

**AWARENESS OF SAAOs ON ICT TOOLS FOR EXTENSION
SERVICES IN RANGPUR DISTRICT**

A Thesis

By

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**MASTER OF SCIENCE
IN
AGRICULTURAL EXTENSION**

**Department of Agricultural Extension
Hajee Mohammad Danesh Science and Technology University
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The Author

AWARENESS OF SAAOs ON ICT TOOLS FOR EXTENSION SERVICES IN RANGPUR DISTRICT

ABSTRACT

The purposes of the study were to determine and describe some selected characteristics of SAAOs, to investigate SAAOs awareness on ICT tools for extension service, to explore the relationship between the selected characteristics of SAAOs with their awareness on ICT tools for extension service, and to identify constraints faced by SAAOs in using ICT for extension service. Data were collected from the SAAOs of four upazilas of Rangpur district during 01 to 30 September 2018. The sample size of the study was 77 and which was drawn from a population of 144 using random sampling technique. The awareness of SAAOs on ICT tools was the focus issue of this study. The scale consisted of 18 ICT tools awareness. The responses about the ICT tools used are taken on the basis of five degrees namely heard, seen, have, used and skill with the assigned score 1, 2, 3, 4, and 5, respectively. Majority of the SAAOs (66.23 percent) are under medium level of awareness on ICT tools followed by 19.48 percent low level of awareness on ICT tools and only 14.29 percent high level of awareness on ICT tools respectively. According to the computed correlation coefficients (r) among the eight selected characteristics of the SAAOs four characteristics namely scientific orientation, innovativeness, planning orientation and knowledge on ICT tools showed positive relationship with their awareness on ICT tools. On other hand age and service experience showed negative relationship and the rest were fail to show any relationship with the focus issue. On the other hand the major problems in using ICT tools faced by SAAOs was 'Lack of training in the use of ICT facilities (PCI =238.96)' and the least problem faced by the SAAOs was "Irregular power supply (PCI = 153.26)'.

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CHAPTER 1

INTRODUCTION

1.1 Background Information

Agricultural extension is the most important public service with the widest range of responsibilities for agricultural and rural development (Adeyanju and Akinwumi, 2015). Therefore, availability of agricultural information among its users for agricultural and rural development cannot be over emphasized. Agricultural information creates awareness among farmers about agricultural technologies for adoption which is needed for overall development of agriculture and for the improvement of living standard of farmers (Bello, 2012).

However, according to Ozowa, (1999) cited in Uganneya (2012) the extents to which information services actually satisfy users and contribute to agricultural development are subject of controversy and debate. This is so because the diffusion and adoption of any given information to a large extent depends on the means through which the information is disseminated and invariably the perception, knowledge and understanding of the users on the channels through which the information is disseminated. Adequate awareness on any given innovation or technology is a key to the success in adoption and utilization of the technology. With regards to this, Ekumankma (2002) in, (2009) note that poor awareness or exposure of farmers to appropriate agricultural information and channels of communicating this information is one of the major reasons for low yield recorded by many Nigerian farmers as well as performance of agricultural extension agents in their duties. Therefore, for human performance to be effective and efficient some knowledge is needed on how, why and when certain things have to be done. The provision or availability of such knowledge is as important as its application to daily life. Agricultural extension agents as well as farmers need to get aware of the necessary information in order to improve methods in activities, increase productivity and performance. However, awareness to effective channels of acquiring information can improve and enable individuals in knowledge which would also enable them to confront their predicaments. Agriculture being a discipline requires the awareness and access for information that its users would adopt in anticipation of the improvement in its various activities. Kwadwo *et al.*, (2012) reported that ‘the advent of ICTs namely personal computers, the internet and mobile telephone during the last two decades has provided a much wider choice in collection, storage, processing, transmission and presentation of information in multiple formats to meet the diverse requirement and skills of people’.

1.2 Statement of the Problem

The role of agricultural extension service has traditionally been to provide the important link between agricultural research and farming communities, especially technology transfer in support to agricultural and rural development (FAO, 2004). Agricultural extension service over the years has been working via different approaches, methodologies and program to ensure farmers adoption of improved technologies with little success (Aker, 2010). Agricultural extension program can provide field advice, innovations from scientists and practitioners, and sound commodity-marketing principles. Yet the enormous demand for smallholder training can never be met through conventional extension methods. Arokoyo (2005) reported that a strong agricultural extension linkage complimented by flawless information flow enhanced by the effective use of information and communication technologies (ICT) would significantly boost agricultural production and improve rural livelihoods in developing countries. Agriculture is one of the vital sectors in which ICT can be used reasonably in transferring the modern agricultural technologies to the farmers. ICT has many potential applications in agricultural extension most especially in accessing required information and knowledge (McNamara, 2009).

In the current scenario of a rapidly changing world, extension services have been recognized as an essential mechanism for delivering knowledge (information) and advice as an input for modern farming and the role of ICT in actualizing so has drawn interest of practitioners. The application of ICT in the field of agriculture and allied sectors has been reported from different parts of the globe. Agriculture is one of the most important sectors in Bangladesh, and could benefit tremendously with the applications of ICTs especially in bringing changes to socio-economic conditions of poor in backward areas.

Extension services, which mostly depends on a large extent of information exchange among SAAOs on the one hand, and a broad range of other actors on the other, has been identified as one area in which ICTs can have a particularly significant impact. There is growing recognition that farmers and members of rural communities have needs for information and appropriate learning methods that are not being met (Greenridge, 2003 and Lightfoot, 2003).

1.3 Significance of the Study

The use of Information Communication Technologies (ICTs) in agricultural extension and rural development in recent times is significant, given their widespread use in almost all areas of rural life—namely agriculture, health, and general social development (CTA, 2003). Comparatively though, extension agents may be the most effective information source for farmers but certainly not the most efficient, as evidenced by the huge cost, extent of coverage, and time (Van den Ban & Hawkins, 1998). It is therefore clear that, no matter how effective extension delivery through the village extension service is, it can neither be efficient nor cost effective for a developing country like Bangladesh, with a whopping population of about 160 million, the majority of whom are engaged in one form of agricultural enterprise or another.

With the current global ICT revolution, it has been found that ICTs portend great potentials for effective agricultural extension information transfer and information sharing (Omotayo, 2005). Arokoyo (2005) identified such potentials of ICT (application in Agricultural Extension service) delivery as in needs assessment, exploring production alternatives, exchanging and sharing of information by peers, training and demonstration, and community learning among others. Madukwe (2006) added in agreement that the promise of ICTs in agricultural extension is that they can energize the collection, processing and transmission of data, thus making it possible to extend quality information faster in a bottom up and interactive channel of communication. According to him ICTs have been found to be the only way in which farmers can access a variety of information sources that are accessible, affordable, relevant and reliable. The increasing use of ICTs in agricultural extension service delivery would narrow the gender disparities in terms of access to agricultural information. Information technology use refers to the extent to which technologies are utilized for communication purposes. It also explains the level to which the potentialities of the technologies are harnessed for the information generation and transfer.

In the present context, the agricultural development mostly depends on the information led by updated technological interventions. The farmers in different disadvantaged areas of our country are facing a problem of digital divide where the farmers residing in remotest areas are not accompanied and supported by modern extension services through use of ICT tools. To make the agriculture society more knowledge vibrant and information enriched, the ICT tools based modern information and extension services may be used as the panacea for the sustainable

livelihood of rural peasants. In such a situation there is a need to explore the effectiveness of ICT enabled extension services for addressing the information needs of the rural peasants.

ICT as an extension tool could enhance the flow of information in the application of agricultural extension services. Agricultural extension, which depends largely on information exchange between and among farmers, has been identified as one area in which ICT can have a particularly significant impact (Ballantyne and Bokre, 2003). If SAAOs are crucial to agricultural and rural development and use of various ICTs promises boost for agricultural and rural development, then a study on awareness of SAAOs on ICT tools for extension services delivery is important.

1.4 Specific Objective of the Study

In view of the problems stated above, the following specific objectives were set forth in order to give proper direction to the study.

1. To determine and describe some selected characteristics of SAAOs. The selected characteristics are:
 - i. Age
 - ii. Service experience
 - iii. Scientific orientation
 - iv. Attitude towards ICT tools
 - v. Cosmopolitaness
 - vi. Innovativeness
 - vii. Planning orientation
 - viii. Knowledge of SAAOs on ICT tools
2. To investigate SAAOs awareness on ICT tools for extension service.
3. To explore the relationship between the selected characteristics of SAAOs with their awareness on ICT tools for extension service, and
4. To identify constraints faced by SAAOs in using ICT for extension service.

1.5 Assumptions of the Study

An assumption is defined as “the supposition that an apparent fact or principle is true in the light of the available evidence” (Goode and Hatt, 1952). The researcher must be followed the assumption in mind while continuing this study.

1. The respondents selected for the study were able to furnish proper responses to the questions included in the interview schedule.
2. The data were considered reliable and dependable which is collected by the researcher.
3. The researcher who acted as interviewer was adjusted to social and environmental condition of the study area.

4. The data collected by him and the respondent were free from bias.
5. The findings of the study will have general application to other parts of the country with similar physical, socio-economic and cultural conditions of the study.
6. The information sought by the researcher revealed the real situation to satisfy the objectives of the study.
7. The views and opinions furnished by the SAAOs included in the sample were the representative views and opinions of all SAAOs of Rangpur district in Bangladesh.

1.6 Limitation of the Study

1. The study was confined to the SAAOs of four Upazilas under Rangpur district.
2. Time and resources are the primary limitations of the present study. The researcher faced the constraints of time and resources in case of completing the study.
3. The study associated with the collection of information from the SAAOs using Information Communication Technology (ICT) tools for their information about agricultural activities, which were mostly based on recall might in spite of the best efforts of the investigator to leave margin for error into creep in.
4. Primarily during data collection the investigator faced a challenge relating to the mobilization of SAAOs in case of sharing information through ICT tools as such type of study was not conducted in this area previously.
5. There are many characteristics of the SAAOs which are always vary but only eight were selected for investigation in this study as stated in the objectives.
6. The study focused on awareness of ICT enablers in agriculture extension services response furnished by the SAAOs.
7. Only 77 SAAOs were selected for the study.

1.7 Definitions of Important Terms

For clarify of understanding, certain terms used through the study are defined as follows:

Respondents: Randomly selected people considered to be representative of the population are known as respondents. They are the people from whom a social research worker usually gets most data required for his research. In this study the respondents were the SAAO (Sub Assistant Agriculture Officer).

Age of respondent was defined as the period of time from his birth to the time of interview.

Service experience referred to one's involvement in direct services activities which was measured in terms of years

Scientific orientation is characterized by a belief in science and scientific approach to solve the problems in farming and it leads the farmers to adopt improved/local agricultural technologies. Supe (1969) defined scientific orientation as the degree to which a farmer is oriented towards the use of scientific method of farming.

Attitude towards ICT: Attitude is the mental predisposition of an individual to act in a particular way. In other words, it refers to one's favorable or unfavorable feelings, beliefs, and action towards an object and concept. Attitude towards ICT referred to one's feeling towards ICT in various aspects.

Cosmopoliteness is defined as the degree to which an individual visits outside of the locality from his own particular social system.

Innovativeness is the degree to which an individual is relatively earlier in adopting agricultural innovation, new ideas, practices and things than the other members of a social system (Rogers, 2003). This was comprehended by the quickness of accepting innovations by an individual in relation to others and was measured on the basis of time dimension.

Planning orientation is operationally defined as the degree to which an ICT user is oriented towards preparation function in farming practices.

Knowledge of SAAOs on ICT tools is operationally defined as the level of knowledge of SAAOs regarding various information communication technology tools.

