



Farmers' Satisfaction with Agricultural Extension: A Service Quality-based Assessment

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HIGHLIGHTS

- The study assessed agricultural extension service through farmers satisfaction.
- Hierarchical regression analysis was used to predict SERVQUAL model's contribution.
- The study compared SERVQUAL dimensions with traditional socioeconomic attributes in measuring satisfaction

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ABSTRACT

With an aim to contribute to the methodology in Agricultural Extension research and draw extension professionals' attention to evaluating farmers' satisfaction with extension service delivery, this research presents a comparative evaluation of the traditional research approach, which treats farmers' selected socioeconomic characteristics as the predictor variables against SERVQUAL five-dimensions (i.e., tangibility, reliability, assurance, responsiveness, and empathy). The study was carried out from 2022-2023 and data used in this research were collected from August 01 to August 15, 2022. Stratified random sampling was used to select 120 farmers from two unions of the Savarupazila (i.e., sub-district) of Dhaka district, Bangladesh, and analyzed using hierarchical regression analysis. Results revealed that without using SERVQUAL dimensions, farmers' socioeconomic characteristics explained 30.9 per cent of the variance of their satisfaction when SERVQUAL dimensions were not used. However, this percentage increased to 61.8 per cent upon adding SERVQUAL dimensions to the model. Therefore, the findings provide a novel dimension for further research on farmers' satisfaction with agricultural extension and evaluate similar agriculture-based rural development programs.

INTRODUCTION

Since the 1980s, service quality and customer satisfaction have received scholarly attention in marketing literature. Professionals constantly investigated how service quality affects customer satisfaction (Nautwima & Asa, 2022). Service quality and customer satisfaction may appear identical at first glance. However, satisfaction is an evaluative assessment of the customers and is considered the outcome of service quality (Prasad & Verma, 2022), while service quality indicates how well a service is delivered to fulfill customers' expectations. The term "satisfaction" further can

be described as how demands of an individual are met comparatively with their requirements (Biam et al., 2022; Dutta et al., 2021). Addressing the service quality and client's satisfaction related aspects, Parasuraman et al. (1985) made contributions to the concept and proposed the SERVQUAL model (an abbreviation of two words, 'service' as 'SERV' and 'quality' as 'QUAL').

The model was initially evaluated in the hotel industry to evaluate the link between service quality and customer satisfaction (Nautwima & Asa, 2022); now, it has been used and acknowledged globally as an instrument for determining how users perceive and

anticipate service quality (Pena et al., 2013). In recent years, the SERVQUAL model has been employed in the travel and tourism sector in Bangladesh (Alauddin et al., 2019; Marsrurul, 2019), in the hotel industry sector in Iraq (Ali et al., 2021), in the banking sector (Fida et al., 2020; Nguyen et al., 2020; Supriyanto et al., 2021) in order to analyze the association between service quality and customer satisfaction (Nautwima & Asa, 2022).

Agricultural extension services are designed based on training, capacity building, and information sharing, provided to farmers to enhance farming methods, practices, and results regarding sustainable livelihood (Baiyegunhi et al., 2019; Ovharhe et al., 2020). Investigating, connecting, and identifying opportunities for effective extension services is crucial in making agricultural extension education more meaningful for farming communities. Since programming and delivering educational interventions related to the quality of services is an undeviating outcome of organizational work progressions, farmers' satisfaction determines the effectiveness or quality of extension services.

