

**DETERMINANTS OF FARMER'S USE OF MOBILE PHONE IN
RECEIVING AGRICULTURAL INFORMATION**

MD. ABUL HASAN



**DEPARTMENT OF
AGRICULTURAL EXTENSION & INFORMATION SYSTEM
SHER-E-BANGLA AGRICULTURAL UNIVERSITY
DHAKA-1207**

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**DETERMINANTS OF FARMERS' USE OF MOBILE PHONE IN
RECEIVING AGRICULTURAL INFORMATION**

BY

MD. ABUL HASAN

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APPROVED BY:

Dr. Muhammad Humayun Kabir

Supervisor

Associate Professor

Dept. of Agril. Ext. and Info. System

Sher-e-Bangla Agricultural University

Md. Masum Abdullah

Co-Supervisor

Assistant Professor

Dept. of Agril. Ext. and Info. System

Sher-e-Bangla Agril. University

Md. Mahbubul Alam, Ph.D

Professor & Chairman

Dept. of Agricultural Extension and Information System

Sher-e-Bangla Agricultural University, Dhaka-1207



**Department of Agricultural Extension and Information
System**

Sher-e-Bangla Agricultural University

**Sher-e-Bangla Nagar,
Dhaka-1207, Bangladesh**

CERTIFICATE

This is to certify that the thesis entitled “**DETERMINANTS OF FARMERS USE OF MOBILE PHONE IN RECEIVING AGRICULTURAL INFORMATION**” submitted to the department of Agricultural Extension and Information System, Faculty of Agriculture, Sher-e-Bangla Agricultural University, Sher-e-Bangla Nagar, Dhaka in partial fulfillment of the requirements for the degree of Master of Science (M.S.) in Agricultural Extension, embodies the result of a piece of bona fide research work carried out by **Md. Abul Hasan, Registration No. 11-04579** 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, as has been availed of during the course of this investigation has been duly acknowledged by the Author.

Dated: 07. 02. 2018
Dhaka, Bangladesh

Dr. Muhammad Humayun Kabir
Supervisor

Dept. of Agril. Extension and Info. System
Sher-e-Bangla Agricultural University,



**DEDICATED
TO
MY BELOVED
PARENTS**

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ABBREVIATIONS

GDP	Gross Domestic Product
BBS	Bangladesh Bureau of Statistics
ICT	Information Communication Technology
IT	Information Technology
GP	Grameen Phone
BTRC	Bangladesh Telecommunication Regulatory Commission
MTA	Mobile Telephone system A
UMTS	Universal Mobile Telecommunications System
GSM	Global System for Mobile
USA	United States of America
CDMA	Code Division Multiple Access
TAC	Technical Assistance Center
RSKs	Ryot Sampaek Kendras
CIDA	Canadian International Development Agency
SAAO	Sub-Assistant Agriculture Officer

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ABSTRACT

The aim of this research was to reveal the extent of mobile phone use by the farmers in receiving agricultural information. This study considered 120 randomly selected farmers in Tetuljhora union under savar upazila of Dhaka district. A pre-tested structured interview schedule was used to collect data from the respondents during 1 August to 30 August, 2018. The findings of the research revealed that 56.7 percent of the respondents used mobile phone in receiving agricultural information and the rest 43.3 percent of them were non-user (did not use mobile phone in agricultural purpose) of mobile phone. Logistic regression findings shows that expensiveness, on farm income and education level of the farmer had significant positive contribution to their use of mobile phone in receiving agricultural information. So, the policy makers should consider these important factors to increase the users of mobile phone among the farmers.

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Socioeconomic improvement of the rural areas mostly depended on increasing farm productivity. But, like most of the developing countries, farming in Bangladesh is still not well organized because of poverty, paucities of resources such as income, lack of farmers' need based policy and supports (Gerber, 2008). Besides, agricultural production can only be increased if appropriate technologies are used by the farmers, who are the primary unit of adoption of improved practices.

An increased agricultural production can play as a development engine for rural people that might have also contributed to economic development of the country. In connection to this, adoption of modern technologies by the farmers is essential.

In Peru, It was observed that per capita farm income was increased by 13 percent due to usage of mobile phone technology (Chong et al., 2005).

Information Communication Technology (ICT) could be one of helping solution to transfer information on new technologies, which depend on Information Technology (IT) infrastructure and network communications (Awuor et al., 2013). Improved information services through telecommunication technology have been proven to have a positive impact on rural incomes.

Access to public telephones, especially individual mobile phones improves agricultural productivity, increases market access and expands marketing options for rural producers (Jansen et al., 2006). Donner distinguishes different livelihood functions of mobile phones, including mediated agricultural extension, market information systems, virtual markets, financial services and direct livelihood support (Donner, 2008). Mobile applications can promote agricultural and rural development, including better access to extension services; better market links, distribution networks; and better access to finance, including credit, insurance and payment methods (Qiang, 2011).

The role of mobile phones in supporting access to information about agricultural technologies and extension services is immense (Aker, 2011). Similar to many other developing countries Mobile phone technology has provided opportunities for increasing productivity and reducing socioeconomic inequalities in Bangladesh (Islam and Gronlund, 2011). In recent years, the mobile industry in Bangladesh has dramatically developed both in urban and rural area. According to BTRC Bangladesh has 131.376 million mobile phone subscribers at the end of June, 2016 which is very high for a developing lower income country. However, The Mobile Phone subscribers by the end of June, 2018 are shown in Table 1.

Table 1.1 Mobile phone operators and users in Bangladesh

(up to June, 2018)

Operator	Subscriber (In Millions)
Grameen Phone Ltd. (GP)	56.909
Banglalink Digital Communications Limited	31.941
Robi Axiata Limited (Robi)	27.442
Airtel Bangladesh Limited (Air tel)	9.892
Pacific Bangladesh Telecom Limited (City cell)	0.702
Teletalk Bangladesh Ltd. (Tele talk)	4.490
Total	131.376

Source: BTRC, 2018

The majority of rural people especially farmers are now using mobile phones. The cheaper call rate and easy network availability influences the low earning farming community to use mobile phones for different agricultural information. Mobile phones have made the farmers aware about the modern technologies, weather forecasting, market price, which reduces the hiking of intermediaries in market value chain. The uses of mobile phones among farmers have played positive impact in their income and productivity. Farmers can communicate with the buyers before travelling and sell their product in a good price (Fafchamps and Hill, 2005) and they can also

communicate directly and sell their products over phone call. This direct marketing save their money, time and energy (Muto and Yamano, 2011; Lee and Bellemare, 2013).In fact, mobile phones affected all stages of the farming cycle, including preparations, farming, harvesting and post-harvesting (Furuholt and Matotay, 2011). Actually,The move to mobile phone based information system is a natural and potentially more beneficial as mobile phone use reduce search time and cost for information, as well as information asymmetries (Overa, 2006).So, use of the mobile by the farmers may be the potential one for farm productivity. Several studies found that mobile phones reduced transportation costs where trips for social and business purposes were substituted with phone calls which is beneficial for easily perishable crops like vegetables having less storage and market facilities (Kameswari *et al.*, 2011;Overa, 2006; Balasubramanian, 2010; Boadi, 2007; Frempong, *et. al.*, 2007; Samuel, et el., 2005; Sife *et al.*, 2010).Better marketing of vegetable ensuring the bargaining capability of vegetable growers, they need to be connected with a greater ICT network, specially the mobile based communication network for increasing their access to need based information on time (Jensen, 2007). Deplorably, very limited information is available on what extent farmers use mobile phone in Bangladesh and what are the factors affecting the mobile phone usage by the farmers in receiving agricultural information. In this context, there is a striking need to conduct a study on determinants of farmers use of mobile phone in receiving agricultural information.

1.2 Statement of the Problem

For bargaining desired socio-economic development, farm people need to be connected with the greater communication network for increasing their access to “just” and “timely” information. To increase the extent of use of mobile phone in receiving agricultural information, it is necessary to have a clear understanding about present status of use of mobile phone by the farmers.

Message can be diffused within a short time by using mobile phone. The use of mobile phone by the farmers in receiving agricultural information is highly dependent on the type of information, timeliness of information, its uses and

scope of application in the real situation. However, it is necessary to ascertain the use of mobile phone by the farmers in receiving agricultural information having the following questions in mind:

1. What are the characteristics of the rural farmers?
2. To what extent the farmers are using mobile phone for acquiring agricultural information?
3. Which characteristics of the farmers are contributing to their use of mobile phone in receiving agricultural information?

1.3 Significance of the Study

Mobile phone can serve as a source of information. It is playing a very useful role in fulfilling the informational needs of farmers, particularly among marginal and small ones. The mobile phone based agricultural information services are now rapidly becoming popular. These services, through short message service or voice-messages provide a variety of agriculture related information on crop cultivation, fertilizer use, plant-diseases, pesticides, market-price, weather and important government policy decisions.

In Bangladesh, private sectors are providing many rural services such as private extension using mobile phone technologies, although clear roles and policies are needed. Mobile phones are the success story of bridging the rural digital divide. Mobile phones have facilitated greater communication and economic benefits and acted as agents of social mobilization. Hence, there seems to be a lot of potential in the use of mobile phones by the farmers for communication for the agricultural development of Bangladesh.

1.4 Specific Objectives of the Study

The following specific objectives were set forth for proper direction of the study:

1. To describe some selected personal and socioeconomic characteristics of the farmers. The characteristics are-
 - i. Age
 - ii. Education
 - iii. Farm size
 - iv. On farm income
 - v. Off farm income
 - vi. Organizational participation
 - vii. Innovativeness
 - viii. Cosmopolitaness
 - ix. Attitude towards mobile use
 - x. Ease of use
 - xi. Expensiveness

2. To determine the extent of mobile phone use in receiving agricultural information; and

3. To identify the factors contributed to influences farmers' use of mobile phone.

1.5 Assumptions of the Study

The researcher has the following assumption in mind while undertaking this study:

1. The responses furnished by the respondents were reliable. They expressed the truth about their opinion and interest.
2. The researcher acted as interviewer was familiar to the social and environmental conditions of the study area. Hence, the data collected by him from the respondents where free from bias.
3. The respondents included in the sample for this study were competent enough to furnish proper responses to the queries included in the interview schedule.
4. Samples are true representatives of the population.

