Full Length Research Article

© 2025, Centre for Advanced Research in Agricultural Sciences
Research Journal of Agricultural Sciences
Volume 16; Issue 04 (Jul–Aug 2025); pp 427–431

ISSN: 0976-1675 (P)
ISSN: 2249-4538 (E)

A Test Developed to Measure the Knowledge Level of Farmers about Market-Led Extension

Alekya B. M[1], Sahana S[2] and Ganesh Prasad T. S*[3]

[1] Research Scholar, Department of Agricultural Extension Education, College of Agriculture, Shivamogga, Karnataka, India
[2] Professor and Head, Department of Agricultural Extension Education, College of Agricultural Sciences, KSNUAHS, Iruvakki, Shivamogga, Karnataka, India
[3] Assistant Professor, Department of NRM, College of Forestry, Ponnampet, Karnataka, India

Received: 13 July 2025; Revised accepted: 02 Sept 2025

Abstract

A market-led extension acts as a tool for delivery of adequate and quality information to farmers for making effective decisions for delivery of adequate issues in order to realize an optimum return over their investment on production and marketing as a tool. The study attempted to develop a test for measuring the knowledge level of farmers about Market-led extension. Relevant items/statements were gathered that covered all aspects of farmers market-led practices. Initially, 122 items were selected for this study and administered to experts for their relevancy rating. Based on item analysis the selected statements were administered to 40 farmers in non-sample area in Davengere district of Karnataka state. Finally, a total of 35 statements were selected for the study based on 'r' values (> 0.97) they were included in the final test. The 'r' value of the test was found to be 0.97, which was significant at five per cent level indicating the high reliability. The test developed was found to be reliable and valid, hence it is recommended to use the test for measuring the knowledge level of farmers about Market-led extension.

***Key words*:** Market-led extension, Knowledge, Items, Reliability, Validity

India's agricultural extension system is at a pivotal point in its development. Agricultural system towards increases in productivity cum profit maximization through the new trend of extension services [1]. According to world trade organization, the globalization of market demands farmers to transform themselves in all levels from production and selling in the domestic market to producer cum seller in the wider market scene to realize the optimum returns over their investments [2]. Profit-oriented business [3]. FAO estimates major losses is due to lack of post-harvest operation among others The need for market-led is of necessity by the paradigm shift of present agriculture scenarios which calls for a conversion of the sector into. Existence of many middlemen has also resulted into less return on farmer's investment as well as high cost paid by the consumer [4-5]. However, this loss can be minimized by the Market Led extension approach through adequate supply of information, direct marketing, and by establishing market and agro-processing linkages and post-harvest operation such as proper handling, grading, standardizing, value addition, packaging. capacity building in terms of improved production as well as storage and transport system.

Market led extension practices and make the farmers to realize better prices to their farm produce [6]. The market-led extension will assist the farmers in solving the problems from planning the production. till the produce reaches consumer. It is of utmost importance for the farmers to have knowledge about these practices. Keeping this in view, an attempt and ultimate use of them made to develop test to measure the knowledge level of farmers about market-led extension play a major role in building the capacity of the farmers to meet the emerging challenges in various level of farming. To develop the test to measure the knowledge level of farmers about market-led extension.

MATERIALS AND METHODS

The development of scale fallows Likert method of summated rating [7] steps developing the desired scale followed in developing the desired scale. A summated rating scale is a set of knowledge statements, all of which are considered of approximately equal value and to each of which statements were subjects to respond with degrees of agreement or disagreement [8]. This method was adopted for the statements, all of which are considered of approximately present study, because the use of single statement to represent a concept whole is avoided in scale development and instead several statements as indicators, all representing different facets of the concept to obtain a more well-rounded perspective can be used and presented below:

Identification of components and statements for knowledge test

Based on an exhaustive review of literature as well as consultation with specialists / scientists from concerned fields five components of market led extension practices were

***Correspondence to:** Ganesh Prasad T. S, E-mail: tsgp7010@gmail.com; Tel: +98803 64748

Citation: Alekya BM, Sahana S, Ganesh Prasad TS. 2025. A test developed to measure the knowledge level of farmers about market-led extension. *Res. Jr. Agril. Sci.* 16(4): 427-431.

identified namely, production practices, role of institution in dissemination of market information, price information, logistics and post-harvest management, trade practices, consumers preference. For measuring the knowledge of farmers about market-led extension the items were enlisted under different components like, under production practices 16 items were listed, 28 items under role of institution in dissemination of market information, 17 items under price information, 30 items under logistics and post-harvest management, 22 items under trade practices and 10 items under consumers preference were developed. Thus, total statements for the test were 122.

