

ASSESSING AGRICULTURAL EXTENSION SERVICE IN RURAL DEVELOPMENT: A SERVICE QUALITY APPROACH

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CERTIFICATE

This is to certify that the thesis entitled “**Assessing agricultural extension service in rural development: a service quality approach**” submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of Master of Science in Agricultural Extension, embodies the result of a piece of bona fide research work carried out by **Sharjana Akter Shaba**, Registration No. **13-05274** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

I further certify that any help or source of information, received during the course of this investigation has been duly acknowledged.

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*Dedicated
to
my beloved
Father*

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ASSESSING AGRICULTURAL EXTENSION SERVICE IN RURAL DEVELOPMENT: A SERVICE QUALITY APPROACH

Sharjana Akter Shaba

ABSTRACT

The present study conducted a comprehensive investigation for assessing agricultural extension service from the perspective of farmers' satisfaction. Hierarchical regression model was used to analyse farmers' satisfaction. This study aimed to examine the level of farmers' satisfaction with agricultural extension service and identify determinant factors for farmers' satisfaction through Service Quality approach. In this study, five socio-economic characteristics (age, education level, farm size, annual income, extension media contact) of the farmers were considered for farmers' condition investigation. Age of the respondents ranged from 38 to 66 years, an average of 53.18, the education score of the respondents ranged from 0 to 10, the average being 2.94, farm size varied from 0.51 to 3 ha, the average being 1.24 ha, annual family income of the farmers ranged from BDT 300 to 1600 thousand, the average being 669.97 thousand, the experiential extension contacts scores of farmers ranged from 10 to 18 against the possible range from 0 to 40, the average being 14.18. In order to measure the service quality of extension workers, the SERVQUAL model was used using all of its five (5) dimensions (tangibles, reliability, responsiveness, assurance and empathy) where reliability and assurance have the highest score 4.80 and mean 4.56, 4.49, 4.51, respectively. The distribution of farmers satisfaction according to their response presents that 35 percent farmers were very satisfied; 30 percent farmers were satisfied and 22.5 percent farmers were moderately satisfied with service quality while the least farmers were in somewhat satisfied category only 12.5 percent. From hierarchical regressions, it was found that implication SERVQUAL dimensions had significant contribution (61.8%) on their expression towards the extension service, whereas measurement of farmers' satisfaction without using SERVQUAL model shows the level of satisfaction was 30.9 percent trends to the use of SERVQUAL model for the measurement of farmers' satisfaction disclose more accurate result. The findings of this research will be useful to those are concerned with planning, implementation and evaluation of agricultural rural development programs.

CHAPTER I

INTRODUCTION

1.1 General Background

The first agricultural extension service of a modern kind came into existence as the result of a crisis and the initiative of the outbreak of potato blight in Europe in 1845. After World War II many formal or informal agricultural extension services were established as countries achieved their independence from colonial powers (Swanson & Claar, 1984). According to Rivera (1991), agricultural extension services worldwide reached a “critical turning point” by the 1980s. In the early years of this century, extension services were in their formative stage; they were relatively small in scale and limited in the scope of their work and contact with farmers, and their organization was often somewhat haphazard even though based on legislation. Extension workers those days were organized predominantly either by central or local governments, agricultural colleges, or by farmers' organizations. As agricultural extension organizations have grown and changed, they have invariably become more bureaucratic with distinct hierarchical structures.

The history of Agricultural Extension Service (AES) in Bangladesh had been started with the commencement of green revolution in 1960s as the knowledge of cultivation method of High Yielding Variety (HYV) of rice was needed to be introduced among farmers. The farmers were uninformed about the cultivation method of high yielding variety of rice; thus, the role of AES had turned out to be important with the introduction of modern technology in agriculture. The present scenario of AES was mended in early 1980s with a view to encouraging and helping farmers in adopting new technology, advanced production practices to increase productivity and meet national requirements, maximize export and minimize import. In 1982, the Department of Agricultural Extension (DAE) was formed under the Ministry of Agriculture; represents a consolidation of efforts to transfer agriculture-related information and technology, protect and promote key main and cash crops and provide necessary services and support to all

farmers. DAE is the largest public sector extension service provider in Bangladesh, having mission to provide all categories farmers with needs-based extension services which at present has 14032 blocks representing by 14032 Sub-Assistant Agriculture Officer (SAAO) and 26042 employees distributed throughout the country, among them about 22000 are under the field service wing (DAE 2016). DAE is working timelessly to form the main supporting arm to assist the farmers who are the main force of our agricultural sector. At present DAE supervises some services to farmers such as Krishi Batayon (2020), Krishoker Janala, e-agriculture extension service, Krishi Mobile app, etc. To increase the efficiency of agricultural extension, however, in 1995, a New Agricultural Extension Policy (NAEP, 1996) was extended. The National Agricultural Extension Policy concentrates on decentralized and demand-led extension to meet farmers' needs, emphasizes on coordinated extension service delivery and encourages effective research-extension-farmer linkages.

Effective extension service involves adequate and timely access by farmers to relevant advice, with appropriate incentives to adopt the new technology to suits their socioeconomic and agroecological circumstances. The services provided by extension have significant farmers -good attributes which helps to reduce the differences between potential and actual yields in farmers' fields by reducing technology gap and aiding farmers become better farm managers. It also has an important role to play in helping the research establishment tailor technology to the agroecological and resource circumstances. Extension thus has a dual function in bridging blocked channels between scientists and farmers. It involves translating information from the store of knowledge and from new research to farmers, and helps to articulate for research systems the problems and constraints faced by farmers (Anderson and Feder, 2003; Anderson *et al.*, 2008).

In the context of sustainable agricultural development, agricultural extension has a very crucial role to play. The tasks and responsibilities of extension service will need to be broad and holistic in contents and scope. Its normal task of transferring and disseminating to farmers appropriate agricultural technologies

and good farm practices would not be sufficient. Although approximately one third of the farmers who have tried a package had discontinued its use due to poor extension service. The effectiveness or quality of services basically depends on farmer's satisfaction. Farmer's satisfaction is a matter of attitude towards or evaluation of service quality. It can be defined as: "a mental or emotional reaction that results as a response to the experience of interaction with the service" (Rust and Oliver 1994). It can also be regarded as "the extent to which one realizes the effectiveness of the received product or service in fulfilling his needs (Reed, 1997 & Johan, 1992). Farmers satisfaction is a personal feeling or evaluation, which explains the difficulty of satisfying all individuals or estimating satisfaction among a group of individuals.

According to Parasuraman *et al.*, 1988, a service can refer to production, performance, output or result, presentation or process. It varies from one field to another based on service characteristics. The main question in understanding service quality is how client realizes quality. In this regard, Gronroos developed the first model to measure service quality (Gronroos, 1982). He distinguished between two aspects of service quality, as follows:

1. **Technical quality**, which involves the delivery of service. It is measured individually by the farmers.
2. **Functional quality**, the state in which service is provided. It is concerned with the personal perception of interaction between farmer and extension officers, including:
 - Extension officers' attitudes and behavior
 - Access to service provider (being approachable and kind treatment)
 - Access to service
 - Personal appearance and personality of extension officers
 - Relations with extension officers
 - Interaction between extension officers and farmers

Therefore, addressing the aforementioned disconnection and encouraging the steady disappearance of the imperfections of rural agricultural development in Bangladesh can be possible by assessing the service quality and measuring farmers' satisfaction towards the services provided by Agricultural Extension workers.

1.2 Statement of the Problems

Rural development in an agriculture-based country like Bangladesh mostly dependent on its agrarian economy. Agriculture is the single largest producing sector of the economy since it comprises about 13.07% of the country's GDP and employs around 45% of the total labor force (BBS, 2017). The achievement of national development without regard to agricultural and rural development as well as improvement of rural socioeconomic status is not possible. So, the scenario suggests that demands on agricultural producers from population growth, increasing urbanization, legislative changes, and market requirements, the more knowledgeable farming population will require different kinds of extension services. Social and economic trends within rural areas will therefore necessitate more highly trained, specialized, and technically competent workers, who also know where to obtain relevant information and problem solutions and various provision and organizational forms (Moris *et al.*, 1985, Haywood, 1988) to replace monolithic government extension agencies.

It is widely accepted that individual performance is affected by human capital, which encompasses both innate and learned skills, including the ability to process information (Jamison and Lau, 1982). Extension services are an important element within the array of market and non-market entities and agents that provide human capital-enhancing inputs, as well as flows of information that can improve farmers' and other rural peoples' welfare; an importance long recognized in development dialogue. While extension agents transferring information, knowledge and technologies to farmers, this paper will assess extension service quality and measure farmers satisfaction at agricultural extension service; considering the SERVQUAL Dimension (tangibility,

reliability, assurance, responsiveness, empathy). Service quality components in the service quality model (SERQUAL) are considered to be one of the most important measures of service quality. Service quality model (SERVQUAL, Parasuraman *et al.*, 1985), is regarded as one of the best methods in this regard. The model stipulates that when a perceived service does not meet expectations, service quality is less than satisfying. Whereas, when the perceived service exceeds expectations, service quality is considered more than satisfying. So, this leads to the following research questions:

1. What are the socio-economic factors of the farmers that influence their satisfaction at agricultural extension service?
2. What is the extent of perceived quality of agricultural extension service using SERVQUAL dimensions?
3. What factors are contributing to farmers' level of satisfaction at agricultural extension service?

1.3 Specific Objectives of the Study

Based on the discussion made in the section 3, the following objectives have been formulated to guide the research:

- To determine the selected socio-economic factors of the farmers that can affect their satisfaction at agricultural extension service; the factors are as follows:
 - i) Age
 - ii) Education
 - iii) Farm size
 - iv) Agricultural work experience
 - v) Agricultural extension media contacts

- To determine the extent of perceived service quality by the farmers at agricultural extension service considering the SERVQUAL dimensions;
 - i) Tangibles
 - ii) Reliability
 - iii) Responsiveness
 - iv) Assurance
 - v) Empathy
- To determine the contribution of the selected factors that affect farmers' satisfaction (overall) to agricultural extension service.

1.4 Justification of the Study

The service quality is the evaluation of what was expected and what was experienced, by considering the image of an organization. Organization's acceptance will increase by increasing the efficiency and effectiveness in providing services. Service quality is more important and necessary due to increasing customer satisfaction. The theory of service quality, customer satisfaction and service loyalty are linked to each other. According to Nath and Zheng (2004) service quality is the measurement of an organization serves their customers and the outcome or the expectations of the perceived service. According to Shahin (2013) service quality is how a customer can perceive a service. According to Mohammad and Alhamadani (2011) "service quality as perceived by customers definitely indicates what is left of their pervious perception of the service quality and the level of their satisfaction with the current performance of the service". Customer satisfaction has been described by many academic researchers and finds out that for good service quality delivery is a must for customer satisfaction. Satisfying farmers' needs is very important for the extension service department, it has been observed that delivery of quality service is imperative for extension service providers to satisfy farmer's needs. Hence, it is essential to be aware of how the farmers satisfied with the quality of extension service. SERVQUAL instrument among several tools of

measuring service quality and farmers satisfaction is the most widely used tool. There are very few researches has been conducted with SERVQUAL instrument in agriculture sector to assess extension service quality and measuring farmers satisfaction in Bangladesh, so this paper focuses on the measurement of farmers satisfaction in the light of service quality provided by agricultural extension service. The findings of this research will be useful to those who are concerned with planning, implementation and evaluation of agricultural rural development programs. The knowledge and skills gained by the researcher in conducting this research will help to conduct similar other studies in the future.

1.5 Scope of the Study

The present study was designed to have an understanding on farmer's satisfaction at agricultural extension services as well as the application of SERVQUAL approach. The findings of the study will fit to the areas of Bangladesh where socio-economic, cultural and geographic condition do not differ much from those of the study area. Thus, the findings are expected to be useful to students, researchers, extension workers for further studies and the further use of SERVQUAL approach to measure the farmers satisfaction to any specific extension services. However, the overall findings of the study would enable the planners, policy makers and the extension providers to formulate extension policy and appropriate strategy to develop sustainability in agriculture and rural development.

1. SERVQUAL model can be used in various service setting/sectors including extension service which provides a basic skeleton that can be adapted to fit the specific attributes of any particular organization. It is applicable across different empirical context and various countries and cultural backgrounds.
2. SERVQUAL gap analysis approach seems a logical and straightforward concept and the questionnaire is also pre-described and can be adapted as required.

