



# Development of a Scale to Analyse the Perception of Krishi Vigyan Kendra Scientists Regarding Social media for Agricultural Development

Dishant Jojit James<sup>1\*</sup>, M.Shivamurthy<sup>1</sup>, M.T.Lakshminarayan<sup>2</sup> and S.Ganesamoorthi<sup>1</sup>

<sup>1</sup>Department of Agricultural Extension, University of Agricultural Sciences (UAS), Bangalore, India.  
dishantjj@gmail.com, murudaiah.shivamurthy@gmail.com, aex201@gmail.com

<sup>3</sup>University Examination Centre, UAS, Bangalore, India. mtlnextn@gmail.com

**Abstract:** An attempt is made in the present study to develop a standardized scale to analyze the perception of scientists working in Krishi Vigyan Kendras (KVKs) also known as Farm Science Centers in India, regarding social media for agricultural development. The developed perception scale was found to be highly reliable and valid. The perception scale consisted of 49 statements classified under eight components. The developed perception scale was administered to 32 KVK scientists working in five districts of Kerala state during 2019-20. It was found that more than three-fourth (78.13%) of the KVK scientists were having good to better perception regarding the social media.

**Index Terms:** KVK scientists, Perception, Reliability, Social media, Validity

## I. INTRODUCTION

Social media are electronic communication tools that allow users to interact, create, share, retrieve and exchange information or ideas in any form that can be discussed upon, archived and used by virtual communities and networks (Aliyu and Safiul, 2017). It is the most recent form of digital communication which, on a global scale has become a revolution. Social media is becoming a very important tool in farming because it has the ability to connect with farmers and agribusiness people from around the world over large geographical distances. Social media plays a very important role in enhancing interactions and information flows among different actors involved in agricultural innovation and also enhance capacities of agricultural extension and advisory service providers. Rural agricultural workers have begun to use social media to fight the feeling of isolation which may have risen due to the nature of their work. Initially, there was a doubt about its use within the agriculture industry regarding how it would link to running a rural business. But usage of smartphone by the rural population

must have strengthened the feeling that it can be a good tool for the information dissemination.

Farmers, researchers, enthusiasts and professionals have taken up Facebook and Twitter to share their views, experiences and ideas through various communities in Facebook and trending topics in Twitter. It is said that pictures speaks a thousand words and if so, videos must tell stories and that is what different agricultural organizations are doing through YouTube to help out everyone related to agriculture (Saravanan and Suchiradipta, 2013). The so-called social media are based on Web 2.0 technologies. It encapsulates a broad range of web-related communication technologies like wikis, blogs, virtual worlds and social networking, and other social media forms. These various characteristics of social media can be precised by the 5 C's: communication, collaboration, community, creativity, and convergence (Lokesh and Harpreet, 2015).

The benefits of social media can be perceived differently by different people. When it comes to agricultural development, scientists of Krishi Vigyan Kendras (Farm Science Centers in India) may or may not have a good perception regarding the social media. Their perception level may vary according to their experience of working in their respective organizations. Hence, the present study is taken up with the following specific objectives:

1. To develop and standardize a scale to analyze the perception of Krishi Vigyan Kendra scientists regarding social media for agricultural development
2. To analyze the perception of KVK scientists regarding social media for agricultural development.

## II. METHODOLOGY

The present study was carried out during 2019-20 for developing a standardized scale to analyse the perception of Krishi Vigyan Kendra scientists regarding social media for

agricultural development. The developed scale was used to analyze the perception of KVK scientists regarding social media for agricultural development in five districts of Kerala state. Thirty two KVK scientists working in Idukki, Thrissur, Ernakulam, Kozhikode and Wayanad districts of Kerala state were interviewed. Based on the cumulated score, the respondents were categorized as poor, good and better levels of perception considering mean and half standard deviation as a measure of check.

### III. RESULTS AND DISCUSSION

#### A. Development of scale to analyse the perception of KVK scientists regarding social media for agricultural development

Perception regarding social media for agricultural development is operationally defined as the 'clear understanding of the usefulness of social media for agricultural development, by scientists working in Krishi Vigyan Kendras'. The method of summated rating scale suggested by (Likert, 1932) and (Edwards, 1969) were 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 (Naveen *et al.*, 2018).

