

AN ANALYSIS OF PUBLIC AND PRIVATE AGRICULTURAL EXTENSION SERVICES IN BALOCHISTAN, PAKISTAN

A.A. Mengal* , M. U. Mallah, Z. A. Mirani* and B. N. Siddiqui**

ABSTRACT:- Present research sought to analyze public and private sector extension in Balochistan province of Pakistan. Five districts, one from each ecological zone, were selected which are Turbat (Kech), Lasbela, Mastung, Sibi, and Loralai. A sample of 375 farmer respondents were taken with a systematic sampling procedure. The response rate was 82.67%. A detailed and comprehensive questionnaire was used for measuring the effectiveness of extension activities performed by public and private sector extension field staff. The results revealed that a number of farmers received visits from private extension field staff on a fortnightly, monthly and quarterly basis, but not from public extension staff during these periods. When public field staff did visit, the favored method of extension was by exhibition and seminar, which ranked 1st and 2nd, respectively, based on the mean score for each extension teaching method used. A majority of the farmers received farm visits and field demonstrations by private extension field staff, which were ranked 1st and 2nd, respectively, as preferred methods of extension. Most of the farmers agreed that public extension field staff provide information regarding application of irrigation and private extension field staff provided advice for the use of plant protection measures. Significant differences were observed between public and private extension field staff on various statements regarding competency level and agronomic practices.

Key Words: Agriculture Extension; Technology Transfer; Public and Private Extension Services; Farmers Contact; Pakistan.

INTRODUCTION

Agriculture sector is the salvation of Pakistan's economy. It contributes 21.8% in GDP, shares 66% in export and employs 45% of the labor forces (GoP, 2010-11a; 2011b). More than 70% of the country population resides in far-flung rural areas and relies on this sector. Their livelihood and socio-economic provision directly or indirectly revolves around agriculture and other allied agriculture activities (GoP, 2011b). The agricultural sector

is not only a dominant and dynamic force for economic growth and food security requirements of rural populace, but it is also a supplier of basic inputs of raw material for key agro-based industries such as textiles, sugar and food processing units. It is a vehicle for reinforcing and fostering diverse economic development, sustainable food security, employment generation, social stability and alleviates rural poverty. Agriculture sector is regarded as engine of Pakistan's economy, which contributes a positive role to

*Sindh Agriculture University, Tandojam, Pakistan.

**University of Arid Agriculture, Rawalpindi, Pakistan.

Corresponding author: zamirani@sau.edu.pk

alleviate poverty and had a lasting impact on poverty reduction over the past four decades (MINFA, 2008).

Overall performance of the agricultural sector remained modest and growth slowed down to 1.2% during 2010-11. The major crops were damaged by environmental disasters (floods), the structural problems like lack of mechanization remained main obstacle to growth of agriculture sector. In spite of difficulties, the agriculture sector was given much required support to increase exports and boost up re-manufacturing industries in 2010-11 (MINFA, 2011).

Balochistan Geography and Demography

Balochistan is a land of outstanding contrast that amalgamation and mixture in geography, ecology, population, culture and life-styles are there. It is located on the migration route of an economically and biologically important site. About 6% of the land is currently cultivated, mainly in small land-holdings, with tremendous potential for fruit and horticulture cultivation (Haider, 2004; Ahmed and Khalida, 2007). The agricultural sector is the most important segment and contributes more than 52% of GDP and constitutes 65% of the labor force in Balochistan's economy. It is also the preliminary source of livelihoods of rural households (Vinning, 2007). Livestock is another key component and source of income, which accounts for 36% of the value of agricultural products and livelihoods in rural masses of the province. The agriculture and livestock sectors are well-integrated and are interdependent. In Baloch-

istan province land areas are unproductive due to their rocky landscape making them unsuitable for cultivation, only about 17% is arable cultivated land and 30% of this supports grazing for livestock (Ahmad, 2007a; USAID, 2008).

Area wise, Balochistan is the biggest province of Pakistan and is known as fruit basket of Pakistan (Haider, 2004; Ahmed and Khalida, 2007). It significantly contributes to the overall economy of the country (Haider, 2004). As in other provinces of Pakistan, the Department of Agriculture and Livestock of Balochistan has provided advisory services to its stakeholders, the rural farmers, but as yet the outcome of these activities are not at par with the success seen in other provinces. As a result, socio-economic condition of the farming community has not improved, which implies that there is a gap between information dissemination and adoption process. Beside public sector extension, private extension services are also involved in extension activities, but limited research work on success or failure of the delivery system has been carried out. Attention is also required in formulation of agricultural extension as need-oriented, cost effective and responsive to specific farmers. In an attempt to do so, there is dire need to establish suitable strategies and adapt a holistic approach to systematize a positive transformation, through public and private extension services, to help rural farming community. The present research was designed to identify the communication/ knowledge gap and to analyze the public and private agricultural extension system in

Balochistan province of Pakistan.

