

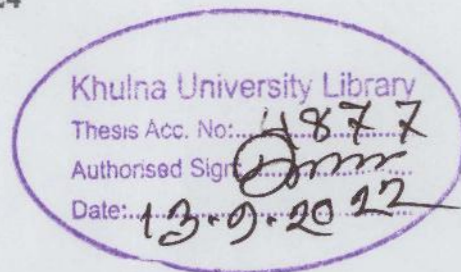
**FARMERS' EXPOSURE TO DEVELOPMENT COMMUNICATION TOOLS OF
AGRICULTURE INFORMATION SERVICE IN BANGLADESH**

A thesis

By

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A Thesis (Course No. AERD-6104) Submitted to the Agrotechnology Discipline in Partial
Fulfillment of the Requirements for the Degree of Master of Science



**AGROTECHNOLOGY DISCIPLINE
LIFE SCIENCE SCHOOL
KHULNA UNIVERSITY
KHULNA-9208**

MARCH, 2022

**KHULNA UNIVERSITY
LIFE SCIENCE SCHOOL**

AGROTECHNOLOGY DISCIPLINE

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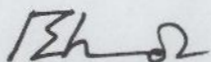
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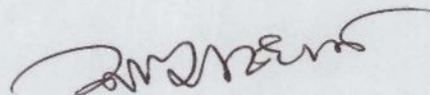
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MARCH, 2022

FARMERS' EXPOSURE TO DEVELOPMENT COMMUNICATION TOOLS OF AGRICULTURE INFORMATION SERVICE IN BANGLADESH

ABSTRACT

The development communication tools (DCTs) of Agriculture Information Service (AIS) plays important role in disseminating agricultural information. Farmers' exposure to these DCTs of AIS influences higher crop production and better farm management. The main purpose of this study was to determine and describe the exposure of DCTs of AIS by the farmers in receiving agricultural information. The individual socioeconomic characteristic of the farmers has been explored from the study and the relationship between the exposure of respondents to DCTs of AIS and their selected characteristics has been determined too. Data were collected from randomly selected 80 farmers of five villages of Dumuria upazila under Khulna district, by using a structured interview schedule through personal interview. Appropriate Likert scales were used in order to measure the concerned variables. Spearman's Ranked Correlation Coefficient (ρ) was used to test the relationship between the independent and dependent variables. The farmers were exposed to 13 out of 14 DCTs of AIS. However, majority (72.5%) of the respondents showed very low exposure to DCTs of AIS. The respondents were highly exposed to poster/sticker (65.93%), while they were less exposed to ICT laboratory (0.94%). Other important DCTs as exposed by the farmers were folder/leaflet/flipchart (64.69%), television program (54.06%), agricultural fair (50.93%) and AisTube (1.87%). Among 13 selected characteristics of the respondents' level of education, farm size, annual family income, cosmopolitanism, innovativeness, extension contact, organizational participation, training, knowledge and attitude were positively correlated with their level of exposure to the DCTs of AIS. Half (50.00%) of the respondents confronted medium extent of problem and 43.75 percent confronted high extent of problem while a few of them (6.25%) reported low extent of problem for being exposed to the DCTs of AIS. Unavailability of personal mobile, TV, radio was the highly confronted problem (90.00%) followed by lack of resources (87.95%), internet (82.08%) and transportation facilities (78.30%) by the farmers in receiving agricultural information. The AIS authority could revise their policy for the improvement of DCTs on the basis of the findings from the current study.

Keywords: Farmers, Exposure, Development Communication Tools, Agriculture Information Service

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March 2022

The Author

Dedicated to
My Parents

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ACRRONYMS

AIS :	Agriculture Information Service
DCTs :	Development Communication Tools
ICT :	Information and Communication Technology
KCC:	<i>Krishi</i> Call Centre
AICC :	Agricultural Information and Communication Centre
Sd :	Standard Deviation
BDT :	Bangladeshi Taka

CHAPTER I

INTRODUCTION

1.1 General Background of the Study

Agriculture is the dominant sector in Bangladesh in providing livelihood, employment and contributions to GDP. But food security is a challenge in this world's most densely populated country, which is extremely vulnerable to natural disasters. This largest economic sector, agriculture is becoming increasingly information sensitive day by day. Hence, access to information has become a pre-requisite and a valuable resource for agricultural development (Rodman, 2006). Success in enhancing agricultural production, providing income and job opportunities and ensuring that the agricultural sub-sector perform its manifest function in furtherance of rural and overall national development, depend largely on the communication system adopted to implement various agricultural programs. There is a great need to pull the rural people out of their frames of habitual experience, to create awareness as a prelude to attitudinal and behavioral changes. Rationally, mass communication provides the means of spreading the knowledge more rapidly and widely than even before (Neville, 1978). While communicating on the role of mass media, Schramm (1988) said, "They have given the developing countries potential channels of information with which to reach fantastically large audiences, to communicate with under-privileged masses, despite the literacy barrier, to teach different skills by 'showing how' they are done, to speak almost with the effectiveness of face-to-face communication". Schramm also discussed the potentialities and the realities of mass media in the developing countries.

About 75 percent of the population living in rural areas and about one-thirds of the population still remaining illiterate, the primary source of employment for the vast majority of our population is agriculture (CIA Website). In our country, the quantity of land available to agriculture is either almost fixed or declining. Over the years, agricultural technology has undergone many changes. The farmers have developed their own innovations and learned from each other's experiences and are applying modern technology and methods made available by experts and scientists. The old method is not enough to modernize the demands of today's rapidly growing population. Therefore, changes in material inputs, farming techniques, storage technology, research, supply and marketing institutions are all part of technological transformation. These activities are, however, intertwined with the flow of information. While

it is widely acknowledged that communication plays a significant role in agriculture and development, there are also divergent opinions as to what communication can and cannot do. Mass media as a "magic multiplier" cannot be accepted for granted because Luis (1975) argued that communication is indeed vital to development of a nation but it is only an instrument. It may be mighty but it is not magic; it cannot generate development by itself.

The extension agencies make use of different media in transferring improved agricultural technologies to the end users. Farmers' communication tools are essential ingredients needed for effective transfer of technologies that are designed to boost agricultural production (Okwu and Daudu, 2011). In order for farmers to benefit from such technologies, they must first access them and learn how to use them effectively in agricultural systems and practices. This should be the work of agricultural extension agencies around the world. Communication tools in agricultural information dissemination generally, are useful in reaching a wide audience at a very fast rate. They serve as a source of agricultural information for farmers and also provide farmers with a way to inform them of new developments and emergencies. They could equally be important in stimulating farmers' interest in new ideas and practices (Ani et al., 1997). Obinne et al. (2000) opined that the mass media does this by setting agenda for important discussion topics, transferring knowledge, forming and changing opinions and changing behaviors. The media is also believed to create awareness and diffuse personal value system favorable to innovations, mobility achievement and consumption (Nwachukwu, 2003). Extension therefore, is a communication process, whereby various participants and stakeholders are linked and exchanged information necessary for sustainable agricultural development (Ani, 2007).

In Bangladesh the Department of Agricultural Extension (DAE) and some other Government and Nongovernment Organizations are working in transferring information/ technologies from a research system (source of technologies) through an extension system (interpreter and dissemination of technologies) to the client system (users of technologies). Extension personnel follow a number of extension methods such as method or result demonstration, farm publications such as. leaflets, bulletins, poster etc., agricultural radio and TV programme, progressive and contact farmers, local and opinion leader, field tour, field days etc.

The Digital Bangladesh under the Vision 2021 is the mandate of the present government (as per their election manifesto) in which ICT has been recognized as the mainstream development tool to lift the economic and social status of the citizens of Bangladesh.

Bangladesh is well positioned to effectively start using ICT for agricultural extension. Notably, the National Agricultural Extension Policy is currently under revision. Unlike the old one that dates back to 1996, in the new version e-agriculture has been added as one of the nine principles of the policy. The policy includes improving the Public Private Partnerships in extension, improving the research extension-farmer linkage and developing a one-stop-shop approach with Farmers' Information and Advice Centers (FIAC), which should be based at every Union Parishad. Furthermore, the Prime Minister's Office is spearheading the Digital Bangladesh concept, to link up each Union Parishad by internet to give better access to information and services (Nasiruddin, 2011).

Many informative agricultural programmes are broadcast through radio and public and private channels of television in Bangladesh. *Mati o Manush*, *Banglar Krishi*, *Krishi Dibanishi*, *Bangladesh Krishi*, *SAARC Krishi*, *Hridoye Mati o Manush*, *Hridoye Mati o Manusher Dak*, *Fire Cholo Matir Tane*, *Shamol Bangla*, *Shabuj Bangla*, *Dipto Krishi*, *Matir Shubash*, *Shonali Din*, *Krishi Jog*, *Khamarbari* etc. are broadcast on television. *Desh Amar*, *Mati Amar*, *Krishi Samachar*, *Chashabad*, *Amar Desh*, *Shonali Fasal*, *Krishikatha* etc. are broadcast on radio (Alam et al., 2012; DAE, 2016). Agricultural news is also broadcast embedded in the national and regional news. Three categories of radio transmission are available now in Bangladesh: Bangladesh Betar, FM Radio and Community radio (DAE, 2016). Seventeen community radio programmes are in existence in the country (DAE, 2016). The community radio established in *Amtali*, *Barguna* is dedicated for agricultural programme broadcasting and the slogan of this community radio is 'My Radio My Voice' (AIS, 2018). Agricultural fair is generally organized by the Department of Agricultural Extension and other agricultural government organization to create awareness about improved technology among a large number of people within a short time and to stimulate general motivation for agricultural and rural development in the area.

Much of the agricultural programs on national TV and Radio is prepared by a dedicated team in AIS. Recently AIS started to produce material for regional and community radio stations in local dialects. These are new initiatives and it is not yet possible to assess the impact.

The low literacy rate particularly among the rural population (72%, CIA Website) is a major limitation for connecting directly with farmers using ICT text-based solutions such as SMS or web-based written information. Organizations involved with ICT in extension are aware that text-based solutions may best work through the use of educated intermediaries such as an

extension worker. Direct contact with farmers may be more effective through either audio or visual means of communication.

The key challenges for extension, not just in Bangladesh, are how to

- ☐ improve the linkage between research and extension,
- ☐ make research and extension more responsive to farmers' needs and priorities and improve the linkage of farmers back to research and extension,
- ☐ provide more site technical/production information concerning more diversified production systems (plant, animal, fish based) for heterogeneous agro-ecological conditions,
- ☐ better integrate farmers into markets via the provision of market-related information e.g., prices in various local and national markets, market need, market quality requirements such as size, taste, color, hygiene, etc. (Afrad et al., 2019).

The success of agricultural development programs in developing countries largely depends on the nature and extent of use of mass media in mobilization of people for development. Press, Radio, Television, Internet, Mobile etc., have been acclaimed to be the most effective media for diffusing the scientific knowledge to the masses (Nazari and Hassan, 2011). In a country like Bangladesh, where literacy level is low, the choice of communication media is of vital importance. The expansion of development communication tools in extension needs to meet at least three criteria in order to be successful

- ✓ **Cost Effectiveness:** The goal will be to increase the access to the greatest amount of information at the least possible cost.
- ✓ **User Friendliness:** The extension agents and farmers who will be the principal users of these technologies are not expected to be specialists in ICTs, but rather functional users of these technologies. The use of the Bangla language and high levels of illiteracy are issues to be considered as well.
- ✓ **Adaptation to Local Conditions:** Constraints include poor availability of electricity, the danger of power surges, and the need for phone/internet network connectivity.

Agriculture Information Service (AIS) is a government organization under the Ministry of Agriculture (MoA), Government of Bangladesh. The main target of this organization is to carry the modern agricultural information and technologies at the farmers' doorstep in grass root level especially through mass media. It was inceptioned in 1961 as Agriculture Information Agency which was turned into Agriculture Information Service in 1985 with a vision "To make available the modern agricultural information services". Information services are being rendered through Headquarter in Dhaka and 11 regional offices across the country (AIS, 2018).

AIS acts as a media focal point of the Ministry of Agriculture for mass media related campaigning of agricultural development. AIS proudly take the responsibility for producing and disseminating demand driven print and video materials for MoA and its agencies. The mission of AIS is "Creating awareness by making available of the agricultural information and technologies using print electronic and ICT based mass media" (AIS, 1985). Agriculture Information Service basically collects the agricultural information from research, academia, extension and other knowledge centers and converts in farmers' friendly manner, then disseminates through different mass media. There are many development communication tools which is used to disseminating any information among the farmers. The development communication tools of AIS can be classified as Print media, Electronic media and ICT media.

AIS is the proud cohorts of the agricultural success made in the last couple of years of the present government. The organization has been achieved Bangabandhu national agricultural award (gold medal), national digital innovation award etc..for its outstanding contribution. AIS is firmly determined to keep its endeavor with the development pathway of the present government and thus to establish the 'Golden Bangladesh' which was the dream of the Father of the Nation Bangabandhu Sheikh Mujibur Rahman (AIS, 2018).

The AIS has different program/development tools such as *Krishi katha*, *Krishi Diary*, irregular publications, Radio, TV, Agricultural News, Agricultural video film / *pramannochitro* , Agricultural training, website (www.ais.gov.bd), ICT lab, Agricultural Information and Communication Centre (AICC), Community Rural Radio, *Krishi Call Centre* (KCC), Mobile Apps and Distribution of printed materials from where the farmers can obtain or seek information. Islam (2019) studied the farmers' exposure to *Krishi Call Centre* of AIS. Besides Ahmed (1994), Shaikh et al. (2010), Hossain et al. (2012) and Amin et al.

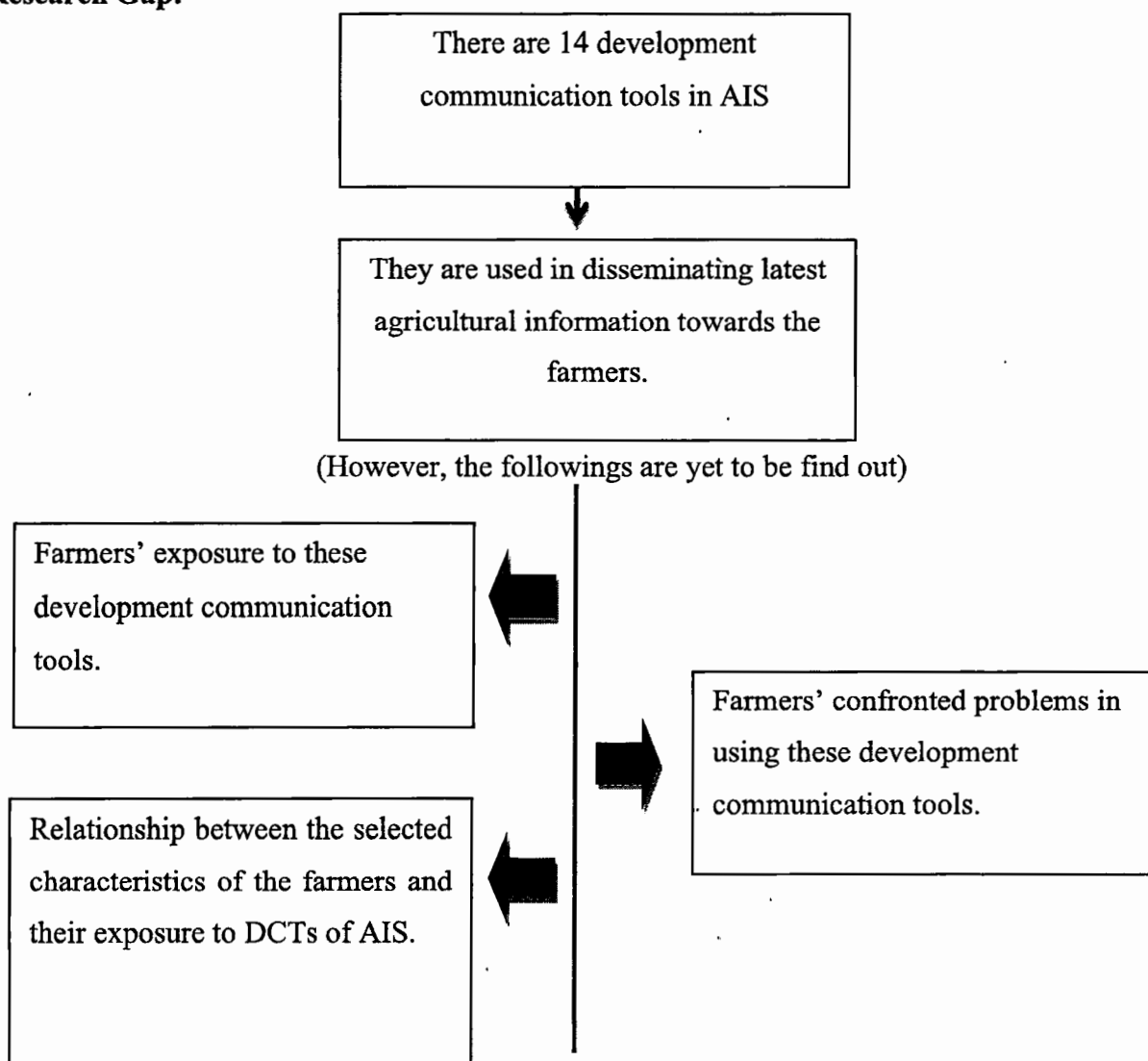
(2013a,2013b,2014a,2014b) conducted their studies related to exposure to and effectiveness of radio and TV broadcasted agricultural programs of AIS and other Satellite Channels.

Now with the harmony of their findings it is need to study the exposure of farmers to different development communication tools/programs which are offered by Agriculture Information Service (AIS) of Bangladesh.

1.2 Statements of the Problem

Exposure assessment is the process of characterizing, estimating, measuring and modeling the magnitude, frequency and duration of contact with an agent as well as the number and characteristics of the population exposed (McKone and Small, 2006).

Research Gap:



Analyzing the issues from farmers' perspective, the researcher undertook this piece of study entitled **"Farmers' Exposure to Development Communication Tools of Agriculture Information Service in Bangladesh"**.

This study was designed to find out the answer of the following research questions considering Farmers Exposure to DCTs of AIS

Agriculture Information Service (AIS) is a government organization which is working for the betterment of the farmer in our country. They provide latest information and training for improving the socioeconomic condition of the beneficiaries. But there is no exact evidence on the fact that how much the farmer exposure to the DCTs of AIS.

- i. What is the extent of farmers' exposure to DCTs of AIS?
- ii. What are the characteristics of the farmers who were exposed to DCTs of AIS?
- iii. Is there any relationship between the selected personal and socioeconomic characteristics of the farmers and their extent of exposure to DCTs of AIS?
- iv. What are the factors influencing the exposure of the farmers to programs or development communication tools of AIS?
- v. What are the problems confronted by farmers in exposure to DCTs of AIS?

1.3 Specific Objectives

In these circumstances, the present research has been taken under with following objectives

- i. To determine farmers' exposure to development communication tools of AIS;
- ii. To analyze the selected characteristics of the farmers;
- iii. To explore relationships between the selected characteristics of the farmers and their exposure to development communication tools of AIS;
- iv. To identify what are the factors influencing the exposure of the farmers to DCTs of AIS;
- v. To determine the problems faced by the farmers to the exposure of DCTs of AIS;

1.4 Scope of the Study

The present study provides valuable information of the Agriculture Information Service, Khulna office as well as officials, other extension personnel and planners about the extent of exposure to DCTs of AIS. The results of the study would help them to design and implement the development programs effectively by considering the extent of exposure and constraints faced by farmers which are essential in increasing their exposure.