Awareness: According to Oxford Dictionary 'knowledge or perception of a situation or fact or concern about and well-informed interest in a particular situation or development'. **Awareness** is the status or ability to perceive, to feel, or to be conscious of events, objects, or sensory patterns. In this level of consciousness, sense data can be confirmed by an observer without necessarily implying understanding. More broadly, it is the state or quality of being aware of something. In biological psychology, awareness is defined as a human's or an animal's perception and cognitive reaction to a condition or event.

Information and Communication Technology (ICTs): ICT is defined as electronic means of communication which process, store and disseminate information.

CHAPTER 2

REVIEW OF LITERATURE

A literature review is a body of text that aims to review the critical points of current knowledge and or methodological approaches on a particular topic. Literature reviews are secondary sources, and as such, do not report any new or original experimental work. A well-structured literature review is characterized by a logical flow of ideas; current and relevant references with consistent, appropriate referencing style, proper use of terminology and an unbiased and comprehensive view of the previous research on the topic. Hence, earnest efforts were made to review the related literature, which was found to be meaningful and having direct and indirect bearing on this study and furnished under the following headings.

2.1 Concept of Information and Communication Technology (ICT)

The ICT is the term used to describe tools and processes to access, retrieve, store, organize, manipulate, produce, present and exchange information by electronic and other automated means. It includes a range of technologies starting from radio, television, telephone up to modern technologies like mobile phone, multimedia, internet and satellite based communication systems. Information refers to the patterned matter energy that affects the probabilities available to an individual making decision. It performs three major functions. First, it increases the knowledge level of the recipients, second, it reduces the uncertainty in decision making and third, it serves as a representation of situation. In recent years, there is a visible shift from the old ways of delivering information to the modern ways of information delivery systems. ICT is rapidly gaining the centre stage for future world economic growth and development.

2.2 Concept of Awareness

According to Oxford Dictionary 'knowledge or perception of a situation or fact or concern about and well-informed interest in a particular situation or development'

Awareness is the state or ability to perceive, to feel, or to be conscious of events, objects, or sensory patterns. In this level of consciousness, sense data can be confirmed by an observer without necessarily implying understanding. More broadly, it is the state or quality of being aware of something. In biological psychology, awareness is defined as a human's or an animal's perception and cognitive reaction to a condition or event.

2.3 General Review on Awareness on ICT tools

Adem (2017) revealed that nearly half of the respondents (56.1percent) had high level of awareness about issues that related environment, environmental problems and conservation activities in the study area. On the other hand, 20 percent of 330 respondents mean scores showed that, they had low level of environmental awareness.

Moon *et al.* (2016) in their study observed that about two-thirds (68 percent) of the farmers had moderate awareness while almost one fourth (26 percent) having high and only 6 percent had low awareness about effective delivery of farm information by ICT centers. The training exposures of the farmers were significantly correlated with their awareness.

Olugbenga (2016) the study recommends easy access, awareness and use of ICTs by instructors and regular supply of electricity to improve and stimulates adoption of ICTs by respondents.

Umanath *et al.* (2016) in their study represented that only 23 percent of the farmers were highly aware about the environmental degradation created by the indiscriminate application of modern inputs.

Patel *et al.* (2015) observed that the majority (67.34 percent) of the organic farming followers had medium level of awareness about organic farming, followed by 21.00 and 11.66 percent of respondents had high and low level of awareness, respectively.

Islam *et al.* (2014) observed that among the respondents 25.00 percent had poor, 61.25 percent respondents had medium and only 13.75 percent had high awareness about environmental degradation caused by the use of modern agricultural technologies.

Okello (2014) in their study found that transaction costs, the characteristics of the area in which ICT-based projects are implemented and farmer endowments with human and financial capital play an important role in smallholder farmers' awareness, use and/or extent of use of ICT-based MIS projects. It concludes that awareness and the use of ICT-based MIS is driven by farmer, farm and location-specific characteristics as well as various capital endowment factors.

Akter (2013) indicated that majority of the respondents (74.5 percent) had medium awareness having by 25.5 percent having high awareness.

Alavion *et al.* (2012) observed that rural ICT were managed with a proper dispersion in areas of villages by personnel who were from farming families and had a suitable capacity to help

agricultural activities through internet, post and bank services. It was considered necessary to create an integrated system of rural ICT offices.

Fawole and Olajide (2012) concluded that awareness of older ICTs like radio and television was more prevalent among farmers as compared with newer ICTs such as Internet and cable television. However, use of modern ICTs like mobile phones and cable television was greater than that for older technologies such as fax machines. Farmers were constrained in ICT use by prohibitive cost and service failure. The Nigerian government should encourage a liberal policy for affordable prices for modern ICT products, especially mobile telephones.

Chowdhury (2011) revealed that majority (78.57 percent) of the fish traders had medium awareness as compared to 12.9 percent low and 8.57 percent high awareness on the effect excessive use of chemicals for dry fish storage. The mean value indicated that the fish traders had medium level of awareness on the effect excessive use of chemicals for dry fish storage.

Meena *et al.* (2011) in their study pointed out that farmers expected information on high yielding varieties (35.00 percent), plant protection (27.50 percent) and market information (22.50 percent) and weather forecasting (19.38 percent) from modern ICT systems.

Subhashsingh *et al.* (2010) in their research study noticed that 18.92 percent of respondents used telephone mostly, 43.24 percent used it often and 37.84 percent used it sometimes. Majority (53.70 percent) of respondents used computer and internet mostly, 46.30 percent used it sometime and none of the respondents was found often user likewise. In case of *Kisan* Call Center (KCC), 37.40 percent respondents used them mostly, 51.22 percent used it often and 11.38 percent used it sometimes.

Hattangdi and Ghosh (2009) opined that ICT could be used as a tool in the process of education in various ways like, Informative tool: It provided vast amount of data in various formats such as audio, video, documents, Situating tool: It created situations, which the student experiences in real life, Constructive tool: To manipulate the data and generate analysis and Communicative tool: It could be used to remove communication barriers such as that of space and time.

Isiaka (2009) was concluded that the extension workers had moderate level awareness of ICT potentials for improved extension services and were in need of training on usage in their extension activities. It was recommended that education on ICT potentials and training on usage for improved extension service delivery should be promoted and intensified among the extension workers.

Parikh *et al.* (2008) conducted study on ICT tool to reach the unreached. E-learning was studied with objectives i.e. improved employment prospects, helped people escape from poverty and overcame the wastage of potential talent.

Wims (2007) analyzed the adoption and use of ICTs among Irish farm families and found that 56 percent of respondents owned a home PC while 48 percent had home internet connectivity. Aboh C. L. (2008) observed that adequate provision should be made for the maintenance of the ICT facilities and systems. That provision should be made in providing training program for the extension agents in order to update their knowledge on the latest and new information technology.

Dada (2006) observed that ICT consisted of some latest technologies such as the computer, internet, cell phone and satellite. Older technologies like radio, television, telephone and technology centers, employers, and investment were also in this zone.

Arunbabu (2005) in his study observed that majority of KISSAN Kerala beneficiaries were found to have medium and high awareness about ICTs while majority of the AKSHAYA beneficiaries and farmers had low and medium awareness.

2.4 Relationships between the Selected Characteristics of SAAOs with their Awareness on ICT Tools for Extension Service

This section deals with the selected characteristics of SAAOs and their awareness on ICT tools. These Characteristics of an individual usually vary from one person to another and those as variables play vital role in making difference regarding SAAOs awareness on ICT tools. However, the relationships between the characteristics of SAAOs with their awareness on ICT tools are discussed below:

2.4.1 Age and awareness

Panda (2017) in his study reported that age of the respondents had negatively and significantly association with their awareness on ICT tools.

Tonni (2017) revealed that there was a no relationship between age of the farmers with their awareness on environmental degradation.

Rudroju (2013) in their study found that age of the respondents had negative and significant relationship with the utilization of ICT.

Rong and Juan (2011) in their study observed that there is a positive relationship between age of the respondents with environmental awareness.

Shrestha (2010) reported that there was a negative relationship between age of the farmers with their environmental awareness.

Islam and Amin (2009) revealed that there was a no relationship between age of the farmers with their awareness on environmental degradation.

Jalal (2009) observed that there was positive significant relationship between age and their awareness on the environmental degradation caused by the use of modern agricultural technologies.

Ajayi and Banmeke (2007) conducted a study on farmers' perception and knowledge of environmental problems affecting their food production and found that age of the farmers had positive relationship with the awareness on environmental pollution.

Farhad *et al.*, (2005) conducted a study about knowledge of rural women on IPM in vegetable cultivation. The findings revealed that there was a negative relationship between age and awareness on environmental degradation.

Hossain (2003) conducted a survey on 102 farmers of Sriramdi and Purbaria villages under Pakundia upazilla under Kishorganj district and he found that 20 percent farmers were young, 46 percent farmers were middle and 34 percent farmers were old age. He reported that some farmers of old age had high knowledge and some young farmers also had high knowledge i.e. age of the farmers was not related to farmers knowledge on modern Boro rice cultivation practices.

Sutradhar (2002) found that age of the respondents had no significant relationship with their awareness on farm environment degradation.

Islam *et al.* (2002) found that there was a negative insignificant relationship between age of the small farmers and their awareness on environmental pollution.

2.4.2 Service experience and awareness

Panda (2017) in his study reported that experiences in farming of the respondents had negatively and significantly association with their awareness on ICT tools.

Rudroju (2013) in their study found that farming experience of the respondents had negative and significant relationship with the utilization of ICT.

Samatha (2011) in her study on 'extent of use of ICTs by farmers of Guntur district of Andhr Pradesh' found that majority of farmers (58.34 percent) have medium farming experience followed by 24.16 percent having high farming experience and 17.50 percent have low farming experience.

2.4.3 Scientific orientation and awareness

The researcher failed to collect any review between scientific orientation and awareness towards ICT tools for extension service.

2.4.4 Attitude towards ICT tools and awareness

After through searching of literature, both home and abroad, no enough findings were also found on this aspect. Hence, it was not possible on the part of research to put relationship in this context.

Verma (2012) indicated of the study that most of the respondents had positive attitude towards various aspects of information and communication technology application in agriculture. It was found that NGOs respondents possessed slightly more favorable attitude than GO respondents about application of ICTs in agriculture

Gurmu (2014) observed that there was positive significant relationship between Attitude towards ICT and their awareness for adopting the technologies.

2.4.5 Cosmopolitaness and awareness

Rudroju (2013) in their study found that cosmopolitaness of the respondents had positive significant relationship with the utilization of ICT.

Islam (2014) indicated of the study that cosmopolitaness were positively correlated with their awareness on agricultural extension services,

Prodhan(2014) found that cosmopolitaness showed positive significant relationship with their perception towards ICT utilization.

2.4.6 Innovativeness and awareness

Tonni (2017) in their study found that innovativeness of the farmers had positive significant relationship with the awareness on environmental degradation.

Prodhan (2014) found that innovativeness showed positive significant relationship with their perception towards ICT utilization.

Rudroju (2013) in their study found that innovative proneness of the respondents had positive significant relationship with the utilization of ICT.

Islam (2013) observed innovativeness had positive significant relationships with their awareness on environmental degradation caused by the use of modern agricultural technologies.

Zaidi *et al.* (2011) in their study found that innovativeness of the farmers had positive significant relationship with the awareness on environmental pollution.

Bo and Linhai (2010) found that innovativeness of the farmers had a positive relationship with the awareness with environmental pollution.

Islam (2009) in his study revealed that there was significant relationship between innovativeness and awareness on environmental degradation.

Adaman and Ozeretan (2007) found that there was a relationship between innovativeness and environment degradation.