1.6 Scope of the Study

The main focus of the study was to determinants of the farmer's use of mobile phone in receiving agricultural information. The findings of the study will be specifically applicable to Saver upazila under Dhaka district. However, the findings will also have implications for other areas of the country having relevance to the socio-cultural context of the study area.

These will be of special interest to the policy makers and planners in formulating and redesigning the extension programmes especially for use of mobile phone in receiving agricultural information. The findings are also expected to be helpful to the field workers of different agricultural departments and organizations to develop appropriate extension strategies for effectively working with the rural people.

1.7 Limitations of the Study

Considering the time, money and other necessary resources available to the researcher and to make the study manageable and meaningful, it became necessary to impose certain limitations as noted below:

1. Population for the present study were kept confined within the heads of the use of mobile phone in receiving agricultural information families as because they were the major decision makers.
2. Characteristics of use of mobile phone in receiving agricultural information are numerous and varied based on context but only 11 were selected for evaluation in this study due to resource limitation.
3. The study was confined mainly to determinants related to the use of mobile phone in receiving agricultural information.
4. Facts and figures collected by the investigator in applicable to the present situation in the selected area.

1.8 Definition of different important terms

Mobile phone/cell phone

A small portable radio-telephone, most commonly known as mobile phone, which is the quickest channel for communication and also treated as specialized interpersonal channel of communication without face to face situation. Mobile phone is popular and powerful interpersonal communication media.

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.

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. Schooling is the first step of education.

Farm size

Farm size referred to the total area on which a farmer's family carries on farming operations, the area being estimated in terms of full benefit to the farmer's family.

Innovativeness

Innovativeness is the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a social system.

Cosmopolitanism

It referred to the orientation or exposure or involvement of an individual respondent external to the own social system.

Organizational participation

Organizational participation of a respondent implies the level of mobility in his/her locality. It also indicates the position of the respondent in his/her own social system.

Expensiveness

Expensive is applied to whatever entails considerable expense; it suggests a price more than the average person would normally be able to pay or a price paid only for something special.

On farm income

On farm income means income that is received from agriculture crops, vegetables, fruits/pulse, livestock/fisheries etc.

Off farm income

Off farm income means those income received from sources other than agriculture such as labour, transport, business, service etc.

CHAPTER II

REVIEW OF LITERATURE

The researcher made an elaborate search of available literature for the present research. Available literature was intensively reviewed to find out work in Bangladesh as well as in abroad. This chapter is divided into four sections. First section deals with the findings on the use of mobile phone in general, Second section deals with the relationship between farmers' characteristics and their use of mobile phone in receiving agricultural information. The third section describes with the conceptual framework of the study.

2.1 Use of mobile phone by the rural people

Although use of mobile phone regarded as an important gateway of information dimension many research studies (Arfan, Ali, Khan & Khan, 2013; Rehman, Muhammad, Ashraf, Ch., Ruby & Bibi, 2013; Arshed, Ch., Iqbal, & Hussain, 2012; Nosheen, Ali & Ahmad, 2010; Taj, Akmal, Sharif & Mahmood, 2009; Chaudhry, Muhammad, Saghir & Ashraf, 2008; Sadaf, Javed & Luqman, 2006; Abbas, Muhammad, Nabi and Kashif, 2003) that completely ignored mobile technology as a significant source for information diffusion among the sources analyzed for their effectiveness. The sources of information assessed in these studies were TV, radio, printed material (newspapers, magazines and books), fellow farmers, progressive farmers, agricultural extension field staff, dealers of seed, fertilizer and pesticide companies, the private sector, NGOs, growers' associations, agri-seminars, exhibitions, conferences and research institutions.

Numerous studies has so far analysed the effectiveness of mobile phone based information sources. For example, Arfan et al. (2013) analysed the effectiveness of the Punjab Agriculture Helpline (PAH) in meeting the information needs of the farming community. Their study concluded that all of the respondents were getting relevant information from the PAH.

Akter (2008) conducted a study to examine what extent of Grameen Phone (GP) operation would bring the changes of livelihood pattern of GP operating households.

Fifty GP operators were purposively selected. The study revealed that Grameen Phone operation (fixi-load, making call) programme under GP was profitable business. It was found that the average annual income from mobile phone operation constituted about 26 percent of total average annual income of the GP operating households which is quite attractive as subsidiary occupation. It was found that GP has brought about positive changes in different types of livelihood capital. Ninety six (96 %) of the respondents reported that their awareness got increased due to GP operation.

Singels (2008) conducted a study on a new approach to implementing computer based decision support for sugarcane farmers and extension staff: the case of Canesim. The main features were (1) use of state-of-the-art technology, (2) limiting users' exposure to system complexity, and (3) participation of users in system design and implementation. The My Canesim system consists of a sugarcane model, an on-line weather database and a communication network. The system uses basic field data, initially entered by the user via the Internet, to calculate the soil and crop status for each day of the growing season as the season progresses. The system was implemented on a pilot scale on two small-scale irrigation schemes in Pongola and Makhathini. South Africa. Farmers, extension staff and mill cane supply management contributed to the design of the web interface, the advice and the reports generated by the system. Irrigation advice and yield estimates are disseminated weekly to 39 farmers using cell phone text messages. Summaries for each scheme are faxed to three extension officers and to mill management. Reports containing detailed information such as estimated current and predicted future cane yield, sucrose content and soil water deficit can be downloaded from the website. The study revealed various inefficient irrigation practices that could be eliminated and showed that significant savings in irrigation water and costs could be achieved by following the advice. It is believed that a similar approach could be followed to support other aspects of crop production, e.g. fertilizer management and harvest scheduling.

Strand and Moden (2007) studied GP affecting Bangladeshi socio-economic development pride and prejudice. This study revealed that how and to what extent GP is affecting the overall development of Bangladesh. Further, it looked into the critical factors contributing to success in development. It also suggests that the impact on the development of Bangladesh due to GP has been significant in technological, political and financial macroeconomic dimensions of the country.

Ofuoku *et al.* (2007) conducted a study in adoption of mobile phone among poultry farmers in Delta State Nigeria. This study was designed to ascertain the level of adoption of mobile phones in information exchange and the constraints of mobile phone adoption by poultry farmers in Delta State, Nigeria. Data were obtained rising questionnaire from 120 respondents. Descriptive Statistics and χ^2 were used to analyze the data. The adoption of mobile phone was fairly good. The information exchanged by poultry farmers and other stakeholders were on health problems, request for drugs and feeds, sources of feeds and drugs, request for the attention of veterinarians, poultry product marketers, current prices of inputs/outputs and information about meetings. The veterinary medical practitioners were the stakeholders that poultry farmers exchanged information with most frequently using mobile phones. The others were veterinary product marketers, feed sellers/marketers, other farmers etc. The reasons behind mobile savings quality assurance of reaching the receivers at all times, flexibility /earn ability quality and faster access to other stakeholders. The constraints of the adoption of mobile phone included the cost of running a mobile phone and network failure. The result of the hypothesis showed that the farm size and the educational attainment of poultry fanners had significant relationships with adoption of mobile phones. The study recommended accompany for adoption of mobile phones among poultry fanners, poultry farmers associations assistance on mobile phone ownership, extension network coverage to rural areas at lower rates and training on mobile phone operation.

Sarker (2006) conducted a study on the impact of village phone (VP) credit on the livelihood improvement of the borrowing households. This study aimed at examining the impact of Grameen Bank VP credit on the livelihood of the loanee. In total 100

VP operators were randomly chosen from the three selected unions of sadar upazila under Mymensingh district. The study found that the VP has brought about positive changes in different types of livelihood capital, food intake etc. The study revealed those positive changes in income and in turn saving took place due to VP operation by the respondents. Average annual income accrued from the VP operation constituted 35 percent of the total household income. The study further revealed that 63 percent of the respondents reported that their socio-economic condition has got improved due to VP operation.

Uttalondi (2006) carried out a study on assessing the customer satisfaction of GP. From his point of view, these issues were very important to find out the gap between expectation and perception of the subscribers and to eliminate dissatisfaction. Prime objective was to find out the satisfaction level of GP subscribers. From the organization part, he found that GP is the market leader in the mobile telecommunication industry of Bangladesh. Their growth rate is very high. But in this edge of competition, it is very difficult to keep the leading edge intact. Companies need to come up with new ideas to remain competitive.

Podder *et al.* (2006) conducted a study on "Application of IT for effective transfer of farm technology-a study of Ryot Sampaek Kendras (RSKs) in Northern Karnataka". The study was conducted with a view to assess the status and progress of IT. With regard to the level of IT knowledge among the personnel of RSK, in spite of the efforts by the Department of Agriculture, the study revealed that only approximately 37 percent respondents possessed high level of knowledge, while 35 percent possessed medium and the remaining 28 percent low level of knowledge. The level of IT knowledge was correlated with age, education, and designation and compensation status of the personnel. Regarding application of IT in farm technology transfer the picture was not encouraging. The findings revealed, inter alia, that the usage of computer as an IT tool was very much restricted. Approximately 21% of respondents used it for reporting while 18 percent used for calculations. Digital still camera was used widely (24 percent) as compared to the digital video (4 percent). But, these were confined for recording official programs. Specialist post may be created in the

Department and posted to RSK. Existing staff of RSK should be trained. More than 80 percent of the personnel were not using internet for availing information on latest farm research findings, on crops, pests, diseases or developmental programmes. However, the extent of use of mobile phone was on the rise and it ranged from 21 percent in the case of knowing about governmental programmes to a highest of 36 percent in providing solution to farmers' problems on crop pests and diseases application in (RSKs).

Marchi *et al.* (2006) conducted a study on “using text messages for assistance in agriculture”. In this study text messages were used for meteorological information and to alert growers of olives and grapes to the threat of pests/diseases, to monitor crop ripening and advice about irrigation. Information targeted to individual farmers (as in Lazio) can be very specific but as the service becomes more widespread the information is necessarily more general to the region. The study revealed that the service is low cost and opens interesting possibilities to cell phone users.