1.5 Assumptions

An assumption is the supposition that an apparent fact in principle is true in the light of available evidence (Goode, 1945). The following assumptions were in mind of the researcher during conducting the study:

- i. The responses furnished by the respondents were reliable and valid.
- ii. The selected respondents were competent enough to reply the queries made by the researcher.
- iii. The respondents included in the sample were capable of furnishing proper responses to the questions included in the interview schedule.
- iv. Views and opinions furnished by the respondents were the representative views and opinions of farmers' population of the study area.
- v. The researcher who acts as the interviewer was well adjusted to the social environment of the study area. Hence, the data collected by the researcher were free from bias.
- vi. The items included in the question of attitude of farmers on exposure to DCTs of AIS and others information including such as their actual value and rights in their family as well as the society.
- vii. All the data concerning the variables of the study were normally and independently distributed.

1.6 Limitations of the Study

This study is a time bound degree-oriented research work conducted by the student and hence there is a limitation of time and resources. Therefore, the findings of the study cannot be generalized to other areas and other population of exposure to DCTs of AIS as a whole.



Considering the time, money and other necessary resources available to the researcher and make the research manageable and meaningful from the practical point of view, the limitations of the current study could be mentioned below:

- i. The study was confined to different villages of Dumuria upazila under Khulna district.
- ii. The characteristics of the respondent in the study area were many and varied but only fourteen characteristics were selected for investigation in this study as stated in the objectives.
- iii. There were many farmers in the study area, but only 80 respondents were considered for this study.
- iv. For information about the study, the researcher dependent on the data as furnished by the sampled respondents during the interview. As none of the respondents kept records, they furnished information to the different queries by recall such as farming maintenance records.
- v. For some cases, the researcher faced unexpected interference from the over interested side-talkers while collecting data from the target populations. However, the researcher tried to overcome the problem as far as possible with sufficient tact and skills.
- vi. Various problems were likely to be faced to expose to the DCTs by the farmers. However, only some selected problems have been considered for investigation in this study.
- vii. Major information, facts and figure supplied by the respondents were applicable to the situation prevailing in the locality during the year 2022.

1.7 Definition of Related Terms

The terms which have been frequently used throughout the research work are defined and interpreted below:

Farmer: A person who owns or manages a farm.

Respondent: Respondent referred to the farmer beneficiaries who were exposed to DCTs of AIS and were included to the sample.

Age: Age of a respondent was defined as the span of their life and was operationally measured by the number of years from his/her birth to the time of interview.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter is to review literature having relevance to the present study. The purpose of this study was to ascertain the use of different media known as development communication tools (DCTs) from AIS. The farmers consider these media as agricultural information sources. Their relationship of the selected characteristics of the farmers with the level of exposure was determined from the current study. Little work had been done in Bangladesh on these subjects. The researcher, therefore, made an exhaustive effort to review researches directly or indirectly related to the present study. The available reviews are presented in three sections.

In order to focus the pertinent reviews, this chapter has been divided into major three sections. Firstly, some literature related to AIS and DCTs. The rest sections deal with farmers exposure to development communication tools and their selected characteristics and confronted problems related to the exposure of DCTs of AIS.

2.1 Development Communication Tools (DCTs) of Agriculture Information Service (AIS)

2.1.1 Print Media Activities

❑ *Krishi Kotha*

AIS publishes and distributes *Krishi Kotha*, the most renowned and pride farm magazine in Bangladesh. At present direct subscriber of *Krishi Kotha* is more than 80 thousand and reader numbers are more than 15 lakh (AIS, 2018).

❑ *Samprosharon Barta*

It is the news bulletin being published and circulated monthly. It comprises the news of agricultural development, success, events and contemporary news.

❑ *Krishi Diary*

It contains the latest necessary technological information, statistics on agriculture as well as contact information of various government and non-government departments and individuals related to agriculture.

☐ **Other Printing materials**

For disseminating agricultural information and technologies printed materials in the form of booklets, posters, folders, festoon etc. play a significant role. From 2009 to 2018 about 35.82 lakh copies of printed materials were published and distributed amongst farmers, extension personnel and other related stakeholders (AIS, 2018).

2.1.2 Electronic Media Activities

☐ **Bangladesh Television (BTV)**

Mati-O-Manush, a very much popular TV program telecasted by the BTV is being prepared by the cooperation and assistance of AIS. Besides, from 2014 another program *Banglar Krishi* is also being telecasted by the BTV where AIS is rendering it's all out cooperation and technical assistance.

☐ **Bangladesh Betar**

AIS has been ensuring its active support and cooperation to the Bangladesh *Betar* for making and broadcasting different agricultural programs both for national and regional stations through "*Krishi Shomachar*" and "*Chashabad*" radio program. With this support nearly 14 hours per week programs are being broadcasted by national and regional stations of the Bangladesh *Betar*.

☐ **Community Radio**

Having the slogan 'My radio, my voice' a community rural radio 'Krishi Radio 98.8 FM' established by AIS at Amtoli under Borguna district has been broadcasting daily 8 hours different need based rural welfare and agro-based program for the people of 12 upazilas under Borguna and Patuakhali district.

☐ **Video materials (Cinema/ Pramanno Chitro)**

AIS prepares different agricultural technology-based video documentary, film, filler, drama, talk show etc. and broadcasts through the BTV and private satellite channels. Besides, these are also shown in rural areas through mobile cinema vans.

2.1.3 ICT and Innovation Activities

☐ **AICC**

AIS is the pioneer for disseminating agricultural information and technologies at the root level by using ICT through establishing 499 Agriculture Information and Communication Centers (AICC) across the country (AIS, 2018). Different ICT devices like laptop, smart phone, internet modem, multimedia instruments etc. were given to these farmers operated centers along with necessary trainings.

❑ **Krishi Call Center**

AIS established 'Krishi Call Center-16123' in 2014 for providing instant expert solution (crop, fishery and livestock) to the people. Anyone can take advice dialing 16123 from his/her mobile, paying only 25 paisa/minute.

❑ **Website**

AIS have developed large web portal (www.ais.gov.bd) containing huge agricultural information and it is regularly being updated. Besides, two mobile apps have been launched.

❑ **AisTube**

'AisTube' is a digital initiative to provide agricultural information to create awareness among farmers in a modern way. In order to provide effective, quality agricultural information services, this archive will present all the modern technologies related to agriculture in the form of documentaries, which will enable the farmers to know the required agricultural information easily.

❑ **Ki-osk**

Ten ICT laboratories in ten agricultural regions and 11 information Ki-osks have also been established (AIS, 2018). Ki-osk is a digital information desk where farmers can find any information about agriculture.

2.1.4 Other initiatives

❑ **Krishi Mela**

AIS organize different agricultural fair with the collaboration of DAE. Every year they organize Tree fair, vegetable fair and development fair where farmers can touch with latest agricultural information.

❑ **ICT laboratory**

Different training on mass media and ICT are being organized regularly by AIS for AICC members, extension personnel, media people and other related stakeholders in ICT laboratory. As a result, efficient media and ICT personnel are being developed and they are dedicatedly working for agricultural development.

❑ **Other programs**

AIS organize different rally, seminar, workshops, etc. on the occasion of national/international days and events.

2.2 Studies Related to Exposure of the Farmers to DCTs

DAE (1995) in order to achieve the objectives of the extension programmes consider the following methods and strategies:

- Media campaign including printed media, radio and television
- Upazila and district fair
- Traditional and folk media
- Group meeting
- Farmers training, motivational tour, farm walk, method demonstrations, field days, result demonstrations, individual farm visit etc. Printed media commonly used are bulletin, poster, leaflet circular letter, newspapers and magazines.

DAE (1995) further reported that the media cell has been established within the Department having responsibility for overseeing all media issues. The main tasks of the media cell are to:

- Coordinate the production and dissemination of technical bulletins
- Assist Radio Bangladesh and Bangladesh Television in the production of farm broadcast
- Create publication formatted for the DAE
- Assist districts and Upazilas with their extension publication

Hasan et al. (2016) carried out a research to determine the existing gap for getting agricultural knowledge from the most preferable sources and propose the improved service design so that personalize agricultural knowledge dissemination for the farmers in Bangladesh can be given support. It was found that the farmers of Bangladesh mostly rely on television for getting update on weather forecast. Bangladesh Television (BTV) is the most watched TV channel (83%) nationally. Television programs are preferable for getting information on cultivation technique since there are 92% view ship in rural areas and 69% view ship in urban areas.

A study was conducted by Alam and Haque (2014) to find out the contribution of various television channels on dissemination of agricultural information to the farmers for agricultural development in Bangladesh. It was revealed in their research that most of the respondents took moderate initiatives in order to use the agricultural technologies and techniques which they learnt by watching the agricultural programmes on television.

Kumari et al. (2014) conducted a research to determine the effectiveness of the radio as an educational media to transfer agricultural information to farmers in two districts of Bihar, India. It was found in the study that, level of knowledge of farmers for all questions before and after intervention had increased significantly.

Khobragade et al. (2014) acknowledged that Agro Advisory Services (AAS) presents normal, timely and safely pre-knowledge of distinctive climate and climate stipulations of exceptional plants. Agro Advisory Services (AAS) worthy to farmers for broaden interest, skills, adoption and impact of climate changes on agricultural practices.

Ango et al. (2013) conducted a research to examine the role of radio agricultural programmes on awareness creation among farmers in Zaria, Kaduna State, Nigeria. It was found in the study that the new practice disseminated through radio agricultural programmes were adopted by majority (97.8%) of the farmers while only (2.2%) of the farmers did not adopt the new agricultural information which they obtained from the radio. The new technologies disseminated through radio were adopted by the farmers because of availability and portability of radio and the format in which the radio agricultural programmes were aired. It was also observed in the study that 24.4% of the farmers strongly agreed that the radio agricultural programmes were effective in awareness creation. On the other hand only (1.1%) of the respondents remained undecided, disagreed and strongly disagreed in this concern. The finding of the study indicated that radio agricultural programmes were effective media to create awareness on improved agricultural programmes among farmers. It was also found that Radio agricultural programmes were very important to majorities (97.8%) of the farmers in their agricultural practices while only 2.2% of the respondents responded that the radio agricultural programs were not important in their agricultural practices. The findings indicate that the agricultural programmes broadcast by radio were enjoyed by majority of the farmers which assisted them to improve their level of productivity and income. Okwu et al. (2007) also observed similar finding.

Mtega and Msungu (2013) carried out a research in Tanzania where the researchers found that radio was the highest ranked communication media which were used by the farmers. The reason of using radio was wide coverage of radio waves and infrastructure throughout the study area. Use of television ranked third among all the communication media. Some television stations could be watched in the study area but very few people used to watch those channels since television is not portable, needs electricity and mostly one way in nature.

Chhachhar et al. (2012) carried out a study to assess the role of television channels on agricultural development on the farmers in Sindh, Pakistan. In the research it was found that majority (80.5%) of the respondents found television as moderately effective in increasing agricultural income while the television was perceived as very effective in increasing agricultural income by the smallest percentage (5.5%) of the respondents. However, 14% of the respondents opined that television was not effective at all in increasing agricultural income.

Rasak and Amusat (2012) carried out a study to assess the efficacy of radio programme on the trend of agricultural commodities among farmers in Nigeria. It was observed in the study that farmers benefited from accessing marketing information from the radio programme. The farmers benefited most from increased income and least from reduced market risk. The high score of the perceived benefits of the radio marketing information was due to general favourable disposition of farmers enhancing bargaining power, boosting of farmers' agricultural product sales and adequacy of the market information.

Lucky and Achebe (2012) remarks that in dissemination of agriculture extension information, the advent of technology and technological devices, the medium of information storage, retrieval and dissemination has prominently led to the utilization of computers and facilities of internet in accessing information other than the conventional method.

Hossain and Islam (2012) carried out a research in Bangladesh and observed that television was used as a source of information by more than 83% of the respondents and radio was used by only about 17% of the respondents to meet their information need. Most of the rural women who were the respondents of the study needed information on agriculture and animal husbandry from the information sources.

Kadiam et al. (2012) outlined e-extension entails the powerful use of ICT, national and global information networks, internet, knowledgeable programs, multimedia finding out methods and PC based coaching methods to fortify information access to farmers,

Orhan et al. (2011) in their exploration recommended that, notwithstanding expanding viability of open expansion, steps must be taken to build the adequacy of agriculturists' associations and the private area in the field of augmentation.

Nazari and Hassan (2011) conducted research to assess the role of television as an educational tool in enhancing farmers' knowledge in Kohgiluyeh va Buyer Ahmad province, Iran. The study was conducted in a randomized subject, pretest-posttest design among those farmers who

were working and residing in Kohgiluyeh va Buyer Ahmad province, Iran. The researchers found that the level of knowledge of farmers concerned with 10 questions before and after the intervention increased significantly ($P < 0.05$). It was found in the research that number of correct answers given by the farmers increased during post test. Chi-square test was conducted and it was observed that the level of knowledge of the farmers was improved significantly after watching the “Khoda Ghovat Keshavarz” program broadcast on television in Kohgiluyeh va Boyer Ahmed province. Al-Namlah (1998) also noticed similar finding.

Sife et al. (2010) stated that the brand-new ICT digital contraptions such as desktops, email, internet, multimedia, video conferencing, cell telephones etc. which have the competencies of providing large amount of central knowledge to rural populace in well-timed and complete and cost amazing method.

According to Chauhan (2010) among the various means of information communication, satellite-based communication through internet are very efficient, accurate, quick and cheaper in the field for spreading the information from research system to farmers.

Demiryurek (2008) points out that the dearth of expertise aid from the institutional sources resulted in the progress of personal understanding sources to exchange knowledge and diffuse technological know-how among the many farmers themselves.

Lawal (2008) opined that there shall be speedy exchange of agricultural information between the extension sellers and farmers if ICT components are integrated in supply of agricultural know-how to farmers in Nigeria.

Fawole (2008) conducted a study to find out the information sources and usage of pineapple farmers in Nigeria. It was observed that farmers’ major daily information sources were radio (71%) and television (46%).

Akpabio et al. (2007) reported that ICT makes it possible for those who work inside the agricultural development sector to play complimentary roles of retrieving and conveying key know-how to farmers, as a substitute than fitting replaced.

Prathap and Ponnusamy (2006) carried out a study to determine the relative effectiveness of four mass media channels (radio, television, newspaper, and Internet) on knowledge gain of rural women who belonged to self-help groups in three villages of Tamil Nadu, India. The selected technology was rabbit farming and parallel message on rabbit farming were transmitted through all the treatment mass media channels to assess the knowledge gain by the

rural women on rabbit farming. The researchers found that significant differences were observed in effectiveness of the four treatments in transmitting knowledge. In the study Duncan's Post Hoc Test was performed to identify which groups differ. It was found from Duncan's Post Hoc Test that the radio and Internet treatment groups were homogenous in nature; the Internet and newspaper treatment groups were also homogenous. Only the television treatment group differed from the other two. The finding thus implies that the respondents who were exposed to television differed significantly from the other three groups in gaining knowledge on rabbit farming. The group mean of 15.08 implies that the television was the most effective and superior treatment for gaining knowledge of the respondents followed by newspaper, Internet and radio.

Kalim (2005) reported that orientation of modernizing of extension should focus on the importance of extension in bringing positive behavioral change among farmers for sustainable rural and agricultural development.

Muhammad et al. (2004) conducted a research to assess the role of television in agricultural technology transfer in Faisalabad, Pakistan. The study revealed that the majority (84.80%) of respondents obtained only up to 25% agricultural information through television while a few respondents (12.80%) obtained 25-50% information through agricultural telecasts by television. Only a negligible number of respondents obtained more than 50% agricultural information through television.

According to Meera et al. (2004) ICT would assist extension workers to gather, store, retrieve and disseminate a extensive array of information required by small producers such as information on best practices, new technology, better prices of inputs and outputs, better storage facilities, improved transportation links, collective negotiations with buyers, information on weather.

Chauhan and Thakor (2004) reported that the initial response of the rural people, particularly farmers has been very encouraging; many organizations are trying to institute internet connectivity to make best use to satellite based communication technology.

Oyegbami and Fabusoro (2003) argued that use of television was hindered by some factors such as lack of electricity and terrestrial connections in rural Tanzania.

According to Roman and Colle (2003), expertise and conversation applied sciences (ICTs) are not quite in regards to the PC, the web and phone lines. They're about understanding and

conversation. This makes the issue of content an extraordinarily important precedence as we try to use new technologies for community development and alleviation of poverty.

Mazher (2003) in a study in Pakistan reported that Pamphlets, Magazines and newspapers were suitable for dissemination of sugarcane production technologies.

Ingale (2002) stated that in India and some South-East Asian nations such as Laos the national NGO sector, personal, public-exclusive and public personal-group partnerships are rising as main vendors of understanding through ICT enabled initiatives.

Perianayagam and Arokiasamy (2002) conducted a study in the northern states in India and reported that women's education and exposure to the mass media are two important developmental indicators that bear a highly significant positive correlation with contraception and a negative relationship with fertility through all regions.

Gosh (2001) stated that the application of Information and Communication Technologies (ICTs) to agriculture and rural development are rising everywhere.

Robert (2001) explained that the extension services with the expertise science (IT) outcomes, affect each and every part of agricultural sequences like relative competencies, compatibility, complexity, trialability and observability.

Egbule and Njoku (2001) in their study on mass media for adult education in Nigeria found that mass media have performed poorly in disseminating requisite agricultural information to farmers, although there is a positive correlation between mass media usage and farm yield.

Grudzinski and Panasiewicz (2000) opined that rapid progress in electronics, telecommunication, PC multimedia and web transmission and presentation of knowledge, one of kind varieties of understanding applied sciences and their software in planning, selling and production are useful to achieve the purpose.

2.3 Studies Related to the Relationship between the Selected Characteristics of the Farmers and their Exposure to Development Communication Tools

2.3.1 Age and Exposure to Development Communication Tools

Islam (2019) found a significant relationship between age of the farmers and their exposure to *Krishi* Call Centre.

Hossain et al. (2019) found a non-significant negative relationship between age of the poultry farmers and their exposure to communication media.

Ahmed and Hossain (2018) found a non-significant relationship between age of the rural women and their exposure to communication media for seeking information regarding homestead gardening.

Asaduzzaman et al. (2016) found a negative insignificant relationship between age of the farmers and effectiveness of mass media.

Rashid and Akanda (2015) found a non-significant relationship between age of the farmers and their access to information and communication media.

Bhuyian et al. (2013) found a negative significant relationship between age of the farmers and their communication exposure for poultry production.

Shaikh et al. (2010) found a negative significant relationship between age of the farmers and their exposure to TV broadcasted agricultural programme.

Roy (2006) in his study concluded that age of the farmers has a negative and non-significant effect on the effectiveness of mass media.

Islam (2005) in his study concluded that age of the farmers had a no significant relationship with their use of printed materials.

Nuruzzaman (2003) stated that age of the farmers had significant negative relationship with the use of mass media.

Anisuzzaman (2003) in his study conducted that age of the farmers had negative and significant relationship with the use of communication media.

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

Islam (1995) found that the age of the farmers had negative and significant relation with the use of communication media.

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

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

2.3.2 Level of Education and Exposure to Development Communication Tools

Islam (2019) found a non-significant relationship between the level of education of the farmers and their exposure to *Krishi* Call Centre.

Hossain et. Al. (2019) found a significant relationship between education of the poultry farmers and their exposure to communication media.

Ahmed and Hossain (2018) found a non-significant relationship between education of the rural women and their exposure to communication media for seeking information regarding homestead gardening.