Mohan and Singh (2007) found that the new ICT includes digital devices such as computers, e-mail, internet, multimedia, video conference, and mobile phones etc. which have the potential of providing vast amount of relevant information to rural farmers in timely, comprehensive and cost effective manner. The frequently used kinds of ICT are electronic database access and search systems (database, teletext, and videotext), feedback systems, advisory systems (decision support system, expert systems, and knowledge systems), Networks (internet, electronic mail, computer conferencing) and multimedia.

Islam *et al.* (2006) in their study observed that there was a significant positive relationship between innovativeness and awareness on environmental degradation.

Farhad *et al.* (2005) revealed that there was no relationship between awareness and environmental degradation.

Sutradhar (2002) observed that innovativeness of farmers had significant positive relationship with their awareness on environmental degradation.

2.4.7 Planning orientation and awareness

Panda (2017) in his study reported that planning orientation of the respondents had positively and significantly association with their awareness on ICT tools.

2.4.8 Knowledge on ICT tools and awareness

Rahman (2016) in his study reported that knowledge on ICT had a significant positive relationship with the extent of use of ICT based media by the farmers.

Das (2014) in his study found that the extent of confinement of ICTs adoption to households with literacy, formal training and large holdings is likely to widen the knowledge-gap.

Kuri (2013) knowledge on climate change issues of the farmers had positive influence on building awareness regarding effect of climate change on farm ecosystem.

Zaidi *et al.*, (2011) was conducted a study to determine the levels of knowledge of the farmers on the effect of pesticides on environment in Dawadmi Province, Saudi Arabia and

found that knowledge about the use of modern agricultural technologies of the farmers had positive significant relationship with the awareness on environmental pollution.

Bo and LinHai (2010) conducted a study to investigate farmers' awareness of pesticide residues and their behaviours regarding pesticide application and found that positive significant relationship between knowledge about the use of modern agricultural technologies of the farmers with the awareness on environmental pollution.

Jalal (2009) observed that there was positive significant relationship between knowledge on ITKs and their awareness on the environmental degradation caused by the use of modern agricultural technologies.

Ajayi and Banmeke (2007) conducted study farmers' perception and knowledge of environmental problems affecting their food production and found that there was no relation between knowledge about the use of modern agricultural technologies of the farmers and awareness on environmental pollution.

Bipasha and Chatterjee (2006) found that there exists a significant relationship between modern technology and food grain production. Among the modern technologies, the impact of HYV seeds followed by fertilizer has the major impact on the food grain production.

Hasan *et al.*, (2005) conducted a study and found there was a significant relationship between IPNS knowledge and environmental awareness.

2.5 Conceptual Framework

In developing a framework for this study, both conceptual ideas and available empirical studies were taken into consideration. The awareness of SAAOs on ICT tools for extension service is being influence by their characteristics. The focus issues that include the framework for this study are awareness of SAAOs on ICT tools for extension service which was considered four aspects namely; computer/telecom, broadcast/audiovisuals, print technology and others. The selected characteristics of the SAAOs include age, service experience, scientific orientation, attitude towards ICT, cosmopoliteness, innovativeness, planning orientation and knowledge on ICT tools. Based on these above discussion and the review of literature, it was observed that all of the earlier studies were to explore relationship between awareness of SAAOs on ICT tools for extension service. Considering the above mentioned discussion a conceptual framework has been developed for this study (Figure 2.1).

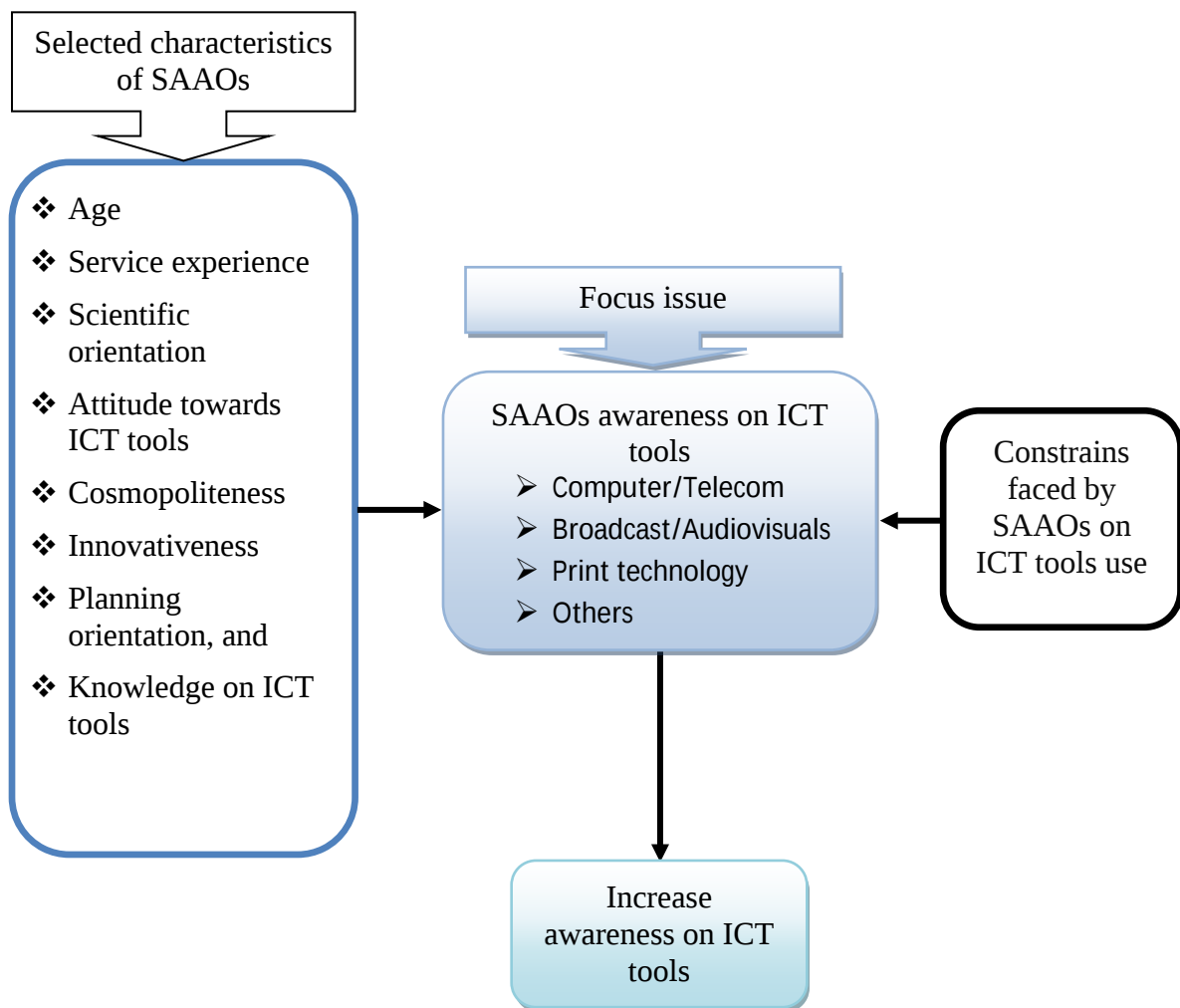


Figure 2.1 Conceptual framework of the study

CHAPTER 3

METHODOLOGY

Methods and procedures used in conducting research need very careful consideration. Methodology 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 study have been discussed in this Chapter. Further, the chapter includes the operational format and comparative reflection of some issues used in this study. Also statistical methods and their use have been mentioned in the last section in this Chapter

3.1 Research Design of the Study

Research design means the plan, structure and strategy of investigation conceived so as to obtain answer to research question and control variance. Designing the research for the study was taken in a scientific method. Firstly, different research themes are collected and analyzed followed by research problem formulation. Reviews were studied to select appropriate issues and preparation of research instrument. Pretesting of the research instrument was done before final data collection. Finally data were collected, analyzed and report was prepared.

3.2 Locale of the Study

This study was conducted at Gongachara, Rangpur sadar, Mithapukur and Bodarganj upazila in Rangpur district. Data were collected from a sample of the SAAOs from four upazilas of Rangpur district. A map of Bangladesh showing Rangpur district and a map of Rangpur district showing upazilas (Bangladesh inset including) as well as has been presented in Figure 3.1 and Figure 3.2 respectively.

3.3 Population and Sampling

Random sampling procedure was followed in this study. At first four out of eight upazilas of Rangpur district was randomly selected. A list of SAAOs from the selected upazila was collected from respective Upazila Agriculture Office. The selected SAAOs situated in four upazilas such as Gongachara, Rangpur sadar, Mithapukur and Bodarganj under Rangpur district were constitute the population of the study. The total SAAOs of these selected Blocks were 144 which constituted the population of this study. In the final stage a total of 77 SAAOs (about 54 percent of the sampling population) were selected as the sample of the present study following random sampling method. Due to the possibility of unavailability of the selected respondent, reserve lists of nine SAAOs were made to substitute the missing respondent in the original list (Table 3.1).

Table 3.1 Distribution of population and sample of SAAOs from the selected upazilas in the Rangpur district

District	Upazila	Union	Population (Block)	Sample size	Reserve list
Rangpur	Gongachara	10	30	16	2
	Rangpur sadar	11	33	17	2
	Mithapukur	17	51	28	3
	Bodarganj	10	30	16	2
Total		48	144	77	9

3.4 Research Instrument

In order to collect relevant data, an interview schedule was carefully prepared, keeping the objectives of the study in mind. The interview schedule contained both open and closed form of questions. The draft interview schedule was pre-tested in actual field situation before using the same for collection of data. This pre-test facilitated the researcher to identify faulty and ambiguous questions. In total 10 respondents from different parts of the study area were interviewed for the pre-test. Necessary alteration, additions and adjustments were made in the schedule on the basis of the pre-test result. The interview schedule was then printed in its final form for collection of data.

3.5 Measurement of Different Issues

This section contains procedure for measurement of both the selected characteristics of the SAAOs and the focus issues of the study. According to the relevant research area, the researcher selected eight characteristics of the SAAOs and awareness on ICT tools for extension service as the focus issue of the study.

3.5.1 Measurement of the selected characteristics of the SAAOs

In total eight selected characteristics of the SAAOs were considered for the study. These were age, service experience, scientific orientation, attitude towards ICT tools, cosmopolitaness, innovativeness, planning orientation and knowledge on ICT tools. The procedures followed for measuring for each of the characteristics are discussed as follows.

3.5.1.1 Age

Age of the SAAOs referred to the period from a respondent's birth to the time of interviewing. It was measured in terms of complete years 1 (Item No.1, Appendix-A).

3.5.1.2 Service experience

Service experience meant the experience which was gained by the SAAOs from his service. It was determined by total number of years of service by the SAAO in his entire lifetime. I.e. score 1 was assigned for each year of service.