Several factors, for example, socioeconomic attributes (age, education, income, frequency of extension media contact, training exposures, etc.) may influence farmers' satisfaction with extension service (Kassem et al., 2021; Lahmachhuana & Devarani, 2016; Yazdanpanah & Feyzabad, 2017a). Yet, it remains ambiguous whether these factors can evaluate extension services objectively based on their socioeconomic attributes. The intention of this study was to establish the importance of using SERVQUAL dimensions in assessing extension service and measuring farmers' satisfaction rather than using socio-economic characteristics. The SERVQUAL model is a generic application with a set of logical and straightforward questionnaires, which makes this model practically appropriate for assessing service quality. This study thus evaluates the quality of agricultural extension services by measuring farmers' satisfaction while extension agents deliver information, expertise, and technologies, taking the SERVQUAL Dimensions (i.e., tangibility, reliability, assurance, responsiveness, empathy) into consideration. The conceptual model for this study, incorporates farmers most frequently used socioeconomic characteristics (age, education, land size and annual income) to evaluate their overall satisfaction with agricultural extension service compared to SERVQUAL dimensions.

METHODOLOGY

The study was conducted in Savar and Pathalia, two unions (smaller administrative units of a sub-district) located in Savar upazila (i.e., sub-district), near the capital city Dhaka, Bangladesh. The selection of these two unions was purposive, based on the assumption that the intensity of extension service in this area would be higher due to its proximity to the Department of Agricultural Extension (DAE). Stratified random sampling was used to select 120 farmers from the two unions based on their availability to participate in the survey.

In order to measure each SERVQUAL dimension, a modified instrument was used, comprised of 23 statements. Each dimension was made up of multiple statements, and respondents were asked to rate their agreement and disagreement using a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The mean

score for each dimension was derived by summing the responses and dividing by the number of statements within that dimension. The mean score for service quality was then calculated by computing the mean scores of all five SERVQUAL dimensions and dividing by the total number of dimensions (here, in this case, 5). Besides, age was measured by actual year, education by years of schooling, farm size by actual possession of the farm in a hectare, annual income in thousand Bangladeshi takas, contact with extension media by frequency, and farmers' satisfaction was measured by using a bipolar scale ranging from 1 (dissatisfied), 2 (somewhat dissatisfied), 3 (neither satisfied nor dissatisfied), 4 (somewhat satisfied), and 5 (satisfied).

At first, Pearson's Product Moment correlation was run to find out the association between the selected characteristics of the farmers and SERVQUAL dimensions. This correlation test found that level of education, farm size, annual income, and extension contact had significant positive relationships with SERVQUAL dimensions. Then, a full model regression analysis was also run using the five SERVQUAL dimensions. The full model regression results were misleading due to the existence of interrelationships and multi-collinearity among the variables. Therefore, to avoid misleading results and determine the best explanatory variables, the hierarchical regression method was administered, where five SERVQUAL dimensions were fitted together in hierarchical regression analysis. Sibai et al., (2021). employed hierarchical regression analysis in their investigation of student satisfaction, pinpointing the most dependable predictor among the five dimensions of service quality and their respective characteristics.

RESULTS

Respondents' selected characteristics and SERVQUAL dimensions

The age range of respondents in the study was 38 to 66 years, with an average of 53.18. Based on the level of education, the respondents were organized into four categories. The 'can sign only' category constituted the highest proportion (38.3%), followed by the 'primary education' category (25.0%), then the 'secondary education' category (23.3%). On the other hand, the 'can't read and write' category constitutes the lowest proportion (13.3%). The highest proportion of farmers had a middle income (59.2%), while only 7.5 per cent had a low income. The study found that the per cent of farmers who often had regular contact with extension media is 96.7 per cent.

The descriptive analysis indicated that farmers had the highest perception of responsiveness, reliability, and assurance. The highest perception was obtained in the reliability dimension, which refers to the appropriateness of the services. Extension service providers were found to be willing to help and respectful towards farmers, leading to a favourable perception of responsiveness. Meanwhile, the assurance dimension relates to the mental state of farmers, specifically their feelings of safety and security. Respondents viewed this dimension favourably, indicating they felt safe and secure while using the service. The high perception scores in the responsiveness, reliability, and assurance dimensions indicate that it is feasible for respondents to depend on the services provided by the organization (Almurshidee, 2018).

