farming techniques pertain to all agricultural operations, right from land preparation to the harvesting of crops (Khan et al., 2019; Leeuwis and Van den Ban, 2004). In developing countries, boosting the livelihood of rural people through agricultural productivity would remain a meagre wish if modern farming technology adoption rate is unsatisfactory. So, this is a need of the day to adopt the improved agricultural innovations in order to increase productivity and thus the life standard of the rural poor (Sanaullah and Pervaiz, 2019; Ullah and Khan, 2019; Ajayi et al., 2003; Gemeda et al., 2001). In this regard, Pervaiz et al. (2018) emphasized the importance of adoption and reported that farmers' income is directly affected by adoption of technologies. It is agricultural technology adoption that enables developing countries to come and stand in the line of developed countries (Gul et al., 2019; Foster and Rosenzweig, 2010). Furthermore, if proper attention is not given to the use and adoption of farming technologies, then agricultural production will decline and as a result rural poverty will increase more (Farooq and Khan, 2019; Uaeieni et al., 2009).

The development of agriculture has direct influence on the improvement of socio-economic status of the rural life. Previous studies show that agricultural credit has been playing a vital role in the development of farming community through increased agricultural production (Khandker and Faruquee, 2000; Richard, 1990). Increasing knowledge of scientific procedures and modern technologies can significantly enhance agricultural production of farmers (Rosegrant and Cline, 2003). Agricultural extension had the function of putting technical research and latest information into farming practices by educating the farmers (Birner et al., 2009).

In order to rise the per acre yield of crops, it is essential to raise awareness of improved farming techniques among the farmers (Sanaullah and Pervaiz, 2019). They should be effectively motivated and convinced of the utility of these techniques leading to the adoption of the same by farmers (Gul et al., 2019; Elahi et al., 2018). This can be accomplished through

an organized and effective extension department comprising of well trained, honest and devoted workers, equipped with at least fundamental facilities required for satisfactory functioning (Sanaullah and Pervaiz, 2019). Keeping in view the importance of extension in agricultural technology dissemination, the present study was initiated to analyze agricultural extension activities in the study area.

Objectives

- To analyze agricultural extension activities in the study area.
- To study the factors constraining extension services in the study area.
- To Measure for future policy implication.

Materials and Methods

This study was conducted in District Muzaffarabad, Azad Jumu Kashmir (AJK), both primary and secondary data were collected for the study. Data were collected through pre-tested Interview schedule. A multistage sampling technique was used to select sample for this study (Cochran, 1977). There are two tehsils in District Muzaffarabad namely Muzaffarabad and Hattian Bala. In stage I: Hattian Bala tehsil was selected randomly. In stage II: A list of all union councils from the selected tehsil was prepared and five union councils i.e. Chakar, Gujar bandi, Lamnia, Hattian bala and Langla were selected randomly. In stage III: A list of all villages from the selected union councils was prepared and one village was randomly selected from each union council. In stage IV: The farmers from each village were selected on the basis of population density at 20%, thus giving a total of 80 sample respondents. Number of sample respondents from each village was; 20 in Kaki Bagh, 15 in Dhani Bakalan, Kathai, Lamnia, Sarai respectively. The data were statistically analyzed by applying descriptive statistics (Eck and Torries, 1996) and t-test using computer softwares SPSS and Microsoft Excel. A five-point Likert scale was used to find out the perceived effectiveness of extension services used by extension personal (Chizari et al., 1999; Lindner et al., 2003).

Results and Discussion

Education

Literate farmers are more dedicated to accept improved farming practices as compared to illiterate.

Table 1: Educational level of respondents.