Specific objectives include: To assess the public and private agricultural extension services / methods, to determine the working pattern, professional skills and ways of technology transfer as performed by public and private extension services and to compare the competency level as possessed by public and private extension field staff.

MATERIALS AND METHOD

Research Design

The research design of this study was to utilize a descriptive survey. This type of survey plays a cardinal role in educational research and provides information from another perspective (Knupfer et al., 2001) and is considered most appropriate for obtaining people's perception on socio-economic facts. This type of survey describes the characteristics or behavior of a particular population systematically and accurately (Mark, 2003). By employing a descriptive survey, the researcher could gain a better understanding of different aspects of the study and the nature of existing condition within the studied situation (Trochim, 2000; Jonassen, 2001).

Sample Size and Sampling Method

The target population for this study consisted of farmers of the five selected districts of Balochistan province namely Turbat (Kech), Lasbela, Mastung, Sibi, and Loralai. As many as 375 farmers (75 farmers from each district) were determined as an appropriate sample size. The sample was selected using systematic sampling procedure whereby every K^{th} number was randomly

selected (Gay and Mills, 2006) from a list developed by Cochran (1977). The sample size for both populations was determined by using Wunsch (1986) table of "selecting sample sizes" at the 0.05 percent error rate.

Research Instrument

To obtain the perceptions of farmers, a questionnaire was developed, with the help of available literature and supervisory committee, keeping in view the objectives of the study. Various extension activities were identified and determined as indicators to judge the impact of farm advisory services. Likert-type scales were used where deemed fit to measure the response. In this study Likert scaling was used for rating of attitude on five point scales to find out the perception of the respondents regarding the efficiency of agricultural extension procedures (Lindner et al., 2003).

Data Collection

The data were collected from five selected districts of Balochistan. A data-coding sheet was developed to record the captured data as collected. Researchers personally conducted interviews during 2010-2011 with the farmers at either respondent's home, fields, offices or alternative suitable locations, using the pre-tested questionnaire prepared for the purpose.

RESULTS AND DISCUSSION

Demographic Information

The demographic characteristics of the sampled farmers depicted that the maximum age of the farmers was 55. Farmers had a maximum 44 years of farming experience. The

maximum landholding of all the category of farmers was 75 acres (Table 1 and 2). A largest number of farmers (38.70%) were owners.

The educational level of farmers was divided into six categories. More than half (50.64%) of the respondents were illiterate and only 1.30% of respondents received above intermediate level education (Table 3). The educational level of farmers was good with more than 49% of the farmers received formal education.

The important aspect of the study was to explore the frequency of the visits paid by the public and private sector extension field staff (EFS) to the farmer's field because the regular visits considered as an important aspect of technology transfer and trust building. The result shows that 24.17% of the farmers opined that public sector extension field staff did not pay any visits to their farms, 21.69% and 20% of farmers received visit once and twice a year, respectively (Table 4). Only few (10.97%) of the respondents received visit on monthly basis followed by 9.3% of the respondents

Table 1. Demographic profile of the farmers (n = 310)

Characteristics	Farmers Respondent		
	Mean	Max	Min
Age (years)	38.69	55	19
Farming experience (years)	25.52	44	8
Farm size (acres)	47.57	75	15

Table 2. Tenancy level (n = 310)

Category	Farmers	
	f	%
Owner	120	38.70
Owner-cum-tenant	90	29.05
Tenant	100	32.25

f = Frequency

Table 3. Educational level (n = 310)

Category	Farmers	
	f	%
Illiterate	157	50.64
Up to primary (1-5 years of schooling)	60	19.35
Primary to middle (6-8 years of schooling)	30	09.68
Middle to matriculation (9-10 years of schooling)	40	12.90
Matriculation to intermediate (11-12 years of schooling)	10	03.23
Above intermediate (13-16 years of schooling)	04	01.30
Post graduate	9	02.90

f = Frequency

who received farm visit on fortnightly basis by the public sector extension field staff.