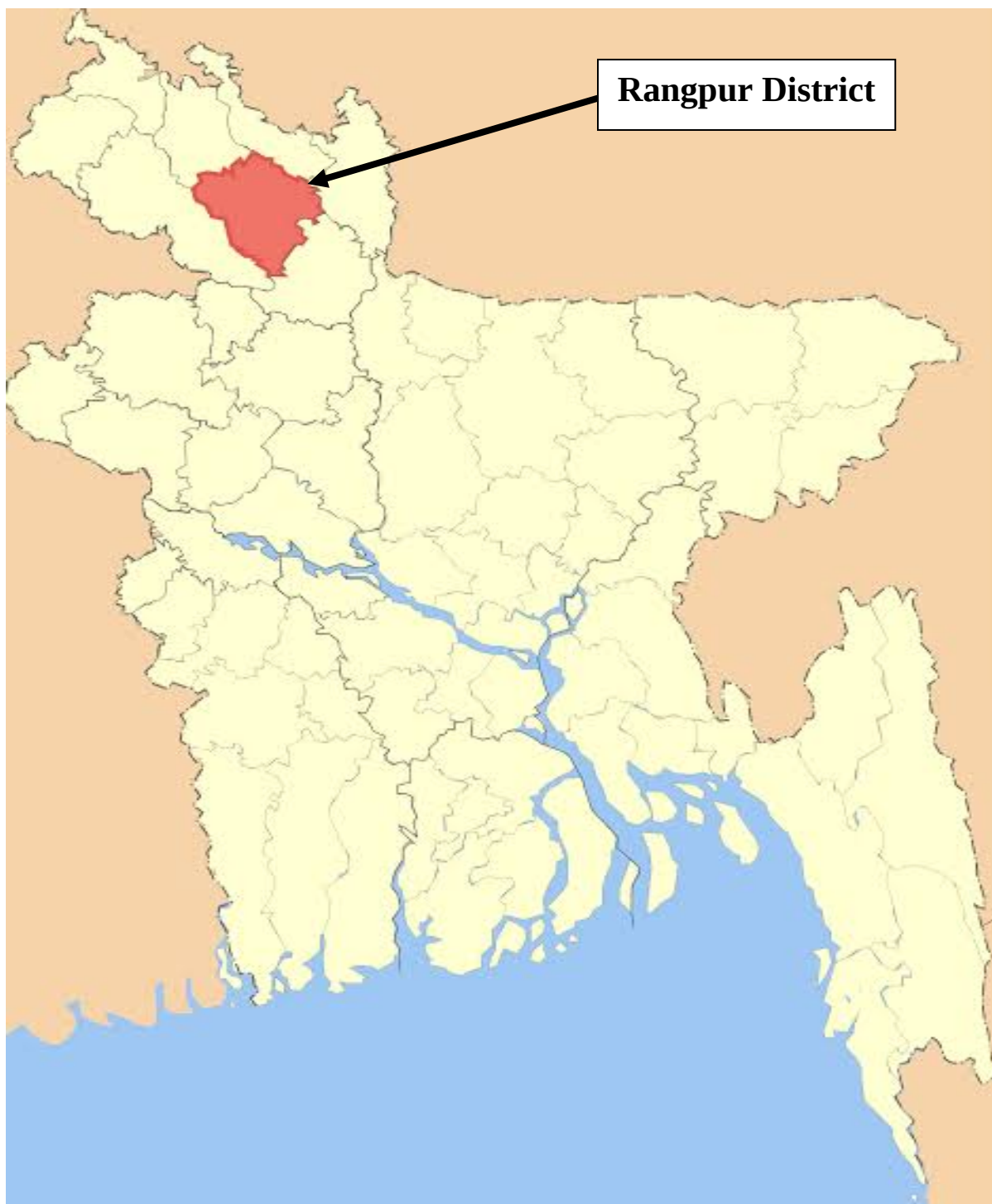


Figure 3.1 Map of Bangladesh indicating Rangpur district

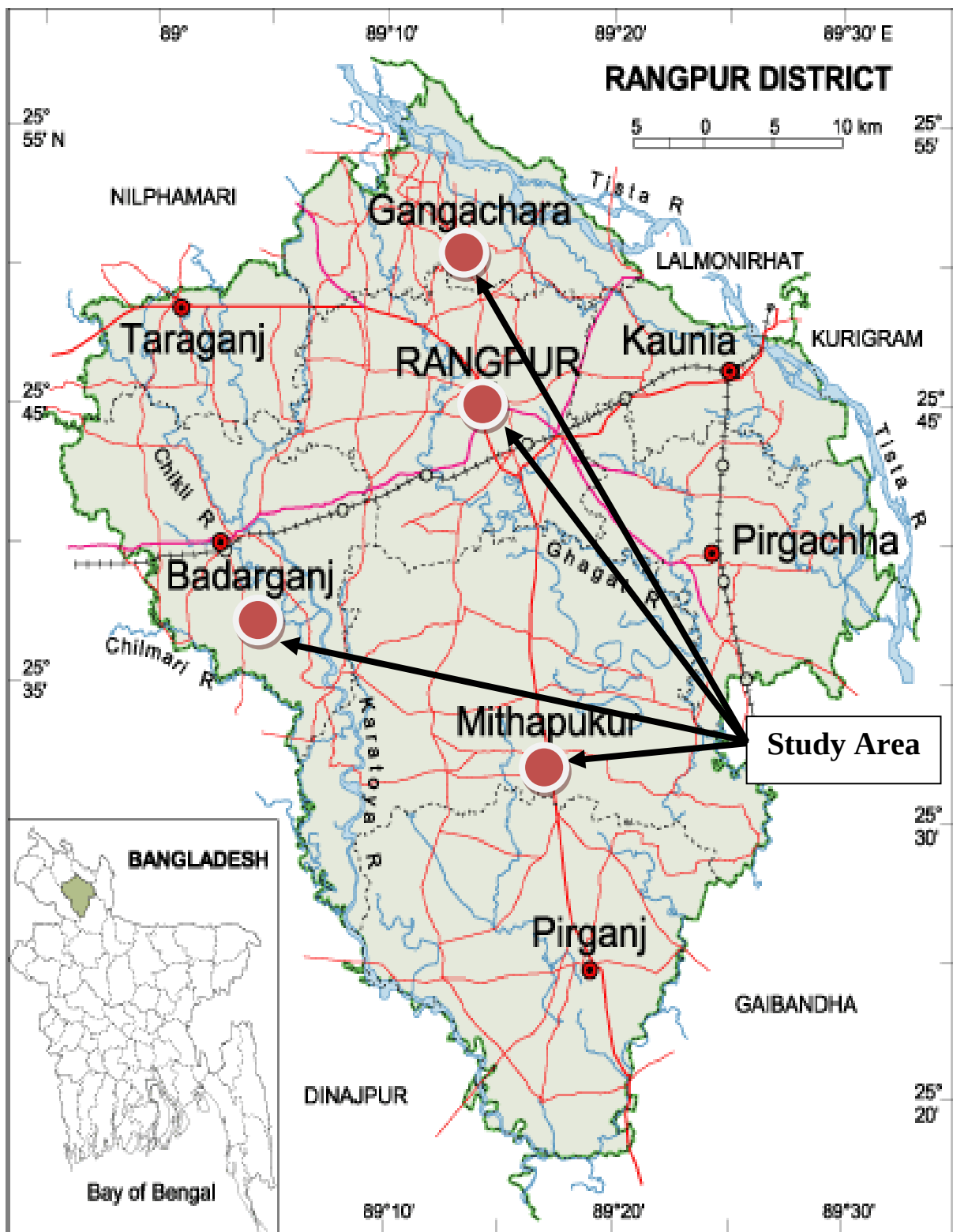


Figure 3.2 Map of Rangpur district including its upazilas (Bangladesh inset)

3.5.1.3 Scientific orientation

This refers to the degree to which a respondent is oriented towards the use of scientific methods. Supe (1969) defined scientific orientation as the degree to which a farmer is oriented towards the use of scientific method of farming. The scoring procedure developed by Supe (1969). There were six statements in the scale of which second one alone was negative.

The scoring procedure followed is given below:

Response	SA	A	UD	DA	SDA
Scores for positive statements	5	4	3	2	1
Scores for negative statement	1	2	3	4	5

SA= Strongly agree, A=Agree, UD=Undecided, DA=Disagree and SDA= Strongly disagree

The scores for the positive and negative statement were summed up to get the total score of an individual respondent. Maximum and minimum possible score of an individual could obtain were 30 and 6, respectively. The respondents were categorized into 'low', 'medium' and 'high' using percentile method.

3.5.1.4 Attitude towards ICT

Attitude is an organized predisposition to think, feel and perceive and behave towards a cognitive object. Defined attitude as the degree of positive and negative effect associated with some psychological object. Attitude towards ICT tools of a SAAO was measured by a Likert scale. The statements were 'strongly agree', 'agree', 'undecided', 'disagree' and 'strongly disagree'. The weights assigned were 5, 4, 3, 2 and 1 respectively for positive statements and the order was reversed for negative statements. An attitude score of a respondent was obtained by summing up the weights for his 6 statements regarding ICT utilization in agricultural extension. The attitude score of a respondent could range from 6 to 30, while 6 indicating low perception and 50 indicating highest level of attitude (Biswas, 2004).

3.5.1.5 Cosmopoliteness

It referred to the degree of an individual's orientation to external or outside to his social system. In this study cosmopolitans of the respondent was measured by computing a score on the basis of his frequency of visit to 5 (five) different type of places. The scales, used for computing the extent of cosmopolitans was not at all, rarely, occasionally and frequently. The weights assigned for these scales were, 0, 1, 2 and 3 respectively. The Weights obtained for visits to each of these 5 (five) categories of places were added together to obtain the cosmopoliteness score of a respondent. The possible range of scores could vary from 0 to 18, where indicates no cosmopoliteness and 18 indicates very high cosmopoliteness (Mondol, 2009). The variable appears in item No. 5 in the interview schedule (Appendix -A).

3.5.1.6 Innovativeness

Innovativeness of a SAAO was measured by computing an innovativeness score on the basis of his adoption of 10 selected ICT related technologies. Innovativeness sub-score was assigned on the basis of his duration of adoption and extent of adoption of a particular technology. Duration of adoption of a new technology was measured as ‘not at all adoption’, ‘adoption after two years of hearing’, ‘adoption after one years of hearing’, ‘adoption within one year of hearing’ and score were assigned as 0, 1, 2, and 3 respectively. However, the extent of adoption of a new technology was measured by the following formula. Sub-scores are summated to find the innovativeness score of a particular respondent. Innovativeness score of a respondent could range from 0 to 30 where 0 indicated no innovativeness and 30 indicated highest innovativeness.

3.5.1.7 Planning orientation

Planning orientation of a SAAO was measured by computing a ‘planning orientation score’ on the basis of six item measuring scale, three of the items being stated positively and other three negatively. For computing the planning orientation of the respondent against each item, a Likert scale was used as: ‘strongly agree’, ‘agree’, ‘undecided’, ‘disagree’ and ‘strongly disagree’. The weights assigned were 5, 4, 3, 2 and 1 respectively for positive statements and the order was reversed for negative statements. Each SAAO indicated their agreement on the weighting scale and from these responses the total planning orientation score of a SAAO was determined by adding the six weights. Planning orientation score of a SAAO could range from 6 to 30, 6 indicated no planning orientation, whereas 30 indicated a very highest planning orientation (Appendix-A).

3.5.1.8 Knowledge of SAAOs on ICT tools

After thorough consultation with relevant experts and reviewing of related literature, 10 questions regarding knowledge of SAAOS on ICT tools were selected and those were asked to the respondents to determine their ICT knowledge. Different scores such as 2 were assigned against different levels of question (Hossain, 2010). Answering a question correctly of an individual could obtain full score, partial score was given to partial correct answer and zero (0) was assigned for wrong answer. Thus, the agricultural knowledge score of a respondent could range 2.5 to 20, where 2.5 indicate no knowledge and 20 indicates very high knowledge. The variable appears in item number 8 Appendix-A.

3.5.2 Measurement of focus issue

Awareness of SAAOs on ICT tools: Awareness is the knowledge provoking approach of human psychology. Here awareness on ICT tools means SAAOs response towards ICT tools regarding their knowledge endowment related to use of ICT tools for seeking information related to agriculture.

The awareness of SAAOs on ICT tools is the focus issue of this study. This is measured with the help of the modified scale constructed by Kabir (2015). The scale consisted of 18 ICT tools awareness. The responses about the ICT tools used are taken on the basis of five degrees namely heard, seen, have, used and skill with the assigned score 1, 2, 3, 4, and 5, respectively. The summated score reflected the total awareness score on ICT tools used by the users. However, the total score of awareness of ICT tools were obtained by adding the score of all items in the scale. Thus, the awareness of ICT tools of a respondent could range from 18 to 90, where 18 indicated not aware at all and 90 indicated highly aware of ICT in case of agricultural information.

