

**KNOWLEDGE OF FARMERS ON MODERN AGRICULTURAL  
MACHINERIES**

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## *CERTIFICATE*

This is to certify that the thesis entitled “**Knowledge of farmers on modern agricultural machineries**” submitted to the **Department of Agricultural Extension and Information System**, Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfilment of the requirements for the degree of **MASTERS OF SCIENCE (M.S.) in AGRICULTURAL EXTENSION AND INFORMATION SYSTEM**, embodies the result of a piece of bonafide research work carried out by **ABDULLAH AL KAFEE**, **Registration No. 19-10239** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

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

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**Dedicated to  
My  
Beloved Parents**

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## ABSTRACT

Bangladesh is a agriculture based country. Most of the people of our country is related with agriculture. But due to low knowledge on agricultural operation or modern agricultural machineries operation the farmer faced huge loss on crop production. That's why the modern agricultural machineries need in agriculture sector to increase crop production. The modern machineries use in agricultural operation is called mechanization. The purpose of the study was to describe the selected socioeconomic characteristic of the farmers; to determine the extent of farmers' knowledge on agricultural machineries; and to explore the relationship of the selected characteristics of farmers on their knowledge on modern agricultural machineries. The study was undertaken purposely in Roumari Upazila under Kurigram district. Validated and well-structured interview schedule was used to collect data from 110 farmers. Data were collected by a pre tested interview schedule during 16 jun 2022 to 15 july 2022. Simple and direct questions with different scales were used to obtain information. Descriptive statistics, multiple co-relation were used for the analysis of collected data. The majority 47.72 percent of the respondents had low knowledge followed by 21.81 percent had high knowledge and 35.45 percent of the farmers had medium knowledge on agricultural machineries. Among 10 selected characteristics of the farmers 6 characteristics namely, education, quantity of modern machinery, attitude of farmers towards using modern agricultural machinery, annual family income, training exposure and extension media contact, had positive significant relationship with their knowledge on modern agricultural machineries but rest of four namely age, farm size, experience in farming, organizational participation had no significant relationship with their knowledge on modern agricultural machinery. Findings leads to conclusion that farmers' socioeconomic characteristics are important for acquiring knowledge on modern agricultural machineries and concerned authority should consider these characteristics to take necessary steps for improving knowledge of farmers on modern agricultural machineries.

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## ABBREVIATIONS

BADC	Bangladesh Agricultural Development Corporation
BARI	Bangladesh Agricultural Research Institute
BRRI	Bangladesh Rice Research Institute
BBS	Bangladesh Bureau of Statistics
DAE	Department of Agricultural Extension
GDP	Gross Domestic Product
MoA	Ministry of Agriculture
PFI	Problems Facing Index
SAAO	Sub Assistant Agriculture Officer
SAU	Sher-e-Bangla Agricultural University
SPSS	Statistical Package for Social Sciences

## **ABSTRACT**

Bangladesh is an agriculture based country. Most of the people of our country is related with agriculture. But due to low knowledge on agricultural operation or modern agricultural machineries operation the farmer faced huge loss on crop production. That's why the modern machineries need in agriculture sector to increase crop production. The modern machineries use in agricultural operation is called mechanization. The purpose of the study was to describe the selected socioeconomic characteristic of the farmers; to determine the extent of farmers' knowledge on agricultural machineries; and to explore the relationship of the selected characteristics of farmers on their knowledge on modern agricultural machineries. The study was undertaken purposely in Roumari Upazilla under Kurigram District. Validated and well-structured interview schedule was used to collect data from 110 farmers. Data were collected by a pre tested interview schedule during 16 jun 2022 to 15 july 2022. Simple and direct questions with different scales were used to obtain information. Descriptive statistics, multiple co-relation were used for the analysis of collected data. The majority 42.72 percent of the respondents had low knowledge followed by 21.81 percent had high knowledge and 35.45 percent of the farmers had medium knowledge on agricultural machineries. Among 10 selected characteristics of the farmers 6 characteristics namely, education, quantity of modern machinery, attitude of farmers towards using modern agricultural machinery, annual family income, training exposure and extension media contact, had positive significant relationship with their knowledge on modern agricultural machineries but rest of four namely age, farm size, experience in farming, organizational participation had no significant relationship with their knowledge on modern agricultural machinery. Findings leads to conclude that farmers' socioeconomic characteristics are important for acquiring knowledge on modern agricultural machineries and concerned authority should consider these characteristics to take necessary steps for improving knowledge of farmers on modern agricultural machineries.

