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Farmer's Perception Paradigm: Public and Private Extension Services in Balochistan, Pakistan

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Abstract
Present research sought to compares the public and private sector's extension services regarding teaching methods, competency level and recommendation of agronomic practices as perceived by farmers in five purposively selected districts of Balochistan. A sample of 375 farmers was taken by using the systematic sampling technique. The hypotheses were tested in order to know the differences in the perception of the respondents regarding various constructs. Farmers gave high preferences to private (usually composed of organizations that are privately owned and not part of the government) extension as compared to public (usually composed of organizations that are owned and operated by the government i.e. federal, provincial, state) extension regarding teaching methods, competency level and disseminating of agronomic practices by using paired t-test. Public extension preferred to arrange exhibition whereas private extension conduct farm visits regularly was highest mean score. Both public and private extension had positive attitude toward their clients. Public extension advice for utilization of pesticides while private extension suggestions for irrigation applications. The study recommended that public extension field staff should be in contact with farmers regularly. Private extension services should use holistic approach. It was also recommended that the in-service trainings should be arranged in order to increase the working efficiency, competency level and capacity building of Extension Field Staff.
Keywords: Agriculture; Balochistan Province; Extension Field Staff; Farmers; Pakistan.

1. INTRODUCTION

Agricultural extension is an effective vehicle to disseminate technical information of new crop technologies in order to raise the living standard and socio-economic circumstances of the rural masses in the developing countries that diminish the occurrence of poverty (Haq 1999; Sen 2005; Mulyanto and Magsi 2014; Memon*et al.*, 2015). The purpose of agricultural extension services is to serve as a vehicle for fostering change in agricultural and rural development, while delivering useful information to farmers and enhancing their mandatory skills (Shafique 2008). The main focus of agricultural extension work is to increase agricultural production and spread the benefits of improved farming techniques more widely (Picciotto and Anderson, 1997). It is commonly accepted that proper technology transfer and adoption thereby can reduce the yield gaps (Jalvi 1996; Khan 1997; Hanif *et al.,* 2004).Thus, the federal and provincial agriculture departments of Pakistan carry out basic agricultural research in Balochistan. Area wise, Balochistan is the biggest province of Pakistan and is known as fruit basket of Pakistan (Haider 2004; Ahmed &Khalida 2007).The provincial agriculture department is responsible for support and conduct agricultural research. Like other provinces of the country the organizational structure of agriculture extension services in Balochistan is based on a conventional top-down approach. The extension agents mostly have a large area of jurisdiction and focus on a small number of large substantial farmers, consequently overlooking the needs of small and medium-sized farmers. Like other provinces of Pakistan, the Department of Agriculture and Livestock of Balochistan has provided advisory services to its stakeholders, the rural farmers, however as yet the outcome of these activities are not on a par with the success seen in other provinces.

However, the current existing agricultural extension services do not meet the needs of most farmers due to lack of trained staff and primary focus on resource-rich farmers (Davidson *et al.,* 2001). Provincial agricultural research system lacks adequate trained personnel and financial resources (GoB and IUCN 2000). On the other hand, Agriculture Extension Wing (EFS) did not carry out agricultural extension activities due to lack of operational funds and poor capacity building of extension staff (Ahmad 2007). 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 (Mengal *et al.,* 2014). Balochistan province of Pakistan was selected for this study due to the need to address the issues of uncertainty in public and private extension services felt by the stakeholders. It is also important to provide relevant information to agriculture sector about extension teaching methods, competency level and agronomic practices in the province.

HYPOTHESES

To operationalize the problem below inquiry, the following research hypotheses was proposed and tested:

H_O1. There is no significant difference in the perception of farmers regarding teaching methods as used by public and private Extension Field Staff (EFS).

H_O2. There is no significant difference in the competency level of public and private EFS as perceived by farmers.

H_O3. There is no significant difference in the perception of farmers regarding recommendations of agronomic practices as made by public and private EFS.

