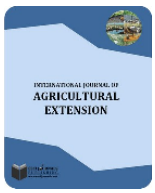

Available Online at ESci Journals
International Journal of Agricultural Extension
ISSN: 2311-6110 (Online), 2311-8547 (Print)
http://www.escijournals.net/IJAE

CONSTRAINTS IN TECHNOLOGY TRANSFER: PERCEPTION OF PUBLIC AND PRIVATE EXTENSION FIELD STAFF REGARDING RICE CROP TECHNOLOGY IN BALUCHISTAN PROVINCE PAKISTAN

[a]Ahmed A. Mengal, [b]Muhammad Z. Y. Hassan, [c]Fateh M. Baloch, [d]Muhammad A. Tareen
[a] Department of Agricultural Education Extension and Short Courses Sindh, Agriculture University Tandojam, Pakistan.
[b] Agricultural Extension Department, Punjab, Pakistan.
[c] Livestock Research Institution (PARC), Turbat Balochistan, Pakistan.
[d] Agricultural Department Quetta, Balochistan, Pakistan.

A B S T R A C T

Present study was conducted to identify constraints to rice technology transfer as perceived by two groups)public and private Extension Field Staff in purposively district Jaffarabad Balochistan-Pakistan. A sample of 70 public extension field staff among them 30 EFS from private extension field staff were selected through the systematic sampling procedure by using McCall (1980) table "selecting sample size" at the 0.05% error rate. A comparison was made between perceptions of public and private extension field staff by using Independent Simples t-test. Researchers interest in problem-oriented research regarding rice crop techniques; cost of pesticide; and availability of required inputs for rice production was identified as the major constraints as perceived by the public EFS. On the other hand, training programs for EFS on rice technology; researcher's interest in problem-oriented research regarding rice crop techniques; cost of labor; and resistance of farmers to adopt hybrid rice technology was identified as important constraints as identified by private extension field staff. Based on the findings of the study, the following recommendations were suggested: Both public and private extension should strengthen the advisory services with the term of linkages and joint venture program regarding rice crop technology and dissemination in order to make sure the economic prosperity of the rice growers.

Keywords: Constraints, EFS, Jaffarabad, Balochistan, Pakistan.

INTRODUCTION

Rice look upon is a significant cash crop and golden grain of Pakistan, which contributes 4.9% of the value added in agriculture and constitute 1.0% of Gross Domestic Product. The sown area for rice crop is 2571 thousand hectares, 8.7% more than last year's 2365 thousand hectares. In this connection, it has been considered a main source of foreign exchange earnings and ranked as 2nd amongst the staple food grain crop in Pakistan; the rice crop cultivates a high quality of rice so as to accomplish the domestic demand. However, rice production comprises60% of coarse types and 40% of Basmati fine type (GoP, 2011-2012). Rice implanting belts is estimated at 2311 thousand hectares, 10.1%less than last year's area of 2571 thousand hectares. Production of the crop is estimated at 5541 thousand tones, alongside the target of 6900 thousand tones shows a weak performance of 19.7% and compare last year production which was 6160 thousand tones shows a decrease of 10.0% during the years of 2012-13. Monsoon rain and late moving back of water period in rice fields had adversely affected the production of rice in country during the years of 2012-13 (GoP, 2011-2012).

Jaffarabad district is the most fertile district of the Balochistan province, falls in the tropical agro-ecological zone bearing a total potential agricultural area and regard as rice belt of the Balochistan province. Rice is incredibly significant production and leading stature however, rice production at the district level is economical (GoB, 2011-12). Exceptionally, vast areas is

* Corresponding Author:
Email: zakariapak63@gmail.com

under rice production cultivation, that covering the 127,530 areas in hectares (production in tones 432,318) which appearances 95% of the total area of the district (Agriculture Statistics Balochistan, 2011-12; GoB, 2011-12). There was huge gap between potential and actual yield which indicates there was gap between technology diffusion and adoption process, resulting a low crop yield and poor performance of agriculture sector. The overall purpose of this study was to identify the perceptions of public and private extension field staff regarding extension, research, technology and client constraints as perceived by respondents in district Jaffarabad, Balochistan.

The following objectives were formulated of the study:

i. To find out the demographic profile of respondents.
ii. To identify the extension, research, technology and client constraints as faced by public and private extension field staff in study area.

