PERCEIVED IMPORTANCE OF DIFFERENT ICT ENABLERS FOR RECEIVING FARM INFORMATION

A Thesis

By

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Student ID. 1705028

Semester: January-June 2018

MASTERS OF SCIENCE

IN

AGRICULTURAL EXTENSION

Department of Agricultural Extension
Hajee Mohammad Danesh Science and Technology University
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PERCEIVED IMPORTANCE OF DIFFERENT ICT ENABLERS FOR RECEIVING FARM INFORMATION

ABSTRACT

The main purpose of the study was to determine the perceived importance of ICT enablers used by the farmers for receiving farm information. Data were collected from the farmers of Dinajpur Sadar, Chirirbandar and Biral Upazila of Dinajpur district during 20 February to 20 March, 2018. The sample size of the study was 102 farmers directly or indirectly involved with Agriculture Information and Communication Centers (AICCs) of DAE and it was drawn from a population of 340 using random sampling technique. For collecting data structured interview schedule were used. The perceived importance of ICT enablers was the focus issue of this study and it was measured considering ten ICT enablers and nine farm related information. A four-point rating scale was used to measure the importance is – "not important at all", "somewhat important", "important" and "very important" with a score of 1, 2, 3 and 4, respectively. The overall perceived importance score could range from 90 to 360. The selected characteristics of the farmers are: age, level of education, family size, farming experience, annual family income, ICT training received, use of ICT enablers in agricultural activities, frequency of use of ICT enablers and ease of use of ICT enablers. Each of the selected characteristics was discussed and analyzed following standard procedure. Correlation test was used to ascertain the relationships between the focus issues and the selected characteristics. It was found that 74.5 percent of the farmers perceived that the ICT enablers was medium important, followed by 13.7 percent of farmers perceived as low important and 11.8 percent of farmers perceived as highly important. The mobile phone ranked top most as perceived important ICT enabler by the farmers for receiving farm information followed by television and radio. Again, farmers perceived the "recent information on agriculture" is most important for receiving from different ICT enablers followed by "information on market of agricultural products" and "get information on new varieties". Farmers' characteristics such as age, level of education, farming experience, ICT training received, Use of ICT enablers in agricultural activities and frequency of use had significant positive relationship with the perceived importance of ICT enablers; while family size, annual family income and ease of use of ICT enablers had no significant relationship with perceived importance of ICT enablers by the farmers.

CHAPTER 1
INTRODUCTION

1.1 General Background

Bangladesh is predominantly an agricultural country with an area of 1,47,610 square kilometers. The economy of the country mostly depending on agriculture represents directly and indirectly, almost 23 percent of the country's gross domestic product (GDP) and gives employment to 62 percent (BBS, 2004). In fact, agriculture plays a vital role in capital formation at home and for foreign exchange also. It also supplies most of the raw materials for the industrial development of the country. The country is supplying to meet the basic need of her population from its cultivatable land which is estimated around 8.29 million hectors. But still agricultural productivity of Bangladesh is one of the lowest in the world.

Through predominately an agrarian country. Bangladesh cannot produce enough food to her population. Although "Agriculture is the principal engine of growth in many low-income developing countries, where it accounts for 60 to 80 percent of all employment" (CGIAR, 1995). Food security should also be linked to environmental, social, cultural, political and institutional aspects of society (Fomo, 1999). At present food situation is alarming and the food reserve is very poor. Besides this, there is no scope to increase the cultivable land rather it is decreasing rapidly to provide new generation. On the other hand, the soils of Bangladesh are very fertile and climate is favorable for crop growth throughout the year. Thus, there is tremendous scope for increasing agricultural production in Bangladesh.

However, agricultural production can only be increased if appropriate technologies are used by the farmers, who are the primary unit of adoption to improved practices. Therefore, proper utilization of modem agricultural inputs, knowledge of the usefulness of inputs and the know-how of their use should reach to the farmers within a shortest possible time and that should be done very effectively. Further, diffusion of knowledge on modem agriculture among the rural people demands effective communication system. "More than natural resources, more than cheap labor, more than financial capital, knowledge is said to be the key factor of production" (World Bank, 1992). So, communication is essential for improving the productivity. That is the way farmers, more

specially the commercial farmers can help them change their way of cultivation from traditional to modem one. Farther more different communication behavior more effective for different person. Rogers (1962) after reviewing many studies on sources of information by stages, made a generalization that communication sources were most important at the stages in the adoption process.

Development of agricultural sector is of prime importance for our country. Therefore, to accelerate the pace of economic growth and development application of ICT could be a better proposition. Globally, the development of ICT has proven its potentials not for enhancing development efforts, but also virtually reduced the distance and turned the world into a global village (O'Farrell, 2003). Besides that, the number of devices or equipment's of communication is increasing in a very rapid speed. Now a larger proportion of farmers have their own TV set and cable TV is available almost everywhere in Bangladesh. Extension communicators are more intensive than previous years. The newspaper and poster are available almost every village. But computer is not available due to its high cost. So, farmers can easily receive information through various information communication media.

The government has declared ICT as thrust sector and put much emphasis on the computerized and establishing e-governance in all aspect of development. Several ICT initiatives or programs were undertaken and the outputs of these are used for agricultural research, development and extension.

Research conducted in foreign countries, particularly of the west, revealed that farmers are contacted, trained and organized generally through the sources like friend, relative contact, result demonstration, general meeting, office call, agricultural magazine, radio, television and but the very few researchers conducted research on ICT in Bangladesh and perhaps no one conducted research to find out the perceived importance of ICT enablers by the farmers for receiving farm information in Bangladesh.

1.2 Statement of the Research Problem

In view of the foregoing discussion, the framework of the study stems from communication system which is very important and a matter of very much consciousness to the policy makers. Agricultural information has been considered as an important input for increased farm productivity. Farmers use various sources for obtaining farm

information. Moreover, by using information and communication technologies, any massage can be diffused effectively within a very short time. ICTs involve mobile phone, television, radio, telephone, internet, multimedia etc. But this research tries to discover the behavioral changes with their perceived importance of use these technologies. For identifying the perceived importance of ICT enablers by the farmers in receiving agricultural information, it is necessary to know the answers of the following questions an appropriate direction.

1. What is the perceived importance of ICT enablers by the farmers?
2. What are the profile characteristics of farmers?
3. What are the relationships between the characteristics of farmers with their perceived importance?

The various selected characteristics and situational factors of the farmers might have some kind of relationships with perceived importance of use of Information and Communication Technologies in receiving farm information which also taken in to consideration during the study. On the basis of the above discussion, the researcher undertook a piece of study, entitled "Perceived Importance of Different ICT Enablers for Receiving Farm Information".

1.3 Objectives of the Study:

In view of the problem as stated above the following objectives were formulated for giving proper direction to the study:

i. To determine perceived importance of different ICT enablers for receiving farm information.

ii. To describe some selected characteristics of the farmers. The selected characteristics are:

    (a) Age
    (b) Level of education
    (c) Family size
    (d) Farming experience
    (e) Annual family income
    (f) ICT training received
    (g) Use of ICT enablers in agricultural activities
    (h) Frequency of using ICT enablers
    (i) Ease of using ICT enablers

iii. To ascertain the relationship between selected characteristics of the farmers with their perceived importance of different ICT enablers for receiving farm information.

1.4 Scope and Limitations of the Study:

The finding of the study will be particular applicable to three upazilas of Dinajpur district, are Dinajpur Sadar, Chirirbandar and Biral. However, the findings may also be applicable in other places of Bangladesh where the physical, socio-economic and cultural conditions do not differ much with those of the study area. Thus, the findings of the study may be profitable utilized by the planners, policy makers, extension personnel and field workers for successful planning and extension of programs aimed at effective communication of agricultural information to the farmers in general. The purpose of the study was to have understanding about the perceived importance of use of information and communication technologies by the farmers in receiving farm information. However, in order to conduct the research in a meaningful and manageable way it becomes necessary to impose certain limitations in regard to certain aspects of the study. Considering the time, money and necessary resources available to the researcher the following limitations have been observed throughout the study.

a) The study was confined to farmers who are directly or indirectly related with AICCs of Dinajpur Sadar, Chirirbandar and Biral Upazila in Dinajpur district because they were the major part of the village who are related to ICTs.

b) Only nine characteristics were selected for investigation in the study. But the characteristics of the farmers were many and varied.

c) The investigator depended on the data furnished by the selected farmers during their interview.

d) Information used by the farmers for various purposes such as planning, business, politics, religion etc. This study investigated the perceived importance of different ICT enablers for receiving farm information.

e) Facts and figures collected by the investigator applied to the situation prevailing during the year 2018.

1.5 Assumptions of the Study

"An assumption is the supposition that an apparent fact or principle is true in the light of the available evidence" (Goode and Hatt, 1952). In this study, the researcher had the following assumptions in mind while undertaking this study.

a) The respondents included in the sample were competent to give proper responses to the queries included in the interview schedule.

b) The researcher who acted as interviewer was well adjusted to the social and cultural environment of the study area. Hence, the data collected by him from the respondents were free from bias.

c) The responses furnished by the respondents were reliable and the respondents truly and freely expressed all facts concerning importance of ICTs use as perceived by them and their selected characteristics.

d) Views and opinions made by the respondents were representative of the whole population of the study area.

e) The researcher was capable to rate the responses of the farmers with adequate precision.

f) The findings of the study will have general application to other parts of the country where physical, socio-economic and cultural conditions do not differ much from the study area.

g) Importance of use of ICTs as perceived by the farmers was linearly related with their selected characteristics.

1.6 Definition of the Terms

Certain terms used throughout the study are defined below for clarity of understanding.

Information and Communication Technologies (ICTs)

ICT stands for Information and Communications Technology. In other words, it can mean almost anything that's new and relevant to communications. This includes the Internet, mobile telephone, satellite communications and digital television over cable or aerials. In this study only ten selected technologies (i.e. Mobile phone, Computer, Internet, Multimedia projector, Digital camera, CD/DVD player, TV, Radio, Printer and Mike/Sound-system) have been taken into consideration.

Age

Age of a respondent is defined as the period of time in actual years from his birth to the time of interviewing.

Education

Education defined as the formal education received up to a certain level from an educational institute (e.g. school, college and university) at the time of interview.

