Pak. J. Agri. Sci., Vol. 49(2), 221-22; 2012
ISSN (Print) 0552-9034, ISSN (Online) 2076-0906
http://www.pakjas.com.pk

IN-DEPTH ANALYSIS OF ELECTRONIC MEDIA TO ENHANCE THEIR ROLE IN AGRICULTURAL TECHNOLOGY TRANSFER IN THE PUNJAB, PAKISTAN

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Effective use of the electronic media seems essential to keep farmers abreast of the latest agricultural information and technologies for meeting the emerging challenges of the new era. The present role of electronic media in dissemination of agricultural information among farmers is questionable, which calls for a comprehensive study on in-depth analysis of the electronic media to enhance their role in agricultural technology transfer. The study was conducted in three districts of the Punjab province with different agro-ecological zones i.e. Faisalabad (mix cropping zone), Sheikhupura (rice zone), and Rahim Yar Khan (cotton zone). Multistage random sampling technique was used. There were total 300 respondents. The data were collected with the help of a pretested and validated interview schedule. The analysis of the data shows that TV appeared relatively more prominent than radio as agri. information source. It was revealed from the study that audio/video cassettes and internet have the least role in dissemination of agricultural information at grass root level. The strong areas of agri. information were livestock sector and major crops both in radio and TV broadcasts. Within the major categories, the weakest side was the marketing aspect. Regarding aspects like interest, effectiveness, usefulness, and practicability "Khait Khait Haryali" followed by "Sandhal Dharti" appeared to be more popular than other radio broadcasts. In case of TV, short messages and advertisements were more popular among farmers than "Kisan Time" and "Haryali".
Keywords: Electronic media, technology transfer, TV, radio, audio/video cassettes, internet

INTRODUCTION

Importance of agricultural sector is very much obvious in terms of its contribution in GDP (21%), employment of of labour force (45%), backstopping of agro based industries through provision of raw material, and a strong support to the livelihood of rural people (Govt. of Pak., 2011). According to an estimation, the country's population has touched the figure of 177.1 million in mid- 2011 and it is going on increase (ibid) which is much higher than the figure at the time of independence 1947 i.e. 32.5 million (Govt. of Pak., 2007). One can easily figure out from the aforesaid data of population that we have to educate the farming community to produce more with better quality to fulfill our national requirements as well as for earning foreign exchange through exports of the surplus. Furthermore, we have been facing another dilemma of fluctuated growth in agricultural sector. This important sector needs to be dynamic in a consistent progressive way for achieving the destination of food security.In this scenario, adoption of improved technologies by farmers can contribute to enhance the overall production and yield per hectare. Creating awareness among farmers about agricultural technologies and stimulating their interest are among the basic essentials of speedy adoption of latest agricultural technologies by the farmers. For this purpose, different techniques including individual, group, and mass contacts are being used by extension organizations (Muhammad, 2005). Exploitation of the limited resources with the greater coverage is one of the major concerns of the extension organizations. Individual and group contact methods have limited scope in this context while mass contact methods are more effective to disseminate the agri. information among the farming community (Muhammad, 2005). Despite the importance of the personal contacts, media can play a vital role for creating awareness with greater coverage (Sheikh *et al.*, 2006). Since, fellow farmers (peers) have their own impact (Agwu *et al.*, 2008), a balanced use of interpersonal interaction as well as media can be more fruitful i.e. acquisition of knowledge from media and sharing it with their peers (Ray, 2003). Media advancements have improved the aspects of swiftness and vast coverage that have paved the way for creating awareness and inciting interest among the farmers (Okunade, 2007). Radio has been playing its role for dissemination of agricultural information to the farmers (Singh, 2001). Television is another important electronic medium, which is being used as an effective teaching tool in agricultural extension having both properties of audio and visual presentation and is closest to a face-to-face approach (Muhammad, 2005). The goals of radio and television are not only to inform the farming community about recent