Rashid and Akanda (2015) found a non-significant relationship between education of the farmers and their access to information and communication media.

Asaduzzaman et al. (2016) found a significant relationship between education of the farmers and effectiveness of mass media.

Bhuyian et al. (2013) found a negative significant relationship between education of the farmers and their communication exposure for poultry production.

Shaikh et al. (2010) found a significant relationship between education of the farmers and their exposure to TV broadcasted agricultural programme.

Roy (2006) in his study observed that education of the farmers has a highly significant and positive relationship with the effectiveness of mass media.

Islam (2005) in his study concluded that education of the respondents had significant positive relationship with their use of printed materials.

Nuruzzaman (2003) in his study observed that education of the farmers had significant positive relationship with their use of mass media.

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

Sarker (1995) in his study concluded that education of the farmers had positive and significant relationship with their use of communication media.

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

Kumari (1988) from the study on communication effectiveness of six media showed that there was significant positive relation between education of women and attitude towards the message.

2.3.3 Farm Size and Exposure to Development Communication Tools

Islam (2019) found a significant relationship between the farm size of the farmers and their exposure to *Krishi* Call Centre.

Hossain et al. (2019) found a positive significant relationship between farm size of the poultry Farmers and their exposure to communication media.

Ahmed and Hossain (2018) found a non-significant relationship between farm size of the rural Women and their exposure to communication media for seeking information regarding homestead gardening.

Rashid and Akanda (2015) found a significant relationship between farm size of the farmers and their access to information and communication media.

Asaduzzaman et al. (2016) found a insignificant relationship between farm size of the farmers and effectiveness of mass media.

Bhuyian et al. (2013) found a negative non-significant relationship between farm size of the farmers and their communication exposure for poultry production.

Shaikh et al. (2010) found a significant relationship between farm size of the farmers and their exposure to TV broadcasted agricultural programme.

Roy (2006) in his study concluded that farm size of the farmers has no significant relationship with the effectiveness of mass media.

Islam (2005) in his study concluded that farm size of the respondents had no significant relationship with their use of printed materials.

Nuruzzaman (2003) in his study conducted that farm size of the farmers had no significant relationship with the use of mass media.

Anisuzzaman (2003) found that the farm size of the respondents had no significant relationship with their use of communication media.

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

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

2.3.4 Family Size and Exposure to Development Communication Tools

Bhuiyan et al. (2013) found a negative non-significant relationship between family size of the farmers and their communication exposure for poultry production.

Shaikh et al. (2010) found a non-significant relationship between family size of the farmers and their exposure to TV broadcasted agricultural programme.

2.3.5 Farming Experience and Exposure to Development Communication Tools

Islam (2019) found a non-significant relationship between the farming experience of the farmers and their exposure to *Krishi* Call Centre.

Hossain et al. (2019) found a non-significant relationship between farming experience of the poultry farmers and their exposure to communication media.

Ahmed and Hossain (2018) found a non-significant relationship between farming experience of the rural women and their exposure to communication media for seeking information regarding homestead gardening.

Rashid and Akanda (2015) found a non-significant relationship between farming experience of the farmers and their access to information and communication media.

2.3.6 Annual Income and Exposure to Development Communication Tools

Islam (2019) found a significant relationship between the annual income of the farmers and their exposure to *Krishi* Call Centre.

Hossain et al. (2019) found a non-significant relationship between annual income of the poultry farmers and their exposure to communication media.

Ahmed and Hossain (2018) found a non-significant relationship between annual income of the men and their exposure to communication media for seeking information regarding homestead gardening.

Rashid and Akanda (2015) found a non-significant relationship between income of the farmers and their access to information and communication media.

Asaduzzaman et al. (2016) found an insignificant relationship between income of the farmers and effectiveness of mass media.

Shaikh et al. (2010) found a significant relationship between annual income of the farmers and their exposure to TV broadcasted agricultural programme.

Nuruzzaman (2003) reported that the annual income of the farmers had no significant relationship with their use of mass media.

Anisuzzaman (2003) related that the annual income of the respondents had no significant relationship with their use of communication media. Islam (2005) in his study concluded that annual income of the respondents had no significant relationship with their use of printed materials.

Uddin (1993) reported that there was strong and highly significant relation between income of the sugarcane growers and their reception of information.

Bhuiyan (1988) in his study observed that income of the farmers had no significant effect on the use of communication media.

2.3.7 Organizational Participation and Exposure to Development Communication Tools

Islam (2019) found a significant relationship between the organizational participation of the farmers and their exposure to *Krishi* Call Centre.

Hossain et al. (2019) found a non-significant relationship between organizational participation of the poultry farmers and their exposure to communication media.

Ahmed and Hossain (2018) found a significant relationship between organizational participation of the rural women and their exposure to communication media for seeking information regarding homestead gardening.

Asaduzzaman et al. (2016) found an insignificant relationship between organizational participation of the farmers and effectiveness of mass media.

Bhuyian et al. (2013) found a insignificant relationship between organizational participation of the farmers and their communication exposure for poultry production.

Shaikh et al. (2010) found a significant relationship between organizational participation of the farmers and their exposure to TV broadcasted agricultural programme.

Roy (2006) in his study concluded that organizational participation of the farmers has a positive and significant relationship with the effectiveness of mass media.

Islam (2005) in his study concluded that organizational participation of the respondents had positive significant relationship with their use of printed materials.

Nuruzzaman (2003) found that organizational participation of the farmers had positive and significant relationship with their use of mass media.

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

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

2.3.8 Training and Exposure to Development Communication Tools

Islam (2019) found a significant relationship between the training of the farmers and their exposure to *Krishi* Call Centre.

Hossain et al. (2019) found a non-significant relationship between training of the poultry farmers and their exposure to communication media.

Ahmed and Hossain (2018) found a non-significant relationship between training of the rural women and their exposure to communication media for seeking information regarding homestead gardening.

Shaikh et al. (2010) found a significant relationship between training of the farmers and their exposure to TV broadcasted agricultural programme.

2.3.9 Cosmopolitanism and Exposure to Development Communication Tools

Shaikh et al. (2010) found a significant relationship between cosmopolitanism of the farmers and their exposure to TV broadcasted agricultural programme.

Islam (2005) in his study concluded that cosmopolitanism of the respondents had positive significant relationship with their use of printed materials.

Bhuiyan (1988) in a study observed that the relationship between cosmopolitanism and the use of communication media was not significant.

Latif (1974) found that the relationship between cosmopolitanism and communication exposure was positively significant.

2.3.10 Innovativeness and Exposure to Development Communication Tools

Islam (2019) found a non-significant relationship between the innovativeness of the farmers and their exposure to *Krishi* Call Centre.

Asaduzzaman et al. (2016) found a significant relationship between extension media contact of the farmers and effectiveness of mass media.

Islam (2005) in his study concluded that innovativeness of the respondents had positive significant relationship with their use of printed materials.

Nuruzzaman (2003) found that innovativeness of the farmers had positive and significant relationship with their use of mass media.

Khan (1996) concluded that there was no significant relationship between innovativeness and use of information by resource poor farmers.

Islam (1995) found that innovativeness of the farmers had positive and highly significant relation with their use of communication media.

Uddin (1993) reported that there was a highly significant relationship between innovativeness of the sugarcane growers and their reception of information on planting method.

2.3.11 Knowledge on Agriculture and Exposure to Development Communication Tools

Islam (2019) found a significant relationship between the knowledge of the farmers and their exposure to *Krishi* Call Centre.

Hossain et al. (2019) found a non-significant relationship between knowledge of the poultry farmers and their exposure to communication media.

Ahmed and Hossain (2018) found a non-significant relationship between knowledge of the rural women and their exposure to communication media for seeking information regarding homestead gardening.

Shaikh et al. (2010) found a significant relationship between agricultural knowledge of the farmers and their exposure to TV broadcasted agricultural programme.

Kashem and Halim (1991) showed that the use of communication media in adoption of modern rice technologies had significant positive correlation with agricultural knowledge. a

Parveen (1995) found that mass media exposure of the respondents had a positive significant relation with their agricultural knowledge.

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

Sarker (1995) found a highly significant and positive relationship between agricultural knowledge of the farmers and their use of communication media.

Islam (1995) in his study observed that agricultural knowledge of the farmers had positive and highly significant relationship with their use of communication media.

Khan (1996) found that there was a highly significant and strongly positive relationship between agricultural knowledge of the farmers and their use of information sources.

Anisuzzaman (2003) found that the agricultural knowledge of the respondent had positive significant relationship with their use of communication media.

Nuruzzaman (2003) in his study observed that agricultural knowledge of the farmers had positive and significant relationship with their use of mass media.

Islam (2005) in his study concluded that knowledge on agriculture of the respondents had positive significant relationship with their use of printed materials.

Roy (2006) in his study observed that knowledge on agriculture of the farmers had a positive and significant relationship with the effectiveness of mass media.

2.4 Studies Related to the Problems Confronted in respect of the Exposure of Development Communication Tools in Agriculture

Derso et al. (2014) stated that high cost of infrastructure, less extension support, inaccessibility towards agricultural information and unavailability on time were the major constraints that faced majority of both users and nonusers of ICT while using ICTS in agricultural extension.

Sireesha et al. (2014) found the major constraints felt in using ICT tools were inadequate precisely competent personnel in using the ICTs, problems of maintenance of ICT tools, disruptions in Internet connectivity, inadequate budget allocation for ICT tools, lack of up gradation of ICT equipment and problem of viruses and junk mails.

Obidike (2011) conducted a study in Nsukka, Nigeria and it was found that some constraints were faced by the rural farmers of Nsukka in using radio and television in accessing agricultural information for better crop and livestock production. The constraints were poor radio and television signals (3.41 ± 0.069), non-availability of electricity/constant power interruptions in most Nsukka villages (3.41 ± 0.087), illiteracy (3.40 ± 0.086) and agricultural information not being broadcast on radio and television in native Nsukka dialect (3.30 ± 0.105).

Cecchini (2003) found that the availability of content in local languages and the use of graphic and voice interfaces can make e-governance application more accessible to poor people, illiteracy and low levels of education are powerful obstacles to the use of computers and other ICT tools.

2.5 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. "a dependent variable" and "an independent variable." A dependent variable is that factor which appears, disappears or varies as the researcher introduces, removes or varies the independent variables (Townsend, 1953). An independent variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationships to an observed phenomenon. A simple conceptual framework for the study is made on the basis of review of literature which is shown below:



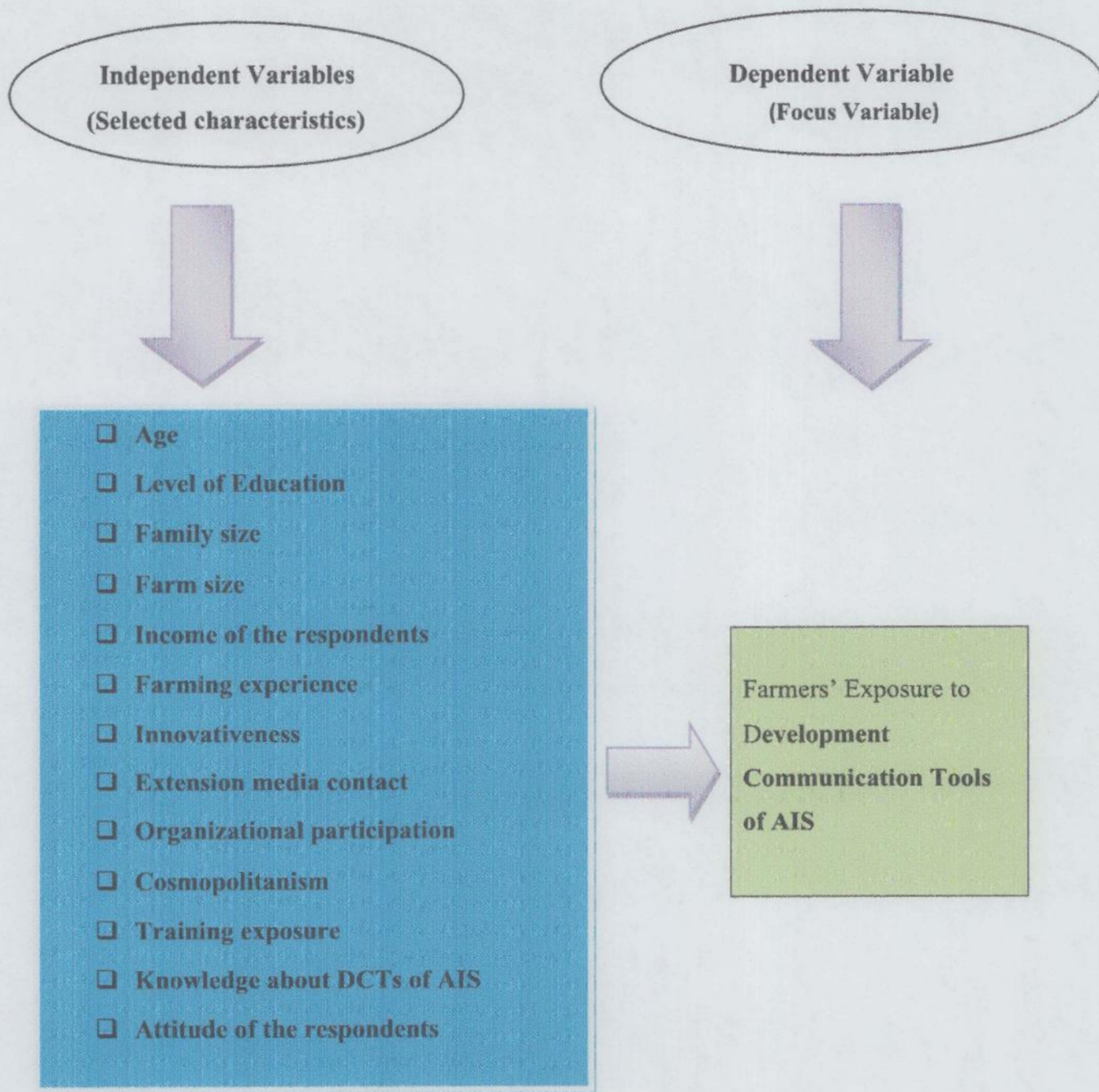


Figure 2.1 Conceptual Model showing relationship between Exposure of farmers and Independent Variables

CHAPTER III

METHODOLOGY

Methods and procedures used in conducting research need very careful consideration. Methodology should be such that enables the researcher to collect valid information and to analyze the same properly to arrive at correct decisions. The methods and procedures followed in conducting this research are being described below:

3.1 Locale of the Study

Dumuria upazila under Khulna district was selected as the study area. The study was conducted at 5 villages of Dumuria upazila under Khulna district. The study area consists of 240 villages. But only 5 villages were selected purposively. Villagers/farm families of these villages considered as sample of the study. The names of the villages are Khornia, Kholshi, Sajiara, Dumuria and Golna. The physical, social and cultural and heritage of this area were similar in many cases with other areas of the country. The study area is situated at 8 km away from Khulna District. The area of Dumuria upazila is 454.2 sq. km. As the census of 2011, the total population 279862; male 144334, female 135528. Villages are easily accessible by van, tempo, bicycle, motor cycle etc. Map of district Khulna showing Dumuria upazila presented in Figure 3.1 and map of Dumuria upazila showing the study area is presented in Figure 3.1 and 3.2.

3.2 Population and Sampling

An up-to-date list was prepared of all the farm families of the selected villages with the help of Upazila Agriculture Extension Officer (UAEO) of Dumuria. The farmers of the study area who were exposed to DCTs of AIS were treated as population of this study. Eighty farmers were selected from accidental sampling method which constituted the sample for the study. The distribution of the sample farmers from the selected villages are shown in Table 3.1.

Table 3.1 Distribution of Sample Population of the Farmers

Name of Union	Name of Villages	Sampled Respondents
Khornia	Khornia	20
Dumuria	Kholshi	20
Dumuria	Sajiara	12
Dumuria	Dumuria	15
Dumuria	Golna	13
Total		80