Location	Education				Total	Level of education										Total
	Literate		Illiterate			Primary		Middle		Matric		Intermediate		Graduate		
	No.	%	No.	%		No.	%	No	%	No.	%	No.	%	No.	%	
Dhani	12	80	3	20	15	4	33	4	33	3	25	1	8.4	0	0	12
Kakibag	16	80	4	20	20	5	31	4	25	3	19	4	25	0	0	16
Kathai	15	100	0	0	15	3	20	3	20	3	20	5	33	1	6.7	15
Lamnia	15	100	0	0	15	1	6.7	8	53	6	40	0	0	0	0	15
Sarai	8	53	7	47	15	4	50	2	25	2	25	0	0	0	0	8
Total	66	83	14	17	80	17	26	21	31	17	26	10	15	1	2	66

Source: Field Survey.

Table 2: Distribution of respondents on the basis of income/ year.

Location	Income (Rs) /Year								Total
	Below 20000		21000-40000		41000-60000		Above 61000		
	No.	%	No.	%	No.	%	No.	%	
Dhani	0	0	13	87	2	13	0	0	15
Kakibag	10	50	8	40	1	5	1	5	20
Kathai	0	0	9	60	5	33	1	7	15
Lamnia	5	33	9	60	1	7	0	0	15
Sarai	0	0	10	67	5	33	0	0	15
Total	15	19	49	61	14	17	2	3	80

Source: Field Survey.

As reported by Oyekale and Idjesa (2009) that extremely low level of education or illiteracy has a prominent effect on the level of technology adoption and skills acquisition among the farmers.

Table 1 represents that out of 80 respondents 66 were literate and 14 were illiterate, whereas only 26% of the respondents were primary, 31% were middle, 26% were educated up to matric, 15% were intermediate and only 2% were graduated. Our results are in line with that of Khan et al. (2009) where majority of the respondents 55 (83%) were literate.

Income/year

In AJK, mostly agriculture is taken as a side business not for commercial purpose because of small land holding and also due to fragmented land. The data given in the Table 2 show that 61% farmers have income per year between 21,000-40,000 Rs, whereas only 3% had income above 61000 per year.

Knowledge about extension workers

Agricultural extension plays an important role in rural development. The extension workers not only transfer new agricultural technologies but also motivate them

to adopt these in order to improve their agricultural productivity (Ullah and Khan, 2019; Mulayim, 1995).

Data presented in Table 3 show that overwhelming majority i.e. 93% of the sample respondents knew extension worker both by name and by face. The results of this study are similar to those reported by Sharif (1990) who observed that a fair majority 72% of the respondents knew the field assistant both by name and face.

Extension recommended practices

Information dissemination is the first step toward adoption of new ideas for sustainable development (Sanaullah and Pervaiz, 2019; Khan et al., 2013). Farmers are aware of their problems and are willing to adopt the recommended practices with in their available resources (Jalal-ud-Din, 2011).

Table 4 shows that 79% farmers knew recommended extension practices and 64% got information from extension workers, 27% from progressive farmers and others from friends, radio/ TV and any other source like magazines like Kisan time. Our results are in line with Elahi et al. (2018) who reported that farmers in

Table 3: *Distribution of respondents on the basis of knowledge about extension workers.*

Location	Know extension worker					If yes, you know him by						Total
	Yes		No		Total	Face		Name		Both		
	No	%	No.	%		No.	%	No	%	No	%	
Dhani	13	87	2	13	15	0	0	0	0	13	100	13
Kakibag	19	95	1	5	20	1	5	0	0	18	95	19
Kathai	15	100	0	0	15	1	7	3	20	11	73	15
Lamnia	15	100	0	0	15	0	0	0	0	15	100	15
Sarai	14	93	1	7	15	0	0	0	0	14	100	14
Total	76	95	4	5	80	2	3	3	4	71	93	76

Source: Field Survey.

