Scale Development to Measure Attitude of Farmers towards Kisan Call Centre Advisory Services

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Abstract

Kisan Call Centre (KCC) was launched on 21st January, 2004 to provide free agricultural advisory services to every citizen engaged in agriculture through a toll-free number 1800-180-1551 and provide the solution to the quarries made by the farmers in the regional languages. In this study an attempt is made to develop and standardize scale to measure the attitude of the farmers towards Kisan Call Centre (KCC) advisory services. To develop a scale five dimensions, a tentative list of 65 items pertaining to the attitude of the farmers distributed under identified five dimensions were made, for which relevancy and item analysis was calculated. The finally developed attitude scale was found to be highly reliable (0.616) and valid (0.7723). The attitude scale consisted of 22 statements classified under five dimensions namely, Services, Feedback, Crop management marketing and weather. The developed scale was administered to 32 KCC beneficiaries in the Bengaluru rural district 2021-22. It was found that nearly half (43.75 %) of farmers had favourable attitude towards Kisan Call Centre advisory services followed by 31.25 per cent of the farmers had least favourable and one-fourth (25.00 %) of the respondents had most favourable attitude towards Kisan Call Centre advisories.

THE Department of Agriculture & Cooperation (DAC), Ministry of Agriculture, Govt. of India has launched Kisan Call Centres (KCC) on 21st January, 2004 across the country to deliver advisory services to the farming community in 22 languages. The purpose of establishing these call centres is to respond to issues raised by farmers, instantly in local language. There are call centres for every state, which are expected to handle traffic from any part of the country and cater to needs of agriculture and allied sector farmers in the local language over a telephonic conversation. A farmer from any part of the State can contact the KCC by dialling the toll-free number 1551 or 1800-180-1551. The operator at the KCC will attend the call to answer queries of the farmers immediately. In case the operator at the call centre is not able to address the farmer's query immediately, the call will be forwarded to agricultural specialists. At the most the call centre will take 48 hours to provide with the suitable solution. Information and Communications Technology (ICT) can be broadly interpreted as technologies that facilitate communication, processing and transmission of information by electronic means. It has revolutionised the whole communication process (Dishant Jojit James, 2017), still there is a problem with the internet connectivity at farmers field and little or no awareness of usage of internet, KCC is one of the best ICT solutions to access the required information but the sophisticated scale to measure attitude was lacking, therefore an attempt is made to develop a scale comprising of five dimensions and 22 Statements were developed with the following objectives

1. To develop and standardize a scale to measure the attitude of the farmers towards Kisan Call Centre advisory services

2. To measure the attitude of the farmers towards Kisan Call Centre advisory services

METHODOLOGY

The present study was carried out during 2021-22 to develop and standardize a scale to measure the attitude of the farmers towards Kisan Call Centre advisories. The data was collected from the beneficiaries of KCC services in Bangalore rural District of Karnataka. A total of 32 KCC beneficiaries were selected randomly and interviewed personally.

Ex-post facto research design was adopted, as the researcher had no direct control over independent variables, because their manifestation has already occurred or because they are inherently not amenable to manipulation and inferences about relationship among variables are made without direct intervention, from associated influence of independent variables on dependent variables (Kerlinger, 1966). The collected data was analysed based on the cumulated score, the respondents were categorized as least favourable, favourable and most favourable attitude by considering mean and half standard deviation as a measure of check.

RESULTS AND DISCUSSION

Development of Scale to Measure the Attitude of the Farmers towards KCC Advisories

Attitude towards Kisan Call Centre is operationally defined as the positive or negative feelings / thoughts that the farmers have developed towards the performance and services of KCC. The method of summated rating scale suggested by Likert, 1932 and Edwards, 1969 was followed in the development of the scale following six stages *viz.,* identification of components, collection of items / statements, relevancy test, item analysis, reliability and validity.

Identification of Dimensions

Services, feedback, crop protection, marketing and weather were the five major dimensions identified related to the Attitude of the Farmers towards KCC advisories based on a review of literature and in discussion with experts in the field of agricultural extension.

Collection and Editing of Items

A tentative list of 65 items pertaining to the attitude of the farmers were distributed under identified five dimensions. The items developed were edited as per the 14 criteria enunciated by Edwards (1969) and Thurstone and Chave (1929). As a consequence, 09 statements were eliminated and the remaining 56 statements were included for obtaining the judge's opinion.