The private extension field staff used a variety of methods to contact farmers. Most (29.03%) of the respondents received visit by private EFS on fortnightly basis and 24.19% of respondents received, visit to their farm on monthly basis. While

Table 4. Farmer's perception regarding frequency of visit paid by public and private Extension Field Staff (EFS)

No. of visits	Public EFS		Private EFS	
	f	%	f	%
Fortnightly	28	09.30	90	29.03
Monthly	34	10.97	75	24.19
Quarterly	43	13.87	55	17.74
Twice a year	62	20.00	40	12.90
Once a year	68	21.69	30	09.42
Not at all	75	24.17	20	06.45
Total	310	100.00	310	100.0

f = Frequency

17.74% of farmers received visit on quarterly basis to their field by the private extension field staff. Only 09.42% of the respondents reported that they received visit once a year followed by 06.45% of the respondents who did not receive visit at all by the private EFS to their farm.

The opinions/suggestions regarding frequency of visits were recorded on open ended questions and are summarized as under:

Public extension field staff must increase their frequency of visits and instead of yearly bases they should regulate their visit according to fortnightly, monthly and quarterly bases.

Due to lack of visit the marginal farmers usually suffer from emerging agriculture related problems at field level.

Adequate transport facility must be provided to extension field staff for better and effective visits.

Most of the farmers (more than two-third) explained their ideas regarding farm visits by the private extension services and also provided their suggestions about how to make extension services more effective. The following are main suggestions:

Besides selling their product, the private companies must also conduct demonstration plots for needy farmers.

Private extension companies should provide the fertilizer, pesticide and insecticide on credit basis.

Besides selling their products, the private input companies should enhance the flow of information to accelerate the rate of adoption of new technologies.

Instead of inviting commercial/ large-scale farmers in seminars and workshops private companies should invite the small farmers in seminars and arrange for them demonstration plots, regulate the farm and home visit for small scale farmers.

Instead of selective approach to progressive and large farmers the private companies should apply holistic approach for marginal farmers.

Farmers were asked to give their perception about the extension teaching methods and their effectiveness as used by public EFS. Based upon the mean score for each extension teaching methods, rank order was: exhibition (3.59), seminar (3.12), and literature distribution (2.79) whereas farm visits (2.07) were the lowest in ranking (Table 5).

Further, farmers provided their suggestions regarding extension teaching methods adopted by public EFS which are as follows.

Public EFS must regulate their farm and home visits.

Public EFS should conduct result and method demonstrations as these methods are proven to be effective method in understanding the concept. It should involve majority of practicing farmers by inviting in workshop and farmers day and not just inviting a few selected farmers.

The farmers were again asked about the extension teaching methods employed by the private EFS. The rank order was calculated on the basis of mean score to find out the relative importance of each method. Conduct farm visit regularly

Table 5. Perception of farmers regarding teaching methods employed by public EFS

Category	Rating Value										Mean	SD	Rank
	Strongly disagree		Disagree		Undecided		Agree		Strongly agree				
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%			
Arranging exhibition	21	06.8	035	11.3	00	0.0	248	80.0	06	1.9	3.59	0.95	1
Arranging seminar	28	09.0	098	31.6	03	1.0	171	55.2	10	3.2	3.12	1.16	2
Literature distribution	29	09.4	145	46.8	01	0.3	132	42.6	03	1.0	2.79	1.12	3
Conduct farmer fair (<i>mela</i>)	34	11.0	157	50.6	01	0.3	110	35.5	08	2.6	2.68	1.14	4
Conduct group discussion regularly	40	12.9	150	48.4	02	0.6	108	34.8	10	3.2	2.67	1.17	5
Conduct FFS regularly	48	15.5	164	52.9	00	0.0	096	31.0	02	0.6	2.48	1.10	6
Conduct method demonstration regularly	62	20.0	186	60.0	01	0.3	057	18.4	04	1.3	2.21	1.00	7
Conduct result demonstration regularly	73	23.5	173	55.8	00	0.0	055	17.7	09	2.9	2.21	1.08	8
Conduct field trips regularly	45	14.5	214	69.0	04	1.3	043	13.9	04	1.3	2.18	0.90	9
Conduct home visit regularly	51	16.5	218	70.3	07	2.3	027	08.7	07	2.3	2.10	0.85	10
Conduct campaign	71	22.9	191	61.6	01	0.3	047	15.2	00	0.0	2.08	0.91	11
Conduct farm visit regularly	60	19.4	210	67.7	05	1.6	029	09.4	06	1.9	2.07	0.87	12

f = Frequency

(4.09), conduct result demonstration regularly (4.07), and conduct group discussion regularly (3.93) were ranked 1st, 2nd, and 3rd respectively (Table 6). Whereas home visit (2.25) and farmer fair (*mela*) (2.02) were ranked 11th and 12th respectively.