METHODOLOGY

The target population for this study consisted of public and private extension field staff in purposively selected district Jaffarabad, Balochistan province. A complete list of public extension field staff who was involved in field level activities and transferring rice technology to farmers was obtained from the office of Director General, Agricultural Extension Wing, Agricultural & Cooperative Department Govt. of Balochistan. The lists of private extension were obtained from their respective regional offices based at Quetta city in order to acquire the sampling frame of this present research.

Sampling method: There were two groups selected in this study; group one comprised public extension and group two consisted private extension. From the group one, a sample of seventy (70)public extension field staff were selected, whereas thirty (30)EFS from private extension field staff were selected through the systematic sampling procedure whereby every Kth number was randomly selected from a list or set of direction(Gay & Mills, 2006). The sample size for both populations was determined by using McCall (1980) table "selecting sample size" at the 0.05 percent error rate.

A 32-construct (11 item for extension; 5 for research; 8 for technology; and 8 for client constraints) was used to identify the constraints in the promotion of the rice technology as perceived by the public and private EFS. In this study perceptions and responses regarding constraints for rice crop technology were gathered on a Likert-type scale ranked 1 to 5 (not at all constraint =1 slightly constraint =2 somewhat constraint =3 moderately constraint =4 extremely constraint =5). Because of Likert type scale is ordinal, easy to apply and takes less time in comparison to the equal-appearing interval scale and best predictors of actual behavior (Likert, 1932; Ray & Sagar, 1999). The demographic profiles covering information about educational level, age of the respondents, job experiences and number of trainings. Survey instrument was developed: questionnaire comprised of closed-ended questions regarding extension, research, technology and client constraints of rice crop technology as perceived by respondents.

The data collected by the researcher was tabulated and analyzed by applying descriptive statistics. Statistical Package for Social Sciences SPSS (PC) program was used to analysis the data (Boone *et al*., 2002; Davis, *et al.,* 2004). Analysis of data was carried out by using frequency distributions, percentages, means, standard deviation, rank orders, standard error differences and significances (Eck and Torres, 1996). The rank order, mean efficient score, standard deviation (SD) was calculated to know the perception of public and private extension field staff. In this connection, the rank orders were assigned to all the categories on the basis of the mean scores. A comparison was also made between perceptions of public and private extension field staff by using Independent Simples t-test.

RESULTS AND DISCUSSION

The demographic characteristics mostly pertaining to age, educational level, age, service experience, number of trainings and the like, which accelerate the rate of adoption (Hassan *et al*., 2002).

The data pertaining to Table 1 reveals that most (44%) of EFS holding master in agriculture discipline followed by 28% of EFS had received education in Bachelor (Agric.). More than half (53%) of extension field staff falls in the age category of 31 to 40 years. More than half (51%) of EFS had 6 to 15 years job experiences. While most (36%) of extension field staff had received 1 to 10 trainings during their entire job period whereas 33% of EFS did not received any sort of in-services trainings, this was followed by 20% of EFS who received 11 to 20 trainings.

Extension field staff was solicited to given their perceptions regarding extension constraints in the promotion of rice.

Table 1. Demographic profile of EFS (n=100).

Demographic profile	Categories	Frequency	%age
Educational level	Matriculation	9	9.0
	Intermediate	8	8.0
	Diploma in agriculture	8	8.0
	Bachelor in Agric.	28	28.0
	Master in Agric.	44	44.0
	PHD	3	3.0
Age	18 to 30	10	10.0
	31 to 40	53	53.0
	41 to 50	35	35.0
	51 and above	2	2.0
Experience (year)	Up to 5	44	44.0
	6 to 15	51	51.0
	16 and above	5	5.0
Number of trainings received	Nil	33	33.0
	1 to 10	36	36.0
	11 to 20	20	20.0
	21 and above	11	11.0

Table 2. Comparative analysis of public and private EFS regarding extension constraints in the promotion of rice crop(n=100).