3.6 Problems confronted by the SAAOs in using ICT Tools

To determine the problems encountered by the SAAOs in using ICT tools the researcher made discussion with the supervisory committee, other experts, review of literature. With discussion with them ten problems were selected for study. Each SAAO was asked to indicate his option regarding each problem. SAAOs had option to indicate each problem as 'no', 'low', 'moderate', and 'severe'. To get score of each problem 'no', 'low', 'moderate', and 'severe' were assigned by 0, 1, 2 and 3, respectively. For getting total score the ten problems of the SAAOs, each item along with rank order was computed by using the following formula (Khan, 2012):

$$\text{Problem Confrontation Index (PCI)} = Pnp \times 0 + Plp \times 1 + Pmp \times 2 + Psp \times 3$$

Where,

Pnp= Percent of respondents with 'no problem'

Plp= Percent of respondents with 'low problem'

Pmp = Percent of respondents with 'moderate problem'

Psp = Percent of respondents with 'severe problem'

The problem confrontation score could range from 0 to 30. This variable appears in item No. 10 in the interview schedule (Appendix-A).

3.7 Data Collection

Data were collected personally by the researcher himself through face to face interview. The researcher made all possible efforts to explain the purpose of the study to the SAAOs. Rapport was established with the SAAOs prior to interview and the objectives were clearly explained by using local language as far as possible. After completion of interview, it was checked and editing was done as per necessary. The researcher did not face any major problem in collecting data. Excellent cooperation and coordination were extended by the respondents and other concern persons at the time of data collection. Data were collected during the period of 01 to 30 September 2018.

3.8 Statement of Hypothesis

As defined by Goode and Hatt (1952) 'A hypothesis is a proposition, which can be put to a test to determine its validity.' It may prove correct or incorrect of a proposition. In any event, however, it leads to an empirical test. Hypotheses are always in declarative sentence form and they relate either generally or specifically variables to sentence form and they relate either generally or specifically variables to variables. Hypothesis may be broadly divided into two categories, namely, research hypothesis and null hypothesis.

3.8.1 Research hypothesis

Research hypothesis (H_a) states anticipated relationships between concerned variables. Based on review of literature and development of conceptual framework, the research hypotheses were 'there were relationships between age, service experience, scientific orientation, attitude towards ICT tools, cosmopolitaness, innovativeness, planning orientation and knowledge on ICT tools of the SAAOs with their awareness ICT tools for extension service'.

3.8.2 Null hypothesis

Null hypothesis (H_o) states that there is no relationship between the concerned variables. Therefore, the null hypothesis developed for this study 'there were no relationships between age, service experience, scientific orientation, attitude towards ICT tools, cosmopolitaness, innovativeness, planning orientation and knowledge on ICT tools of the SAAOs with their awareness on ICT tools for extension service'.

3.9 Data Processing and Analysis

After completion of field survey, all the data were coded, compiled and tabulated according to the objectives of the study. Local units were converted into standard units. All the

individual responses to questions of the interview schedule were transferred in to a master sheet to facilitate tabulation, categorization and organization. In case of qualitative data, appropriate scoring technique was followed to convert the data into quantitative form.

The data were analyzed in accordance with the objectives of the study. Qualitative data were converted into quantitative data by means of suitable scoring techniques wherever necessary. The statistical measures such as range, means, standard deviation, number and percentage distribution were used to describe the variables. Pearson's Product Moment Coefficient of Correlation (r) was used in order to explore the relationships between the concerned variables. Five percent (0.05) level of probability was the basis for rejecting any null hypothesis throughout the study. The SPSS computer package was used to perform all these process.

CHAPTER 4

RESULTS AND DISCUSSION

In this Chapter, findings have been presented in four sections according to the objectives of the study. First section deals with the selected characteristics of the SAAOs. Second section focused on the awareness of respondents on ICT tools. The relationships between the selected characteristics of the SAAOs their awareness on ICT tools for extension services are presented in third section. The last selecting deals with the problems faced by SAAOs in using ICT tools for extension services.

4.1 Selected Characteristics of the SAAOs

There are many interrelated and constituent attributes that characterize an individual and form an integral part on the development of one's behavior and personality. It was, therefore assumed that awareness on ICT tools by the SAAOs for extension services may be influenced by their various characteristics. A total eight characteristics namely; age, service experience, scientific orientation, attitude towards ICT tools, cosmopoliteness, innovativeness, planning orientation and knowledge on ICT tools of the SAAOs were selected for this study. These characteristics of the respondents have been described in this section.

4.1.1 Age

The age of an individual is one of the most important factors pertaining to his/her personality makeup which play an important role in her/his adoption behavior. Age of the SAAOs ranged from 25 to 56 years. The mean being 40.32 years and the standard deviation was 10.26 years. On the basis of age, SAAOs were classified into three categories namely 'young' (23 to 35) 'medium' (36-50) and 'old' (above 50) as shown in Table 4.1.

Data presented in Table 4.1 indicates that the highest proportion (42.86 percent) of the SAAOs was young aged compared to 32.47 percent under middle aged and 24.68 percent old age category. Thus, the finding indicates that the overwhelming majority (75.33 percent) of the SAAOs were young to middle aged. Young people are generally receptive to new ideas and things. They would have a favorable attitude towards ICT tools if necessary steps are taken by the extension personnel.

4.1.2 Service experience

Duration in service is the length of time measured in years that an individual had been in a particular profession or related activity that lead to his/her increase in knowledge or skill. In other words, it is the active involvement of an individual in an activity or exposure to events or people over a period of time that leads to an increase in knowledge or skill.

Table 4.1 Selected characteristics of the SAAOs (n=77)

Characteristics	Scoring method	Range	Categories	Respondents		Mean	SD
		Observed (Possible)		No.	%		
Age	No. of year	25-56 (Unknown)	Young (23-35)	33	42.86	40.32	10.26
			Middle aged (36-50)	25	32.47		
			Old (>50)	19	24.68		
Service experience	Year of service	1-37 (Unknown)	Short term (up to 12)	38	49.35	16.00	12.16
			Medium term (13-24)	14	18.18		
			Long term (>24)	25	32.47		
Scientific orientation	Score	16-30 (6-30)	Low (≤ 19)	21	27.27	20.68	2.18
			Medium (20-23)	51	66.23		
			High (>23)	05	06.49		
Attitude towards ICT tools	Score	10-22 (6-30)	Less favorable (≤ 15)	16	20.78	17.08	2.32
			Moderately favorable (16-19)	52	67.53		
			Highly favorable (>19)	09	11.69		
Cosmopolite-ness	Score	1-9 (0-15)	Low (≤ 3)	14	18.18	4.53	1.52
			Medium (4-6)	56	72.73		
			High (>6)	07	9.09		
Innovativen-ess	Score	3-24 (0-30)	Low (≤ 10)	48	62.34	7.38	4.30
			Medium (11-20)	22	28.57		
			High (>20)	05	06.49		
Planning orientation	Score	11-27 (6-30)	Low (≤ 16)	21	27.27	9.57	4.12
			Medium (17-26)	42	54.55		
			High (>26)	14	18.18		
Knowledge on ICT tools	Score	4-19 (0-20)	Low (≤ 5)	12	15.58	9.57	4.11
			Medium (6-13)	47	61.04		
			High (>13)	18	23.38		

The service experience score of the respondents ranged from 1 to 37 years with a mean of 16.00 years and standard deviation of 12.16. The respondents were classified into three categories namely 'low experience' (up to 12), 'medium experience' (13 to 24) and 'high experience' (above 24). The distribution of the SAAOs on the basis of the service experience scores is shown in Table 4.1.

Results indicate that the highest proportion (49.35 percent) of the respondents had low service experience while 18.18 percent had medium service experience and 32.47 percent having high service experience. Idrisa *et al.* (2013) in their study on use of Information and Communication Technology (ICT) among extension workers in Borno state, Nigeria who

reported that majority of agricultural extension agents in the area had above 20 years' experience in service.

4.1.3 Scientific orientation

Scientific orientation refers to the degree to which a respondent is oriented towards the use of scientific methods. Scientific orientation score of the respondents towards ICT tools could theoretically range from 6 to 30. However, the observed ranged was 16 to 30 with an average of 20.68, standard deviation of 2.18. Based on the scientific orientation score, the respondents were placed under three categories namely 'low' (≤ 19), 'medium' (20-23) and 'high' (> 23) (Table 4.1).

The data contained in Table 4.1 shows that more than half (66.23percent) of the respondents belonged to the medium scientific orientation category, while, 27.27and 06.49 percent of them were found to have low and high scientific orientation, respectively. However, the overwhelming (93.5 percent) of the respondents had low to medium scientific orientation category.

4.1.4 Attitude towards ICT tools

Attitude towards ICT tools can express itself as SAAOs' mental state of readiness responding to Information and Communication Technology tools. Attitude towards ICT tools score of the SAAOs ranged from 10 to 22 against a possible range of 6 to 30 with a mean and standard deviation of 17.08and 2.32 respectively. Based on attitude scores, the respondents were classified into three categories i.e. 'less favorable' (≤ 15), 'moderately favorable' (16-19), and 'highly favorable' (> 19) attitude towards ICT tools (Table 4.1).

The result shows that the highest proportion (67.53 percent) of the SAAOs had moderately favorable attitude towards ICT tools compared to 20.78 percent less favorable and 11.69 percent had highly favorable attitude towards ICT tools. The findings show that a good number (88.31 percent) of the SAAOs had less to moderately favorable attitude towards ICT in the study area.

4.1.5 Cosmopolitaness

Cosmopolitaness means respondents movement outside of his workplace, Such as SAAOs. When a SAAOs moved frequently outside of his own workplace which make his attitude positive towards ICT tools. The cosmopolitaness scores of the respondent ranged from 1 to 9 against the possible range of 0 to 15 with a mean of 4.53 and standard deviation of 1.52. Based on their cosmopolitaness score, the respondents were classified into three categories. These categories were 'low' (≤ 3), 'medium' (4-6) and 'high' (> 6) cosmopolitaness (Table 4.1).

Data presented in Table 4.1 shows that almost three-fourths (72.73 percent) SAAOs were medium cosmopolitaness, where as 18.18 percent were low cosmopolitaness and only 9.09 percent of the SAAOs were high cosmopolitaness. Alam (2004) reported close to similar result in his respective study. The results have become possible due to improvement of transport facility of in Bangladesh. At present vehicles like bus, tempo, baby taxi, easy bike, van, bi-cycle etc. are almost always available in the study areas.

4.1.6 Innovativeness

The innovativeness scores of the respondents ranged from 3 to 24, against the possible score of 0 to 30. The mean and standard deviation were 7.38 and 4.30 respectively. Based on innovativeness scores, the respondents were classified into three categories such as 'low' (≤ 10), 'medium' (11-20) and 'high' (> 20) (Table 4.1).

The computed data indicated that 62.34 percent of the respondents had Low innovativeness compared with 28.57 percent had Medium and only 06.49 percent had high innovativeness. Thus, overwhelming majority (90.91 percent) of the SAAOs had low to medium innovativeness on ICT tools. This means that remarkable portion of the respondents of the study area were low to medium innovativeness towards the improved ICT tools practices.

4.1.7 Planning orientation

Planning orientation score of the respondents towards ICT tools could theoretically range from 6 to 30. However, the observed ranged was 11 to 27 with an average of 9.57, standard deviation of 4.12. Based on the Planning orientation score, the respondents were placed under three categories namely 'low' (≤ 18), 'medium' (19-22) and 'high' (> 22) (Table 4.1).