Campbell (2005) studied the impact of the mobile phone on young people's social life. He identified both positive and negative impacts of mobile phone on young people. He observed that the mobile phone has led to changed dynamics in the family with issues of safety. Campbell also identified along with other problems of which financial difficulties, non-custodial parent access, as well as over reliance on the mobile phone for safety issues and intrusion into young people's lives were important.

Oestmann (2005) carried out a study on the mobile operators: their contribution to universal service and access. He examined that marginal mobile phone service was often more affordable than fixed phones. Mobile service can penetrate the low income classes deeper than fixed in many cases, and mobile public payphones increase the access to rural and low-income users. Thus there is strong evidence that mobile operators make a significant contribution to provide universal service and access.

Burr (2002) conducted a study on the Grameen Village phone: its current status and future prospects. This study identified that about 25 percent of the total calls were made by the poor (poor was defined as someone who consumes less than the norm of 2120 calories per capita day) and about 75 percent of the calls were made by the non-poor. The study also found that 40 percent of the total calls were done for economic reasons of which poor the expectedly made more economic calls than those of the non-poor. The study revealed that earning of women accrued from the phone was helping her husband. The study also showed that consumer surplus increased because of using VP in the study areas.

Hat *et al.* (2002) conducted the study on “Village phone program in rural Bangladesh: a multi-media case studies”. They collected data from both phone users (198) and no phone users (94). The study revealed that VP program yielded significant positive social and economic impacts including relatively large consumer surplus and immeasurable quality life benefits. Among all male phones users surveyed in the study, 44 percent indicated that they should prefer a male phone owner, 6 percent indicated that they preferred a snowmen phone over and 50 percent were observed to be indifferent regarding gender issue. In the case of female users, 52 percent responded would prefer a women phone owner, 2 percent prefer a male phone owner, and 46 percent had no preference. The study found that village phone operators became socially and economically empowered.

Tanvir (2007) stated that ICTs for poverty alleviation through agricultural development was increasing rapidly. Electronic media which were far more effective in view of its high speed, vast range of coverage and particularly because it offers visual contents except in case of Radio.

Bays and Rasheda. (1999) carried out a study on the village pay phones and poverty reduction. They collected data from 50 VP operators in 50 villages over 350 users. Among the 50 operators, 14 percent were moderately poor and 86 percent were non-poor. In case of users, they found 6 percent to be extremely poor, 9.3 percent moderately poor and 84.6 percent as non-poor. They found that VP has perceptible

and positive effects on the empowerment and social status of phone-leasing women and their households. They also identified that the income derived from the VP was reported to be about 24 percent of the household income on an average and in some cases it was as high as 40 percent. The study reveals that VP has brought about significant benefits to the poor and women and raised their social status.

Satio and Weidemann (1990) prepared a World Bank report highlighting operational guideline on how to provide cost effective agricultural extension services to women farmers in sub-saharan Africa, and suggested specially for use of mobile training courses and mass media such as radio and video cassettes.

2.2 Relationship between farmers' characteristics and their use of mobile phone

2.2. 1 Age and use of mobile phone use

Nyamba and Mlozi (2012) conducted a study on Factors Influencing the Use of Mobile Phones in Communicating Agricultural Information: A Case of Kilolo District, Iringa, Tanzania, and found that age had significant effect on the use of mobile phone.

Richardson *et al.* (2000) find, in a study on Grameen Telecom's Village Phone Programme in Bangladesh, that “higher expenditures for better service are more likely to come from younger phone users aged 20 to 30, an age group that would more likely be receptive to a wider range of phone services, including card phones”

Bhuiyan (1988) found in his study that age of the farmers had significant negative correlation with the use of communication media.

Galindo (1994) found that the exposure to the communication media was closely related with the age of the farmers.

Sarker (1995) in his study concluded that age of the farmers had negative and insignificant effect on the use of communication media.

Shin and Evans (1991) found significant and positive relationship between age and impact of use of communicate on technologies.

Ullah (1996) observed that age of farmers showed a negative but not significant relationship with their use of different information media.

Khan (1996) concluded that age of the farmers had a negative and insignificant effect on the use of information media.

Most of the research findings on age and impact of information communication technologies use showed that either the variables are of independent or they had negative relationships.

2.2.2 Education level and use of mobile phone use

Ofuoku *et al.* (2007) found that the educational attainment of the poultry farmers had significant relationships with adoption of mobile phones.

kashem and Jones (1988) found in their study that education of the small farmers had significant positive correlation with their information sources.

Bhuiyan (1988) showed that education had positive and significant contribution to the comprehensive use of information and communication media.

Rahman (1974) found that the level of education of the respondents had significant influence on various information and communication technologies.

Rahman (1996) observed that education of the winter vegetable growers had moderate association with their use of different information sources.

Ullah (1996) concluded in his study that education of the vegetable growers had positive and highly significant relationship with their use of information sources. This means that the more the education of the vegetable growers, the more was their impact of information and communication sources use for vegetable cultivation.

Anisuzzaman (2003) concluded that the education of the farmers had significant positive relationship with their use of information and communication media.

Hooda (1989) found that land holding of the farmers had positive and significant correlation with their communication behavior.

Fuglie and Kascak (2001) find that diffusion of new technology among this community is relatively slow due to their low education level.

Majority of the researchers opined that the education level had relationship with their perceived impact of various information and communication technologies use and adoption of improved farming practices.

2.2.3 Farm size and Use of mobile phone use

Ofuoku *et al.* (2007) found that the farm size of the poultry fanners had significant relationships with adoption of mobile phones.

Bhuiyan (1988) found that the farm size of the farmers had positive and significant effect on the use of communication media.

Sarker (1995) in his study concluded that farm size of the respondents had a positive and significant relationship with their use of communication media.

Islam (1995) found that farm size of the farmers had a positive and significant relationship with their use of communication media.

2.2.4 Income and Use of mobile phone use

Nyamba and Mlozi (2012) conducted a study on Factors Influencing the Use of Mobile Phones in Communicating Agricultural Information: A Case of Kilolo District, Iringa, Tanzania, and found that income had significant effect on use of mobile phone.

Latif (1974) observed a significant positive relationship between income of the farmers and their communication exposure.

Sawheny (1996) showed that income was positively related to use of different information sources and media.

Karim (2005) found that income of the farmers had significant effect on the use of communication sources in receiving agricultural information.

2.2.5 Organizational participation and mobile phone use

Bhuiyan (1988) in a study found that organizational participation of the farmer had no significant effect on the use of communication media.

Islam (1995) in his study on wheat growers found that organizational participation of the farmers had positive and significant relationship with their use of communication media.

2.2.6 Innovativeness and mobile phone use

Pandian et. al. (2002) found direct positive effect on the Impact of Video Education on Knowledge Retention with the innovativeness of farmers.

2.2.7 Cosmopolitanism and mobile phone use

Anisuzzaman (2003) observed in his study that cosmopolitanism of rice growers had significant positive effect on their use of information and communication media.

Hossain and Crouch (1992) reported that cosmopolitanism had positive relationship with the information sources.

Considering the above mentioned research finding it may be concluded that the cosmopolitanism of the farmer and their impact of various information and communication technologies use are dependent on each other

2.3 Conceptual Framework of the Study

In scientific research, selection and measurement of variables constitute an important task. The hypothesis of a research while constructed properly contains at least two important elements i.e. a dependent variable and an independent variables. A variable whose value depends on that of another is called dependent variable . Independent variable is that factor which is manipulated by the researcher in this attempt to ascertain its relationship to an observed phenomenon. A simple conceptual framework for the study is shown in Figure 2.

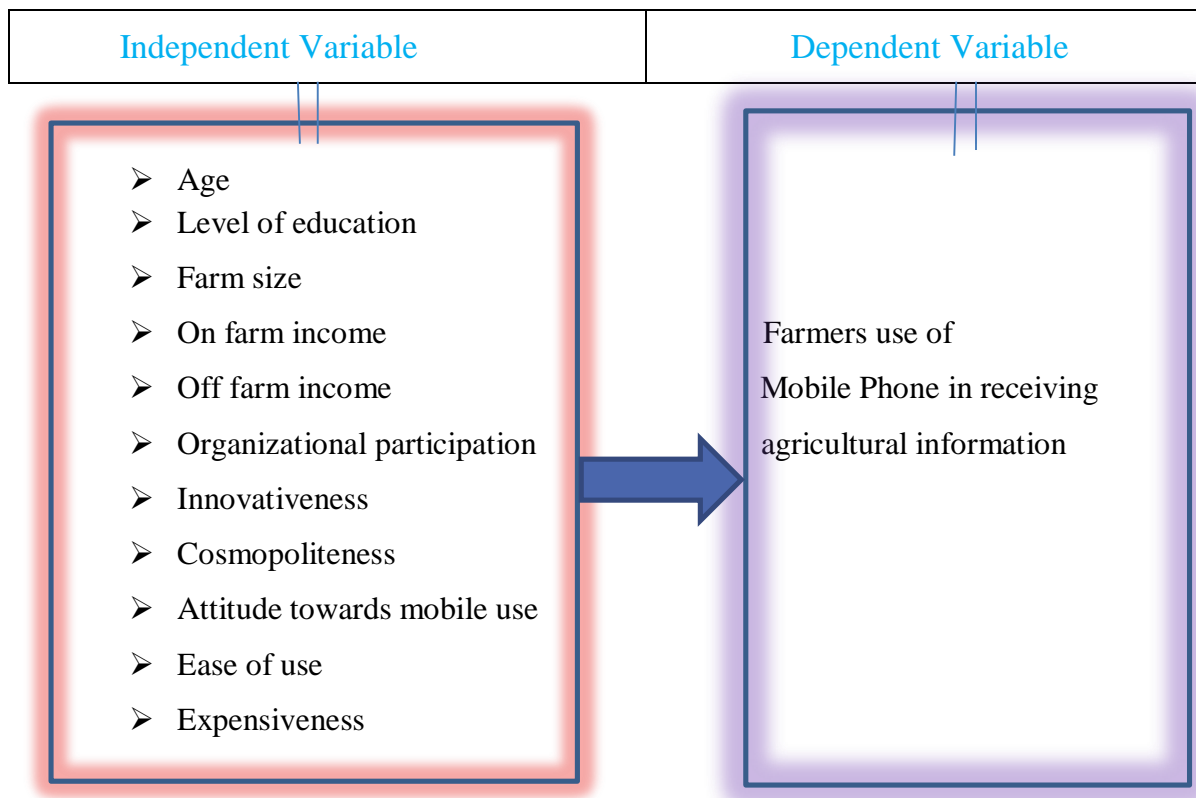


Figure 2.3: A Conceptual Framework of the Study

CHAPTER III

METHODOLOGY

Methods and procedures maintained for collection and analysis of data are essential for any kind of scientific research. It is one of the most important parts of a research work. Methodology deserves a very careful consideration in a scientific research. Methodology of any study should be such as to enable the researcher to collect valid and reliable information to analyze the same properly and to arrive at appropriate decisions.