Table 4: *Distribution of respondents on the basis of awareness about extension recommended practices.*

Location	Know recommended practices					Source of information										Total
	Yes		No		Total	Extension worker		Progressive farmer		Friend		Radio/TV		Any other		
	No.	%	No.	%		No.	%	No.	%	No.	%	No.	%	No.	%	
Dhani	11	73	4	27	15	11	65	5	29	1	59	0	0	0	0	17
Kakibag	17	85	3	15	20	16	64	8	32	0	0	1	4	0	0	25
Kathai	10	67	5	33	15	10	63	2	13	1	6	2	13	1	6	16
Lamnia	15	100	0	0	15	14	67	6	29	1	5	0	0	0	0	21
Sarai	10	67	5	33	15	10	59	5	29	0	0	2	12	0	0	17
Total	63	79	17	21	80	61	64	26	27	3	3	5	5	1	1	96

Source: Field Survey.

the study area rely more on informal sources for agricultural advisory and credit services than public or private sources. However, the quality of private advisory and credit services was reported better than other sources due to its easy availability and processing.

Benefit of extension recommendations

Farmers are working in difficult conditions as compared to those working in other sectors (Ullah and Khan, 2019). Agricultural practices/farming is exposed to different environmental factors such as frost, drought, flood, precipitation, disease/ insects and other factors, technological changes etc. are the sources of instability, risk and uncertainty in agricultural sector (Gul et al., 2019; Trieschmann and Gustavson, 1998). In order to reduce/minimize these effects; it is necessary to increase awareness among farming community about economic and technical aspects of farming (Sanaullah and Pervaiz, 2019).

Table 5 reflected that results are highly significant in case of wheat and maize and it can be concluded that seed rate kg/acre decreases after adoption of extension recommendations. Table 6 also shows significant results. It is concluded that production of maize increased up to 910 kg/ acre after adoption of

extension recommendations. In case of wheat yield was increased from 1177.50 kg/ acre after extension recommendations to 1806.25 kg/ acre.

It is also concluded that extension services helped the farmers to reduce input cost in order to decrease the seed rate by providing High Yielding Varieties Seeds (HYVs) which ultimately increased kg/ acre Yield. It is also important to note that area under maize and wheat cultivation was same before and after extension recommendations.

Problems in adoption of recommendations

Socio-economic attributes effect information dissemination and adoption of innovations (Rogers and Shoemaker, 1971). The factors impeding the adoption of farm implements were lack of trained manpower, lack of finance, high cost of agricultural inputs (Rogers, 1995).

Table 7 shows that 33% respondents have small land holding due to which they cannot use extension recommendations properly, where as 30% reported poor financial position as an important problem faced in adoption of recommendations. The lack of technical know-how was pointed out by 13% respondents as a problem.

Table 5: Seed rate comparison of major crops before and after extension recommendations.

Crops	Seed rate (kg/acre)		Difference	Std. deviation	Std. error mean	t ratio	P-value
	Before	After					
Maize	55.4	16.9	38.6	33.245	3.740	10.322*	.000
Wheat	21.4	9.07	12.3	18.320	2.048	6.005*	.000

*Level of significance: 1%.

Table 6: Yield comparison of major crops before and after extension recommendations.

Crops	Production (kg/acre)		Difference	Std. deviation	Std. error mean	t ratio	P-value
	Before	After					
Maize	1398.75	2308.75	-910.000	733.226	81.977	-11.101*	.000
Wheat	1177.50	1806.25	-7.009	802.400	89.711	-7.009*	.000

Source: Field Survey; *Level of significance: 1%.

Table 7: Problems faced by respondents in adoption of recommendations.

Location	Problems faced in adoption of Recommendation										Total
	Small land holding		Lack of irrigation		Lack of technical knowledge		Poor financial position		Any other		
	No.	%	No.	%	No.	%	No.	%	No.	%	
Dhani	15	55	4	15	0	0	8	30	0	0	27
Kakibag	13	36	7	19	2	6	14	39	0	0	36
Kathai	5	28	1	6	5	28	2	11	5	28	18
Lamnia	1	5	4	20	6	30	8	40	1	5	20
Sarai	6	27	2	9	3	14	6	23	5	23	22
Total	40	33	18	15	16	13	38	30	11	9	123

Source: Field Survey; Note: The total may tally due to multiple answers by the respondents.