Extension constraints	Public Extension			Private Extension			Std. Error Diff.	t-value	Sig*
	M	SD	RO	M	SD	RO			
Transportation facility of EFS involved in rice technology promotion	3.43	1.04	5	3.88	3.52	4	0.462	.979	0.330 NA
Adequate number of EFS to promote technology of rice crop	3.36	0.92	6	3.65	0.832	9	0.196	1.47	0.145NA
Confidence of rice growers on EFS	3.36	0.92	6	3.55	0.82	10	0.196	.971	0.336NA
Availability of required inputs to conduct demonstrations of rice	3.23	1.10	7	3.67	.89	8	0.228	1.91	0.061NA
Incentives for EFS involve in rice promotion	3.43	0.89	5	3.70	0.90	7	0.196	1.35	0.180NA
Training programs for EFS on rice	3.53	0.81	2	4.04	0.43	1	0.158	3.22	0.003**
Availability of teaching/ audio visual aids for rice crop promotion	3.46	1.10	4	3.91	0.58	3	0.213	2.09	0.043*
Satisfaction of EFS in their work	3.53	0.86	2	3.81	0.70	5	0.178	1.57	0.122NA
Interest of EFS to their duties in promoting rice crop technology	3.50	1.04	3	3.77	0.74	6	0.210	1.29	0.203NA
Competency of EFS to promote rice crop technology	3.63	0.85	1	3.95	0.60	2	0.171	1.89	0.065NA
Spirit of EFS towards their work	2.63	0.55	8	2.52	0.55	11	0.121	0.863	0.392 NA

*Scale: not at all constraint =1slightly constraint = 2 somewhat constraint = 3moderately constraint = 4 extremely constraint = 5

* Significant at 0.05 Level SD = Standard deviation RO= Ranked order

**Significant at 0.01Level NA= Non-significant

In this regard, the replies of the EFS were verified on a 5 point Likert-scale whereas 1 standard for “not at all constraint”, 2 for “slightly constraint”, 3 for “somewhat constraint”, 4 for “moderately constraint” and 5 for “extremely constraint”. Significant differences at 0.05 probability level were found between the perceptions of both sectors EFS regarding extension constraints by using the Independent Simples t-test as shown in Table-2. Results reveal that all the eleven (11) extension constraints were examined and being important.

Statistical differences were observed two (2) out of eleven (11) constraints statement. In addition, noteworthy extension constraints as perceived by public extension field staff was: competence of EFS to promote rice crop technology (M= 3.63; p ≤.05); satisfaction of EFS in their work (M= 3.53; p ≤.05); training programs for EFS on rice (M= 3.53; p ≤.05) and interest of EFS to their duties in promoting hybrid rice crop (M= 3.50; p ≤.05) were ranked 1st, 2nd and 3rd respectively. Conversely, training programs for EFS on rice (M= 4.04; p ≤.05); competence of EFS to promote rice crop technology (M= 3.95; p ≤.05) and availability of teaching/ audio visual aids for rice crop promotion (M= 3.91; p ≤.05) identified extension constraints as perceived by private extension EFS were ranked1st 2nd and 3rd respectively. Public extension field staff perceived that extension constraints as a "somewhat constraint" while private EFS identified it as "moderate constraint".

The rank order were calculated based on mean scores in order to find out the relative ranking of each categories related to the research constraints as perceived by public and private extension field staff. In this connection, Table-3 summarizes the t-values for the two main groups of extension field staff for 5research constraints.

Table 3. Comparative analysis of public and private EFS regarding research constraints in the promotion of rice crop(n=100).

Research constraints	Public Extension			Private Extension			Std. Error Diff:	t-value	Sig*
	M	SD	RO	M	SD	RO			
Availability of funds to conduct quality research regarding rice crop	1.88	.55	5	1.73	.58	5	.125	1.216	.229 NA
Researchers interest in problem-oriented research regarding rice crop techniques	3.98	.84	1	3.66	.99	1	.207	1.537	.131NA
Lack of equipment/material of researchers to conduct research regarding rice technology	1.91	.55	4	1.76	.62	4	.132	1.115	.270NA
Availability of time to conduct quality research regarding rice crop	1.94	.61	3	1.80	.66	3	.141	1.009	.318NA
Feedback from rice growers to agriculture research	2.10	.68	2	1.93	.63	2	.142	1.169	.247NA

*Scale: not at all constraint = 1slightly constraint = 2 somewhat constraint = 3 moderately constraint = 4 extremely constraint = 5