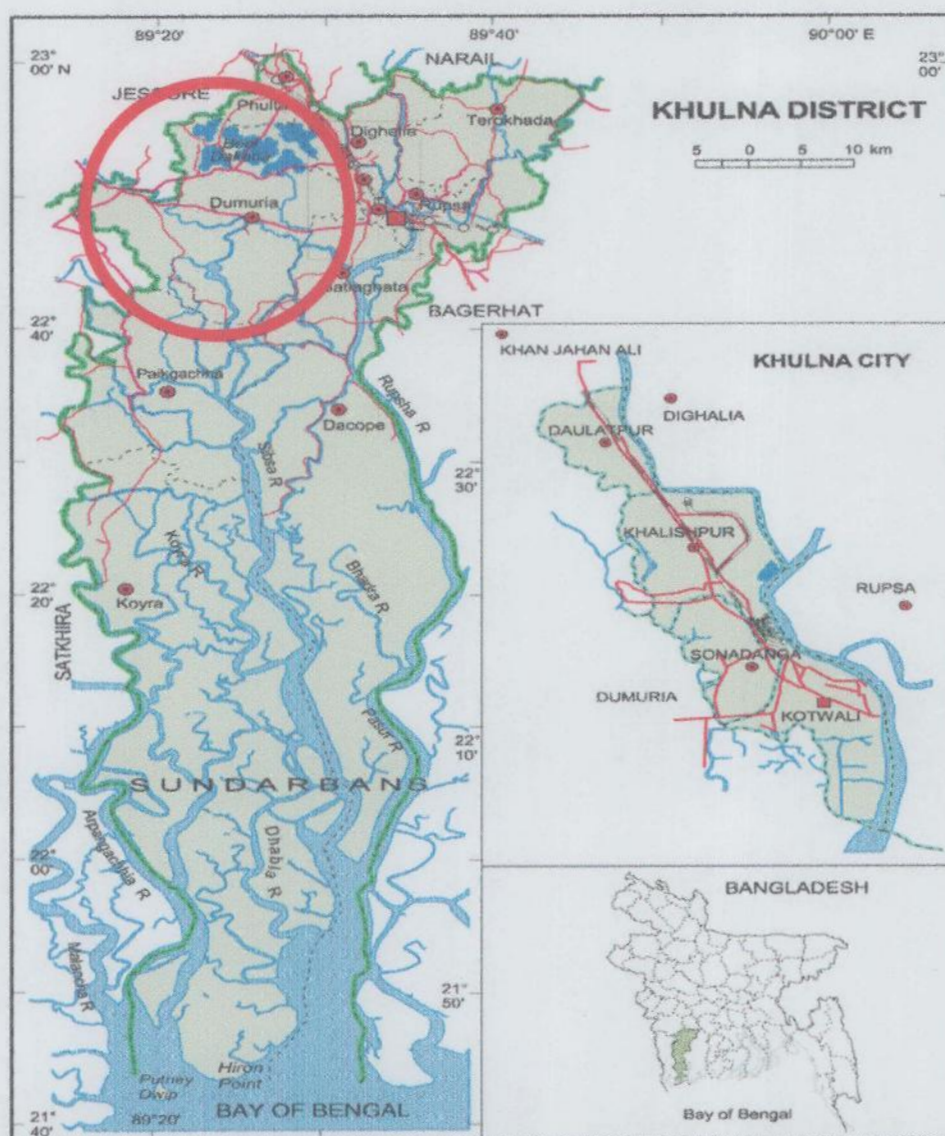


Figure 3.1 A Map of Khulna District

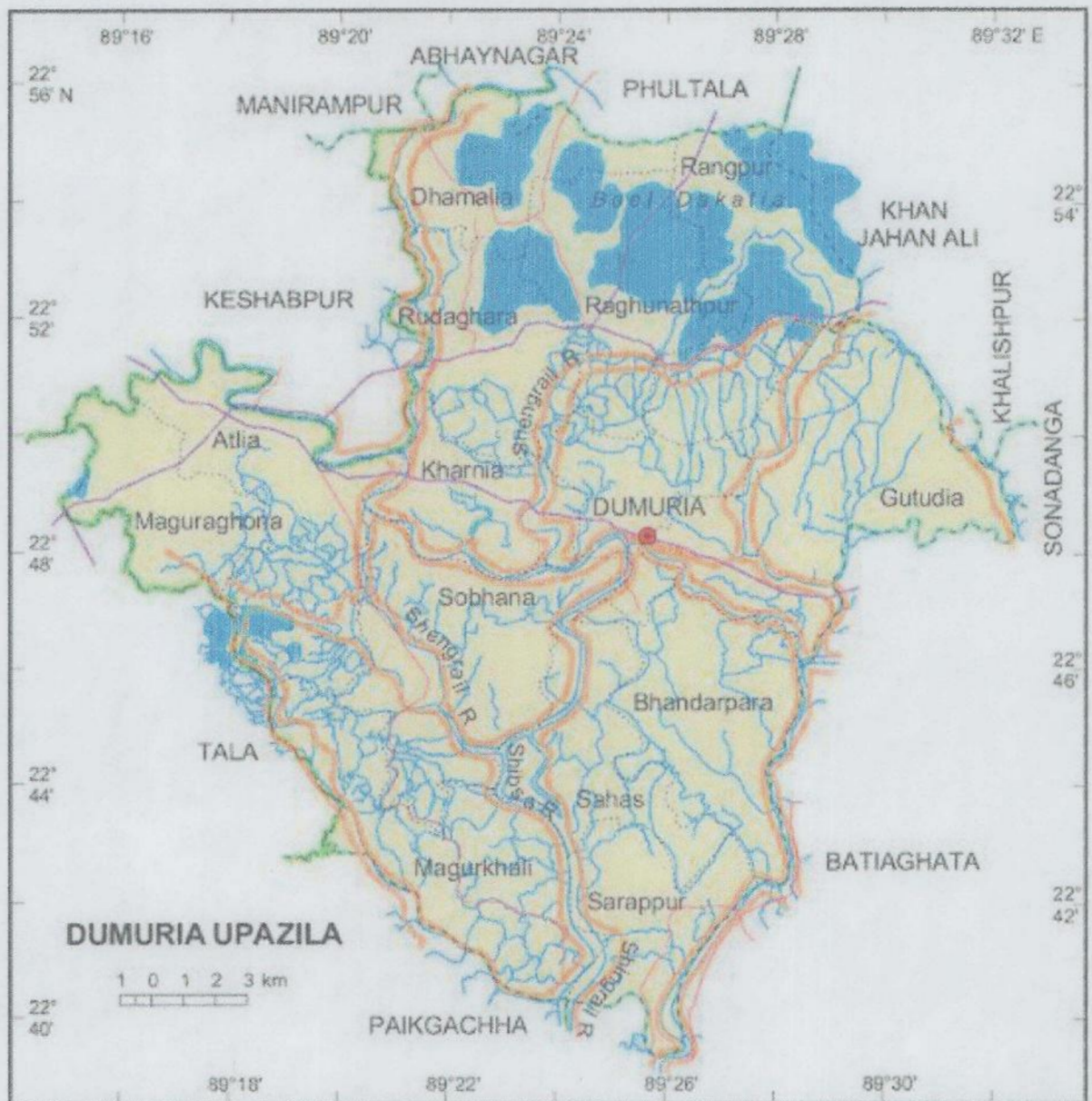


Figure 3.2 A Map of Dumuria Upazila

3.3 Selection and Measurement of Variables

3.3.1 Selection of variables

Farmers' exposure to DCTs of AIS was focus (dependent) variable of the study while the selected characteristics of the farmers considered as independent variable. The selected characteristics (independent variables) were age, level of education, family size, farm size, occupation, income of the respondents, farming experience, innovativeness, extension media contact, organizational participation, cosmopolitanism, training exposure, knowledge and attitude of respondents towards the exposure of DCTs of AIS.

3.3.2 Measurement of Focus (Dependent) Variable

3.3.2.1 Measurement of Farmers' Exposure to the DCTs of AIS

There are 14 DCTs of AIS incorporated in item no. 15 of the interview schedule (Appendix A) to measure the exposure of the farmers. To measure the exposure of DCTs a 5-point rating scales were used such as regularly, often, sometimes, rarely and not at all. A score 4, 3, 2, 1 and 0 were assigned against the rating scales respectively (Table 3.2). The exposure score of a respondent was calculated by all the score obtained by his/her against the selected 14 DCTs of AIS.

Table 3.2 Scale of exposure to the DCTs of AIS of the respondents

Scale	Score assigned
Regularly (4)	If the farmer contacts to DCTs when he faces any problem or need them and there any information
Often (3)	If the farmers contact often to DCTs
Occasionally (2)	If the farmers contact casually to DCTs
Rarely (1)	If the farmers contact very casually to DCTs
Not at all (0)	If the farmer does not expose to DCTs

The exposure score of a respondent could range from '0' to '56' where '0' indicates very low exposure and '56' indicates high exposure towards DCTs of AIS. Based on exposure score, the respondents were grouped into following categories as shown in Table 3.3.

Table 3.3 Categories of the respondents based on their Exposure to DCTs of AIS

Categories	Score
Very low exposure	1-14
Low exposure	15-28
Medium exposure	29-42
High exposure	>42

To compare the level of exposure of 14 DCTs of AIS exposure index (EI) was calculated by using the following formula:

$$(\%) \text{ EI} = \frac{\text{Obtained EI Scores}}{\text{Highest Possible EI Scores}} \times 100$$

$$\text{EI Score} = N_{re} \times 4 + N_{of} \times 3 + N_{oc} \times 2 + N_{ra} \times 1 + N_{na} \times 0$$

Where, EI= Exposure Index

N_{re} = No. of the respondents exposed to DCTs of AIS regularly

N_{of} = No. of the respondents exposed to DCTs of AIS often

N_{oc} = No. of the respondents exposed to DCTs of AIS occasionally

N_{ra} = No. of the respondents exposed to DCTs of AIS rarely

N_{na} = No. of the respondents not at all exposed to DCTs of AIS

As there were 80 respondents, so Exposure Index (EI) score could range from 0 to 320. Where '0' indicates no exposure and '320' indicates high/ regular exposure. Based on EI (%) DCTs of AIS were ranked to compare the level of exposure by the respondents.

3.3.3 Measurement of Independent Variables

In this study selected fourteen (14) personal, economic, social and psychological characteristics of the farmers were considered as independent variables. Procedure for measuring independent variables mentioned under section 3.3.3 has been discussed.

3.3.3.1 Age

Age of the farmers refers to the period of time from his/her birth to the time of interview. It was measured in terms of actual years on the basis of his/her response to question no. 1 of the interview schedule. Based on age, the respondents were classified into different categories as shown in Table 3.4.

Table 3.4 Categories of the respondents according to their age

Categories	Score (Years)
Young aged	≤ 35
Meddle aged	35-50
Old aged	> 50

3.3.3.2 Level of Education

The level of education of a respondent was measured by the number of years of schooling. A score of one (1) was assigned for each year of schooling completed. For example, if a respondent completed study of class five his education score was assigned as five (5). The educational status of an illiterate respondent was assigned a score zero (0) if a respondent could not read and write.

Besides, a score of one (1) was assigned for those who can sign their name only. Based on level of education score, the respondents were grouped into different categories as presented in Table 3.5.

Table 3.5 Categories of respondents according to their level of education

Categories	Score (Years of schooling)
Illiterate	0
Primary	1-5
Secondary	6-10
Higher secondary	11-12
Above Higher secondary	13-16

3.3.3.3 Family Size

The family size of a respondent was measured by the total number of his family members including the respondents, his/her spouse, children and other dependents who were eating and staying together. This variable has been shown in the question no. 3 of the interview schedule. Based on family size, the respondents were classified into different categories as shown in Table 3.6.

Table 3.6 Categories of respondents according to family size

Categories	No of family members
Small size family	1 - 4
Medium size family	5 -6
Large size family	>7

3.3.3.4 Farm Size

Farm size was measured as the size of the farm on which the farmers continued their farming operations during the period of study. It included the area of homestead, land cultivation under his or her family cultivation, land given to others on lease.

The area was measured in terms of hectare. The farm size of a respondent was measured by using the following formula:

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

Where,

- A. Homestead area
- B. Own land under own cultivation
- C. Own land under others cultivation
- D. Others land under own cultivation
- E. Leased in
- F. Pond/Ditches
- G. Others

Actual size of the farm was considered as the score of the farm size. For example, if a respondent having 0.05 ha of land, then his score was 0.05. The data were first recorded in

local unit and then converted to hectare (question no. 4 of the interview schedule). Based on farm size, the respondents were classified into five categories as shown in Table 3.7.

Table 3.7 Categories of respondents according to farm size

Categories	Score (ha)
Landless farmers	<0.02
Marginal farmers	0.02 -0.20
Small farmers	0.21- 1.0
Medium farmers	1.01-3.0
Large farmers	>3.00

3.3.3.5 Occupation

Occupation is operationally defined as the actual bread winning time spent in a particular profession and was reckoned as primary and all other occupations in which the respondent were engaged at the time of interview. The scoring procedure is represented in table 3.8.

Table 3.8 Occupation-wise distribution of farmers

Occupation	Score
Farming	1
Farming + Business	2
Farming + Service	3
Farming + Business + Service	4

3.3.3.6 Income of the Respondents

Annual income is operationally defined as the total income of the respondents from farming and other sources for a period of one year including the income of the family members. The response was obtained by asking the respondent about the income he/she received during the preceding year. Then the responses were categorized. The scoring procedure is represented in table 3.9.

Table 3.9 Annual income-wise distributions of farmers

Categories	Annual Income (BDT '000)
Low income	≤ 150
Medium income	151 -300
High income	>300

3.3.3.7 Farming Experience

Farming experience of a respondent was measured on the basis of years he/she involved in farming. For example, if a respondent involved in one year, his/her experience score is "1". Based on the farming experience scores, the respondents were grouped into following categories as shown in Table 3.10.

Table 3.10 Categories of the respondents based on farming experience

Categories	Score (Years of experience)
Low experience	1-15
Medium experience	16-30
High experience	>30

3.3.3.8 Innovativeness

Innovativeness is operationally defined as the degree to which the respondent is relatively earlier in adopting new ideas. The respondents were asked as to when they would like to adopt an improved practice in farming. The measurement of innovativeness was as follows:

Table 3.11 Categories of the respondents based on innovativeness (Rogers, 1971)

Categories	Score
Laggard (1)	$\geq (\bar{X} + 2Sd)$
Late majority (2)	$(\bar{X} + 1Sd) \text{ to } (\bar{X} + 2Sd)$
Early majority (3)	$(\bar{X} + 1Sd)$
Early adaptor (4)	$(\bar{X} - 2Sd) \text{ to } (\bar{X} - 1Sd)$
Innovators (5)	$\leq (\bar{X} - 2Sd)$

3.3.3.9 Extension Media Contact

It refers to the extent of exposure to different sources of agricultural information during the last year. The procedure followed by Ranuji (2006) in order to assess the extent of exposure of the respondents in extension activities with slight modification, the different activities were listed and they were asked to indicate their extent of exposure as regularly, sometimes, rarely and not at all. The scores assigned as 3, 2, 1 and 0 respectively. This entire exposure score against the 12-selected information sources ranged between 0-36 where "0" indicates that no exposure and 36 indicate high exposure. The respondents were classified in to three groups (low, medium, high) based on extent of exposure in the particular extension activity by considering frequency and percentage. Based on extension media contact score of the respondents were classified into different categories as shown in Table 3.12.

Table 3.12 Categories of respondents according to their extension media contact

Categories	Score
Low extension media contacts	1-12
Medium extension media contacts	13-24
High extension media contacts	>24

3.3.3.10 Organizational participation

Organizational participation of respondents was measured on the basis of the number of organizations involved and according to their nature of participation. For example, if a respondent involved in a organization his/her organizational participation score is accordingly as general member (1), executive member (2), executive officer (3) and no involvement (0)with duration.

The organizational participation score was calculated by adding all the scores against all the organizations he/she participated and his/her nature of participation. Based on organizational participation scores, the respondents were grouped into following categories as shown in Table 3.13.

This variable has been shown in the question no. 11 of the interview schedule. Based on training score the respondents were classified into following categories as shown in Table 3.15.

Table 3.15 Categories of respondents according to their training exposure

Categories	Score
No training	0
Low training	1
Medium training	2-3
High training	≥ 4

3.3.3.13 The Knowledge level of the respondents about the DCTs of AIS

The knowledge of the respondents about DCTs of AIS was measured by asking 20 selected questions and a score of 2 was assigned to each of the questions. Full marks were given to appropriate answer and partial score was given for partially correct answer whereas 0 score was given to wrong or no answer.

Knowledge score could range from 0 to 40 where 0 indicated no knowledge while 40 indicated high knowledge (question no. 13 of the interview schedule). Based on Knowledge score, the respondents were grouped into following categories as shown in Table 3.13.

Table 3.16 Categories of the respondents based on knowledge about DCTs of AIS

Categories	Scores
Low	1-10
Medium	11-20
High	21-30
Very High	>30

3.3.3.14 Attitude of the respondents towards the DCTs of AIS

A number of 26 statements were included in item no. 14 of the interview schedule (Appendix A) to measure the attitude of the respondents towards DCTs of AIS. A five-point Likert type scale such as very highly favorable attitude (5), highly favorable attitude (4), moderately favorable attitude (3), unfavorable attitude (2) and high unfavorable attitude (1) was employed against the 26 statements.

Each of the respondents was asked to indicate their opinion against the 26 statements. The attitude sum of a respondent was calculated by adding all the scores obtained by his/ her against 26 statements. The attitude sum was ranged from 26-130 where '26' indicate high unfavorable attitude and '130' indicate very highly favorable attitude. The respondents were classified into following categories according to their attitude as shown in table 3.17.

Table 3.17 Categories of respondents according to Attitude towards the DCTs of AIS

Categories	Scores
High Unfavorable attitude	1-26
Unfavorable attitude	27-52
Moderate favorable attitude	53-78
Highly favorable attitude	79-104
Very highly favorable attitude	>104

3.3.4 Identification and Measurement of problems to the DCTs of AIS

A number of 7 problems were incorporated under item no. 16 of interview schedule (Appendix A). Each of the farmers was deliberately asked to identify the listed problems with severe, moderately severe, less severe and not all rating scale. A score of 3, 2, 1 and 0 was assigned against each of the scale (Table 3.18).

Table 3.18 Identification of extent of problems in exposure to the DCTs of AIS

Scale	Score assigned
Severe	3 (If the problem of the farmer is severe to the DCTs)
Moderately severe	2 (If the problem of the farmer is moderately severe to the DCTs)
Less severe	1 (If the problem of the farmer is less severe to the DCTs)
Not at all	0 (If the problem of the farmer is not at all to the DCTs)

Problems confronted score of a respondent was determined by summing up all the scores obtained by the respondent against the 7 problems in exposure to DCTs of AIS. The problems confronted score of a respondent could range from '0' to '21' where '0' indicate not at all and '21' indicate severe problems. Based on exposure score, the respondents were grouped into following categories as shown in Table 3.19.

Table 3.19 Categories of the respondents based on Extent of problems to Exposure of DCTs of AIS

Categories	Score
Low	1-7
Medium	8-14
High	>14

To compare the level of extent of problems in exposure of 14 DCTs of AIS Problem Confronted Index (PCI) was calculated by using the following formula:

$$(\%) \text{ PCI} = \frac{\text{Obtained PCI Scores}}{\text{Highest Possible PCI Scores}} \times 100$$

$$\text{PCI Score} = N_s \times 3 + N_{ms} \times 2 + N_{ls} \times 1 + N_{na} \times 0$$

Where, PCI= Problems Confronted Index

N_s = No. of the respondents facing severe problem to DCTs of AIS severe

N_{ms} = No. of the respondents facing moderately severe problem to DCTs of AIS

N_{ls} = No. of the respondents facing less severe problem to DCTs of AIS

N_{na} = No. of the respondents facing no problem to DCTs of AIS is

As there were 80 respondents, so Problems Confronted Index (PCI) could range 0 to 240. Where '0' indicate not at all and '240' indicate too severe. Based on (%) PCI 7 problems to DCTs of AIS were ranked to compare the level of extent by the respondents.

3.4 Instrument for Data Collection

In order to collect relevant information from the respondents, an interview schedule was used. The schedule was carefully designed to keep the objectives of the study in view. The schedule contained both open and closed questions. Most easy, simple direct questions and different scales were used to obtain the information. Direct questions were also used to obtain information like age, level of education, farm size, and family income, training and organizational participation etc. Different scales were developed and used to measure selected characteristics of the farmers and their exposure to DCTs of AIS. Both closed and open form of question included in interview schedule (Appendix-A). Before finalization of interview schedule, it was pretested. Necessary correlations and modification were made based on pretest results. An English version of the interview schedule is enclosed.

3.5 Collection of Data

Data were collected personally by the researcher himself through face-to-face interview. To familiarize with the study area and for getting local support, the researcher took help from the local leaders and one of his senior brother. The researcher made all possible efforts to explain the purpose of the study to the farmers. Rapport was established with the farmers prior to interview and the objectives were clearly explained by using local language as far as possible. Data were collected during the period of 13th to 25th January, 2022.

3.6 Compilation of Data

After completion of field survey all the data of the interview schedule were compiled. Local units were converted into standard unit. Appropriate coding and scoring technique were followed to convert the qualitative data into quantitative forms. The responses of the individual respondent contained in the interview schedules were transferred to a master sheet for entering the data in the computer. As soon as the data entered into the computer, it was then analyzed in accordance with the objectives of the study.

3.7 Statistical Analysis

Statistical measure such as number, percentage, range, rank order, mean and standard deviation were used in describing the independent and dependent variables of the study. For clarity of understanding tables were used to present the data. For exploring the relationships between the selected characteristics of the respondents and their exposure to DCTs of AIS Spearman's Ranked Correlation Coefficient (ρ) and regression were computed. Data were analyzed by using software named SPSS version 25.

CHAPTER IV

RESULTS AND DISCUSSION

Data were collected from the respondents (farmers) and were carefully accomplished, coded, computed, tabulated and analyzed in accordance with the objectives of the study. After completion of those processes, this chapter was written carefully. The findings of the study and logical interpretations of the results have been presented in this chapter. This chapter is divided into four sections.

- The first section deals with the focus variable of the study.
- The independent variables (selected characteristics of the farmers) have been discussed in second section.
- In the third section, the relationships between the selected characteristics of the farmers and their exposure to DCTs tools of AIS.
- Lastly, the problems faced by the farmers in exposure to DCTs of AIS have been discussed.

4.1 Farmers' exposure to Development Communication Tools of AIS

4.1.1 Identification of Development Communication Tools Exposure by the Farmers

The respondents (farmers) of the study exposed to 13 DCTs to different extent out of 14 DCTs AIS (Figure 4.1). Variation in exposure of the farmers' to DCTs of AIS was observed (Figure 4.1). However, the farmers were highly exposed to poster/sticker (65.93%) while they were less exposed to ICT laboratory (0.94%). Other the development communication tools as exposed by the farmers were folder/leaflet/flipchart (64.69%), television program (54.06%), agricultural fair (50.93%) and AisTube (1.87%).