Relevancy Analysis

The proforma containing 56 items under the five dimensions were sent to 110 judges by means of google forms and handed over personally in the field of Agricultural Extension and Economics to critically evaluate the relevancy of each item on five-point continuum *viz.* Most Relevant (MR), Relevant (R), Somewhat Relevant (SWR), Less Relevant (LR) and Not Relevant (NR) and the responses were assigned the score of 5,4,3,2,1, respectively. The judges were also requested to make necessary modifications and additions or deletion of statements if they desire to do so. Out of 110, 52 judges returned the questionnaire duly completed and were considered for further processing. From the data gathered, 'Relevancy Percentage' 'Relevancy Weightage' and 'Mean Relevancy Score' were worked out for all the 56 statements. Using the said criteria, individual statements were screened for relevancy using the following formulae.

$$\text{Relevancy Weightage of } i^{th} \text{ indicator } (RW_i) = \frac{(MRx5)+(Rx4)+(SWRx3)+(LRx2)+(NRx1)}{\text{Maximum possible score}}$$

$$\text{Relevancy Percentage of } i^{th} \text{ indicator (RP}_i) = \frac{(MRx5)+(Rx4)+(SWRx3)+(LRx2)+(NRx1)}{\text{Maximum possible score}} \times 100$$

$$\text{Mean Relevancy Score of } i^{th} \text{ indicator (MRS}_i) = \frac{(MRx5)+(Rx4)+(SWRx3)+(LRx2)+(NRx1)}{\text{Number of judges respondent}}$$

Individual items were screened based on these three calculated values. Accordingly, items having relevancy weightage of more than 0.80 *i.e.* relevancy percentage of more than 80 per cent and mean relevancy score with more than or equal to 4 (Table 1) were included for further analysis, from 56 statements a total of 26 were retained and considered for item analysis.

Item Analysis

For item analysis, thirty-two farmers were selected from the non-sample area *i.e.,* Bangalore rural District and the respondents were asked to indicate their response in each of the items in their respective scoring pattern. Based on the total scores obtained, the respondents were arranged in descending order. The top 25 per cent of the respondents with their total scores were considered as high group and the bottom 25 per cent as low group. These two groups provide criterion groups in terms of evaluating the individual statements suggested by Edwards (1969). 't' value was calculated for each of the statement using the following formula given below :

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

Where,

X_H = The mean score on given statement of the high group

X_L = The mean score on given statement of the low group

$\sum X^2_H$ = Sum of squares of the individual score on a given statement for high group

$\sum X^2_L$ = Sum of squares of the individual score on a given statement for low group

n = Number of respondents in each group

Σ = Summation

t = The extent to which a given statement differentiates between the high and low groups.

After computing the 't' value for all the 26 statements, and only those with 't' value equal and greater than 1.69 (Table 2) were finally selected for inclusion in the final scale. Wherein, out of 26 statements 22 items were significant at 5 per cent.

Standardization of the Scale

Reliability of the Scale

The split-half method was employed to test the reliability of the scale. The value of correlation coefficient was 0.5518 and this was further corrected by using Spearman Brown formula (1910) to obtain the reliability coefficient of the whole set. The 'r' value of the scale was 0.616, which was found significant at one per cent level indicating the high reliability of the scale. It was concluded that, the scale constructed was reliable.

a) Half test reliability formula

$$r_{1/2} = \frac{N(\Sigma XY) - (\Sigma X)(\Sigma Y)}{\sqrt{(N\Sigma X^2 - (\Sigma X)^2)(N\Sigma Y^2 - \Sigma Y)^2)}}$$

Where,

ΣX = Sum of the scores of the odd number items

ΣY = Sum of the scores of the even number items

ΣX^2 = Sum of the squares of the odd number items

ΣY^2 = Sum of the squares of the even number items

b) Whole test reliability formula

$$r_{11} = \frac{2 \times r1/2}{1 + r1/2}$$

Where, $r_{1/2}$ = Half test reliability

Validity

The data was subjected to statistical validity, which was found to be 0.7723 for scale which is greater

TABLE 1

Selected statements based on the relevancy percentage, relevancy weightage and mean relevancy

(n- 52)