* Significant at 0.05 Level SD = Standard deviation RO= Ranked order

**Significant at 0.01Level NA= Non-significant

Results of the t-test showed that the perceptions of public extension field staff were not statistically significance from those of private extension field staff related to the research constraints statement. Public extension field staff perceived that researchers interest in problem-oriented research regarding rice crop techniques (M= 3.98; p ≤.05) as a "moderately constraint" while private extension field staff perceived (M= 3.66; p ≤.05) it as "somewhat" of research constraint, and was placed at 1st. Of the statements that were judged by public and private extension field staff as research constraints in the promotion of the rice. Feedback from rice growers to agriculture research, received the second uppermost mean scores (M= 2.10; p ≤.05) and (M= 1.93; p ≤.05), respectively, suggested as a slightly constraint were ranked 2nd.This was followed by availability of time to conduct quality research regarding rice crop (M= 1.94; p ≤.05) and (M=1.80, p ≤.05) as identified research constraints as perceived by public and private extension field staff respectively. All the five statements were received as "slightly constraint".

An important aspect of present study was to investigate the public and private extension filed staff perceptions regarding constraints of technology. The results depicts that public extension field staff was faced following technology constraints; cost of pesticide (M= 4.04; p ≤.05); social risk improved in adopting rice seed technology (M= 3.72; p ≤.05) and cost of fertilizer (M= 3.62; p ≤.05)were ranked 1st 2nd and 3rd respectively.

On the hand, private extension was faced technology constraints: cost of labor (M= 3.90; p ≤.05); social risk improved in adopting rice seed technology (M= 3.86; p ≤.05) and cost of hybrid seed (M= 3.83; p ≤.05) were ranked 1st 2nd and 3rd respectively as shown in Table-4. Statistically significant differences at p.≤.01; .05 alpha level were found among the perceptions of the two groups concerning two technology constraint as perceived by public and private extension field staff. However, public and private extension field staff were rated the technology constraints, in this regard a majority of the statements were ranged between "somewhat" to "moderately constraint" as perceived by both groups.

Table 4. Comparative analysis of public and private EFS regarding technology constraints in the promotion of rice crop (n=100).

Technology constraints	Public Extension			Private Extension			Std. Error Diff.	t-value	Sig*
	M	SD	RO	M	SD	RO			
Cost of pesticide	4.04	0.907	1	3.06	1.08	8	0.225	4.33	0.000**
Cost of labor	3.48	0.988	6	3.90	0.844	1	0.194	2.13	0.037*
Cost of fertilizer	3.62	1.02	3	3.70	0.876	4	0.201	0.354	0.724NA
Rice pest and insect problem	3.51	1.20	5	3.33	1.09	5	0.245	0.736	0.465NA
Cost of hybrid seed	3.52	0.943	4	3.83	0.949	3	0.206	1.47	0.146NA
Cost involvement adopting rice seed technology	3.34	1.01	7	3.16	0.949	6	0.211	0.831	0.409 NA
Compatibility of technology with society values	3.11	1.00	8	3.13	1.04	7	0.224	0.085	0.933 NA
Social risk improved in adopting rice seed technology	3.72	0.915	2	3.86	1.04	2	0.219	0.629	0.532NA

*Scale: not at all constraint = 1slightly constraint = 2 somewhat constraint = 3 moderately constraint = 4 extremely constraint = 5

* Significant at 0.05 Level SD = Standard deviation RO= Ranked order

**Significant at 0.01Level NA= Non-significant

Table-5: Comparative analysis of public and private EFS regarding client constraints in the promotion of rice crop (n=100)

Client constraints	Public Extension			Private Extension			Std. Error Diff.	t-value	Sig*
	M	SD	RO	M	SD	RO			
Cost of inputs in rice production	3.23	0.950	3	3.22	0.935	2	0.205	0.023	0.982NA
Resistance of farmers to adopt rice technology	3.41	1.24	2	3.26	0.691	1	0.195	0.756	0.451NA
Complexity of the rice technology	1.04	0.464	8	0.933	0.253	8	0.072	1.51	0.133NA
Incentives for adopting the rice technology	1.94	1.61	7	1.80	1.27	7	0.301	0.474	0.637NA
Availability of required inputs for hybrid rice production	3.52	1.21	1	2.80	1.58	5	0.323	2.25	0.029NA
Timely availability of inputs in rice production	3.07	1.41	4	3.20	1.29	3	0.291	0.442	0.660NA
Acceptability of hybrid rice by traders	3.05	1.31	5	3.16	1.36	4	0.295	0.371	0.712 NA
Training opportunities for rice farmers	2.67	1.53	6	2.16	1.46	6	0.324	1.55	0.125NA