Although 4.2 per cent of the respondents had a neutral perception of the tangibility dimension, most farmers (95.8%) were satisfied with the extension service. Therefore, the results suggest that infrastructure development might require more investment to provide a better working environment. Unexpectedly, our findings revealed that most respondents (65%) showed an unfavourable or low perception, with only 35 per cent expressing opinion neutrality of empathy dimension, indicating that extension services should improve their responses to farmers regarding their services (Almurshidee, 2018). The overall satisfaction with the service quality among farmers was favorable for 82.5 per cent of the respondents and neutral for 17.5 per cent, with a mean value of 4.14 and a standard deviation of 0.15. The construct reliability of the five dimensions of SERVQUAL with service quality is presented in Table 1.

Table 1. Distribution of farmers according to SERVQUAL dimensions

SERVQUAL dimensions	Factor loading	Mean	Standard deviation
Tangibility	0.71	4.29	0.26
Reliability	0.69	4.51	0.19
Responsiveness	0.77	4.49	0.26
Assurance	0.66	4.57	0.19
Empathy	0.54	2.75	0.29
Service quality	0.93	4.14	0.15

Farmers' satisfaction with service quality

The quality of agricultural extension services can be assessed by the level of farmers' satisfaction (Juita et al., 2023), which strongly influences the improvement of the organization. Based on the responses, the satisfaction levels of farmers varied (Figure 1). 35 per cent of farmers reported being satisfied, 30 per cent reported being somewhat satisfied, and 22.5 per cent reported feeling neither satisfied nor dissatisfied with the extension service. The smallest percentage (12.5%) expressed some level of dissatisfaction. Overall, the findings suggest that a significant majority of farmers (more than half) reported satisfaction with the extension services they

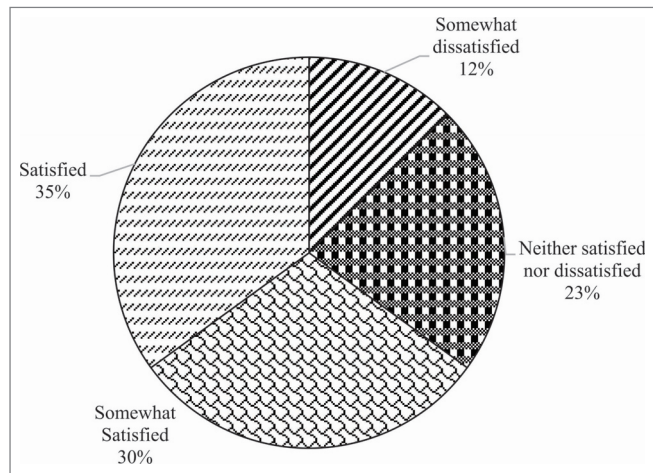


Figure 1. Distribution of the respondents according to their level of satisfaction

received based on the quality of service provided. However, some farmers did express some level of dissatisfaction, which revealed comparative consistency with the results of previous studies (Debnath et al., 2016; Kassem et al., 2021). It is important to note that while the service received by farmers may not always be perfect, it does not necessarily mean that they perceive the overall service quality as poor.

Contribution of selected characteristics to their satisfaction with SERVQUAL dimensions

An unstandardized coefficient represents the change in a dependent variable (i.e., satisfaction) due to a change of 1 unit of an independent variable. A standardized β implies the strength of the influence of each independent variable on the dependent variable. A higher beta coefficient indicates a higher effect size. Model 1 (Table 2) shows the influence of selected socioeconomic characteristics of the respondent farmers that affect their satisfaction without the service quality (i.e., SERVQUAL) dimensions. In Model 1, extension contact (standardized $\beta=0.471$) and farm size (standardized $\beta=0.340$) showed a significant and positive impact on farmers' satisfaction. At the same time, age and education negatively influenced farmers' satisfaction with agricultural extension services.