Family Size

Family size may be considered from two perspectives. At the individual (micro) level, it defines one aspect of an individual's family background or environment. As such, it represents a potential influence on the development and accomplishments of family members. At the societal (macro) level, family size is an indicator of societal structure that may vary over time, with concomitant implications for individual development and social relations in different cohorts. In this essay, consideration is given to both aspects of family size, as it is reflected in sociological theory and research.

Farm size

Farm size referred to the area of land possessed by a farmer through different land tenure system such as own land under own cultivation, land given other as borga, land taken from other as borga, land given lease, land taken as lease etc.

Annual family income

Annual family income referred to the total earning of a respondent himself and the members of his family from agriculture and non- agriculture (services, business, etc.) sources during a year.

Farming experience

Farming experience of a respondent defined as the period of time he practices agricultural work.

ICT enablers

ICT enablers are devices or objects used in information and communication technology. Such as.: computer, cell phones, cell phone towers, video conferencing, software, radio, television, laptop etc.

CHAPTER 2
REVIEW OF LITERATURE

The researcher made an elaborate search of available literature for this research. Available literatures were extensively reviewed to find out work in Bangladesh as well as abroad. The reviews are conveniently presented in accordance with the major objectives of the study. This Chapter is divided into three sections. First section deals with the concept on perceived importance of information and communication technology enablers by the farmers and the second section is devoted to a discussion on the findings of studies exploring relationships between the selected characteristics of the farmers and perceived importance of information and communication technology enablers by the farmers in receiving farm information. The third section presents the conceptual framework of the study.

2.1 Concept on Perceived Importance of Different ICT Enablers

Kaini (2007) in a study found that Farmers Perception towards ICT materials was very much positive for developing agricultural sector. He found ICTs were very efficient in terms of time, cost and distance, developing agricultural programs through assisting access to new technologies, production inputs and market information. ICT had its direct and indirect effect for poverty alleviation. The main direct effect was higher profits from agricultural productions through adopting new technologies and indirect effect was employment generation through commercialization of agriculture.

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.

Pandian et al. (2002) conducted a study on the perception of the farmers towards Video Education on Knowledge Retention and found direct positive effect with age, education, farming experience, economic motivation, mass media exposure, and extension agency contact, involvement in decision making, innovativeness and direct negative effect with respondent's annual income, family size, and social participation.

Kabir and Bhattachargee (1994) conducted a study on the perception towards Radio and Television on rural farming and found that the responses regarding the impact of TV programs were similar to responses regarding the impact of Radio broadcasts. All of the telecasts were of average benefit to most of the male and female audience. No one of the respondent started that many of the selected programs had adequate use to him or her. That the programs were of no use was said none of the female TV audience. Among the need-based telecasts "Apnar Shasthya" seemed to be the most effective program for male viewers. About 53 per cent of the male respondents watch this program. The next important one was "Mati-O-Manush", which had 35.25 percent audience.

Diaz-knauf et al. (1993) stated in a study on consumer attitude towards food safety of product in Costa Rica that information sources on which consumers rely are television (92%), radio (73%) and newspaper (63%).

Laharia and Joshi (1992) found in a study on farm telecast viewing behavior of farmers in India that about two thirds of the respondents (total 100) reported the Krishi Darshan Program (KJDP) of Delhi Doordarshan Kenda was very useful. The study implied that the perception of usefulness increased with the increase in one's periodicity of viewing the program.

Saianturi (1992) found in a study that Radio was the highest rated source of agricultural information, followed by Television.

Papa (1991) conducted a study on intensity of extension contact and innovativeness of multiple cropping farmers in Philippines and the study showed that fifty-four per cent of the farmers had high intensity of extension contact while only forty-seven per cent had extent of innovativeness. The extension contacts of leaching methodologies frequently preferred by the multiple cropping farmers were farm and home visit, leaflet, television, general meeting and seminar / short course.

Allin-Ton (1991) reported by the mid-term review of the Fifth Malaysia Plan (198690) and has stated that emphasis would be placed on accelerating transfer of technology to small holders to improve their productivity and efficiency. Technology transfer could be achieved through publications, newspaper, radio, and television networks and interpersonal methods as exemplified program launched in 1983 by the Ministry of

Agriculture which has contributed to increase farmers' communication through the printed media. The advent of information technology had benefited Malaysia in the transfer of technology by reducing costs in terms of time. This seen in the rapidity with which information could be mass produced for dissemination by using desktop publication which further allowed information transfer through the printed media to be expedited, thus bringing to the farmer's new information quickly. This approach to publication was cost effective.

Singh and Sharma (1973) and Reddy (1986) conducted researches in India about dissemination of agricultural information though television and have reported significant impact of farm telecasts in increasing the technology knowledge of farmers and farm women.

Cherian and Chandra (1989) in their study had shown that rural women took interests in watching the television programs produced. The extent of watching the television programs was more frequent in case of men than women. The television helped women and men to gain significant amount of knowledge about green leafy vegetables, potato, vaccination and laparoscopy. The grain in knowledge was more among females than males.

Haque (1982) in a study with M. 99 farmers in the Philippines determined the perceived effectiveness of 10 communication media in which television was included. Farmers' perceived effectiveness was measured on a four-point rating scale for each of the message trait-adequateness, understandability, applicability and persuasiveness. The comprehensive message trait-index of the television was observed as 311 which occupied ninth rank.

Reddy (1982) opined that with the help of new modes of communication like radio and television the research findings can be conveyed to the farmers quickly and in a way that intelligibly eligible to them.

Chanhan and Sinha (1979) found in their study that TV alone is no doubt, capable of imparting knowledge to its audience by it became more effective then it combines with other channels like group discussion and / or printed matters and, the effectiveness, further

increases with increase in the number of channels in combination employed to communicate to the farmers.

Parvez (1977) conducted a study on the radio listening habit and other related aspects of the farmers of the Bhabokhali union of Mymensing district. The finding of the study revealed a picture about the extent of use of radio by the farmers. The researcher found that 67 per cent of the farmers had high or medium exposure to Agricultural Radio Program (ARP). This indicated that information be made available to the farmers through radio. Regarding the opinion of the farmers about the usefulness of ARP for agricultural work Parvez opined that 67 per cent of the farmers considered ARP very useful for agricultural work while 20 per cent considered the ARP useful. Thirteen per cent of the farmers expressed no opinion about the usefulness of ARP.

Singh and Sharma (1973) found in a study that the farmers of TV-villages were far ahead of their counterparts of non-TV group with respect to adoption of HYV wheat. The impact of TV was found all the conducive to small farmers and those without schooling. The specialized source credibility in TV-villages indicate a 'monomorphic' pattern in the information seeking behavior of farmers, while the polymorphic trend was found still prevalent among the farmers of non- TV villages. Sharma and Dry (1970) conducted a study on the relative effectiveness of radio and television in dissemination of agricultural information and from the study television was found to be significantly effective than radio in case of all the programs, with respect to gain and retention of knowledge, with lapse of time in case of both media and with all the programs. The average grain of knowledge was 30.95 per cent with the television viewers as against 21.92 per cent with radio listeners. Similarly, the extent of average retention after 15 days exposure with TV viewers and radio listeners was 35.04 per cent and 16.12 per cent respectively.

Singh and Shankariah (1969) recommended an optimal use of all the mass media like television, radio, films, demonstration, and farmers' training camps.

Knox (1962) in a study in Barten county, Kansas found that these is seldom complete agreement among extension climate as to whether extension program can be made more effective by efficient use of available mass media, if so, which media are all respondents had radios and daily and weekly newspapers and 92 percent of them had TV sets.

2.2 Relationship between the Selected Characteristics of the Farmers and Their Perceived Importance of Different ICT Enablers

2.2.1 Age and perceived importance of ICT enablers

Pandian *et al.* (2002) found that the age farmers had direct positive effect between age of the farmers and perception towards ICT enablers on receiving farm information.

Khalil (1998) observed a negatively insignificant relationship between age of the farmers and their use of information sources in producing HYV Rice.

Rahman (1996) undertook an investigation on communication behavior of winter vegetable growers at Sherpur upazila of Gazipur District. He reported that age had no relationship with communication behavior.

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.

Sarker (1995) observed a negatively insignificant relationship between age of the small farmers and their use of communication media in receiving agricultural information.

Shin and Evans (1991) found significant and positive relationship between age and perceived importance of ICT enablers on receiving farm information.

Huque (1982) found no significant relationship between farmers' age and their perception towards ICT enablers on receiving farm information.

Ahmed (1977) in his study found that age of the farmers had no significant influence on the use of various communication media in the adoption of improved farm practices.

Rahman (1974) observed no relationship between communication media and farmers age of registered jute seed growers.

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. This means that age of the farmers does not possess any significant influence upon their impact of information communication technologies use in receiving agricultural information as well as the farming practices.

2.2.2 Level of education and perceived importance of ICT enablers

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

Pandian *et al.* (2002) found that education of the farmers had direct positive effect on the Impact of Video Education on Knowledge Retention.

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.

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

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

Huque (1982) found no significant relationship of farmers' education with their perception of effectiveness of television programs.

Halim (1982) in his study on schooling, extension and agricultural production found that increase of educational level of the farm operators resulted increased per acre production of rice, jute and net farm income of the farm, but this positive trend between level of education and increased production tended to fall in those farms where the operator received more the secondary level of education. He found significant regression between

level of formal schooling of the farm operator and per hectare production of jute and rice which also resulted significant increase in net farm income.

Hossain (1981) in his study found that there was no relationship of education of the farmers with their adoption of improved practices.

Ahmed (1977) found that education had no effect on the use of communication media in the adoption of recommended variety of jute, recommended dose of fertilizer but showed an effect of education on the use of communication media and the relationship was positive.

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

The above research findings suggested that in most of the cases level of literacy of the farmers encouraged them to maintain better contact with various information and communication media which ultimately kept good impact of ICTs in receiving agricultural information.

2.2.3 Family size and perceived importance of ICT enablers

Pandian *et al.* (2002) found negative insignificant relationship and direct negative effect of respondent's family size with on perceived importance of ICT enablers for receiving farm information.

Rahman (1996) concluded in his study that family size had moderate association with their use of information sources and communication media.

Sarker's (1995) study showed that family size of the small farmers had a significant amount of influence upon their decision on using communication sources of information.

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

Bhuiyan (1988) found that the family size had significant positive correlation with the use of information media in the adoption of selected improved farm practices in rice cultivation.

Huque (1982) found no significant relationship between farmers' family size and their perceived importance of ICT enablers.

Ahmed's (1977) study showed that family size had significant influence on perceived importance of ICT enablers for keeping farm communication.