3. There are inconsistencies between farmers expectations and extension workers perceptions of those expectations. Public extension service provider may not always understand what features indicate high quality to farmers, what features a service must have in order to meet farmers' needs, and what the level of performance on those features should be to deliver high quality service. As a result, extension service quality perceptions may be affected. SERVQUAL gap analysis approach can be model to identify those gaps (Parasuraman *et al.*, 1985).
4. SERVQUAL approach can be used to find the gap between public extension service providers perceptions of farmer expectations and the actual specifications established for a service (Parasuraman *et al.*, 1985).
5. Although agricultural extension organizations may have formal standards or specifications for maintaining service quality, it may be difficult to adhere to these standards because of variability in employee performance (Parasuraman *et al.*, 1985). This will affect service quality from the farmer's point of view. SERVQUAL gap analysis approach can be model to identify those performance variabilities in public extension service providers.
6. SERVQUAL approach can be used to find the gap in the discrepancies between service delivery and what the organization promises through external communications and/or the absence of information about service delivery aspects. Which may affect farmers perceptions of service quality (Parasuraman *et al.*, 1985).
7. SERVQUAL approach can be regarded as a function of the gap between expected service and perceived service of the extension personnel (Parasuraman *et al.*, 1985).
8. Finally, SERVQUAL approach is tried and tested instrument which can be used comparatively for benchmarking purposes. It benefits from being a statistically valid instrument as a result of extensive field testing and refinement (Al Bassam & Al Shawi, 2010).

1.6 Assumptions of the Study

The researcher cherished the following assumptions keeping in mind while undertaking this study:

- i) The respondents included in the sample were capable of furnishing proper responses to the questions of the interview schedule.
- ii) Views and opinions furnished by the respondents were the representative views and opinions of the whole population of the study.
- iii) The responses furnished by the respondents were reliable.
- iv) The data collected by the researcher were free from bias.
- v) The researcher who acted as the interviewer was well adjusted to the social and cultural environment of the study area. Hence, the respondents furnished their correct opinions without any hesitation.
- vi) The respondents had almost similar background and seemed to be homogenous to a great extent.
- vii) The information sought by the researcher revealed the real situation to satisfy the objectives of the study.
- viii) The findings were useful in choosing the clients as well as for planning execution and evaluation the extension program.

1.7 Limitations of the Study

Due to various reasons, such as fund, time and other necessary resources availability to the researcher and from the practical point of view, to make the study meaningful and manageable, this study has following limitations:

- i. The study was confined in only 4 blocks of two union of Savar upazila in Dhaka district.
- ii. The study was restricted within the farmers who had some cultivable land under their own cultivation.

- iii. The young farmers were missing involuntarily who were very important respondents for conducting research.
- iv. There were many characteristics of the farmers in the study area but only five of them were selected for investigation.
- v. For information about the study, the researcher depended on the data furnished by the selected respondents during their interview with him.
- vi. Reluctance of the farmers to provide information was overcome by rapport establishment.

1.8 Definition of Important Terms

A researcher needs to know the meaning and contents of every term that he uses. It should clarify the issue as well as explain the fact to the investigator and readers. However, for clarity of understanding, a number of key concepts/terms frequently used throughout the study defined are interpreted as follows:

Age

Age of a respondent defined as the span of his/her life and is operationally measured by the number of years from his/her birth to the time of interviewing.

Level of Education

Education referred to the development of desirable knowledge, skill, attitudes, etc. of an individual through the experiences of reading, writing, observation and related matters.

Farm size

The farm size was defined as total amount of land owned by the respondents during the data collection period.

Annual Family Income

Annual income referred to the total annual earnings of all the family members of a respondent from agriculture, livestock and fisheries and other accessible sources (business, service, daily working etc.).

Extension media contact

It referred to an individual's (farmer) exposure to or contact with different communication media, source and personalities being used for dissemination of new technologies.

Tangibility

Tangibility refers the physical evidence of the service, for instance, the appearance of the physical facilities, tools and equipment used to provide the service; the appearance of personnel and communication materials in the service facility.

Reliability

Reliability means that the company delivers on its promises-promises about delivery, service provision, problem resolutions and pricing. It depicts the consistent performance, free of non-compliance, in which the user can trust.

Responsiveness

It is the willingness to help customers and provide prompt service. This dimension emphasizes attentiveness and promptness in dealing with customer's requests, questions, complaints and problems.

Assurance

Assurance is defined as employees' knowledge of courtesy and the ability of the firm and its employees to inspire trust and confidence.

Empathy

Empathy is related to whether the organization cares for the user and assists him in an individualized manner, referring to the ability to demonstrate interest and personal attention. Empathy includes accessibility, sensitivity and effort in understanding the needs of users. It's an individual attraction to customers or users.

CHAPTER II

REVIEW OF LITERATURE

In order to carry out this research works, review of literature giving the clear and concise direction for the researcher, review of literature relevant to the objectives of this study is discussed. This is mainly concerned with assessing agricultural extension service in rural development considering the SERVQUAL approach. Some researchers addressed various aspects of SERVQUAL approach, its uses towards different aspects regarding assessing agricultural extension service in rural development and its potentials. In this Chapter, the first section contains the concept of extension with principles and functions. The second section is concerned with service quality approach: SERVQUAL Model and farmers' perception towards agricultural extension service. The third section deals with the relationship between different characteristics of extension service quality and farmers' satisfaction and the fourth section deals with the conceptual framework of the study.

2.1 Concept of Extension Service

Research has found that the meaning of the term “extension” is well known and accepted by people who work in extension organizations and services but not well understood in the wider community. One reason is because there is no single definition of extension applicable to all situations. Extension can be applied in other fields such as: preventive health, family planning, environmental protection, recreation, waste disposal and so on (Roeling, 1988). Agricultural extension is a system of non-formal education for adults in rural areas which is based on relevant content derived from agricultural, social, and communication research synthesized into a body of concepts, principles and operational procedures. Many authors agree that Extension is a process of working with rural people in order to improve their living standard (Bembridge, 1989; Garforth and Oakley, 1985), accepted the concept of extension because it depends on context and interpretations that is given to it (Garforth and Oakley, 1985, Rivera et al, 2003; Bembridge, 1989, Van Den Ban and Hawkins, 1996). Furthermore,

extension is not a single, once off activity, but an intervention (Roeling, 1988). Extension is also seen as an applied science with specific principles to guide the practice. Few principles are discussed next.

2.1.1 Principles of extension service

Extension service is practiced throughout the world and it is guided by principles. Many authors (Bembridge, 1989; Garforth and Oakley, 1985, Van den Ban, 1999) have come with new principles however the difference is minimal except that the emphasis tended to focus on how these principles are applied. Extension works with people not for them: Extension works with rural people. The extension officer does not take decisions for the farmers, but guide them to take decisions to solve their problems. People have more confidence and projects tend to be sustainable because participants own the decision.

- ✓ **Extension is accountable to its clients:** Extension services and officers have two sets of masters. This is a difficult to maintain a balance, because on one hand they are accountable to their senior officers and to the government. The extension officers are expected to follow official policies and guidelines in their work. On the other hand, extension is the servant of rural people and it has the responsibility to fulfil the needs of the people in the area where it operates (Garforth and Oakley, 1985).
- ✓ **Extension is a two- way link:** Extension is not a one-way process in which the extension officer transfers knowledge and ideas to farmers and their families, but it should be a two-way flow of ideas, suggestions or even advice. Extension bridges the gap between the farmer and research (Garforth and Oakley, 1985).
- ✓ **Extension cooperates with other rural development organizations:** Extension services should work closely with other organizations found in the rural areas that provide essential services to the farmers. Such organizations include political, health services, support organizations, local schools and community development (Garforth and Oakly, 1985).

- ✓ **Extension works with different target groups:** Extension recognizes that not all farmers in one area will have the same problems, for example they will have differential access challenges to resources. Different groups cannot be offered a single package of advice suitable to all farmers different groups need to be identified and each be assisted to have program appropriate to each group.
- ✓ **Extension provide technical knowledge and information:** Extension provides technical knowledge and information to assist farmers to improve their farming. The information can be related to crops, animal, economics, and natural resources.

2.1.2 Functions of extension service

Extension service performs functions in the areas where it operates. Different authors have documented different kinds of functions (Garfoth and Oakly, 1985, Bembridge, 1989, and Van den Ban and Hawkins, 1996). Extension employs teaching and learning principle which is aimed at effecting behavioral change in the farmers, because some are tradition bound and therefore conservative. Extension is educational and informal in nature. The extension tasks involve the following:

- Developing knowledge, skills, favorable attitude among the farmers.
- Dissemination of useful and practical information related to agriculture as well as transferring the farmers' problems back to research institutions.
- Practical application of such knowledge to help farmers analyze their problems and effect improvement through carefully planned and organized program. The programs are participatory in nature.
- Helping farmers to gain managerial skills to operate in a commercial economy through training and guidance in problem – solving and decision making.
- Promoting project sustainability

2.1.3 Review of studies on farmers' perception on extension service quality

For agricultural extension education in our community to be significant, then the farmers' environment must be explored, harnessed and identified with useful opportunities for quality extension service. Hackman and Wageman (1995) stated that "uncontrolled variance in process or outcomes is the primary cause of quality problems". Quality is the direct result of work processes within the organization and, in the area of Extension, it relates to aspect of programming and delivery of educational interventions. Clients or Customer Satisfaction Survey (CSS) are considered important assessment tool for measuring program quality (Hatry, 1999; Ladewig, 1999; Rossi *et al.*, 2007). When a client is very satisfied, it connotes that the organization offering the service is performing fine and thus enjoys very high level of loyalty (Terry & Israel, 2004). The understanding of farmers experience with Extension measures another hidden dimension of program quality.

There is a need to provide agricultural extension workers with capacity, knowledge, and skills to assist communities to deal with challenges of increased agricultural production. However, to keep pace with these rural agriculture and development, the delivery of quality extension services become dependent upon two major elements:

- relevant information and technology and
- quality teaching approach to bring about the desired change (Zainuddin & Teh, 1982). It is important to assess the perception of farmers on the quality of extension support services in the study area.

The perception of quality and satisfaction by farmers from extension service quality rating has been diverse among researchers since 1980 (Allen & Rao, 2000). Farmers who are regarded as customers in the delivery of extension program desire quality benefits from the outcome of extension services. The extension officers are accountable for farmers' level of satisfaction, quality and relevance of educational learning programs. Service quality focuses on

evaluation that echoes the customer's perception of reliability, assurance, responsiveness, empathy and tangibility (Wilson, *et al.*, 2008). According to Parasuraman *et al.* (1985), when service quality is perceived as high, then it will invariably lead to growth in customer satisfaction. However, various researchers accepted the idea posited by Parasuraman *et al.* (1985) and they recognized that "Customer satisfaction is based upon the level of quality service that is provided by the service providers" (Saravanan & Rao, 2007, Lee *et al.*, 2000). In a study by Kuo (2003) on service quality of community websites using Factor analysis, t-test, and Pearson correlation analysis for analyzing the data collected from respondent in Taiwan; one of the results among others was that "on-line quality and information safety is positively related to the overall service quality, customer satisfaction, and loyalty". Other researchers like Wilson *et al.* (2008) revealed that the bases of customer satisfaction are a function of service quality, price, personal and situational factors. Several researchers also examined the connection between total quality management and customer satisfaction as customer satisfaction is also based upon the level of quality service provided by an organization (Lee *et al.*, 2000).

Positive farmers feedback portrays that an establishment is "on track" and may adore great levels of loyalty (Terry & Israel, 2004). On the other hand, framers' feedbacks also assist in identifying if lapses exist in the extension service process adopted by extension practitioners. A good extension program entails the setting out of definite objectives which is the basic for describing work process and for measuring conformity in implementation. Thus, quality is perceived as a direct result of work processes occurring in an industry. In the environment of Extension, quality relates to programming and delivery of services with some dimensions. Numerous studies have shown, however, that gender issues, age and education (Oly Ndubisi, 2006; Anderson, *et al.*, 2008) have an influence on customer satisfaction and loyalty. In another study carried out by Mittal and Kamakura (2001); on service satisfaction of male and female auto-motor industry, found that female customers reported greater satisfaction with services offered than their male counterpart. Several other studies also posit that the

ground for customer satisfaction varies between gender, age, annual income, extension media contact and training exposures (Anderson, *et al.*, 2008; Voss & Cova, 2006).