Relevancy weightage

All statements were then subjected to scrutiny by an expert panel of judges to determine the relevancy. List of items were sent to 300 judges from relevant field with vast experience for critical evaluation, out of 300 judges, 93 judges sent the responses for items in time further the scoring and analysis of the items was done. The responses were obtained on five-point continuum viz., 'most relevant (MR)', 'relevant (R)', 'somewhat relevant (SWR)', 'least relevant (LR)' and not relevant (NR)' with scores of 5, 4, 3, 2 and 1, respectively for positive statements and scoring was reversed for negative statements.

From the obtained responses Relevancy Percentage (RP), Relevancy Weightage (RW) and Mean relevancy score (MRS) were worked out for all the 122 items statements by using the following formulae:

Relevancy Precentage (RP)

$$= \frac{\text{MR} \times 5 + \text{R} \times 4 + \text{SWR} \times 3 + \text{LR} \times 2 + \text{NR} \times 1}{\text{Maximum possible score } (93 \times 5 = 465)} x100$$

Relevancy Weightage (RW)

$$= \frac{\text{MR} \times 5 + \text{R} \times 4 + \text{SWR} \times 3 + \text{LR} \times 2 + \text{NR} \times 1}{\text{Maximum possible score } (93 \times 5 = 465)}$$

Mean Relevancy Score (MRS)

$$= \frac{\text{MR} \times 5 + \text{R} \times 4 + \text{SWR} \times 3 + \text{LR} \times 2 + \text{NR} \times 1}{\text{Number of judge's respondent}}$$

The statements having relevancy percentage more than 75.00 per cent and relevancy weightage more than 0.75 and mean relevancy score more than 3.00 were considered for final selection of items. By following this process out of 122 items, 86 items were selected and rewritten as per the comments of the experts. Thus, finally 86 items were selected for further process.

Item analysis

After following criteria, final 86 items were selected then these items were subjected for item analysis [9-10] and administered to 40 respondents from non- sample area of Honnali taluk of Davengere district were pre tested. For conducting item analysis, 't-test' was used. Where, respondents were asked final items and indicated their knowledge level of based on statement on a Yes or No (two -point continuum) Scale. For each respondent maximum possible score for 86 statement is 86 and minimum score is 0. in an ascending order on the basis of total score earned by them. Further, based on these scores 25 per cent of respondents with highest total score. The score of respondents were arranged then arranged and 25 per cent with lowest total score were selected and these two groups formed the criterion groups for item analysis. The critical ratio (t) for each item was calculated by using the following formula:

$$t = \frac{\bar{x}_H - \bar{x}_L}{\sqrt{\left(\Sigma \bar{x}_H{}^2 \frac{\left(\Sigma \bar{x}_H\right)^2}{n}\right) X \left(\Sigma \bar{x}_L{}^2 \frac{\left(\Sigma \bar{x}_L\right)^2}{n}\right)}{n(n-1)}}$$

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

$\Sigma \bar{x}_H$ = Sum of squares of the individual score on a given statement for high group

$\Sigma \bar{x}_L$= Sum of squares of the individual score on a given statement for low group

n = Number of respondents in each group

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

The significance of difference between means of these two groups was found out by 't' test. The 't' value is the measure of extent to which given statement differentiates between high and low groups. The 't' value equal to or greater than 2.10 were selected. The thumb rule of rejecting items with 't' value less than 2.10 was followed as suggested by, Edward [11]. This indicated that the average response of high and low group differed significantly. Finally, the statements having 't' value equal or greater than 2.10 were selected (Table 1). By following this criterion finally, 35 items were selected. Further, these obtained statements were subjected to reliability and validity.

Table 1 Scale on measure knowledge of farmers about market-led extension 't' test

S. No.	Statements	t value
	I. Production dimension	
1.	One has to decide crop based on suitability of land	3.00
2.	Selection of suitable varieties based on market demand	2.82
3.	Fallowing market-based crop planning	4.43
4.	Demand assessment is essential for effective marketing	4.80
5.	Diversified cropping helps for complimentary marketing opportunities	3.16
	II. Role of institution in information dissemination	
1.	Nationwide marketing information is provided through AGMARKNET portal	4.10
2.	Kissan call center provides technical information around the clock	3.18
3.	m-Kisan portal provides information on marketing	3.74
5.	HOPCOMS provides information about consumers preference in market	4.08
6.	Intime Policy support is important for effective market led production.	3.72