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

2.2.4 Farming experience and perceived importance of ICT enablers

Chandra and Raddy (2004) found negative insignificant relationship of respondents Farming experience with their perceived importance of television program.

Pandian *et al.* (2002) found direct positive effect on the perceived importance of Video Education on Knowledge Retention with the Farming experience of farmers.

Khalil (1998) mentioned in his study that farming experience of the farmers had low association with their use of different information sources.

Shin and Evans (1991) found significant and positive relationship between farming experience and perceived importance of ICT enablers.

2.2.5 Annual family income and perceived importance of ICT enablers

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

Pandian *et al.* (2002) found positive significant effect of respondent's annual family income with the perceived importance of Video Education for receiving farm related information.

Sawheny (1969) showed that income was positively related to use of different information sources and media.

Rahman (1996) found in his study that annual income of the winter vegetable growers had moderate association with their use of different information sources.

Uddin (1993) found that there was a relationship between annual income of the sugarcane growers and their reception of information in sugarcane cultivation.

Hossain and Crouch (1992) observed that farmers' annual income had positive relationship with their use of mass media.

Huque (1982) found no significant relationship of farmers' annual income with their perceived importance of ICT enablers.

Latif (1974) observed a significant positive relationship between income of the farmers and their perceived importance of ICT enablers.

Majority of the research findings indicated that the annual income of the farmers had significant relationship with their perceived impact of information and communication technologies use.

2.2.6 ICT training received and perceived importance of ICT enablers

Chandra and Raddy (2004) found positive insignificant relationship of farmers ICT training with perceived importance about ICT enablers on farming.

Pandian *et al.* (2002) found negative insignificant relationship and direct negative effect of respondent's ICT training experience with the perceived importance of ICT enablers receiving farm information.

On the basis of research finding mentioned above it may be concluded that the ICT training may not have any effect of maintaining exposure with various information sources.

2.2.7 Use of ICT enablers in agricultural activities and perceived importance of ICT enablers

Reddy (1982) conducted researches in India about dissemination of agricultural information though television and have reported significant impact of farm telecasts in increasing the technology knowledge of farmers and farm women as well as perception of importance of ICT enablers on farming.

2.2.8 Frequency of using ICT enablers and perceived importance of ICT enablers

Sarker (1996) had undertaken a study to determine ICTs self-efficiency of rural farmer and explained that frequent usage and exposure to ICT must be considered if someone wants to form a positive attitude towards ICTs. When people frequently use and expose to ICT, it informed them that ICT was helpful and beneficial to them thus creating a positive attitude towards ICT usage.

2.2.9 Ease of using ICT enablers and perceived importance of ICT enablers

Burrel (2008) focused on six variables that have the potential to influence conception towards ICT usage and the variables are self-efficiency, perceived usefulness, perceived ease of use, subjective norm compatibility and job relevance. There were a lot of existing literatures that have proven that influence of self-efficacy, perceived usefulness and perceived ease of use compatibility, and subjective norm on ICT usage. Therefore, it can be concluded that self-efficacy was a dominant factor for ICT adoption and use.

2.3 The 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. "selected characteristics" and "focus issue". Selected characteristics are that factors which appears, disappears or varies as the researcher introduces, removes or varies the focus issue. A focus issue is that factor which is manipulated by the researcher in his attempt to ascertain its relationship to an observed phenomenon. A simple conceptual framework for the study is shown in Fig. 2.1. It anticipates that there are functional relationships of the nine selected characteristics of the farmers with their perceived importance of different ICT enablers (focus issue) for receiving farm information.

Selected Characteristics	Focus Issue

Selected characteristics of
the farmers

(a) Age
(b) Level of education
(c) Family size
(d) Farming experience
(e) Annual family income
(f) ICT training received
(g) Use of ICT enablers in
agricultural activities
(h) Frequency of using ICT
enablers
(i) Ease of using ICT enablers

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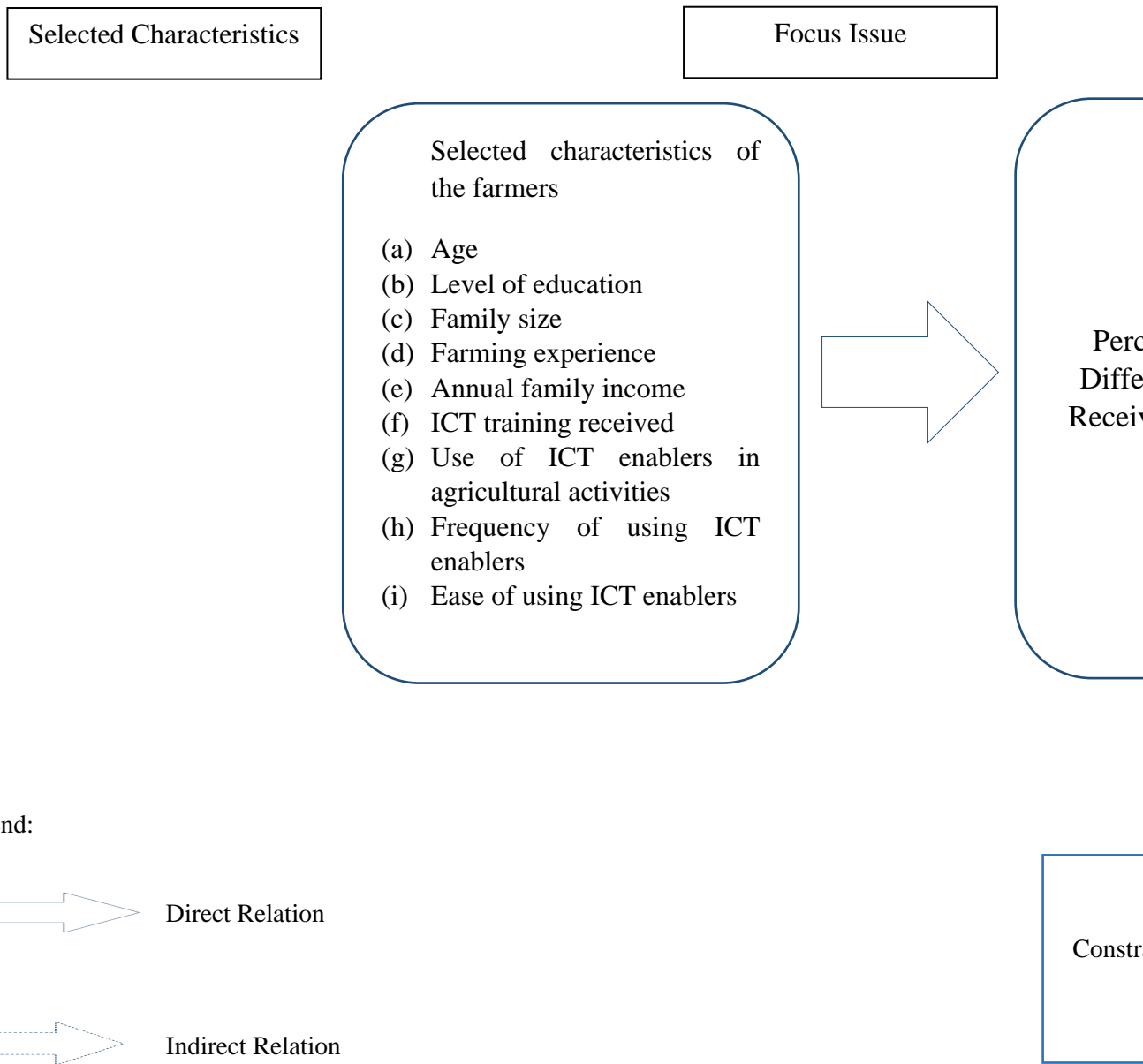
Figure 2.1 Conceptual Framework of the Study

CHAPTER 3
METHODOLOGY

Methodology deserves a very careful consideration in conducting scientific research. 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.

3.1. Locale of the study

The study was conducted in Dinajpur Sadar, Chirirbandar and Biral Upazila under Dinajpur district. These three upazilas of Dinajpur district was selected randomly among the thirteen upazilas of the district. Thus, these three upazilas are the locale of the study. The study areas are showing in Figure 3.1.

3.2. Population and Sampling Design

An up-to-date list of the farmers directly or indirectly involved with AICCs (Agriculture Information and Communication Centers) of the selected upazilas was prepared with the help of respective Upazila Agriculture Office. The list comprised a total of 340 farmers in the study area. These farmers constituted the population of this study. Thirty percent of the farmers from this list were selected randomly from each upazila. This constitutes the sample of the study and was 102 farmers. In addition, 10 farmers were also enlisted as reserve list to interview in case of unavailability of the sample farmers during interview. The sampling distribution is given in Table 3.1.

Table 3.1 Sampling distribution of the study

Upazila	Population	Sample	Reserve list
Sadar	140	42	4
Chirirbandar	123	37	4
Biral	77	23	2
Total	340	102	10