The objectives of this study were as under: (i) to study the comparative analysis of public and private agricultural extension services regarding, extension teaching methods, competency level and recommendations of agronomic practices as perceived by the farmers; and (ii) to develop need-based recommendations for policy implication.

MATERIALS AND METHODS

The research design of this study was to utilize a descriptive survey method. This type of survey plays a cardinal role in educational research and phenomena (Gall *et al.,* 1996; Gall *et al.,* 2007; Trochim 2000; Jonassen 2001; Knupfer*et al.,* 2001) and is considered most appropriate for obtaining people's perception on socio-economic facts (Trochim 2000; Cohen *et al.,* 2007).The target population for this study consisted of intended beneficiaries (farmers). The study covered five purposively selected districts namely Kech, Lasbela, Mastung, Sibi and Loralai of Balochistan province for being the enormous potential for agriculture productions. A sample size of 375 farmers; seventy five (75) farmers from each district of Balochistan province were selected by using systematic sampling procedure whereby every K^{th} number is randomly selected (Gay and Mills, 2006) from a list developed by Cochran (1977). The sample size of respondents was determined by using (McCall 1980; Wunsch 1986; Fitz-Gibbon and Morris 1987) table of "selecting sample sizes" at the 0.05 percent error rate. A detailed questionnaire were developed keeping in view the objectives of the study. In this study Liker scaling was used for rating of attitude on five point scales in order to find out the perception of the respondents (Likert 1932).Where the Cronbach's Alpha program was used to test the reliability for the questionnaire (Ary*et al.*, 1996). The reliability coefficients ranged from .70 to .80, indicating that the interval consistency of the instrument was outstanding (Nunnally 1967; Rothbard and Edwards 2003).Hence; data collected was tabulated and analyzed by applying quantitative approaches and standard statistical techniques, with the help of Statistical Packages for Social Sciences (SPSS). A comparison was also made between perceptions of farmers regarding teaching methods, competency level and recommendations of agronomic practices by using paired t-test.

RESULTS AND DISCUSSION

The study inquired about the effectiveness of extension teaching methods which were used by public and private EFS as perceived by the farmers. As results, there were numerous extension teaching methods used by EFS to transfer technical expertise to end-users. In order to satisfy the research hypotheses, the results are categorized as under:

H_O1:

"There is no significant difference in the perception of farmers regarding teaching methods as use by public and private EFS".

To test this hypothesis, present study assesses the teaching methods. Perceptions of farmers toward the twelve identified teaching methods as used by public and private EFS were measured using a five point Likert-type scale that ranged from 1 "strongly disagree" to 5 "strongly agree". The paired t-test was used to determine if there were any significant differences existed between the overall means of group perceptions of EFS as perceived by farmers.

Statistically significant at 0.05 confidence level were observed on various statements. Segregated data based upon teaching methods revealed that private extension conduct farm visits regularly was highest mean score (M = 4.10) and public extension was lowest mean score (M = 2.07). The differences between teaching methods were highly significant ($\underline{P} \leq 0.05$) as shown in (Table 1). Within result demonstration category, the significant difference ($\underline{P} \leq 0.05$) between two group as perceived by the farmers, public extension (M = 2.21) and private extension (M = 4.06) was recorded. Likewise, difference between arranging seminar category was also highly significant ($\underline{P} \leq 0.05$) for public extension (M = 3.12) and private extension (M = 3.55). Significant difference between group perceptions were also recorded regarding farmer fair (melaa) public (M = 2.68) and private extension (M = 2.03). Unlike conduct farmer field school regularly and conduct home visit regularly was not significant at a $P \leq 0.05$.Similar results were reported by Rajper (2013) who found that farm visits were effective teaching methods as employed by private EFS. A large number of growers perceived that the farm visit is very common and popular among the private EFS. Because farmers are always involved in the farming practice of their field and most of time they spend time in their field. Farmers perceived that private extension were skilled regarding uses teaching methods. Therefore, *H_O1* was rejected for 10 out of 12 categories and it was

concluded that private extension more competent as compared to public extension regarding teaching methods.