The methods and procedures followed in conducting this research have been discussed in this Chapter. Further, the Chapter includes the operational format and comparative reflection of some variables used in the study. Also statistical methods and their use have been mentioned in the later section of this chapter.

3.1 Locale of the Study

The study was conducted at Savar upazila under Dhaka district. Savar has 13 Unions/Wards, 350 Mauzas/Mahallas, and 321 villages. The municipal area (Savar Town) consists of 9 wards and 55 mahallas. The area of the town is 24.1 km². It has a population of 124885; male 53.03%, female 46.97%; population density per km² of 5182. Savar thana was established in 1912 and was turned into an upazila in 1983. Savar upazila under Dhaka district was selected purposively for the study as this is a typical upazila of Bangladesh. Out of 13 unions Tetuljhora was purposively selected for the study. Then three villages namely Shampur, Meitka and Hemayetpur were selected randomly as the locale of the study. A map of Bangladesh showing Dhaka district and a map of Dhaka district showing Savar upazila and that considered as study have been shown in Figure 3.1 and 3.2, respectively.

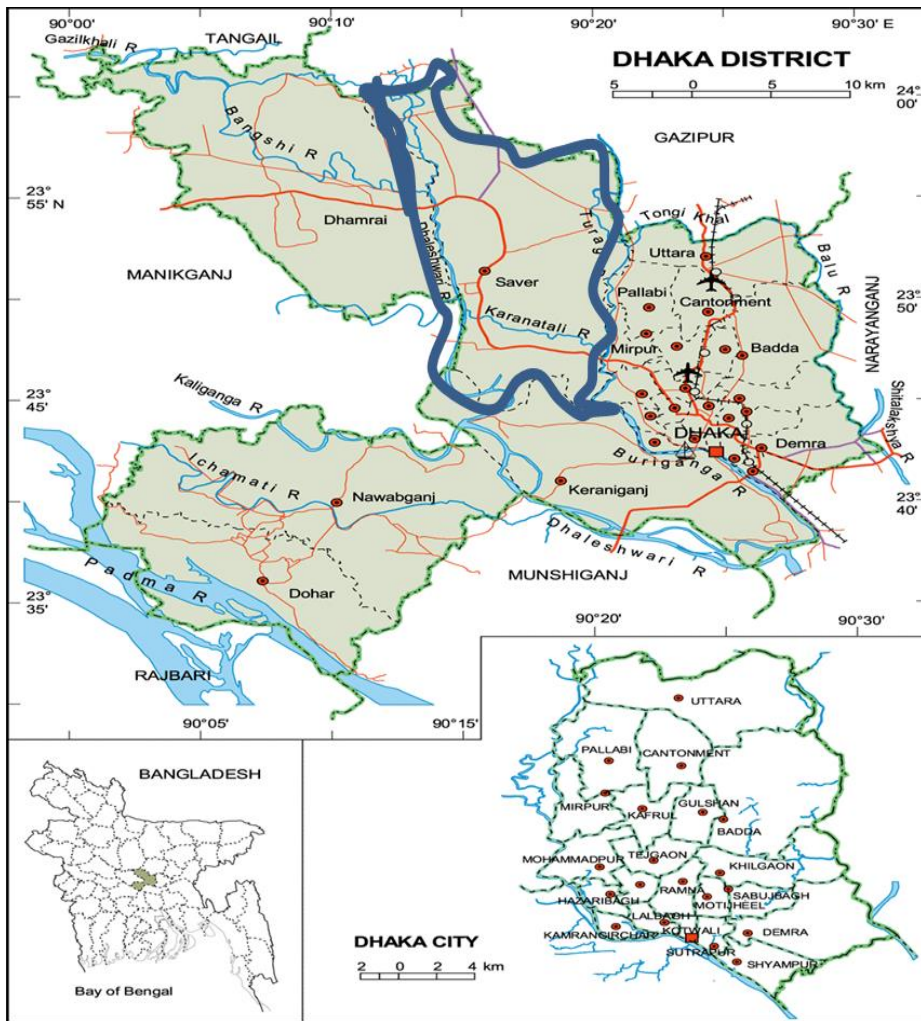


Figure 3.1: Map of Dhaka District showing Savar Upazila

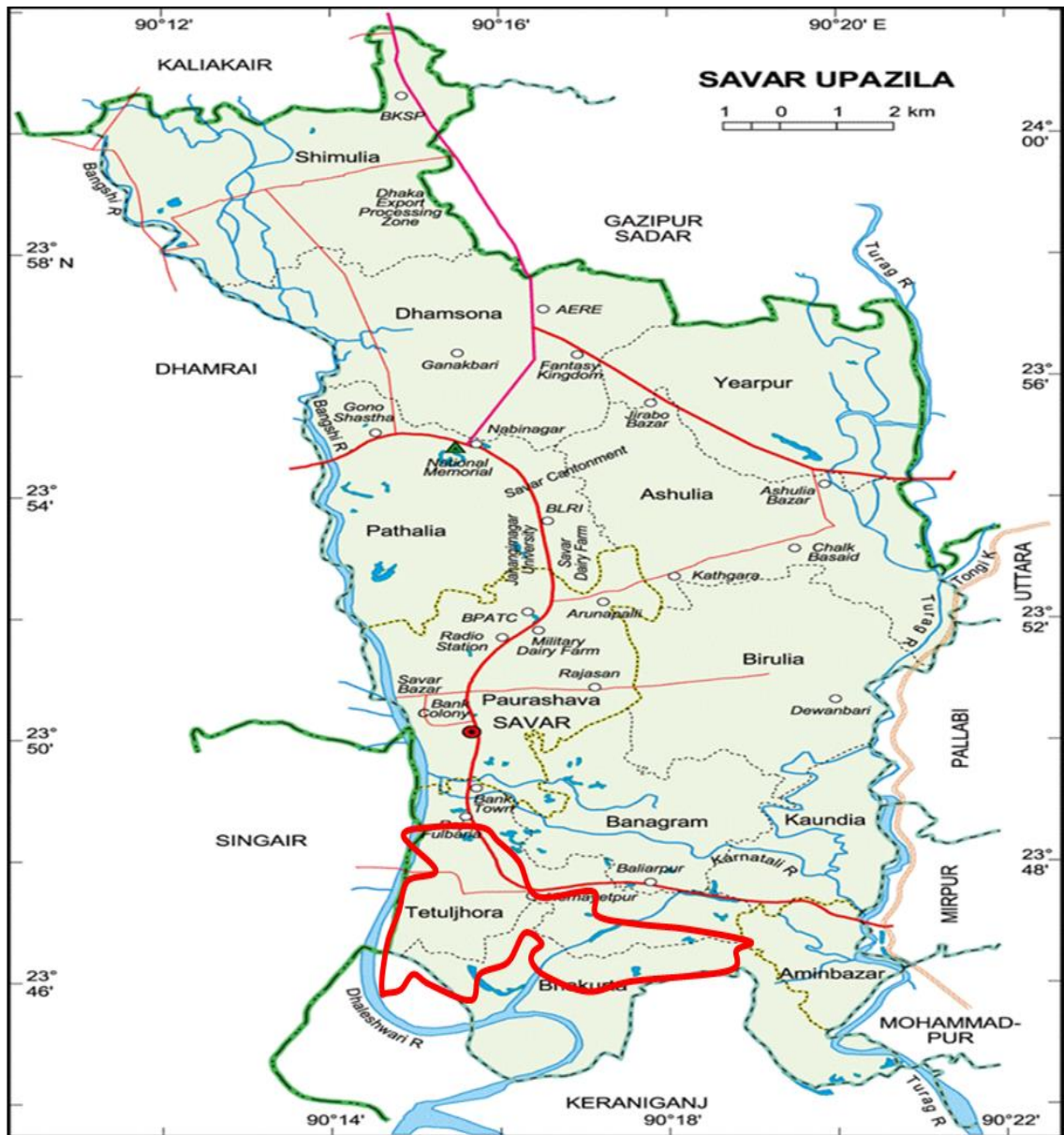


Figure 3.2: Map of Savar Upazila showing Tetuljhora Union

3.2 Population and Sampling Procedure

The study location was in Savar upazila. A list of farmers of the study area were prepared by the researcher with the help of Sub-Assistant Agriculture Officer (SAAO) of Savar Upazila Agriculture Office. The lists comprised of 403 which served as population of the study. Among 403 farmers, 120 (30% of total population) farmers were selected as following sample size of the study.

Table 3.1 Distribution of the farmers constituting the population and sample size in selected villages under Savar upazila

Upazila	Union	Villages	Number of the farmers	
			Populations	Samples size (30%)
Saver	Tetuljhora	Shampur	159	47
		Meitka	140	42
		Hemayetpur	104	31
Total			403	120

3.3 Development of Instrument

The face to face interview technique was used for data collection. A structured interview schedule containing both closed and open form questions were prepared for this purpose. Pre-test with the draft interview schedule with 10 farmers was accomplished. Pre-test conducted from 15 July to 20 July, 2018. Based on the pre-test result, necessary corrections, modifications, addition, alternation were made in the interview schedule and then finalized it.

3.4 Data Collection Procedure

Data were collected from the selected 120 farmers by face to face interview. Questions were asked systematically and explanation was made whenever necessary. The respondents were interviewed at their leisure time so that they can give accurate information in a relax mind. The investigator faced no serious problems. The final data were collected during 1 August to 30 August, 2018.

