

ROLE OF COMMUNICATION IN DIFFUSION AND ADOPTION OF AGRICULTURAL INNOVATIONS

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ABSTRACT

This paper discusses the long-range communication strategy for media men in evaluating the diffusion of agricultural innovations. This study, advocates the widely recognized role of communication. It investigates the central importance of interpersonal network influences on farmers in convincing them to adopt agricultural innovation in particular. In this study the various theoretical considerations will be reviewed related to the conditions on Pakistan. The empirical work will help in understanding the knowledge, attitude and practice (KAP) formula.

INTRODUCTION

Modern agriculture is characterized among other things by the salient role of communication as factor of change and progress. Electronic media transmit the agriculture innovation to the farming community. Undoubtedly, there has been a rapid quantitative diffusion of mass media. The primary conveyors of development information in agriculture are also the persuasive agents of change in rural areas. Communication of development information; and equally persuasive conveyors of change, is the development workers: extension agriculture personnel in agriculture. A third source of development information is influential opinion leaders. Pakistan has increasingly become aware of the tremendous role that mass media can play in agriculture growth. Agriculture development is the need of time for a better and prosperous nation. This KAP

survey will probably require internal human resources as well as external experts with specialized skills. Communication and social mobilization are three distinct sets of activities, all of which have the shared goal of bringing about behavioral change.

Knowledge: Newspapers, magazines, Radio, TV, Billboards, Brochures, posters and other printed materials, agro-workers, opinion leaders, and peer groups.

Attitudes: what people (farmers) know having agricultural technology. Attitude refers to their feelings toward this subject, as well as any preconceived ideas they may have towards it.

Practice: The adoption of agricultural innovations

KAP Study tells us what people know about certain things, how they feel and also how they behave. KAP study measures the Knowledge, Attitude and Practice and to understand that what

people know about certain things, how they feel and also how they behave.

The population of Pakistan has been growing at the rapid rate since the creation of the country in 1947. The result of the population increase has been continued pressure on the land and a tendency to place more fragile lands in production. The total geographic area of the DIKhan is about 730575 hectares of which 216678 hectares is considered to be cultivated, statistics for the year (1996-97). Dera Ismail Khan is the southernmost district of North West Frontier Province (NWFP) with an area of 3780 square miles. The district forms an irregular cone, hills lie on its western and northern borders, and river Indus on its East while Punjab is situated in its southern boundary (F A D, 1980).

The district is divided between KACHA (Indus riverain) and DAMAN, a great plain stretching between and the hills. It is a fertile plain without trees and grass. The average rainfall is slight averaging to 10 inches. Chashma Right Bank Canal Project has been designed to irrigate an area of 230671 hectares of which 61% [141640 hectares] is located in D.I.Khan, NWFP (F A D, 1980).

This study, advocates the widely recognized role of communication. It also advocates communication facilities, transmission of related information to farmers and feedback to the top planner and decision makers in agricultural sector. This thesis deals with two closely interconnected phenomena, the consumption of media and the adoption

and diffusion of agricultural innovations. The research aims at developing both the theory-models of individual (farmer) adoption decisions and the diffusion of an agriculture innovation on the whole of the farming community.

Many efforts have been made to analyze the "farmers" adoption level of agriculture innovations. Media consumption and adoption of agricultural innovations, is an ideal means for predicting the future rate of adoption the new methods of agri-growth. The researcher also investigated the central importance of interpersonal network influences on farmers in convincing them to adopt agricultural innovation. Farmers use a variety of information different farmers has different sources" Campbell, A. & R. Junior. (1992).

Literature Review

The Ryan and Gross (1943) study of the diffusion of hybrid seed corn in Iowa is the most influential diffusion study. The adoption of hybrid corn meant that an Iowa farmer had to make important changes in his corn-growing behavior (cited in the work of Rogers, 1995). Overall, there was a minimal overlap between functions of opinion leaders and contact farmers. In addition, contact farmers as a source of farm information were of limited use among opinion leaders and other respondents. Rather, opinion leaders were the natural preference for farm information. In the majority of the socio-economic characteristics, contact farmers were ahead of opinion leaders indicating some

degree of alienation of contact farmers from the existing socio-economic norms of the villages. Economic set of variables was relatively more efficient discriminating between opinion leaders and contact farmers in the progressive village. Considering the less progressive village, non-economic set of variables was more powerful discriminating and correctly classifying opinion leaders and contact farmers. Appropriate policy strategies are discussed considering different levels of village development (T & V Agricultural system, 1997).

The extension system had a strong influence on farmers' decision-making process, especially by giving "how-to" advice. The family seems to have more influence on the decision to adopt an innovation, where socio-economic family bonds are stronger. Farmers in both regions showed a rational decision making behavior, balancing between a wish to innovate and careful weighing of the economic worth of the innovation. Once farmers had made a decision, only very few regretted their choice ((Blum, 2003).

Surveys of farmers frequently reveal that although they believe certain environmental problems to be serious, they often feel that the problem is not one they experience on their own properties (Vanclay, 1992a). Much of the previous literature on technology adoption has focused on mechanical (e.g., tractors), chemical (e.g., pesticides), and agronomic (e.g., integrated pest management) innovations. More recent research has

been devoted to informational (e.g., precision farming) and biological (e.g., BE) innovations (Feder, *et al.*, 1985; Fernandez-Cornejo, *et al.*, 1994; Fernandez-Cornejo & McBride, 2002).

Traditional extension methods have only had limited success in promoting the widespread adoption of new management practices and technology (Röling, 1988; Vanclay & Lawrence, 1994; 1995). Radio is currently utilized more than television by most farmers, they perceive that the television program is providing very useful content (Mohammed Kuta Yahaya, 2002).

There are two major approaches to using media and technology in agriculture: farmers can learn "from" media and technology, and they can learn "with" media and technology (Jonassen & Reeves, 1996). Learning "from" media and technology is often referred to in terms such as instructional television, computer-based instruction, or integrated learning systems (Hannafin, *et al.*, 1996; Seels, *et al.*, 1996). Learning "with" technology, less widespread than the "from" approach, is referred to in terms such as cognitive tools (Jonassen & Reeves, 1996) and constructivist learning environments (Wilson, 1996).

Rationale

Keeping in view the rapid and alarming population growth of Pakistan, food security has assumed a pivotal place in our national development. At the threshold of 21st century to meet with such challenging situation, we as a nation badly required to give central contribution to agriculture development

.It was, therefore, essential to launch a massive national campaign to improve agriculture period.

Objectives of the Study

For the present study the following main objective are developed:

1. To identify and compare the messages of radio and TV and interpersonal communication in diffusion of agricultural innovations
2. To find out the knowledge, attitude and practice level the farmers
3. To document the use of messages in motivating farmers towards modern technology
4. To explore the extent and amount of the farmers who in tern get opinion and information from opinion leaders

Theoretical Framework

A theoretical framework is a conceptual model of how one theorizes the relationships among the several factors that have been identified as important to the problem. Theoretical framework for our research is that historically slow diffusion and adoption of innovation has been the concern of many scholars who has presented theoretical models and theories. Most of the theories and models on the adoption and diffusion of agricultural innovations were formulated.

In this study the various theoretical considerations will be reviewed related to the conditions on Pakistan. The empirical work will help in understanding the knowledge, attitude,

and practice (KAP) formula. A KAP survey can be conducted at any point during farming activities, but is most helpful for agricultural activities if conducted in the early phases of a crop production, after the overall programmatic objectives have been determined (such as the implementation of new approaches or interventions to address specific challenges like seeds, pesticides and technology) and before extensive project planning has been completed. In this scenario, data from the KAP survey can be used to orient resource allocation and project design, and to establish a baseline for comparison with subsequent, post-intervention KAP surveys.

The models and theory to illustrate the present study, the researcher will examine the Roger and Shoemaker's (1973) model "diffusion of innovation". This model is relevant to the developing societies. The most important feature of this model about work on diffusion is the weight in which the behavioral changes are sought by giving information and trying the influence motivation and attitude. The model chosen to illustrate this approach is based on the assumption that is acting at least four distinct steps in diffusion and innovation process.

Communication

Radio and TV-Interpersonal Communication

Exposures to agricultural innovation are treated independent variables

Dependent variables: Awareness-----
Interest----Decision-----Adoption

Adoption

Knowledge-Attitude formation-Practice

Demographic--Effects on KAP levels is treated as dependent variable.

The basis of knowledge depends on experience and observation. Attitude is a predisposition to response in a certain manner (Reardon, 1981). Practice option may be considered in terms of how appropriate, consistent, and effective they are.

Hypothesis: Greater the exposure and reinforcement of agriculture innovations through electronic media, the greater is the knowledge, persuasion, decision and confirmation.

Hypothesis: Farmers who interconnected through interpersonal communication are likely to have a higher means of total agricultural innovations' adoption score than those who are not.

Hypothesis: Higher the exposure to agriculture technological innovations, higher will be the relevant index of use.

Methodology: The present study is survey research in nature. District Dera Ismail Khan (DIKhan) is the area where the research was conducted. In order to make sure the equal representative of the mentioned area, quota sampling technique would be preferred to adopt. Quota sampling is a procedure that appears to ensure similar control on the type of persons selected for interview. The basic idea of quota sampling is to balance the number of interviewees across the entire population. Keeping in

view the present study's large population, the researcher will adopt quota sampling procedure for data collection. As it is mentioned early that 30 village would randomly be selected from the entire area of 396 Mozas/villages for the required data. In such process total sample size for the present study is 500.

Data collection will involve a survey of DIKhan farming community through a well planned questionnaire. The respondents would be contacted personally and will get their responses. It is hoped that this personal contact would eliminate or minimize any type of confusion and misunderstanding and would ensure an accurate response rate. Questionnaire was developed on the basis of the study's main objectives as already mentioned. Closed-ended questions method is adopted.

Data Analysis

This cross-sectional survey is focused on the evaluation of the district Dera Ismail Khan's farmers knowledge, attitude and, practice level agricultural innovations' campaign.

Table 1 Extent of Interpersonal Contact

	Extension agents		Number of farmers		Co-farmers	
Value	(f)	% age	(f)	% age	(f)	% age
1	132	27	142	30	283	57
2	169	34	196	39	153	30
3	130	26	113	22	55	12
4	44	08	28	05	05	01
	25	05	20	04	04	00
		100 %		100 %		100 %

*1, stands for "always"*2, indicates "some times"*3, stands for "rarely" while *4, stands for "never" and*9, indicates, "Dk" which is treated as missing cases.

Analysis of Variance for the extent of interpersonal contact

Source	DF	SS	MS	F	P
C2	3	49227	16409	6.88	0.013
Error	8	19067	2383		
Total	11	68294			

For respondent’s interpersonal contact, I have formulated my hypotheses as:

a. H₀: At the average they contact extension agents, numberdaar, and co-fellow equally

H_a: No, there is a significant difference
To check the significant difference I prefer level of significance to be set at 5%.

b) To reach the conclusion test statistics works as a key. Here, the suitable most T.S. is F- statistic for faction as sources.

c) The critical region for rejecting H₀ is then given by generally, $F_{cal} \geq F_{tab}$.
When $F_{tab} = F_{(3,6)} = 4.76$

Since the calculated *F* value 5.18 is greater than the observed *value* 4.76 from the table. Therefore, I accept H_a and conclude that it is unlikely that farmers’ contact with extension agents, numberdaars and, co-farmers is significantly different. Their interpersonal contact comes with different average responses. Statistical calculation shows that co-farmer has great performance. Fifty seven percent of the farmers fall in the response category of “always”. Table 1 also shows that there is a significant difference in percentage of interpersonal contact that confirms the score on always category significantly. The sources of information by farmers showed that it is through personal

knowledge or through neigh-farmer information that they gain knowledge of important information regarding farming innovations. This study reveals that the personal sources were important for gaining first knowledge of awareness about farming innovation information.

Table 2 Confirmation of decision

Coding categories	(f)	% age	Valid %	Cumulative %
Very often	106	21.2	21.2	21.2
Less often	223	44.6	44.6	65.8
Never	121	24.2	24.2	90
Can't say	50	10	10	100%
Total	500	100		

Valid cases =450 Missing cases=50

Table 2 indicates the univariate frequency description of farmers’ confirmation of decision about agriculture innovations. Finding shows that 44.6% of the total sample “less often” spends time on confirmation of decision, while 21.2% are those who “often” spend time on the case, and 24.2% “never” confirm their decision about agricultural innovations.

Table 3 Intend to Use Hybrid Seeds, Fertilizer and Pesticides

Categories	Frequency	% age	Valid %	Cumulative %
Yes	290	58	67	67
No	210	42	33	100%

Table 3 indicates the univariate frequency description of farmers’ intend to use hybrid seeds, fertilizers and, pesticides for better yield. Finding shows that 58% of the total sample use to intend hybrid seeds, fertilizers and, pesticides, while 42% don’t.

Table 4 If not then why?

Categories	Frequency	% age	Valid %	Cumulative %
It is expensive	68	32%	32%	32
I have no money	102	48%	48%	80
It is not easily available	23	11%	11%	91
The innovations are not effective	17	9%	9%	100%
Can't say	-			

This univariate frequency distribution provides the causes of “not using” hybrid seeds, fertilizers and, pesticides. Table 4 shows that majority (48%) of farmers not using these innovations due to lack of money, followed by “it s expensive (32%) and 11% respondents in the sample says “it is not easily available”. Only 9% not intend to use hybrid seeds, fertilizers and, pesticides due to “not effective are the innovations”.

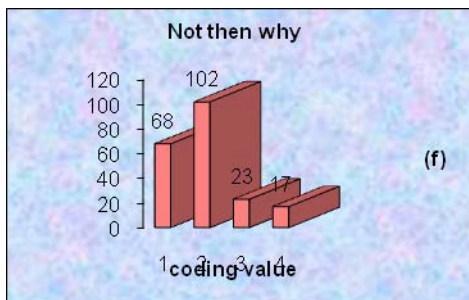


Figure 1 If not then why?

CONCLUSION

This study found that our friends and relatives who we saw as “opinion leaders” primarily guided our decisions. Friends/relatives were found 50% among other sources of information (agricultural inputs; extension education; agricultural technology). These findings also endorsed the second research

question “do the farmers get opinion and information regarding agricultural innovations from opinion leaders? *Opinion leader* emerged as the more likely of the two social factors to influence adoption level, specifically in groups. It also is among those that appear to be emphasized in the effort to introduce agricultural innovations. These comments also ring true with the conclusion made in table 5.8 and 5.12 that peer group pressure seems to be the single biggest influence in transforming innovation use for personal work into farming.

Results prescribed that majority of the target sampled intend to use processed seeds, fertilizers and, pesticides. Farmers were intended to use innovations for the increase of more yields. The first formulated alternative hypothesis (chapter 3), “greater the exposure to the messages of agricultural innovations, the greater is the knowledge, attitude and, practice level” has found accepted.

Efforts were made to see that “if the farmers don’t adopt the innovation” then what the reasons were? The perceived perceptions of the farmers explored that a great majority of the respondents ranked the reasons as: “they have no money” for purchasing these innovations number first. Some of them have chalked out, “it is expensive”, “it is not easily available” and,” the innovations are not effective” respectively. The empirical evidence illustrated that majority of the total sample “less often” spent time in confirmation of decision, while 21.2% were those who “often”

spend time on the case, and 24.2% never confirm their decision.

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