2.2 Service Quality Approach: SERVQUAL Model

There are many different definitions of what is meant by service quality. The most common definition used to define service quality is the extent to which a service meets farmers' needs or expectations (Lewis and Mitchell, 1990; Dotchin and Oakland, 1994(a) & 1994(b); Asubonteng *et al.*, 1996; Wisniewski and Donnelly, 1995). Service quality can also be defined as the difference between customer expectations of service and perceived service. If expectations are greater than performance, then perceived quality is less than satisfactory and the result is customer dissatisfaction (Parasuraman *et al.*, 1985; Lewis and Mitchell, 1990).

Lewis and Booms (1983) pioneered service quality research by defining service quality as a "measure of how well the service level delivered matches the customer's expectations". This was further advanced by Parasuraman *et al.*, (1985), who conceptualized service quality as the gap between consumers' expectations and perceptions of the actual service performance. To date substantial research attention has been devoted to defining, modeling, and measuring service quality. Services scholars have thus far developed various definitions of services. In the 1990s, it was proposed that services differ to goods as they are more often performances or experiences provided via equipment or personnel (Furrer *et al.*, 2000).

SERVQUAL is an analytical tool, which can help managers to identifying the gaps between variables affecting the quality of the offering services (Seth, *et al.*, 2005). This model is the most used by marketing researchers and scientists, although it is an exploratory study and does not offer a clear measurement method for measuring gaps at different levels.

The SERVQUAL service quality model was developed by a group of American authors, Parasuraman, Valarie Zeithaml and Len Berry, in 1988. It highlights the main components of high-quality service. The SERVQUAL authors originally identified ten elements of service quality, but in later work, these were combined into five factors: reliability, assurance, tangibles, empathy and responsiveness, creating the acronym RATER.

Farmers will evaluate service quality and the outcome will be in range of either satisfaction or dissatisfaction concerned with assessing agricultural extension service in rural development (Swartz and Brown 1989).

After this refinement, the following definitions were used:

- Tangibility: concerns the physical facilities, equipment, personnel and materials that can be perceived by the five human senses. (Parasuraman *et al.*, 1988)
- Reliability: translated into the ability of the supplier to execute the service in a safe and efficient manner. It depicts the consistent performance, free of non-compliance, in which the user can trust. The supplier must comply with what was promised, without the need for rework. (Parasuraman *et al.*, 1988)
- Assurance: it is identified as the courtesy, knowledge of employees and their ability to convey trust. (Parasuraman *et al.*, 1988)
- Responsiveness: refers to the availability of the provider to attend voluntarily to users, providing a service in an attentive manner, with precision and speed of response. It concerns the availability of employees of the institution to assist users and provide the service promptly. (Parasuraman *et al.*, 1988)
- Empathy: related to whether the organization cares for the user and assists him in an individualized manner, referring to the ability to demonstrate interest and personal attention. Empathy includes accessibility, sensitivity and effort in understanding the needs of users. (Parasuraman *et al.*, 1988)

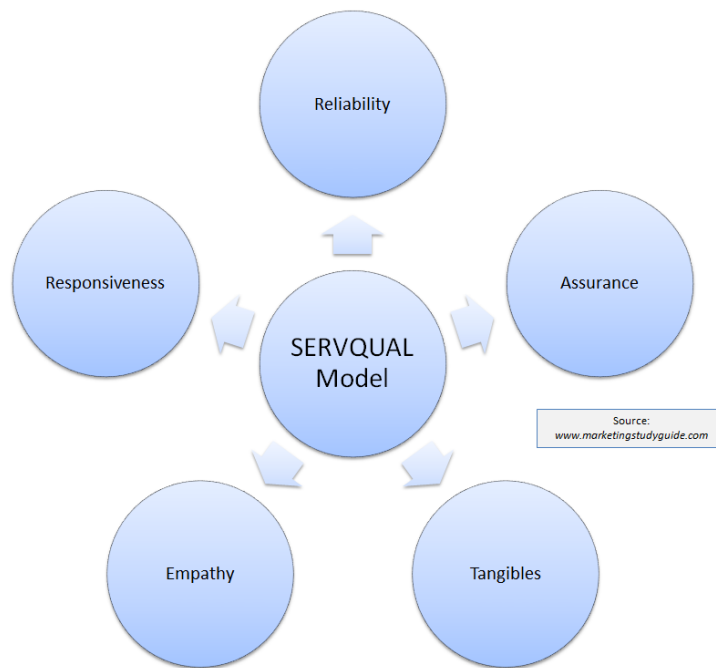


Figure 2.1 SERVQUAL Model (Parasuraman, *et al.*, 1988)

Literature review assisted to get for measuring service quality. Tangibility is measured by modern looking equipment, the physical facilities, neat-appearing employees and materials associated with the service. Responsiveness is measured by timing of services, prompt service, willing to help and never be too busy to respond to farmers' requests. Empathy is measured by individual attention, convenient operating hours, farmers' personal attention, customer's best interests at heart and understanding of the specific needs of their farmers. Assurance is measured by the behavior of employees, safe transactions, employees courteously with farmers and knowledge to answer farmers' questions. Empathy is measured by farmers individual attention, convenient operating hours, personal attention to farmers, customer's best interests at heart and understanding of specific needs of their farmers. Construct, variables are derived from literature review and adopted from Parasuraman, *et al.* (1985).

Researchers have continued to use SERVQUAL instruments. Van Dyke *et al.* (1997) employed SERVQUAL in an Information System (IS) context, while Banwet and Datta (2002) measured Information Technology (IT) service quality

in a library service, as did Landrum and Prybutok (2004). Still, some researchers question the appropriateness of using SERVQUAL as IS or IT context; others disagree about whether the service quality should be the difference between expected and perceived service. Parasuraman *et al.* (1988) stated that since service quality depends on the relationship of customer expectations with customer perceptions, it is appropriate to calculate service quality by subtracting expected from perceived service. One then achieves an overall measure of service quality by averaging the scores of all items (Brown *et al.* 1993).

The SERVQUAL instrument uses the disconfirmation approach within the gap between customer's (farmer's) expectations and the actual performance of the service promised is measured. An alternative approach to this could be the SERVPERF which is the measurement of the customer's perception of the performance of the service offered by a provider. This is the assessment of the adequacy of the performance of the service and its quality (Cronin and Taylor, 1992; Peter *et al.*, 1993; Debholkar *et al.*, 2005, Brown *et al.*, 1993 and Bebeko, 2000).

Since its introduction and modification, the SERVQUAL instrument has been applied and validated in a variety of service settings. However, the appropriateness of the five dimensions of SERVQUAL in certain service contexts has been questioned. The instrument has also been criticized because it necessary to measure expectations and perceptions separately (as a gap score), which is regarded by some critics as inappropriate in terms of scale reliability and questionnaire length. As a result of these criticisms, Cronin and Taylor (1994) proposed a perception-only measure of service quality (known as, SERVPERF).

Cronin and Taylor (1992) measured service quality. This study found the conceptualization and measurement of service quality and the relationships between service quality, consumer satisfaction, and purchase intentions. The results suggest that a performance-based measure of service quality may be an improved means of measuring the service quality construct; service quality is an

antecedent of consumer satisfaction; consumer satisfaction has a significant effect on purchase intentions, and service quality has less effect on purchase intentions than does consumer satisfaction. Carman (1990) studied about consumer perceptions of service quality. This study measures the perceived quality of a service situation.

Service quality dimensions by asking two questions; what and how it is delivered (Gronroos 1982). The answer to the former, it is described as technical quality and the answer to the latter is named as interactive quality. The manner in which service is delivered, i.e., interactive quality, is more important since it influences to a greater extent in creating service quality perceptions (Gronroos 2001).

Gronroos (1984) studied about a service quality model. This study is based on test of a sample of business executives, which describes how the quality of services is perceived by farmers. Study concludes that quality dimensions are interrelated and that the importance of image should be recognized.

2.2.1 Review of past studies relating to the dimension of service quality approach

Consumer perception of service quality is a complex process. Therefore, multiple dimensions of service quality have been suggested (Brady and Cronin, 2002). One of the most popular models, SERVQUAL, used in service marketing, was developed by Parasuraman *et al.*, (1985, 1988). SERVQUAL is based on the perception gap between the received (perceived) service quality and the expected service quality, and has been widely adopted for explaining consumer perception of service quality.

Zeithaml *et al.* (1996) have referred to ten dimensions of service quality in their primary researches. But, in their further researches, they found a strong correlation among those dimensions. Thus, they combined these dimensions and applied the fivefold dimension of Reliability, Responsiveness, Assurance, Empathy and Tangibles as a basis for making a tool for testing the service quality, known as SERVQUAL. In their researches, they emphasize that

SERVQUAL is a lasting and reliable scale of service quality (Parasuraman et al., 1994). They also said that this tool is applicable in an extensive spectrum of service domains such as financial institutions, libraries, hotels, medical centers and..., although some of its components should be rephrased, or more components should be added to it. Many researchers have tried to use this tool in different service domains.

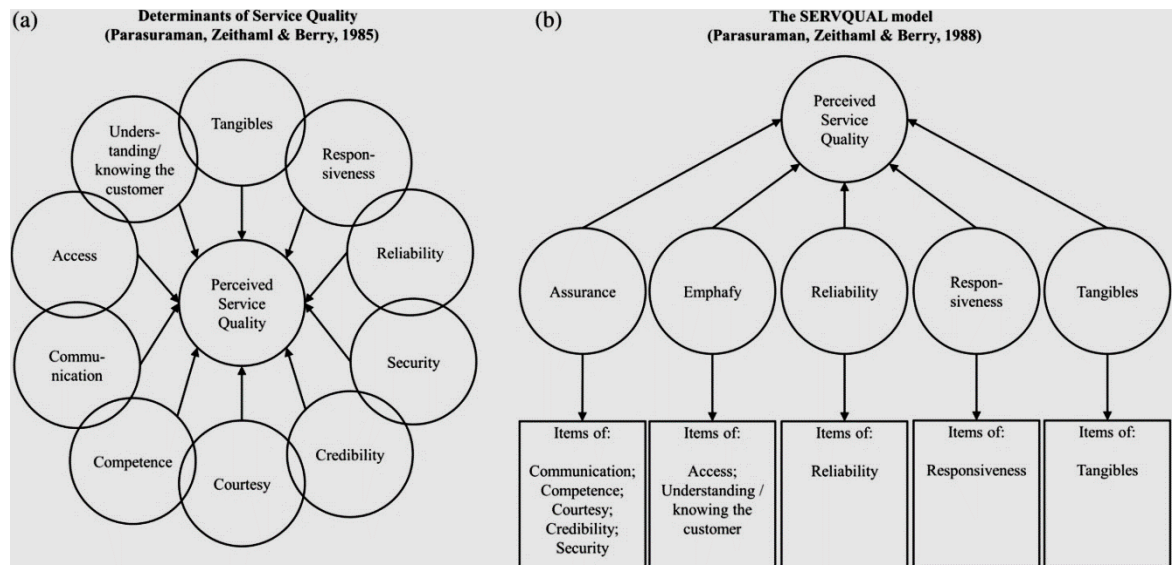


Figure 2.2 Original SERVQUAL Model proposed by Zeithaml et al., 1985

The SERVQUAL has been used by many researchers to measure quality of service in the service industries like aviation, banks, hotels, hospitals, fast foods, retail stores, dry cleaning (Babakus and Boller 1992; Babakus & Mangold, 1992; Carman 1990; Finn & Lamb, 1991; Ford *et al.*, 1974; Hayward and Botha, 1995; Headley and Bowen, 2000; Das et al. (2008); Wong & Sohal (2002); Mehta et al. (2000), Bloemer et al. (1998), Christo & Terblanche (1997) White, 1994; Woodside *et al.*, 1989;). Use of SERVQUAL to study the quality of Agriculture sector, especially in Bangladesh has not been very common. This study has adopted the original SERVQUAL model developed by Parasuraman et al (1988) as this is a pioneering study. Based on the results of this study the questionnaires should be modified for further research.

SERVQUAL is based on the proposition that service quality can be measured as the gap between the service that farmers expect and the performance they

perceive to have received. Respondents rate their expectations of service from an excellent organization, and then rate the performance they perceive from a specific organization. Service quality is calculated as the difference in the two scores where better service quality results in a smaller gap (Landrum *et al.*, 2008).

Tangibles

Tangibles are the images of the facilities, equipment, machines, attitude of staffs, materials, manuals, and information systems of the bank (Parasuman *et al.*, 1985). In others words, the tangibles refer to the effect of physical facility, equipment, personnel and communication materials on customer (Sureshchandar *et al.*, 2002). The atmosphere also called services capes influences directly both employees and farmers in physiological, psychological, sociological, cognitive and emotional ways (Sureshchandar, 2002).