3.5 Variables of the Study

A variable is any characteristics, which can assume varying or yield different values in successive individual cases (Ezekiel and Fox, 1959). An organized piece of research usually contains at least two important variables viz., dependent and independent variables.

3.5.1 Dependent variable

Dependent variable is the variable that is being measured in an experiment or the variables those are affect during research are called dependent variable. In this study the dependent variable that is farmers' use of mobile phone in receiving agricultural information was measured based on whether farmers use or not use of mobile phone for agricultural purposes.

3.5.2 Independent variables

Independent variables are the variables that the researcher changes to test their dependent variables. Or the variables that can take different values and can cause corresponding changes in other variables. In this research, the researcher selected ten characteristics of the respondent as the independent variables. The

independent variables for this study were: age, level of education, farm size, occupation, on farm income, off farm income, organizational participation, innovativeness, cosmopolitaness, attitudes towards mobile phone, ease of use and expensiveness.

3.5.3 Measurement of Independent Variables

For conducting the study in accordance with the objectives it was necessary to measure the independent variables. The independent variables were age, level of education, farm size, occupation, on farm income, off farm income, organizational participation, innovativeness, cosmopolitaness, attitudes towards mobile phone, ease to use and expensiveness. Procedures for measuring these variables are described below:

3.5.3.1 Age

Age of the farmers was measured in terms of actual years from his birth to the time of interview, which was found on the basis of the verbal response of the rural people (Rashid, 2004). A score of one (1) was assigned for each year of one's age.

3.5.3.2 Level of education

Level of education was measured as the ability of an individual respondent to read and write or the formal education received up to a certain standard. If a respondent did not attain formal education, his score was assigned as zero (0). A score of 0.5 was given to a respondent who only could sign his/her name. A score of one (1) was assigned for each year of schooling. If a respondent passed the S.S.C examination, his education score was given as 10, 12 for H.S.C., and so on.

3.5.3.3 Farm Size

Farm size of the respondents' farmer was measured using the following formula. The farm size was expressed in hectare.

$$\text{Farm size} = \mathbf{A+B+1/2(C+D) +E}$$

Where,

A= Homestead area including pond

B= Own land under own cultivation

C= Land given to others as borga

D = Land taken from others as borga

E=Land taken from others as lease

3.5.3.4 On farm income

On farm income indicates total earning of a farmer and the members of his family from agriculture during a year. The value of all the agricultural products encompassing crops, livestock, vegetables etc. were taken into consideration. For calculation, a score of one (1) was assigned for each one thousand (1000) Taka on farm income of a family.

3.5.3.5 Off farm income

Off farm income indicates total earning of a farmer and the members of his family from non-agriculture income during a year. Services encompassing labour, transport, business etc. were taken into consideration. For calculation, a score of one (1) was assigned for each one thousand (1000) Taka off farm income of a family.

3.5.3.6 Organizational participation

Social organizational participation of respondent was measured on the basis of the nature of their participation in different organizations. Final score was computed by adding all the scores of selected organizations. Following scores were assigned for nature of participation: The social organizational participation score could range from 0 -infinite where 0 indicated no participation and infinite indicated very high social organizational participation.

3.5.3.7 Innovativeness

Innovativeness of a respondent was measured on the basis of the period of duration of use based on five technologies, such as cultivation of HYV, land preparation by powertiller, use of biofertilizer, use of recommended dose of fertilizer and use of sex feromone trap . Scores were assigned on the basis of time required for an individual to adopt each of the five technologies in the following manner:

Duration of adoption	Assigned score
Do not use	0
Within 1 year	1
Within 2 years	2
Within 3 years	3
Above 4 years	4

Thus the innovativeness score of a respondent was obtained by adding the score of all items and it ranged from 0 to 20, 0 indicating no innovativeness and 20 indicating very high innovativeness.

3.5.3.8 Cosmopolitanism

Cosmopolitanism of a respondent was measured in terms of his nature of visits to the five (5) different places external to his own social system. The cosmopolitanism of a respondent was measured by computing cosmopolitanism score on the basis of his/her visits with five selected cosmopolitanism.

Nature of cosmopolitanism	Scores assigned
Never	0
Rarely	1
Occasionally	2
Regularly	3

The cosmopolitanism score could range from 0 to 15 where 0 indicated low and 15 indicated high cosmopolitanism.

3.5.3.9 Attitude towards mobile phone use

Attitudes towards mobile phone use refer to the thinking of an individual to use mobile phone in receiving agricultural information. It was measured based on their response to use mobile phone. Those who thought that they should use mobile for getting agricultural information was given score 1 otherwise 0. Therefore, based on their attitudes towards mobile phone use, the respondents were classified into two groups such as favorable and unfavorable (Kabir and Rainis, 2015)

3.5.3.10 Ease of use

Ease of use refers to the capability of an individual to use mobile phone. The farmers were categorized into two groups regarding ease of use where one group of farmers thought that mobile use is complex while other opined that it is ease

to use mobile for getting agricultural information. Based on their comment on ease of use, the respondents were classified into yes and no categories. A score of 1 was given for yes and 0 for no.

3.5.3.11 Expensiveness

Expensiveness refers to the high price an individual spend to use mobile phone. The farmers were categoried into two groups regarding expensiveness where one group of farmers thought that mobile use is expensive while other opined that it is not expensive to use mobile phone for getting agricultural information. Based on their comment on expensiveness, the respondents were classified into two categories as yes and no.

3.6 Measurement of Dependent Variable

Use of mobile phone by the farmers in receiving agricultural information was the dependent variable for the study. The variable was measured on the basis of whether the farmers use or not use mobile phone for agricultural purpose. The scoring method for both group is mentioned below:

Extent of use of mobile phone	Assigned score
Mobile user	1
Non-user	0

The farmers who used mobile phone was given a score of 1 and the farmaers who didn't use mobile was given a score of 0.

Table 3.2 A short description of both dependent and independent variables

Variables	Types	Measuring technique
Age	Continuous	1 for 1 year
Level of education	Continuous	1 for 1 year of schooling and 0 for no education, 0.5 for can sign only
Farm size	Continuous	1 for 1 ha
On farm income	Continuous	1 for 1000 taka
Off farm income	Continuous	1 for 1000 taka
Organizational participation	Continuous	score
Innovativeness	Continuous	score
Cosmopolitaness	Continuous	score
Attitude towards mobile use	Binary	1 for favourable and 0 for unfavourable
Ease to use	Binary	1 for ease to use and 0 for not easy to use
Expensiveness	Binary	1 for expensive and 0 for inexpensive
Mobile use	Binary	1 for mobile use and 0 for not mobile use

3.7 Null Hypothesis

The following null hypothesis was undertaken for the present study. There is no significant relationship between the selected characteristics of farmers with the use of mobile phone. The related characteristics are - age, level of education, farm size, on farm income, off farm income, innovativeness, cosmopolitaness, attitudes towards mobile phone use, ease of use and expensiveness.

3.8 Data Processing and Analysis

The collected raw data were examined thoroughly to detect errors and omissions. Having consulted with the research supervisor, the Investigator prepared a detailed coding plan. Data were then coded into a coding sheet. In case of qualitative data, putting proper weight against each of the traits to transfer the data into quantitative forms followed suitable scoring techniques. Collected, data for the study were compiled, tabulated and analyzed in accordance with the objectives of the study. Various statistical measures such as number and percentage distribution, range, mean, standard deviation and rank order were used in describing the variables of the study. Tables and figures were used in presenting data for clarity of understanding.

The contribution of the individual characteristics of the respondents on their use of mobile phone in receiving agricultural information were ascertained by binary logistic regression model which is popularly known as logit model. The model for this study is given below:

Log [P/1-P] =

$$\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + e$$

Where,

P= Probability of outcome

β_0 = Intercept

β_1 - β_{11} = Age, Education, Farm size, On farm income, Off farm income, Organizational participation, Innovativeness , Cosmopolitaness, Attitude towards mobile phone, Ease of use and Expensiveness

X_1 - X_{11} = Coefficient for Age, Education, Farm size, On farm income, Off farm income, Organizational participation, Innovativeness, Cosmopolitaness, Attitude towards mobile phone, Ease of use and Expensiveness

e = Random error

The analysis was done by using SPSS (version 20) software. Five percent (0.05) level of probability was used for rejecting a null hypothesis. Co-efficient values signification at 0.05 level is indicated by one asterisk (*) and that at 0.01 level by two asterisks (**).

CHAPTER IV

RESULTS AND DISCUSSION

In this Chapter, the findings of the study and interpretation of the results have been presented. Data obtained from respondents through interview were measured, analyzed, tabulated and statistically treated according to the objectives of the study. These are presented in three sections according to the objectives of the study. The first section deals with the selected characteristics of the farmers', the second section deals with the extent of farmers' use of mobile phone in receiving agricultural information, the third section deals with the determinants of farmers' use of mobile phone in receiving agricultural information.

4.1 Selected Characteristics of the Farmers

This section deals with the classification of the farmers according to their various characteristics. Behavior of an individual is largely determined by his characteristics. In this section, findings on the farmers' eleventh selected characteristics have been discussed. The selected characteristics were age, education, farm size, on farm income, off farm income, organizational participation, innovativeness, cosmopolitaness, attitude towards mobile use, ease of use and expensiveness. Therefore, the major hypothesis of the study was that the use of mobile phone in receiving agricultural information would also be influenced by various characteristics of the farmers. Range, mean and standard deviations of these characteristics of the farmers have been described in the following sub-sections. Table 4.1 gives a summary profile of the farmer's characteristics.

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

Categories	Measuring unit	Range		Mean	S.D
		possible	observed		
Age	Year	-	20-75	41.80	11.38
Level of education	Year of schooling	-	0.00-12	5.02	3.14
Farm size	Hectare	-	.23-3.34	.86	.68
On farm income	‘000’ taka	-	100-550	281.50	103.45
Off farm income	‘000’ taka	-	0-400	72.25	67.73
Organizational participation	Score	-	0-13	4.09	3.02
Innovativeness	Score	0-20	9-20	15.29	3.04
Cosmopoliteness	Score	0-15	2-11	5.52	2.27
Attitude towards mobile use	Score	0-1			
Ease of use	Score	0-1			
Expensiveness	Score	0-1			

4.1.1. Age

Age of the farmers’ was found to range from 20 to 75 years. The average age was 41.80 years with the standard deviation 11.38. On the basis of age, the farmers were classified into three categories as shown in Table 4.2.