7.	Minimum support price safeguards during crises	4.50
8.	Under Pradhan Mantri Fasal Bhima Yojana premium rate prescribed for annual horticultural crops is 5%	2.12
9.	Weather based crop insurance scheme helps to get minimum returns during climatic aberration.	4.47
	III. Price information	
1.	Information on market price is provided by:	
	a. APMC informants	
	b. m Kissan	
	c. Krishi Marata Vahini	4.24
	d. AGMARKNET portal	
2.	Up to date price information enables farmers improves bargaining power	4.02
3.	Price behaviour of market changed based on the seasons	4.38
4.	Price and market information facilitates spatial distribution of produce	2.73
	IV. Logistics and post-harvest management	
1.	Grading and standardization contribute to pricing efficiency	3.92
2.	Bulk transport at a time increases quantity and quality losses	5.56
3.	Value addition helps in extension of shelf life of the produce and fetch more price	4.83
4.	APMCS provides warehouse and credit for pledging the produce	3.67
5.	Pack house helps to maintain quality by reducing field heat	2.53
6.	Cold storage helps to sell produce during high market price	4.64
	V. Trade practice	
1.	Do you know about different type of collection points for the produce?	5.76
2.	Direct marketing enables	
	a. To know customers preference	
	b. To elimination middlemen	
	c. Efficient marketing of produce	4.11
	d. Fetches more profit	
3.	Organic farming helps in getting specialized produce and fetches higher price	3.67
4.	In Contract farming farmers are assured for buy back with predetermined prices	4.03
5.	Direction of trading helps to know the marketing route of the produce	2.51
6.	Traders and commission agent are licensed dealers	5.19
7.	Traders visit surplus collection points	4.02
8.	Marketing cost increases with middlemen involvement and reduces profit	5.60
	VI. Consumer preference	
1.	Consumer prefer more of value-added products	3.28
2.	Varity with high consumer preference helps in getting better profit	3.03
3.	Quality and appearance of produce attract consumer towards market	3.62
4.	Consumer demand is more when its available during off season	2.92
5.	Consumer prefer more of value-added products	3.28

Reliability and validity of scale

The scale developed was further standardized by establishing its reliability and validity. Reliability is the ability of a test instrument to yield consistent results from one set of measures to another. According to Kerlinger [12] reliability is the accuracy or precision of a measuring instrument. To know the reliability of the knowledge test split-half method was used.

a. Split-half method

The final 35 items were administered to the respondents of non-sample area by following Split half method. In this method total 35 items were divided into two halves by odd-even method by following criteria of odd numbered and even numbered items. The two halves were administered separately to 20 farmers in a non-sample area. The scores were subjected to product moment correlation test in order to find out the reliability of the half-test. The reliability coefficient of the test was computed using the Spearman-Brown prophecy formula given by Spearman [13] and Brown [14].

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

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

n = Number of respondents

Finally, whole reliability of the test obtained with correlation coefficient (r) of 0.97, which was significant at five per cent level indicating that test was having high reliability.

b. Content validity

In the present study the judge's opinion was sought to know the relevancy of the items. This justified the content validity of the scale the items were identified through the review of relevant literature and discussion with experts in the concerned field.

c. Construct validity

Then construct validity of an instrument means the extent to which a test measures the concept it was designed to evaluate [15]. Finally, the test developed for the study was administered to 40 farmers other than the respondents selected for the study. In other hand, higher the values of correlation coefficient justified construct validity of the scale hence test was having Spearman-Brown prophecy coefficient of 0.97 indicated that test was justified construct validity.

Administration and scoring of attitude scale

The final scale consisted of 25 statements (Table 2). The responses had to be recorded on a five-point continuum representing strongly agree, agree, undecided, disagree and strongly disagree with scores of 5, 4, 3, 2, and 1, respectively for positive statements and vice versa for negative statements. The attitude score on this scale ranges from a minimum of 25 to maximum of 125. The scale developed was found to be reliable and valid and administered. Ravi and Patil [16] also developed scale by using same procedure where a scale used to measure core competency of extension field functionaries in land resource inventory-based watersheds.

Table 2. Statements selected for inclusion in the final scale

S. No.	Statements	Yes \ No
	I. Production dimension	
1.	One has to decide crop based on suitability of land	
2.	Selection of suitable varieties based on market demand	
3.	Fallowing market-based crop planning	
4.	Demand assessment is essential for effective marketing	
5.	Diversified cropping helps for complimentary marketing opportunities	
	II. Role of institution in information dissemination	
1.	Nationwide marketing information is provided through AGMARKNET portal	
2.	Kissan call center provides technical information around the clock	
3.	m-Kisan portal provides information on marketing	
5.	HOPCOMS provides information about consumers preference in market	
6.	Intime Policy support is important for effective market led production.	
7.	Minimum support price safeguards during crises	
8.	Under Pradhan Mantri Fasal Bhima Yojana premium rate prescribed for annual horticultural crops is 5%	
9.	Weather based crop insurance scheme helps to get minimum returns during climatic aberration.	
	III. Price information	
1.	Information on market price is provided by:	
	a. APMC informants	
	b. m Kissan	
	c. Krishi Marata Vahini	
	d. AGMARKNET portal	
2.	Up to date price information enables farmers improves bargaining power	
3.	Price behaviour of market changed based on the seasons	
4.	Price and market information facilitates spatial distribution of produce	
	IV. Logistics and post-harvest management	
1.	Grading and standardization contribute to pricing efficiency	
2.	Bulk transport at a time increases quantity and quality losses	
3.	Value addition helps in extension of shelf life of the produce and fetch more price	
4.	APMCS provides warehouse and credit for pledging the produce	
5.	Pack house helps to maintain quality by reducing field heat	
6.	Cold storage helps to sell produce during high market price	
	V. Trade practice	
1.	Do you know about Different type of collection points for the produce?	
2.	Direct marketing enables	
	a. To know customers preference	
	b. To elimination middlemen	
	c. Efficient marketing of produce	
	d. Fetches more profit	
3.	Organic farming helps in getting specialized produce and fetches higher price	
4.	In Contract farming farmers are assured for buy back with predetermined prices	
5.	Direction of trading helps to know the marketing route of the produce	
6.	Traders and commission agent are licensed dealers	

