Construction of AGRISERV Scale to Assess the Service Quality of Agricultural Service Providers in Karnataka, India

Abstract

The research being conducted in 2022–2023, describes how the AGRISERV scale was developed to assess the quality of service rendered by Karnataka's agricultural service providers from the perspective of the farmers. The construction of the scale followed the guidelines provided by Parasuraman *et al.,* 1998. An informational questionnaire that was self-administered was completed by fifty farmers. The multi-item scale consists of 22 items total from five dimensions: Assurance, Responsiveness, Empathy, Tangibility, and Dependability. The scale was standardized using the item whose Cronbach's alpha value fell between 0.73 and 0.83 for each of the five dimensions. Utilizing the validity, factor structure, and a1n6d reliability, the scale was standardized.The combined reliability of the 22 items was 0.92, indicating that the scale was internally consistent. The analysis indicated that the scale had construct, content, and face validity. The final scale on a five-point continuum was presented to the farmers.

Key words: Service Quality, AGRISERV scale, Validity, Reliability, customers' responses

INTRODUCTION

A strong agricultural extension system is necessary to transfer the knowledge and technology generated by the research system to the various stakeholder categories that may lead to its adoption and to convert production gains into increased value generation. Increasing extension spending will have positive economic effects, according to numerous studies (Benin *et al.*, 2011). In India, there are numerous public, private, community-based, and non-governmental organizations (NGOs) that provide information, advice, and support services to farmers. This has led to pluralism in agricultural extension. The most common sources of information for farmers, according to NSSO (2005), were radio (13.00%), input dealers (13.10%), and other progressive farmers (16.70%).The 2013 NSSO survey highlighted the value of farmer-to-farmer information exchange in Indian agriculture. Both traditional and modern ICTs are important information sources for Indian farmers. Contradictions like the complexity of the extension landscape brought about by the many diverse actors and the requirement for diversity in extension to address the various farmer types and farming conditions are brought together by the idea of pluralism (Sajesh*et al.,* 2018).

There are opportunities for competition, duplication of effort, and the provision of contradicting information, but the existence of multiple agencies can address the various needs of the farming community and complement each other. The need of the hour is efficient coordination between various agencies and programs with clear role and activity definitions.Increased farmer mobilization, validation of context-specific information, improved service delivery system efficiency, and capacity building for various agencies based on the idea of leveraging the efforts, investments, and resources from different agencies lead to increased productivity and sustainable food security.The convergence of various actors in the community, extension, and research domains makes these results possible.

As various agricultural service providers converge, it is imperative to take farmers' perspectives on service quality into account. In the current competitive environment, offering top-notch services is regarded as essential to success and survival. Service quality is a critical and strategic component of future management for companies in the public and private sectors as well as non-profit organizations, claim Rana *et al,* (2013). However, assessing the quality of extension services from the client's point of view can help cut down on the amount of labor and crucial resources that are wasted by precisely identifying a program's strengths and weaknesses. However, little is known about the quality and efficacy of Bangladesh's extension systems from the perspectives of their users.As a result, when gauging the effectiveness of extension services through client feedback, demand-driven extensions must be given significant weight (Rashid *et al.,* 2018).

Since service quality affects customer satisfaction directly and customer loyalty indirectly, the literature has recognized the importance of service quality for business performance (Al Khattab and Aldehayyat, 2011). The SERVQUAL (Parasuraman *et al.,* 1985, 1988), SERVPERF (Cronin & Taylor, 1992), Antecedents and Mediator model (Dabholkar et al., 2000), Synthesized model of service quality (Brogowicz*et al.,* 1990), and Technical and Functional Quality model (Gronroos, 1984) are a few of the scales and indices that academics and practitioners have developed and used to measure service quality. Among them, SERVQUAL is thought to be the most commonly used, having been used in a large number of empirical studies conducted in various service industries and countries.

In 1985, Parasuraman, Zeithaml, and Berryl carried out one of the first investigations to create a Gap Model (SERVQUAL). According to the gap model, a customer's level of

satisfaction depends on how closely their experience (perception) matched their pre-experience expectations. The differences in expectations and perceptions between the two extremes of acceptable and unacceptable quality determine how service quality is perceived on a continuum.Out of 44 variables, they found 22 variables related to expectations and perceptions. The five RATER dimensions- Assurance, Responsiveness, Empathy, Tangibility, and Dependability- were tagged using these variables. Here, customers' responses on a seven-point Likert scale about their expectations and perceptions are compared to determine GAP(E-P) scores.The perceived level of service quality increases with the difference between E and P.