Majority of the farmers suggested that diffusion of new improved practices should be continued with realistic approach. For this, there should be collaboration and effective linkage between public and private extension services.

The competency level is the significant variable. Job performance of extension field staff is always correlated with the competency level. Stone and Bieber (1997); Langdon and Whiteside (2004) and

Lakai (2010) described the competency as the comprehensive and combined set of skills, knowledge, attitudes and attributes that assists collective performance of the actions. The competency level is considered as ability to involve and lead farmers to adopt innovation and act accordingly (Linders, 2001; Armstrong, 2006 and Ali et al., 2008). Four domains i.e. knowledge, attitude, skill, and quality contribute to develop competency level of extension workers (Cooper and Graham, 2001 and Ali et al., 2009). A number of factors such as time management, quantity, quality and effectiveness of work, knowledge, and skill in work, effectiveness of communication, ability to manage

Table 6. Perception of farmers regarding teaching methods employed by private EFS

Category	Rating Value										Mean	SD	Rank
	Strongly disagree		Disagree		Undecided		Agree		Strongly agree				
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%			
Conduct farm visit regularly	06	1.98	15	4.90	04	0.97	203	65.60	82	26.55	4.09	0.79	1
Conduct result demonstration regularly	08	2.58	19	6.12	06	1.93	190	61.29	87	28.08	4.07	0.86	2
Conduct group discussion regularly	15	4.83	23	7.42	10	3.22	181	58.39	81	26.14	3.93	1.01	3
Conduct field trips regularly	22	7.10	27	8.70	08	2.58	175	56.45	78	25.17	3.83	1.11	4
Literature distribution	28	9.03	32	10.32	10	3.23	166	53.55	74	23.87	3.72	1.19	5
Conduct method demonstration regularly	33	10.65	38	12.26	09	2.90	160	51.61	70	22.58	3.63	1.25	6
Arranging seminar	37	11.94	43	13.87	10	3.22	154	49.68	66	21.29	3.54	1.29	7
Arranging exhibition	48	15.49	55	17.74	05	1.61	142	45.80	60	19.36	3.35	1.38	8
Conduct campaign	62	20.0	95	30.65	15	4.84	88	28.39	50	16.12	2.90	1.42	9
Conduct FFS regularly	70	22.58	120	38.71	10	3.23	70	22.58	40	12.90	2.64	1.38	10
Conduct home visit regularly	80	25.80	160	51.61	05	1.61	40	12.92	25	8.6	2.25	1.20	11
Conduct farmer fair (<i>mela</i>)	90	29.5	176	56.77	04	1.29	25	8.6	15	4.83	2.02	1.03	12

f = Frequency

and discipline has influence on competency level of extension workers (Tiraieyari, 2009).

Results revealed that all the 13 competency level examined in this study was perceived by the respondents as being important. Differences were observed in eight statements (Table 7). The competency level and their mean perception scores included: assessment ability to identify the need and problem of the farmers ($t= 2.569$; $P 0.05$); audio visual material effectively utilize in extension programme ($t= 3.852$; $P 0.05$); ability of planning and organizing tactics ($t= 3.234$; $P 0.05$); pro-active and innovative on delivery agriculture extension activities ($t= 6.709$; $P 0.05$); talent to use latest agriculture information

and communication technology ($t= 2.902$; $P 0.05$); ability to mobilize farming community to adoption in innovation ($t= 3.972$; $P 0.05$); tactic and skill regarding cooperation, dialogue, and conflict management ($t= 12.363$; $P 0.05$), and the extension agent attitude towards clients lenient and candid ($t= 2.895$; $P 0.05$). Farmers gave high preferences to private extension field staff as compared to public extension field staff regarding competency level. Therefore, it was concluded that private extension field staff were competent as compared to public EFS (Table 7).