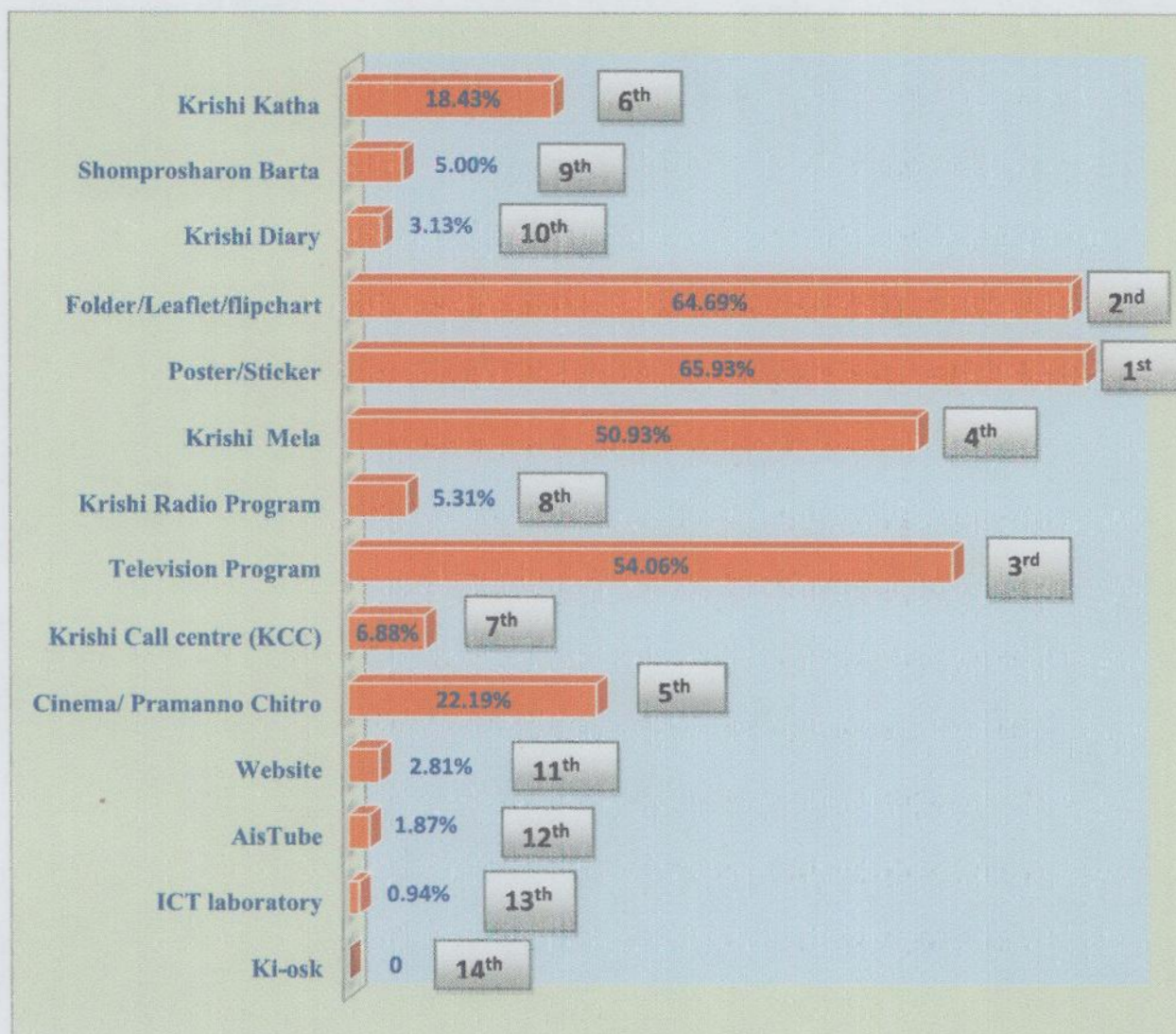


Figure 4.1 Graphical Representation of Development Communication Tools Index of AIS

It is implied that most of the agricultural information reached to the farmers by poster/sticker and folder/leaflet/flipchart. Because it can easily attract farmers about latest news of the farming without any cost incurred by the farmers whereas other DCTs require a minimum cost at least. Due to the technological advancement all over the country television takes the position of radio. So, radio programs are not doing well in dissemination of agricultural news. On the other hand, television program “*Banglar Krishi*” and “*Mati-O-Manush*” are also popular program among the farmers for getting new agricultural information. Majority of the farmers participate in the agricultural fairs organized by DAE with the collaboration of AIS which are held every year at upazila level. Most of the farmers in this area are not highly educated and belonged to low-income group. So, they are not well exposed to the *Krishi Katha*,

Shomprosharon Barta and *Krishi Diary*. Farmers are not well trained to use internet. So they cannot use website and AisTube to get agricultural information at the time of their need. Educated and trained farmers are well exposed to the *Krishi* Call Centre. According to their need they can get any help from *Krishi* Call Centre at any time. There are 11 ICT laboratory by AIS in this country. Farmers need to come to the city to use ICT lab for training which hindered them to exposed in ICT laboratory more frequently. The researcher also found that farmers have much interest on agriculture related cinemas which is showed by AIS.

4.1.2 Farmers Extent of Exposure to DCTs of AIS

The exposure scores of the respondents ranged from 2-24 with a mean of 12.17 and standard deviation of 4.68. The distribution of farmers according to their extent of exposure towards DCTs of AIS is shown in Table 4.1.

Table 4.1 Distribution of respondents according to their exposure to DCTs of AIS

Categories	Scores	Respondents(N=80)		Range		Mean	SD
		Number	Percentage	Min	Max		
Very low exposure	1-14	58	72.5				
Low exposure	15-28	22	27.5				
Medium exposure	29-42	0	0	2	24	12.17	4.68
High exposure	>42	0	0				
Total		80	100				

Data presented in Table 4.1 show that about three-fourth (72.5%) of the respondents expressed very low exposure whereas other one-fourth (27.5%) of the respondents showed low exposure towards DCTs of AIS.

4.2 Selected Characteristics of the Respondents

Fourteen characteristics of the farmer were selected to find out their relationship with the exposure to DCTs of AIS. The selected characteristics included age, level of education, family size, farm size, occupation, income of the respondents, farming experience, innovativeness, extension media contact, organizational participation, training, cosmopolitanism, knowledge, attitude of the respondents, exposure to DCTs tools of AIS and problems confronted in exposure. These characteristics of the farmers were described in this section.

4.2.1 Age

The age of the respondents ranged from 25 to 73 years, with a mean of 41.93 years and the standard deviation of 10.48. The distribution of the respondents according to their age categories is shown in Table 4.2.

Table 4.2 Distribution of respondents according to their age

Categories	Scores (Years)	Respondents(N=80)		Range		Mean	SD
		Number	Percentage	Min	Max		
Young	≤35	25	31.2				
Middle aged	36-50	39	48.8	25	73	41.93	10.48
Old aged	>50	16	20.0				
Total		80	100				

Data presented in Table 4.2 indicate that about half (48.8%) of the respondents fall in the middle-aged category compared to young aged (31.3%) and old aged (20%). It was also found that middle aged respondents are more interested in exposure to DCTs tools of AIS. It was seen that young and middle-aged farmers are generally receptive to new ideas and things. They have a favorable attitude towards trying of new ideas and they maintain better communication with various information sources available in rural areas. They are usually influential partner in making decisions regarding farming affairs.

Islam (2019) and Shaikh et al. (2010) also found the similar result but Uddin (2007) found that the percentage of young farmers was more than the middle and old aged farmers.

4.2.2 Level of Education

The level of education score of the farmer ranged from 0-16, with a mean of 8.11 and standard deviation of 3.64. The distribution of the farmers according to their level of education categories is shown in Table 4.3.

Table 4.3 Distribution of farmers according to their education

Categories	Score (Years of schooling)	Respondents (N=80)		Range		Mean	SD
		Number	Percentage	Min	Max		
Illiterate	0	2	2.5				
Primary	1-5	20	25				
Secondary	6-10	44	55	0	16	8.11	3.64
Higher Secondary	11-12	9	11.25				
Above Higher Secondary	≥13	5	6.25				
Total		80	100				

Majority (55%) of the respondents belonged to the secondary level of education category while 25%, 11.3%, 6.3% and 2.5% of the farmers belonged to primary level, higher secondary level, above secondary level and illiterate categories respectively (Table 4.3).

Farmers need to have some education in order to use the various DCTs of AIS properly and ultimately fall good effect. The findings also indicate that most of (80%) the respondents belonged to primary level to secondary level of education.

Islam (2019), Shaikh et al. (2010), Uddin (2007) and Hoque (2007) also found the similar result in their respective study.

4.2.3 Family Size

Family size is ranged from 3-7, with a mean of 3.00 and standard deviation of 1.06. The distribution of the respondents according to their family size is shown in Table 4.4.

Table 4.4 Distribution of rural women according to their family size

Categories	Scores	Respondents(N=80)		Range		Mean	SD
		Number	Percentage	Min	Max		
Small size family	1-4	46	57.5				
Medium size family	5-6	32	40	3	7	3.00	1.06
Large size family	≥ 7	2	2.5				
Total		80	100				

Data Table 4.4 demonstrate that majority (57.5%) of the respondents belonged to the small sized family whereas 40 % and 2.5 % of the respondents belonged to medium and large sized family respectively.

Average three members are including per family of the study area which is lower than that of national average (4.2; BBS 2021). It means that the farmers of the study area are aware about family size and over population problems. The findings also reveal that a large proportion of (97.5%) the respondents belonged small to medium sized family involved in farming activities. These findings are dissimilar with Islam (2019) and Shaikh et al. (2010) where Islam (2019) found 67.8 % of respondents and Shaikh et al. (2010) found 44.4 % of respondents were from medium sized family.

4.2.4 Farm Size

The observed farm size scores of the farmers (respondents) varied from 0.01 hectare to 3.12 hectares. The average farm size was 0.621 hectares and the standard deviation was .45. The distribution of the farmers (respondents) according to their farm size categories is shown in Table 4.5.

Table 4.5 Distribution of Respondents According to Farm Size

Categories	Score (ha)	Respondents (N=80)		Range		Mean	SD
		Number	Percentage	Min	Max		
Landless	<0.02	1	1.3				
Marginal	0.02-0.20	10	12.5				
Small	0.21-1.00	62	77.5	0.01	3.12	0.621	0.45
Medium	1.01-3.00	6	7.5				
Large	>3.00	1	1.3				
Total		80	100				

The findings (Table 4.5) reveal that above three-fourth (77.5%) of the farmers possessed small farm while 12.5% and 7.5% having marginal and medium farm respectively and similar percent (1.3) of them holding large farm and were landless. Most (90 %) of the farmers belong small and marginal sized farm. This type of distribution is helpful to access different sources for disseminating agricultural information according to farmers need and which kept good impact of using DCTs of AIS. Though the result is similar with Islam (2019) and Shaikh et al. (2010), it is dissimilar with Hoque (2007) who found that 36 % of his respondents (farmers) were holding medium sized farm.

4.2.5 Occupation

On the basis of their occupation, the farmers were classified into four categories. Farmers (respondents) occupied in farming, business and in service. The distribution of the farmers (respondents) according to their occupation categories is shown in Table 4.6.

Table 4.6 Distribution of farmers according to their Occupation Category

Occupation	Frequency	Percent
Farming	62	77.5
Farming+Business	14	17.5
Farming +Service	4	5
Farming+Business+Service	0	0
Total	80	100.0

The results on occupation presented in Table 4.6 indicate that 77.5% of the respondents who were exclusively involved in farming and 17.5% of them earn from farming and business. Only 5 percent of the respondents were involved in farming as well as services.

The findings are dissimilar with Islam (2019) where he found 66.1 percent of his respondents (farmers) were involved in farming and business both.

4.2.6 Annual Income

Annual income of the respondents (farmers) ranged from 50000 BDT to 350000 BDT with a mean of 157930 BDT and standard deviation 66195. The distribution of the respondents according to their annual income categories is shown in Table 4.7.

Table 4.7 Distribution of farmers according to their annual income

Categories	Scores (‘000 BDT)	Respondents (N=80)		Range		Mean	SD
		Number	Percentage	Min	Max		
Low income	≤150	40	50				
Medium income	151-300	38	47.5	50	350	157.93	66.195
High income	>300	2	2.5				
Total		80	100				

Data contained in Table 4.7 indicate that the half of the respondents (50%) belonged to low-income group whereas 47.5% belonged to medium income and 2.5% respondents were in high income category. Since, the greater proportion (97.5%) of farmers belonged to the low income to medium income group, it is logical to assume that they might have not or low/less access to modern DCTs such as TV, radio, mobile etc. This is so because income is obviously associated with purchasing these types of modern instruments.

Islam (2019), Shaikh et al. (2010), Uddin (2007) and Hoque (2007) also found the similar result in their respective study.

4.2.7 Farming Experience

The score related to farming experience of the respondents (farmers) ranged from 5.00- 50 years with a mean of 25.21 years and standard deviation of 10.43. The distribution of the respondents according to their farming experience categories is shown in Table 4.8.

Table 4.8 Distribution of the farmers according to their farming experience score

Categories	Scores	Respondents (N=80)		Range		Mean	SD
		Number	Percentage	Min	Max		
Low	1-15	21	26.3				
Medium	16-30	40	50.0	5	50	25.21	10.43
High	>30	19	23.8				
Total		80	100				

Data of Table 4.8 demonstrate that half (50.0%) of the respondents were highly experienced whereas 26.3% and 23.8% respondents were medium and low experienced respectively.

Agriculture is a complex business. Therefore, one needs multi-information to take correct decision. The farming experience of an individual helps him to learn new technologies and may lead him to take correct decisions. The findings show harmony with Islam (2019) and Uddin (2007).

4.2.8 Innovativeness

The score range for innovativeness was 1-5. The distribution of the respondents according to their farming experience categories is shown in Table 4.9.

Table 4.9 Distribution of respondents according to their innovativeness

Innovativeness	Score	Frequency	Percent
Laggard	1	2	2.5
Late majority	2	12	15
Early majority	3	29	36.3
Early adaptor	4	30	37.5
Innovators	5	7	8.8
Total		80	100.0

The results presented in Table 4.9 depict that 37.5% and 36.3% of the respondents belonged to early adopter and early majority categories respectively while 8.8% were innovators, 1% were in late majority category and 2.5% of the farmers were laggard.

The farmers of the study area are more innovators than that of Rogers (1983). He stated that 2.5% were innovators whereas laggard in this study is observed as 2.5% which is opposite of his statement.

The laggard farmers opined that they received agricultural information from their peer groups, while the others used interpersonal, group and mass media sources of information for getting agricultural information. These two results would help the extension planners to chalk out future extension program for transfer of new ideas to the potential farmers.

The result is dissimilar with Islam (2019) where his study revealed that 44.9 percent of his respondents belonged to early majority category.

4.2.9 Extension Media Contact

The observed extension media contacts scores of the respondents ranged from 3-29 having an average of 16.68 with a standard deviation of 4.91. The distribution of respondents (farmers) according to their extension media contact categories is shown in Table 4.10.

Table 4.10 Distribution of farmers according to their extension media contacts

Categories	Scores	Respondents (N=80)		Range		Mean	SD
		Number	Percentage	Min	Max		
Low	1-12	15	18.7				
Medium	13-24	62	77.5	3	29	16.68	4.91
High	>24	3	3.8				
Total		80	100				

Table 4.10 shows that majority (77.5%) of the farmers belonged to medium extension contact compared to 18.8% and 3.8% of the respondents maintained low and high extension contact respectively. Thus, it can be concluded that most (81.3%) of the respondents were getting help from the extension workers or they were aware of the services provided by different extension agencies. Islam (2019) and Shaikh et al. (2010) also found the similar result in farmers' extension media contact on their respective study.

4.2.10 Organizational participation

The observed organizational participation score of the farmers ranged from 0 to 5 with a mean of .65 and standard deviation of 1.10. The distribution of the respondents according to organizational participation categories is presented in Table 4.11.

Table 4.11 Distribution of the farmers according to their organizational participation

Categories	Scores	Respondents(N=80)		Range		Mean	SD
		Number	Percentage	Min	Max		
No	0	51	63.7				
Low	1	16	20				
Medium	2	8	10	0	5.00	.65	1.10
High	>2	5	6.3				
Total		80	100				

Data contained in Table 4.11 reveal that more than three-fifth (63.7%) of the respondents were belonged to no organizational participation and on the other hand, 20%, 10% and 6.3% of the respondents belonged to low, medium and high organizational participation categories respectively. It also reveals that majority (77.5%) of the respondents were confined in their farming activities (Table 4.6). Being busy with their farming activities it obviously that they do not have enough time to participate in different organization. Organizational participation is very much important for self-actualization as well as technological information generation. The result obtained from the current study is similar with Hoque (2007) but dissimilar with Islam (2019) and Uddin (2007). Where Islam (2019) found that 94.9 percent of his respondents were belonged to low participation category and Uddin (2007) found that 50 percent of his respondents were belonged to medium participation category.

4.2.11 Cosmopolitanism

The cosmopolitanism of the respondents ranged from 8-21 with an average of 14.68 and a standard deviation of 3.02. The distribution of farmers (respondents) according to their cosmopolitanism categories is shown in Table 4.12.

Table 4.12 Distribution of farmers according to their cosmopolitanism

Categories	Scores	Respondents (N=80)		Range		Mean	SD
		Number	Percentage	Min	Max		
Low	1-11	15	18.8				
Medium	12-17	51	63.7	8	21	14.12	3.02
High	>17	14	17.5				
Total		80	100				

Data Table 4.12 demonstrate that majority (63.7%) of the respondents showed medium cosmopolitanism whereas 18.8% and 17.5% respondents hold low and high cosmopolitanism respectively. The result shows similarity with Shaikh et al. (2010) but dissimilarity with Hoque (2007) and Uddin (2007) in their respective study. Where Hoque (2007) found 64 percent of his respondents and Uddin (2007) found 46 percent of his respondents were belonged to low cosmopolitanism category.

4.2.12 Training Exposure

The observed training exposure score of the farmers ranged from 0 to 4 with mean of 1.2 and standard deviation of 1.06. The distribution of the respondents according to organizational participation categories is presented in Table 4.13.

Table 4.13 Distribution of respondents according to Training Exposure

Categories	Scores	Respondents (N=80)		Range		Mean	SD
		Number	Percentage	Min	Max		
No	0	25	31.3				
Low	1	25	31.3				
Medium	2-3	28	35	0	4	1.2	1.06
High	≥ 4	2	2.5				
Total		80	100				

Data contained in Table 4.13 indicate that 35% of the respondents showed medium training exposure whereas similar percent (31.3) respondents belonged to the no training and low training exposure. On the other hand, 2.5% of them expressed high training exposure.

The present findings are dissimilar with Islam (2019) and Shaikh et al. (2010) where Islam (2019) found 69.5 percent of respondents and Shaikh et al. (2010) found 40.74 percent of respondents were belonged to low training category.

4.2.13 Knowledge about Different DCTs tools of AIS

Knowledge of the respondents ranged from 4 to 24 with a mean of 12.55 and standard deviation of 4.96. The distribution of farmers (respondents) according to their knowledge categories is shown in Table 4.14.