3.3 The Research Instrument

An interview schedule was prepared for data collection from the respondent farmers keeping the objectives of the study in mind. The questions and statements contained in the schedule were simple, direct and easily understandable by the respondents. The questionnaire contained both open and closed from questions.
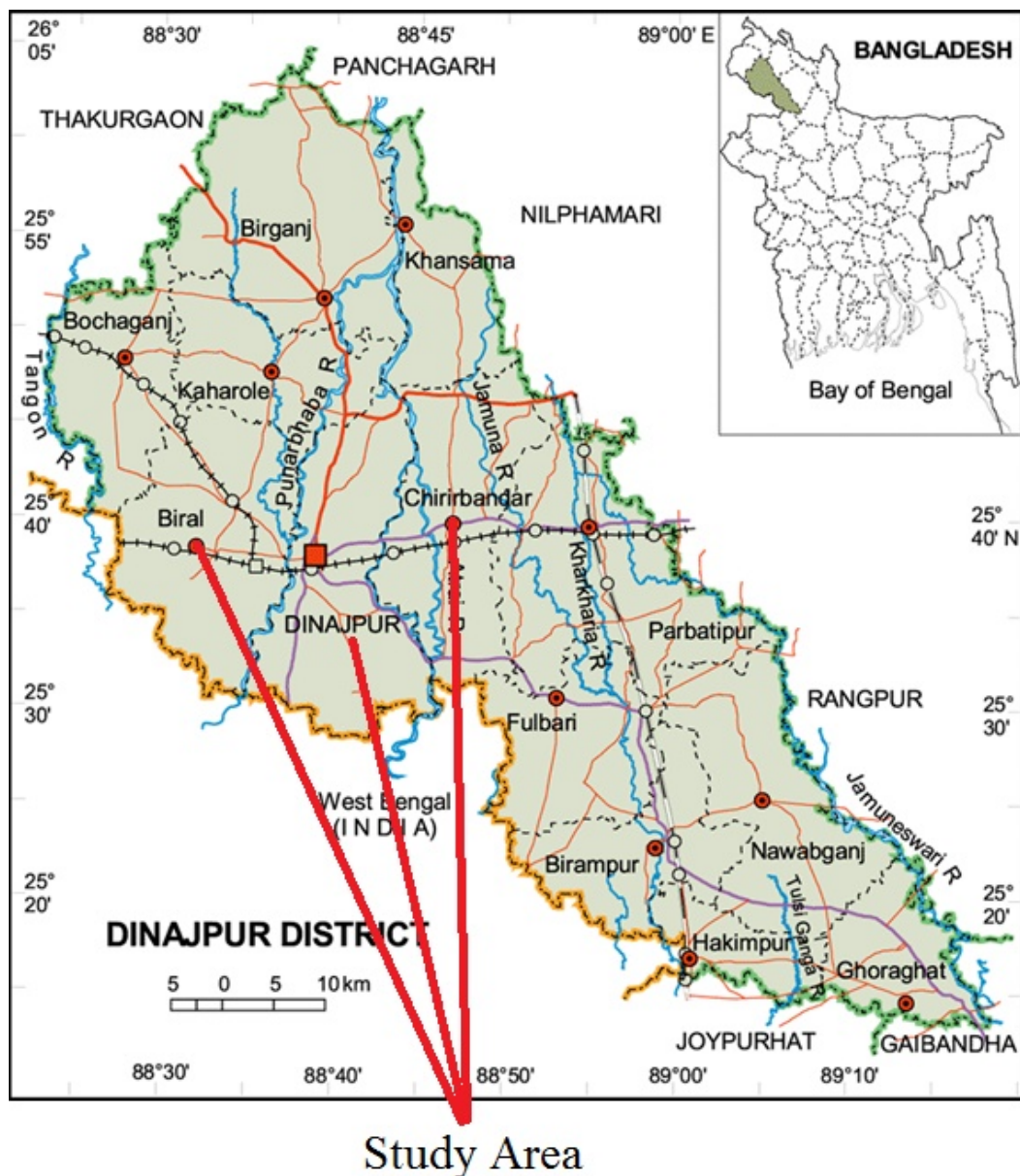
Figure 3.1 A map of Dinajpur District showing the locale of the study

Prior to final data collection, the completely developed interview schedule was pre-tested among eight farmers of Dinajpur Sadar Upazila of the Dinajpur district. Corrections, alterations and adjustments were done in the schedule on the basis of the pre-test result. After that the finalized schedule was used for data collection.

3.4 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 (selected characteristics). In this connection, the investigator looked into the literature to widen his understanding about the nature and scope of the variables involved in the research studies. It is stated variable as any measurable characteristics, which can assume varying or different values in successive individual cases. Independent variables are that factor which is manipulated by the experimenter in his attempt to ascertain the relationship to an observed phenomenon. It also stated that dependent variables varies as the experimenter introduces, removes or varies the independent variables.

The researcher keeping in mind took adequate care in selecting the selected characteristics and the focus issue of the study. Before selecting selected characteristics and the focus issue, the researcher himself visited the study area and talked to the farmers intimately and he was able to observe the various factors of the farmers, which might have influence on their perceived importance of Information and Communication Technologies by the farmers in receiving farm information. Based on this experience, literature for the study, discussion with relevant experts and academicians and also with the research supervisor, the researcher selected the following variables for this study.

Two types of variables were concerned with the study such as

      i. Selected Characteristics of the farmers and

      ii. Focus issue of the study

Selected Characteristics: In this study the selected characteristics are age, level of education, family size, farming experience, annual family income, ICT training received, use of ICT enablers in agricultural activities, frequency of using ICT enablers, ease of using ICT enablers.

Focus issue: Perceived importance of ICT enablers by the farmers for receiving farm information is selected as focus issue.

3.5 Measurement of Variables

In order to conduct the study in accordance with the objectives, it was necessary to measure the selected variables. This section contains procedures for measurement of both

selected characteristics as well as focus issue of the study. The procedures followed in measuring the variables are presented below.

3.5.1 Measurement of the selected characteristics

A total of nine characteristics of the farmers were considered to describe the socio-economic profile of the farmers. The measurements of these characteristics are given below.

3.5.1.1 Age

The age of a respondent was determined in terms of the actual years passed from his/her birth to the day of interview. A score of one (1) was assigned to each year of age.

3.5.1.2 Level of education

The level of education was measured on the basis of grade (class) passed by a respondent from a formal institution of equivalent qualification possessed. A score of one (1) was assigned for each year of schooling in formal institution. For example, if a respondent passed the final exam of class V, her education score was assigned as 5. Score 0.5 was given to the respondent who could sign his/her name only and a zero (0) was given to the respondent who could not read and write.

3.5.1.3 Family size

The total number of the family member is measured by assigning a score of one (1) for each member of the family. For example, if a family consists of three (3) members, the family size score was three.

3.5.1.4 Farming experience

Farming experience meant the experience which was gained by an individual from active farming. It was determined by total number of years of farming activity by the farmer in his/her entire lifetime. i.e. score 1 was assigned for each year of farming.

3.5.1.5 Annual family income

Annual family income was the total financial return of a household from farming (crops, livestock, poultry and fish) and from non-farm sources (job, business and others) in one year. The earning from these sources was added together for computation of annual income score. Annual household income was expressed in Taka.

3.5.1.6 ICT training received

ICT Training received of a respondent was measured by the total number of days he/she received training on ICTs from various organizations. A score of one (1) was assigned for each day of training participated by the respondent.

3.5.1.7 Use of ICTs in agricultural activities

Use of ICTs in agricultural activities was measured by nine items related to ICTs utilization for agricultural activities by the farmers. A four-point rating scale was used to measure the extent of use of ICTs for each item. There were four options to response a item, namely 'not at all', 'less', 'high' and 'very high' with a corresponding score of 0, 1, 2 and 3, respectively. A respondent was asked to indicate his/her opinion regarding an item by selecting the appropriate option. The use of ICTs score of a respondent was computed by summing the scores for his/her responses to all the items. Hence, scores of a respondent could range from 0 to 27; while 0 indicating no use of ICTs and 27 indicating very high use of ICTs in agricultural activities.

3.5.1.8 Frequency of using ICT enablers in agricultural activities

Frequency of using ICTs in agricultural activities was measured by ten ICT enablers for agricultural activities by the farmers. A four-point rating scale was used to measure the frequency of use of ICTs for each item. There were four options to response an item, namely 'Not at all', 'Monthly, 'Weekly' and 'Daily' with a corresponding score of 0, 1, 2 and 3, respectively. A respondent was asked to indicate his/her opinion regarding an item by selecting the appropriate option. The frequency of use of ICT enablers score of a respondent was computed by summing the scores for his/her responses to all the items. Hence, scores of a respondent could range from 0 to 30; while 0 indicating no use of ICTs and 30 indicating very high frequency of use of ICT enablers in agricultural activities.

3.5.1.9 Ease of using ICT enablers in agricultural activities

Ease of using ICT enablers in agricultural activities was measured by ten ICT enablers used for agricultural activities by the farmers. A four-point rating scale was used to measure the ease of use of ICTs for each item. There were four options to response an item, namely 'Difficult', 'Moderately easy', 'Easy' and 'Very easy' with a corresponding score of 0, 1, 2 and 3, respectively. A respondent was asked to indicate his/her opinion regarding an item by selecting the appropriate option. The ease of use of ICT enablers score of a respondent was computed by summing the scores for his/her responses to all

the items. Hence, scores of a respondent could range from 0 to 30; while 0 indicating difficult use of ICTs and 30 indicating very easy of use of ICT enablers in agricultural activities.

3.5.2 Measurement of the focus issue (Perceived Importance of ICT enablers by the farmers)

Perceived importance of ICT enablers' refers to one's change regarding use of various enablers related to information and communication technologies. For selecting the ICT enablers of this research, various journals were accessed and consulted with the experts of ICTs. Finally, for computing perceived importance of ICT enablers, ten enablers were selected. Those were Mobile Phone, Computer, Internet, Multimedia Projector, Digital Camera, CD/DVD Player, Television, Radio, Printer and Public Address System. Nine farm related information were selected for the measurement of the perceived importance for each of the ICT enablers. A four-point rating scale was used to measure the importance is – "not important at all", "not important", "important" and "very important" with a score of 1, 2, 3 and 4, respectively. Thus, the overall perceived importance score could range from (10 ICT enablers, with 9 farm information for each enabler, measured by four-point rating scale) 90 (=10×9×1) to 360 (=10×9×4).

Rank order of the ICT enablers based on their perceived importance score was also determined. For ranking mean value of the nine farm information for each ICT enabler with the above four-point rating scale was considered. Again, rank order of the nine farm information was determined. For ranking mean value of the ten ICT enablers for each farm information with the above mentioned four-point rating scale was considered.

3.6 Collection of Data

For the purpose of data collection, an interview schedule was prepared. It was prepared keeping the objectives of the study in mind. The schedule contained both open and closed from questions. Direct simple questions were included in the schedule to collect data on the selected characteristics. Appropriate scales were developed to measure the selected characteristics of the respondents. Scales were also developed to ascertain the perceived importance of ICT enablers' by the farmers in receiving farm information. The draft schedule was prepared in Bengali and pretested before using it for collection of data. For pretest purpose, eight farmers taking from the Dinajpur Sadar upazila was interviewed by using the draft interview schedule. Based on the pre-test experience, necessary

corrections, additions, alternations and rearrangements were made in the schedule. Thus, the schedule was prepared for final use. The schedule was prepared both in Bengali and English version. The Bengali version of interview schedule was multiplied as per requirements to collect data from the respondents. The English version of interview schedule was enclosed in appendix A.

Data were collected personally by the researcher himself through face to face interview to all the selected farmers of Dinajpur Sadar, Chirirbandar and Biral upazila to obtain valid and pertinent information. The researcher made all possible efforts to explain the purpose of the study to the farmers. Rapports were established with the farmers prior to interview and the objectives were clearly explained by using local language to the extent possible. So, he did not hesitate to furnish proper responses to the questions and statements which were collected during 20 February 2018 to 20 March, 2018. At the time of data collection, the researcher was also aware of side talking and tried to avoid that problem tactfully. The researcher sought the help of the local supervisors for this purpose. Excellent co-operation and coordination were obtained from all the respondents.