Reliability

Reliability shows the ability to provide services accurately, on time, and credibly (Parasuman *et al.*, 1985). This requires consistency in the implementation of services and respects commitments as well as keeps promises to farmers.

Assurance

This element creates credibility and trust for farmers, which is considered through professional services, excellent technical knowledge, attitude courtesy, and good communication skills, so that farmers can believe in the quality of services. (Ravichandran *et al.*, 2010)

Responsiveness

This criterion measures the ability to solve the problem fast, deal with farmers' complaint effectively and the willing to help farmers as well as meet the farmers' requirements (Parasuman, *et al.*, 1988).

Empathy

Empathy is the caring, consideration, and the best preparation for farmers, so that they can feel as ‘guests’ of the service and are always welcome at any times, anywhere. Human factors are the core of this success and the more caring the extension workers gives to farmers, the more farmer’s understanding increases. (Ravichandran *et al.*, 2010)

The five SERVQUAL Dimensions can be briefly describes as follows:

Table 2.1 SERVQUAL 5 dimensions in precise definition

SERVQUAL Dimensions	Definition
Tangibles	Physical facilities, equipment and appearance of personnel.
Reliability	Ability to perform the promised service dependably and accurately
Responsiveness	Willingness to help customers (i.e., farmers) and provide prompt service.
Assurance	Knowledge and courtesy of employees (i.e., extension officers/ workers) and their ability to inspire trust and confidence.
Empathy	Caring and individualized attention that the firm provides to its customers (i.e., farmers).

(Mensah, *et al.*, 2012)

2.2.2 Applications of SERVQUAL model

It can be said that SERVQUAL is multiple – item scale with good reliability and validity that help farmers to have better understanding evaluation the services expectations and perception of customer and improve the services as well. Parasuraman *et al.* (1988) claimed that ‘SERVQUAL provides a basic skeleton through its expectations/perceptions format encompassing statements for each of the five service quality dimensions. The skeleton, when necessary, can be

adapted or supplemented to fit the characteristics or specific research needs of a particular organization’.

SERVQUAL shows its best valuation when it is used to track service quality trends as well as in combination with other forms of service quality measurement. Moreover, SERVQUAL is used to evaluate the service’s quality according to the five services dimensions by averaging the difference scores on items making up the dimensions (Parasuraman *et al.*, 1985). Similarly, an overall measure of service quality in the form of an average score across all five dimensions. Determining the relative importance of the five dimensions affecting farmers’ overall quality perception is one potential application of SERVQUAL. Another application of SERVQUAL is used in categorizing a farmer into several perceived – quality segments on the basis of their individual SERVQUAL scores (Parasuraman *et al.*, 1988).

2.3 Review of Literature Related to Relationship Between Different Characteristics of Extension Service Quality and Farmers’ Satisfaction

There are many different factors influencing farmers satisfaction which are friendly employees, courteous employees, knowledgeable employees, helpful employees, service quality, good value and quick services (Hokanson, 1995).

In order to gain the farmers satisfaction, first of all extension workers have to understand and satisfy farmers needs and wants (La Barbera and Mazursky, 1983). According to Kotler (2003) customers’ needs illustrate the felt deprivation of a customer. Meanwhile customers’ wants refer to the form taken by human needs as they are shaped by culture and individual personality.

Singh & Spreng, (1993) indicated that farmers satisfaction affects positively and directly to an organization’s accountability. To some extents, the consequences of a lack of satisfaction need to be taken into account.

Farmers’ satisfaction is often defined as the farmers’ post-service comparison between pre-service expectation and performance received (Oliver, 1980; Zeithaml *et al.*, 1993). The relationship between service quality and farmers’

satisfaction has been discussed in numerous previous papers during the past decade. Many researchers and academicians highlighted the importance of customer (farmers') satisfaction. They stated that customer (farmers') satisfaction had a positive effect on organization's development. It is also considered as the outcome of perceived performance of a service (Biljana & Jusuf, 2011). In other words, service quality influences farmers' satisfaction and at the same time farmers' satisfaction contribute quality (Jun and Cai, 2003). According to Hansemark and Albinson (2004), satisfaction is an overall customer attitude or an emotional reaction to the difference between what customers anticipate and what they receive, regarding the fulfillment of some needs, goals or desire.

In contrary, Liljander & Strandvik (1993) said that experience is not needed for evaluating service quality but service can be evaluated on the basis of the knowledge about service provider where satisfaction is an inner view, resulted from customer's own experience from the service. Finally, several researches have been done on the relation between service quality and satisfaction: findings of some of these researches show that satisfaction results in service quality (Parasuraman *et al.*, 1988). Also, the research conducted by Sureshchandar *et al.* (2002) shows that, there is a two-way relation between satisfaction and service quality.

2.4 Conceptual Framework of The Study

It is evident from the past studies that every occurrence or phenomenon is the outcome of a number of variables, which may, or may not be interdependent or interrelated with each other. In other words, no single variable can contribute wholly to a phenomenon. Variables together are the cause and the phenomenon are effect and thus, there is cause effect relationship everywhere in the universe. The conceptual framework was kept in mind framing the structural arrangement for the variables. This study was concerned with the farmers' perception on agricultural extension service in rural development. It is impossible to deal with all characteristics in a single study. It was therefore, necessary to limit the

characteristics, which include age, education, land size, agricultural experience, annual income, extension media contact and training experience. The conceptual model of the study has been presented in Figure 2.2.

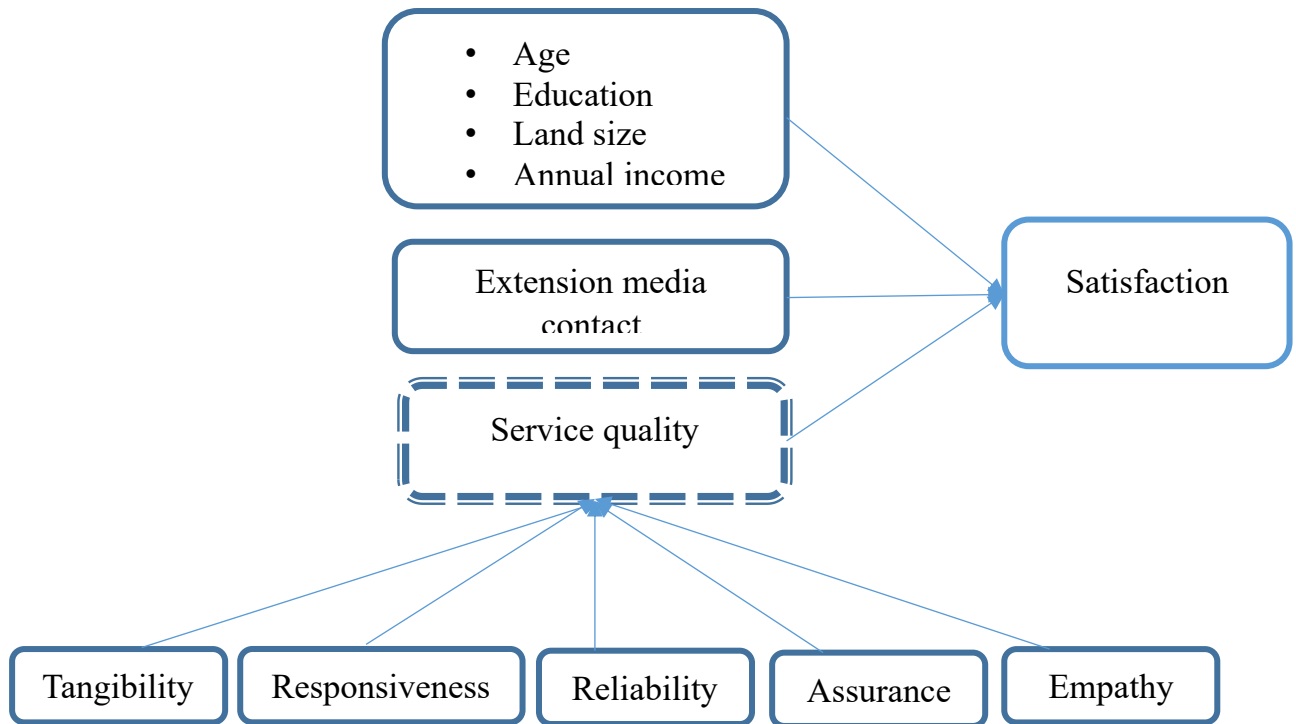


Figure 2.2 Conceptual framework of the study

CHAPTER III

METHODOLOGY

Methodology is very important in any research which deserves a very careful consideration in conducting any scientific research. Importance of methodology and procedure in conducting any research cannot be undermined. Methodology enables the researcher to collect valid and reliable information and to analyze them properly to arrive at correct decisions. Keeping this point in view, the researcher took utmost care for using proper methods in all the aspects of this piece of research work. Methods and procedures followed in conducting this study has been described in this chapter. The basic materials for conducting any research are the unbiased information and facts. The purpose of this chapter is to describe the study area, research design and sampling procedure.

3.1 Locale of the Study

Savar Upazila is not so far from Dhaka district, has 12 unions and each union has 3 blocks, total 37 blocks. Among 12 unions, Hemayetpur and Pathalia unions have been purposively selected as the study area for this research. While Hamayetpur union is famous for its vegetable cultivation, most of the farmers at Pathalia union are rice farmer and doing cattle farm and business. Purposively the two unions have been selected and 4 blocks of mentioned 2 unions have been randomly selected as the study area to avoid biasness.

3.2 Selection of Sample and Sampling Technique

The study concerned about assessing extension service and farmers satisfaction. So, the farmers of the randomly selected blocks, who directly getting extension service from DAE were considered to be the population of the study. List of the farmers of that union were prepared by the cooperation of SAAO of the respondent blocks, population of that area was 1760. While the researcher performed data collecting procedure, DAE also was conducting a survey for their new service “Krishi Batayon”. From the entire population out of 1760 farmers, 120 farmers were interviewed based on their availability and researcher’s

limitation to collect further data. So, 120 farmers from 4 blocks were interviewed for this study. The 120 farmers were proportionately selected from 4 blocks. Respondents were informed about the study purpose beforehand to the data collection and seek for their consent. Data collection was conducted only once they willingly agreed to participate in the survey as a voluntary basis.

Table 3.1 Population and sample of the study area

Upzilla	Union		Population size	Sample size	Pretest sample
Savar	Hemayetpur	Block A	450	28	4
		Block B	485	32	
	Pathalia	Block A	435	35	2
		Block B	390	25	
Total			1760	120	6

3.3 Instruments for Data Collection

In order to collect relevant data from the respondents an interview schedule was prepared keeping the objectives of the study in mind. Both open and closed form questions were used in the questionnaire. Simple and direct questions were included in the schedule to ascertain experimental and focal variables. The interview schedule was pre-tested with 6 farmers of the study area. On the test experiences, necessary additions and modifications of the schedule were done. Appropriate scales were used to operationalize some characteristics of the farmers. The interview schedule was prepared both in English and Bengali. A copy of the interview schedule in English version is presented in the Appendix-I.

3.4 Collection of Data

Data were collected personally by the researcher herself through face to face interview from the selected respondents. Interviews were usually conducted with the respondents in their own working places/house. While starting interview with any respondent the researcher took all possible care to establish rapport with him/her so that s/he did not hesitate to furnish proper responses to the questions and statements in the schedule. However, if any respondent failed to understand any question, the researcher took care to explain the issue. The researcher received excellent co-operation from the respondents and others concerned during the time of interview. The entire process of collecting data took place during 10 September-25 September, 2019.

3.5 Variables of the Study

In a descriptive social research, the selection of variables constitutes an important task. Success of a research to a considerable extent depends on the successful selection of the variables. In this connection, the researcher looked into the literature to widen her understanding about the nature and scope of the variables involved in the research studies. Fox (1991) stated variable as any measurable characteristics, which can assume varying or different values in successive individual cases. Before selecting variables, the researcher herself visited the study area and talked to the local farmers intimately and she was able to observe the various factors of the farmers, which might relationship with the assessment of agricultural extension service in rural development. The researcher selected 5 characteristics such as age, education, farm size, annual family income, agricultural extension contacts to measure farmers' satisfaction. In addition, to assess service quality the SERVQUAL 5 dimensions were taken in account as per the SERVQUAL model as tangibles, reliability, responsiveness, assurance and empathy.