The findings were consistent with previous studies (Elias et al., 2015; Ganpat et al., 2014; Ragasa & Mazunda, 2018), which reported that farm size significantly influenced farmers' satisfaction with agricultural extension services. Larger-scale farmers were likelier to follow extension advice, leading to increased output and improved product quality (Kassem et al., 2021). Therefore, it is reasonable to conclude that the higher the economic return from agricultural products, the higher the possibility of farmers' satisfaction with extension services (Yazdanpanah et al., 2013; Anang, 2016; Elias et al., 2016; Sinha et al., 2021). Moreover, the frequency of extension contacts contributed significantly to farmers' satisfaction. Extension workers are the main information source and training for farmers to adopt new extension packages and innovations, and their frequent contact with farmers is important for effective extension services. Thus, the intensity of extension services also influenced farmers' satisfaction significantly (Kassem et al., 2021).

According to Table 2, the full model (model 2) demonstrates a significant outcome regarding service quality. Notably, farm size ($\beta=0.221$), extension contact ($\beta=0.222$), and service quality ($\beta=0.607$) all had positive significant impacts. Meanwhile, education ($\beta=-0.190$) had a negatively significant impact at a 5% level of significance. Service quality is recognized as a performance concept contingent upon specific performance criteria and is a significant determinant of farmers' satisfaction. Table 2 (model 2) shows that the unstandardized coefficient β value was 4.111 and the standardized coefficient β value was 0.607 with a t value of 9.670. Additionally, the model yields an R^2 and adjusted R^2 value of 0.638 and 0.618, respectively, with an F value of 33.126. This emphasizes the substantial influence of service quality on farmers' satisfaction. The adjusted R^2 value further reinforces this idea, indicating that service quality plays a major role in explaining farmers' satisfaction, even when accounting for other factors. Therefore, to raise satisfaction to the services provided to the farming community, quality of the agricultural extension services must be strengthened (Kadaraiah et al., 2022).

Table 2. Hierarchical regression analysis demonstrates selected characteristics' contribution to farmers' satisfaction with SERVQUAL dimensions

	Model							
	Model 1				Model 2 (Full Model)			
	Unstandardized Coefficient	Standardized Coefficient	t	Sig.	Unstandardized Coefficient	Standardized Coefficient	t	Sig.
	B	Std. Error	Beta		B	Std. Error	Beta	
(Constant)	.373	1.058		.725	-14.925	1.766		-8.449 .000
Age	-.014	.014	-.091	-.970 .334	-.008	.010	-.056	-.798 .426
Education	-.074	.038	-.237	-1.937 .055	-.060	.028	-.190	-2.094 .038*
Farm Size	.671	.196	.340	3.432 .001***	.436	.147	.221	2.959 .004***
Annual income	-0.00	.000	-.020	-.208 .835	.000	.000	.052	.718 .474
Extension contact	.257	.065	.471	3.973 .000***	.121	.050	.222	2.422 .017**
Service Quality					4.111	.425	.607	9.670 .000***
R ²			.338				.638	
Adj.R ²			.309				.618	
F			11.619***				33.126***	

The findings in Table 2 reveal that incorporating SERVQUAL dimensions into the assessment of farmers' overall satisfaction with agricultural extension service accounts for up to 61.8 per cent of the variance. The selected socioeconomic variables aggregately only explained 30.9 per cent of the variance in farmers' satisfaction. In contrast, SERVQUAL dimensions alone explained 30.9 per cent of the variance without factoring in any socioeconomic determinant. In essence, these statistical findings highlight the critical importance of service quality in determining farmers' satisfaction with agricultural extension services.