Table 4.14 Distribution of farmers according to Knowledge about DCTs of AIS

Categories	Scores	Respondents (N=80)		Range		Mean	SD
		Number	Percentage	Min	Max		
Low	1-10	30	37.5				
Medium	11-20	45	56.3	4	24	12.55	4.96
High	21-30	5	6.3				
Very High	> 30	0	0				
Total		80	100				

Data of Table 4.14 show that majority (56.3%) of the respondents showed medium knowledge about DCTs of AIS and 37.5% low knowledge whereas 6.3% expressed high knowledge about DCTs of AIS. Knowledge influences the farmers to adopt any improved technology.

As all the time they spent their time to perform different activities of agriculture so they have some knowledge about different DCTs tools of AIS. But most of these are not adopted by the farmers. So, they are deprived of gaining higher knowledge.

4.2.14 Attitude of respondents towards the use of DCTs of AIS

The attitude score of the respondents ranged from 54 to 100 with a mean of 77.35 and standard deviation of 7.349. The distribution of farmers (respondents) according to their attitude is shown in Table 4.15.

Table 4.15 Distribution of farmers according to their Attitude towards the exposure of DCTs of AIS

Categories	Scores	Respondents (N=80)		Range		Mean	SD
		Number	Percentage	Min	Max		
High Unfavorable Attitude	1-26	0	0				
Unfavorable Attitude	27-52	0	0				
Moderate Favorable Attitude	53-78	0	0				
Highly Favorable Attitude	79-104	68	85	80	120	96.56	8.34
Very Highly Favorable Attitude	>104	12	15				
Total		80	100				

The data (Table 4.15) emphasize that most (85%) of the respondents showed highly favorable attitude towards DCTs of AIS compared to very highly favorable attitude (15%) towards DCTs of AIS.

4.3 Relationship between the characteristics of the respondents and their Exposure to DCTs of AIS

Coefficient of correlation was computed by the Spearman's Ranked Correlation Coefficient (ρ) in order to explore the relationship between the selected characteristics of the respondents and their exposure to fourteen DCTs of AIS. The selected characteristics of the farmers constituted independent variables and exposure to DCTs of AIS constituted the dependent variable of the study. In this section relationships between thirteen selected characteristics (independent variables) of the respondents and farmers' exposure (dependent variables) to DCTs of AIS have been described.

Spearman's Ranked Correlation Coefficient (ρ) has been used to test the hypothesis concerning the relationship between two variables. Five percent and one percent level of significance were used as the basis for rejection and acceptance of a hypothesis. The tabulated value of " ρ " was calculated at $(80-2) = 78$ degrees of freedom. The summary of the results of the co-efficient of



correlation indicating the relationships between the selected characteristics of the respondents and their exposure DCTs of AIS has been shown in Table 4.16.

Table 4.16 Relationship between the selected characteristics of the farmers and their exposure to DCTs of AIS

Characteristics (Independent variables)	Focus Variable (Dependent variable)	Correlation coefficient
		Spearman (ρ)
1. Age	Farmers' Exposure to Development Communication Tools of AIS	-0.129 ^{NS}
2. Level of Education		0.486**
3. Family Size		0.037 ^{NS}
4. Farm Size		0.241*
5. Annual family income		0.485**
6. Farming experience		-0.178 ^{NS}
7. Cosmopolitanism		0.279*
8. Innovativeness		0.456**
9. Extension contact		0.500**
10. Organizational participation		0.506**
11. Training		0.433**
12. Knowledge		0.609**
13. Attitude		0.513**

NS= non-significant **. Correlation is significant at the 0.01 level (2-tailed) * Correlation is significant at the 0.05 level (2-tailed)

Table 4.16 revealed that level of education, farm size, annual family income, cosmopolitanism, innovativeness, extension contact, organizational participation, training, knowledge and attitude was positively correlated with the exposure to AIS development communication tools. However, age, family size, farming experience of farmers having non-significant relationship with the DCTs of AIS.

Figure 4.2 Identification of the contributing factors in the exposure of DCTs of AIS by the farmers

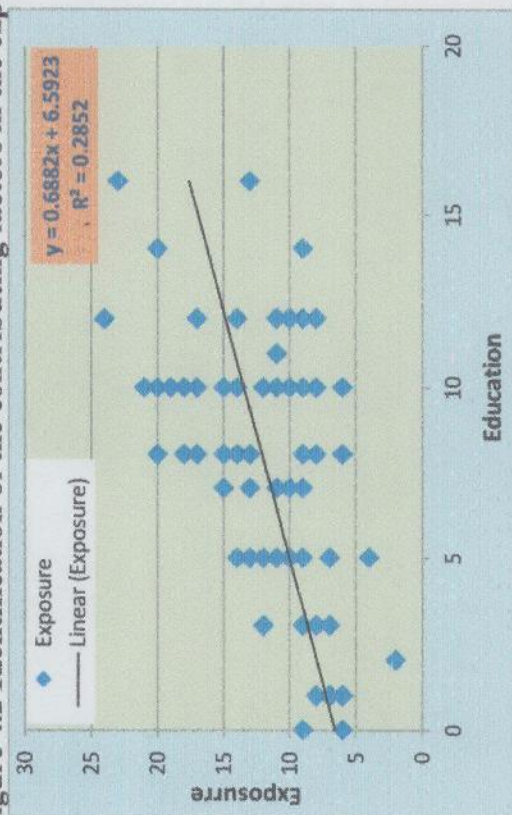


Figure 4.2.1 Farmers' Level of Education and their Exposure to DCTs

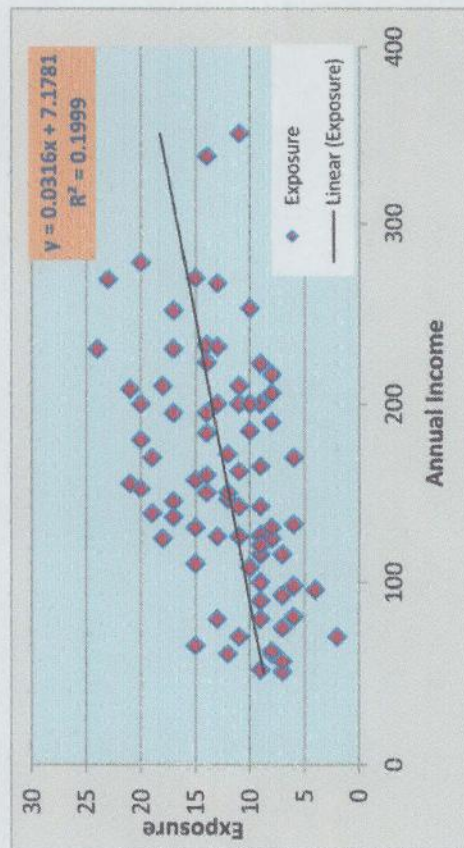


Figure 4.2.3 Farmers' Annual Income and their Exposure to DCTs

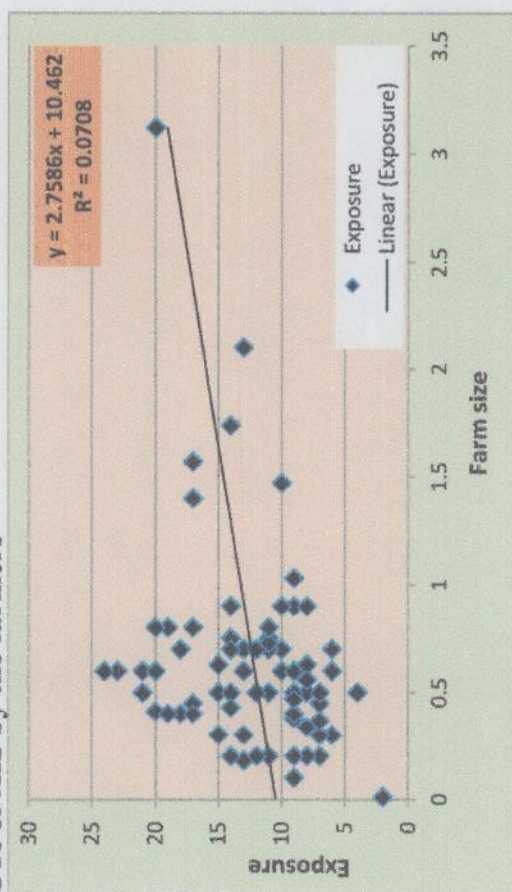


Figure 4.2.2 Farmers' Farm Size and their Exposure to DCTs

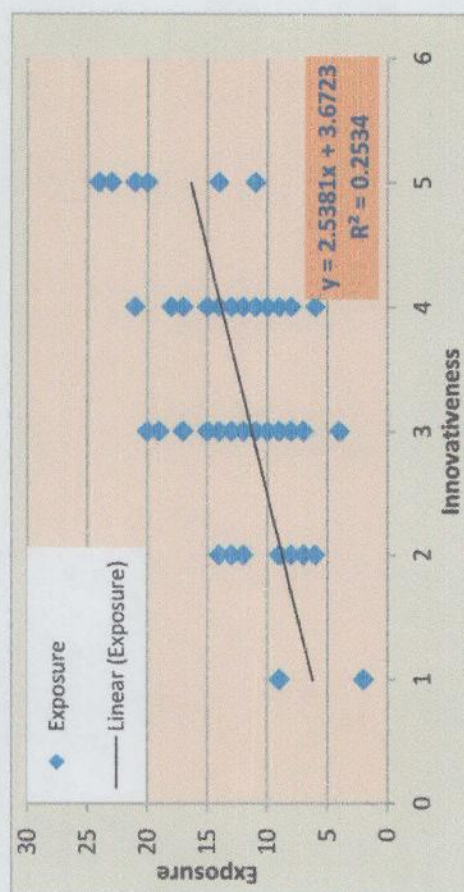


Figure 4.2.4 Farmers' Innovativeness and their Exposure to DCTs

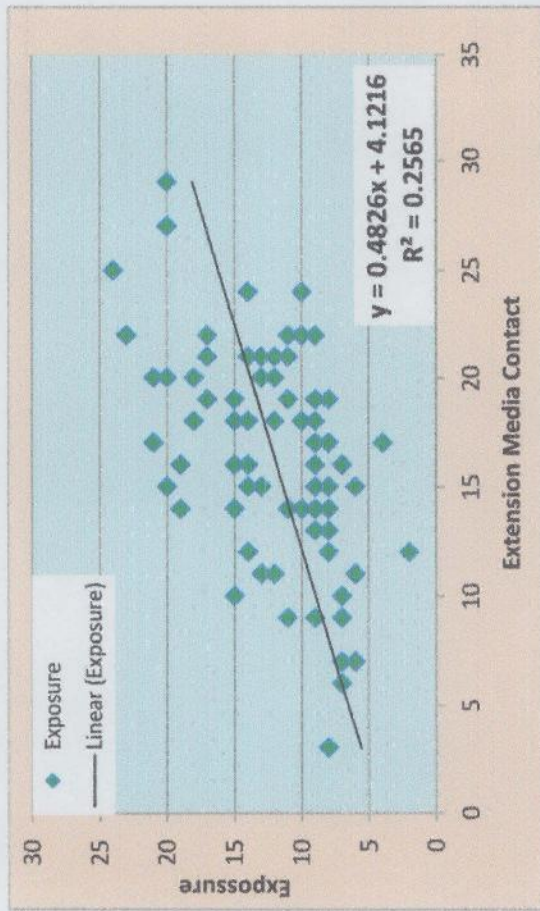


Figure 4.2.5 Farmers' Extension Media Contact and their Exposure to DCTs

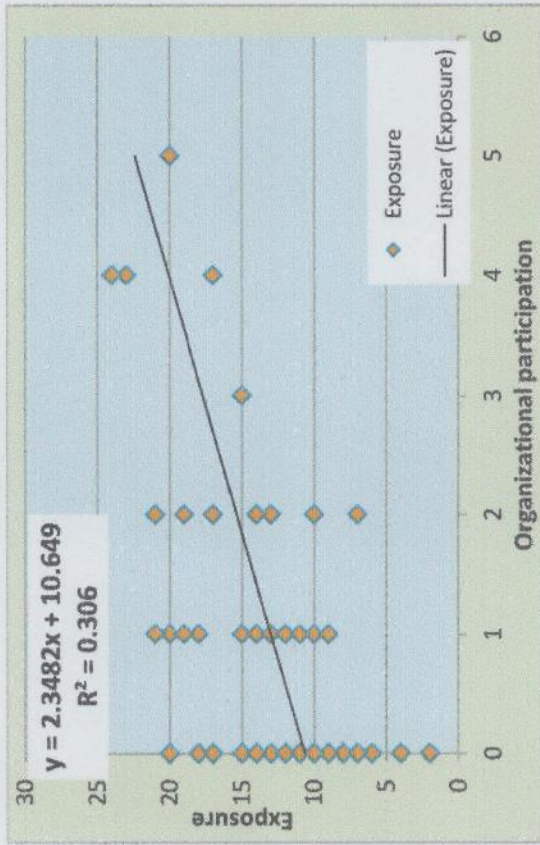


Figure 4.2.6 Farmers' Organizational Participation and their Exposure to DCTs

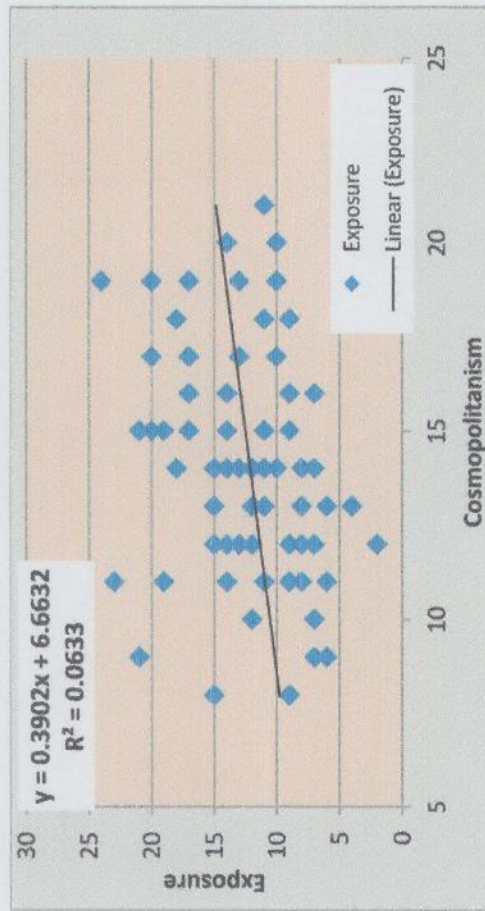


Figure 4.2.7 Farmers' Cosmopolitanism Exposure and their Exposure to DCTs

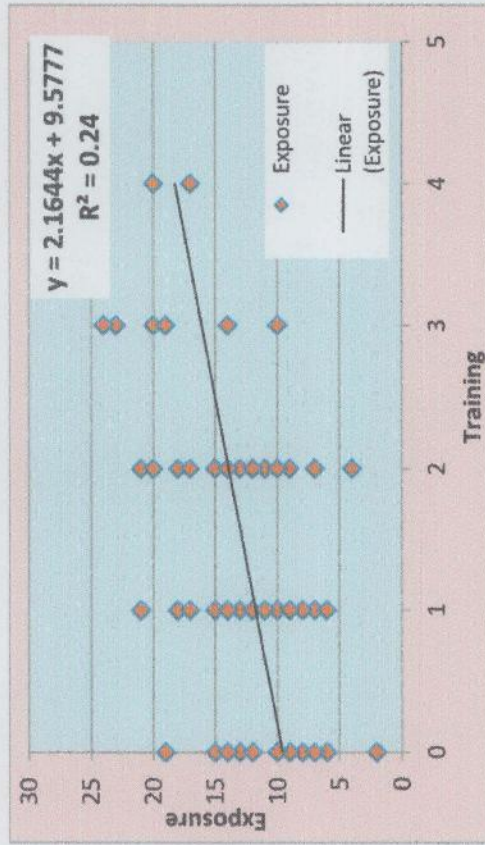


Figure 4.2.8 Farmers' Training and their Exposure to DCTs

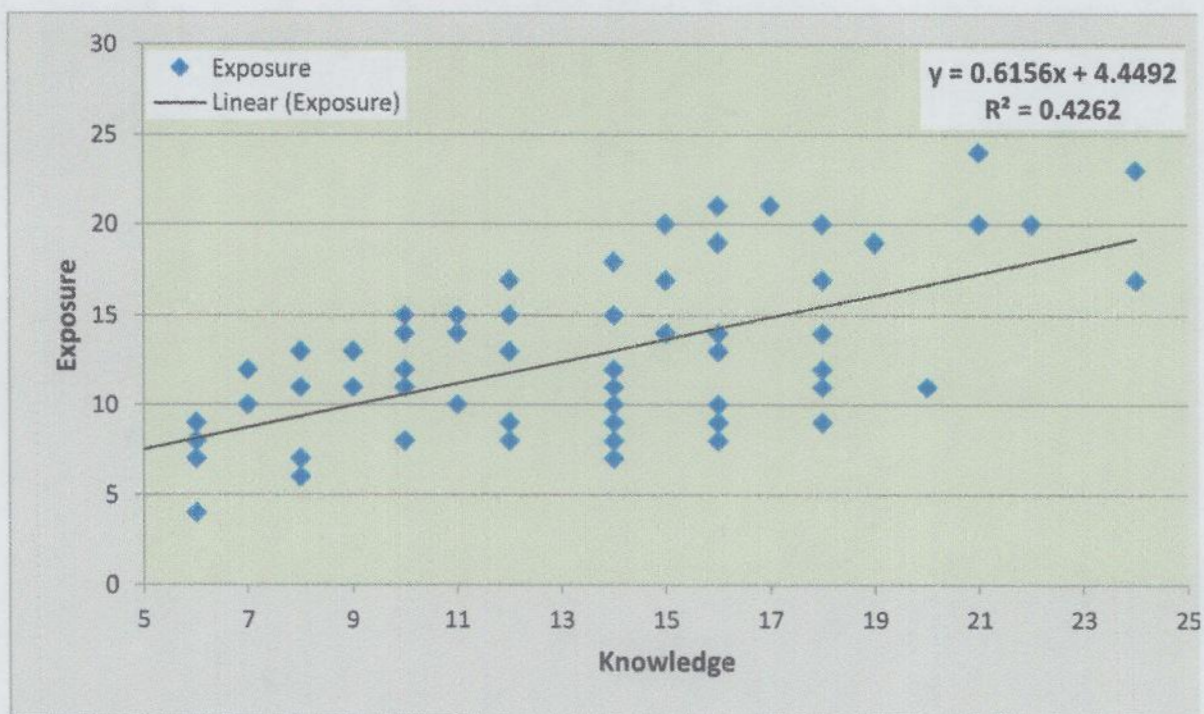


Figure 4.2.9 Farmers' Knowledge about DCTs and their Exposure

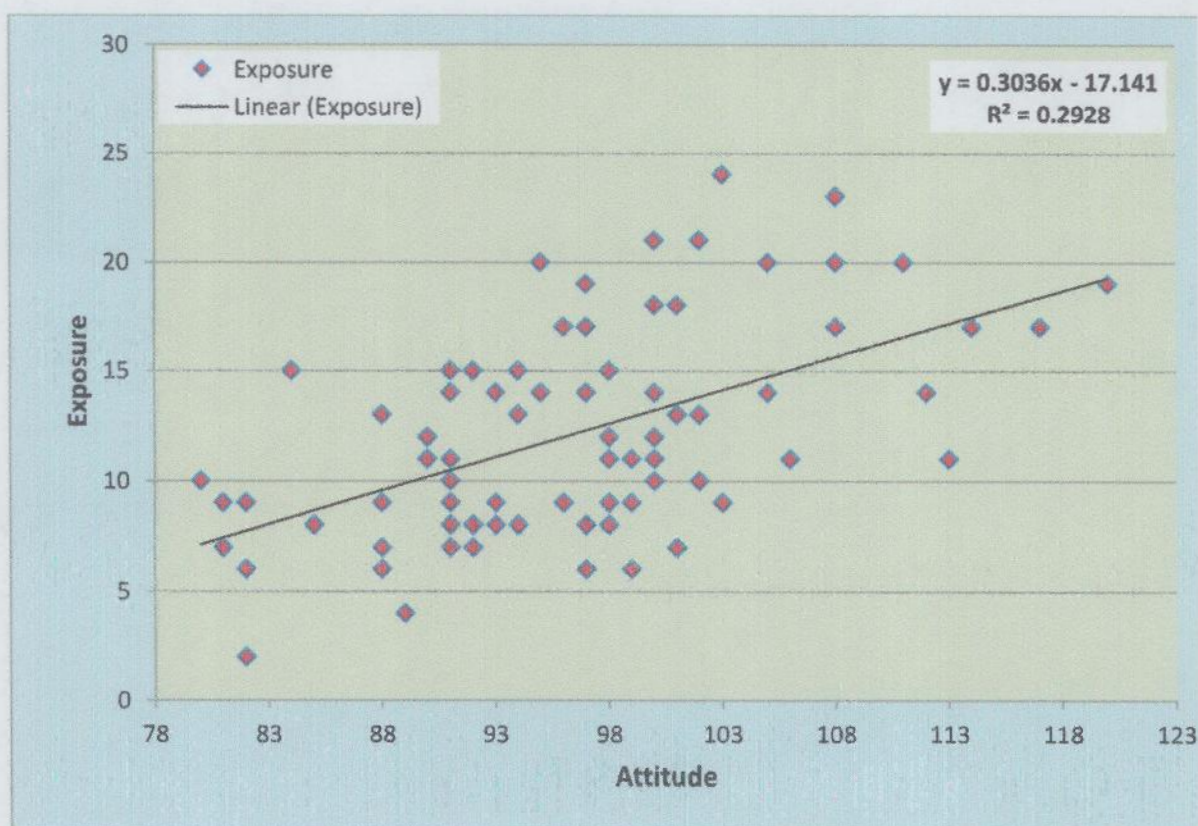


Figure 4.2.10 Farmers' Attitude towards DCTs and their Exposure

4.3.1 Age and Exposure to DCTs of AIS

The Hypothesis stated in this regard was “There is no relationship between age of farmers and their exposure to the DCTs of AIS.” The computed value of the co-efficient of correlation between age of the farmers and their exposure to the DCTs of AIS was found to be $\rho = -0.129^{NS}$ as shown at table 4.16. The following observation was made regarding the relationship between two variables based on the variables on the correlation values.