##### 1) Identification of components

Eight components related to perception regarding social media were identified based on review of literature and discussion with social scientists. The identified eight components are: (1) social media for knowledge and skill development, (2) social media for mobilizing farmers, (3) social media for inclusion and accessibility, (4) social media for professionalism, (5) social media for outreach, (6) social media for effectiveness, (7) social media for communication, and (8) drawbacks/ limitations of social media.

##### 2) Collection of items/ statements

The first step in the construction of perception scale was to collect statements pertaining to the perception of KVK scientists regarding social media for agricultural development. A tentative list of 104 statements pertaining to the perception of KVK scientists regarding social media for agricultural development were collected through extensive review of literature and by consulting social scientists.

##### 3) Editing of the items

These 104 statements were edited as per the 14 criteria enunciated by Edwards (1969) and Thurstone and Chave (1929). As a consequence, 26 statements were eliminated. The remaining 78 perception statements were included for the study.

##### 4) Relevancy test

Seventy eight statements were sent to 90 experts in the field of social sciences working in State Agricultural Universities, Indian Council of Agricultural Research Institutes and Development departments, to critically evaluate the relevancy of each statement viz. Most Relevant (MR),

Relevant (R), Somewhat Relevant (SWR), Less Relevant (LR) and Not Relevant (NR) with the score of 5,4,3,2 and 1, respectively. The judges were also requested to make necessary modifications and additions or deletion of statements, if they desired to. A total of 61 judges returned the questionnaires duly completed and these were considered for further processing. From the data gathered, 'relevancy percentage' and mean relevancy score' were worked out for all the 78 statements. Using these criteria, individual statements were screened for relevancies using the following formulae.

##### a) Relevancy Percentage (RP)

It was obtained by using the following formula.

$$R.P. = \frac{MR \times 5 + R \times 4 + SWR \times 3 + LR \times 2 + NR \times 1}{\text{Maximum possible score}} \times 100$$

##### b) Mean Relevancy Score (MRS)

It was worked out using the following formula

$$M.R.S. = \frac{MR \times 5 + R \times 4 + SWR \times 3 + LR \times 2 + NR \times 1}{\text{No. of judges responded}}$$

Accordingly, statements having 'relevancy percentage' of 75 per cent and above and mean relevancy score of 3.75 and above were considered for final selection. Accordingly, 59 perception statements were retained after relevancy test and these statements were suitably modified and written as per the comments of the judges wherever applicable.

##### 5) Item analysis

Fifty nine statements were subjected to item analysis to delineate the items based on the extent to which they can differentiate the respondent having better perception from the respondent with poor perception regarding social media for agricultural development. A sample of 32 KVK scientists working in Idukki, Thrissur, Ernakulam, Kozhikode and Wayanad districts of Kerala state were chosen for the study. The respondents were asked to indicate their degree of agreement or disagreement with each statement on a five-point continuum ranging from 'strongly agree' to 'strongly disagree'. Based upon the total scores, the respondents were arranged in descending order. The top 25 per cent of the respondents with their total scores were considered as the high group and the bottom 25 per cent as the low group. These two groups provided criterion groups in terms of evaluating the individual statements. Thus, out of 32 KVK scientists to whom the items were administered for item analysis, eight scientists with highest and eight scientists with lowest scores were used as criterion groups to evaluate individual items. The critical ratio, that is, the 't' value which analyses the extent to which a given statement differentiates between the better and poor groups of respondents for each statement, was calculated by using the following formula:

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

Where,

$\bar{X}_H$  = The mean score on given statement of the high group  
 $\bar{X}_L$  = 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  
 t = The extent to which a given statement differentiates between the high and low groups.

After computing the 't' value for all the 59 items, forty nine perception statements with 't' value equal to or greater than 1.67 were finally selected and included in the final perception scale.

6) Reliability

Reliability refers to precision of the scale constructed for any purpose. A reliability test will be reliable when it gives the same repeated result under the same conditions. In any social science research, a newly constructed scale has to be tested for its reliability before it is used. The split-half method was employed to test the reliability of the perception scale. The value of correlation coefficient was 0.701 and this was further corrected by using Spearman Brown formula to obtain the reliability coefficient of the whole set. The 'r' value of the scale was 0.824, which was significant at one per cent level indicating the high reliability of the scale. It was concluded that the perception scale constructed was reliable.

a) Half test reliability formula

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

Where,

- $\sum X$  = Sum of the scores of the odd number items
- $\sum Y$  = Sum of the scores of the even number items
- $\sum X^2$  = Sum of the squares of the odd number items
- $\sum Y^2$  = Sum of the squares of the even number items

b) Whole test reliability formula

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

Where,

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

7) Validity

It refers to how well a scale analyses what it is purported to measure. The data was subjected to statistical validity, which was found to be 0.9077 for scale which is greater 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 developed scale to analyze perception of KVK scientists regarding social media for agricultural development was feasible and appropriate.