scientific technologies for crops and animals but also to raise the standards of living (Singh, 2001). Thus these electronic media can be effectively utilized for agricultural technology transfer. The use of audio and video cassettes is a modified and refined form of radio and television respectively having certain advantages like playback facility (Muhammad, 2005). Moreover, internet has opened new horizons for speedy connectivity in various formats among diversified spheres of life (Saxena, 2005). In the Punjab province, a number of radio stations are playing their role by broadcasting different agricultural programs like " Utum Khaiti", Sandhal Dharti", Khait Khait Haryali, "Dharti Bakht Bahar", and Wasnay Rehan Garan" broadcasted from Multan, Faisalabad, Lahore, Bahawalpur, and Rawalpindi, respectively in local language/dialects. Similarly, television is playing its role by telecasting different programs ("Haryali" "Kissan Time" etc.), short messages and various advertisements relating to agriculture from public and private sectors. Department of Agriculture (Extension), Govt. of the Punjab, is facilitating the farmers by providing them the opportunity to get their blank audio and video cassettes recorded (free of cost) on different topics relevant to agriculture i.e. production technology of various crops, vegetables, fruits, oil seed crop etc. The use of new media like internet in the rural areas can facilitate the process of development (Rapten, 2001). In addition to international agricultural web sites, there are number of Pakistani web sites available for acquisition of latest information e.g. www. Pakissan.com. In addition, the role of internet in terms of quick mail service (E-mail) has enhanced the quickest accessibility among the researchers, extension workers, and the farmers to bridge the existing communication gap. For instance, the Directorate of Agricultural Information, Lahore has E-mail address i.e. agri.@lhr.paknet.com.pk. Different international and national databases are available e.g. biological abstract, Pakistan agricultural database, medicinal plants of Pakistan, plant genetic resource institute, Union database of journals, NARC library catalogue etc. (Awan, 2003) Use of electronic media seems essential to keep our farmers abreast of the latest information about agri. technologies for meeting the emerging challenges of the new millennium like population explosion, low and fluctuated yield of various crops, and other challenges of new era. For this reason, it seems imperative to undertake in-depth analysis of the electronic media to enhance their role in the dissemination of agricultural technologies among the farmers.

MATERIALS AND METHODS

The study was conducted in three districts from different agro- ecological zones of the Punjab province. The three districts viz. Faisalabad , Sheikhupura and Rahim Yar Khan were selected from central mixed cropping zone, rice zone and cotton zone respectively. A multistage random sampling technique was employed. From each of the selected districts, five rural union councils were selected randomly. From each selected union council, two villages were selected at random and from each selected village, ten farmers were selected randomly. In this way the sample size comprised 300 farmers. For getting a diversified and comprehensive picture, the respondents were drawn from the general farmers. The data were collected with the help of a pretested and validated interview schedule. After great deliberation, a team of agri. graduates was engaged for data collection in Faisalabad, while in Sheikhupura, and Rahim Yar Khan districts, Extension Field Staff (Field Assistants) were involved. Trainings of data collection teams were conducted in each study district. The respondents were interviewed in their own language and dialect. For ensuring the quality of the data, proper monitoring was done by the PI and Co-PIs. The collected data were analyzed through SPSS.

RESULTS AND DISCUSSION

***Electronic media as information sources*:** Media have improved the style of educating the people with a touch of attraction and interest. However, the range of using these media may vary (Prathap and Ponnusamy, 2006). Moreover, there are different views about using electronic media for agricultural purposes. The extent of information obtained through electronic medium like TV may be considered as a sign of usefulness and effectiveness of the medium (Muhammad *et al.*, 2004).

***Use of electronic media for getting agri. Information*:** In the present study, radio, TV, audio/video cassettes, and internet were considered as electronic media. It was deemed necessary to collect information about these electronic media. For digging out the empirical evidence about the extent of getting agricultural information from electronic media, the respondents were asked to rate the contribution of different electronic media against a five point Likert Type scale i.e. 1-Very low, 2-Low, 3-Medium, 4-High, 5-Very high. Based on the data, the scores of the electronic media under study were calculated which are presented in (Table 1)**.**

The data presented in (Table 1) indicate that in all the three districts, TV got the maximum score values with respect to use of electronic media as agri. information source followed by radio. There was no respondent who reported the use of audio/video cassettes, and internet. The total scenario of the research districts reflects the similar picture as in the three districts. Moreover, the mean values of both radio and TV fell under the low category. But the mean value is relatively more in case of TV.

The findings are also in consonance with those of Abbas *et al.* (2003), Sheikh *et al.* (2006) and Khan *et al.* (2010) where the results did not show extraordinary contribution of media.