Table 8: Level of effectiveness of extension activities.

Extension activities	Not satisfied 1	Less satisfied 2	Satisfied 3	More satisfied 4	Most satisfied 5
Extension office location	18(18)	21(42)	35(105)	15(60)	11(55)
Extension staff availability	5(5)	24(48)	38(114)	29(116)	4(20)
Farm home visit	6(6)	39(78)	47(141)	8(32)	0 (0)
Result demonstration	10(10)	29(58)	49(147)	9(36)	3(15)
Method demonstration	13 (13)	31(62)	45(135)	11(44)	0 (0)
Radio programmes	34(34)	48(96)	16(48)	3(12)	0 (0)
Television programmes	50(50)	35(70)	14(42)	1(4)	0 (0)
Exhibition	26(26)	40(80)	26(78)	8(32)	0 (0)
Pamphlets/ journals	53(53)	27(54)	4(12)	16(64)	1 (5)
Farmer day	41(41)	29(58)	11(33)	3(12)	16(80)
Personal meeting	19(19)	31(62)	30(90)	18(72)	3(15)

Source: Field Survey; Note: Calculated scores are given in parenthesis.

Our results are in line with Elahi et al. (2018) who reported that Small land holdings, lack of education and high interest rates were some of the key barriers that restrict farmers' access to both public and private services. Further, the study also found that majority of the farmers (accessors) use agricultural credit for non-farm activities for several reasons. And were

in contrast to the findings of Aslam (1998) who studied the factors impeding of improved agriculture practices.

Agricultural extension worker plays a vital role in the transfer of technology (Pervaiz et al., 2018; Akram et al., 2003). He makes the technology package

understandable to the farmers: although all of its inputs are working accordingly. In adoption process various information sources like radio, television, magazines, brochures, pamphlets, and handouts are effective tools in reaching to the farming communities' mass audience (Farooq and Khan, 2019).

Table 8 shows level of effectiveness about various extension/facilities. First of all, the respondents were asked about the extension office location, 35% respondents showed satisfactory behavior towards extension office location. In the similar way, 71% farmers were satisfied with extension staff availability, where as 29% were not satisfied.

In Pakistan farm/ home visit is commonly used in information dissemination among farming community (Pervaiz et al., 2018; Asghar, 1990). Similarly, in this study about 55% of the sample respondents were satisfied with farm/home visits of extension workers, where as 45% were not satisfied.

Result demonstration involves showing a practice to farmers in an actual field situation (Pervaiz et al., 2018; Ferreira, 1997). This method allows the farmers to get the benefit of using all his senses i.e. sight, hearing, touch, and smell. This study shows that 61% farmers were satisfied from result demonstration by extension staff where as 39% were not satisfied. In result demonstrations, the extension worker deals with the farmers who have not yet been convinced of the utility of the innovation, but in method demonstrations one usually deals with those farmers who are fully convinced and now want to know how they can carry out the recommended practice. Here, 56% respondents were satisfied with method demonstration, where as 44% were not satisfied.

Radio is frequently referred to as a substitute for literacy in agricultural development support communications. Radio is also a kind of mass communication which presents certain kind of information. It is very effective in developmental process in the country as well as agricultural technology. Radio reaches 95% of the total population in Pakistan (Hussain, 1987). In this study only 19% of the respondents were satisfied with the radio programs related to agriculture whereas majority i.e. 81% of the respondents were not satisfied.

Television is an effective extension tool, utilize to quickly telecast news and information among the masses

(Amjad, 2002). But in this study, only 15 % respondents were satisfied with agriculture related extension programs on TV whereas 85 % were not satisfied.

