ASSESSMENT OF TECHNOLOGY TRANSFER PROCESS PERCEIVED BY PUBLIC AND PRIVATE EXTENSION FIELD STAFF IN BALOCHISTAN, PAKISTAN

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ABSTRACT

The focus of this study was to assess the public and private sector extension system for technology transfer in Balochistan province of Pakistan. Descriptive survey research design was used using a pre-structured questionnaire. Five districts, one from each ecological zone, Kech, Lasbela, Mastung, Sibi, and Loralai were selected purposively. A sample of hundred public extension field staff (EFS), twenty from each district and thirty private EFS were selected by using systematic sampling procedure whereby every Kth number is randomly selected from a list developed by Cochran. Response rate was 86.15 percent. The results revealed that the private extension system in Balochistan has been performing effectively as compared to the public extension system due to its effective networking, planning, strong linkages with research and farmers, continuous staff training, monitoring and evaluation, and availability of funds. Public extension service is facing more difficulties in technology transfer as compared to private extension services due to the non-availability of operational funds, lack of staff development opportunities, weak research-extension linkages, and lack of motivation among the EFS.

Keywords: Extension field staff, public and private extension, technology transfer.

INTRODUCTION

Balochistan is a land of outstanding dissimilarity that amalgamation and mixture in geography, ecology, population, cultures, and life-styles. It is located on the migration route of economically and biologically important site. About 6% of the land is currently being cultivated mainly in small landholdings. Having tremendous potential of fruits cultivation and growth for horticulture, Balochistan province is known as fruit basket of Pakistan (Haider, 2004; Ahmed and Khalida, 2007). Agriculture sector is the most important segment and contributes more

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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 a key component and another important source of income which accounts more than 36% of the value of agricultural products and livelihoods in rural masses of the province. Agriculture and livestock are well-integrated and are inter-dependent. Due to rocky landscape, most of the area of Balochistan is unproductive and unsuitable for agriculture cultivation. Only about 17% is arable cultivated land and 30% of this offer fine grazing for livestock (Ahmad, 2007; USAID, 2008).

Department of Agriculture and Livestock of Balochistan provides advisory services to the stakeholders but unfortunately the fruit of these efforts have not been harvested as yet at par with other provinces which indicates that there is gap between information dissemination and adoption process. As a result, socio-economic condition of the farming community is not yet improved. Beside public sector extension, private extension services are also involved in extension activities however limited research work on success or failure of the delivery system has been carried out in Balochistan. It is therefore, important to know the strengths and weaknesses of the public and private extension services and their relative contribution. Besides it is also necessary to identify the constraints and various factors responsible for the poor performances of extension organizations and suggest ways and means to improve the services. Therefore, present research was designed to analyze the public and private agricultural extension system in order to explore their strengths, existing weaknesses, constraints to agricultural technology transfer and major sources of agriculture information in Balochistan province of Pakistan.

MATERIALS AND METHODS

Descriptive survey was used for data collection. A descriptive survey design is appropriate for obtaining people's perceptions on social issues and social facts concerning the current status of phenomena. By descriptive survey, researcher could gain a better understanding of different aspects of the study and the nature of existing condition in a situation (Trochim, 2000; Jonassen, 2001).

Target population

The target population for this study consisted of public and private EFS in five purposively selected districts of Balochistan province (Kech, Lasbela, Mastung, Sibi and Loralai) as these districts have enormous potential and vast latent for promoting fruit orchards and agriculture productions. The list of public EFS who was involved in field activities such as transferring technologies to farmers was obtained from the offices of Director General, Agriculture Extension Wing and Agriculture Research Institute Quetta, Government of Balochistan. The list of private EFS was obtained from concerned Regional Offices in Quetta and other places.