3.7 Statement of Hypothesis

As defined by Goode and Hatt (1952), "A hypothesis is a proposition which can be put to a test to determine its validity. It may seem contrary to, or in accord with common sense. It may prove to be correct or incorrect. In any event, however, it leads to an empirical test". A hypothesis simply means a mere assumption or some supposition to be proved or disproved. But for a researcher, hypothesis is a normal question that he intends to resolve. According to Kerlinger (1973), "A hypothesis is a conjectural statement of the relation between two or more variables. Hypotheses are always in declarative statements form, and they relate either generally or specifically variables to variables". Hypotheses may be broadly divided into two categories, namely, research hypothesis and null hypothesis. In studying relationships between variables, an investigator first formulates research hypotheses which states anticipated relationships between the variables.

3.7.1 Research hypothesis:

There is a relationship of age, level of education, family size, farming experience, annual family income, ICT training received, use of ICT enablers, frequency of using ICT enablers and ease of using ICT enablers of farmers with their perceived importance of ICT enablers in receiving farm information.

However, for statistical test it becomes necessary to formulate null hypothesis. A null hypothesis states that there is no relationship between concerned variables.

3.7.2 Null hypothesis

The null hypotheses were developed in this study to explore the relationship between dependent and independent variables. For testing the hypothesis statistically, the following null hypotheses were formulated:

1. There is no relationship between age of the farmers and their perceived importance of different ICT enablers.
2. There is no relationship between level of education of the farmers and their perceived importance of different ICT enablers.
3. There is no relationship between family size of the farmers and their perceived importance of different ICT enablers.
4. There is no relationship between farming experience of the farmers and their perceived importance of different ICT enablers.
5. There is no relationship between annual family income of the farmers and their perceived importance of different ICT enablers.
6. There is no relationship between ICT training received of the farmers and their perceived importance of different ICT enablers.
7. There is no relationship between use of ICT enablers of the farmers and their perceived importance of different ICT enablers.
8. There is no relationship between frequency of using of ICT enablers of the farmers and their perceived importance of different ICT enablers.
9. There is no relationship between ease of using of ICT enablers of the farmers and their perceived importance of different ICT enablers.

3.8 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 the computer software SPSS to facilitate analysis.

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 selected characteristics and the focus issue, 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.

3.9 Statistical Analysis

The collected data were compiled, coded tabulated and analyzed in accordance with the objectives of the study. Qualitative data were quantified by means of suitable scoring techniques. The statistical measures such as range, mean, standard deviation, percentage distribution were used to describe both the dependent and independent variables. Tables were also used in presenting data for clarity of understanding. In order to explore the relationships of the selected characteristics of the farmers with their perceived importance of ICT enablers in receiving farm information. The Pearson's Product Moment Correlation Co-efficient was computed. Correlation matrix was also computed to determine the inter relationship among the variables. Five (0.05) percent level of significance with relevant degrees of freedom considered to reject the null hypothesis.

CHAPTER 4
RESULTS AND DISCUSSION

A sequential and detailed discussion on the findings of the study has been presented in this Chapter. The Chapter is divided into three sections. In the first section, perceived importance of ICT enablers for receiving farm information has been discussed. The second section dealt with the selected characteristics of the farmers. The third sections deals with the relationship between the focus issue and selected characteristics of the farmers.

4.1 Perceived Importance of the ICT enablers

The prudent use of ICT enablers is the key to agricultural progress (Kashem, 1990). Farmers use modem technologies when they find those useful in their own socioeconomic set-up and agro-economic settings. Moreover, perception towards information and communication technologies differ from farmer to farmer that is, farmer's individual characteristics and personal make-up play a vital role in adopting any agricultural practice in the overall technology transfer process. A particular technology might be proved or perceived as beneficial or suitable for a farmer but he may not be in a position to accept it due to his varied mental make-up and situational factors. The individual characteristics of the farmers may greatly vary and the various factors might have great impact on their perception about various information and communication technologies. In this study the perceived importance of ICT enablers was considered in three ways: firstly, overall importance of ICT enablers for receiving farm information; secondly, ranking of the ICT enablers according to their perceived importance and thirdly, ranking of the farm information according to the perceived importance of ICT enablers used for the same.

4.1.1 Overall perceived importance of the ICT enablers

Perceived importance of ICT enablers score of the respondents could range from 90 to 360, while the observed range of perceived importance was 90 to 358. The mean importance score is 196.23 and the standard deviation is 66.70. On the basis of overall perceived importance scores, the farmers were classified into three categories: "low" (up to 180), "medium" (181 to 270) and "high" (above 270) are given in Table 4.1.

Table 4.1 Distribution of the respondents according to their perceived importance score

Category	Frequency	Percent	Possible Range (Observed)	Mean	Standard Deviation
Low (Up to 180)	14	13.7	90 to 360 (92 to 358)	196.23	66.70
Medium (181 to 270)	76	74.5			
High (above 270)	12	11.8			
Total	102	100.0			

Results of Table 4.1 shows that 76 (74.5 percent) respondents had perceived medium importance where 14 (13.7 percent) respondents had perceived low importance and 12 (11.8 percent) respondents had perceived high importance of the ICT enablers for receiving farm information. This means that majority (74.5 percent) of the farmers of the study area had perceived medium importance of ICT enablers in receiving farm information, while 13.7 percent had perceived low and 11.8 percent had perceived high importance. It was so, because ICT enablers were available in the study area through government intervention by DAE. Though, the materials of ICTs were very expensive and the farmers were not much rich but they can use the ICT enablers through AICCs of the study area.

4.1.2 ICT enablers according to their perceived importance

In this study ten ICT enablers used by the farmers for receiving farm information are considered. The ranking of the ICT enablers was done by their respective mean values of perceived importance. The observed mean value of the ICT enablers ranged from 15.09 to 28.27. The distribution of the ICT enablers according to their mean scores of the perceived importance is given in Figure 4.1.

Figure 4.1 indicates that farmers perceived mobile as the most important ICT enablers for receiving farm information (mean score is 28.27) followed by television (mean score is 25.55), radio (mean score is 22.66) and so on. The lowest perceived important ICT enabler was found digital camera (mean score is 15.09). Thus, the mobile based information system need to be emphasized for farm related information dissemination by different agricultural extension agencies. Farm related programs need to be broadcasted more frequently by television and radio for effective and quick dissemination.
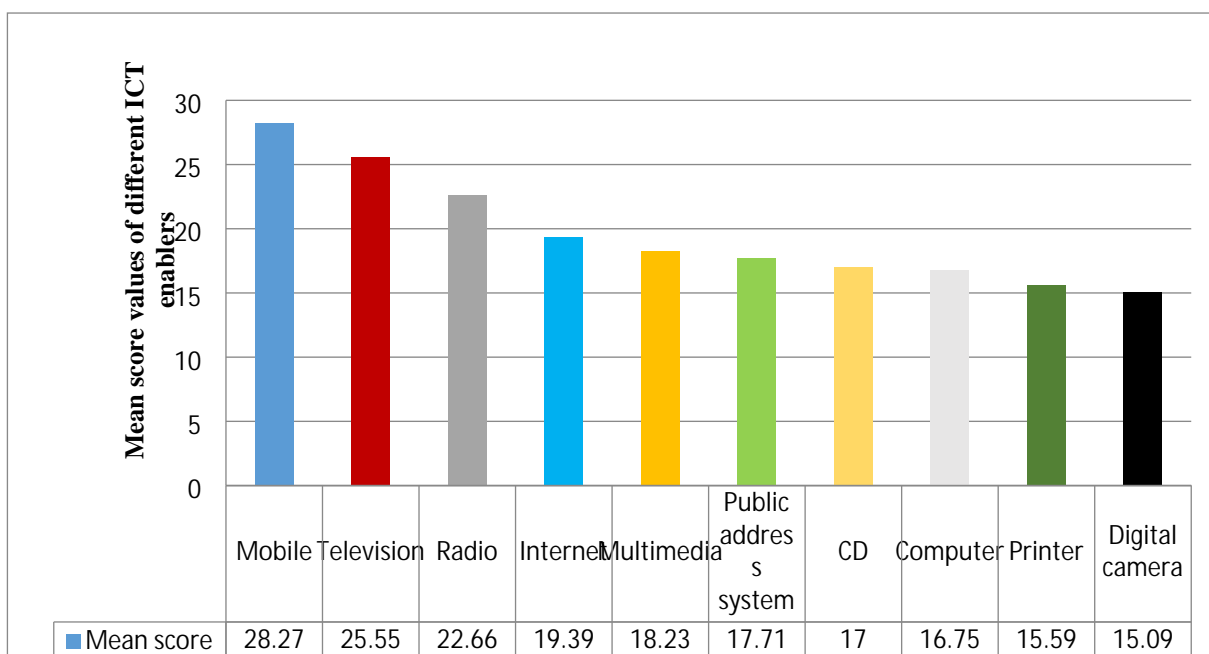
Figure 4.1 Distribution of the ICT enablers according to their perceived importance mean scores

4.1.3 Different farm information received through ICT enablers

In this study nine farm related information was considered for received through ten ICT enablers. The perceived importance of the ICT enablers for these nine farm information are analyzed for getting the mean score of these nine farm information. The ranking of the farm information according to the mean perceived importance score of the ten ICT enablers for each of the farm information are given in Table 4.2.

Table 4.2 Distribution of the farm information according to the mean values of the perceived importance of ICT enablers

Farm information	Mean	Rank order
Searching for recent information on agriculture	23.86	1st
Information on market of agricultural products	23.53	2nd
Get information on new varieties	22.81	3rd
Get information on market situation	22.44	4th
Get information on farm inputs availability, cost and where to obtain them	21.70	5th
Acquisition of skill through training	21.35	6th
Acquire information from research institution	21.28	7th
Exchange of knowledge and ideas with fellow farmers	19.82	8th
Exchange of knowledge and ideas with extension workers	19.42	9th

Results of Table 4.2 show that the mean values ranged from 19.42 to 23.86. Farmers perceived the "recent information on agriculture" is most important for receiving from different ICT enablers followed by "information on market of agricultural products" and "get information on new varieties". The lowest perceived important farm information is "exchange of knowledge and ideas with extension workers".