# CHAPTER I

## INTRODUCTION

### 1.1 Background of the study

Mechanization is a process through which agricultural activities can be improved and optimum crop production can be achieved. Tools, implements and powered machinery are essential and major inputs to agriculture.

Agricultural mechanization implies the use of various power sources and improved farm tools and equipment for reducing the drudgery of the human beings and drought animals, enhancing the cropping intensity, precision and timeliness of efficiency in utilization of various crop inputs and reducing the losses at different stages of crop production.

Agriculture of Bangladesh is characterized by overwhelmingly small holdings due to higher population density and nearly 80 percent of its population residing in the rural areas coupled with unabated land fragmentation due to the inheritance laws of the country (Rahman et. al., 2011). Bangladesh agriculture is currently faced with range of challenges like farm labor shortage, shrinking land, degradation of natural resources, soaring prices, and vulnerability to climate change. According to BBS (2017), agriculture contributes a leading part for gaining the Gross Domestic Production (GDP) target which is 0.43% in 2016-17 in Bangladesh.

Most of the people are involved in agriculture sector which employs 43.6% of total national employment (BBS, 2012) and on average 0.31 hectares owned by a small farm holder (Mottaleb et al., 2016). For the 160 million people, Bangladesh still can achieve self-sufficiency in food but it is getting harder day by day. Aus. was cultivated in 0.94 million hectares in 2016 which was 0.70 million hectares in 2015 (Majumder et al., 2016). In the face of these challenges, we need knowledge intensive green revolution that combines advances in science and agricultural machineries with the unique traditional knowledge to make agriculture more environmentally resilient (ESCAP, 2016).

To keep economical consistency over the shifting of manpower from agriculture to service and industry, it requires filling up the labor gap in agricultural operations by mechanical interventions (Islam et. al., 2016). Mechanization enables farm family members not only to increase farm productivity via production intensification in some cases expansion, but also to seek off-farm employment opportunities (Houmy et al., 2013). Farm mechanization saves time and labour, cuts

down crop production costs in the long run, reduces post-harvest losses and boosts crop output and farm income.

The level of mechanization of different operations in Bangladesh agriculture differs from operation to operation (Singh *et al.*, 2009). Farm mechanization helps to enhance the overall productivity and production with the lowest cost of production. Farm mechanization can help in 15-20 percent saving in seeds, 15-20 percent saving in fertilizers, 5-20 percent increase in cropping intensity, 20-30 percent saving in time, 20-30 percent reduction in manual labour and 10-15 percent overall increase in farm productivity (Gautam and Kumar, 2014).

In a Modern era, growth in population has led to increase the many related issues. One of the issue is agriculture related causes. Farmers worldwide have ambiguous and varied opinions, perspectives on integrating technology into agricultural activities. Some of them are enthusiastic and all focused towards accepting the technology, others are wary and bemused towards introducing modern technologies, while most of them are cautious while hard towards the usage of technologies to increase yields and boost returns.

## **1.2 Statement of the problem**

Systematic evaluation is an approach to synthesizing evidence from multiple studies. Bangladesh agriculture is currently faced with range of problems like ageing farmers, feminization of agriculture, farm labor shortage, shrinking land, degradation of natural resources, soaring prices, and vulnerability to climate change. In the face of these problems, we need knowledge intensive green revolution that combines advances in science and agricultural engineering with the unique traditional knowledge to make agriculture more environmentally resilient (ESCAP Social and Economic Survey, 2016). According to BBS (2017). All the farmers may not have sufficient knowledge about improved farm implements and modern agricultural technologies. Mechanization in the country is always associated with some inherent drawbacks like, fragmented lands, poor buying capacity of farmers, lack of quality machines for farm operation, inadequate knowledge of the users about machines and insufficient awareness building activities, tariff difference on machines and spare parts, financial and institutional constraints. Therefore, the researcher has undertaken the study titled “Knowledge of farmers on modern agricultural machineries”. In order to make the study manageable the following research questions were taken into consideration



1. What was the extent of knowledge of farmers on modern agricultural machineries?
2. What were the selected characteristics of the farmers that influence their knowledge on modern agricultural machineries?
3. Is there any relationship between farmers selected characteristics and their knowledge on modern agricultural machinery?