Table 1. Ranking of electronic media according to their use for getting agri. information in three districts of Punjab province

Electronic media	Faisalabad	Sheikhupura	Rahim Yar Khan	Total		
	Score	Score	Score	Score	Mean	SD
Radio	65	30	53	148	2.11	1.16
TV	133	161	169	463	2.26	1.02
Audio cassettes	-	-	-	-	-	-
Video cassettes	-	-	-	-	-	-
Internet	-	-	-	-	-	-

The results of the study reflect a similar picture as in case of Irfan *et al*. (2006) and Khan *et al.* (2010) in which TV was in leading position as compared to radio. Moreover, the findings of Khan *et al.* (2010) are similar with regard to the use of audio/video cassettes and internet. However, the results are contradictory to those of Ejembi *et al.* (2006) and Butt *et al.* (2008) where radio was more prominent than TV.

***Effectiveness of radio/TV broadcasts regarding various production practices*:** Radio/TV broadcasts cover various production practices. Muhammad *et al.* (2004) reported that TV had provided information regarding different areas of agriculture i.e. crop varieties, sowing methods, farm machinery, livestock etc. which had made it valuable to farmers. The effectiveness of radio/TV broadcasts may be attributed to the coverage of various agricultural dimensions by the media for the benefits of the farming community. Thus for the real comprehension of respondents' perceptions regarding agri. radio/TV broadcasts, it was thought necessary to collect data pertaining to various areas of agriculture including production practices of major crops, minor crops, horticultural crops, forest, livestock and poultry. The information pertinent to other related farm enterprises was also collected. Depending upon the data, the scores of various areas of agriculture with respect to effectiveness of radio/TV were calculated**,** which are depicted in (Tables 2 -3).

The data presented in (Table 2) highlight that in Faisalabad and Sheikhupura districts, radio broadcasts were reported to be more effective in the dissemination of information regarding livestock sector. However, in Rahim Yar Khan districts, radio broadcasts were more effective in the dissemination of information regarding major crops. In total situation, livestock was at the top with the highest mean score 186, followed by major crops with mean score 154. Horticultural crops and poultry were the subsequent categories with mean scores of 80 and 78, respectively. The other succeeding categories were minor crops with mean score 69 and forest with 34. Other farm enterprises with mean score 18 got the least position.

Getting in-depth insight, within the major categories, agronomic practices were at the top in case of major crops, horticultural crops, and forest with mean scores 47, 23, and 11, respectively. However, in case of minor crops, plant protection was at highest level with mean score 21. Moreover, feeding techniques in case of livestock were at the top with mean score 26. In case of poultry, meat production, cure of diseases and parasites etc. were at the top with equal mean score 13. In addition, within the major categories, marketing aspect was at the lowest level in all the cases.

The data presented in (Tables 3**)** manifest that in Faisalabad and Sheikhupura districts, TV broadcasts were perceived by the respondents as more effective in the dissemination of information regarding livestock sector. However, in Rahim Yar Khan district, TV broadcasts were more effective in the dissemination of information regarding the major crops category. In total situation, livestock was at the top with highest mean score 562, followed by major crops with mean score 476. Poultry and horticultural crops were the subsequent categories with mean scores 228 and 220, respectively. The other succeeding categories were minor crops with mean score 210 and forest with 101. Other farm enterprises with mean score 50 got the least position.

Further probing, within the major categories, reveal that agronomic practices were at the top in case of major crops, minor crop, and forest with mean scores 152, 63, and 30, respectively. However, in case of horticultural crops, plant protection was at highest level with mean score 68. Moreover, feeding techniques in case of livestock were at the top with mean score 92. Precautionary measures against the diseases with mean score 37 were at the top in case of poultry. Furthermore, within the major categories, marketing aspect was at lowest level in all the cases.

Muhammad *et al*. (2004) found that most of the respondents acquired information about various practices regarding crops. Oyegbami and Fabusoro (2003) identified radio and TV as important information sources for the dissemination of information on poultry aspects. Okwu et al. (2007) affirmed the contribution of radio in providing a variety of information including crop and livestock sectors. Abbas *et al.* (2009) pointed out the role of radio as information source regarding agro-forestry.