The data contained in Table 4.1 shows that above half (54.55 percent) of the respondents belonged to the medium planning orientation category, while, 27.27 and 18.18 percent of them were found to have low and high planning orientation, respectively. Findings that more Four-Fifth (81.82 percent) of the SAAOs had low to medium planning orientation.

4.1.8 Knowledge on ICT tools

Knowledge on ICT tools of the SAAOs ranged from 4-19 against possible range 0-20 with an average of 9.57 and standard deviation 4.11 as shown in the Table 4.1. On the basis of SAAOs knowledge on ICT tools score the SAAOs were classified into three categories such as 'low' (≤ 5), 'medium' (6-13) and 'high' (> 13) as shown in Table 4.1.

Result of Table 4.1 indicate that highest proportion (61.04 percent) of the SAAOs had good knowledge while 23.38 percent had excellent knowledge on ICT tools and 15.58 percent had

poor knowledge on ICT tools. Knowledge refers to the information, understanding and skills that one gain through education or experience. SAAOs gained knowledge on ICT tools in course of time, experience and relevant training. Now Bangladesh is going to be a digital country. That is why it is observed from the findings that more Four-Fifth (84.42 percent) of the SAAOs had good to excellent knowledge on ICT tools.

4.2 SAAOs Awareness on ICT Tools for Extension Services

Awareness of SAAOs on ICT Tools for extension service was the focus issue of this study. An attempt was made to ascertain the awareness of SAAOs a total 18 ICT tools were considered. The focus issue was divided into four aspects such as computer/telecom, broadcast/audiovisuals, print technology and others were considered for ascertaining the focus issue. The first four sub-sections dealt with the dimensions of ICT tools while the 5th sub-section dealt with SAAOs overall awareness on ICT Tools for extension service. The findings of the four dimensions have been described below:

4.2.1 SAAOs awareness on computer/telecom

Awareness on computer score of the SAAOs varied from 5 to 25 against the possible range of 5 to 25, with an average of 13.69 and standard deviation of 3.38. The respondents were classified into three categories such as 'low' (≤ 10), 'medium' (11-17) and 'high' (> 17) based on their awareness on computer score (Table 4.2).

Table 4.2 Distribution of the SAAOs according to their awareness on computer

Category	Number	Percent	Observed Range (Possible)	Mean	Standard Deviation
Low (≤ 10)	12	15.58	5-25 (5-25)	13.69	3.38
Medium (11-17)	56	72.73			
High (> 17)	09	11.69			
Total	77	100.00			

Data contained in Table 4.2 indicates that majority of the respondents (72.73 percent) are under medium level of awareness on computer followed by 15.58 percent low level of awareness on computer and only 11.69 percent high level of awareness on computer respectively. The result indicates that an overwhelming majority (88.31 percent) of the SAAOs were low to medium level of awareness on computer.

4.2.2 SAAOs awareness on broadcast/audiovisuals

Awareness on audiovisuals score of the SAAOs varied from 3 to 12 against the possible range of 3 to 15, with an average of 7.47 and standard deviation of 2.22. The respondents were classified into three categories such as 'low' (≤ 5), 'medium' (6-10) and 'high' (>10) based on their awareness on audiovisuals score (Table 4.3).

Table 4.3 Distribution of the SAAOs according to their awareness on audiovisuals

Category	Number	Percent	Observed Range (Possible)	Mean	Standard Deviation
Low (≤ 5)	15	19.48	3-12 (3-15)	7.47	2.22
Medium (6-10)	55	71.43			
High (>10)	07	9.09			
Total	77	100.00			

Data contained in Table 4.3 indicates that majority of the respondents (71.43 percent) are under medium level of awareness on audiovisuals followed by 19.48 percent low level of awareness on audiovisuals and only 9.09 percent high level of awareness on audiovisuals respectively. The result indicates that an overwhelming majority (90.91 percent) of the SAAOs were low to medium level of awareness on audiovisuals.

4.2.3 SAAOs awareness on print technology

Awareness on print technology score of the SAAOs varied from 5 to 21 against the possible range of 5 to 25, with an average of 10.87 and standard deviation of 4.04. The respondents were classified into three categories such as 'low' (≤ 7), 'medium' (8-15) and 'high' (>15) based on their awareness on print technology score (Table 4.4).

Table 4.4 Distribution of the SAAOs according to their awareness on print technology

Category	Number	Percent	Observed Range (Possible)	Mean	Standard Deviation
Low (≤ 7)	16	20.78	5-21 (5-25)	10.87	4.04
Medium (8-15)	50	64.94			
High (>15)	11	14.29			
Total	77	100.00			

Data contained in Table 4.4 indicates that majority of the respondents (64.94 percent) are under medium level of awareness on print technology followed by 20.78 percent low level of awareness on print technology and only 14.29 percent high level of awareness on print

technology respectively. The result indicates that an overwhelming majority (85.72 percent) of the SAAOs were low to medium level of awareness on print technology.

4.2.4 SAAOs awareness on others

Awareness on others score of the SAAOs varied from 5 to 21 against the possible range of 5 to 25, with an average of 11.10 and standard deviation of 4.04. The respondents were classified into three categories such as 'low' (≤ 7), 'medium' (8-14) and 'high' (>15) based on their awareness on others score (Table 4.5).

Table 4.5 Distribution of the SAAOs according to their awareness on others

Category	Number	Percent	Observed Range (Possible)	Mean	Standard Deviation
Low (≤ 7)	17	22.08	5-21 (5-25)	11.10	4.04
Medium (8-14)	43	55.84			
High (>15)	17	22.08			
Total	77	100.00			

Data contained in Table 4.5 indicates that majority of the respondents (55.84 percent) are under medium level of awareness on others followed by equal proportion 22.08 percent low level of awareness and high level of awareness.

4.2.5 Overall awareness of SAAOs awareness on ICT tools for extension services

Overall awareness of the SAAOs varied from 23 to 68 against the possible range of 18 to 90, with an average of 43.35 and standard deviation of 10.02. The respondents were classified into three categories such as 'low' (≤ 33), 'medium' (34-53) and 'high' (>53) based on their overall awareness (Table 4.6).

Table 4.6 Distribution of the SAAOs according to their overall awareness

Category	Number	Percent	Observed Range (Possible)	Mean	Standard Deviation
Low (≤ 33)	15	19.48	23-68 (18-90)	43.35	10.02
Medium (34-53)	51	66.23			
High (>53)	11	14.29			
Total	77	100.00			

Data contained in Table 4.6 indicated that majority of the SAAOs (66.23 percent) are under medium level of awareness on ICT tools followed by 19.48 percent low level of awareness on ICT tools and only 14.29 percent high level of awareness on ICT tools respectively. It is revealing the fact that most of the SAAOs in the study area have medium level of awareness

on ICT tools and initiatives could be taken for enhancing their awareness on ICT enabled extension services.

This means that majority (85.71 percent) of the SAAOs were low to medium aware about the ICT tools for extension service. It is revealing the fact that most of the SAAOs in the study area have medium level of awareness on ICT tools and initiatives could be taken for enhancing their awareness on ICT tools enabled extension services. Islam (2014) and Tonni (2017) reported similar findings in their respective studies.

4.3 Relationships between the Selected Characteristics of SAAOs with their Awareness on ICT Tools for Extension Service

The purpose of this section was to explain the relationship between the selected characteristics of the SAAOs and their awareness on ICT tools. Pearson's Product Moment Correlation Coefficient (r) was used to test the concerned null hypothesis in explaining relationship between the concerned variables. The summary of the results of correlation test is presented in Table 4.7 and the correlation matrix appears in the Appendix-B.

4.3.1 Age and awareness on ICT tools

The relationship between age of the SAAOs and their awareness on ICT tools was examined by testing the null hypothesis: There is no relationship between age of the SAAOs and their awareness on ICT tools. The observed value of the coefficient between age of the SAAOs and their awareness on ICT tools was found to be $r = -0.277$ as shown in (Table 4.7). However, the following observations were made regarding the relationship between age of the SAAOs and their awareness on ICT tools, based on the coefficient values:

- a. The relationship showed a negative trend.
- b. A significant relationship was found between the concerned variables.
- c. The observed value of ($r = -0.277$) was significant at 5 percent level of probability.

Based on the above findings, the null hypothesis was rejected. Thus, it was concluded that extension age of the respondents had a significant negative relationship with their awareness on ICT tools. Roy (2018) observed similar findings.

4.3.2 Service experience and awareness on ICT tools

The relationship between service experience of the SAAOs and their awareness on ICT tools was examined by testing the null hypothesis: There is no relationship between service experience of the SAAOs and their awareness on ICT tools. The observed value of the

coefficient of correlation between Service experience of the SAAOs and their awareness on ICT tools was found to be $r = -0.235$ as shown in (Table 4.7). However, the following observations were made regarding the relationship between Service experience of the SAAOs and their awareness on ICT tools, based on the coefficient values:

- a. The relationship showed a negative trend.
- b. A significant relationship was found between the concerned variables.
- c. The observed value of ($r = -0.235$) was significant at 5 percent level of probability.

Based on the above findings, the null hypothesis was rejected. Thus, it was concluded that extension service experience of the respondents had a significant negative relationship with their awareness on ICT tools. The findings had consistency with Roy (2018).

Table 4.7 Relationship between respondent characteristics and awareness on environmental degradation

Focus issue	Selected characteristics	Computed values of 'r' with 75 d.f.
Awareness of SAAOs on ICT tools	Age	-.277*
	Service experience	-.235*
	Scientific orientation	.270*
	Attitude towards ICT tools	-.068
	Cosmopoliteness	.089
	Innovativeness	.309**
	Planning orientation	.256*
	Knowledge on ICT tools	.401**

*, Significant at 5 percent level of significance; **, Significant at 1 percent level of significance

4.3.3 Scientific orientation and awareness on ICT tools

The relationship between scientific orientation of the SAAOs and their awareness on ICT tools was examined by testing the null hypothesis: There is no relationship between scientific orientations of the SAAOs with their awareness on ICT tools. The observed value of the coefficient of correlation between scientific orientation of the SAAOs and their awareness on ICT tools was found to be ($r = 0.270$) as shown in (Table 4.7). However, the following observations were made regarding the relationship between scientific orientation of the SAAOs and their awareness on ICT tools, based on the coefficient values:

- a. The relationship showed a positive trend.

- b. A significant relationship was found between the concerned variables.
- c. The observed value of ($r = 0.270$) was significant at 5 percent level of probability.

Based on the above findings, the null hypothesis was rejected. Thus, it was concluded that extension scientific orientation of the respondents had a significant positive relationship with their awareness on ICT tools.

4.3.4 Attitude towards ICT tools and awareness on ICT tools

The relationship between attitude towards ICT tools of the SAAOs and their awareness on ICT tools was examined by testing the null hypothesis: There is no relationship between attitude towards of the SAAOs and their awareness on ICT tools. The observed value of the coefficient of correlation between attitude towards of the SAAOs and their awareness on ICT tools was found to be $r = -0.068$ as shown in (Table 4.7). However, the following observations were made regarding the relationship between attitude towards of the SAAOs and their awareness on ICT tools, based on the coefficient values:

- a. The relationship showed a negative trend.
- b. A non-significant relationship was found between the two issues.
- c. Thus, the null hypothesis could be accepted and it may be concluded that attitude towards ICT tools of the SAAOs had negative relationship with their awareness on ICT tools.