### **1.3 Objective of the study**

To give proper direction of the study the following objectives were formulated

- i. To determine farmer's knowledge on modern agricultural machineries;
- ii. To describe the selected characteristic of the farmers;
- iii. To determine the relationships between the knowledge of farmers on modern agricultural machineries and their selected characteristics;

### **1.4 Justification and scope of the study**

Bangladesh is, at present, about to achieve self-sufficiency in cereal crop production. This is due to irrigation development and knowledge on modern machineries and partial use of modern agricultural machineries in other agricultural operations. But to meet up the food requirements of the large growing population of the country in 2015, an additional 5 million tons of food grain need to be produced from the continuously decreasing agricultural lands.

Thus, to increase production and cropping intensity, the most important achieving will be the faster development of adapting agricultural machineries as well as variety development. Replacing the old and traditional agricultural operational tools to modern agricultural machineries in different agricultural operations.

The good news is that the government has already taken step due importance to increase knowledge of farmers on modern agricultural machineries and agricultural mechanization in the National Agricultural Policy (MOA, 2013).

Manufacturing workshops and industries now involve in agricultural mechanization activities will be provided with appropriate support. Government and non-government organizations are currently giving effort and provide resources for increasing uses of agricultural machinery and also

help in farmers to encouraging both rural and urban people. And encourage them to adapting and use of those modern agricultural machineries.

So, evaluation of knowledge, attitude and utilization of the concerned farmers is necessary for the further development of agricultural mechanization and adoption of machineries in Bangladesh. Considering the above fact, the researcher felt a necessity to undertake a study to determine the Knowledge of farmers on modern agricultural machineries in kurigram district.

### **1.5 Assumption of the study**

An assumption is the supposition that an apparent or principle is true in the light of the available evidence (Goode and Hatt,1952). An assumption is taken as a fact or belief to be true without proof. The researcher had the following assumptions in mind while undertaking this study:

- i. The respondents had the capacity to response the questions furnished in the interview schedule.
- ii. The responses furnished by the respondents were reliable. They express the truth while passing their opinions and providing information.
- iii. The sample size was representative to the whole population of the study area.
- iv. The items, questions and scale of measurement of the variables were reasonably authentic to represent the actual condition of the respondents.
- v. The data collected by the researcher were free from bias.
- vi. The researcher was capable to adjust with the social and cultural environment of the study area.

### **1.6 Limitation of the study**

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

- i. The research was conducted to a confined area of Roumari Upazilla of Kurigram district.
- ii. The characteristics of the respondent farmers in the study area were many and varied but only 10 characteristics were selected for examining their relationship with their knowledge on modern agricultural machineries.

- iii. Data were collected from the selected farmers furnished by them from their memory during interview.
- iv. For some cases, the researcher faced unexpected interference from the over interested side-talkers while collecting data from the target populations. However, the researcher tried to overcome the problem as far as possible with sufficient tact and skill.

### **1.7 Definition of the related terms**

In this section the terms which have been frequently used throughout the thesis are defined and interpreted below

**Age:** Age of the farmer referred to the span of his /her life in years from his / her birth to the time of interview.

**Education:** Education referred to the ability of the respondents to read and write or having formal education received up to a certain level from educational institute at the time of interview. It was measured on the basis of classes a farmer has passed from a formal educational institution.

**Farm size:** Farm size referred to the cultivated own area either owned by the farmer or obtained from others on barga system, the area being estimated in terms of full benefit and half benefit to the farmer respectively. The self-cultivated owned land and cultivated area taken as lease or mortgage from others was recognized as full benefit. In this study farm size was measured in hectare.

**Quantity of modern agricultural machineries:** This is the matter of having something or something that is owned. So quantity of modern machineries (Such as Tractor, Power tiller, etc.) means agril. implements are normally owned by the individuals, respondents.

**Attitude of farmers toward using modern agricultural machineries:** Attitude of farmers using machineries means achieving of one's wishes, expectations, or needs, or the pleasure derived from this.

**Experience in farming:** Experience in farming refers to years of farmers involve and doing in agricultural farming.

**Annual family income:** The term annual family income referred to the total amount of money earned by the earning members of a farm family from agriculture, livestock, fisheries and other accessible sources (business, service, daily labor etc.) during a year. It was expressed Thousand in Taka.

**Training exposure:** Training exposure refers to respondent involve or taking any agricultural training program which is related to agree mechanization.

**Organizational participation:** Organizational participation related to the nature of the movement of the respondents with different social organization with duration. It refers to the degree to which the farmers were involved in a formal organization as a member or as a chief executive.