*Scale: not at all constraint = 1slightly constraint = 2 somewhat constraint = 3 moderately constraint = 4 extremely constraint = 5

* Significant at 0.05 Level SD = Standard deviation RO= Ranked order

**Significant at 0.01Level NA= Non-significant

The result in Table-5 reveals that eight (8) client constraints were examined based on the perceptions and responses of the respondents received by the public and private extension field staff on Likert five point

scales. Results of the t-test revealed that the perceptions of the both sectors extension field staff were non-significant difference related to the client constraints statements. Availability of required inputs for hybrid rice production(M= 3.52; p ≤.05);resistance of farmers to adopt rice technology(M= 3.41; p ≤.05) and cost of inputs in rice production(M= 3.23; p ≤.05) major client constraints as perceived by public extension field staff were ranked 1st 2nd and 3rd respectively. On the other hand, statements identified as client constraints based on the responses of the private extension field staff: resistance of farmers to adopt rice technology(M= 3.26; p ≤.05); cost of inputs in rice production (M= 3.22; p ≤.05) and timely availability of inputs in rice production (M= 3.20; p ≤.05) at the top of ranking. Public extension field staff perceived that client constraints were ranged between slightly constraints to somewhat constraint, while private extension field staff was perceived it as somewhat of a constraint.

CONCLUSIONS AND RECOMMENDATIONS

The present study was determined the perceptions of public and private extension field staff on constraints of rice crop and develop the strategies in order to accelerate the socio-economic condition and sources of livelihood of rural people. The study based on mean scores showed that competency of EFS to promote rice crop technology; researchers interest in problem-oriented research regarding rice crop techniques; cost of pesticide; and availability of required inputs for rice production was the major extension, research, technology and clients constraints respectively as perceived by the public EFS. While, training programs for EFS on rice; researchers interest in problem-oriented research regarding rice crop techniques; cost of labor; and resistance of farmers to adopt rice technology was the key extension, research technology and clients constraints respectively as identified by private extension field staff. Based on the findings of the study, the following recommendations are put forwarded: Both public and private extension should strengthen the advisory services with the term of linkages and joint venture program regarding rice crop technology and dissemination of information. Both public and private extension should conduct demonstration plot (result and method), take part in the field days and give latest agriculture information to farmers about rice crop technology so as to ensure and the economic prosperity of the rice growers. Public extension should encourage and promote the hybrid rice technology.

REFERENCES

Agricultural Statistics Balochistan, (2011-12). Directorate of Crop Reporting Services, Agriculture Department Balochistan, Quetta.

Boone, H.N., S.A. Gartin, C.B.Wright, L.D. Lawrence, &K.S. Odell, (2002). Adult education philosophies practiced by agricultural education teachers in Pennsylvania, Virginia, and West Virginia. J.Agric. Educ., 43: 37-48.

Davis, K., S. Franzel, P. Hildebrand, &N. Place, (2004). Extending technologies among small-scale farmers in Meru: Ingredients for success in farmer groups. Proceedings of the 20th AnnualConference of Association for International Agricultural andExtension Education (AIAEE), Pp: 902-13. Dublin, Ireland.

Eck, D. &Torres, R.M. (1996). Factors Associated with Administrators' Attitudes towards Agricultural Education at the Primary School Level in Belize. J. Int. Agric. Ext. Educ., (3): 25-31.

Gay, L. R. & G. E. Mills, (2006). Educational Research: Competencies for Analysis and Applications (8th ed.). Upper Saddle River, N.J.: Merrill/Prentice Hall.

GoB, (2011-12). District development profile Jaffarabad. Planning & Department, Government of Balochistan in Collaboration with UNICEF. Pp. 21-29.

GoP, (2011-12). Pakistan Economy Survey: Ministry of Food, Agriculture and Livestock, Government of Pakistan, Islamabad.

Hassan, M. Z. Y., B. N. Siddiqui & M. N. Irshad. (2002). Effect of socio-economic aspects of mango growers on the adoption of recommended horticultural practices: Pak. J. Agri. Sci., 39 (1): 20-21.

Likert, R. (1932). A technique for the measurement of attitudes: Archives of psychology. 22 (140): 1-55.

McCall, C. (1980). Sampling and Statistic Handbook for Research in Education. National Education Association. USA.

Ray, G.L. & M. Sagar. (1999). Research Methods in Social Sciences and Extension Education. Kalyani Publishers, Delhi.