METHODOLOGY

A widely used instrument for evaluating service quality in a variety of service domains, including agriculture, is the SERVQUAL scale, which was first developed by Parasuraman *et al.* in 1988. The quality of the agricultural services provided to farmers is determined by how well their needs and expectations are met, or by the discrepancy between what they expect and what they receive. Reliability, responsiveness, tangibility, empathy, and assurance are the five service quality dimensions that were considered in the research. For the scale construction, the methodology used by Parasuraman *et al.,* (1988) in the development of the AGRISERV model was utilized. Every item on the scale was recast as two statements: one articulated the expectations of farmers regarding service providers in general, and the other their opinions regarding the particular service providers whose caliber of work was being evaluated. utilizing a five-point grading system: 1 represents strongly disagreeing, 2 disagreeing, 3 undecideds, 4 agreeing, and 5 strongly agreeing. The scale values of statements with negative wording were inverted. A negative sign inside a parenthesis indicates a statement that is negative in nature.

A collection of items addressing the five dimensions of service quality were gathered following a review of previous research and interviews with experts in the field of agricultural extension. To create an exhaustive list of relevant items, in-person consultations with extension personnel from commercial agricultural service providers, assistant/agriculture officers, and additional KVK scientists were also conducted. The statements' relevance to the field of study was taken into consideration when compiling a preliminary list of 57 items. Following collection, the materials underwent meticulous editing in accordance with Edwards' suggested standards (1957). In total, fifty items were retained.

To make sure each statement was easily understood, the bare minimum of words needed was reviewed.

RESULTS

Relevancy Analysis:each of the 100 judges, who served as assistant professors, subject matter experts, and scientists in the departments of agricultural economics and extension at various agricultural universities, Krishi Vigyan Kendras, and ICAR research stations around the nation, received 50 framed items in total. It was requested of the judges to make the necessary modifications. The categories of Most Relevant (MR), Relevant (R), and Least Relevant (LR) were assigned weights of 3, 2, and 1, respectively, on a three-point continuum. We received 100 fully completed questionnaires from judges, totalling 50. The Relevancy Percentage (RP), Relevancy Weightage (RW), and Mean Relevancy Scores (MRS) for each statement were computed using the judges' answers as a reference to decide which item to choose. To conduct further analysis, 74 statements totalling 37 items were selected based on the following criteria: Relevancy Percentage (RP) greater than 80.00, Relevancy Weightage (RW) greater than 0.80, and Mean Relevancy Score (MRS) greater than 2.42. Pre-testing and refinement were applied to the 37-item instrument. The 50 farmers who were not residents of the sampling area were given the scale, and they were asked to indicate how much they agreed or disagreed with each statement on a five-point continuum consisting of Strongly disagree (1), Disagree (2), Agree (4), and Strongly agree (5). Statements with negative wording had their scale values reversed. (Jumi et al., 2023)

First, the scale was purified by calculating the coefficient of alpha (Cronbach 1951). Because the service quality construct is multidimensional, the coefficient of alpha for each dimension was calculated separately to ascertain the extent to which the items that comprised each of the five dimensions shared a common core. In the computation of the coefficient of alpha (and subsequent analyses), a difference score Q for each item was defined as Q=P-E, where P and E stand for the ratings on the corresponding perception and expectation statements, respectively.

Each of the five dimensions had a different coefficient of alpha value, ranging from 0.53 to 0.85, indicating that deleting some items from each dimension would increase the alpha values. The criterion that determined whether or not to remove an item was the corrected item-to-total correlation. With SPSS, the corrected item-to-total correlation was computed. Things that showed very little correlation were removed. The items that improved

the corresponding alpha values were removed by recalculating the alpha values for the reduced sets of statements and examining the newly corrected item-to-total correlation. Several items were eliminated during the iterative process of calculating alphas and item-to-total correlations. This produced a set of 22 items, which were then subjected to additional analysis. The alpha values of these items ranged from 0.71 to 0.91 across the 5 dimensions. Experts felt after the pre-test that the negatively worded expectations statements were less reliable than the positively worded items and that they were awkward and meaningless. The reliability coefficients had also decreased from the original study. The items with negative wording exhibited a greater variation, indicating that the respondents might have been perplexed by them (Parasuraman *et al.*, 1988). Owing to these considerations, all negatively worded items were changed to positively worded versions in the final questionnaire.

