Research Article

Field Assistants Impact on Agricultural Extension Activities: A Case Study of District Dera Ismail Khan, Khyber Pakhtunkhwa Pakistan

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Abstract | To investigate the role and performance of field assistants in Agricultural Extension, the present study was commenced in district Dera Ismail Khan, Khyber Pakhtunkhwa during year 2014. Eight villages were selected randomly. Among all the farmers, 120 farmers were evaluated through valid, reliable and pre-tested interview schedule. Data collected was analyzed through Statistical Package for Social Sciences ver. 20. Descriptive and inferential statistics were used. The study has revealed that field assistants (FA) provide new information (75 respondents). It was observed that FAs were available at their offices (70) and farmers were satisfied from the solution of problems they reported (92). Correlation coefficients demonstrate that education, frequency of FAs visits, accessibility of FAs office and establishment of demonstration have highly significant association with provision of new knowledge at (P≤0.01) level of probability. Analysis of variance confirms that most of the farmers with more than 20 hectare land visit the offices of FAs more frequently. Rank Based Quotient technique depicted that the top priority problem identified in the study area was the scarcity of extension staff. It is recommended that public financial support should be increased which are working with same interests, to have a better Extension Service in place, functional, operational, adequate and with enough availability of staff. Furthermore funding must be improved, for proper infrastructure and latest communication technologies so that extension workers may have far reaching approach to disseminate the improved technologies and give benefit to the farmers.

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Introduction

Agriculture is known for providing immense opportunities of employment, food, feed, nutritional and ecological securities in the country. Agriculture and allied activities contributes 21% to GDP, employs 45% of total labor work force. It has been central to all economic activities directly and indirectly resulting in striking socio-economic improvement (GOP, 2013). Drastically modified and rapid growth strategies are essential for achieving much better results; food security; household security and self-reliance both at national and international level. It has been successful to keep pace with the rising demands of growing population. Unfortunately, agriculture sector is producing far below than its potential due to many technical barriers on one hand whereas many new challenges have emerged recently on the other

hand (Takenaka, 2006). Despite, agricultural production in the country continues to be lower and it is generally believed that dearth of information tailored to local needs and lack of technical knowledge at the farm level are the principal factors for this low and stagnant production (Khan, 2004; Farooq et al., 2010).

Agriculture extension is playing its role untiringly in disseminating modified and improved technologies from lab to land (Ullah et al., 2014). Agricultural extension is known to offer technical guidance, provide information, help farmers to identify their problems and organize themselves (Baig and Aldosari, 2013). Transfer of farm worthy and location specific technology is vital for harnessing the fruits of research and thereby improves socio-economic condition of down trodden people (Abbas et al., 2008; Sharma et al., 2013). Agricultural development is continuous and dynamic process. It emphasized that Agricultural Knowledge and Information System (AKIS) must operate with synergy, having two-way flows between research, extension and clientele subsystems. There should be the linkage between the technology generation and technology transfer system (Sharma et al., 2013).

Field Assistants (FAs) are the pivot of agriculture extension activities. They are accomplishing their duties at union council level and are qualified diploma holders from various Agriculture Training Institutes (ATI). They are responsible for advising farmers regarding crop protection, improved seeds and to layout demonstration plot etc. Field Assistants are, in return, supervised by Agriculture Extension Officer (AEO) at Tehsil Level. Agricultural Extension Officer often provides consultation with farmers and agricultural businesses. In these consultations, they give talks, guidance and actual demonstration on the latest technologies related to agriculture and on how they can take advantage of such technologies. They also attend seminars and also work with other experts in agriculture to learn more or even develop new methods that could advance production. Administratively, the district is controlled by the District Director Agriculture (DDA). He is the in-charge of the department at district level, and is responsible for the supervision of the activities of the Agricultural Extension Officers and Field Assistants working in the whole district. He supervises all the development projects, demonstration farms and nursery farms in his area (Memon et al., 2013).

The crucial role of Field Assistants in the dissemination of latest technologies and social and economic development of the nation cannot be over-emphasized. Field Assistants perform as a link between researchers and farmers. They are envisaged to deliver feedback of problems to researchers as an input and researchers pass on the solutions of farmer's problems as output via Field Assistant. Field assistants use various communication sources, channels and mechanisms for acquiescing of farm technology and transfer to farmers (Anaeto et al., 2012). Mahmood and Sheikh (2005) stated that awareness is the first step in the adoption process. For this purpose agricultural extension is one of the means available to help farmers for their capacity building. It is a unique service in the sense that it gives access to small farmers and rural poor living far from the urban areas in addition to technology transfer. After generation of farm technology by the research system, it is the responsibility of extension system to disseminate and persuade about the farm technology to client system for adoption. Here, extension system plays a crucial role. Keeping in focus the importance of Field Assistant in transfer of technology, the study was undertaken with the following specific objectives; comprehending the performance of Field Assistant and identifying barriers to efficient extension work from farmer's perspective.