4.3.5 Cosmopoliteness and awareness on ICT tools

The relationship between cosmopoliteness of the SAAOs and their awareness on ICT tools was examined by testing the null hypothesis: There is no relationship between cosmopoliteness of the SAAOs and their awareness on ICT tools. The observed value of the coefficient of correlation between cosmopoliteness of the SAAOs and their awareness on ICT tools was found to be $r = 0.089$ as shown in (Table 4.7). However, the following observations were made regarding the relationship between cosmopoliteness of the SAAOs and their awareness on ICT tools, based on the coefficient values:

- a. The relationship showed a positive trend.
- b. A non significant relationship was found between the concerned variables.

Based on the above findings, the null hypothesis was accepted. Thus, it was concluded that cosmopoliteness of the respondents had a positive relationship with their awareness on ICT tools.

4.3.6 Innovativeness and awareness on ICT tools

The relationship between innovativeness of the SAAOs and their awareness on ICT tools was examined by testing the null hypothesis: There is no relationship between innovativeness of the SAAOs and their awareness on ICT tools. The observed value of the coefficient of correlation between innovativeness of the SAAOs and their awareness on ICT tools was found to be $r = 0.309$ as shown in (Table 4.7). However, the following observations were made regarding the relationship between innovativeness of the SAAOs and their awareness on ICT tools, based on the coefficient values:

- a. The relationship showed a positive trend.
- b. A significant relationship was found between the concerned variables at 1 percent level of significance.

Based on the above findings, the null hypothesis was rejected. Thus, it was concluded that innovativeness of the respondents had a positive and significant relationship with their awareness on ICT tools. Begum (2014) and Alam (2004) also found similar findings in their studies.

4.3.7 Planning orientation and awareness on ICT tools

The relationship between planning orientation of the SAAOs and their awareness on ICT tools was examined by testing the null hypothesis: There is no relationship between planning orientation of the SAAOs and their awareness on ICT tools. The observed value of the coefficient of correlation between planning orientation of the SAAOs and their awareness on ICT tools was found to be $r = 0.256$ as shown in (Table 4.7). However, the following observations were made regarding the relationship between planning orientation of the SAAOs and their awareness on ICT tools, based on the coefficient values:

- a. The relationship showed a positive trend.
- b. A significant relationship was found between the concerned variables.
- c. The observed value of ($r = 0.256$) was significant at 5 percent level of probability.

Based on the above findings, the null hypothesis was rejected. Thus, it was concluded that extension planning orientation of the respondents had a significant positive relationship with their awareness on ICT tools.

4.3.8 Knowledge on ICT tools of using ICT tools and awareness on ICT tools

The relationship between knowledge on ICT tools of the SAAOs and their awareness on ICT tools was examined by testing the null hypothesis: There is no relationship between

knowledge on ICT tools of the SAAOs and their awareness on ICT tools. The observed value of the coefficient of correlation between knowledge on ICT tools of the SAAOs and their awareness on ICT tools was found to be $r = 0.401$ as shown in (Table 4.7). However, the following observations were made regarding the relationship between knowledge on ICT tools of the SAAOs and their awareness on ICT tools, based on the coefficient values:

- a. The relationship showed a positive trend.
- b. A significant relationship was found between the concerned issues.
- c. The observed value of ($r = 0.401$) was significant at 1 percent level of probability.

Based on the above findings, the null hypothesis was rejected. Thus, it was concluded that extension knowledge on ICT tools of the respondents had a significant positive relationship with their awareness on ICT tools.

4.4 Problems confronted by SAAOs in Using ICT Tools for Extension Services

The present study also assessed problems confronted by the SAAOs for extension service through ICT tools. In order to understand the problem facing status of the SAAOs the 10 selected problems were arranged in rank order by using Perception Indices (Table 4.8).

Table 4.8 Problems confronted by the SAAOs for extension service

Sl. No.	Problems	Extent of constraints				PCI	Rank order
		Not at all	Low	Mode-rate	Severe		
1.	Inadequate supply of computer software	10.39	15.58	45.45	28.57	192.19	7 th
2.	Irregular power supply	12.99	33.77	40.26	12.99	153.26	10 th
3.	Lack of training in the use of ICT facilities	3.90	15.58	18.18	62.34	238.96	1 st
4.	Malfunctioning of internet connectivity	3.90	22.08	49.35	24.68	194.82	6 th
5.	Insufficient knowledge of how to use ICT	6.49	15.58	48.05	29.87	201.29	4 th
6.	Poor maintenance of computer hardware	7.79	25.97	40.26	25.97	184.4	9 th
7.	Administrative blockage in funding for ICT	10.39	14.29	29.87	45.45	210.38	2 nd
8.	Too difficult to integrate ICT use into farming	10.39	14.29	55.84	19.48	184.41	8 th
9.	Higher price of ICT tools	3.90	19.48	44.16	32.47	205.21	3 rd

10.	Lack of technological facilities	9.09	14.29	44.16	32.47	200.02	5 th
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PCI= Problem confrontation Index

The major problem faced by the SAAOs in using ICT tools for extension service as shown in Table 4.8 was ‘Lack of training in the use of ICT facilities (PCI =238.96)’, followed by ‘Administrative blockage in funding for ICT (PCI =210.38)’ and ‘Higher price of ICT tools (PCI =205.21)’ with rank of 1st, 2nd and 3rd respectively. This implies that human capital development, lack of financial resources and computer literacy are very important factors for effective use of ICT tools in agricultural extension delivery. However the least problem identified by the SAAOs was ‘Irregular power supply (PCI =153.26)’.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Findings

5.1.1 Selected characteristics of the SAAOs

The **age** of an individual is one of the most important factors pertaining to his/her personality make up which play an important role in her/his adoption behavior. Age of the SAAOs ranged from 25 to 56 years. The mean being 40.32 years and the standard deviation was 10.26 years. On the basis of age, SAAOs were classified into three categories namely 'young' 'medium' and 'old'. The findings indicates that the highest proportion (42.86 percent) of the SAAOs was young aged compared to 32.47percent under middle aged and 24.68 percent old age category.

The **service experience** score of the respondents ranged from 1 to 37 years with a mean of 16.00 years and standard deviation of 12.16. The respondents were classified into three categories namely 'low experience', 'medium experience' and 'high experience'. The highest proportion (49.35 percent) of the respondents had low service experience while 18.18 percent had medium service experience and 32.47 percent having high service experience.

Scientific orientation score of the respondents towards ICT tools could theoretically range from 6 to 30. However, the observed ranged was 16 to 30 with an average of 20.68, standard deviation of 2.18. Based on the scientific orientation score, the respondents were placed under three categories namely 'low', 'medium' and 'high'. More than half (66.23percent) of the respondents belonged to the medium scientific orientation category, while, 27.27and 06.49 percent of them were found to have low and high scientific orientation, respectively.

Attitude towards ICT tools score of the SAAOs ranged from 10 to22 against a possible range of 6 to 30 with a mean and standard deviation of 17.08and 2.32 respectively. Based on attitude scores, the respondents were classified into three categories i.e. 'less favorable', 'moderately favorable' and 'highly favorable' attitude towards ICT tools. The highest proportion (67.53 percent) of the SAAOs had moderately favorable attitude towards ICT tools compared to 20.78 percent less favorable and 11.69 percent had highly favorable attitude towards ICT tools.

Cosmopolitaness scores of the respondent ranged from 1 to 9 against the possible range of 0 to 15 with a mean of 4.53 and standard deviation of 1.52. Based on their cosmopolitaness score, the respondents were classified into three categories. These categories were 'low',

‘medium’ and ‘high’ cosmopolitaness. Almost three-fourths (72.73 percent) SAAOs were medium cosmopolitaness, where as 18.18 percent were low cosmopolitaness and only 9.09 percent of the SAAOs were high cosmopolitaness. However, the overwhelming majority of (72.73 percent) SAAOs belonged to low to medium cosmopolitaness category.

The innovativeness scores of the respondents ranged from 3 to 24, against the possible score of 0 to 30. The mean and standard deviation were 7.38 and 4.30 respectively. Based on innovativeness scores, the respondents were classified into three categories such as ‘low’, ‘medium’ and ‘high’. The result indicate that 62.34 percent of the respondents had Low innovativeness compared with 28.57 percent had Medium and only 06.49 percent had high innovativeness.

Planning orientation score of the respondents towards ICT tools could theoretically range from 6 to 30. However, the observed ranged was 11 to 27 with an average of 9.57, standard deviation of 4.12. Based on the Planning orientation score, the respondents were placed under three categories namely ‘low’, ‘medium’ and ‘high’. About half (54.55 percent) of the respondents belonged to the medium planning orientation category, while, 27.27 and 18.18 percent of them were found to have low and high planning orientation, respectively.

Knowledge on ICT tools of the SAAOs ranged from 4-19 against possible range 0-20 with an average of 9.57 and standard deviation 4.11 as shown in the Table 4.1. On the basis of farmers knowledge on climate change score the farmers were classified into three categories such as ‘low’), ‘medium’ and ‘high’. The highest proportion (61.04 percent) of the SAAOs had good knowledge while (23.38 percent) had excellent knowledge on ICT tools and 15.58 percent had poor knowledge on ICT tools.

5.1.2 SAAOs awareness on ICT tools for extension services

Awareness of SAAOs on ICT Tools for extension service was the focus issue of this study. An attempt was made to ascertain the awareness of SAAOs a total 18 ICT tools were considered. The focus issue was divided into four aspects such as computer/telecom, broadcast/audiovisuals, print technology and others were considered for ascertaining the focus issue.

5.1.2.1 SAAOs awareness on computer/telecom: Awareness on computer score of the SAAOs varied from 5 to 25 against the possible range of 5 to 25, with an average of 13.69 and standard deviation of 3.38. The respondents were classified into three categories such as low, medium and high based on their awareness on computer score. Majority of the respondents (72.73 percent) are under medium level of awareness on computer followed by

15.58 percent low level of awareness on computer and only 11.69 percent high level of awareness on computer respectively.

5.1.2.2 SAAOs awareness on broadcast/audiovisuals: Awareness on audiovisuals score of the SAAOs varied from 3 to 12 against the possible range of 3 to 15, with an average of 7.47 and standard deviation of 2.22. The respondents were classified into three categories such as low, medium and high based on their awareness on audiovisuals score. Majority of the respondents (71.43 percent) are under medium level of awareness on audiovisuals followed by 19.48 percent low level of awareness on audiovisuals and only 9.09 percent high level of awareness on audiovisuals respectively.

5.1.2.3 SAAOs awareness on print technology: Awareness on print technology score of the SAAOs varied from 5 to 21 against the possible range of 5 to 25, with an average of 10.87 and standard deviation of 4.04. The respondents were classified into three categories such as low, medium and high based on their awareness on print technology score. Three-fifths of the respondents (64.94 percent) are under medium level of awareness on print technology followed by 20.78 percent low level of awareness on print technology and only 14.29 percent high level of awareness on print technology respectively.

5.1.2.4 SAAOs awareness on others: Awareness on others score of the SAAOs varied from 5 to 21 against the possible range of 5 to 25, with an average of 11.10 and standard deviation of 4.04. The respondents were classified into three categories such as low, medium and high based on their awareness on others score. Majority of the respondents (55.84 percent) are under medium level of awareness on others followed by equal proportion 22.08 percent low level of awareness and high level of awareness.

5.1.2.5 Overall awareness of SAAOs awareness on ICT tools for extension services: Overall awareness of the SAAOs varied from 23 to 68 against the possible range of 18 to 90, with an average of 43.35 and standard deviation of 10.02. The respondents were classified into three categories such as low, medium and high based on their overall awareness. Majority of the SAAOs (66.23 percent) are under medium level of awareness on ICT tools followed by 19.48 percent low level of awareness on ICT tools and only 14.29 percent high level of awareness on ICT tools respectively.