7. Traders visit surplus collection points
8. Marketing cost increases with middlemen involvement and reduces profit

VI. Consumer preference

1. Consumer prefer more of value-added products
2. Varity with high consumer preference helps in getting better profit
3. Quality and appearance of produce attract consumer towards market
4. Consumer demand is more when its available during off season
5. Consumer prefer more of value-added products

CONCLUSION

The scale made using proper standard measurement devices such as item analysis, reliability and validity are all used to know the test stability and obtained scale is neither too difficult nor easily accessible to all. Finally scale to measure the knowledge level of farmers towards Market-Led Extension was developed by following Likert method. Thirty-five items were selected.

Recommendations

- The scale should be used as a diagnostic tool to identify knowledge gaps and design need-based training programs on market intelligence, value chains.
- All market-led extension programs should include pre- and post-assessment using the knowledge scale to measure learning outcomes and program impact.

Conflict of interest

No conflict of interest among researchers.

Acknowledgement

The authors thank and acknowledge Judges and Farmers of Southern Transitional, Northern Transitional and Central Dry Zone of Karnataka for sharing their experiences.

LITERATURE CITED

1. Krishna DK, Kumbhare NV, Prabhakar Itigi, Swetha BS, Ashoka N. 2019. Innovations in market-led extension. *International Journal of Current Microbiology and Applied Sciences* 8(2): 3256-3263.
2. Kumar A, Vikash P, Singh R. 2017. Managerial ability of lime growers about recommended cultivation of lime in Rajasthan. *International Journal of Agricultural Science and Research* 7(2): 155-162.
3. Vilas M, Kadrolkar. 2016. Agricultural marketing in India: Role of agricultural produce marketing committee (APMC). Department of Studies and Research in Economics, Tumkur University, Tumkur, Karnataka, India.
4. Kumar PG, Ratnakar R. 2016. A scale to measure farmers' attitude towards ICT-based extension services. *Indian Research Journal of Extension Education* 11(21): 109-112.
5. Kaleel FMH, Jayasree K, Satheesh Babu K. 2007. Market-led extension: Dimensions and tools. Agrotech Publishing Academy, Udaipur, India. pp 42-43.
6. Vasanthi C, Angadi JG. 2020. Constraints in utilization of market-led extension practices by the farmers. *Asian Journal of Agricultural Extension, Economics and Sociology* 38(12): 54-59.
7. Likert R. 1932. A technique for the measurement of attitudes. *Archives of Psychology* 140(22): 5-55.
8. Patel Bhavik, Patel Mahesh R, Patel Arun. 2017. Development of scale to measure the knowledge about drip irrigation system of drip irrigated banana growers. *Gujarat Journal of Extension Education* 28(1): 184-186.
9. Vinaya Kumar HM, Shivamurthy M, Biradar GS, Govinda Gowda V. 2016. Fishery based farmers' perception of climate change in coastal Karnataka (India). *International Journal of Agriculture Sciences* 8(53): 2646-2650.
10. Kale RA, Bhange SB. 2019. Development of scale to measure the knowledge of rural and urban high school students about agriculture. *Journal of Pharmacognosy and Phytochemistry* 8(2): 2011-2013.
11. Strang BMH. 1969. Modern English structure. Edward Arnold, London, UK.
12. Kerlinger FH. 1964. Foundations of behavioural research: Educational and psychological inquiry. Holt, Rinehart & Winston, New York, USA.
13. Spearman C. 1910. Correlation calculated from faulty data. *British Journal of Psychology* 3: 271-295.
14. Brown W. 1910. Some experimental results in the correlation of mental abilities. *British Journal of Psychology* 3: 296-322.
15. Anastasi A. 1950. The concept of validity in the interpretation of test scores. *Educational and Psychological Measurement* 10: 67-78.
16. Ravi KN, Patil SL. 2022. A scale to measure core competency of extension field functionaries in land resource inventory-based watersheds. *Gujarat Journal of Extension Education* 33(1): 1-7.