Sample size and sampling method

One hundred public EFS (20 from each selected district) of Agriculture Extension Wing, Agriculture Research Institute (ARI) of Agriculture Department, Government of Balochistan, Technology Transfer Institute (TTI) Quetta, and Lasbela University of Agriculture, Water and Marine Sciences, Uthal Balochistan (LUAWMS) were determined as sample. Thirty (30) private EFS were also selected as a part of the sample for this survey. The sample size for both populations was determined by using Wunsch (1986) table of "selecting sample sizes" at the 0.05 percent error rate. The sample was selected using systematic sampling procedure whereby every K[th] number is randomly selected from a list (Best *et al*, 2006; Gay and Mills, 2006) developed by Cochran (1977). The response rate 86.15% was obtained for both public and private EFS.

RESULTS AND DISCUSSION

The T-Test was used to determine the difference between the perceptions of public and private extension field staff for various statements about strengths of extension system in Balochistan. Results are presented in Table 1.

Table 1. Comparative analysis of public and private EFS regarding strengths of agricultural extension system.

Categories	Public Extension			Private Extension			Std. Error Diff.	t-value	Sig*
	Mean	SD	RO	Mean	SD	RO			
Often embolden farmers participation research activities in productive manner	3.09	1.10	05	3.30	1.26	10	0.254	0.79	0.427
Ample financial resources are available for completion of research priorities	2.34	1.03	15	3.07	1.10	11	0.232	3.16	0.002**
Productive/ dynamic external linkages with line and allied departments/ ministries	2.74	1.08	11	3.67	1.10	08	0.240	3.84	0.001**
Effective trend of monitoring and evaluation of agriculture extension programs	2.65	1.07	13	3.74	1.19	07	0.244	4.47	0.001**
This system has tactical planning which provide future direction	2.84	1.05	08	3.78	0.89	06	0.225	4.18	0.001**
This system considers bottom-up (participatory) in function and structure	2.71	1.07	12	3.93	0.82	05	0.226	5.39	0.001**

Effective programs implementation with cooperation of NGOs and, stakeholders involvement	2.79	1.07	10	3.56	0.97	09	0.232	3.31	0.001**
This system emphasizes to identify the client need and problem	3.66	0.92	01	4.15	0.60	02	0.189	2.58	0.011*
This system prefers the profit-oriented in its characteristic/ motives	2.42	0.93	14	3.56	0.93	09	0.207	5.51	0.001**
The existing system interprets the exorbitant in its feature	2.80	1.08	09	3.56	0.97	09	0.235	3.21	0.002**
Professional training and opportunities are adequate available for EFS	3.07	1.16	06	3.93	0.67	05	0.236	3.62	0.001**
Front extension agents highly qualified and experienced	3.02	1.16	07	3.78	1.05	06	0.252	2.99	0.003**
This system believes in problem solving approaches	3.51	1.05	02	4.04	0.33	03	0.207	2.57	0.011*
This system promotes the capacity building of EFS regarding agribusiness support service provision	3.20	1.08	04	3.96	0.85	04	0.229	3.32	0.001**
In this system the EFS performed multi-disciplinary function and docile the farmer problems in worse situation	3.29	1.06	03	4.19	0.62	01	0.217	4.11	0.001**

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 0.01 Level

Significant differences were found between the overall means of group perceptions related to strengths of extension system. Results show that private extension sector had ample technical and financial resources as compared to public extension. Private extension promotes the dynamic external linkages and mechanism with line departments as compared to public extension. Private extension persuades the participatory approach, effective monitoring and evaluation system as weigh against public extension. Private extension encourages bottom-up approach, effective communication linkage between system actors and promotes to involve stakeholder in decision-making process whereas public extension was inclined towards top-down approach. Private extension identify farmers need, encourage working relationship with others

organizations and prefer profit-oriented motives as compared to public extension. Private extension arranges professional training; enhance the capacity building and engage highly qualified extension filed staff as compared to public extension. Private extension promotes collaborate learning, multi-disciplinary function and establishes collaboration between technology generators (research) and disseminators (extension) as compared to public extension.