T-test analysis was used to compare the differences regarding recommendations of agronomic practices used by the public and

Table 7. Comparative analysis of public and private extension field staff regarding competency level

Category	Public Extension			Private Extension			Std. Error Diff.	t-value	Significance
	Mean	SD	Ranked order	Mean	SD	Ranked order			
Leadership/Hegemony quality	2.65	1.125	10	2.75	1.081	10	0.089	1.238	0.216
Assessment ability to identify the need and problem of the farmers	3.14	1.231	06	3.37	1.043	07	0.092	2.569	0.010*
Audio visual material effectively utilize in extension program	2.74	1.166	09	3.10	1.210	08	0.095	3.852	0.001**
Ability of planning and organizing tactics	2.48	0.994	11	2.74	1.042	11	0.082	3.234	0.001**
Quality, knowledge and skill in work	2.79	1.175	08	2.89	1.075	09	0.090	1.034	0.301
Pro-active and innovative on delivery agriculture extension activities	2.89	1.199	07	3.48	0.994	04	0.088	6.709	0.001**
Maintain personal communication relationship with clients	3.22	1.242	04	3.37	1.064	07	0.093	1.632	0.103
Ascertaining discussion and lecture meeting with clients frequently	2.43	1.103	12	2.41	0.964	12	0.083	0.233	0.816
Talent to use latest agriculture information and communication technology	3.19	1.286	05	3.45	0.960	05	0.091	2.902	0.004**
Ability to mobilize farming community in adoption of innovations	3.39	1.253	03	3.73	0.841	02	0.086	3.972	0.001**
Tactic and skill regarding cooperation, dialogue and conflict management	2.37	1.062	13	3.44	1.095	06	0.087	12.363	0.001**
Self-confidence and sound communication skill	3.43	1.264	02	3.55	0.897	03	0.088	1.466	0.143
The extension agent attitude towards clients lenient and candid	3.61	1.160	01	3.84	0.772	01	0.079	2.895	0.004**

* and ** = Significant at 0.05% and 0.01%, respectively

private EFS. Significant differences at the P. 0.01; 0.05 alpha level were found between two groups, related to the dissemination of agronomic practice (Table 8).

Accordingly public extension field staff disseminated the following agronomic practices as perceived by farmers;

Suggestion for fertilizer requirement;

Advice for the pesticide insecticide;

Advice for plant protection measures;

Which private EFS disseminated the following agronomic practices as perceived by farmers;

Suggestion for application irrigation;

Recommendation for seed rate/seed treatment;

Suggestion for fertilizer requirement;

Advice for the pesticide insecticide;

Advice for plant protection measures;

Advice for soil and water testing;

Recommendation for new varieties;

Hence, it was concluded that private EFS were disseminating more agronomic practices as compared to public extension field staff.

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Table 8. Comparative analysis of public and private extension field staff regarding recommendations of agronomic practices

Agronomic Practices	Public Extension			Private Extension			Std. Error Diff.	t-value	Significance
	Mean	SD	Ranked order	Mean	SD	Ranked order			
Suggestion for application irrigation	3.41	1.145	04	3.78	0.911	02	0.083	4.452	0.001**
Recommendation for seed rate/ seed treatment	3.34	1.249	05	3.52	0.978	07	0.090	1.970	0.049*
Suggestion for fertilizer requirement	3.57	1.222	03	3.53	0.933	06	0.087	0.501	0.616
Advice for the pesticide insecticide	3.66	1.195	01	3.77	0.740	03	0.080	1.293	0.196
Advice for plant protection measures	3.60	1.183	02	3.83	1.273	01	0.099	2.256	0.024*
Guidance for integrated pest management (IPM)	2.38	1.130	09	2.65	1.070	09	0.088	3.137	0.002**
Recommendation for proper grading/ packing/ harvesting/ storage of fruits & crops	2.91	1.258	08	3.08	1.124	08	0.096	1.718	0.086
Advice for soil and water testing	3.17	1.218	07	3.54	0.974	05	0.089	4.115	0.001**
Recommendation for new varieties	3.29	1.183	06	3.56	0.956	04	0.086	3.137	0.002**

* and ** = Significant at 0.05% and 0.01%, respectively

RECOMMENDATIONS

Public extension field staff should be more regular in their farm and home visits, conduct demonstration plots regularly.

The agricultural extension system could be more strengthened by providing more opportunities to the public extension field staff, streamline regular professional/ in-service training procedure both in domestic and abroad to enhance their competency level, as well addresses learning objectives.

Public extension field staff may be attached with any private organization for six (6) to twelve (12) months to demonstrate and propagate their skills and activities regarding extension

teaching methods.

Coordination and linkages among agricultural research, agricultural extension, and private sectors are needed to bring joint actions so as to restore the self-assurance of extension clientele group (farmers).

Meetings with the farming communities be arranged at district level to transfer new technology and get feedback of the farmers.

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