Statements	RP	RW	MRS
Services			
KCC provides advisories on various aspects of agricultural and allied sectors	88.846	0.888	4.442
Awareness programmes on KCC organized to encourage farmers to avail the services	87.308	0.873	4.365
KCC does not create awareness of schemes in relation to the Agriculture and allied sectors (-ve)	83.846	0.838	4.192
Farmers get their queries solved faster through KCC	83.846	0.838	4.192
KCC has helped farmers in improving their economic conditions by its advisory services	85.000	0.850	4.250
Feedback			
Farmers need not to be educated to avail the benefits of KCC advisories	82.02	0.82	4.201
The queries made by farmers are responded by KCC officials are friendly and cordial	82.256	0.822	4.2827
Farmers feedback is fast in KCC than other conventional methods	80.385	0.804	4.019
KCC has impacted significantly on the economic conditions of the farmers	80.769	0.808	4.038
Awareness among the farmers need to be created to avail the benefits of Agro-advisory services of KCC	86.538	0.865	4.827
KCC does not provides up-to-date and suitable information for the queries (-ve)	82.692	0.827	4.635
Crop management			
The advises given by KCC are practical and motivate farmers to adopt them in the farm situation	86.538	0.865	4.327
KCC advisories have helped farmers to take proper plant protection measures	85.385	0.854	4.269
Faces difficulties in connecting to KCC and in explaining the symptoms of diseases over phone call	84.615	0.846	4.231
KCC provides a solution without analysing the symptoms thoroughly (-ve)	83.462	0.835	4.173
KCC is a boon to the farmers in improving the yield of the crops	80.385	0.804	4.019
Marketing			
KCC provides market information at the right time	81.154	0.812	4.058
KCC advisories help to know the daily market prices for various commodities	81.154	0.812	4.058
Market information given by KCC are based on the proper analysis of supply and demand	80.385	0.804	4.019
KCCs are helping farmers in connecting to the regulated markets	80.000	0.800	4.000
The farmers can rely on KCC for marketing related information	84.231	0.842	4.212
Weather			
KCC does not predicts and forecasts the weather conditions well in advance (-ve)	84.538	0.842	4.27
KCC offers the solutions based on the weather conditions	80.000	0.800	4.000
KCC weather advisories saved my crops and yield despite the adverse conditions	80.769	0.808	4.038
Contingency crops advised by KCC have helped to get income despite of failure of main crop due to adverse climatic conditions	81.154	0.812	4.558
The advice given by KCC on weather are not based on the scientific analysis	88.846	0.888	4.442

TABLE 2

Selection of statements based on the 't' value for the final scale

(n- 32)

Statements	Mean	T value
Services		
KCC provides advisories on various aspects of agricultural and allied sectors	4.625	5.163
Awareness programmes on KCC organized to encourage farmers to avail the services	3.851	0.917*
KCC does not create awareness of schemes in relation to the Agriculture and allied sectors (-ve)	4.500	2.558
Farmers get their queries solved faster through KCC	4.375	1.714
KCC has helped farmers in improving their economic conditions by its advisory services	4.125	1.906
Feedback		
Farmers need not to be educated to avail the benefits of KCC advisories	4.224	2.468
The queries made by farmers are responded by KCC officials are friendly and cordial	4.412	3.125
Farmers feedback is fast in KCC than other conventional methods	4.375	2.887
KCC has impacted significantly on the economic conditions of the farmers	4.015	1.562*
Awareness among the farmers need to be created to avail the benefits of Agro-advisory services of KCC	4.625	3.661
KCC does not provides up-to-date and suitable information for the queries (-ve)	4.375	3.098
Crop management		
The advisories given by KCC are practical and motivate farmers to adopt them in the farm situation	4.251	3.023
KCC advisories have helped farmers to take proper plant protection measures	4.262	3.026
Faces difficulties in connecting to KCC and in explaining the symptoms of diseases over phone call	4.871	3.512
KCC provides a solution without analyzing the symptoms thoroughly (-ve)	4.375	3.556
KCC is a boon to the farmers in improving the yield of the crops	4.625	3.336
Marketing		
KCC provides market information at the right time	3.912	0.642*
KCC advisories help to know the daily market prices for various commodities	4.750	3.244
Market information given by KCC are based on the proper analysis of supply and demand	4.625	3.336
KCCs are helping farmers in connecting to the regulated markets	4.875	5.035
The farmers can rely on KCC for marketing related information	4.375	2.562
Weather		
KCC does not predicts and forecasts the weather conditions well in advance (-ve)	4.375	2.873
KCC offers the solutions based on the weather conditions	4.421	3.032
KCC weather advisories saved my crops and yield despite the adverse conditions	4.125	1.835
Contingency crops advised by KCC have helped to get income despite of failure of main crop due to adverse climatic conditions	4.500	3.335
The advice given by KCC on weather are not based on the scientific analysis	3.912	1.254*

*Statements which is having a 't' value less than 1.69 were eliminated

TABLE 3

New scale to measure the attitude of the farmers towards kisan call centre advisory services