H_O2:

"There is no significant difference in the competency level of public and private EFS perceived by farmers".

To test this hypothesis, farmers were asked to assess competency level of public and private EFS on various competency statements. The responses were recorded on a 1 to 5 point Likert-type scale where 1 was "very least efficient", 2 "least efficient", 3 "neutral", 4 "efficient", and 5 was "most efficient".

Competence means the overall capability and skill to do a certain job and perform tasks (Armstrong 1999). When competency methodspread over in human resources management the importantstage is to identification of competencies (Hay Group 2003; Königová and Hron 2012).In this regard, a comparison was made between the public and private EFScompetency and performance by using paired t-test. The results are presented in table 2. Differences were observed in the following nine statements. Audio visual material effectively utilize in extension program (M = 2.74 "Public", M = 3.10 "Private"), ability of planning and organizing tactics (M = 2.48 "Public", M = 2.74 "Private"), pro-active and innovative on delivery agriculture extension activities (M = 2.89 "Public", M = 3.48 "Private"), talent to use latest agriculture information and communication technology (M = 3.19 "Public", M = 3.45 "Private"), ability to mobilize farming community in adoption of innovations (M = 3.39 "Public", M = 3.73 "Private"), tactic and skill regarding cooperation, dialogue and conflict management (M = 2.37 "Public", M = 3.44 "Private") and the extension agent attitude towards clients lenient and candid (M = 3.61 "Public", M = 3.84 "Private") were highly significant difference ($\underline{P} \leq 0.01$). However, Leadership/ hegemony quality (M = 2.65 "Public", M = 2.75 "Private"), quality, knowledge and skill in work (M = 2.79 "Public", M = 2.89 "Private"), ascertaining discussion and lecture meeting with clients frequently (M = 2.43 "Public", M = 2.41 "Private")self-confidence and sound communication skill (M = 3.43 "Public", M = 3.55 "Private") was not significant at a $P \leq 0.05$. Segregated data of competency level based upon public and private categories leadership/ hegemony quality, quality, knowledge and skill in work, ascertaining discussion and lecture meeting with clients frequently was not significant at a $P \leq 0.05$.Similar results were found by (Tiraieyari*et al.,* 2010; Mengal*et al.,* 2012: Lopokoiyit*et al.,*2013; Wasihun*et al.,*2013) who also reported there was a significant difference between the extension agent's perceptions regarding competency level. This similarity is may be because the similar mode of data collection procedure.Farmers gave high preferences to private EFSas compared to public EFSregarding competency level. On the basis of results, the null hypothesis 2 was rejected and it was concluded that private EFS was comparatively more competent as compared to public EFS.

H_O3:

"There is no significant difference in the perception of farmers regarding recommendations of agronomic practices as made by public and private EFS".

In testing this hypothesis, present study identified various possible recommended agronomic practices. Five point Likert scale was used where 1 stands for "strongly disagree", 2 for "disagree", 3 stands for "undecided", 4 for "agree", and 5 stands for "strongly agree".

Paired t-test was used to test for any statistically significant differences on statements related to various possible recommended agronomic practices as shown in table 3. Results show that all the nine agronomic practices examine in this study was perceived by the respondents. Suggestions for irrigation applications (M = 3.41 "Public", M = 3.78 "Private"), recommendations for seed rate/ seed treatment (M = 3.34 "Public", M = 3.52 "Private"), suggestions for fertilizer requirement (M = 3.57 "Public", M = 3.76 "Private"), advice for the utilization of pesticides and insecticides (M = 3.60 "Public", M = 2.65 "Private") and guidance for integrated pest management (IPM) (M = 2.38 "Public", M = 3.77 "Private") were highly significant difference ($\underline{P} \leq 0.01$). Whereas advice for plant protection measures (M = 3.66 "Public", M = 3.53 "Private") was significant ($\underline{P} \leq 0.05$). The null hypothesis showed significant differences between the group's perception (public and private EFS). Similar results were found by (Ahmad *et al.,* 2009; Mengal*et al.,*2012) who also observed there was a significant difference between the responses of extension agents regarding disseminating of agronomic practices. Therefore, the *H_O3* was rejected 9 categories. Hence, it was concluded that private EFS were disseminating more agronomic practices as compared to public EFS.