3.6 Measurement of Variables

In order to conduct the study in accordance with the objectives, it was necessary to measure the selected variables. The selected characteristics of the farmers constituted the variables of the study. To keep the research manageable, seven experimental variables were selected for the study. The procedures of measurement of the selected variables were as follows:

3.6.1 Age

The age of individual is one of the important factors pertaining to his personality make up which can play an important role in his adoption behavior. The age of respondent growers was measured by counting the actual years from his/her birth to the time of interview on the basis of his statement. It was measured in terms of actual years. No fraction of year was considered. A score of one (1) was assigned for each years of age. Age was placed in item no. 1 of the interview schedule (Appendix-I).

3.6.2 Education

Education was measured in terms of grades of formal education (school/college) completed by an individual. It was expressed in terms of years of schooling. A score of one (1) was assigned for each year of schooling completed (item no. 2, Appendix-I). For example, if the respondent passed the class up to a level, his education score was given as his/her level of education, if he passes the final examination of class seven, his education score was given as 7. If the respondent did not know how to read and write or even can't sign his name, his education score was given as "0" (zero). A score of 0.5 was given to that respondent who could sign his/her name only.

3.6.3 Farm size

Farm size of a respondent was measured by the land area possessed by him. Data obtained in response to questions under item No. 3 of the interview schedule formed the basis for determining the farm size of the respondent. The respondent

has given information for their farm size in local measurement decimal unit. Finally, it was converted into hectare and was considered as the land size score of a respondent. This variable appears in item number three (3) in the interview schedule as presented in Appendix-I.

3.6.4 Annual income

Annual family income of a respondent was measure in taka on the basis of his/her total yearly earnings from agriculture and other sources in which the respondent was involved. The price of the other enterprises (i.e., Livestock: cows, goats, poultry, fish etc.) was also added to the earnings. Earnings of each respondent from different sources (like service, business and labor) were also included in calculating the income. Yearly earnings from farming and other sources were also added together to obtain total income of a respondent. A score of one (1) was given for each one thousand takas. This variable appears in item number four (4) in the interview schedule as presented in Appendix-I.

3.6.5 Agricultural Extension Contact

Extension contact of a respondent was measured by the extent of contact with 10 different extension media, with five alternative responses as ‘regularly’, ‘often’, ‘occasionally’, ‘rarely’ and ‘not at all’ basis and scores were assigned as ‘4’, ‘3’, ‘2’, ‘1’ and ‘0’ respectively. The extension contact scores of a respondent were measured by summing up his/her scores for contact with all the selected media. Thus, possible extension contact score could range from zero (0) to 40, where zero (0) indicated no extension contact and 40 indicated the highest level of extension contact. Interviewer asked every respondent to indicate the extent of his/her contact with each of the selected media.

3.6.6 SERVQUAL dimension

In order to measure the service quality of extension service using SERVQUAL model (5 dimensions- tangibles, reliability, responsiveness, assurance and empathy), **weighted score** method was used which was very popular for measuring Service Quality all around the world. Hirmukhe (2012) & Mensah,

O. *et al.*, (2012) also used weighted score method for measuring SERVQUAL dimensions. Weighting depends upon allocation of 100 points among the five SERVQUAL categories. A modified use of the questionnaire (SERVQUAL model is predicated on a set 22 or 23 elements grouped around the five dimensions) was to limit it to just the total 23 or average perception score. This was called SERVPERV. Weights can be applied here as well.

Steps to Obtain Unweighted SERVQUAL Score

Step 1. Using the SERVQUAL instrument, respondents were asked to score for each of the 23 perception questions. For each question researcher used 5-point Likert-scale where the respondents are asked to select the most appropriate number that corresponds to extent to which they agree with a statement. The scales in this survey questions are 1 to 5 with “1” denoting “strongly disagree” and “5” denoting “strongly agree”. The original scale of Likert-type scale was developed by Rensis Likert.

Step 2. Researcher obtained an average score for each dimension by assessing the perception scores for each of the statements that constitute the dimension and dividing the sum by the number of statements making up the dimension.

Step 3. In Table 3.2, researcher transferred the average dimension SERVQUAL scores (for all five dimensions) from the SERVQUAL instrument and sum up the scores and divided it by five to obtain the unweighted measure of service quality.

SERVQUAL 5 Dimensions with 23 questions appeared in item number six (6) at part B in the interview schedule as presented in Appendix-I.

Table 3.2 Calculations to obtain unweighted SERVQUAL Score

Average Tangibles score	
Average Reliability score	
Average Responsiveness score	
Average Assurance score	
Average Empathy score	
Total	

Average (=total/5) Unweighted SERVQUAL Score -----

Steps to Obtain the Weighted SERVQUAL Score

Step 1. In order to obtain weighted SERVQUAL score, respondents were asked to allocate points summing up to 100 among the five dimensions according to the relative importance they place on each of them. Table 3.3 below shows the allocation of the points among the dimensions.

Step 2. The weighted SERVQUAL score is achieved by multiplying the average scores of each dimension (in table 3.2) by their weights (in table 3.3).

Step 3. We added the weighted SERVQUAL scores for each dimension to obtain the overall weighted SERVQUAL score (table 3.4).

Table 3.3: SERVQUAL importance weights

Sl. No	Features	Points
1.	The appearance of agricultural extension office physical facilities, equipment, personnel, and communication materials	
2.	Agricultural extension service has ability to perform the promised service dependably and accurately	
3.	Agricultural extension service willing to help farmers and provide rapid service	
4.	The knowledge and politeness of agricultural extension personnel and their ability to convey trust and confidence	
5.	The caring, individual attention agricultural extension service provides to farmers	
Total		100 points

Table 3.4: SERVQUAL weighted scores

SERVQUAL Dimension	(Score from table 3.2) X (Importance weight from table 3.3)	Weighted score
Average Tangible		
Average Reliability		
Average Responsiveness		
Average Assurance		
Average Empathy		
Total		

Average (=total/5) Weighted SERVQUAL Score -----

3.6.7 Farmers' Satisfaction

Satisfaction of respondents was measured by using bipolar scale ranging from five statements- 'dissatisfied', 'somewhat dissatisfied', 'neither satisfied nor dissatisfied', 'somewhat satisfied', 'satisfied'. Scores were provided as follows:

Items	Score Assigned
Dissatisfied	1
Somewhat dissatisfied	2
Neither satisfied nor dissatisfied	3
Somewhat satisfied	4
Satisfied	5

This variable appears in item number seven (7) in the interview schedule as presented in Appendix-I.

3.7 Processing of Data

The collected raw data were examined thoroughly to find out the errors and omissions. For this, the researcher made a careful scrutiny of the completed interview schedule to make sure that they were entered as complete as possible and well arranged to facilitate coding and tabulation. Very minor mistakes were detected by doing this, which were corrected promptly having consulted with his research supervisor, the investigator prepared a detailed coding plan. All responses in the interview schedule were given numerical coded values. Local units were converted into standard units. All the individual responses to the questions of the interview schedule were transferred to a master sheet to facilitate tabulation. In case of qualitative data; appropriate scoring technique was followed to convert the data into quantitative forms. These were then tabulated according to the objectives of the study. For describing the various independent and dependent variables, the respondents were classified into various categories and arranged in simple table for description. These categories were developed

for each of the variable by considering the nature of distribution of the data and the general consideration prevailing in the social system. The procedure and the effect of categorization of a particular variable were discussed while describing the variable in the subsequent sections.

3.8 Statistical Analysis

The data after collection were coded, compiled, tabulated and analyzed in accordance with the objectives of the study. Various statistical measures such as range, mean, percentage, standard deviation was used in categorizing and describing the selected personal characteristics of the respondents. For clarity of understanding tables were used for presentation of data. Hierarchical Regression Analysis test was used to explore the relationships among variables. Throughout the study five percent (0.05) level of probability and one percent (0.01) level of probability were used to reject any null hypothesis.

CHAPTER IV

RESULTS & DISCUSSION

This Chapter compiles with the data that is collected by interviewing the respondents and have been measured, treated, tabulated and statistically analyzed according to the objectives of the study, which is thoroughly called result and discussion. The findings of the study and interpretations of the results have been presented in this Chapter. Logical argument, appropriate interpretation and to the point explanation were presented to make the research findings comprehensible, reliable and widely admittable. Results and discussion have been presented under the following sub-headings:

- Selected characteristics of the respondents (i.e., farmers)
- SERVQUAL dimensions and its implementation
- Farmers satisfaction in extension service
- Contribution of SERVQUAL dimension on farmers satisfaction as well as assessing extension service

4.1 Selected Characteristics of the Respondents and Descriptive Statistics

In the following study, five characteristics of the farmers were considered for farmers' condition investigation. The characteristics included: age, education level, farm size, annual income, extension media contact. Measuring unit, range, mean and standard deviations of those mentioned characteristics have been described in a summery in Table 4.1. In this section, selected characteristics of the farmers which are assumed to be related for assessing extension service quality and measuring farmers satisfaction at extension service. Characteristics based on individuals' behavior are varied from farmer to farmer.

Table 4.1 The salient features of the selected characteristics of the farmers

Characteristics	Frequency	Percent	Observed Range	Mean	Standard deviation
Age (years)					
Middle age (36-50)	39	32.5	38-66	53.18	6.93
Old age (>50 years)	81	67.5			
Level of education (schooling years)					
Can't read & write (0)	16	13.3	0-10	2.94	3.29
Can sign only (0.5)	46	38.3			
Primary education (1-5)	30	25.0			
Secondary education (6-10)	28	23.3			
Farm size (hector)					
Small farm (up to 1 ha.)	54	45	0.51-3	1.25	0.53
Medium farm (1.1 to 2 ha.)	58	48			
Large farm (2.1 to 3 ha.)	8	7			
Annual income ('000' BDT)					
Low income (Up to 3.5 lakh)	9	7.5	300-1600	669.97	327.60
Middle income (>3.5 to 7 lakh)	71	59.2			
High income (>7 lakh)	40	33.3			
Extension contacts (score)					
Occasionally (up to 10)	4	3.3	10-18	14.18	1.89
Often (11 to 15)	84	70.0			
Regularly (above 15)	32	26.7			

4.1.1 Age

According to the Ministry of Youth and Sports, Bangladesh (2020) age was categorized as “young aged” (up to 35), “middle aged” (36-50) and “old aged” (above 50 years). However, two categories were found such as “middle aged” (36-50 years) and “old aged” (above 50 years). Results contained in Table 4.1 revealed that the old aged farmers comprised the highest proportion (67.5%) followed by middle aged category (32.5%). Agriculture and manufacturing are the two major economic sectors in Savar upazila. Bangladesh Export Processing Zone is located in this upazila. Educated and young members of family were found to be mostly involved in business or manufacturing factories in that locality compare to unemployed older members of family who found to be involved in agriculture. That is why young age frames were not found (up to 35 years) in the sample. So, researcher found age of the respondents ranged from 38 to 66 years, an average of 53.18 with the standard deviation of 6.93 yrs. According to Lavis and Blackburn (1990) and Terry and Israel (2004) older farmers are more satisfied with the services provided by extension than younger farmers which may be related to their farm experience.

4.1.2 Education level

The score of education level of a respondent was measured by the level of his/her formal education i.e., the number of class passed by him/her. The education score of the respondents ranged from 0 to 10, the average being 2.94 with the standard deviation 3.29. Based on their level of education, the respondents were organized into four categories such as- “Can't read and write” (0), “Can sign only” (0.5), "Primary education" (1-5), "Secondary education" (6-10). Information shown in the Table 4.1, presents that respondent under ‘can sign only’ category constitute the highest proportion (38.3%) followed by ‘primary education’ category (25.0%), then ‘secondary education’ category (23.3%). On the other hand, ‘can't read and write’ category constitute lowest proportion (13.3%). Education enlightens the possible outlook of farmers and develops their competence to examine any situation related to agricultural production or perceived extension

service. Aphunu and Otoikhian, (2008) stated that, being literate is necessary in effective extension communication. The better the educational status, the better they wisely utilize extension services (Hegde, 2005). Moreover, Terry and Israel (2004) found that the higher clients' education level the greater their likelihood of satisfaction in extension service.

4.1.3 Farm size

Observed farm size of the respondents varied from 0.51 to 3 hectares, the average being 1.24 of hectares with the standard deviation was 0.52. Based on their farm size, the respondent farmers were classified into three categories as suggested by DAE which is shown in Table 4.1, presents that the farmers having medium farm constitutes highest proportion 48.0 percent while the farmers having small farm constitutes 45.0 percent and the rest 7.0 percent of farmers having larger farm. The average farm size of the farmers of the study area (1.25 hectare) was higher than that of national average (0.68 hectare) of Bangladesh (BBS, 2017).