Various aspects of radio/TV broadcasts: The respondents' perceptions about various aspects of radio/TV programs determine the popularity of the programs among the respondents. Interesting, informative, useful, and practicable programs are likely to be more effective than lacking these qualities. The information regarding the said aspects can

Table 2. Perceptions of the respondents about the effectiveness of radio broadcasts regarding various production practices by districts

Areas covered through radio broadcasts	Faisalabad Score	Sheikhupura Score	Rahim Yar Khan Score	Mean*
Major crops (wheat, rice, sugarcane, maize,cotton)				
Agronomic practices	51	41	49	47
Plant protection measures	55	41	43	46
Harvesting/Post harvest technology	50	24	29	34
Marketing	19	34	27	27
Total	**175**	**140**	**148**	**154**
Minor crops (oilseed crops, pulses, fodder etc.)				
Agronomic practices	26	18	16	20
Plant protection measures	25	24	14	21
Harvesting/Post harvest technology	19	17	14	17
Marketing	8	13	13	11
Total	**78**	**72**	**57**	**69**
Horticultural crops (fruits, vegetables, flowers etc.)				
Agronomic practices	37	16	15	23
Plant protection measures	35	16	15	22
Harvesting/Post harvest technology	30	15	15	20
Marketing	14	15	15	15
Total	**116**	**62**	**60**	**80**
Forest (plantation of trees etc.)				
Agronomic practices	18	10	5	11
Plant protection measures	15	10	2	9
Harvesting/Post harvest technology	12	10	2	8
Marketing	6	10	2	6
Total	**51**	**40**	**11**	**34**
Livestock				
Feeding techniques	40	18	19	26
Dairy products	21	19	20	20
Beef/Mutton production	18	16	13	16
Sheep, goat etc. products	26	15	8	16
Breeding techniques	39	13	12	21
Farm management	30	18	17	22
Precautionary measures against diseases	46	21	21	29
Cure of diseases and parasites etc.	39	15	20	25
Marketing	6	14	14	11
Total	**265**	**149**	**144**	**186**
Poultry				
Meat production	21	14	5	13
Egg production	18	13	5	12
Breeding techniques	12	12	5	10
Farm management	12	14	5	10
Precautionary measures against diseases	24	11	4	13
Cure of diseases and parasites etc.	24	11	5	13
Marketing	3	11	6	7
Total	**114**	**86**	**35**	**78**
Other farm enterprises				
Fisheries	-	11	-	4
Sericulture	9	14	-	8
Apiculture	6	11	-	6
Total	**15**	**36**	**-**	**18**

*Mean scores were obtained by adding the scores of the three districts divided by 3 in each case.

Table 3. Perceptions of the respondents about the effectiveness of TV broadcasts regarding various production practices by districts

Areas covered through radio broadcasts	Faisalabad	Sheikhupura	Rahim Yar Khan	Mean*
	Score	Score	Score	
Major crops (wheat, rice, sugarcane, maize, cotton)				
Agronomic practices	149	162	145	152
Plant protection measures	135	157	137	143
Harvesting/Post harvest technology	121	97	109	109
Marketing	29	75	112	72
Total	**434**	**491**	**503**	**476**
Minor crops (oilseed crops, pulses, fodder etc.)				
Agronomic practices	69	60	59	63
Plant protection measures	67	53	60	60
Harvesting/Post harvest technology	61	43	51	52
Marketing	19	37	49	35
Total	**216**	**193**	**219**	**210**
Horticultural crops (fruits, vegetables, flowers etc.)				
Agronomic practices	70	68	51	63
Plant protection measures	73	78	52	68
Harvesting/Post harvest technology	54	57	52	54
Marketing	9	47	49	35
Total	**206**	**250**	**204**	**220**
Forest (plantation of trees etc.)				
Agronomic practices	35	32	23	30
Plant protection measures	36	30	23	30
Harvesting/Post harvest technology	17	28	22	22
Marketing	8	27	21	19
Total	**96**	**117**	**89**	**101**
Livestock				
Feeding techniques	109	106	61	92
Dairy products	62	75	65	67
Beef/Mutton production	34	58	44	45
Sheep, goat etc. products	44	55	42	47
Breeding techniques	73	43	36	51
Farm management	46	79	54	60
Precautionary measures against diseases	94	93	60	82
Cure of diseases and parasites etc.	97	99	60	85
Marketing	12	40	46	33
Total	**571**	**648**	**468**	**562**
Poultry				
Meat production	19	41	41	34
Egg production	22	39	43	35
Breeding techniques	21	32	39	31
Farm management	10	44	41	32
Precautionary measures against diseases	31	41	39	37
Cure of diseases and parasites etc.	31	44	35	37
Marketing	4	34	29	22
Total	**138**	**275**	**267**	**228**
Other farm enterprises				
Fisheries	27	30	9	22
Sericulture	11	28	3	14
Apiculture	11	26	6	14
Total	**49**	**84**	**18**	**50**

*Mean scores were obtained by adding the scores of the three districts divided by 3 in each case.

pave the way for the improvement of the weaker side of the program.