Table 4.2 Distribution of the farmers according to their age

Category	Number of farmers	Percent	Observed range	Mean	Standard Deviation
Young aged (up to 35)	42	35.0	20-75	41.80	11.38
Middle aged (36-50)	53	44.8			
Old aged (above 50)	25	20.2			
Total	120	100			

Data presented in Table 4.2 indicate that the highest proportion (44.8 percent) of the respondents was in medium aged category compared to 20.2 percent old age and 35.0 percent young aged category. However, data also revealed that 79.8 percent of the farmers' in the study area were middle to young aged. The middle aged farmers' are the most effective group in the use of mobile phone in receiving agricultural information. The extension agents can make use of these views and opinions in designing their extension activities among young and middle aged growers.

4.1.2 Level of Education

Education scores of growers ranged from 0 to 12. The average score was 5.02 with the standard deviation 3.14. Based on their score, the growers were classified into five categories as shown in Table 4.3.

Table 4.3 Distribution of the farmers according to their education

Category	Number of farmers	Percent	Observed range	Mean	S D
Cannot read and write(0)	17	14.2	0-12	5.02	3.14
Can only sign (.5)	7	5.8			
Primary level (1-5)	39	32.5			
Secondary level (6-10)	56	46.6			
Above secondary	1	.9			
Total	120	100			

Data presented in Table 4.3 indicate that a large proportion (46.6 percent) of the respondents fell under category of secondary education compared to 14.2 percent cannot read and write, 5.8 percent can only sign, 32.5 percent primary and only 0.9 percent above secondary education. The findings indicate that 79.0 percent of the respondents were educated that varied from primary to secondary levels. The literacy rate of the country is 65.5 percent (BBS, 2017). Thus the findings indicate that in the study area, the literacy seems to be greater than the national average.

4.1.3 Farm size

The farm size of the farmers' in the study area ranged from 0.23 to 3.34 hectares (ha). The average farm size was 0.86 ha with the standard deviation 0.68. Based on their farm size, the growers were classified into three categories as shown in Table 4.4.

Table 4.4 Distribution of the farmers according to their farm size

Category	Number of farmers	Percent	Observed range	Mean	Standard Deviation
Small farm (up to 1)	88	74.2	.23-3.44	.86	.68
Medium farm (1.01-3.0)	22	17.5			
Large farm (above 3)	10	8.3			
Total	120	100			

Data presented in the Table 4.4 shows that the major portion of the respondents (74.2 percent) fell under the small farm category while 17.5 percent under medium farm and 8.3 percent under large farm. Data also revealed that majority (91.7 percent) of the farmers of the study area were small to medium farms.

4.1.4 On farm income

On farm income of the farmers in the study area were ranged from 100 to 550 thousand taka ('000'). The average on farm income was 281.50 thousand with the standard deviation 103.45. Based on their on farm income, the farmers were classified into three categories as shown in Table 4.5.

Table 4.5 Distribution of the farmers according to their on farm income

Category	Number of farmers	Percent	Observed range	Mean	Standard Deviation
Low income (up to 178 thousand taka)	16	13.3	100-550	281.50	103.45
Medium income (179-384)	82	68.4			
High income (above 384)	22	18.3			
Total	120	100			

Data presented in table 4.5 show that the major portion of the respondents (68.4 percent) fell under medium on farm income category while 18.3 percent under high on farm income and 13.3 percent were under low on farm income category. Data also revealed that majority (86.7 percent) of the farmers of the study area medium to high on farm category.

4.1.5 Off farm income

Off farm income of the farmers' in the study area ranged from 0 to 400 thousand taka. The average off farm income was 72.25 thousand with the standard deviation 67.73. Based on their off farm income, the farmers were classified into three categories as shown in Table 4.6.

Table 4.6 Distribution of the farmers according to their off farm income

Category	Number of farmers	Percent	Observed range	Mean	SD
No income (0)	30	25.0	0-400	72.25	67.73
Low income (up to 133)	75	62.5			
Medium income (133-266)	10	8.33			
High Income (above 266)	5	4.17			
Total	120	100			

Data presented in the Table 4.6 show that the major portion of the respondents (62.5 percent) fell under low off farm income category while 25.0 percent no on farm income and 8.33 percent had medium off farm income and 4.17 percent had high off farm income. Data also revealed that majority (87.5 percent) of the farmers of the study area had low off farm income.

4.1.6 Organizational participation

Organizational participation scores of the respondents ranged from 0 to 13. The average score was 4.09 with a standard deviation of 3.03. The respondents were classified into the following three categories namely; low participation (0 to 1), medium participation (2 to 7) and high participation (above 7). Based on Mean \pm sd the respondents were classified into three categories. The distribution of the farmers according to their organizational participation is presented in Table 4.7.

Table 4.7 Classification of the farmers according to their organizational participation

Category	Number of farmers	Percent	Observed range	Mean	SD
Low participation (up to 1)	25	20.8	0-13	4.09	3.03
Medium participation (2-7)	67	66.7			
High profit (above 7)	15	12.5			
Total	120	100			

Data presented in Table 4.7 indicate that major (66.7) percent of the respondents had medium participation while 20.8 percent of the respondents had low participation and 12.5 percent had high participated in various organizations.

4.1.7 Innovativeness

Innovativeness of a respondent ranged from 9 to 20 with the mean of 15.29 and standard deviation 3.04. On the basis of the innovativeness the farmers were classified into three categories as shown in Table 4.8.

Table 4.8 Distribution of the farmers according to their innovativeness

Category	Number of farmers	Percent	Observed range	Mean	SD
Low Innovativeness (up to 12)	29	24.2	9-20	15.29	3.04
Medium Innovativeness (13-18)	67	60.0			
High Innovativeness (>18)	19	15.8			
Total	120	100			

Data presented in Table 4.8 indicated that the highest proportion (60.0 percent) of the respondents had medium innovativeness compared to 15.8 percent having high innovativeness and 24.2 percent having low innovativeness. Thus, the majority (82.2 percent) of the respondents had medium to low innovativeness.

4.1.8 Cosmopolitanism

The score of cosmopolitanism of the farmers ranged from 2-11 with a mean 5.52 and standard deviation of 2.27. On the basis of cosmopolitanism, the respondents were classified into three categories namely, ‘low’ cosmopolitanism, ‘medium’ and ‘high’ cosmopolitanism. The scale used for computing the cosmopolitanism score is presented in Table 4.9.

Table 4.9 Distribution of the farmers according to their cosmopolitanism

Category	Number of farmers	Percent	Observed range	Mean	SD
Low cosmopolitanism (2-3)	22	18.3	2-11	5.52	2.27
Medium cosmopolitanism (4-7)	75	62.5			
High cosmopolitanism (>7)	23	19.2			
Total	120	100			

Data arranged in Table 4.9 shows that the highest proportion (62.5%) of the respondents had medium cosmopolitanism while (18.3%) and (19.2%) of them had low and high respectively thus the majority of the farmers (81.7%) had medium to high cosmopolitanism.

4.1.9 Attitude towards mobile use for agricultural information

The respondents were classified into two categories based on their attitude scores: favorable attitude and unfavorable attitude. The categories and the distribution of the farmers according to their attitude towards mobile use are shown in Figure 4.1.

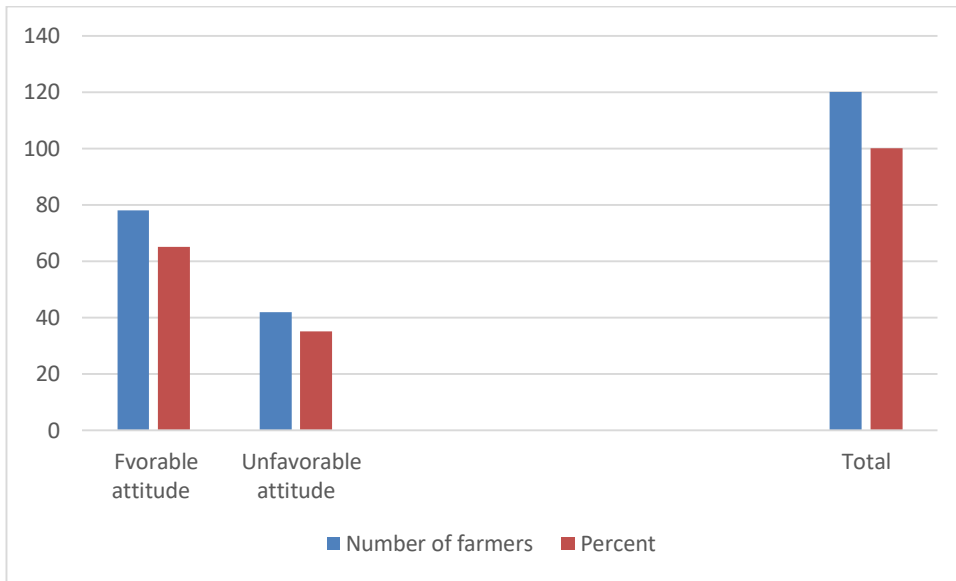


Figure 4.1: Distribution of the farmers according to their attitude towards mobile use

Data presented in Figure 4.1 indicate that the highest proportion (65.0 percent) of the respondents had favorable attitude compared to about 35.0 percent of them having unfavorable attitude towards mobile phone use.