4.1.4 Annual income

Annual family income of the farmers ranged from BDT 300 to 1600 thousand, the average be being 669.97 thousand with the standard deviation of 327.60 thousand. On the basis of their annual income scores, the respondent farmers were divided into three categories. The distribution of the farmers according to their annual family income showing in Table 4.1 presents that the farmers with middle income constitutes highest proportion 59.2 percent and the farmers with high income constitutes 33.3 percent while farmers with low income were only 7.5 percent. As farmers of Hamayetpur union involved in vegetable cultivation and many other businesses, their annual income was higher than the annual income of Pathalia union's farmers who were mainly involved in rice cultivation, livestock production and other small business.

4.1.5 Extension media contact

Observed experiential extension contacts scores of farmers ranged from 10 to 18 against the possible range from 0 to 40, the average being 14.18 with the standard deviation 14.18 and 1.892 respectively. According to this score, the respondent farmers were classified into three categories (on the basis of mean \pm 1 SD): “occasionally extension contact” (up to 10), “often extension contact” (11-15) and “regularly extension contact” (above 15). The distribution of the farmers according to their extension contact is shown in Table 4.6, presents that the farmers with often extension contact constitutes 70.0 percent and the farmers with regularly extension contact constitutes 26.7 percent while occasionally contacted farmers were only 3.3 percent. Thus, overwhelming majority (96.7%) of the farmers had often to regular extension contact. Extension contact plays an effective and powerful role for assessing service quality and farmers satisfaction on extension service. Frequency of extension contact on a regular bases help farmer to learn and discuss in detail about agricultural extension knowledge and innovations which influence farmers’ decision that enable them to take action. In this study, it was found that farmers with often or regular extension contact are more satisfied with the extension service. Furthermore, farmers’ experience of the extension positively influences their satisfaction due to their acquaintance with exposure (Elias *at al.*, 2013).

4.2 SERVQUAL Dimensions and its Implementation

In order to measure the service quality of extension workers the SERVQUAL model was used using all of its five (5) dimensions (tangibles, reliability, responsiveness, assurance and empathy) and average score per dimension was calculated. All the questions are multiple-choice and close-ended questions. In the questions 5-point Likert-scale was used where the respondents were asked to select the most appropriate number that corresponds to extent to which they agree with a statement. The scales in the survey questions were “1” to “5” with “1” denoting “strongly disagree” and “5” denoting “strongly agree”.

Table 4.2 Descriptive statistics of SERVQUAL dimensions

Categories	Minimum	Maximum	Mean	SD
Tangibility	3.50	4.75	4.39	0.25
Reliability	4.00	4.80	4.51	0.19
Assurance	4.00	4.80	4.49	0.26
Responsiveness	4.20	4.80	4.56	0.19
Empathy	2.00	3.50	2.75	0.29
Service quality	3.72	4.44	4.14	0.15

Table 4.3 Distribution of farmers according to SERVQUAL dimensions

Categories	Number of farmers	Percent	Mean	SD
Tangibility				
Neutral	5	4.2	4.39	.26
Favorable	115	95.8		
Reliability				
Favorable	120	100.0	4.51	0.19
Responsiveness				
Favorable	120	100.0	4.49	0.26
Assurance				
Favorable	120	100.0	4.57	0.19
Empathy				
Unfavorable	78	65.0	2.75	0.29
Neutral	42	35.0		
Service quality				
Neutral	21	17.5	4.14	0.15
Favorable	99	82.5		

Descriptive results in Table 4.2 present that out of SERVQUAL 5 dimensions responsiveness, reliability and assurance have the highest average score 4.80 and mean 4.56, 4.49, 4.51 respectively as well as standard deviation 0.19, 0.26, 0.19 respectively. Andreas and Panagiotis, (2016) found almost same result in perception of service quality. Tangibility constitutes average 4.39 and standard deviation 0.25 while empathy constitutes lowest score average 2.75 and standard deviation 0.29. Over all service quality score ranges from 3.72 to 4.44 with average 4.14 and standard deviation 0.15.

Tangibility concerns with the physical facilities, equipment, personnel and materials that can be perceived by the five human senses. The score farmers satisfaction according to tangibles as SERVQUAL dimension was neutral for 4.2 percent and favorable for 95.8 percent. The farmers were classified into two categories as shown in Table 4.3. Findings revealed that majority (95.8%) of the farmers had favorable tangibility, while only 4.2 percent farmers neutral tangibles as SERVQUAL dimension and suggested that more investment should be needed on improvement in the infrastructure and equipment for better working environment (Hirmukhe, 2012).

Reliability simply translated into the ability of the supplier to execute the service in a safe and efficient manner within due time. It depicts the consistent performance, free of non-compliance, in which the user can trust. The supplier must comply with what was promised, without the need for rework. The score farmers satisfaction according to reliability as SERVQUAL dimension was favorable for 100.0 percent. The farmers were classified into one category as shown in Table 4.3. Findings revealed that the highest perception score in this dimension refers to the timeliness of the services. The extension service organization should consider the possibility of investment in training and resources so that the promised deadlines can actually be adhered to as the importance score for this dimension is the highest (Hirmukhe, 2012).

Responsiveness refers to the availability of the provider to attend voluntarily to users, providing a service in an attentive manner, with precision and speed of

response. It concerns the availability of employees of the institution to assist users and provide the service promptly. The score farmers satisfaction according to responsiveness as SERVQUAL dimension was favorable for 100.0 percent. The farmers were classified into one category as shown in Table 4.3. Findings revealed that extension service providers were always willing to help farmers as well as respectful to them thus led to the 100.0 percent favorable of farmers.

Assurance is identified as the courtesy, knowledge of employees and their ability to convey trust. The score farmers satisfaction according to Assurance as SERVQUAL dimension was favorable for 100.0 percent. The farmers were classified into one category as shown in Table 4.3. Findings revealed that all (100%) of the farmers had favorable Assurance as SERVQUAL dimension. This dimension relates to the feeling of safety and security in the mind of the farmers while experiencing the service.

Empathy related to whether the organization cares for the user and assists him in an individualized manner, referring to the ability to demonstrate interest and personal attention. Empathy includes accessibility, sensitivity and effort in understanding the needs of farmers. The score farmers satisfaction according to empathy as SERVQUAL dimension was neutral for 35.0 percent and unfavorable for 65.0 percent. The farmers were classified into two categories as shown in Table 4.3. Findings revealed that majority (65%) of the farmers had unfavorable empathy, while only 35.0 percent farmers neutral empathy as SERVQUAL dimension. This didn't indicate a high level of satisfaction. This was a welcome sign as it indicated that most of the officers are unbiased towards the farmers. Findings also revealed another important piece of information – the weight of this particular item on overall farmers satisfaction was not very high (i.e., it is low), which means that improvement in this direction could, to a certain extent, mitigate this dissatisfaction cause, but on the other hand it would not bring significant improvements in farmers satisfaction (Hirmukhe, 2012).

During past few decades, the concepts of **service quality** and **service satisfaction** have been highly considered and used in organization texts and

activities (Olsen, 2002). Berry (cited in Kandampully, 1998) called it the most powerful competition weapon and Clow (1993) called it the organization's life-giving blood. The score farmers satisfaction in overall service quality was neutral for 17.5 percent and favorable for 84.5 percent. The farmers were classified into two categories as shown in Table 4.3. Findings reveal that majority 99 farmers were favorable for service quality while only 21 farmers were neutral in their satisfaction.

4.3 Farmers Satisfaction

Satisfaction of farmers in extension service has been ranged from 2 to 5, average being 3.87 with the standard deviation 1.03. On the basis of satisfaction score farmers were divided into four categories. The distribution of farmers satisfaction according to their responses are shown in figure 4.1, presents that 35.0 percent farmers were satisfied, 30.0 percent farmers were somewhat satisfied and 22.5 percent farmers were neither satisfied nor dissatisfied with service quality while the least farmers were in somewhat dissatisfied category only 12.5 percent. Thus, overwhelming majority of the farmers response as satisfied based on the way the SERVQUAL model was used. Debnath *et al.* (2016) also found majority of farmers' satisfaction in Tripura State of North-East India. Rahim *et al.*, (2010) said that although the result of service received by farmers may not be appropriate, it does not mean that farmers consider service quality totally weak. Therefore, researcher found that though some findings indicate that a few farmers are somewhat dissatisfied but overall farmers can be satisfied.

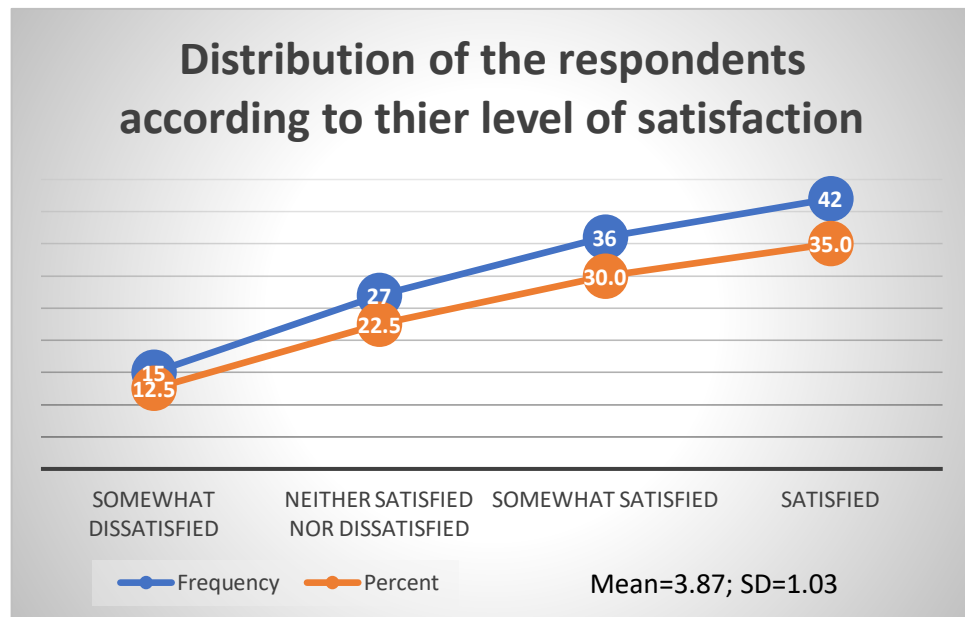


Figure 4.1. Distribution of the respondents according to their level of satisfaction

4.4 Contribution of SERVQUAL Dimension on Farmers Satisfaction as well as Assessing Extension Service

For measuring contribution of the selected characteristics of the farmers with SERVQUAL dimensions, 5 characteristics were considered which includes age level of education, farm size, annual income, extension contact. Initially, Pearson's Product Moment correlation was run to find out the relationship between the selected characteristics of the farmers and SERVQUAL dimensions. From this correlation test, it was found that level of education, farm size, income, extension contact had significant positive relationship with SERVQUAL dimensions.

Then full model regression analysis was also run with selected 5 independent variables where independent variable the five dimensions of SERVQUAL Model are tangibility, reliability, responsiveness, assurance, empathy. It was observed that the full model regression results were misleading due to the existence of interrelationships and multi-collinearity among the variables.

Therefore, in order to avoid the misleading results and to determine the best explanatory variables, the method of hierarchical regressions was administrated and 5 independent variables were fitted together in hierarchical regression analysis.

Hierarchical regression has been designed for testing specific, theory-based hypotheses and examining the influence of several predictor variables in a sequential way, such that the relative importance of a predictor may be judged on the basis of how much it adds to the prediction of a criterion, over and above that which can be accounted for by other important predictors (Aron & Aron, 1999; B. H. Cohen, 2001). These methods may also be used to examine the degree of standardized unit change in the criterion for every standardized unit change in the predictor variable when holding all other predictor variables in the model constant (at their mean) as indicated by the β coefficient (standardized partial regression coefficient). In hierarchical regression, the focus is on the change in predictability associated with predictor variables entered later in the analysis over and above that contributed by predictor variables entered earlier in the analysis. The reason for performing a hierarchical regression analysis in this research study is that, the independent variables (age, education, annual income, farm size, extension contact) are highly correlated as well as to examine the contributions of specific variables (service quality) after controlling for more general variables.