Exhibition of agricultural products is also a source of awareness among farmers (Ferreira, 1997). But unfortunately, this practice is done very rarely. Almost 66% respondents were not satisfied with exhibitions conducted by agriculture department.

The literate farmers give more importance to printed material from the agriculture department than to any other source of information (Sanaullah and Pervaiz, 2019; Aziz et al., 2018). Here, in this study 80% respondents criticized the non-availability of pamphlets/ journals from agriculture department. Our results were in line with Jensen et al. (2009) who reported that the pamphlets were more authentic and accurate source of information in the study area.

Rank order of various extension methods

Five point Likert scale was used for ranking of various extension methods in this research study i.e. 'not satisfied', 'less satisfied', 'satisfied', 'more satisfied' and 'most satisfied' 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 9.

Table 9: Ranking of extension activities used by extension personnel.

Extension activities	Weighted score	Rank order	Mean	SD
Extension office location	280	2	2.81	1.22
Extension staff availability	303	1	3.03	0.94
Farm home visit	257	5	2.56	0.73
Result demonstration	266	3	2.65	0.87
Method demonstration	254	6	2.55	0.86
Radio programmes	190	9	1.87	0.77
Television programmes	166	11	1.66	0.76
Exhibition	216	8	2.15	0.90
Pamphlets/ journals	188	10	1.88	1.15
Farmer day	224	7	2.24	1.43
Personal meeting	258	4	2.54	1.07

Source: Calculation by Author.

The data analyzed in Table 9 showed that extension staff availability was ranked as '1', followed by extension

office location ranked as '2nd', demonstration plots were ranked as '3rd', followed by personal meetings ranked as '4th'. Farm/home visit was ranked as '5th'. Method demonstration was ranked as '6th', followed by Farmer day as '7th'. Exhibition was ranked as '8th', followed by radio as '9th'. Pamphlets were ranked '10th', followed by TV programmes ranked '11th'.

Conclusions and Recommendations

It is concluded that the role of extension services in the study area was effective and satisfactory, majority of respondents adopted extension recommendations, but faced major problems i.e. small land holding, and poor financial conditions in the adoption of extension recommendation. It is also concluded that majority of the farmers were not satisfied with agricultural related programmes on TV.

It is concluded that maize yield was increased up to 910 kg/ acre after extension recommendations. In case of wheat yield was increased from 1177.50 kg/acre after extension recommendation to 1806.25 kg/ acre. It is also concluded that extension services helped the farmers to reduce input cost in order to decrease the seed rate by providing High Yielding Varieties Seeds (HYVs) which ultimately increased kg/ acre yield. It is also important to note that area under maize and wheat cultivation was same before and after extension recommendations.

Taking all these results into consideration, the following recommendations can be drawn so that the farmers get more benefit from extension services.

- Extension workers should have regular contact with the farmers to develop rapport with the clients and help farmers to overcome difficulties faced by them during the adoption of new agricultural practices to restore the confidence of the farmers.
- Informative agricultural programmes/documentaries should be broadcasted on TV or radio in local languages.
- Audio/visual aids should be used to educate farmers as well as agriculture related literature either in the form of pamphlet or journal also be provided to them.
- Majority of respondents were engaged in other business and were not satisfied from the present production because of non-adoption of modern

practices and less interest in agriculture. It is therefore suggested that the extension workers should organize special field days/exhibition to increase their interest in agriculture.

Novelty Statement

Increasing knowledge of scientific procedures and modern technologies can significantly enhance agricultural production of farmers. This can be accomplished through an organized and effective extension department comprising of well trained, honest and devoted workers, equipped with at least fundamental facilities required for satisfactory functioning. Keeping in view the importance of extension in agricultural technology dissemination, the present study was initiated to analyze agricultural extension activities in AJK, Pakistan.

Author's Contribution

Urooba Pervaiz developed the idea and wrote the manuscript. Madiha Iqbal collected the data. Dawood Jan helped in analysis of data.

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