CONCLUSION AND RECOMMENDATIONS

Based on the aforesaid results it was concluded that farm advisory services of public agricultural extension are not up to the farmer's expectation. Overall private EFS performance was better in comparison with the performance of public EFS. Three null hypotheses were tested in the present research study. All three null hypotheses were examined for statistical significance using paired t-test at 0.05 significant level. A comparison was made between the groups perception about teaching methods. Means, standard error and paired t-value from thirteen 13 categories related to teaching methods. Significant differences were observed for 10 out of 12 categories. Therefore, *Ho1* is rejected for 10 categories. Significant differences were observed in the overall means between public and private EFS for 9 out of 13 categories related to competency level. Therefore, *Ho2* is

rejected for 9 categories. Means, standard error and paired t-value in order to observer if there is any significant differences, at 0.05 alpha level, between the means assigned by public and private EFS for nine 9 categories related to recommendations of agronomic practices. Significant differences were observed in the overall means of groups for nine 9 categories. Hence, *Ho3* is rejected for 9 categories.

Survey findings conclude that public EFS had paid few visits to farmers; therefore it is recommended that public EFSshould pay more visits in farmer's farm and home, conduct demonstration plots regularly. The agricultural extension system could be more strengthened by providing more opportunities to the EFS; streamline regular professional/ in-service training procedure both in domestic and abroad in order to enhance their competency level, as well addresses learning objectives. Diffusion of new improved practices should continue with more realistic approach. For this, there should be effective liaison between public, private extension and other stakeholders. Farmers are first and last in the ladder of agricultural development, therefore, it is suggested that rather than selective approach toward better farmers the private extension services should utilize a holistic approach the farmers having small and medium size land holdings. Invite small and marginal farmers to the seminars and workshops more often, to be more realistic in their approach.

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Table-1: Comparative Analysis of Public and Private EFS regarding teaching methods as perceived by farmers

Categories	Public Extension			Private Extension			Std. Error Diff.	t-value	Sig*
	Mean	SD	RO	Mean	SD	RO			
Conduct farm visit regularly	2.07	.869	12	4.10	.799	1	.069	29.38	.000**
Conduct result demonstration regularly	2.21	1.081	8	4.06	.881	2	.073	25.41	.000**
Conduct group discussion regularly	2.67	1.172	5	3.94	1.012	3	.092	13.81	.000**
Conduct field trips regularly	2.18	.893	9	3.84	1.115	4	.082	20.18	.000**
Literature distribution	2.79	1.125	3	3.73	1.195	5	.088	10.68	.000**
Conduct method demonstration regularly	2.21	1.007	7	3.63	1.254	6	.089	16.04	.000**
Arranging seminar	3.12	1.161	2	3.55	1.293	7	.102	4.180	.000**
Arranging exhibition	3.59	.957	1	3.36	1.381	8	0.87	2.677	.008*
Conduct campaign	2.08	.194	11	2.90	1.425	9	.097	8.452	.000**
Conduct FFS regularly	2.48	1.105	6	2.65	1.383	10	.098	1.649	.100 ^{NS}
Conduct home visit regularly	2.10	.855	10	2.26	1.206	11	.084	1.874	0.62^{NS}
Conduct farmer fair (melaa)	2.68	1.143	4	2.03	1.031	12	.092	7.058	.000**

Scale: *1= Strongly disagree, 2= Disagree, 3= Undecided, 4= Agree, 5= Strongly agree*
** Significant at 0.05 Level* ***SD*** *= Standard deviation* ***RO*** *= Ranked order*
** *Significant at 0.01Level*
^{NS} *Non-significant*