In addition to strengths, weaknesses in public and private extension system were also identified. Table 2 indicates the weaknesses of the existing agricultural extension services as perceived by extension field staff of public and private extension. The data revealed that there were significant differences existed between public and private extension system. The public extension criticized due to its top-down approach as compared to private extension. Salary and financial constraints were the most limiting factors to the activities of both sectors. However, this problem was comparatively less felt by the private sector as they get charming and good packages for the employees. Public extension had lack of operational funds, low knowledge level of front-line extension filed staff and lack of effective mechanism as compared to private extension.

Table 2. Comparative analysis of public and private EFS regarding weaknesses of existing agricultural extension services.

Categories	Public Extension			Private Extension			Std. Error Diff.	t-value	Sig*
	Mean	SD	RO	Mean	SD	RO			
The current system has been criticized on the basis of top-down approach	3.25	1.204	08	1.96	1.192	10	0.265	4.838	0 .001**
Political influence affects the competency of extension workers	3.74	0.928	05	4.07	0.874	02	0.202	1.646	0.103
Tendency to contact and concentrate only affluent farmers and overlooked the small farmers	3.15	2.388	10	2.33	1.074	07	0.475	1.725	0.087
Present salary and other financial problems affecting the extension workers efficiency	4.27	1.062	01	3.78	1.251	03	0.245	2.010	0.047*
Irresponsive attitude of extension agent toward clients	2.35	0.948	12	2.15	.989	08	0.211	0.968	0.335
Considerably staff turnover and go away to projects/ programs	2.79	1.103	11	2.07	1.035	09	0 .240	2.973	0.004**

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Lack of integrated and holistic approach	3.19	1.129	09	2.52	1.051	06	0 .245	2.729	0.007*
Socio-political/ socio-economical atmosphere not conducive to ordinary procedure	3.92	0.966	03	4.26	0.594	01	0 .197	1.733	0 .086
Firm resistance from political/ local leaders and influential farmers during diffusion of information at village level	3.64	0.962	06	3.48	1.014	04	0 .215	0.715	0 .476
This system has lack of operational funds and other resources	4.11	0.859	02	3.04	1.224	05	0.212	5.049	0 .001**
Outmoded knowledge and poor capacity building of front line extension agents	3.44	1.085	07	2.33	1.074	07	0.239	4.608	0 .001**
Technical and managerial bottlenecks during delivery of extension message	3.76	0.996	04	2.52	0.935	06	0.217	5.746	0.001**

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 0.01 Level

Study also determines the perceptions of respondents regarding constraints to technology transfer confronting public and private extension services. Results are presented in Table 3 which depicts that there was multiple nature/ constraints of technology transfer among public and private extension. The public extension has more constraints than private extension; such as the lack of discipline among extension staff, lack of insentive for extension workers and lack of training and need assessment for extension functionaries were significant at p > 0.01. However, the clients, technology and research constraints were non-significant at p > 0.05.

The extension field staff were inquired to rate their perceptions concerning sources of information. The sources of information were categorized into four groups; electronic media (radio, television, mobile phones, and internet); printed media (newspaper, magazine, pamphlet); institutional sources; (self, farm manager, field assistant, NGO); and others local mobilizers (neighboring farmers, dealers). The t-test was used to determine if there was significant differences existed between the overall means of group perceptions of public and private extension field staff. Radio and magazine were considered as important sources of information as used by public extension whereas mobile phones, internet, pamphlet and newspaper were the important sources of agricultural information as used by private extension. In terms of local mobilizers; self information, NGOs and Filed Assistant were used by public extension as important sources of agricultural information whereas Farm Mangers, neighboring farmers and dealers were the important of agricultural information as used by the private extension.

Table 3. Comparative analysis of public and private EFS regarding constraints of transfer technology.