Material and Methods

The present study was commenced in district Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan during year 2014. The district was selected purposively because it has a crucial role in food supply through-out the province. It lies on 71.07 longitude and 31.57 latitude and 500m above the sea level. The land is hard clay and sandy loams to sandy calcareous in nature, deficient in organic matters, nitrogen, and phosphorous and adequate to marginal in potassium. This is the foremost suited region for production of wide range of agricultural crops and vegetables (Saleem et al., 2011).

Eight villages were selected randomly i.e. Prova, Draban, Malana, Draban Khurd, Hissam, Kaich and Gara Hayat for selection of respondents and collection of data. All the farmers in the area were considered as a population out of which 120 respondents were randomly selected. They were personally inter-

viewed by in-depth interview method.

Valid, reliable and pre-tested interview schedule was utilized for collection of data. The questionnaire was composed of demographic and Field Assistant performance related questions. The questionnaire was composed of open ended and closed ended questions mostly in "yes" "No" while few were categorized i.e. satisfaction level of farmers from reporting problem and getting recommendation were valued as 1 (to some extent) 2 (to greater extent) and 3 (Not at all). Percentages, counts and Pearson's Correlation coefficient were calculated using Statistical Package for Social Sciences (SPSS) version 20. Microsoft Excel version 2013 was used for calculating One-Way Anova. The major problems identified in the study area were listed and Rank Based Quotient (RBQ) of the problems was calculated using the following formula as suggested by Sabarathnam (1988):

$$RBQ = \frac{\sum f_i(n+1-i)\times 100}{N\times n}$$

Where
i = Concerned ranks,
N = Number of farmers,
n = Number of ranks,
f_i =Frequency of farmers for ith rank

Results and Discussion

Demographic characteristics

The age of the respondents ranged from below <30 to >51. Results in Table 1 indicated that majority (36.7%) of the respondents were from age category of 41-50 years followed by age category of 36-40 years (23.3%). Fifteen percent of the respondents were from age category of above 50 years whereas 14.2% of the respondents were from age category of less than 30. Almost 11% of the respondents were observed in the age category of 31-35 years. Educational level of the rural community greatly influences the acceptance of extension advice and guidance. The acceptance and adoption of an innovation highly depends upon the literacy rates and understanding levels of the farming community. Educated farmers grasp the concepts of modern and technical agriculture. Such innovators understand, assimilate, accept, and use the new technology passed on to them by the extension agent (Anandajayasekeram et al., 2008). Data in Table 1 depicts that majority of the farmers have education level up to middle (45) followed by matric (29), intermediate (19), graduate (10), primary (9) and only 8 respondents were professionals. Our results are in line with that of Siddiqui and Mirani (2012). Tenurial status also effects the adoption of latest technologies, as tenants are not usually in the condition to adopt modern methods, mostly seems to them costly. It was found that fair majority of the respondents were owner cultivators (93) followed by tenants (16) while 11 respondents were owner-cum tenants. Past researches show that with greater land holding farmers accept to take risks like innovators and adopt the innovations. In the study area it was recorded that 75 respondents have land holding less than 10 hectare followed by respondents having size of land holding from 10-20 hectare while only 10 respondents had a size of landholding 21 hectare and above (Table 1). Our results are in contrast with that of Rehman *et al.* (2013) who reported that only 33% of the respondents had landholding less than 10 ha. This might be due to the fact of diversification in the study area as well as sample size.

Table 1: *Demographic attributes of respondents*

Variable	Categories	%	SE
Age	<30 years	14.2	0.115
	31-35 years	10.8	
	36-40 years	23.3	
	41-50 years	36.7	
	> 50	15.0	
Education	up to primary	7.5	0.122
	up to middle	37.5	
	up to matric	24.2	
	up to intermediate	15.8	
	up to graduate	8.3	
	professional	6.7	
Tenurial status	tenant cultivator	13.3	0.065
	owner-cum tenant	9.2	
	owner cultivator	77.5	
Land size	<10 ha	62.5	0.59
	10-20 ha	29.2	
	> 20 ha	8.3	

Performance of field assistants

The complexity of agriculture extension services implies that farmers need information on all aspects of plant husbandry. Variety of stages of production process i.e. deciding what to grow, seeding, seedbed preparing, planting, harvesting, packaging, storing and selling are the sectors of which they required up to date information frequently. Based on the requirements of farmers they were interacted for visit to