Hierarchical regression is an appropriate tool for analysis when variance on a criterion variable is being explained by predictor variables (age, education, annual income, farm size, extension contact) that are correlated with each other (Pedhazur, 1997). Since correlated variables are commonly seen in social sciences research and are especially prevalent in educational research, this makes hierarchical regression quite useful. Hierarchical regression is a popular method used to analyze the effect of a predictor variable after controlling for other variables. This “control” is achieved by calculating the change in the adjusted R^2 at each step of the analysis (Pedhazur, 1997). If the change in R^2 that occurred

as a result of including the specific predictor variable in the model, produced a very small change in R^2 and this change was not statistically significant. If the dataset had been actual data instead of fabricated data, the change in explained variance would be expected to be larger and statistically significant. So, significant change in R^2 depends on accuracy of dataset. In order to assess the overall regression model, fit in supporting the research hypotheses. This is done by, firstly, examining the adjusted R squared (R^2) to see the percentage of total variance of the dependent variables explained by the regression model. Whereas R^2 tell us how much variation in the dependent variable is accounted for by the regression model, the adjusted value tells us how much variance in the dependent variable would be accounted for if the model had been derived from the population from which the sample was taken. Specifically, it reflects the goodness of fit of the model to the population taking into account the sample size and the number of predictors used. Results shown in table 4.4 indicates the summarized results of hierarchical regression analysis with all independent variables on the determination of farmers' satisfaction with the implementation of SERVQUAL dimensions. In this hierarchical regression procedure, at first, farmers' selected characteristics viz. age, education, annual income, farm size, extension contact were inserted in the model, and in the second stage, dimensions of service quality were inserted in order to see the change of the variance of the two models.

Table 4.4 Summary of hierarchical regression analysis showing the contribution of selected characteristics of the farmers' satisfaction with the contribution of SERVQUAL dimensions

	Model									
	1					2				
	UnS_Cof		S_Cof	t	Sig.	UnS_Cof		S_Cof	t	Sig.
	B	SE	Beta			B	SE	Beta		
(Constant)	.373	1.058		.353	.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
Land Size	.671	.196	.340	3.432	.001***	.436	.147	.221	2.959	.004** *
Annual Family 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***				

Unstandardized coefficient represents the amount by which dependent variable changes if independent variable changes by one unit keeping other independent variables constant. Standardized coefficient is found by multiplying the unstandardized coefficient by the ratio of the standard deviations of the independent variable and dependent variable. Standardized coefficients are used to find Independent variables (age, education, annual income, land size, extension contact) with more impact on dependent variable (satisfaction). An independent variable with a larger standardized coefficient will have a greater effect on the dependent variable. Unstandardized coefficients are useful in interpretation and standardized coefficients in comparison of impact of any independent variable on the dependent variable. When measurement scale of independent variables are different, standardized coefficients are used to interpret and compare their effects on dependent variable. The standardized

coefficients indicate Beta (β) values and the unstandardized coefficients indicate b values in standard deviations. A standardized beta (β) coefficient compares the strength of the effect of each individual independent variable to the dependent variable. The higher the absolute value of the beta (β) coefficient, the stronger the effect. When regression co-efficient ≤ 0.95 the method is standardized and when coefficient lies out of range (< 0.1 and > 1.0) the method is insignificant.

4.4.1. Contribution of selected characteristics of the farmers satisfaction without the implication of SERVQUAL dimensions

Age: Results presented in table 4.4 show that, unstandardized coefficient b value $-.014$ and standardized coefficient β value $-.091$ with t value $-.970$, significant $.334$. R^2 and adjusted R^2 value $.338$ and $.309$, respectively. And F value 11.619^{***} . Unstandardized coefficients are ‘raw’ coefficients produced by regression analysis when the analysis is performed on original, unstandardized variables. An unstandardized coefficient represents the amount of change in a dependent variable satisfaction due to a change of 1 unit of independent variable age. A standardized beta coefficient compares the strength of the effect of each individual independent variable to the dependent variable. The higher the absolute value of the beta coefficient, the stronger the effect. From the Table 4.4, unstandardized coefficients b value was obtained $-.014$ and standardized beta coefficient $-.091$ which clearly represent the reverse and negligible effect of age on the extent of farmers satisfaction towards extension services as higher age represent lower farmers satisfaction towards extension services and lower age express higher farmers satisfaction towards extension services.

Education level: Table 4.4 shows that, unstandardized coefficient b value $-.074$ and standardized coefficient β value $-.237$ with t value -1.937 , significant $.055$. R^2 and adjusted R^2 value $.338$ and $.309$, respectively. And F value 11.619^{***} . Unstandardized coefficient represents the amount of change in a dependent variable satisfaction due to a change of 1 unit of independent variable education level. Table 4.4 shows that unstandardized coefficients b value was obtained $-.074$ and standardized beta coefficient $-.237$ which clearly represent the reverse

effect of education level on the extent of farmers satisfaction towards extension services. Though researchers said that farmers' education status influence positively his/her satisfaction with the extension service, this result unexpectedly shows reverse effect of education on the extent of farmers satisfaction; this might be due to the respondents were 67.5 percent older farmers and mostly illiterate, and according to Lavis and Blackburn (1990) older farmers are more satisfied with extension service based on their experience.

Farm size: Table 4.4 shows that, unstandardized coefficient b value .671 and standardized coefficient β value .340 with t value 3.432, significant .001. R^2 and adjusted R^2 value .338 and .309, respectively, and F value 11.619***. Unstandardized coefficient represents the amount of change in a dependent variable satisfaction due to a change of 1 unit of independent variable land size. Table 4.4 shows that unstandardized coefficients b value was obtained .671 and standardized beta coefficient .340 which clearly represent the positive effect of land size on the extent of farmers satisfaction towards extension services as higher land ownership represent higher farmers satisfaction towards extension services and lower land ownership express lower farmers satisfaction towards extension services. Farm that might help farmers to mitigate labour shortage, incomplete credit, insurance markets (Zerfu and Larsony, 2011; Ayalew and Deininger, 2012) and to implement extension advices effectively. So, Elias *et al.*, (2013) proposed that farm ownership positively influences farmers' satisfaction with extension service.

Annual income: Table 4.4 shows that, unstandardized coefficient b value 0 and standardized coefficient β value -.020 with t value -.208, significant .835. R^2 and adjusted R^2 value .338 and .309, respectively, and F value 11.619***. Unstandardized coefficient represents the amount of change in a dependent variable satisfaction due to a change of 1 unit of independent variable annual income. Table 4.4 shows that unstandardized coefficients b value was obtained 0 and standardized beta coefficient -.020 which clearly represent the reverse effect of annual income on the extent of farmers satisfaction towards extension

services as higher income represent lower farmers satisfaction towards extension services and lower income express higher farmers satisfaction towards extension services.

Extension contacts: Table 4.4 shows that, unstandardized coefficient b value .257 and standardized coefficient β value .471 with t value 3.973, significant 0.00. R^2 and adjusted R^2 value .338 and .309, respectively, and F value 11.619***. Unstandardized coefficient represents the amount of change in a dependent variable satisfaction due to a change of 1 unit of independent variable land size. Table 4.4 shows that unstandardized coefficients b value was obtained .257 and standardized beta coefficient .471 which clearly represent the positive effect of extension contact on the extent of farmers satisfaction towards extension services as higher extension contact represent higher farmers satisfaction towards extension services and lower extension contact express lower farmers satisfaction towards extension services.

4.4.2. Contribution of selected characteristics of the farmers satisfaction with the implication of SERVQUAL dimensions

Age: Table 4.4 shows that, unstandardized coefficient b value -.008 and standardized coefficient β value -.056 with t value -.798, significant .426. R^2 and adjusted R^2 value .638 and .618 respectively, and F value 33.126***. unstandardized coefficient represents the amount of change in a dependent variable satisfaction due to a change of 1 unit of independent variable age. From the table 4.4 unstandardized coefficients b value was obtained -.008 and standardized beta coefficient -.056 which clearly represent the reverse effect of age on the extent of farmers satisfaction towards extension services as higher age represent lower farmers satisfaction towards extension services and lower age express higher farmers satisfaction towards extension services. Older farmers are found more satisfied with the extension services than younger farmers because of their farm experience. On the contrary, older farmers are often found as less flexible, and less willing to engage in a new or innovative activity due to fear of risk whereas young farmers may be more enthusiastic to take risk averse to

implement of new technologies on their farm (Elias et al., 2013). Hence the influence of age on farmers' satisfaction is ambiguous.

Education level: Table 4.4 shows that, unstandardized coefficient b value -.060 and standardized coefficient β value -.190 with t value -.190, significant .038. R^2 and adjusted R^2 value .638 and .618, respectively, and F value 33.126***. Unstandardized coefficient represents the amount of change in a dependent variable satisfaction due to a change of 1 unit of independent variable education level. Table 4.4 shows that unstandardized coefficients b value was obtained -.060 and standardized beta coefficient -.190 which clearly represent the reverse effect of education level on the extent of farmers satisfaction towards extension services as higher education represent lower farmers satisfaction towards extension services and lower education express higher farmers satisfaction towards extension services.

Land size: Table 4.4 shows that, unstandardized coefficient b value .436 and standardized coefficient β value .221 with t value 2.959, significant .004. R^2 and adjusted R^2 value .638 and .618 respectively, and F value 33.126***. Unstandardized coefficient represents the amount of change in a dependent variable satisfaction due to a change of 1 unit of independent variable land size. Table 4.4 shows that unstandardized coefficients b value was obtained .436 and standardized beta coefficient .221 which clearly represent the positive effect of land size on the extent of farmers satisfaction towards extension services as higher land ownership represent higher farmers satisfaction towards extension services and lower land ownership express lower farmers satisfaction towards extension services.

Annual income: Table 4.4 shows that, unstandardized coefficient b value .000 and standardized coefficient β value .052 with t value .718, significant .474. R^2 and adjusted R^2 value .638 and .618 respectively, and F value 33.126***. Unstandardized coefficient represents the amount of change in a dependent variable satisfaction due to a change of 1 unit of independent variable annual income. Table 4.4 shows that unstandardized coefficients b value was obtained

0 and standardized beta coefficient .052 which clearly represent the positive effect of annual income on the extent of farmers satisfaction towards extension services as higher income represent higher farmers satisfaction towards extension services and lower income express lower farmers satisfaction towards extension services. Elias *et al.* (2013) stated that additional off farm income contributes not only to the increase of total income, but more importantly, to income stability that facilitates farmers to afford the expenses of extension service inputs and increases farmers satisfaction.

Extension contacts: Table 4.4 shows that, unstandardized coefficient b value .121 and standardized coefficient β value .222 with t value 2.422, significant .017. R^2 and adjusted R^2 value .638 and .618 respectively. And F value 33.126***. Unstandardized coefficient represents the amount of change in a dependent variable satisfaction due to a change of 1 unit of independent variable land size. Table 4.4 shows that unstandardized coefficients b value was obtained .121 and standardized beta coefficient .222 which clearly represent the positive effect of extension contact on the extent of farmers satisfaction towards extension services as higher extension contact represent higher farmers satisfaction towards extension services and lower extension contact express lower farmers satisfaction towards extension services. As the extension worker is the main source of information and training of farmers in adopting new extension packages, their frequent contact with farmers is important for improving the effectiveness of the extension services (Elias *et al.*, 2013).

Service quality: Service quality was considered as a performance concept as it depends on performance criteria and an important determinant of satisfaction. Table 4.4 shows that, unstandardized coefficient b value 4.111 and standardized coefficient β value .607 with t value 9.670, significant 0. R^2 and adjusted R^2 value .638 and .618, respectively, and F value 33.126. As we know unstandardized coefficient represents the amount of change in a dependent variable change of 1 unit of independent variable, with the value of 4.11 Service quality express its major influence over other independent variables. Considerably adjusted R^2

value represents similar result. Nguyen, *et al.* (2015) said that service quality is an undeniable driver of customer loyalty and satisfaction and express obviously strong effects on customer loyalty and satisfaction level.

4.4.3 Discussion of the findings

Table 4.5 Summary of hierarchical regression analysis showing the contribution of SERVQUAL dimensions

Model	F Value	Increased R²	Adjusted R²	Variation explains in percent
Variables without SERVQUAL dimensions	11.619***	0.338	0.309	30.9%
Variables with SERVQUAL dimensions	33.126***	0.638	0.618	61.8%

Results shown in table 4.5 reveal that inclusion of SERVQUAL dimensions in assessing the service quality of agricultural extension service yields up to 61.8% of the variance while farmers selected socio-economic characteristics only explained 30.9% of the variance of farmers' satisfaction. In comparing the contribution to the estimated variance, SERVQUAL dimensions play more impact over socio-economic characteristics in explaining farmers' satisfaction that implies to pay higher attention for improving service quality of agricultural extension service. Obviously, implication SERVQUAL dimensions show higher rate of farmers satisfaction which is close to the reality. If the farmers' satisfaction was not measured by implication of SERVQUAL dimensions for the extension service misleading results can be found.