Categories	Public Extension			Private Extension			Std. Error Diff.	t-value	Sig*
	Mean	SD	RO	Mean	SD	RO			
Constraints & barriers Lack of self discipline among extension staff	3.35	1.141	09	2.33	1.074	11	0.249	4.100	0.001**
Racial, position and status conflict among farming communities	3.51	1.031	05	3.22	1.050	04	0.229	1.240	0.218
Favoritism, nepotism and corruption among staff	3.36	1.111	08	3.00	1.271	07	0.254	1.434	0.154
Clients constraints Cost and timely available of required inputs for farmers	3.06	1.158	10	3.44	1.013	02	0.249	1.551	0.124
Resistance of farmers to adopt innovation/ new technology	3.35	1.032	09	3.33	1.074	03	0.230	0.085	0.932
Technology constraints Complexity and cost involvement in adopting new technology	3.72	0.921	02	3.59	0.888	01	0.202	0.620	0.537
Compatibility of technology with society and culture norms/ values	3.44	0.919	07	3.44	0.892	02	0.202	0.045	0.964
Culture/ social risk improved in adopting technology	3.47	0.995	06	3.44	0.974	02	0.219	0.120	0.905
Research constraints Availability of funds/ incentives to conduct the timely and quality research	2.93	1.307	12	3.15	1.064	05	0.277	0.790	0.431
Lack of equipment/ material of researchers to conduct research	3.58	1.028	04	3.04	0.898	06	0.221	2.445	0.160
Researchers interest in problem-oriented research	2.94	1.095	11	2.81	0.736	10	0.226	0.560	0.577
Extension constraints Lack of incentive for extension workers	3.88	0.905	01	2.93	1.174	08	0.215	4.438	0.001**
Lack of training and need assessment for extension functionaries	3.64	1.067	03	2.89	1.121	09	0.239	3.128	0.002**

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 0.0 Level

The present study further determines the main sources of agricultural information as perceived by the extension field staff. Table 4 depicts the results.

Table 4. Comparative analysis of public and private EFS regarding agricultural sources of information.

Categories	Public Extension		Private Extension		Std. Error Diff.	t-value	Sig*
	Mean	SD	Mean	SD			
Electronic media Radio	2.44	1.277	1.52	.643	.256	3.582	.001**
Television	3.22	1.051	3.11	1.013	.230	.488	.626
Mobile phones	3.01	1.160	4.33	.620	.234	5.658	.000**
Internet	2.45	.866	3.93	.874	.192	7.713	.000**
Printed media Newspaper	2.92	1.093	3.70	.869	.231	3.406	.001**
Magazine	3.31	1.00	2.15	.989	.220	5.254	.000**
Pamphlet	2.26	.928	3.81	1.039	.211	7.373	.000**
Institutional sources Self	3.64	1.153	1.70	.724	.236	8.192	.000**
Farm Manager	1.76	.996	3.67	1.109	.226	8.410	.000**
Field Assistant	2.19	1.418	1.37	.629	.282	2.900	.005**
NGOs	2.95	1.204	1.63	.792	.248	5.346	.000**
Local mobilizers Neighboring farmers	2.46	1.097	3.30	.869	.231	3.619	.000**
Dealers	1.82	1.071	4.07	1.174	.242	9.293	.000**
Friends	2.51	1.368	2.22	1.368	.302	.939	.350

Scale 1= Not at all, 2= Some time, 3= Often, 4= Almost always, 5= Always
* Significant at 0.05 Level   **SD** = Standard deviation   * *Significant at 0.0 Level

CONCLUSION

The study results indicated that private extension system is performing an effective role in Balochistan by involving farmers in decision-making, providing advisory services and technical help at their door-step and farm level. As compared to public extension, private extension system believes in bottom-up approach, had enough/ ample financial, technical resources, active geographical mobility and arrange exposure visits to farmer fields. Public extension is facing more difficulties in reaching farmers due to its top-down approach, lack of operational funds, lack of technical expertise and large area of jurisdiction. The study therefore recommended that coordination and linkages among agricultural research, agricultural extension, and private extension need to bring joint actions in order to restore the self-assurance of extension clientele group (farmers). It was also recommended that Agriculture and Cooperative Departments in Balochistan should promote and encourage the joint venture programs between public and private extension services at community and farm level in order to accelerate and encourage farmers to adopt new technologies. Service delivery of

public EFS should be regularized through trainings. Public extension should effectively use electronic media in order to enhance and increase the information of the front extension filed staff.

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