4.2 Selected Characteristics of the farmers

Nine characteristics of the farmers were selected to describe the profile characteristics of the farmers. The selected characteristics included their age, level of education, farm size, farming experience, annual family income, ICT training received, use of ICT enablers in agricultural activities, frequency of use of ICT enablers and ease of use of ICT enablers. The distribution of the farmers according to different categories of the respective characteristics has been presented in Table 4.3.

4.2.1. Age

Age of the farmers ranged from 18 to 55 years, the average being 29.66 years and the standard deviation was 9.26. On the basis of age, the farmers were classified into three categories: "young aged" (up to 35), "middle aged" (36 to 50) and "old aged (51 and above). Table 4.3 contains the distribution of the respondents according to their age.

Data presented in table 4.3 indicated that the highest proportion (80.4 percent) of the respondents fell in the young-aged category compared to 16.7 percent middle and 2.9 percent old-aged category. It was also revealed that 80.4 percent of the respondents comprised of young-aged categories.

4.2.2 Level of education

Level of education of a respondent was measured by the level of his formal education i.e. highest grade (class) passed by him. The education score of the respondents ranged from 0 to 15, the average being 7.06 and the standard deviation was 3.72. Based on their level of education, the respondents were grouped into five categories, "no" (0), "can sign only" (0.5), "primary" (1-5), "secondary" (6-10), and above secondary" (above 10).

Table 4.3 Distribution of selected Characteristics of the farmers (N=102)

Characteristics	Scoring method	Possible range (observed)	Categories	Respondents		Mean	SD
				No	%		
Age	No. of year	Unknown (18-55)	Young (< 36)	82	80.4	29.66	9.26
			Middle (36 - 50)	17	16.7		
			Old (>50)	3	2.9		
Level of education	Year of schooling	Unknown (0-15)	Illiterate (0)	9	8.8	7.06	3.72
			Can sign only (0.50)	4	3.9		
			Primary (1 to 5)	25	24.5		
			Secondary (6 to 10)	50	49.0		
			Above secondary (>10)	14	13.7		
Family size	No. of members	Unknown (3-8)	Small (1 to 4)	41	40.2	4.83	1.298
			Medium (5 to 6)	49	48.0		
			Large (>6)	12	11.8		
Farming Experience	Year of farming	Unknown (2-39)	One decade (<10)	47	46.1	13.96	9.68
			Two decades (11 to 20)	35	34.3		
			Three decades (21 to 30)	12	11.8		
			Four decades (31 to 40)	8	7.8		
Annual Family income	("Tk")	Unknown (10,000-600,000)	Low (<120,000)	72	70.6	105,078.43	88,458.38
			Medium (120,001 to 240,000)	23	22.5		
			High (>240,000)	7	6.9		
ICT training received	No. of days	Unknown (0 to 90)	No (0 days)	11	10.8	9.73	22.17
			Week Long (1 to 7)	77	75.5		
			Week Long to Monthly (8 to 30)	7	6.9		
			Above Monthly (>30)	7	6.9		
Use of ICT enablers	No. of days	0 to 27 (3-27)	Low (<10)	19	18.6	16.29	6.25
			Medium (10 to 18)	53	52.0		
			High (>18)	30	29.4		
Frequency of use of ICT enablers	Score	0 to 30 (1-25)	Low (<9)	19	18.6	10.08	5.02
			Medium (10 to 18)	53	52.0		
			High (>18)	30	29.4		
Ease of use	Score	0 to 30 (0-30)	Low (0 to 10)	71	69.6	10.68	8.22
			Medium (11 to 20)	14	13.7		
			High (above 20)	17	16.7		

Data presented in Table 4.3 indicate that a large proportion (87.2 percent) of the respondents are having standard level of education (24.5 percent having "primary education", 49.0 percent having "secondary education" and 13.7 percent having "above secondary education") compared to 3.9 percent "can sign only", and 8.8 percent having "no education or illiterate". Data of Table 4.3 indicates that Farmers need to have some education in order to use the various agricultural information sources properly and ultimately fall good effect. It is evident that 87.2 per cent of the farmers had education of various degrees from primary to above secondary level and 8.8 percent have no education in the study area. Thus, it can be said that in the study area the education of the farmers

was relatively higher compared to typical rural area in Bangladesh, because the education rate of the people of Bangladesh is 62.66%.

4.2.3 Family size

The family size of the respondents ranged from 3 to 8 with an average of 4.83 and a standard deviation of 1.298. On the basis of their family size scores, the respondents were classified into three categories namely 'small' (up to 4), 'medium' (5 to 6) and 'large' (above 6). The distribution of the respondents according to their family size is shown in Table 4.3. Data presented in Table 4.3 indicate that majority of the farmers (48.0 percent) have medium sized family. On the other hand, 11.8 percent had large sized family and 40.2 percent had small sized family. It indicates at present times; the numbers of medium families are increasing.

4.2.4 Farming experience

Farming experience of the farmers ranged from 2 to 39 years, the mean being 13.96 with a standard deviation, of 9.68. Based on their farming experience, the farmers were classified into four categories as shown in Table 4.3. The highest proportion (46.1 percent) of farmers in the study group had one-decade farming experience, while 34.3 percent had two decades of farming experiences, 11.8 percent had three decades of farming experiences, only 7.8 percent of the farmers had four decades of farming experience. Agriculture is a complex business. Therefore, one needs multiple information to take correct decision. One acquires practical knowledge only after a long experience for judicial using the information sources. Moreover, the farming experience of an individual helps him to learn new technologies and may lead him to take correct decisions or perception towards tools.

4.2.5 Annual family income

Annual family income was estimated on the basis of total receipt of money, goods and services during a year and expressed in taka. Annual family income of the respondent ranged from TK.10,000.00 to TK. 600,000.00. The average annual income was TK 105,078.43 and standard deviation 88,458.38. On the basis of annual income, the respondents were classified into three categories: "low income" (up to TK. 120,000), "medium income" (TK. above 120,001 to 240,000) and "high income" (above 240,000). The distribution of the respondents according to their annual family income is shown in Table 4.3. Data shown in Table 4.3 revealed that highest proportion (70.6 percent) of the respondents had low annual family income compared to 22.5 percent having medium and

6.9 percent under high annual family income. The average annual family income of the farmers of the study area was a bit lower than the average per capita annual income of the country. This might be due to the fact that the respondents were only engaged in farming and they don't have few other sources of income, such as, selling of labors, small trade, fishing and gardening. Since, the greater proportion (70.6 percent) of farmers had low income, it is logical to assume that they might not have access or not properly using the scope of modem information sources such as Radio, TV etc. This is so because income is obviously associated with purchasing these types of modem instruments.

4.2.6 ICT training received

ICT training received of the farmers ranged from 0 to 90 days, the mean being 9.73 with a standard deviation, of 22.17. Based on their ICT Training reception, the farmers were classified into four categories as shown in Table 4.3. The highest proportion (75.5 percent) of farmers in the study group had week long ICT training received, while 10 percent had no training, 6.9 percent had eek long to monthly training received and 6.9 percent of the farmers had above monthly ICT training received. Agriculture is a complex business. Therefore, one needs multiple information to take correct decision. One acquires practical knowledge only after a long experience for judicial using the information sources. Moreover, the ICT training experience of an individual helps him to learn new technologies and may lead him to take correct decisions or perception towards tools.

4.2.7 Use of ICT enablers in agricultural activities

Use of ICT enablers scores of the respondents were computed on the basis of the degree of use of different ICT enablers in agricultural activities. Use of ICT enablers in agricultural activities of the respondents ranged from 3 to 27. The average was 16.29 with a standard deviation 6.25 against the possible range of 0 to 27. On the basis of use of ICT materials, the farmers were classified into three categories: "low level of use" (below 10), "medium level of use" (10-18), "high level of use" (above 18). Data presented in the table 4.3 show that the highest proportion (52.0 percent) of the respondents had medium level of use of ICT enablers compared to 18.6 percent having low level of use of ICT enablers and 29.4 percent of the respondent had high level of use of ICT enablers. The findings indicate that most of the farmers (81.4 percent) had either medium or high level of use of ICT enablers in their agricultural activities. This means that the respondents got many of ICT enablers due to availability and favorable cost. But the available materials like mobile phone, television, radio were frequently used by them. GOs and NGOs should come up to take

appropriate steps for spreading ICT enablers and for the continuation of this ICT enablers by the farmers.

4.2.8 Frequency of using ICT enablers

Frequency of using ICT enablers scores were computed on the basis of the degree of use of different ICT enablers. Possible range of frequency of use ranged from 0 to 30 while the observed range was 1 to 25. The average was 10.08 with a standard deviation 5.02. On the basis of frequency of using ICT enablers, the farmers were classified into three categories: "low" (up to 10), "medium" (11 to 20), "high" (above 20). The findings indicate that most of the farmers (52.0 percent) had medium frequency of use of ICT enablers, while 29.4 percent had high and only 18.6 percent had low frequency of use of ICT enablers. GOs and NGOs should come up to take appropriate steps for spreading ICT enablers and for increasing frequency of ICT enablers by the farmers.

4.2.9 Ease of using ICT enablers

Ease of using ICT enablers scores were computed on the basis of the degree of ease of different ICT enablers. Possible range of ease of using ICT enablers by the respondents ranged from 0 to 30 while the observed range was 0 to 30. The average was 10.68 with a standard deviation 8.22. On the basis of ease of using ICT enablers, the farmers were classified into three categories: "low" (up to 10), "medium" (11 to 20), "high" (above 20). The findings indicate that most of the farmers (69.6 percent) had low ease of use of ICT enablers, while 13.7 percent had medium and only 16.7 percent had high frequency of use of ICT enablers. This means that majority of the respondents mentioned low ease of ICT materials to use due to low technical knowledge and training. GOs and NGOs should come up to take appropriate steps like training, motivation, group discussion on ICTs in agriculture for spreading ICT materials use and for increasing ease of ICTs use by the farmers.

4.3 Relationships between the Selected Characteristics of the Farmers and the Perceived Importance of Different ICT Enablers for Receiving Farm Information

This section deals with the relationships with nine selected characteristics of the farmers and their perceived importance of different ICT enablers. The characteristics included, age, level of education, family size, farming experience, annual family income, ICT training received, use of ICT enablers, frequency of use of ICT enablers and ease of use of

ICT enablers. Pearson's product moment correlation co-efficient "r" has been used to test the hypothesis concerning the relationship between the selected characteristics and the focus issues and five percent level of significance was used as the basis for acceptance or rejection of a hypothesis. The summary of the results of the correlations analysis is shown in Table 4.4 and the correlation matrix is given in the APPENDIX B.