One crucial component of scale construction is scale standardization. To standardize the scale, the current study computed the scale's validity and reliability.

Table 1. Final AGRISERV Scale to Assess the Service Quality of Selected Agricultural Service Providers

SI.NO	Statements	Response pattern				
		SA	A	UD	DA	SDA
I	**Expected Service Quality**					
	A. Tangibility					
1	Materials and Information related to the services (brochures, posters, pamphlets etc.,) should be visually pleasing					
2	Materials and Information related to the services (brochures, posters, pamphlets etc.,) should be up- to-date					
3	The help desk should be furnished with all the facilities (Ex: Internet, Computers, Printing machine etc.,)					
4	Possession of physical facilities of the service providers should be as per the farmers need					
5	location of the service providers should be appropriate to the farmers					
	B. Reliability					
6	Service providers should provide the service accurately					
7	Service providers should provide the service in time					

8	Excellent service providers will show a sincere interest in solving the problems					
9	Service providers should keep records of farmers accurately					
	C. Responsiveness					
10	Service providers should quickly inform the farmers about extension activities/ information					
11	Service providers should never busy to respond to farmers requests					
12	Excellent service providers will give prompt services to the farmers					
13	Service providers should make information easily obtainable by farmers					
	D. Empathy					
14	The extension activity timings of service providers should be comfortable to the farmers					
15	Service Provider should be interested in satisfying farmers need					
16	Location of extension events proposed to be taken up should be convenient for all the farmers					
17	Excellent service providers will recognize the specific needs of the farmers					
18	Service providers must be focused on the best service for the farmers					
	E. Assurance					
19	The service provider should be credible					
20	Service providers seems to receive adequate support from the higher authority to provide services to the farmers					
21	Excellent service providers will be polite with the farmers					
22	Service providers should have the information to reply to queries posed					
II	**Perceived Service Quality**					
	A. Tangibility					
1	Materials and Information related with the service (brochures, posters, pamphlets etc.,) were visually pleasing					
2	Materials and Information related with the service (brochures, posters, pamphlets etc.,) were up -to -date					
3	The help desk is furnished with all the facilities (Ex: Internet, Computers, Printing machine etc.,)					
4	Possession of physical facilities of the service providers are as per the farmers need					

5	Location of the service providers is appropriate to me					
	B. Reliability					
6	Service provider is providing the service accurately					
7	Service providers is providing the service in time					
8	When you have a problem , service providers shows a sincere interest in solving it					
9	Service providers keeps record of farmers accurately					
	C. Responsiveness					
10	Service providers quickly inform the farmers about extension activities					
11	Service providers is never busy to respond to my requests					
12	Service providers offers you prompt services					
13	Service providers make information easily obtainable by farmers					
	D. Empathy					
14	The extension activity timings of service providers are comfortable to me					
15	Service provider is interested in satisfying farmers need					
16	Location of extension events proposed to be taken up are convenient for me					
17	Service providers understand your specific needs					
18	The service provider is focused on the best service for the farmers					
	E. Assurance					
19	The service provider is credible					
20	Service providers has received adequate support from the higher authority to provide services to the farmers					
21	Service providers is polite with the you					
22	Service provider has the information to reply to queries posed					

Internal consistency, or the degree of intercorrelation between the items that make up the measure or summated scale, is one method for assessing reliability (Flynn et al., 1990). Cronbach's alpha, which is the average of each item's correlation coefficient with its own item, is the most commonly used metric for assessing internal consistency (Cronbach & Meehl, 1955). Strong internal consistency was shown by the high alpha values of the current study (values ranging from 0.73 to 0.91). This was evident for each dimension's items. The

22-item scale's high (0.92) combined reliability, which was calculated using Nunnally's (1978) formula for the reliability of linear combinations, provides additional evidence of the scales' internal consistency.