4.1.10 Ease of use

Here, the respondents were classified into two categories: no and yes. The distribution of the respondents according to ease to use is shown in Figure 4.2

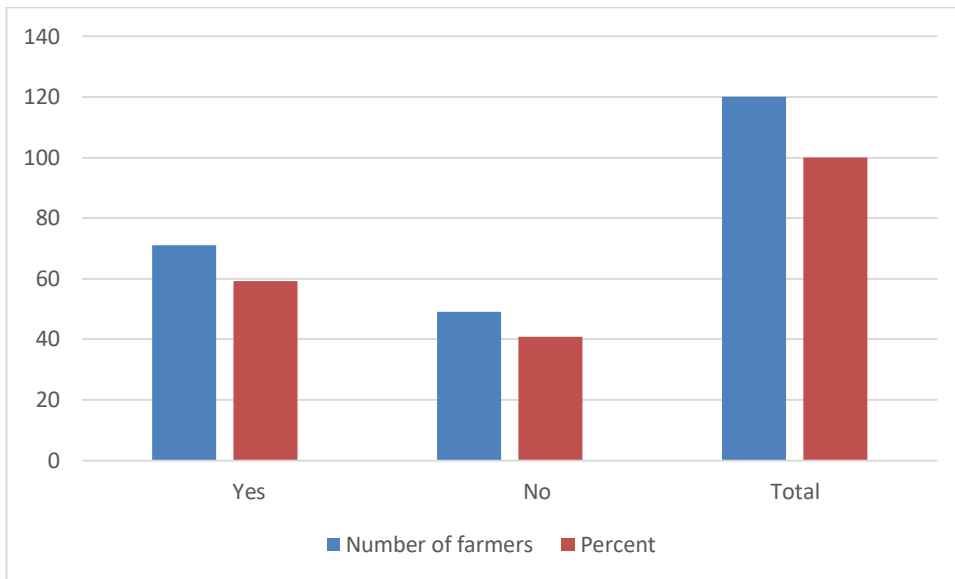


Figure 4.2: Distribution of the farmers according to ease to use

Data presented in Figure 4.2 indicate that the highest proportion (59.2 percent) of the farmers had thought that mobile phone is ease to use, while 40.8 percent of the respondents thought that mobile phone is not ease to use in receiving agricultural information.

4.1.11 Expensiveness

Based on their expensiveness scores, the respondents were classified into two categories: no and yes. The distribution of the respondents according to their expensiveness is shown in Figure 4.3.

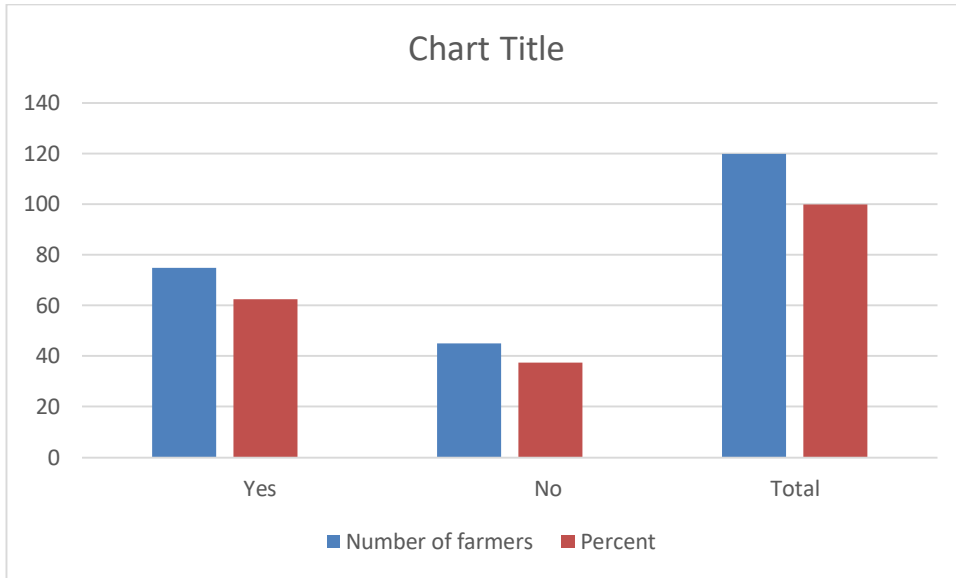


Figure: 4.3 Distribution of the farmers according to their expensiveness

Data contained in Figure 4.12 indicate that the highest proportion (62.5%) of the farmers commended that use of mobile phone is expensiveness in receiving agricultural information. On the other hand, 37.5% farmers commended that it is not expensive to use mobile phone in receiving agricultural information.

4.2 Use of Mobile Phone for receiving agricultural information

Based on the scores of use of mobile phone by the farmers in receiving agricultural information, the farmers were classified into two categories as mobile user and mobile non-user. The distribution of the respondents according to their use of mobile phone by the farmers in receiving agricultural information has been presented in Figure 4.4.

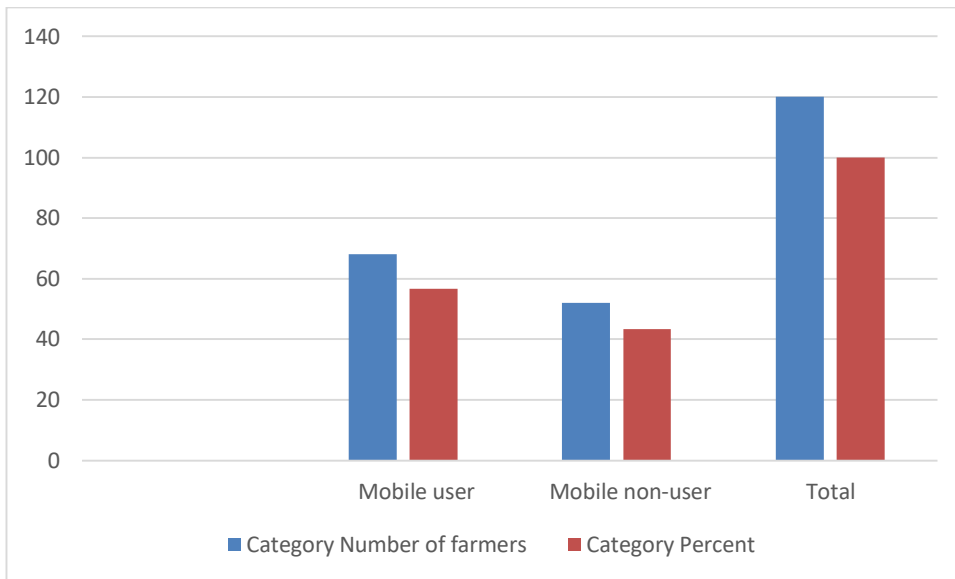


Figure 4.4: Distribution of the farmers according to their use of mobile phone in receiving agricultural information

Figure 4.4 revealed that the higher proportion (56.7 percent) of the respondents were mobile user regarding receiving agricultural information, while 43.3 percent farmers do not use mobile phone in receiving agricultural information. Here, it can be said that the number regarding mobile user and non-user don't indicate the actual picture of mobile holder rather mobile user in receiving agricultural information. There were few farmers who had no mobile but they used to take from others of his family, friends or neighbour.

4.3 Determinants of Mobile Phone use in receiving agricultural information

In order to estimate the contributing factors on the use of mobile phone by the farmers in receiving agricultural information binary logistic regression analysis was used which is shown in Table 4.14

Table 4.10 Binary logistic regression coefficients of contributing factors related to the use of mobile phone by the farmers in receiving agricultural information

Dependent Variable	Independent variable	B	S.E	Wald	Sig.	Exp (B)
Use of mobile phone by the farmers in receiving agricultural information	Age	-.002	.043	.002	.965	.998
	Education	.599	.303	3.902	.048*	1.820
	Farm size	-.919	1.043	.777	.378	.399
	On farm income	.014	.007	4.083	.043*	1.014
	Off farm income	.003	.006	.228	.633	1.003
	Organizational participation	-.536	.309	2.998	.083	.585
	Innovativeness	-.427	.307	1.937	.164	.653
	Cosmopolitaness	-.058	.311	.035	.851	.943
	Attitude towards mobile phone use	-18.820	1093 9.01	.000	.999	.000
	Ease of use	26.640	1093 9.01	.000	.998	.017
Expensiveness	2.523	1.093	5.323	.021*	12.463	

Overall percentage of correct prediction = 56.7%

Omnibus test of model coefficient = 125.327**

Cox and Snell $R^2 = 0.648$

Nagelkerke $R^2 = 0.869$

Table 4.14 shows that level of education, on farm income and expensiveness were the important contributing factors (significant at the 5% level of significance). The data in Table 4.14 test the final null hypothesis: There is no relationship between the selected characteristics (age, farm size, off farm income, organizational participation, innovativeness, cosmopolitaness, attitudes towards mobile phone use and ease of use) and the probability of use of mobile phone by the farmers in receiving agricultural

information. In order to assess which factors, contribute to the use of mobile phone by the farmers in receiving agricultural information, Binary logistic regression analysis was used. The analysis suggests that the respective authority should consider the respondents' level of education, on farm income and expensiveness for increasing the use of mobile phone by the farmers in receiving agricultural information.

The Cox and Snell $R^2 = 0.648$ of the variation in the respondents changed the probability of use of mobile phone by the farmers in receiving agricultural information can be attributed 64% to their respondents' level of education, on farm income and expensiveness. However, each predictor may explain some of the variance in respondents' use of mobile phone by the farmers in receiving agricultural information simply by chance. Besides, the overall percentage of correct predictness is 56.7% and the omnibus test of model coefficient is 125.327 which is significant at 1% level (Table 4.15). These findings indicate that, the model is valid.

4.3.1 Determinants of mobile phone use in receiving agricultural information

The contribution of education on the probability of use of mobile phone by the farmers in receiving agricultural information by testing the following null hypothesis; "There is no contribution of education in the probability of use of mobile phone by the farmers in receiving agricultural information".

Based on p value and the direction of coefficient value of the concerned variable of the study under consideration the following observations were made.

- a. The contribution of the education was significant at 5% level. So, the null hypothesis could be rejected.
- b. The direction between education and the use of mobile phone is positive.

Based on the direction of coefficient value it can be said that a farmer with more education increased the probability of using mobile phone in receiving agricultural information. Moreover, the odd ratio value (1.82) indicates a farmer with high

education has 1.82 times higher probability of using mobile phone in receiving agricultural information. Education enhances the abilities of the farmers at short time to use mobile phone in receiving agricultural information problems.

4.3.2 Determinants of mobile phone use in receiving agricultural information

The contribution of on farm income on the probability of use of mobile phone by the farmers in receiving agricultural information by testing the following null hypothesis; “There is no contribution of on farm income on the probability of using mobile phone by the farmers in receiving agricultural information”.

The p value of the concerned variables was found .043. The following observations were made on the basis of the value of the concerned variable of the study under consideration.