Table 4.4 Co-efficient of correlation of the selected characteristics of the farmers and their perceived importance of ICT enablers

Focus Issue	Selected Characteristics	Computed values of 'r' with 100 df	Table value of "r" at 100 df	
			0.05	**0.01**
Farmers perceived importance of ICT enablers	Age	0.216*	± 0.194	± 0.252
	Level of Education	0.289**		
	Family Size	0.090		
	Farming Experience	0.276**		
	Annual Family Income	0.139		
	ICT Training received	0.412**		
	Use of ICT enablers in agricultural activities	0.226*		
	Frequency of use	0.306**		
	Ease of use	0.045		

* = Significant at 0.05 level ** = Significant at 0.01 level

4.3.1 Relationship between age of the farmers and their perceived importance of different ICT enablers for receiving farm information

In order to determine the relationship between age of the farmers and their perceived importance of ICT enablers, the following null hypothesis was tested:

"There is no relationship between age of the farmers and their perceived importance of ICTs use"

The co-efficient of correlation between the concerned variables was computed and found 0.216* as shown in table 4.4 which led to the following observation regarding the relationship between the two variables under consideration:

The trend of relationship between age of the farmers and their perceived importance of different ICT enablers was positive and significant at 0.05 level of significance. Thus, it can be concluded that with the increase of age of the farmers, their perceived importance increases.

4.3.2 Relationship between level of education of the farmers and their perceived importance of different ICT enablers for receiving farm information

The relationship between level of education of the farmers and their perceived importance of ICT enablers, the following null hypothesis was tested:

"There is no relationship between level of education of the farmers and their perceived importance of ICT enablers".

Computed value of the co-efficient of correlation between level of education of the farmers and their perceived importance of ICT enablers was found to be 0.289** as shown in table 4.4.

The trend of relationship between level of education of the farmers and their perceived importance of ICT enablers was positive direction and significant at 0.01 level of significance. The researcher can conclude that with the increase of level of education of the farmers, their perceived importance of ICT enablers' increases. The researcher can conclude that with the increase of education of the farmers, their perceived importance of ICT enablers' increases.

4.3.3 Relationship between family size of the farmers and their perceived importance of different ICT enablers for receiving farm information

The relationship between family size of the farmers and their perceived importance of ICT enablers, the following null hypothesis was tested:

"There is no relationship between family size of the farmers and their perceived importance of ICT enablers"

Computed value of the co-efficient of correlation between family size of the farmers and their perceived importance of ICT enablers was found to be 0.090 as shown in Table 4.4. So, the null hypothesis could not be rejected. It can be concluded that there is no relationship between the family size of the farmers and their perceived importance of ICT enablers at five percent level of significance.

4.3.4 Relationship between farming experience of the farmers and their perceived importance of different ICT enablers for receiving farm information

In order to determine the relationship between farming experience of the farmers and their perceived importance of ICT enablers, the following null hypothesis was tested:

"There *is no relationship between farming experience of the farmers and their perceived importance of ICT enablers*

Computed value of the co-efficient of correlation between farming experience of the farmers and their perceived importance of ICT enablers was found to be 0.276** as shown in table 4.4. The trend of relationship between farming experience of the farmers and their perceived importance of ICT enablers was positive direction and significant at 0.01 level of significance. Thus, it can be concluded that with the increase of farming experience of the farmers, their perceived importance of ICT enablers' increases.

4.3.5 Relationship between annual family income of the farmers and their perceived importance of different ICT enablers for receiving farm information

The relationship between annual family income of the farmers and their perceived importance of ICT enablers, the following null hypothesis was tested:

"There is no relationship between annual income of the farmers and their perceived importance of ICT enablers"

The computed value of the co-efficient of correlation between annual family income of the farmers and their perceived importance of ICT enablers was found to be 0.139 as shown in table 4.4. So, the null hypothesis could not be rejected even at five percent level of significance. It can be concluded that there is no relationship between the annual income of the farmers and their perceived importance of ICT enablers at five percent level of significance.

4.3.6 Relationship between ICT training received and farmers' perceived importance of different ICT enablers for receiving farm information

The relationship between ICT training received and farmers' perceived importance of ICT enablers, the following null hypothesis was tested:

"There is no relationship between ICT training received and farmers' perceived importance of ICT enablers"

The computed value of the co-efficient of correlation between ICT training received by the farmers and their perceived importance of ICT enablers was found to be 0.412** as shown in table 4.4. The relationship between ICT training received by the farmers and their perceived importance of ICT enablers is positively significant at 0.01 level of significance. Thus, it can be concluded that with the increase of ICT training received by the farmers, their perceived importance of ICT enablers' increases.

4.3.7 Relationship between use of ICT enablers in agricultural activities by the farmers and their perceived importance of different ICT enablers for receiving farm information

In order to determine the relationship between use of ICT enablers in agricultural activities by the farmers and their perceived importance of different ICT enablers for receiving farm information, the following null hypothesis was tested:

"There is no relationship between use of ICT enablers in agricultural activities by the farmers and their perceived importance of ICT enablers"

The co-efficient of correlation between the concerned variables was computed and found to be 0.226* as shown in table 4.4 which led to the following observation regarding the relationship between the two variables under consideration. The relationship between use of ICT enablers by the farmers and their perceived importance of ICT enablers was positively significant at 0.05 level of significance. Thus it can be concluded that with the increase of use of ICT enablers by the farmers, their perceived importance of ICT enablers' increases.

4.3.8 Relationship between frequency of using ICT enablers and farmers' perceived importance of different ICT enablers for receiving farm information

The relationship between frequency of using ICT enablers and their perceived importance of ICT enablers, the following null hypothesis was tested:

"There is no relationship between frequency of using ICT enablers by the farmers and their perceived importance of ICT enablers"

Computed value of the co-efficient of correlation between frequency of using ICT enablers and their perceived importance of ICT enablers was found to be 0.306** as shown in table 4.4. The trend of relationship between frequency of using ICT enablers and their perceived importance of ICT enablers was positive and significant at 0.01 level of significance. Thus, it can be concluded that with the increase of frequency of using ICT enablers, their perceived importance of ICT enablers' increases.

4.3.9 Relationship between ease of using ICT enablers and farmers' perceived importance of different ICT enablers for receiving farm information

The relationship between ease of using ICT enablers and their perceived importance of ICT enablers, the following null hypothesis was tested:

"There is no relationship between ease of using ICT enablers of the farmers and their perceived importance of ICT enablers"

Computed value of the co-efficient of correlation between ease of using ICT enablers and their perceived importance of ICT enablers was found to be 0.045 as shown in Table 4.4. So, the null hypothesis could not be rejected. It can be concluded that there is no relationship between the ease of using ICT enablers and their perceived importance of ICT enablers even at five percent level of significance.

CHAPTER 5
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter summarizes empirical results consisting of perceived importance of the ICT enablers by the farmers, selected characteristics of farmers and the relationship between selected characteristics and perceived importance of ICT enablers by the farmers in receiving farm information. The conclusion of the study is also drawn based on the major findings, interpretation and related facts. It also suggests some recommendations for policy action to increase the extent of perceived importance of ICT enablers by the farmers in receiving farm information. This chapter finally recommends probable research endeavors that can be carried out in future.

5.1 Summary of Findings

The present study was undertaken to assess the perceived importance of ICT enablers by the farmers, to determine some selected characteristics of the farmers and to ascertain the relationship between the selected characteristic of the farmers and the perceived importance of ICT enablers by the farmers. The study was conducted in Dinajpur Sadar, Chirirbandar and Biral Upazila of Dinajpur district. The farmers who are directly and indirectly benefitted for at least one year from the Agriculture Information and Communication Centers (AICCs) of Department of Agricultural Extension (DAE) constitute the population of the study and the total number was 340. Thirty percent of the population that is 102 farmers randomly selected as sample by using simple random sampling method for the purpose of data collection. Data were collected by the researcher himself during 20 February to 20 March, 2018. In this study, the perceived importance of ICT enablers by the farmers was the focus issue and was measured by computing a composite importance score. The selected characteristics of the farmers were age, level of education, family size, farming experience, annual family income, ICT training received, use of ICT enablers by the farmers, frequency of using ICT enablers and ease of using ICT enablers.

5.1.1 Perceived importance of ICT enablers

The average perceived importance scored was 196.23 and the standard deviation was 66.70. It was found that 76 (74.5 percent) respondents had medium perceived importance, 14 (13.7 percent) respondents had low perceived importance and 12 (11.8 percent)

respondents had high perceived importance of ICT enablers. Among the ten selected ICT enablers, mobile phone, television and radio found to be top ranked three ICT enablers as perceived important by the farmers. Again out of nine selected farm related information, farmers perceived the "recent information on agriculture" is most important for receiving from different ICT enablers followed by "information on market of agricultural products" and "get information on new varieties".

5.1.2 Selected characteristics of the farmers

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

Age: It was found that the age of the respondents ranged from 18 to 55 years, the average being 29.66 years and the standard deviation was 9.26. Highest proportion (80.4 percent) of the respondents fell in the young-aged category compared to 16.7 percent middle and 2.9 percent old-aged category. It was also revealed that 80.4 percent of the respondents comprised of young aged categories.

Level of education: The education score of the respondents ranged from 0 to 15, the average being 7.06 and the standard deviation was 3.72. Large proportion 87.2 percent of the respondents are having standard level of education (24.5 percent having "primary education", 49.0 percent having "secondary education" and 13.7 percent having "above secondary education") compared to 3.9 percent "can sign only", and 8.8 percent having "no education or illiterate".

Family size: The family size of the respondents ranged from 3 to 8 with an average of 4.83 and a standard deviation of 1.298. It was found that overwhelming majority of the farmers (48.0 percent) have medium sized family. On the other hand, 11.8 percent had large sized family and 40.2 percent had small sized family. It indicates at present times; the numbers of medium families are increasing.

Farming experience: Farming experience of the farmers ranged from 2 to 39 years, the mean being 13.96 with a standard deviation, of 9.676. The highest proportion (46.1 percent) of farmers in the study group had one-decade farming experience, while 34.3 percent had two decades of farming experiences, 11.8 percent had three decades of farming experiences, only 7.8 percent of the farmers had four decades of farming experience.