DISCUSSION

The aim of the study was to determine whether service quality factors or socioeconomic factors were more significant in assessing overall farmers' satisfaction with local extension services. The results demonstrated that incorporating SERVQUAL dimensions in evaluating agricultural extension services accounted for 61.8 per cent of the variance, while socioeconomic characteristics alone explained 30.9 per cent of the variance of farmers' satisfaction. These findings emphasize the importance of utilizing SERVQUAL dimensions to evaluate extension services and measure farmers' satisfaction rather than relying solely on traditional socioeconomic predictors. Prior research focused on socioeconomic factors that may influence farmers' satisfaction somewhat; however, the present study provides evidence that the contribution of socioeconomic characteristics cannot truly define farmers' satisfaction with the quality of agricultural extension service. The findings of the study showed that respondents' socioeconomic characteristics like farm size and extension contact have a positively significant contribution to farmers' satisfaction; other factors like age and annual income have not shown any significant contribution. Again, education was expected to influence farmers' satisfaction with the extension service positively, but the study found the opposite effect, negatively significant in predicting farmers' satisfaction. It can be interpreted that farmers with higher education may have a greater influence on satisfaction. Education is important for adoption of innovations (Sarnaik et al., 2020), effective extension communication, and wise utilization of extension services. Due to their high expectation,

farmers were often dissatisfied or somewhat satisfied with the service they received from extension officials (Ao et al., 2017; Ganpat et al., 2014).

On the other hand, previous studies found farm size, annual income, and extension contact were significant determinants of farmers' satisfaction, while age education was found insignificant (Kassem et al., 2021). Some studies even found age as an ambiguous attribute in measuring satisfaction (Elias et al., 2013a). Therefore, it is obvious from previous studies that the contribution of socioeconomic characteristics in measuring farmers' satisfaction as well as service quality is uncertain; nevertheless, it varies with perceived values (for instance, higher yield and income) and perceived quality of service (Yazdanpanah and Feyzabad, 2017). Additionally, the findings of this study provide evidence that socioeconomic characteristics are not necessarily important for predicting farmers' satisfaction with extension services.

It is important to consider whether the extension service programme is suitable and relevant for the actual needs of small farmers, as well as the importance of anticipating farmers' demands with service quality (Aguda et al., 2022). Preceding research has established that service quality is characterized by a unique set of attributes, which is abstract and challenging to describe and quantify. Moreover, since the customer is the one who receives the service, much of this research concurs that the customer's assessment of the quality of the service reflects the most aptness of the service (Alnodel et al., 2020). The hierarchical regression full model analysis of this study has shown that service quality as a composite of SERVQUAL's five dimensions has a significant contribution to farmers' satisfaction with extension service, and the contribution leads to 30.9 per cent alone (subtracting from full model to model 1). Ultimately, this approach helps agricultural extension organizations better understand and meet the expectations of their client farmers.

The SERVQUAL model integrates customer-centric service design with standardized metrics for assessing service quality, making it a popular tool for evaluating customer satisfaction with the services offered by various organizations (Jonkisz et al., 2021). Customer satisfaction is the most important factor for organizational

success and profitability (Elias et al., 2013b; Hansen & Strate, 2020). With the use of the SERVQUAL model, organizations can pinpoint areas for improvement in their service offerings while also measuring and enhancing farmers' satisfaction.

CONCLUSION

This study employed a service quality framework and hierarchical regression analysis to evaluate farmers' satisfaction with agricultural extension services. Among the five socioeconomic characteristics, farm size and extension contact positively and significantly contributed to satisfaction. In contrast, education was also found to be significant yet had a negative impact on farmers' satisfaction. Applying SERVQUAL dimensions resulted in a substantial increase in explanatory power, demonstrating its significance in assessing farmers' satisfaction with agricultural extension services. It is recommended that future research focus on more dependable measurements rather than only socioeconomic attributes, and extension services tailored to meet farmers' needs should be prioritized to enhance satisfaction and acceptance of programs. In summary, the research emphasizes the crucial role of service quality in shaping farmers' satisfaction with extension. It signifies the need for tailored, quality-driven approaches to enhance program effectiveness and farmers' well-being.

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