Field Assistant (FA) office and majority of them (74) reported that they made visits to field assistant office while 46 respondents never visited FAs office. It is evident from the chi-square test that there was significant association of visits to the FAs office with size of landholding and age representing that irrespective of age and landholding they have made visits to FAs office for collection of relevant information. Furthermore they were asked about the satisfaction level of their problem or information they required; a fair response recorded i.e.92 respondents reported that they were satisfied while 28 were not satisfied (Table 2). Accessibility of FAs office is of immense importance because farmers can easily reach there. The farmers are not in the conditions to visit frequently FAs office on account of higher rates of public transport fare. During interaction with farmers it was found the FAs office is accessible to the majority of the respondents (62) out of 120 respondents (Table 2). Non-significant association of accessibility of FAs office with size of landholding while significant associations with age of the respondents were observed. It was also investigated that when you pay visit to the FAs office was he present to serve you? And majority was agreed with their presence i.e. 70 while 50 were not in favor. Non-significant association was also observed with size of landholding while significant association was observed with age. It reveals that the elder farmers have experienced their presence in office (Table 2). As FAs has not assigned only the job of serving in the office, he is also responsible for area under his jurisdiction to pay visits to farmer's fields, homes as well to deal their problems on the spot. It was observed that they were very much devoted to their duties and they were performing their duties with their level best; reported by 85 respondents while 35 respondents were not satisfied. FAs visits have close association with both size of landholding and age (Table 2).

Past researches also reported that there is huge gap between the research institutes and extension in flow of latest information but in the study area more than half of the respondents (75) reported that FAs is providing latest information while 45 complain about their unmet information needs for their agricultural practices. In-service training facilities are quite unsatisfactory and insufficient; career development options are limited and the basis for staff rewards and accountability remains mostly absent (Shalaby *et al.*, 2011) results in not covering whole area for provision of new knowledge. It is a general belief in extension that "seeing is believing". Based on such assumption FAs usually establishes demonstration for farmers so that they have practical experience of improved and latest techniques of farming, their application, management and perfect utilization. Field survey revealed that demonstration method was utilized rarely for the transfer of latest technologies i.e. 51 respondents reported the establishment of demonstration in the area while fair majority (69 Respondents) reported no demonstration in their territory. Significant association was observed with size of landholding and age respectively (Table 2). The principle aim of any information disseminated to the farmer is its ability to be translated into productive activity for establishment of better farming practices. However such information has to be accessible, available and affordable. It was observed that overwhelming majority got benefit from the recommendations of FAs i.e. 86 while 34 were not in favor. Chi-square results depict significant association with size of landholding and age. More over the farmers were also asked about their existing level of knowledge about improved practices. It was observed that more than half of the respondents were aware about the improved practices of agriculture farming which also has a significant association with size of landholding and age (Table 2).

Table 2: *Association of land holding and age with other extension activities*

Variable	Yes	No	Association with land holding	Association with age
			Chi-square Value	Chi-square Value
Visit to Field Assistant office	74	46	10.592*	13.476*
Accessibility of FAs Office	62	58	3.924 ns	13.361*
Availability of FAs in office	70	50	5.658 ns	8.030*
Field Assistant Visit to Field	85	35	68.394*	58.73*
Provision of New Knowledge	75	45	6.381*	26.087*
Field Demonstration	51	69	17.624*	15.0*
Satisfaction from Problem Reported	92	28	32.564ns	37.796*
Benefit Of Recommendations	86	34	33.489*	39.916*
Knowledge about improved Practices	72	48	10.525*	14.211*

Correlation coefficient

The correlation coefficient of new knowledge provision by FAs with other variables is presented in Table 3. It is evident from Table 3 that five variables viz. education (2.59), frequency of FAs visits (85), accessibility of FAs office, benefit of recommendations and establishment of demonstration have highly significant (P≤0.01) positive relation. Similarly age, size of land holding and knowledge about inputs have a significant positive association at (P≤0.01) with FAs provision of new knowledge while tenurial status have positive but non-significant association. This positive correlation of tenurial status might be attributed to the FAs provision of new knowledge irrespective of their tenurial status.

Table 3: *Relationship between new knowledge by field assistants and other variables*

Variables	Correlation coefficient (r)
Age	0.233*
Education	0.59**
Tenurial status	0.21 NS
Landholding	0.230*
Frequency of FAs visits	0.487**
Accessibility of FAs Office	0.439**
Benefit Of Recommendations	0.567**
Establishment of Demonstration	0.422**
Knowledge About Inputs	0.202*

**, ** Significant at 5% and 1% level of probability respectively.*

Mean comparison of size of landholding

Data in Table 4 depicts that highly significant (P≤0.01) differences have been found in size of landholding with other attributes viz. visit to field assistant office, provision of new knowledge, field demonstration, satisfaction from problem reported and benefit of recommendations while availability of FAs in office was significant (P≤ 0.05). Non-significant effect was observed with accessibility of FAs office and knowledge about improved practices. It is evident from Table 4 that mostly those consult FAs at their office whose size of landholding was above 20 ha which shows that they were progressive farmers and were have the desire to get greater production results from their fields. Those farmers having size of landholding 10-20 ha find FAs available at their office (0.62±0.68) and were furnished with new knowledge (0.71±0.77). Field demonstration method of transferring of improved technologies was experienced by those farmers having size of landholding above 20 ha (0.9±0.06). Those farmers having size of landholding less than 10 ha was satisfied from solution of the problem they reported (2.18±0.067) and they got benefit from the recommendations (2.25±0.06) of FAs. It might be due to the fact that they have small landholdings and were easy to manage in contrast to big size of landholdings.