8) Administration of perception scale and method of scoring

The final scale consists of 49 statements (Table I) for determining the perception of KVK Scientists. The response was collected on a five-point continuum, namely, strongly agree, agree, undecided, disagree and strongly disagree with assigned score of 5,4,3,2 and 1, respectively. The perception score of a respondent was calculated by adding up the scores obtained by

him/her on all items/statements. The perception score of this scale ranges from a minimum of 49 to a maximum of 245. Based on the mean (159.28) and half standard deviation (11.90), the respondents were categorized into three perception categories, viz., poor, good and better. Higher score on this scale indicates that the respondent has better perception regarding social media for agricultural development.

Table I. Scale to analyze the perception of KVK scientists regarding social media for agricultural development

Sl. No.	Perception statement	SA	A	UD	DA	SD
<b>I.</b>	<b>Social media for knowledge and skill development</b>					
1.	Social media is a useful tool for learning about new agricultural information.					
2.	Information by scientific fraternity on social media helps farmers have a better understanding about agriculture.					
3.	Social media gives opportunities for agricultural scientists to create content in order to promote learning among farmers.					
4.	Scientists can get timely information about many conferences, workshops and new publications using social media.					
5.	New business opportunities can be discovered by farmers while using social media.					
6.	Social media gives the farmers an opportunity to learn from the experiences of their counterparts worldwide.					
7.	Social media are good platforms to portray the indigenous knowledge of farmers and bring more ITKs to the limelight.					
<b>II.</b>	<b>Social media for mobilising farmers</b>					
8.	Social media are handy to indicate precise location of farmer's field, thus saving time.					
9.	Farmers can use social media to improve their income from farms and other rural businesses.					
10.	Social media can provide information to farmers about various traders and prices offered by them.					
11.	Processing firms can be contacted via social media, by which shelf-life and price of agricultural produce can be increased.					
12.	Finance options for agricultural activities can be made available with the help of social media, by scientists.					
13.	Social media makes it certain that farmers can improve their timing of getting crops to the market.					
<b>III.</b>	<b>Social media for inclusion and accessibility</b>					
14.	Farmers can freely express their problems and felt needs on social media.					
15.	Social media can bring together a collective voice and attract policy makers' attention to the issue being posted.					
16.	Social media gives a chance to farmers to become active stakeholders of development					

	efforts.					
17.	Farmers can gain easy access to specific sources of information via social media.					
18.	Social media has been useful in finding new markets for perishable crops like fruits and vegetables.					
19.	Farmers on social media can come together and help each other in forming cooperative societies.					
<b>IV. Social media for professionalism</b>						
20.	It is more encouraging to work with a colleague who uses social media for agricultural development than with one who doesn't.					
21.	The use of social media increases an agricultural scientist's professional competence.					
22.	Posts from co-farmers regarding their produce instils a competitive spirit in farmers to perform better.					
23.	It is necessary for scientists to be technologically skilful to use social media.					
24.	Scientists have to be actively involved in social media in order to influence farmers positively.					
25.	Social media helps farmers to fine-tune their production strategies to match the speedy rates of change in consumer demand.					
<b>V. Social media for outreach</b>						
26.	With the help of social media, it is possible to increase the accessibility of KVK scientists to more farmers.					
27.	Social media helps extension workers in gaining first-hand experience of the living condition of the farmer and farmer's family.					
28.	Social media is an effective tool to bring together all the stakeholders of Agricultural Knowledge Information System.					
29.	Social media increases the online visibility of extension websites, for quicker information dissemination.					
30.	Social media fosters communication and collaboration between scientists regardless of their geographical location.					
31.	Social media provides easy avenues to the scientists for regularly reaching audiences related to agriculture.					
<b>VI. Social media for effectiveness</b>						
32.	Farmers heed more to the messages that the scientists post on social media compared to other media.					
33.	Social media provides farmers the facility of direct, instant communication with consumers, by avoiding middlemen.					
34.	Social media lacks in verified and authentic					