Annual family income: Annual family income of the respondent ranged from TK.10,000.00 to TK. 600,000. The average annual income was TK 105,078.43 and standard deviation 88,458.38. It was found that highest proportion (70.6 percent) of the respondents had low annual family income compared to 22.5 percent having medium and 6.9 percent under high annual family income.

ICT training received: ICT training received of the farmers ranged from 0 to 90 days, the mean being 9.73 with a standard deviation, of 22.170. The highest proportion (75.5 percent) of farmers in the study group had week long ICT training experience, while 10 percent had no training, 6.9 percent had eek long to monthly training experiences and 6.9 percent of the farmers had above monthly ICT training experience.

Use of ICT enablers in agricultural activities: Use of ICT enablers' scores of the respondents ranged from 3 to 27. The average was 16.294 with a standard deviation 6.248 against the possible range of 0 to 27. It was found that the highest proportion (52.0 percent) of the respondents had medium level of use of ICT materials compared to 18.6 percent having low level of use of ICT materials and 29.4 percent of the respondent had high level of use of ICT materials.

Frequency of using ICT enablers: Possible range of frequency of use ranged from 0 to 30 while the observed range was 1 to 25. The average was 10.08 with a standard deviation 5.02. The findings indicate that most of the farmers (52.0 percent) had medium frequency of use of ICT enablers, while 29.4 percent had high and only 18.6 percent had low frequency of use of ICT enablers. GOs and NGOs should come up to take appropriate steps for spreading ICT enablers and for increasing frequency of ICT enablers by the farmers.

Ease of using ICT enablers: Possible range of ease of using ICT enablers by the respondents ranged from 0 to 30 while the observed range was 0 to 30. The average was 10.67 with a standard deviation 8.21. The findings indicate that most of the farmers (69.6 percent) had low ease of use of ICT enablers, while 13.7 percent had medium and only 16.7 percent had high frequency of use of ICT enablers.

5.1.3 Relationships between the focus issue and the selected characteristics

Out of nine selected characteristics, age, level of education, farming experience, ICT training experience, use of ICT enablers, frequency of using ICT enablers found

significantly and positively related with perceived importance of ICT enablers. But family size, annual family income, ease of using ICT enablers have no relationship with perceived importance of ICT enablers.

5.2 Conclusions

On the basis of the findings of the study, their logical interpretations and other relevant facts, the researcher drawn following conclusions:

i. The study shows that majority (74.5 percent) of the farmers replied medium level of importance of ICT enablers as perceived by them while 13.7 percent of the farmers replied low and 11.8 percent replied high level of importance of ICT enablers as perceived by them. So, it can be concluded that there is an ample scope of increasing their perceived importance of ICT enablers in the study area though the existing perceived importance by the farmers is good enough.

ii. Mobile phone, television and radio was found high important as perceived by the farmers. Thus, information dissemination system emphasizing these enablers needs to be highlighted in different agricultural extension programs.

iii. Recent information on agriculture, information on marketing system and new varieties need to be emphasized to disseminate through ICT enablers.

iv. The study shows that education, farming experience, ICT training received had significant positive relationships to the perceived importance of ICT enablers. So, it leads to the conclusion that to formulate any program to improve the perceived importance of ICT enablers all of these factors should be considered.

v. The study revealed that education of the farmers had positive and significant relationship with the perceived importance of ICT enablers. The higher the educational level, the better they will have perception of importance. Education level of the farmers in the study area was relatively good. So, it may be concluded that ICT enablers will be more effective if opportunity of education in the study will be increased. Thus, if any program implemented to improve the perception of importance about ICT enablers, the program must take attention on educational aspect of farmers as one of the key factors of perception.

vi. Findings showed that access to ICT training received had positive significant relationship with the perceived importance of ICT enablers. Thus, it may be concluded that farmers having higher training on ICTs will feel higher perceived importance of ICT enablers. Thus, like training different non-formal educational programs e.g., innovation campaign, farmers workshop, group discussion could be

arranged in this regard.

5.3 Recommendations

5.3.1 Recommendations for policy implications

On the basis of the findings and conclusion of the study, the following recommendations for policy implication are made:

1. Considering the overall situation, it was recommended that care should be taken by the GOs, NGOs, DAE and other development agencies in properly handling communication media with the farmers and disseminates ICT enablers to farmers. It should be remembered that failure of one effort may lead to reduce credibility of a particular communication medium which may take long time to overcome associated psychological barriers for proper use of ICTs.

2. The study reveals that the farmers having better education could improve the existing status of using ICT enablers. As majority of the farmers in the study area had education to primary level and higher, formal and non-formal education facilities (i.e. mass education program) should be continue as previous to them by Extension Agents of both GOs and NGOs.

3. It was revealed that the farmers with experience could expose themselves more within their locality and also with various information sources and communication technologies. Therefore, group approach of extension could effectively be used by different extension agencies as well as communication media in disseminating information. Different motivational programs by the concerned organizations could encourage them further in the use of more ICT tools and media to have better perception regarding ICT enablers.

4. ICT training showed a positive and significant relationship with their perceived importance of ICT enablers. It is recommended to arrange adequate training programs for the farmers and other instructional methods to increase their technical knowledge related to ICT tools and media.

5.3.2 Recommendations for future study

Short term and sporadic study being conducted in some specific location cannot provide all information for proper understanding about different activities and related matters. Future studies should be undertaken covering more dimensions in the related matters. The following recommendations arc suggested in this connection:

1. It is strongly felt that study of this nature be replicated in other parts of Bangladesh. This recommendation is made because the study area at Dinajpur Sadar, Chirirbandar and Biral Upazila in Dinajpur district is not typical of the situation in the entire country. The results of the study need to be verified in other areas of the country.

2. This study investigated only nine characteristics of the farmers on their perceived importance of information and communication technologies enablers. Therefore, it is recommended that further study should be conducted involving other characteristics (farm facilities, social status, marketing facilities etc.) in this regard to better interpret the unexplained variations.

3. Similar study should also be replicated in future for studying any change of pattern regarding perceived importance of ICTs use among the same population of the present study area to arrive at generalizations for policy implications.

4. On the basis of the characteristics pattern of farming population, more researches should be conducted to investigate the comparative perceived importance of ICTs use with other extension method and also identify the factors influencing perceived importance of ICTs use, its utilization as well as perceived importance of receiving information by the farmers.

5. In this study, only the survey method (quantitative tool) was used for collection of data. It is recommended to conduct further research using some other qualitative tools (e.g. Focus group discussion (FGD), case study, problem free analysis etc.) in order to achieve more accuracy of information.

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APPENDIX A

Department of Agricultural Extension

Hajee Mohammad Danesh Science and Technology University, Dinajpur

An interview schedule for a research study entitled

Perceived Importance of Different ICT Enablers in Receiving Farm Information

Name of the respondent : ....Sl. No............

Village : .... Union : ....

Upazila : .... District : ....

1. Age: What is your age? ……………… Years

2. Level of education:

a. Cannot read and write ( )

b. Can sign name only ( )

c. I have passed class: ---------------------------

3. Family size: Please mention the number of total family members of your family.

……………. Nos.

4. Farming Experience:

For how many years you are involved in farming? ……………… Years

5. Annual family income:

Sl.	Sources	Income
a.	Agriculture	
b.	Service	
c.	Business	
d.	Wage labor	
e.	Others	
	Total	

6. ICT training received

Have you received any ICT training?

( ) Yes …………… days ( ) No

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7. Use of ICTs in agricultural activities:

Farm information	Extent of use			
	Very high	High	Less	Not at all
Get information on new varieties				
Get information on market situation				
Exchange of knowledge and ideas with fellow farmers				
Exchange of knowledge and ideas with extension workers				
Acquire information from research institution				
Acquisition of skill through training				
Get information on farm inputs availability, cost and where to obtain them				
Searching for recent information on agriculture				
Information on market of agricultural products				

8. Frequency of use of ICT enablers

Please mention your frequency of use of the following ICT enablers

ICT enablers	Frequency of use			
	Not at all (0)	Monthly (1)	Weekly (2)	Daily (3)
Mobile phone				
Computer				
Internet				
Multimedia projector				
Digital camera				
CD/DVD player				
TV				
Radio				
Printer				
Public Address System				

9. Ease of use of ICT enablers

Please mention your easiness of using the following ICT enablers

ICT enablers	Extent of ease			
	Difficult (0)	Moderately easy (1)	Easy (2)	Very easy (3)
Mobile phone				
Computer				
Internet				
Multimedia projector				
Digital camera				
CD/DVD player				
TV				
Radio				
Printer				
Public Address System				

10. Perceived importance of different ICT enablers

Please mention your perceived importance of using different ICT enablers in agricultural activities

Scale: 1=Not important at all, 2=Not important, 3=Important, 4=Very important

Farm Information	Different ICT Enablers									
	Mobile Phone	Computer	Internet	Multimedia Projector	Digital Camera	CD/DVD	Television	Radio	Printer	Public Address System
Get information on new varieties										
Get information on market situation										
Exchange of knowledge and ideas with fellow farmers										
Exchange of knowledge and ideas with extension workers										
Acquire information from research institution										
Acquisition of skill through training										
Get information on farm inputs availability, cost and where to obtain them										
Searching for recent information on agriculture										
Information on market of agricultural products										

Thank you for your cooperation.

…………………………

Signature of the interviewer

Correlation Matrix of the Focus Issue and Selected Characteristics

	Age	Level of education	Family Size	Farming experience	Annual family income	ICT training	Use of ICT enablers	Frequency of use of ICT enablers	Ease of use of ICT enablers	Perceived importance of ICT enablers
Age	1									0.216*
Level of education	-0.133	1								0.289**
Family Size	0.047	0.010	1							0.090
Farming experience	0.924**	-0.054	0.061	1						0.276**
Annual family income	-0.074	0.052	0.093	-0.014	1					0.139
ICT training received	0.070	0.329**	0.068	0.146	0.414**	1				0.412**
Use of ICT enablers in agricultural activities	0.086	0.187	0.137	0.104	0.078	0.244*	1			0.226*
Frequency of use of ICT enablers	0.142	0.253*	0.043	0.189	0.073	0.121	0.072	1		0.306**
Ease of use of ICT enablers	-0.088	-0.149	-0.086	-0.117	0.091	-0.064	-0.056	-0.035	1	0.045

* Correlation is significant at the 0.05 level of probability

** Correlation is significant at the 0.01 level of probability