Rank Based Quotient (RBQ) of problems identified

Pakistan is experiencing Extension staff shortages in remote, marginal and underdeveloped areas (Ali et al., 1994; Anderson and Feder 2004; Shalaby et al., 2011). In the study area based on RBQ, the most alarming problem was lack of enough extension staff (90.5). Many of the extension activities are not successful because they are not adequately coordinated and integrated into the system by adopting top-down approach while completely ignoring the clientele; they plan to serve (Baig and Straquadine, 2011). The second problem of importance identified was Top-Down Approach of Technology Need (84.1%). The influence of extension organization also depends upon the working conditions and on the equipment made available to them. To be effective extension workers, they must be mobile enough to reach the scattered clients. Factors like lack of transport, heterogeneous

Table 4: *Mean table of landholding with other related attributes (revise title)*

Variable	<10 Ha	10-20 Ha	>20 Ha	Total	F-Stat
Visit to Field Assistant office	0.52±0.05	0.71±0.077	1±0	0.62±0.045	5.663**
Accessibility of FAs Office	0.41±0.05	0.6±0.08	0.6±0.163	0.48±0.046	1.977 NS
Availability of FAs in office	0.52±0.05	0.62±0.68	0.9±0.1	0.58±0.045	2.89*
Provision of New Knowledge	0.54±0.05	0.71±0.77	0.9±0.1	0.63±0.044	3.28**
Field Demonstration	0.29±0.05	0.44±0.101	0.9±0.06	0.43±0.045	14.47**
Satisfaction from Problem Reported	2.18±0.067	1.65±0.13	1.4±0.16	1.97±0.065	12.005**
Benefit Of Recommendations	2.25±0.06	1.88±0.14	1.6±0.22	2.09±0.063	6.84**
Knowledge about improved Practices	1.21±0.07	1.42±0.09	1.3±0.3	1.28±0.061	1.265 NS

**, ** Significant at 5% and 1% level of probability respectively.*

Table 5: *Rank Based Quotient of the major problems identified affecting extension activities.*

Problems	1	2	3	4	5	RBQ (%)	Rank
Insufficient extension staff	87	15	12	3	3	90.5	I
Poor level of infrastructure	35	29	14	33	9	68	III
Negligence of extension department	25	21	6	42	26	56.1	V
Top down approach of technology transfer	68	29	3	20	-	84.1	II
Lack of farmers' interest	48	14	11	7	40	63.8	IV

nature of these areas and underdeveloped infrastructure prevent the extension workers to perform their duties (Antholt, 1994; Andrew et al., 2001).

The third problem on propriety basis identified were infrastructure (68%). Farmers were complaining about the lack of roads, lack of transport as well as they were complaining that there is no other easy method to inform us instead of face to face to communication which costs a lot of time and money. Farmers also agreed with fact that they have lost interest (63.8%) in commercial farming which is because of no proper motivational activities arranged which have incentives so farmers get motivated to feed the nation. The last problem identified was negligence of extension department (56.1) but that negligence was due to no proper infrastructure and no proper availability of technology transfer equipment (Table 5). Our results are in agreement with that of Shanthy et al. (2013).

Conclusions and Recommendations

From the present study it is concluded that FAs are very devoted to their work and are busy in transferring of latest technologies to the deprived farmers but due to the problem of infrastructure and lack of enough staff, the FAs' performance is not the best, because they have to cover large areas with minimum resources. The State's financial support can improve the existing Extension Service in place, by making it more functional and operational. Funding must be channeled for proper infrastructure and latest communication technologies. The concepts of decentralized planning and devolution should be enhanced, to increase farmer's participation in planning and location specific technology up-brought. Being front line development agents, the FAs should be better treated, through capacity building trainings, so to be more able to make the right diagnosis to identify and analyze the existing farming problems.

Author Contributions

Rehmat Ullah conducted this research. Kalim Ullah provided the technical guidance at each step of the study. Muhammad Zafarullah helped in designing of study. Data collection was made by Asif Nawaz and Inam Ullah. Asif Nawaz also helps in introduction chapter whereas Inam ullah helps in review of literature. Data Analysis and overall write-up of manuscript was done by Rehmat Ullah whereas Kalim Ullah fine-tuned the manuscript and corrected technically for submission.

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