	scientific information on agriculture to intervene with farmers.					
35.	The voice notes, photos, videos and text messages that can be shared via social media have made modern extension effectual.					
36.	Social media can be used to better analyse the real-time situation of a farmer's field in an effective manner.					
37.	Suppliers can use social media to conduct real-time market research and identify consumer preferences.					
<b>VII. Social media for communication</b>						
	For agricultural scientists, communication has become hassle-free, as managing contacts have become easier with social media.					
38.	Professional communication via social media is more popular among scientists when compared to informal communication.					
39.	Social media strengthens up connections between scientists in the virtual space when compared to connections within the academic circle.					
40.	Dissemination of knowledge is faster through social media than traditional mass media channels of extension communication.					
41.	Less literate farmers can also interact with agricultural scientists via social media.					
42.	Social media helps scientists in obtaining larger feedback from the farmers.					
43.						
<b>VIII Drawbacks/ limitations of Social media</b>						
44.	Knowledge transferred through social media is valued less by farmers than personal communication.					
45.	Negative comments and instant critical feedback received in social media demotivates the agricultural scientist.					
46.	Social media is not a silver bullet and should be combined with traditional communication methods for effective transfer of technology.					
47.	In rural areas, where internet connectivity is very poor, social media is not a good solution for transferring technology.					
48.	Encouraging participation of farmers in social media interactions and ensuring their continuous engagement is a tough task.					
49.	The large number of responses on social media causes tiredness and stress					

SA-Strongly Agree, A-Agree, UD-Undecided, D-Disagree, SD-Strongly Disagree

*B. Perception of KVK scientists regarding social media for agricultural development*

The perception scale developed was administered to 32 KVK scientists in five districts of Kerala state during 2019-20. The results revealed that 78.13 per cent of KVK scientists had good to better perception and 21.87 per cent of scientists had poor perception regarding social media (Table II). In agricultural

sector, social media can be used for technology demonstration, weather forecasting, management of soil and water, informing about new varieties and their features, pest and disease management, crop cultivation techniques, fertilizer application, preservation and processing, management of food storage, transportation and marketing (Lokesh and Harpreet, 2015). An organization like KVK can obtain the advantages of social media and enhance their presence among farming community, obtain feedback from farmers, make easy demonstration of technology, stay in touch with the farming community around the clock and address common problems effectively. These are the major reasons for a majority (78.13%) of the KVK scientists belonging to good to better perception regarding social media for agriculture development.

Table II. Perception of KVK scientists regarding social media for agricultural development

(n=32)

Sl. No.	Perception categories	KVK Scientists	
		Number	Per cent
1.	Poor (<147.38 score)	7	21.87
2.	Good ( 147.38 to 171.18 score )	10	31.25
3.	Better (>171.18 score )	15	46.88
Total		32	100.00

#### CONCLUSION

The perception scale developed is found to be reliable and valid; hence it can be used to analyze the perception of scientists regarding social media for agricultural development. The results of the study revealed that majority (78.13%) of scientists had good to better perception regarding social media for agricultural development. It can be concluded that the scale developed could be useful in explicitly analyzing the perception of scientists regarding social media for agricultural development.

#### REFERENCES

- Aliyu Akilu Barau & Safiul Islam Afrad. (2017). An overview of social media use in agricultural extension service delivery. *Journal of Agricultural Informatics*, 8(3), 50-61.
- Edwards, A.L. (1969). *Techniques of attitude scale construction*. Vikils, Feger and Simons Pvt. Ltd., 9, Sport Road, Ballard Estate, Bombay.
- Likert, R.A. (1932). A technique for the analysement of attitudes. *Archives of Psychology*, New York, pp. 140.
- Lokesh Jain & Harpreet Kaur. (2015). Social media using mobiles – a boon for the agricultural extension workers: a generic concept. *International Journal of Agricultural Science and Research*, 5(5), 295-304.
- Naveen Kumar, P., Narasimha, N., & Lakshminarayan, M.T. (2018). Development of a scale to analyse the well-being of farmers in Kolar district of Karnataka. *Journal of Scientific Research and Reports*, 19(2), 1-7.
- Saravanan, R., & Suchiradipta Bhattacharjee. (2013). Mobile Phone and Social Media for Agricultural Extension: Getting Closer to Hype & Hope? *International Conference on*

Extension Educational Strategies for Sustainable Agricultural Development: A Global Perspective, UAS, Bangalore, pp. 140-148.

Thurstone, L.L., & Chave, E.J. (1929). *The analysement of attitude*. Chicago University Press, USA, pp. 39-40.

\*\*\*