5.1.3 Relationships between selected characteristics of the SAAOs and their awareness on ICT tools

According to the Computed Correlation Coefficients (r) among the eight selected characteristics of the SAAOs four characteristics namely scientific orientation, innovativeness, planning orientation and knowledge on ICT tools showed positive significant relationship with their awareness on ICT tools. On other hand age and service experience showed negative significant relationship and the rest were fail to show any significant relationship.

5.1.4 Problems confronted by SAAOs in using ICT tools for extension services

The major problems in using ICT tools faced by SAAOs was 'Lack of training in the use of ICT facilities (PCI =238.96)', followed by 'Administrative blockage in funding for ICT (PCI =210.38)' and 'Higher price of ICT tools (PCI =205.21)' with rank of 1st, 2nd and 3rd respectively.

5.2 Conclusions

1. The result also indicates that more than three-fifths (62.34 percent) of the SAAOs had low innovativeness. Thus, it may be concluded that it is necessary to increase knowledge of the SAAOs on ICT tools through training programs.

The result also indicates that more than half (54.55 percent) of the SAAOs had medium planning orientation. Thus, it may be concluded that the SAAOs are moderately efficient in their office management.

2. The study revealed that the SAAOs had highest awareness on computer followed by others, print technology and audio visuals. Therefore, it may be concluded that the SAAOs awareness of different ICT tools of the selected four areas which is a good sign.

The majority (85.71 percent) of the SAAOs were low to medium aware about the ICT tools for extension service. Therefore it may be conclude that there is a need to raise awareness of the SAAOs about the ICT tools for extension service, through increasing knowledge.

3. Innovativeness of the SAAOs had significant relationship with their awareness on ICT tools. The finding leads to conclude that the SAAOs are more aware on ICT tools for extension service.

The knowledge of SAAOs on ICT tools had positive and significant relationship with their awareness. It may therefore be concluded that knowledge have important role to increase the use of ICT tools for extension service.

4. The respondents opined some considerable problems faced in provide extension service through ICT tools. Therefore it may be concluded that SAAOs are conscious about their problems regarding use of ICT tools for extension service.

5.3 Recommendations

5.3.1 Recommendations for policy implications

1. A little more than three-fourths (76.62 percent) of the SAAOs had poor to good knowledge on ICT tools. Therefore, it is strongly recommended that adequate technical support and training facilities should be extended to improve the knowledge of SAAOs on ICT tools.
2. The result indicates that there is a positive and significant relationship between scientific orientations of SAAOs with their awareness on ICT tools. Thus, it is recommended that DAE may take initiatives dissemination of scientific information among the SAAOs for increasing their ICT knowledge.
3. As the result of the study indicates positive and significant relationships between innovativeness with their awareness on ICT tools. Therefore it is recommended that DAE may be given emphasis to the innovative SAAOs while providing extension service through ICT tools.
4. As the result of the study indicates positive and significant relationships between ICT knowledge and awareness of SAAOs on ICT tools. Thus, it is recommended that DAE should initiate appropriate training programmers for the SAAOs for providing extension service through ICT tools.
5. SAAOs faced a considerable amount of problems in using ICT tools for extension service. It is therefore, recommended that DAE should give attention to solve the problems which are faced by the SAAOs.

5.3.2 Recommendations for further study

Considering the scope and limitations of the study, the following recommendations are made for further study.

1. This study was conducted with the SAAOs in four upazilas of Rangpur district. So, similar attempts may be taken in other parts of the country to verify the results.
2. This study investigates the relationship of eight characteristics of the SAAOs. Further research should be undertaken considering other characteristics of the SAAOs and situational factors.

3. Awareness on ICT tools was investigated by considering computer, audio visual, print technology and others. Thus, such study may be conducted considering other areas of ICT tools.
4. In the present study age, and service experience of the SAAOs should negative significant relationship with the awareness of SAAOs on ICT tools. Attitude towards ICT tools and cosmopolitaness should no significant relationships with the awareness of SAAOs on ICT tools. Hence further investigation is necessary to find out such relationships between the concern variables to authentic the present study.
5. Attitude towards ICT tools and cosmopolitaness had no significant relationship with their awareness of SAAOs on ICT tools. Therefore, further verification is necessary in this regard.
6. In the present study has been carried out at block level extension workers to determine their awareness on ICT tools. Similar study could be conducted with the unit level extension workers of DAE as well as other extension agencies.

Awareness of SAAOs on ICT Tools for Extension Services in Rangpur district

In view of the problems stated above, the following specific objectives were set forth in order to give proper direction to the study.

5. To determine and describe some selected characteristics of SAAOs. The selected characteristics are:
 - i. age
 - ii. service experience
 - iii. ICT training received
 - iv. effectiveness of ICT
 - v. attitude towards ICT
 - vi. cosmopolitaness
 - vii. innovativeness
 - viii. frequency of using ICT tools
 - ix. planning orientation
6. To investigate SAAOs awareness on ICT tools for extension services.
7. To explore the relationship between the selected characteristics of SAAOs with their ICT tools for extension services, and
8. To identify constrains faced by SAAOs in using ICT for extension services.

APPENDIX A

Department of Agricultural Extension

Hajee Mohammad Danesh Science and Technology University, Dinajpur

An interview schedule of the research study entitled
Awareness of SAAOs on ICT Tools for Extension Service in Rangpur District

Date: - - - - -

Serial No.

SAAOs' name - - - - - Upazila: - - - - - Block: - - - - -

Union - - - - - Mobile No - - - - -

(Please answer the following questions and put tick (✓) whenever necessary)

1. Age: What is your age? Years

2. Service experience: For how many years you are involved in service? Years

3. Scientific orientation: Indicate your opinion about the following statements.

Sl. No.	Statements	SA	A	U	DA	SDA
1(+)	New method of farming give better results to a farmer than old methods					
2(-)	The way a farmer's forefather operate is still the best way of farming today					
3(+)	Even a farmer with lot of experience should use new methods of farming					
4(-)	A good farmer experiments with new idea in farming					
5(+)	Traditional methods of farming have to be changed in order to raise the level of living					
6(-)	Though it takes time for a farmer to learn new methods in farming it is worth the efforts					

SA= Strongly agree, A=Agree, UD=Undecided, DA=Disagree and SDA= Strongly disagree

4. Attitude towards ICT: Please indicate your opinion about the following statements.

Sl. No.	Statements	Level of agreement				
		SA	A	U	D	SD

+1.	Illiteracy will not deter farmers in availing ICT services					
- 2.	ICT services' is a distant dream for resource poor farmers					
+3.	All kinds of information exchange are possible only through ICTs					
- 4.	Only resourceful farmers can get the benefit of the ICTs					
+5.	ICT extension services avoid the personal extension contact					
-6.	ICT based extension services are alternative to the present extension system					

SA= Strongly agree, A=Agree, U=Undecided, D=Disagree and SD= Strongly disagree

5. Cosmopoliteness: Indicate how frequently you visit the following places.

Sl. No.	Places of visit	Not at all	Extent of participation		
			Rarely	Occasionally	Frequently
1.	Visit to houses of friends or relatives (times/week)		1-3	4-5	≥ 6
2.	Visit to own district town (times/month)		Do	Do	Do
3.	Visit to other district town (times/3 months)		Do	Do	Do
4.	Division/capital city (times/year)		Do	Do	Do
5.	Out of the country (times/life)		1	2	≥ 3

6. Innovativeness: Please furnish your opinion about the duration and extent of uses of the following ICT tools in receiving farm information.

Sl. No.	Name of the technologies	Duration of adoption			
		Not at all	After 2 years of hearing	After 1 years of hearing	Within 1 year of hearing
1.	Mobile phone				
2.	Computer				
3.	Access to internet for agricultural purpose				
4.	E-mail				
5.	Fax				
6.	FM radio				
7.	Watching Satellite channel				
8.	Banglalink Jigyasha 7676 service				
9.	Grameenphone Community Information Centre Service				
10.	Facebook				

7. Planning Orientation: Please state the degree of your agreement or disagreement to each of the statements.

Sl. No.	Statements	Level of agreement				
		SA	A	U	D	SD
+1.	Each year, one should think a fresh about the crop to be					

	cultivated in each type of land					
- 2.	It is not necessary to make prior decision about the varieties of crop to be cultivated in the land					
+3.	It is possible to increase the yield through farm production plan					
- 4.	It is not necessary to think ahead the cost involved in raising a crop					
+5.	Timely planting of a crop can ensures good yield					
-6.	One need not consult agricultural experts for crop plan					

SA= Strongly agree, A=Agree, U= Undecided, D=Disagree and SD= Strongly disagree

8. Knowledge of SAAOs on ICT Tools: Can you reply the following questions on the five ICT tools.

Sl. No.	Questions	Total Marks	Obtained Marks
1.	Internet is a worldwide network.	2	
2.	It makes contact with people by chat facility.	2	
3.	Microsoft Word is word processor.	2	
4.	It is a powerful tool to create professional looking.	2	
5.	Excel is a data processor.	2	
6.	It stores data in the forms of columns and rows.	2	
7.	It consists of a number of individual pages or slides.	2	
8.	It helps in interesting pictures, diagrams etc.	2	
9.	GIS is for analysis and management of spatial data and mapping.	2	
10.	It helps to get information like populations, literacy level, density of roads, land etc.	2	
	Total	20	

9. Awareness on ICT tools: Please give your opinion on the following ICT tools.

Sl. No.	ICT Tools	Heard	Seen	Have	Used	Skills
A.	Computer/Telecom					
1.	Mobile phone calling					
2.	Computer					
3.	E-mail					
4.	Internet					
5.	Fax					

Contd.

Sl. No.	ICT Tools	Heard	Seen	Have	Used	Skills
B.	Broadcast/Audiovisuals					
1.	F.M. Radio					

2.	Television					
3.	Multimedia projector					
C.	Print Technology					
1.	Research bulletin					
2.	Newspaper					
3.	Posters					
4.	Magazines					
5.	Annual reports					
D.	Others					
1.	Video calling					
2.	Video recording					
3.	<i>Grameenphone</i> Community Information Centre Service					
4.	<i>Banglalink Jigyasha</i> 7676 service					
5.	Social Media (Facebook)					

10. Problems Confrontation: Please indicate the extent of problems that you face in provide ICT based agricultural extension services.

Sl. No.	Constraints	Extent of constraints			
		No	Low	Moderate	Severe
1.	Inadequate supply of computer software				
2.	Irregular power supply				
3.	Lack of training in the use of ICT facilities				
4.	Malfunctioning of internet connectivity				
5.	Insufficient knowledge of how to use ICT				
6.	Poor maintenance of computer hardware				
7.	Administrative blockage in funding for ICT				
8.	Too difficult to integrate ICT use into farming				
9.	Higher price of ICT tools				
10.	Lack of technological facilities				

Thanks for your kind cooperation.

.....
Signature of interviewer
Date:

APPENDIX-B

Correlation Matrix of the Focus Issue and Selected Characteristics of the SAAOs

	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	Y
X ₁	1								
X ₂	.976**	1							
X ₃	-.250*	-.250*	1						
X ₄	.026	.002	.112	1					
X ₅	-.059	-.065	.105	.149	1				
X ₆	-.184	-.168	.141	.191	.023	1			
X ₇	-.219	-.235*	.359**	-.352**	-.004	.301**	1		
X ₈	-.310**	-.312**	.274*	.044	.180	.297**	.282*	1	
Y	-.277*	-.235*	.270*	-.068	.089	.309**	.256*	.401**	1

*. Correlation is significant at the 0.05 level (2-tailed)

**. Correlation is significant at the 0.01 level (2-tailed)

Note:

X₁=Age

X₂= Service experience

X₃= Scientific orientation

X₄= Attitude towards ICT tools

X₅= Cosmopoliteness

X₆= Innovativeness

X₇= Planning orientation

X₈= Knowledge on ICT tools

Y= Awareness of SAAOs on ICT tools

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