- a. The contribution of on farm income was significant at 5% level. So, the null hypothesis could be rejected.
- b. The direction between on farm income and the use of mobile phone is positive.

Based on the direction of coefficient value it can be said that a farmer with more on on farm income increased the probability of using mobile phone in receiving agricultural information. Moreover, the odd ratio value (1.014) indicates a farmer with high on farm income has 1.014 times higher probability of using mobile phone than the others who have less on farm income. On farm income enhances the abilities of the farmers to purchase and use mobile phone which they can use in receiving agricultural information.

4.3.3 Deteminants of mobile phone use in receiving agricultural information

The contribution of expensiveness on the probability of use of mobile phone in receiving agricultural information by testing the following null hypothesis; “There is

no contribution of expensiveness in the probability of using mobile phone in receiving agricultural information”.

The p value of the concerned variables was found .021. The following observations were made on the basis of the value and coefficient of the concerned variable of the study under consideration.

- a. The contribution of expensiveness was significant at 5% level. So, the null hypothesis could be rejected.
- b. The direction between expensiveness and the probability of using mobile phone is positive.

Expensiveness was the highest contributory factor on use of mobile phone by the farmers in receiving agricultural information. The farmers who thought that mobile phone is expensive had probability to use this tool. The finding is contradict with generalization. However, some farmers commented that despite expensiveness they should use mobile for getting information timely and conveniently.

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATION

This chapter presents the summary of findings, conclusions and recommendations of the study.

5.1 Summary of Findings

The major findings of the study are summarized below:

5.1.1 Selected characteristics of the farmers

Findings in respect of the 11 selected characteristics of the farmers summarized below:

Age

The highest proportion (44.8 percent) of the farmers were middle aged while 20.2 percent was old and 35.0 percent was young aged.

Education

The highest proportion (46.6 percent) of the respondent had secondary level of education, while 32.5 percent had primary level of education, 14.2 percent cannot read and write, 5.8% can only sign and 0.9 percent had above secondary level of education.

Farm size

The highest proportion (74.2 percent) of the farmers had small farm size, while 17.5 percent had medium farm size and 8.3 percent had large farm size.

On farm income

On farm income of the farmers ranged from 100 to 550 thousand Tk. with the mean of 281.50 thousand Tk. The highest proportion (68.4 percent) of the farmers had medium on farm income compared with 13.3 percent and 18.3 percent having low and high on farm income respectively.

Off farm income

Off farm income of the farmers ranged from 0 to 400 thousand Tk. with the mean of 72.25 thousand Tk. The highest proportion (62.5 percent) of the farmers had low off farm income compared with 25.0 percent and 12.5 percent having no and medium off farm income respectively.

Organizational participation

The observed organizational participation scores of the farmers ranged from 0 to 11 with the mean of 4.09. The highest proportion (66.7 percent) of the farmers had medium organizational participation; while 20.8 percent had low and 29.5 percent farmers had high organizational participation.

Innovativeness

Innovativeness ranged from 9 to 20 with an average 15.29 and standard deviation 3.04. The highest proportion (60.0 percent) of the respondents of the study area had the medium innovativeness, while 24.2 percent had low innovativeness and 15.8 percent had high innovativeness.

Cosmopolitanism

The observed cosmopolitanism ranged from 2 to 11 with an average 5.52 and standard deviation 2.27. The highest proportion (62.2 percent) of the respondents had medium cosmopolitanism compared to 19.2 percent having high cosmopolitanism and 18.3 percent had low cosmopolitanism.

Attitude towards mobile phone use

The highest proportion (65.0 percent) of the respondents of the study area had unfavorable attitude and 35.0 percent had favorable attitude towards mobile phone use.

Ease of use

The highest proportion (59.2 percent) of the respondents of the study area had yes ease to use and 40.8 percent had no ease to use.

Expensiveness

The highest proportion (39.2 percent) of the respondents of the study area had yes expensiveness and 29.4 percent had no expensiveness.

5.1.2 Use of Mobile Phone by the Farmers in Receiving Agricultural Information

The use of mobile phone by the farmers in receiving agricultural information scores of the farmers ranged from 0 to 1 with an average of 0.57 and the standard deviation 0.498. The highest proportion 56.7 percent of the farmers fell under yes category and 43.3 percent had no use of mobile phone by the farmers in receiving agricultural information.

5.1.3 Determinants of mobile phone use by the farmers

Expensiveness, on farm income and education had significant positive contribution to their use of mobile phone by the farmers in receiving agricultural information. Characteristics of the farmers like age, farm size, off farm income, organizational participation, innovativeness, cosmopolitaness, attitude towards mobile phone use and ease of use had no contribution to their use of mobile phone by the farmers in receiving agricultural information.

5.2 Conclusions

- i. About half of the farmers do not use mobile phone in receiving agricultural information. In one hand, frequent face to face contact by the SAAO with the farmers is difficult because of poor SAAO and farmers ratio. On the other hand, mobile phone is a small ICT tool that can easy use in receiving agricultural information. So, Steps should be taken to increase the number of mobile phone users.

- ii. Expensiveness was the highest contributory factor on the use of mobile phone by the farmers in receiving agricultural information. The farmers who thought that mobile phone is expensive had probability to use this tool. The findings is contradict with generalization. However, some farmers commented that despite expensiveness they should use mobile phone for getting information timely and conveniently.
- iii. The farmers who had move on farm income from agricultural source had move probability to use mobile phone in receving agricultural information. Therefore, it may be concluded that on farm income of the farmers played important role in using mobile phone.
- iv. Education had positive and significant contribution with their use of mobile phone by the farmers. Education develops mental and psychological ability of average person to understand, decide and adopt new practices and ideas. This lead to the conclusion that any attempt to raise higher literacy level of the farmers would be helpful for increasing their use of mobile phone by the farmers in receiving agricultural information.

5.3 Recommendations

5.3.1 Recommendations for policy implications

On the basis of observation and conclusions drawn from the findings of the study following recommendations are made to the planners and policy makers in contriving micro or macro level policy for increasing the use of mobile phone by the farmers in receiving agricultural information:

- i. The DAE and other related organization should motivate farmers more to purchase and use mobile phone. In this content, the government can give interest free loan to the farmers for purchacing mobile. The relevant NGO's can provide mobile phone to the farmers with very less price.
- ii. To increase the use of mobile phone in receiving agricultural information. The DAE and other government and non-government personel should strongly motivate more the farmers who has less on farm income.

- iii. It may be recommended that, adult education should be provided to the farmers so that they could increase their educational level which might be helpful to increase their use of mobile phone.

5.3.2 Recommendations for the future study

The following recommendations are made for the future study:

1. The present study conducted on the population of the farmers of only 3 villages under one union of Savar upazila in Dhaka district. The findings of the study need to be verified in diverse geographical location of the country.

2. The study investigated the contributions of the 11 selected characteristics of the farmers with their use of mobile phone in receiving agricultural information. But farmer's use of mobile phone by the farmers in receiving agricultural information might be affected by various other personal, social, psychological, cultural and situational factors. It is, therefore, recommended that further study should be conducted involving other characteristics in this regard.

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Appendix-I

An English Version of Interview Schedule

DEPARTMENT OF AGRICULTURAL EXTENSION & INFORMATION SYSTEM

SHER-E-BANGLA AGRICULTURAL UNIVERSITY, DHAKA-1207

An interview schedule for data collection of the reseach study entitled

“DETERMINANTS OF FARMERS USE OF MOBILE PHONE IN RECEIVING AGRICULTURAL INFORMATION”

Serial No:

Respondent Name:

Village:

Union:

Upazila:

District:

Mobile No:

Please provide information on the following issues :

1. Age:

What is your present age? ----- Years.

2. Level of Education:

a) Cannot read and write.....

b) Can sign only.....

c) I read up to class

d) I passedclass

3. Farm Size:

Please mention the area of your land possession :

Sl. No.	Types of land ownership	Area of land		Total Area (Hectare)
		Local unit	Hectare	
1.	Homestead area (Including pond)(A)			
2.	Own land under own cultivation (B)			
3.	Land given to others as borga (C)			
4.	Land taken from others as borga(D)			
5.	Land taken from others as lease (E)			
	Total=A+B+1\2(C+D)+E			

4. On farm income:

Items	Amount of production	Price (BDT)
Rice		
Maize/wheat/Jute		
Vegetables		
Fruits/Pulse		
Livestock/Fisheries		

5. Off farm income:

Items	Amount of production	Price (BDT)
Labour		
Transport		
Business		
Service		

6. Organizational participation:

Please extent your engagement with the following organization:

Organization	Engagement for years	Not engagement
Common Interest Group (CIG)		
IPM/ICM club		
Village Cooperative association		
NGO's		

7. Innovativeness:

Please mention your duration of use with the following technologies:

Sl. No.	Name of technologies	Do not use	Duration of Adoption			
			Above 3 years	3 years	2 years	Within 1 year
1.	Cultivation of HYV					
2.	Land preparation by power tiller					
3.	Use of bio-fertilizer					
4.	Use of recommended dose of fertilizer					
5.	Use of sex pheromone trap					

8. Cosmopolitaness:

Please extent your visit in the following places:

Sl. No.	Places of visit	Extent of Visit			
		Regularly	Occasionally	Rarely	Never
1.	Other village	5 or more times/month	3-4 times/month	1-2 times/month	Zero times/month
2.	Own upazilla	5 or more times/month	3-4 times/month	1-2 times/month	Zero times/month
3.	Other upazila	5 or more times/month	3-4 times/month	1-2 times/month	Zero times/month
4.	Own district	5 or more times/month	3-4 times/month	1-2 times/month	Zero times/month
5.	Other district	5 or more times/season	3-4 times/season	1-2 times/season	Zero times/season

9. Attitude towards mobile use:

Do you think that mobile is a good tool to receive agricultural information?

- a) Yes b) No

10. Ease to Use:

Do you think that mobile is ease to use?

- a) Yes b) No

11. Expensiveness:

Do you think mobile use is expensive to collect agricultural information?

- a) Yes b) No

12. Have Mobile Phone and use for Agricultural Purpose:

Do you use mobile phone in agricultural purpose?

- a) Yes b) No

Thanks for your co-operations

.....

Date :

Signature of Interviewer