For assessing radio/TV broadcasts with respect to various aspects, the respondents were enquired. Based upon the collected data, the scores of various aspects regarding radio/TV broadcasts were calculated**,** which are presented in (Tables 4-5).

The data presented in (Table 4) indicate that "Khait Khait Haryali" was at the top with total score value of 308 followed by "Sandhal Dharti" with score 299 and "Jithey Teray Hal Wagday" with score 239. "Utum Khaiti" and "Dharti Bakht Bahar" were at 4th and 5th positions with total scores 149 and 143, respectively.

The data presented in (Table 5) reveal that short messages were at the top with total score value of 1824 followed by advertisement with total score 1545 and "Kissan Time" with total score 1214. While the lowest rank was acquired by "Haryali" with total score 771. Short messages excel in all the said aspects with maximum score. It may be deduced that short messages had more value with respect to the said aspects. The appealing side behind the scene might be the brief and comprehensive nature with visual impact of these messages. Despite the promotion of their own products (like pesticides, fertilizers, seed etc.) by the public and private agencies, second position of advertisements pertinent to agriculture revealed its importance regarding the said dimensions.

Moreover, It also appeared from the data mentioned in Tables 4 and 5 that the practical aspect of agri. information depicted weakest form in all the radio/TV broadcasts under study.

CONCLUSIONS

The study results depict that TV was relatively ahead of radio as agricultural information source while as audio/video cassettes and internet appeared to be the weakest forms of the electronic media. The strong areas of agricultural information were livestock sector and major crops both in radio and TV broadcasts. Within the major categories, the weakest side was the marketing aspect. Regarding agri. TV broadcasts, short messages were ranked at the top with respect to various aspects like interest, effectiveness, usefulness and practicability followed by advertisements. Among agri. radio broadcasts Khait Khait Haryali" was at the top in all the said aspects followed by "Sandhal Dharti". Moreover, the practical aspect of the agri. information needs special attention in an earnest manner.

RECOMMENDATIONS

Since, the study results depicted that use of audio/video cassettes, and internet was nil as a source of agricultural information. Therefore, the farmers should be provided opportunities to use these media. Regarding internet, the farmers should be equipped with the vocational and technical education pertinent to computer and internet. For this purpose the cyber centers should be developed at village level to facilitate the farming community. For getting initiative, literate and progressive farmers should be involved in this process that will pave the way for other farmers to get benefits from this modern technology. For developing interest among the farmers regarding the use of these media audio/video cassettes (containing agri. contents) should be used by the respective Agri. Officer (AO) during farmers' training meetings at village level. Websites containing information on agriculture and related issues be developed with maximum links placed on it for getting diversified information.

Marketing information of commercial agri. products be disseminated through electronic media for keeping the farmers updated about market situation.

Table 4. Ranking of radio broadcasts with respect to various aspects

Radio broadcasts	Score				Total Score	Rank Order
	Interest	Informativeness	Usefulness	Practicability		
Khait Khait Haryali	86	78	77	67	308	1
Sandhal Dharti	89	78	73	59	299	2
Jithey Teray Hal Wagday	67	64	57	51	239	3
Utum Khaiti	50	36	33	30	149	4
Dharti Bakht Bahar	46	37	31	29	143	5

Table 5. Ranking of TV broadcasts with respect to various aspects

TV broadcasts	Score				Total Score	Rank Order
	Interest	Effectiveness	Usefulness	Practicability		
Short Messages	529	468	441	386	1824	1
Advertisements	431	390	383	341	1545	2
Kissan Time	309	322	306	277	1214	3
Haryali	195	194	197	185	771	4

Regarding TV broadcasts, the short messages were ranked at the top. Hence, maximum information should be given through short messages regarding agricultural updates.

Practical nature of agri. information can boost the worth thereof, so, the need based practical information should be provided to the farming community through these media. The findings of the research may be applied especially in those areas of the Punjab, and even Pakistan having similar conditions.

ACKNOWLEDGEMENTS

The research paper is based on the project entitled "An in-depth analysis of the electronic media for the development of a strategy to enhance their role in agricultural technology transfer in the Punjab, Pakistan" funded by the Higher Education Commission (HEC), Islamabad. The financial support of HEC is highly acknowledged.

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