**Extension media contact:** Agricultural extension contact referred to an individual exposure to different information sources and personalities related to agriculture for dissemination of new technologies and acquire knowledge and information related to agriculture and their activities.

**Knowledge of farmer on agricultural machineries:** Knowledge of farmers on modern agricultural machineries referred to the idea and insights of the respondents regarding different modern agricultural machineries that helps in agri mechanization.

## **CHAPTER II**

### **REVIEW OF LITERATURE**

Review of literature gives the clear and concise direction of the researcher for conducting the experiment. With aim to get clear and concise direction this chapter deals with the review of past research works that relates to this investigation directly or indirectly. The reviews are conveniently presented based on the major objectives of the study. This study was mainly concerned with knowledge of farmers on modern agricultural machineries. Despite frantic search, the researcher found only a few literatures related to this study. The researcher came across with some subject matter specialist opinions and has tried his best to collect necessary information through searching relevant studies, thesis, journal, articles, periodicals, bulletins, leaflets, websites etc. However, a brief review of the available literature has been incorporated in the light of the objectives of this study under the following heads:

2.1 Concept of agricultural mechanization

2.2 Knowledge of Agricultural mechanization in Bangladesh

2.3 Relationship between selected characteristics of the respondents and their knowledge of farmers on modern agricultural machineries.

2.5 Research gap of the study.

2.6 Conceptual framework of the study.

#### **2.1 Concept of agricultural mechanization**

Agricultural mechanization is the application of technology into the field of agriculture in order to improve agricultural output, as well as deliberate conscious departure from the peasant and subsistence agriculture into a commercial agriculture. Farm mechanization encompasses in its widest sense hand- tool technology, draught animal technology and mechanical power technology (Maharjan and Cheltri, 2006). Farm mechanization is the process of development and introduction of mechanized assistance of all forms and at any level of technological sophistication in

agricultural production in order to reduce human drudgery, improve timeliness and efficiency of various farm operations, bring more land under cultivation, preserve the quality of produce, improve living condition and markedly advance the economic growth of the rural sector (Akande, 2009). Agricultural mechanization includes three main power sources: human, animal and mechanical. There have been some studies conducted on the impacts of mechanization on overall livelihood of the rural population (Anon, 1973; Gill, 1984; Miah et. al., 2002).

Khalequzzaman and Karim (2007) studied agricultural mechanization and its impact on rural environment. (Aurangzeb et. al., 2007) found with the introduction of small scale mechanization the nature of using cultivation power has changed significantly and it appeared that the use of power tiller for tillage has increased rapidly.

## **2.2 Knowledge on Agricultural Mechanization in Bangladesh**

Mechanization may be defined as the process of injecting power and machinery between man and materials in a production system (Khalequzzaman and Karim, 2007). Agricultural mechanization is an art and scientific application of agricultural machinery, tool and implement for increasing farm production and cropping intensity. Agricultural mechanization in Bangladesh there by started with DTW for irrigation (Pingali, 2007). Irrigation system development and a cooperative-model were associated with the government promotion of four-wheel tractors (4 weight) since 1960s.

However, small land holding coupled with further fragmentation of land impeded the wide-scale adoption of 4 wt (Hossain et. al.,2007). After independence, irrigation policy in Bangladesh increasingly focused on the use of shallow tube wells (STWs) and less energy requiring Low Lift Pumps (LLPs) for irrigation (Biggs & Justice, 2015). Several institutional models were under taken to promote small-scale mechanization. Consequently, by mid 70sthe number of LLPs in Bangladesh reached 35,000 units (Anon, 2012). Since the 1960s locally manufactured mechanical threshers are extensively used as economical options to overcome labor shortages. In 1960, a pedal thresher was reproduced in Bangladesh by Comilla Cooperative Karkhana using the Japanese model (Anon, 2012). At present, almost each district in Bangladesh has a local thresher manufacturer. In some districts such as Jessore and Khulna, there are more than 100 thresher manufacturers (Anon, 2012).

Before 1988, the import of agricultural equipment was restricted. The Standardized Committee of Bangladesh was responsible for controlling the quality of imported machinery including agricultural equipment and only a list of standardized machines required for agricultural operations could be imported. In 1988, the Ershad Government started liberalizing markets, lowered the tariffs on machine imports, and dissolved the Standardized Committee. This policy change resulted in an import surge of low-cost small engines and engine powered machinery such as power tillers (two-wheel tractors, 2WTs), diesel pumps and other equipment into Bangladesh, primarily from China (Gisselquist et. al., 2002; Kienzle et. al., 2013; