A SCALE TO MEASURE COMMUNICATION OF AGRICULTURAL OFFICERS

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Abstract

The current research study was carried out between 2021 and 2022. This study examined the way agricultural officers communicate. As part of the research efforts, to analyze the communication behavior of the agriculture officers a scale was developed. For the construction of the scale the Likert (1932) summarized rating scale method was employed. A preliminary selection of 56 statements was made after considering their relevance and research-related suitability. A total of 44 assertions were compiled using the available materials, evaluated carefully, and then sent to specialists in the form of a questionnaire. Through relevancy testing, 38 statements were chosen out of 44.

Keywords: Agriculture officers, Communication, behavior, Relevancy.

Introduction

The information need of the farmers is diverse and they also search different sources for getting information on agriculture. It was observed that 88.33 per cent of the respondents perceived that the extension services implemented by agricultural officers were useful to more useful for them regarding the dissemination of knowledge (Sarnaik*et al.*, 2020). Especially in areas with such a geographic complexity as Pakistan, agricultural extension departments serve to gather, test, and disseminate knowledge between centralized institutions and a geographically dispersed rural population.

There are three systems involved in the agriculture development process namely 'Research system', 'Extension system' and 'Client system'. The research system generates knowledge; the extension system disseminates the same to the farmers (Client system). Therefore, a constant flow of information from the 'Research

system' to the 'Extension system' and there on to farmers is necessary for rapid agricultural development. This flow of information comprises information acquisition (input), information processing (processing), information dissemination (output) and feedback (response). It is only through communication that external ideas, new information and new technologies enter the communities. This entails the extension personnel agricultural officers to have thorough understanding of the communication process. The extension worker cannot expect change among farmers unless he or she is able to communicate effectively to them. Hence, there is need to study the communication behavior of the agricultural officers. Communication behavior of the agricultural officers has been operationalized as the various activities undertaken by them for the development and dissemination of the improved agricultural information.

Materials and Methods

To measure the communication behavior of the agricultural officers a scale has been developed by the following procedure. Method of summated rating scale developed by Likert (1932) was used to construct the communication behavior of the agricultural officers.

The first step in the scale construction is to define the general area of universe of content. The class of all possible statements that could be made about a given psychological object is often called a universe. In the present study all the possible statements about 'Communication behavior of agricultural officers, represent the universe.

I) Collection of items

Fifty-six statements expressing the communication have been collected after thorough review of available literature, in consultation with the experts in the field of Agricultural Extension and the senior agricultural officers, they were edited based on criteria suggested by Thurstone and Chave (1929), Likert (1932) and Edward (1957). Based on the screening, forty-four items were finally selected which formed the universe of contents.

After giving the scores to the statements, 'z' values were calculated for each statement. Finally, the grand 'z' of all the 44 statements were obtained and '$\bar{z}$' was calculated. All the statements with 'z' values above $\bar{z}$ (0.00) were selected as the scalable statements of communication behavior of agricultural officers. The statements with 'z' values below '$\bar{z}$' were eliminated. Thus, 38 statements out of 44 were selected through relevancy testing. The list of statements along with their 'z' values was given in Table 1.

ii) Calculation of 't' value

The scores of the individual statements were summed up to get the total scores of the respondents. Based on the total scores obtained, the respondents were arranged in descending order. The top 25 percent of the respondents with their total

scores were considered as the high group and the bottom 25 per cent as the low group, so as the set of groups provide criterion groups in terms of evaluating the individual statements as suggested by Edwards (1957). Thus, out of 58 respondents to whom the items were administered for the item analysis,14 respondents with highest scores and14 respondents with lowest scores were used as criterion groups to evaluate individual items.

The critical ratio, *i.e.*, t-value which was a measure of the extent to which a given statement differentiates between the high and low groups of respondents for each statement, was calculated by using the formula suggested by Edwards (1957).

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum (X_H - \bar{X}_H)^2 + (X_L - \bar{X}_L)^2}{n(n-1)}}}$$

X_H= The mean score on a given statement for the high group

$\bar{X}_L$ =The mean score on a given statement for the low group

ΣX_H^2= Sum of squares of the individual score on a given statement for high group

ΣX_L^2= Sum of squares of the individual score on a given statement for low group

ΣX_H=Summation of scores on a given statement for high group

ΣX_L = Summation of scores on a given statement for low group

n=Number of respondents for in each group

Σ =Summation

After computing the 't' value for all the statements, statements comprising of twenty-six positive and six negative statements with t value equal to or greater than 1.75 were finally selected and included in the scale developed to measure the communication behavior of scientists of agricultural officers. There were 32

statements in the final scale developed from 38 statements and mentioned in Table 2.

V) Reliability of the scale

The reliability of the scale was determined by 'split- half' method (Garrett and Wood worth, 1973). The thirty-two selected attitude items were divided into two equal halves by odd-even method (Singh,2008). The two halves were administered separately to 50 extension personnel in a non-sample area. The score for each respondent were recorded separately for even and odd questions based on a five-point continuum of 'strongly agree', 'agree', 'undecided' 'disagree' and 'strongly disagree' was used as response categories. The scoring procedure adopted was as follows. The scoring was given for all the statements on a five-point continuum. The score given for the positive statement were 5,4,3,2 and 1 for strongly agree, agree, undecided, disagree and strongly disagree respectively and the score was reversed for negative statements. Then scores were summed to get total score of each respondent. The scores were subjected to Pearson product- moment correlation coefficient (r) between the respondents scores on the even-numbered items and their scores on the odd-numbered items. The resulting coefficient is an estimate of the half-test reliability *i.e*., the reliability of the odd-numbered items, or the even-numbered items, but not both combined. The value of r is **0.71** So, further the reliability coefficient of the whole test was computed using the Spearman-Brown prophecy formula because only half the number of items were used so the reliability coefficient was reduced hence to get a better estimate of the reliability of the full test, we apply this correction.

The formula of Spearman-Brown correction

$$\rho = \frac{2 \times rhalf{-}test}{1 + rhalf{-}test}$$

The whole test reliability(rtt) was **0.86** According to Singh (2008), when the mean scores of the two groups are of narrow range, are liability coefficient of 0.50 or 0.60 would suffice. Hence, the constructed scale was reliable as their t value was greater than 0.60.

iii) Content validity of the scale

It referred to the representativeness or sampling adequacy of the content of a measuring instrument (Kerlinger, 2008). The validity of the test dependents upon the fidelity with which it measures what is expected to measure. This method was used in the present scale to determine the 'content validity' of the scale. As the scale value differences for almost all statements included had a very high discriminating value, it seemed reasonable to accept the scale as a valid measure communication behavior.

iv) Administration of the scale

The scale thus met the reliability and validity test satisfactorily indicated its ability as an instrument for measuring communication behavior. A five-point continuum of 'strongly agree', 'agree', 'undecided' 'disagree 'and 'strongly disagree 'was used as response categories. The scoring procedure adopted was as follows. The scoring was given for all the statements on a five-point continuum. The score given for the positive statement were 5,4,3,2 and 1 for strongly agree, agree, undecided, disagree and strongly disagree respectively and the score was reversed for negative statements. The total score of the respondent on the scale was obtained by summing up the scores of all the statements in the scale. The possible minimum and maximum score was 32 and 160. The scale met the reliability and validity test satisfactorily indicated its ability and validity test satisfactorily indicated its ability as an instrument for measuring the communication behavior of the agricultural officers. This study aims at constructing a scale to measure the communication behavior of the agricultural officers.

Application of research

The scientists of agricultural officers are the crucial human resource persons working for the fulfilment of the mandate framed for the agricultural officers. Communication behavior of the agricultural officers has been operationalized as the various activities undertaken by them for the development and dissemination of the improved agricultural information. Measuring the communication behavior of the agricultural officers is very much essential and need of the hour for more inclusion of recent Agri related information and technologies which will be measured with help of this developed and standardized Likert scale.

Table 1: Selection of statements based on relevancy test

Sr. No.	Statements	'Z' values
A	**Information input behavior**	
1.	I prefer considering of farmers' reaction or feedback. (+)	0.80
2.	I used to interact with talented (senior) extension personnel for new farm information. (+)	1.99
3.	I often discuss with colleagues to get current agricultural information. (+)	1.33
4.	I get new ideas through group discussions and meetings. (+)	-0.95
5.	I am interested in listening to farm broadcast. (+)	1.51
6.	I don't have a good rapport with Agri input and bank agencies. (-)	0.39
7.	I wish to read farm journals (Periodicals) to find research findings. (+)	1.61
8.	When I need information, I Visit Agri portals and websites. (+)	1.19
9.	I refer various news published in local newspaper and believe them. (-)	-1.71
10.	I try to watch other people's body language and facial expressions while communicating with them. (+)	0.72
11.	I am not giving equal importance to verbal and non-verbal language. (-)	1.25
12.	I try to see the other person's point of view. (+)	0.81
13.	I use Agri-mobile apps and expert system portals to get crop specific information. (+)	1.12
14.	I follow social media (Facebook, WhatsApp, and YouTube) to get information about modern farm technologies. (+)	1.26
15.	I undergone training programs and participates in workshop to update the knowledge skills. (+)	1.57
B	**Information processing behavior**	
16.	Whatever the information I gets from other scientists, I accept it unreservedly. (-)	0.39
17.	Before disseminating, new technology to farmers, I discuss with other scientists in the KVK. (+)	1.36
18.	I never consider the economic and local flexibilities of information/ technology. (-)	0.49
19.	I conduct a trail on farmer's fields to know the feasibility of technical information. (+)	0.20
20.	I always judge new information/ technology in the light of past experiences. (+)	0.15
21.	I preserve or keep the information for future use by maintaining in proper files. (+)	0.37
22.	I prepare charts, graphs, posters etc. with the information for better communication. (+)	0.14
23.	I recognize when two people are trying to say the	0.42

	something, but indifferent ways. (+)	
24.	I organize in formation in my head before speaking. (+)	1.89
25.	Before I respond, I try to understand what another person is saying. (+)	1.73
26.	I never rephrase what others says to me. (-)	0.33
27.	I discuss with progressive farmers for new technology. (+)	-0.81
28.	I add my personal experiences to the information which I received. (+)	1.82
29.	I prepare lectures and power points of scientific information in local language which I received from different sources. (+)	2.17
30.	I Am judging by technology by the degree of complexity. (-)	-1.09
C	**Information output behavior**	
31.	I disseminate farm information among farmers by participating farm broadcasts. (+)	0.74
32.	I utilize training programs to disseminate knowledge and skills. (+)	1.03
33.	I use SMS/voice messages mails for sending information among farmers. (+)	0.77
34.	I use my tone of voice to reinforce what I am trying to say. (+)	0.50
35.	I prefer film shows mostly in all locations. (-)	-1.26
36.	I wish to complete what I want to say rather than listening a person, he/she wish to say. (-)	0.81
37.	I try to utilize my body language to reinforces what I am trying to say. (+)	1.54
38.	When talking to someone, I try to maintain eye contact. (+)	0.56
39.	I interrupt other people to speak before I forgot what I want to say. (+)	1.10
40.	I recognize when a person is hearing tome, but not listening. (+)	1.63
41.	I interact with farmers regularly over phone (+)	-0.33
42.	On the basis my own experiences, I makes my friends to understand that I am getting what they are saying. (+)	0.05
43.	I change the way of taking to someone based on my relationship with them (*i.e.*, farmer, friend, senior scientist, colleagues, *etc.*). (+)	0.66
44.	I use most modern means of ICTs like WhatsApp, Facebook, and other means to disseminate the information. (+)	1.03

Table 2. Selection of statements based on 't' values

Sr. No.	Statements	't' values
A	**Information input behavior**	
1.	I prefer considering of farmers' reaction or feedback. (+)	2.14
2.	I used to interact with talented (senior) extension personnel for new farm information. (+)	2.99
3.	I often discuss with colleagues to get current agricultural information. (+)	2.12
4.	I am interested in listening to farm broadcast. (+)	1.82
5.	I don't have a good rapport with Agri input and bank agencies. (-)	1.94
6.	I wish to read farm journals (Periodicals) to find research findings. (+)	3.21
7.	When I need information, I Visit Agri portals and websites. (+)	2.19
8.	I try to watch other people's body language and facial expressions while communicating with them. (+)	2.11
9.	I am not giving equal importance to verbal and non-verbal language. (-)	1.25
10.	I try to see the other person's point of view. (+)	1.81
11.	I use Agri-mobile apps and expert system portals to get crop specific information. (+)	3.12
12.	I follow social media (Facebook, WhatsApp, and YouTube) to get information about modern farm technologies. (+)	2.26
13.	I undergone training programs and participates in workshop to update the knowledge skills	2.73
B	**Information processing behavior**	
14.	Whatever the information I gets from other scientists, I accept it unreservedly. (-)	3.86
15.	Before disseminating, new technology to farmers, I discuss with other scientists in the agricultural Department. (+)	1.98
16.	I never consider the economic and local flexibilities of information/ technology. (-)	2.09
17.	I conduct a trail on farmer's fields to know the feasibility of technical information. (+)	2.37
18.	I always judge new information/ technology in the light of past experiences. (+)	2.19
19.	I preserve or keep the information for future use by maintaining in proper files. (+)	2.74
20.	I prepare charts, graphs, posters etc. with the information for better communication. (+)	2.81
21.	I recognize when two people are trying to say the something, but in different ways. (+)	0. 42
22.	I organize in formation in my head before speaking. (+)	1.89
23.	Before I respond, I try to understand what another person is saying. (+)	1.93
24.	I never rephrase what others says to me. (-)	2.33

25.	I add my personal experiences to the information which I received. (+)	1.82
26.	I prepare lectures and power points of scientific information in local language which I received from different sources. (+)	2.11
C	**Information output behavior**	
27.	I disseminate farm information among farmers by participating farm broadcasts. (+)	2.24
28.	I utilize training programs to disseminate knowledge and skills. (+)	1.12
29.	I use SMS/voice messages mails for sending information among farmers. (+)	2.77
30.	I use my tone of voice to reinforce what I am trying to say. (+)	0.87
31.	I wish to complete what I want to say rather than listening a person, he/she wish to say. (-)	1.99
32.	I try to utilize my body language to reinforce what I am trying to say. (+)	2.07
33.	When talking to someone, I try to maintain eye contact. (+)	2.29
34.	I interrupt other people to speak before I forgot what I want to say. (+)	2.02
35.	I recognize when a person is hearing to me, but not listening. (+)	1.63
36.	On the basis my own experiences, I makes my friends to understand that I am getting what they are saying. (+)	0.95
37.	I change the way of taking to someone based on my relationship with them (*i.e.*, farmer, friend, senior scientist, colleagues, etc.). (+)	2.66
38.	I use most modern means of ICTs like WhatsApp, Facebook, and other means to disseminate the information. (+)	2.38

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