Table-2: Comparative Analysis of Public and Private EFS regarding competency level as perceived by the farmers

Categories	Public Extension			Private Extension			Std. Error Diff.	t-value	Sig*
	Mean	SD	RO	Mean	SD	RO			
Leadership/ hegemony quality	2.65	1.125	10	2.75	1.081	10	.065	1.68	.093 NS
Assessment ability to identify the need and problem of the farmers	3.14	1.231	6	3.37	1.043	7	.069	3.40	.001**
Audio visual material effectively utilize in extension program	2.74	1.166	9	3.10	1.210	8	.058	6.34	.000**
Ability of planning and organizing tactics	2.48	.994	11	2.74	1.042	11	.062	4.25	.000**
Quality, knowledge and skill in work	2.79	1.175	8	2.89	1.075	9	.064	1.47	.143 NS
Pro-active and innovative on delivery agriculture extension activities	2.89	1.199	7	3.48	.994	4	.063	9.46	.000**
Maintain personal communication relationship with clients	3.22	1.242	4	3.37	1.064	7	.057	2.65	.008*
Ascertaining discussion and lecture meeting with clients frequently	2.43	1.103	12	2.41	.964	12	.051	.382	.703 NS
Talent to use latest agriculture information and communication technology	3.19	1.286	5	3.45	.960	5	.063	4.19	.000**
Ability to mobilize farming community in adoption of innovations	3.39	1.246	3	3.73	.841	2	.068	5.04	.000**
Tactic and skill regarding cooperation, dialogue and conflict management	2.37	1.062	13	3.44	1.095	6	.077	13.88	.000**
Self-confidence and sound communication skill	3.43	1.264	2	3.55	.897	3	.069	1.88	.061 NS
The extension agent attitude towards clients lenient and candid	3.61	1.160	1	3.84	.772	1	.061	3.73	.000**

Scale*1= Very least efficient, 2= Least efficient, 3= Neutral, 4= Efficient, 5= Most efficient*
** Significant at 0.05 Level* ***SD*** *= Standard deviation* ***RO*** *= Ranked order*
** *Significant at 0.01Level*
NS *Non-significant*

Table-3: Comparative Analysis of Public and Private EFS regarding recommendations of agronomic practices as perceived by farmers

Categories	Public Extension			Private Extension			Std. Error Diff.	t-value	Sig*
	Mean	SD	RO	Mean	SD	RO			
Suggestions for irrigation applications	3.41	1.145	4	3.78	.912	1	0.57	6.61	.000**
Recommendations for seed rate/ seed treatment	3.34	1.249	5	3.52	.978	7	0.52	3.39	.001**
Suggestions for fertilizer requirement	3.57	1.222	3	3.76	0.933	3	0.58	3.22	.001**
Advice for the utilization of pesticides and insecticides	3.60	1.195	2	2.65	0.740	9	0.79	11.93	.000**
Advice for plant protection measures	3.66	1.183	1	3.53	1.273	6	0.59	2.31	.021*
Guidance for integrated pest management (IPM)	2.38	1.130	9	3.77	1.070	2	.071	19.52	.000**
Recommendations for proper grading/ packing/ harvesting/ storage of fruits & crops	2.91	1.258	8	3.08	1.124	8	.048	3.44	.001**
Advice for soil and water testing	3.17	1.218	7	3.54	0.974	5	0.55	6.62	.000**
Recommendation for new varieties	3.29	1.183	6	3.56	0.956	4	0.52	5.20	.000**

Scale: *1= Strongly disagree, 2= Disagree, 3= Undecided, 4= Agree, 5= Strongly agree*
** Significant at 0.05 Level* ***SD*** *= Standard deviation* ***RO*** *= Ranked order*
** *Significant at 0.01Level*
NS *Non-significant*

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Figure-1: Map of Balochistan province, showing districts from which sample selected