- a. The relationship showed a negative trend.
- b. A negligible relationship was found to exist between the two variables.
- c. The computed value of $\rho = -0.129^{NS}$ was found to be smaller than the tabulated value $\rho = \pm 0.223$ with 78 degrees of freedom at 0.05 level of probability.

Hence, the null hypothesis was accepted and it can be said that age of farmers and their exposure to the DCTs of AIS have no relationship with each other. Studies of Asaduzzaman et al. (2016), Rashid and Akanda (2015) and Bhuyian et al. (2013) also found an insignificant relationship between the same variables. Thus, the present findings show consistency with all these findings.

4.3.2 Level of Education and Exposure to DCTs of AIS

The null hypothesis (H_0) stated in this regard was “There is no relationship between level of education of the farmers and their exposure to the DCTs of AIS.” The computed value of the co-efficient of correlation between level of education of the farmers and their exposure to the DCTs of AIS was found to be $\rho = 0.486^{**}$ as shown at table 4.16. The following observation was made regarding the relationship between two variables based on the variables on the correlation values.

- a) The relationship showed a positive trend.
- b) A high relationship was found to exist between the two variables
- c) The computed value of $\rho = 0.486^{**}$ was found to be larger than the tabulated value $\rho = \pm 0.291$ with 78 degrees of freedom at 0.01 level of probability.

Thus, the null hypothesis was rejected, so it can be said that level of education of the farmers and their exposure to the DCTs of AIS was positively correlate with each other. The existing relationship between the concerned variables indicates that with increase of the level of education of the farmers, the exposure to the DCTs of AIS for getting information increased.

Studies of Rashid and Akanda (2015), Bhuyian et al. (2013) and Shaikh et al. (2010) also found a significant relationship between the concerned variables. The study of Pandian (2002) revealed that with the increase of education of the farmers, the exposure of ICTs in getting agricultural information is also increased which indicates significant relationship.

The regression analysis (Figure 4.2.1) indicates that 28.5% of the total variation of the focus variable (farmers' exposure to DCTs of AIS) explained by farmers' level of education while the remaining 71.5% remain unexplained.

4.3.3 Family Size and Exposure to DCTs of AIS

The Hypothesis stated in this regard was "There is no relationship between family size of farmers and their exposure to the DCTs of AIS." The computed value of the co-efficient of correlation between family size of the farmers and their exposure to the DCTs of AIS was found to be $r = 0.081^{NS}$ and $\rho = 0.037^{NS}$ as shown at table 4.16. The following observation was made regarding the relationship between two variables based on the variables on the correlation values.

- a) The relationship showed a positive trend.
- b) A negligible relationship was found to exist between the two variables.
- c) The computed value of $\rho = 0.037^{NS}$ was found to be smaller than the tabulated value $\rho = \pm 0.223$ with 78 degrees of freedom at 0.05 level of probability.

Based on the findings, the null hypothesis was accepted and it can be said that the variables of the family size of farmers and their exposure to the DCTs of AIS were not dependent on each other. Asaduzzaman et al. (2016), Rashid and Akanda (2015), Bhuyian et al. (2013) and Shaikh et al. (2010) also found an insignificant relationship between the concerned variables in their respective study.

4.3.4 Farm size and Exposure to DCTs of AIS

The null hypothesis (H_0) stated in this regard was "There is no relationship between farm size of the farmers and their exposure to the DCTs of AIS." The computed value of the co-efficient of correlation between level of education of the farmers and their exposure to the DCTs of AIS was found to be $\rho = 0.241^*$ as shown at table 4.16. The following observation was made

regarding the relationship between two variables based on the variables on the correlation values.

- a. The relationship showed a positive trend.
- b. A high relationship was found to exist between the two variables
- c. The computed value of $\rho = 0.241^*$ was found to be larger than the tabulated value $\rho = \pm 0.223$ with 78 degrees of freedom at 0.05 level of probability.

Hence, the null hypothesis was rejected and it can be said that farm size of the farmers and their exposure to the DCTs of AIS was positively correlate with each other. This means the increase of the farm size of the farmers, the exposure to the DCTs of AIS is increased. Asaduzzaman et al. (2016), Rashid and Akanda (2015) and Shaikh et al. (2010) also found a similar significant relationship between the concerned variables in their study.

Figure 4.2.2 indicates that 7% of the total variation of the focus variable (farmers' exposure to DCTs of AIS) explained by farmers' farm size variable. This means that farm size was the not vital factor that affecting the farmers' exposure to DCTs of AIS.

4.3.5 Annual Income and Exposure to DCTs of AIS

The null hypothesis (H_0) stated in this regard was "There is no relationship between annual income of the farmers and their exposure to the DCTs of AIS." The computed value of the coefficient of correlation between annual income of the farmers and their exposure to the DCTs of AIS was found to be $\rho = 0.485^{**}$ as shown at table 4.16. The following observation was made regarding the relationship between two variables based on the variables on the correlation values.

- a) The relationship showed a positive trend.
- b) A high relationship was found to exist between the two variables
- c) The computed value of $\rho = 0.485^{**}$ was found to be larger than the tabulated value $\rho = \pm 0.291$ with 78 degrees of freedom at 0.01 level of probability.

Thus, the null hypothesis was rejected, so it can be said that annual income of the farmers and their exposure to the DCTs of AIS was positively correlate with each other. This means that annual income of the farmers is related with their exposure to the DCTs of AIS. So, the variables were dependent of each other. Shaikh et al. (2010) also observed a significant relationship between the concerned variables in his study.

The regression analyses (Figure 4.2.3) indicate that 19.9% of the total variation of the focus variable (farmers' exposure to DCTs of AIS) explained by farmers' annual income variable while the remaining 80.1% remain unexplained.

4.3.6 Farming Experience and Exposure to DCTs of AIS

The null hypothesis (H_0) stated in this regard was "There is no relationship between farming experience of farmers and their exposure to the DCTs of AIS." The computed value of the co-efficient of correlation between farming experience of the farmers and their exposure to the DCTs of AIS was found to be $\rho = -0.178^{NS}$ as shown at table 4.16. The following observation was made regarding the relationship between two variables based on the variables on the correlation values.

- a) The relationship showed a negative trend.
- b) A negligible relationship was found to exist between the two variables.
- c) The computed value of $\rho = -0.178^{NS}$ was found to be smaller than the tabulated value $\rho = \pm 0.223$ with 78 degrees of freedom at 0.05 level of probability.

Thus, the null hypothesis was accepted so it can be said that the variables of the farming experience of farmers and their exposure to the DCTs of AIS have no relationship between each other. Chandra and Raddy (2004) also observed the tendency of similar relationship. Rashid and Akanda (2015) also found an insignificant relationship between the concerned variables in his study which shows similarity in findings with present findings.

4.3.7 Innovativeness and Exposure to DCTs of AIS

The null hypothesis (H_0) stated in this regard was "There is no relationship between innovativeness of the farmers and their exposure to the DCTs of AIS." The computed value of the co-efficient of correlation between innovativeness of the farmers and their exposure to the DCTs of AIS was found to be $\rho = 0.456^{**}$ as shown at table 4.16. The following observation was made regarding the relationship between two variables based on the variables on the correlation values.

- a) The relationship showed a positive trend.
- b) A high relationship was found to exist between the two variables

- c) The computed value of $\rho = 0.456^{**}$ was found to be larger than the tabulated value $\rho = \pm 0.291$ with 78 degrees of freedom at 0.01 level of probability.

Thus, the null hypothesis was rejected which express that existing relationship between the concerned variables indicated that positive correlation with each other where with the increase of innovativeness, the exposure to the DCTs of AIS is also increases. Similar findings were also observed by Pandian (2002).

Figure 4.2.4 showed that 25.3% of the total variation of farmers' exposure to DCTs of AIS explained by farmers' innovativeness while the remaining 74.7% remain unexplained. This indicates that farmers' innovativeness plays a vital role in affecting their exposure to DCTs of AIS.

4.3.8 Extension Contact and Exposure to DCTs of AIS

The null hypothesis (H_0) stated in this regard was "There is no relationship between extension media contact of the farmers and their exposure to the DCTs of AIS." The computed value of the co-efficient of correlation between extension contact of the farmers and their exposure to the DCTs of AIS was found to be $\rho = 0.500^{**}$ as shown at table 4.16. The following observation was made regarding the relationship between two variables based on the variables on the correlation values.

- a) The relationship showed a positive trend.
- b) A high relationship was found to exist between the two variables
- c) The computed value of $\rho = 0.500^{**}$ was found to be larger than the tabulated value $\rho = \pm 0.291$ with 78 degrees of freedom at 0.01 level of probability.

Hence, the null hypothesis was rejected and it can be said that extension contact of the farmers and their exposure to the DCTs of AIS was positively correlate with each other. The existing relationship between the concerned variables indicates that with increase of the extension contact of the farmers, the exposure to the DCTs of AIS for getting information is also increase. Shaikh et al. (2010) also found a significant relationship between the concerned variables in his study.

Figure 4.2.5 depict that 25.6% of the total variation of farmers' exposure to DCTs of AIS explained by farmers' extension media contact while the remaining 74.4% remain unexplained.

This means farmers' extension media contact is one of the major factors which influence them in exposure to DCTs of AIS.

4.3.9 Organizational Participation and Exposure to DCTs of AIS

The null hypothesis (H_0) stated in this regard was "There is no relationship between organizational participation of the farmers and their exposure to the DCTs of AIS." The computed value of the co-efficient of correlation between organizational participation of the farmers and their exposure to the DCTs of AIS was found to be $\rho = 0.506^{**}$ as shown at table 4.16. The following observation was made regarding the relationship between two variables based on the variables on the correlation values.

- a) The relationship showed a positive trend.
- b) A high relationship was found to exist between the two variables
- c) The computed value of $\rho = 0.506^{**}$ was found to be larger than the tabulated value $\rho = \pm 0.291$ with 78 degrees of freedom at 0.01 level of probability.

Hence, the null hypothesis was rejected and it can be said that organizational participation of the farmers and their exposure to the DCTs of AIS was positively correlate with each other. This indicated that the organizational participation of the farmers helped them to improve their outlook and exposure towards improved farming practices which lead them to use different DCTs of AIS. Studies of Asaduzzaman et al. (2016) and Shaikh et al. (2010) also found a significant relationship between concerned variables in their study.

The regression analyses (Figure 4.2.6) indicate that 30.6% of the total variation of the focus variable (farmers' exposure to DCTs of AIS) explained by farmers' organizational participation variable. It means organizational participation is the vital factor that affecting the farmers' exposure to DCTs of AIS.

4.3.10 Cosmopolitanism and Exposure to DCTs of AIS

The null hypothesis (H_0) stated in this regard was "There is no relationship between cosmopolitanism of the farmers and their exposure to the DCTs of AIS." The computed value of the co-efficient of correlation between cosmopolitanism of the farmers and their exposure to the DCTs of AIS was found to be $\rho = 0.279^*$ as shown at table 4.16. The following observation was made regarding the relationship between two variables based on the variables on the correlation values.

- a) The relationship showed a positive trend.
- b) A high relationship was found to exist between the two variables
- c) The computed value of $\rho = 0.279^*$ was found to be larger than the tabulated value $\rho = \pm 0.223$ with 78 degrees of freedom at 0.05 level of probability.

Based on the findings, the null hypothesis was rejected suggesting the existing relationship between the concerned variables indicated that with the increase of exposure to the DCTs of AIS, their cosmopolitanism also increased. This means, the variables were dependent of each other. Asaduzzaman et al. (2016) and Shaikh et al. (2010) also observed a significant relationship between the concerned variables in their respective study.

Figure 4.2.7 indicate that 6.3% of the total variation of the focus variable (farmers' exposure to DCTs of AIS) explained by farmers' cosmopolitanism variable while the remaining 93.7% remain unexplained.

4.3.11 Training and Exposure to DCTs of AIS

The null hypothesis (H_0) stated in this regard was "There is no relationship between training of the farmers and their exposure to the DCTs of AIS." The computed value of the co-efficient of correlation between training of the farmers and their exposure to the DCTs of AIS was found to be $\rho = 0.433^{**}$ as shown at table 4.16. The following observation was made regarding the relationship between two variables based on the variables on the correlation values.

- a) The relationship showed a positive trend.
- b) A high relationship was found to exist between the two variables
- c) The computed value of $\rho = 0.433^{**}$ was found to be larger than the tabulated value $\rho = \pm 0.291$ with 78 degrees of freedom at 0.01 level of probability.

Hence, the null hypothesis was rejected and it can be said that training of the farmers and their exposure to the DCTs of AIS was positively correlate with each other. This expressed that the training of the farmers increases the exposure to the DCTs of AIS. Shaikh et al. (2010) also found similar significant relationship between the concerned variables in his study.

The regression analyses (Figure 4.6.8) indicate that 24% of the total variation of the focus variable (farmers' exposure to DCTs of AIS) explained by farmers' training exposure variable. It means training exposure is one of the major factors that affect the farmers' exposure to DCTs of AIS.

4.3.12 Knowledge and Exposure to DCTs of AIS

The null hypothesis (H_0) stated in this regard was “There is no relationship between knowledge of the farmers and their exposure to the DCTs of AIS.” The computed value of the co-efficient of correlation between knowledge of the farmers and their exposure to the DCTs of AIS was found to be $\rho = 0.609^{**}$ as shown at table 4.16. The following observation was made regarding the relationship between two variables based on the variables on the correlation values.

- a) The relationship showed a positive trend.
- b) A high relationship was found to exist between the two variables
- c) The computed value of $\rho = 0.609^{**}$ was found to be larger than the tabulated value $\rho = \pm 0.291$ with 78 degrees of freedom at 0.01 level of probability.

Based on the above findings, the null hypothesis was rejected which means variables are dependent on each other and it can be expressed as more the knowledge of the farmers result in more exposure to the DCTs of AIS. Similar results were also observed by Islam (2019), Karim (2005) and Sarker (1995).

The regression analyses (Figure 4.2.9) indicate that 42.6% of the total variation of the focus variable (farmers’ exposure to DCTs of AIS) explained by farmers’ knowledge variable. It means farmers’ knowledge about DCTs plays vital factor in their exposure to DCTs of AIS.

4.3.13 Attitude and Exposure to DCTs of AIS

The null hypothesis (H_0) stated in this regard was “There is no relationship between attitude of the farmers and their exposure to the DCTs of AIS.” The computed value of the co-efficient of correlation between attitude of the farmers and their exposure to the DCTs of AIS was found to be $\rho = 0.513^{**}$ as shown at table 4.16. The following observation was made regarding the relationship between two variables based on the variables on the correlation values.

- a) The relationship showed a positive trend.
- b) A high relationship was found to exist between the two variables
- c) The computed value of $\rho = 0.513^{**}$ was found to be larger than the tabulated value $\rho = \pm 0.291$ with 78 degrees of freedom at 0.01 level of probability.

Thus, the null hypothesis was rejected it can be said that attitude of the farmers and their exposure to the DCTs of AIS was positively correlate with each other. It means farmers’ positive attitude towards the DCTs of AIS shows high exposure to the DCTs of AIS.

The regression analyses (Figure 4.2.10) indicate that 29.2% of the total variation of the focus variable (farmers' exposure to DCTs of AIS) explained by farmers' attitude variable. It means farmers' attitude towards DCTs is one of the major factors which influence them in exposure to DCTs of AIS.