Chapter V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This study aimed to examine the level of farmers' satisfaction with agricultural extension service and identify determinant factors for farmers' satisfaction through Service Quality approach. This paper conducted a comprehensive investigation for assessing agricultural extension service from the perspective of farmers' satisfaction. Hierarchical regression model was used to analyze farmers' satisfaction. The summary of this study was presented in this chapter.

5.1 Summary of the Findings

5.1.1 Selected characteristics of the farmers

Age: Findings revealed that majority (67.5%) of the respondents were old aged farmers, 32.5% farmer were middle aged farmers with average age 53.18 years. It was found that satisfaction level higher in older farmers than middle aged farmers because of their experience in extension service.

Education level: 38.3% of the respondents can sign only, 25% and 23.3% of the respondents complete their primary and secondary education respectively while only 13.3% of the respondents can't read & write. That means, about majority percent (86.6%) of the respondent were literate or having education up to secondary level.

Farm size: Majority of the respondents 48% and 45% of farmers were having medium farm and small farm respectively, and rest 7% of the respondents were having larger farm.

Annual income: Majority of the respondents 59.2% and 33.3% of farmers were belonged to middle income and high income, rest 7.5% of farmers were belonged to low-income category.

Extension media contact: Majority (70%) of the respondents contacted extension media often, 26.7% of the respondents contacted extension media regularly while only 3.3% of the respondents contacted extension media occasionally. That means overwhelming majority (96.7percent) of the farmers had often to regular extension contact. Frequency of extension contact is very important for farmers' satisfaction.

5.1.2 SERVQUAL Dimensions

Tangibility had a positive effect on farmer's satisfaction which included physical appearance or infrastructure of extension service. 95.8% of the respondents were favorable and 4.2% of the respondents were neutral for tangibility as SERVQUAL dimension.

Reliability was the first most important SERVQUAL dimension that affects farmer's satisfaction including service accuracy dependency of farmers. 100% of the respondents were favorable for reliability.

Responsiveness was the second most important SERVQUAL dimension that affects farmer's satisfaction and had a significant impact on it including availability of service in due time. 100% of the respondents were favorable for responsiveness.

Assurance was the third most important SERVQUAL dimension that had a positive significant impact on farmer's satisfaction which included making trust and confidence among farmers by extension service. 100% of the respondents were favorable for assurance.

Empathy was very important SERVQUAL dimension which included individualized attention and fulfilling farmers' demand by extension service. Though majority of the respondents (65%) were unfavorable and 35% of the respondents were neutral for empathy but it had a significant effect on farmers' satisfaction.

5.1.3 farmers satisfaction on extension service

With respect to overall level of satisfaction, mean frequencies suggested that 35% respondents expressed very satisfied, 30% and 22.5% respondents expressed satisfied and moderately satisfied respectively while 12.5% respondents were somewhat satisfied.

5.1.4 Contribution of service quality on farmers satisfaction

The regression analyses showed that all the five dimensions of SERVQUAL were positively related to the overall satisfaction. This means that the five dimensions played a major role in the contribution of farmers satisfaction. Result showed that extension contact directly influenced farmers satisfaction. The higher extension contacts the higher farmers satisfaction. Application of SERVQUAL dimensions determines actual result of farmers satisfaction since farmers satisfaction increased to 61.8% with service quality then without service quality satisfaction was 30.9%.

5.2 Conclusion and Recommendation

This paper has focused on building the SERVQUAL model to assess the service quality in extension service and measuring farmers' satisfaction. From the results of the study it can be concluded that

- Although older farmers were reluctant to adopt innovations but they experienced a lot of services from extension service, so they seemed to be satisfied with extension service.
- Education is necessary in effective extension communication, being eager to adopt innovations and wisely utilizing extension services. So, education level had a positive significant effect on farmers' satisfaction.
- The role of annual income for farmers' satisfaction with agricultural extension service is positively significant. Therefore, it was reasonable to say that the higher economic return from extension service the greater possibility of farmers' overall satisfaction with extension service. The result is reliable with studies stated by Coughenour and Swanson (1988) who found that satisfaction with farming is associated with farmers' perceptions of the economic rewards farming.
- Frequency of extension contact had positive significant relationship on farmers' satisfaction. As the extension worker is the main source of information and training of farmers in adopting new extension packages, as well as innovations, their frequent contact with farmers was important for improving the effectiveness of the extension services.
- Though 4.2% of the respondents were neutral for tangibility as SERVQUAL dimension majority of the farmers were satisfied with extension service.
- Farmers showed favorable satisfaction with extension service through reliability, responsiveness and assurance as SERVQUAL dimension.
- Majority of farmers were unfavorable for empathy but it was a positive sign that extension workers were unbiased towards their duty.

5.3 Recommendation

5.3.1 Recommendations for policy implications

- From empathy score researcher found that there is a communication gap between farmers and extension officers which needs to be minimized. This gap is of 'farmers' time-efficient demand what needs to be fulfilled.

- Frequency of extension contact is an important factor for farmers' satisfaction, suggesting that the need to arrange frequent extension contact that enables farmers to develop trust and make them accountable to adopt improved technologies and extension service-packages.
- There is a need to go beyond “one size fits all” solutions and provide demand-driven extension service instead of the existing supply-driven approach. In this way, farmers' satisfaction with the service and acceptance of the extension program can increase.

5.3.2 Recommendation for further studies

- The study was conducted in two union of Savar Upazila, so repeating this study at any other places in Bangladesh and compare the findings would be effective and helpful for policy formulation.
- It is recommended that more study should be conducted on service quality dimensions for agricultural extension service, rather investigating the relationship with farmers' selected socio-economical or demographical characteristics. As a considerable number of studies had been conducted on this issue. Unrevealing other aspect of extension service is not only important for academic perspective but also valuable for formulating important policies.
- Despite this study adopted a well-designed measurement strategy, it is also recommended that future studies should be included more reliable measurement of concerned variables.

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APPENDIX A

Department of Agricultural Extension and Information System
Sher-e-Bangla Agricultural University

An interview schedules

ASSESSING AGRICULTURAL EXTENSION SERVICE IN RURAL DEVELOPMENT: A SERVICE QUALITY APPROACH

Serial no

Name of the respondent: Village:

Union: Upazila:.....

District:

(Please provide following information. Your information will be kept confidential and will be used for research purpose only)

Part-A

1. **Age:** How old are you? Years.
2. **Educational Qualification:** Please mention your educational status from the following:
 - i. Can't read and write
 - ii. Can sign name only
 - iii. Studied up to class:
 - iv. I did not formally study but my education is equivalent to class.....
3. **Land Size:** Please indicate area of your land according to use

SL. No.	Types of land ownership	Area of Land	
		Local unit	Hectare
i.	Homestead area		
ii.	Own land under own cultivation		
iii.	Land taken from others as lease		
iv.	Land taken from others as borga		
v.	Land given to others as borga		
Total			

4. **Annual Income:** Please indicate the production and income of your family has earned last year from different sources

Source of income		Income (Tk.)
A	Agricultural sources	
	Rice	
	Other crops	
	Livestock	
	Poultry	
	Fisheries	
B	Non-agricultural sources	
	Business	
	Service	
	Labor	
	Remittance	
	Others (please specify).....	
	Total (A+B)=	

5. **Agricultural Extension Contact:** Please state the extent of your contact with the following communication media.

Sl. No	Extension Media	Extent of contact				
		Regularly (4)	Often(3)	Occasionally (2)	Rarely (1)	Not at all(0)
1.	Model/Progressive Farmer	>5 times/ Month	4-5 times/ month	2-3 times/ month	1 time/ month	
2.	Sub-Assistant Agriculture Officer (SAAO)	>5 times/ Month	4-5 times/ month	2-3 times/ month	1 time/ month	
3.	NGO worker	>5 times/ month	4-5 times/ month	2-3 times/ month	1 time/ month	
4.	Upazila Agricultural Officer (UAO)	>6 times/ year	5-6 times/ year	3-4 times/ year	1-2 times/ year	
5.	Agricultural Extension Officer (AEO)	>6 times / year	5-6 times/ year	3-4 times/ year	1-2 times/ year	

6.	Listening agricultural program in radio	>5 times/ week	4-5 times/ week	2-3 times/ week	1-2 times/ week	
7.	Watching agricultural program on TV	>5 times/ week	4-5 times/ week	2-3 times/ week	1-2 times/ week	
8.	Reading printed media (e.g. agricultural news, poster, leaflet)	>6 times / month	3-4 times/ month	2-3 times/ month	1-2 times/ month	
9.	Participation in group discussion	>6 times / month	4-5 times/ month	1-3 times/ month	1-2 times/ month	
10.	Participation in demonstration meeting	>3 times/ month	2-3 times/ month	1-3 times/ month	1-2 times/ month	
Total						

Part-B

6. SERVQUAL Dimension

a) Tangibles

Sl. No	Items	Extent of Perception				
		Strongly disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly agree (5)
1.	Local extension office uses different extension aids (e.g., poster, leaflet, flashcard, bulletin, etc.) are good looking and up-to-date					
2.	Physical facilities of the local extension office are adequate					
3.	Extension officers and other staffs of local extension					

	office are neat appearing					
4.	Different teaching/training methods used by local extension office such as field-day, method demonstration, result demonstration is seeming to be effective for extension service					

Average Tangibles score:

b) Reliability

Sl. No	Items	Extent of Perception				
		Strongly disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly agree (5)
1.	Extension officers/staffs keep their promises					
2.	Extension officers/staffs show sincere interest in solving farmers problem					
3.	Extension officers/staffs perform the service right the first time					
4.	Extension officers/staffs provide services at the time they promise to do so					
5.	Agricultural extension service ensures error free service					

Average Reliability score -----

c) Responsiveness

Sl. No	Items	Extent of Perception				
		Strongly disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly agree (5)
1.	Extension officers/ staffs tell farmers exactly when services will be performed					
2.	Extension officers/ staffs provide rapid service					
3.	Extension officers/ staffs are always willing to help farmers					
4.	Extension officers/ staffs are respectful to farmers					
5.	Extension officers/ staffs are never showed them busy to respond to farmers' request					

Average Responsiveness score -----

d) Assurance

Sl. No	Items	Extent of Perception				
		Strongly disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly agree (5)
1.	Extension officers/ staffs are trustworthy					
2.	Extension officers/ staffs are polite					
3.	Extension officers/ staffs have the knowledge to answer farmers question					
4.	Behaviors of officers/ staffs					

	grow confidence in farmers					
5.	Farmers feel safe to receive extension service					

Average Assurance score -----

e) Empathy

Sl. No	Items	Extent of Perception				
		Strongly disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly agree (5)
1.	Agricultural extension service gives attention to individual farmer					
2.	Operating hours of agricultural extension service is convenient to all farmers					
3.	Extension officers/staffs give farmers personal attention					
4.	Extension officers/staffs understand farmers specific needs					

Average Empathy score -----

Table 1: Calculations to obtain unweighted SERVQUAL Score

Average Tangibles score	
Average Reliability score	
Average Responsiveness score	
Average Assurance score	
Average Empathy score	
Total	

Average (=total/5) Unweighted SERVQUAL Score -----

Table 2: SERVQUAL Importance Weights

Listed below are five features regarding to agricultural extension and the services they offer. We would like to know how much each of these features is important to the farmers. 100 points is allocated among the five features according to how important it is & the points should be up to 100.

Sl. No	Features	Points
1.	The appearance of agricultural extension office physical facilities, equipment, personnel, and communication materials	
2.	Agricultural extension service has ability to perform the promised service dependably and accurately	
3.	Agricultural extension service willing to help farmers and provide rapid service	
4.	The knowledge and politeness of agricultural extension personnel and their ability to convey trust and confidence	
5.	The caring, individual attention agricultural extension service provides to farmers	
Total		100 points

Table 3: SERVQUAL Weighted Scores

SERVQUAL Dimension	(Score from table 1) X (Importance weight from table 2)	Weighted score
Average Tangible		
Average Reliability		
Average Responsiveness		
Average Assurance		
Average Empathy		
Total		

Average (=total/5) Weighted SERVQUAL Score -----

7. Farmer’s satisfaction: On an average, how satisfy or dissatisfy you are with at extension service.

Dissatisfied . . . Satisfied

1 2 3 4 5

Thank you.

Signature of the interviewer-----