Statements	SA	A	UD	DA	SDA
Services					
Farmers get their queries solved faster through KCC					
KCC does not creates awareness on schemes about the Agriculture and allied sectors *					
KCC provides advisories on various aspects of agriculture and allied sector.					
KCC has helped farmers in improving their economic conditions by its advisory services					
Feedback					
Farmers feedback is fast in KCC than other conventional methods					
The queries made by farmers are responded to by KCC officials are friendly and cordial					
Farmers need not be educated to avail the benefits of KCC advisories					
Awareness among the farmers need to be created to avail the benefits of agro-advisory services of KCC					
KCC does not provide up-to-date and suitable information for the queries *					
Crop management					
The advisories given by KCC are practical and motivate farmers to adopt them in the farm situation					
KCC advisories have helped to take proper plant protection measures					
Face difficulties in connecting the call to KCC and in explaining the symptoms of diseases over phone call					
KCC provides a solution without analyzing the symptoms thoroughly *					
KCC is a boon to the farmers in improving the yield of the crops					
Marketing					
KCC advisories help to know the daily prices for commodities in various markets.					
Market information given by KCC is not based on the proper analysis of supply and demand *					
KCCs are helping farmers in connecting to the regulated markets					
The farmers cannot rely on KCC for marketing related information *					
Weather					
KCC weather advisories have helped my crops and yield despite the adverse conditions					
KCC does not predicts and forecasts the weather conditions well in advance *					
KCC offers the solutions based on the weather conditions					
Contingency crops advised by KCC have helped to get income despite of failure of the main crop due to adverse climatic conditions					

*- Negative statements; SA-Strongly Agree, A-Agree, UD-Undecided, DA- Disagree, SDA- Strongly Disagree

than the standard requirement of 0.70. Hence, the validity coefficient was also found to be appropriate and suitable for the tool developed. Thus, the scale was developed to analyse the Attitude of farmers on Kisan Call Centre advisory services.

$$\text{Validity} = \sqrt{r_{11}}$$

Administration of the Scale

The final scale (Table 3) consists of 22 (16 positive and Six negative) statements for determining the attitude of farmers on Kisan Call Centre advisory services. The response was collected on a five-point continuum, *viz.,* Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree with an assigned score of 5,4,3,2 and 1 for positive statements and reverse scoring for negative statements respectively.

Attitude of Farmers towards KCC Advisories

The attitude scale developed was administered to 32 farmers (users of KCC services) in Bengaluru Rural District during 2021-22. The Table 4 revealed that, nearly half (43.75) of farmers had favourable attitude towards KCC advisory services followed by 31.25 per cent of the farmers had least favourable and one fourth (25.00%) of the respondents had most favourable attitude towards KCC advisories. This implies considerable number of users of KCC have favourable attitude and KCC is serving the farming community. These findings are in the line with the findings of Parmar *et al.* (2015) Koshy & Kumar (2016), Srikanth (2016) and Suresh & Shivamurthy (2017)

The attitude scale developed is found to be reliable and valid. Hence, it can be used in the future by the researchers conducting research on KCC to

analyse the attitude of farmers towards Kisan Call Centre advisories. The results of the study revealed that less than half (43.75 %) of farmers had favourable attitude towards KCC advisory services. Thus, it can be concluded that, the scale developed could be useful to analyse the attitude of the farmers towards KCC advisory services overtly.

REFERENCES

JAMES, D. J. AND LAKSHMINARAYAN, M. T., 2017, Attitude of agricultural extension functionaries towards information and communication technology tools. *Mysore J. Agric. Sci.*, **51** (4) : 872 - 876.

EDWARDS, A. L., 1969, Techniques of attitude scale construction. VIkils, Feger and Simons Pvt. Ltd., 9, Sport Road, Ballard Estate, Bombay.

KERLINGER, F. N., 1986, Foundation of behavioural research. *S. S. Chandra publishers,* Delhi, 151 - 153.

KOSHY, S. M. AND KUMAR, N. K., 2016, Attitude of farmers towards Kisan Call Centres. *Journal of Extension Education*, **28** (4) : 5753 - 5759.

LIKERT, R. A., 1932, A technique for the analysement of attitudes. *Archives of Psychology,* New York, pp. : 140.

PARMAR, V. S., SHARMA, O. P., BHUVA, R. M. AND PATEL, A. I., 2015, Relationship between personal and socio-economic characteristics of farmers and their attitude towards the use of Kisan Call Centre. *Trends in Biosciences,* **8** (3) : 693 - 694.

SURESH, D. K. AND SHIVAMURTHY, M., 2017, Development of a scale to measure the attitude of farmers towards carbon sequestration technologies and its application in rice and sugarcane based farming system. *Part I-research Papers*, **51** (2) : 315 - 320.

SRIKANTH CHOWADRY, L. V., 2016, Impact of kisan call centre (KCC) Services in Kolar district. *M.Sc. (Agri.), Thesis*, (Unpub.), University of Agricultural Sciences, Bangalore.

TABLE 4

Overall attitude of the farmers about KCC advisories

(n-32)

Category	Frequency	Per cent
Least favorable	10	31.25
Favorable	14	43.75
Most favorable	8	25.00