4.4 Farmers' Problems Confronted in Exposure of Development Communication Tools of Agriculture Information Service

4.4.1 Identification of Problems Confronted in Exposure of DCTs of AIS by Farmers

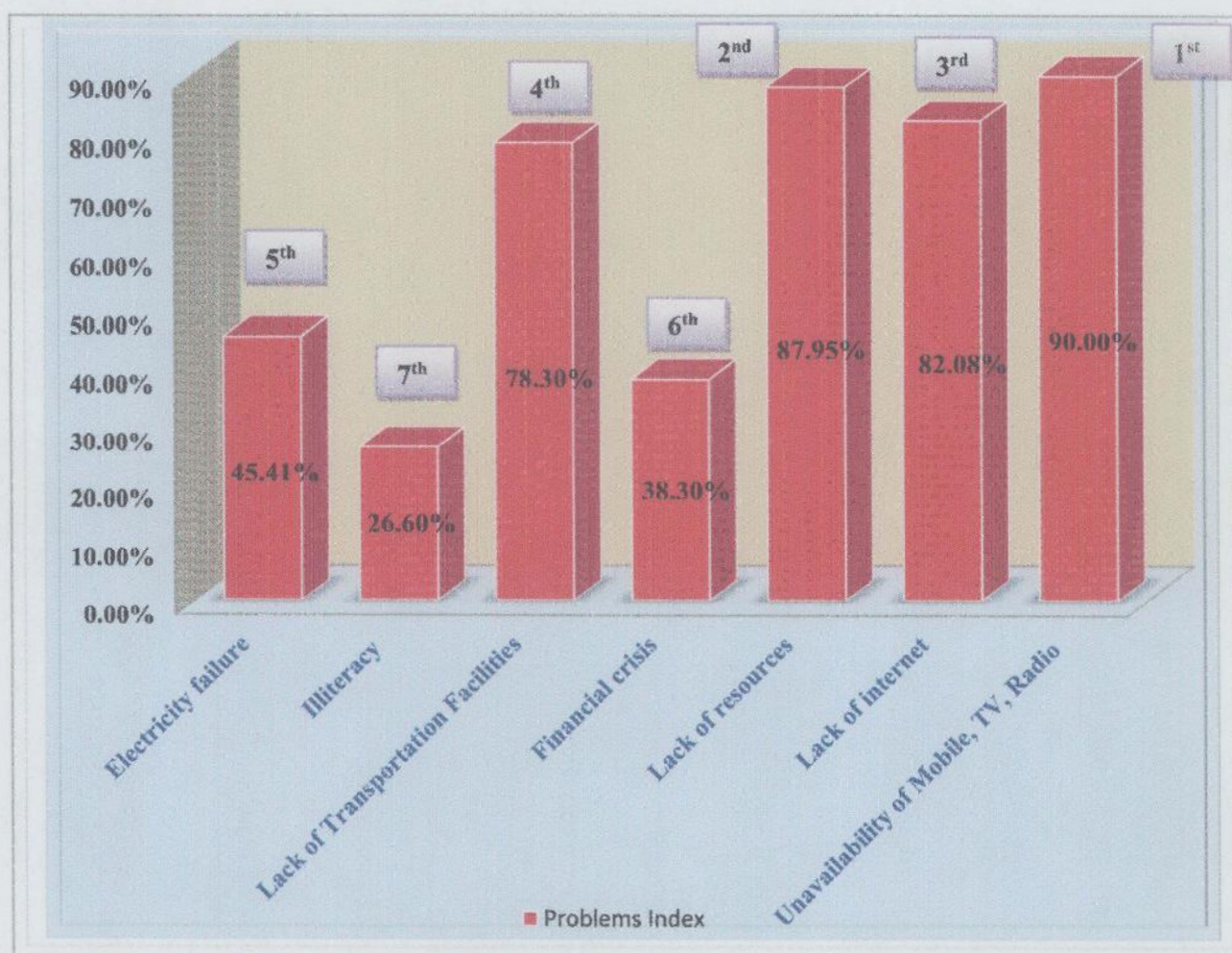


Figure 4.3 Rank Index of the Confronted problems in exposure of DCTs by the farmers

The respondents (farmers) of the study confronted 7 problems related to exposure to the DCTs of AIS at different extent. There were variations in the problems where highest index found was 90.00% and the lowest index was 38.30%. Unavailability of mobile, TV, radio was the highly confronted problem (90.00%) followed by lack of resources (87.95%), internet

(82.08%) and transportation facilities (78.30%) while electricity failure (45.41%), financial crisis (38.30%) and illiteracy (26.60%) were some of less confronted problem (Figure 4.3).

For use of development communication tools of AIS for getting agricultural information there is need of mobile. As researcher found most of the farmers in Dumuria upazila were in low- and medium-income family so, they cannot afford mobile, TV and radio usually. Also, AIS cannot make available sufficient resources in different farmers club (AICC) of different villages. Dumuria upazila is still backward in telecommunication network. At some point AIS need decentralization. People needs to go to their office for getting any agricultural information and for training. People also suffer financial problem to use some development tools of AIS. Because some tools are not free to use such as *Krishi diary*, *Shomposharon Barta* etc. Dumuria upazila also have electricity problem at some extent which hinder their exposure to the DCTs of AIS. As DCTs are based on modern technology illiteracy and less education reduce farmers' exposure to the DCTs of AIS.

4.4.2 Extent of Problems Confronted in Exposure to DCTs of AIS

The extent of problems scores of the respondents ranged from 5-20 against with a mean of 13.51 and standard deviation of 3.80. The distribution of farmers according to their extent of exposure towards DCTs of AIS is shown in Table 4.17.

Table 4.17 Distribution of respondents according to their problems confronted in exposure to DCTs of AIS

Categories	Scores	Respondents (N=80)		Range		Mean	SD
		Number	Percentage	Min	Max		
Low	1-7	5	6.25				
Medium	8-14	40	50.00	5	20	13.51	3.80
High	>14	35	43.75				
Total		80	100				

Data presented in Table 4.18 revealed that half (50.00%) of the respondents faced medium extent of problem and 43.75 percent faced high extent of problem while few of them (6.25%) faced low extent of problem in exposure towards DCTs of AIS.

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

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

5.1 Summary

Agricultural productivity is influenced remarkably by agricultural information in various ways. It is well accepted that timely, reliable, and relevant information can contribute to improved production. Information and communication media are increasingly being used to deliver information on agricultural research and their potentials for enhancing economic development is becoming transparent with the passes of time. In many cases, information is often considered more valuable than monetary resources.

Information and Communication Technologies (ICTs) has been now accepted as a tool for development worldwide and this is because of the increased benefits and changes it has brought to the various sectors in the economy. The benefits of ICT have been realized in the field of agriculture also.

For farmers to benefit from such technologies, they must first have access to them and learn how to effectively utilize them in their farming systems and practices. The DCTs of AIS addresses the need of the farming community making use of increased information technology, professional help and information available to farmers at their doorstep by putting the farmers directly in contact with Agricultural Experts and making authentic field data available for Agriculture Policy decisions by the authorities. Expert advice is provided by trained agricultural extension officer. Since the inception of DCTs of AIS in Khulna, no studies have been conducted and hence the present study "Farmer's exposure to DCTs of Agricultural Information Service (AIS) in Bangladesh" was undertaken with the objective to determine farmers' exposure to development communication tools of AIS aimed at suggesting performance improvement of agricultural Information services and to identify the factors influencing the exposure of the farmers to DCTs of AIS. Besides, the study also aimed to find out the confronted problems in the exposure of DCTs of AIS.

Dumria upazila under Khulna district was selected as the study area. The study was conducted at 5 villages of Dumuria upazila under Khulna district. The names of the villages are Khornia, Kholshi, Sajiara, Dumuria and Golna. With a view to determine the level of exposure of farmers towards DCTs of AIS, data were collected from 80 selected respondents (farmers) using an interview schedule. Data were collected personally by the researcher himself through face-to-face interview during the period of 13th January, 2022 to 25th January, 2022. A summary of the major findings is given in the subsequent sections.

5.2 Major Findings

5.2.1 Selected Characteristics of the Respondents

Half (48.8%) of the respondents (farmers) fall into the middle-aged category compared to young aged (31.3%) and old aged (20%) group. Majority (55%) of the respondents belonged to the secondary level of education category while 25%, 11.3%, 6.3% and 2.5% of the farmers belonged to primary level, higher secondary level, above secondary level and illiterate categories respectively. Also, majority (57.5%) of the respondents belonged to the small sized family whereas 40% and 2.5% of the respondents belonged to medium sized family and large sized family respectively. Above three-fourth (77.5%) of the farmers possessed small farm while 12.5% and 7.5% having marginal and medium sized farm respectively and similar percent (1.3) of them holding large farm and were landless. Most (77.5%) of the respondents were exclusively involved in farming and 17.5% of them earn from farming and business. Only 5% of the respondents were involved in farming as well as services. Half of the respondents (50%) belonged to low income whereas 47.5% belonged to medium income and 2.5% respondents were in high income category.

Half (50.0%) of the respondents were highly experienced whereas 26.3% and 23.8% were medium and low experienced respectively. 37.5% and 36.3% of the respondents belonged to the early adopter and early majority category respectively while 8.8% were innovators, 15% were in late majority category and 2.5% of the farmers were laggard. Majority (77.5%) of the farmers belonged to medium extension contact compared to 18.8% and 3.8% of the respondents expressed low and high extension contact respectively.

More than three-fifth (63.7%) of the respondents were belonged to no organizational participation and on the other hand, 20%, 10% and 6.3% of the respondents belonged to low, medium and high organizational participation categories respectively. Majority (63.7%) of the



respondents showed medium cosmopolitanism whereas 18.8% and 17.5% respondents showed low and high cosmopolitanism respectively. 35% of the respondents hold medium training exposure whereas similar percent (31.3) respondents were belonged to the no training and low training exposure. On the other hand, 2.5% of them maintained high training exposure.

Majority (56.3%) of the respondents showed medium knowledge about DCTs of AIS and 37.5% showed low knowledge whereas 6.3% showed high knowledge about DCTs of AIS. Most (85%) of the respondents showed highly favorable attitude towards DCTs of AIS compared to very highly favorable attitude (15%) towards DCTs of AIS.

5.2.2 Farmers Exposure to DCTs of AIS

The respondents (farmers) of the study exposed to 13 DCTs to different extent out of 14 DCTs AIS. Variation in exposure of the farmers' to DCTs of AIS was observed. However the farmers were highly exposed to poster/sticker (65.93%) while they were less exposed to ICT laboratory (0.94%). Other the development communication tools as exposed by the farmers were folder/leaflet/flipchart (64.69%), television program (54.06%), agricultural fair (50.93%), AisTube (1.87%).

About three-fourth (72.5%) of the respondents showed very low exposure whereas other one-fourth (27.5%) of the respondents showed low exposure towards DCTs of AIS.

5.2.3 Relationship between the Selected Characteristics of the Farmers and their Exposure to DCTs of AIS

The study revealed that out of 13 selected characteristics of farmers 10 characteristics showed significant relationship with farmers' exposure to DCTs of AIS where level of education, farm size, annual family income, cosmopolitanism, innovativeness, extension contact, organizational participation, training, knowledge and attitude was positively correlated with the exposure to AIS development communication tools. Wherever age, family size, farming experience of farmers had non-significant relationship with the DCTs of AIS.

5.2.4 Identification of Problems Confronted in Exposure of DCTs of AIS by Farmers

The respondents (farmers) of the study confronted 7 problems related to get expose to the DCTs of AIS at different extent. Lack of mobile, TV, radio was the highly confronted problem (90.00%) followed by unavailability of resources (87.95%), lack of internet (82.08%) and

transportation problems (78.30%) while electricity failure (45.41%), financial crisis (38.30%) and illiteracy (26.60%) were some of less confronted problems.

Half (50.00%) of the respondents faced medium extent of problem and 43.75% faced high extent of problem while few of them (6.25%) faced low extent of problem in exposure towards DCTs of AIS.

5.3 Conclusions

“A conclusion presents the statements based on major findings of the study and these statements mostly confirm to the objectives of the research in the shortest form. It presents the direct answers of the research objectives, or it relates to the hypothesis” (Labon and Schefter, 1990).

The government emphasis on integrated and technical based approach for socio-economic and agricultural development of the farmers. Through this study an effort is attempted to study the AIS beneficiaries and the role of AIS in trending knowledge on agriculture. The purpose of the study is to estimate an understanding on the development communication tools used in receiving information. Though the farmers of the study were exposed to 13 DCTs of AIS but majority of them (72.5%) showed very low exposure to DCTs due to unavailability and unpopularity of DCTs of AIS and for farmers' illiteracy. Among the problems unavailability of personal mobile, TV, radio was the highly confronted problem (90.00%) in exposure of DCTs of AIS. For this, proper emphasis should be given on the farmers of all categories by the extension workers in order to encourage receiving agricultural information through DCTs of AIS. Also, the AIS authority should revise their policy for the betterment of DCTs on the basis of these current findings.

5.4 Recommendations

Recommendations have been divided into two sub sections, viz. recommendation for policy implication and recommendation for the further study. Based on the findings and conclusion of the study the following recommendation for policy implications are presented below:

5.4.1 Recommendations for Policy Implication

- i. For encouraging adoption of improved farm practices by the farmers in receiving agricultural information there is an urgent need for a sound system of DCTs of AIS

such as television, agricultural fair, newspaper, radio, and poster for providing adequate innovative information to the farmers.

- ii. The Department of Agricultural Information Service (AIS) needs to pay more attention to ensure the use of DCTs of AIS by the farmers. For some DCTs especially poster/sticker, television and agricultural fair seemed to have great impact in the diffusion of agricultural innovation.
- iii. While taking programmes, television viewers, radio listener's age should be taken into consideration. Comparatively young and middle-aged farmers would be given more consideration while selecting programmes for agricultural information.
- iv. As a large number of farmers are not trained to use DCTs, arrangement should be made to provide non-formal training to the farmers. This will help to change attitude, behavior and outlook of the future farmers.

5.4.2 Recommendations for Future Study

A small piece of study as has been conducted cannot provide all information for the proper understanding of the exposure of DCTs of AIS in receiving agricultural information by the farmers.

The results of the present study prove the need for further inquiry in other directions. The following suggestion are made for the further research who undertake similar studies

- i. The study was limited to the selected district from south zone due to the limitation of time therefore a survey on the entire Khulna as well as whole Bangladesh would give a better picture of DCTs of AIS in Bangladesh.
- ii. Further studies can be conducted using exploratory research design.
- iii. There is a need to conduct experimental research by making the respondents utilize the service of DCTs and then elicit their perception and attitude and exposure towards DCTs of AIS.

CHAPTER VI

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APPENNDIX-A

Agrotechnology Discipline

Life Science School

Khulna University, Khulna-9208

Interview Schedule

(English version of the questionnaire)

Farmer's Exposure to Development Communication Tools of Agriculture Information

Service In Bangladesh

(Confidentiality will be maintained and all information will be used only for study purpose)

Sample no.

Date: / /2022

Name of the respondent:			
Father /Husband name:			
Village:	Union:	Upazilla:	District:
Contact No. (must provide):			

1. Age (year):

2. Educational Qualification: Please put tick mark (✓) against the correct response

- a) Can't read and write
- b) Can sign only
- c) Passed Class/PEC/JSC/SSC/HSC/Bachelor/Master Degree

3. Family size (number of member):

4. Farm size:

Type/Ownership of Land	Area		Remark
	Local Unit	Hectare	
A) Homestead area			
B) Own land under own cultivation			
C) Own land under others cultivation			
D) Others land under own cultivation			
E) Leased in			
F) Leased out			
G) Pond/Ditches			
H) Others			
Total =A+B+1/2(C+D)+E-F+G+H			

5. Occupation:

A) Major occupation.....() B) Subsidiary.....()

6. Annual family income:

Please mention you and your family member annual income from different sources:

A. Income from agricultural sectors

How much money did you receive from the following agricultural sectors in the preceding year?

Sl. No.	Income sources	Sources	Total production (Local unit)	Price/Unit (Taka)	Total price (Taka)
1.	Agriculture	Crops			
		Vegetables			
		Fruits			
2.	Livestock rearing	Cattle			
		Goat			
		Poultry			
		Others (specify)			
3.	Fisheries				
4.	Social forestry				
5.	Homestead gardening				
4.	Others (specify)				
	Total				

B. Income from non-agricultural sectors

How much money did you receive from the following non-agricultural sectors in the preceding year?

Sl. No.	Income sources	Total value (Taka)
1.	Service	
2.	Business	
3.	Day labor	
	Total	

Total income = A+B (BDT) = ... Taka

7. Farming experience: Years

8. Innovativeness

Kindly furnish your innovativeness by putting (V) against the following with which you are agree.

Sl no	Statement	Tick mark
01	As soon as it come to my knowledge, I have adopted the innovation	
02	Having seen the success of others, I have adopted the innovation	
03	I adopt innovation to see my peers who have already adopt technology	
04	I adopt technology by the pressure of my peers group	
05	I prefer to wait before adoption of innovation	

9. Extension media contact

Please state where you get the information about agricultural technology

Sl. No.	Communication media	Frequency of contact			
		Regularly (3)	Occasionally (2)	Rarely (1)	Not at all (0)
A.	Personal media contact				
1.	Sub Assistant Agricultural Officer (SAAO)				
2.	Agricultural Extension Officer (AEO)				
3.	Upazilla Agricultural Officer (UAO)				
4.	Other extension Officers (Livestock, Fisheries)				
5.	NGO workers				
B.	Group media contact				
1.	Village meeting				
2.	Result demonstration				
3.	Farmers field day				
C.	Mass media contact				
1.	Television				
2.	Radio				
3.	Internet/Web media				
4.	Printed Materials				

10. Organizational participation:

A) Are you involved in any organization? Yes () /No ()

B) If yes, then answer the following question

SI No.	Name of the Serial organization (Non-political)	Extent of involvement				Duration (year)
		No Involvement (0)	General Member (1)	Executive Member (2)	Executive Officer (3)	
01	Youth organization					
02	Farmer club					
03	Committee (mosque/Temple /church/Mondir)					
04	Institutional organization (other than NGO and GO)					
05	NGO maintained ass.					
06	GO maintained ass.					
07	Other(specify)					

* Executive officer mean President, General Secretary

11. Training exposure:

Are you trained? "yes" or "No"

If your answer is "yes", please giving me the following information

SI no	Title of training(s)	Duration (Days)	Venue of training	Organized by
01				
02				
03				

9.	When agricultural program telecasted in TV?		
10.	What type of information delivered by agricultural tv program?		
11.	How many days in a week agricultural program broadcasted in radio?		
12.	What type of information delivered by agricultural radio program?		
13.	When Bangladesh Betar Telecast "Krishi Shomachar" ?		
14.	When Bangladesh Betar Telecast "Chashabad" ?		
15.	What is the mobile number of KCC?		
16.	What type of cinema/Pramannochitro shows in AICC?		
17.	What is the name of AIS website?		
18.	What type of videos found in AIS tube?		
19.	What type of information supplies Ki-Osk at AIS?		
20.	What type of training suggests from ICT lab of AIS?		

14. Attitude of respondents towards the use of Development Communication Tools of AIS

SI no	Statement	Strongly Agree (5)	Agree (4)	Undecided (3)	Disagree (2)	Strongly Disagree (1)
01	All agricultural problems of the farmers are solved by DCTs of AIS					
02	"Krishi katha" provide useful information to the farmers					
03	"Shomprosharon Barta" has all the agricultural news					
04	Price of "Krishi Katha" and "Shomprosharon Barta" is high					
05	"Krishi Diary" has all the farming information					
06	"Krishi diary" is costly					
07	Folder/Leaflet/flipchart provides information of new technology in farming					
08	Poster/Sticker provide ideas of new agricultural news					
09	"Krishi Mela" motivates farmer to gather new farming technique					
10	"Krishi Shomachar" (KRC) program provides useful information					

11	"Chashabad" (KRC) program helps farmers to get knowledge about new farm technology					
12	Experts in these program are well acknowledged about the problem					
13	The schedule of telecasting "Krishi Shomachar" and "Chashabad" program in Bangladesh Betar is in comfortable time					
14	"Banglar Krishi" and "Mati o Manush" program in BTV is a source of new information about agriculture for farmers					
15	The timing of telecast and re-telecast "Mati o Manush" and "Banglar Krishi" in BTV is good					
16	Experts advice make the farmers enterprise activities productive					
17	AICC is useful to watch cinema/ pramannochitro					
18	KCC provide first hand information about queries					
19	Literate and illiterate both farmers can get help from KCC easily					
20	AIS club technical officers are helpful					
21	Cinema/ "Pramannochitro" is related to latest agricultural farming system					
22	AIS website is a resourceful website					
23	AIS tube videos helpful to find any agriculture related solution					
24	Ki-Osk is userfriendly to search any agriculture information					
25	ICT laboratory provides adequate training of new farm technology					
26	Regular attending in training program update agricultural knowledge					