Table 2. Reliability Test

Dimensions	No. of items	Cronbach's Alpha
Reliability	04	0.74
Assurance	04	0.84
Tangibility	05	0.73
Empathy	05	0.89
Responsiveness	04	0.91

Finding out if an item on a scale actually measures the intended construct and whether it measures nothing else is one way to determine if the scale is valid. The face validity, content validity, and construct validity tests were the three types of validity that were employed in this study's scale validity examination. Face validity: To those who are not familiar with scale construction, it is best restricted to the fact that an exam "looks" valid. A more professionally and scientifically justified use of face validity is to make it agreeable for the examinee. When the scale was shown to experts in agricultural economics and extension, they seemed reasonable enough. (Muyal et al., 2022) They were asked to comment on it. Thus, the scale was valid on its face.Content validity: A scale's content validity must always be assessed qualitatively rather than quantitatively. To properly scale a construct, two factors must be taken into account: 1) how well the construct and its domain were explained; and 2) how well the scale items represent the construct domain. The process of developing the scale involved stratifying both of these evaluation requirements. The scale is therefore believed to have content validity(Chatterjee, et al., 2023). Validity of construction:To make sure the scale is a suitable operational definition of an abstract variable, factor analysis is used to test the scale (Flynn et al., 1990). Five summated scales are used concurrently in the factor analysis of this study: tangible, dependable, assured, responsive, and empathic. Adequate sampling is indicated by a KMO value of 0.710 (more than 0.5) and a significant value of 0.000 in the Bartlett's Test and KMO. These figures show that the data are suitable for exploratory factor analysis. Five components with multiple eigenvalues are extracted by combining the Varimax rotation method with Principal Component Analysis and Kaiser Normalization. These five

factors are responsible for 67.09 percent of the variation in service quality, according to the cumulative variance of 67.09 percent.Every service quality item's factor loading shows that the variables and the factor have a correlation of more than 0.5. These findings would confirm the information and provide fresh research directions.

DISCUSSIONS

Reactivity, which is characterized as being available to clients, willing to help them, and flexible to their needs, is the factor that affects farmer satisfaction the most. Reliability, which includes traits like delivering services accurately and on time, solving issues in an honest manner, and keeping private records, is the next strong impact dimension. The next factor is assurance, which is influenced by staff members' professional abilities, courteous behavior, and understanding of the region they work in as well as farmers' sentiments of security and safety. This conclusion is emphasized by the research findings of Hossain (2012). Additionally, Knutson et al. (1990) provided additional support for this conclusion by highlighting the consistently high expectations that customers have for the Reliability and Assurance dimensions, which include timely and consistent services, promptly fixed issues, knowledgeable staff, and customers' comfortable feelings. Furthermore, Juwaheer's (2004) study on how foreign visitors view hotel operations in Mauritius revealed that staff outlook, accuracy, and reliability factor are crucial service dimensions that have an impact on hotel patrons' satisfaction.

The study deepens our comprehension of service quality from the viewpoint of farmers. It improves knowledge of the relationship between farmer satisfaction and service quality in the delivery of agricultural services. Extension agents employed by various agricultural service providers who wish to boost competitive advantage through quality dimensions will find the findings and implications useful. This empirical evidence could be strengthened and more accurately represented for agricultural service providers in Karnataka and throughout India with larger sample sizes and year-round data collection in future studies. Further investigation could fully explore whether the dimensions and items of the study are appropriate for assessing the quality of services provided by public and private agricultural service providers in addition to other ones.Additionally, in order to investigate the various effects of service quality on farmers' satisfaction across various sample groups, different demographic variables may be taken into consideration as controlling variables.

CONCLUSION

In order to assess the level of service provided by agricultural service providers in Karnataka, this study creates the AGRISERV scale. After a pre-test and refinement phase, 22 items with alpha values ranging from 0.71 to 0.91 across the five dimensions were retained for additional analysis of the 37-item instrument. Based on the high alpha values, the reliability analysis of this study showed that items within each dimension had good internal consistency. Additionally, the internal consistency of the scales is indicated by the high (0.92) combined reliability for the 22-item scale, which was calculated using the formula for the reliability of linear combinations. Finding out if an item on a scale actually measures the intended construct and whether it measures nothing else is one way to determine if the scale is valid.The face validity, content validity, and construct validity tests were the three forms of validity that were applied in this study's scale validity analysis.

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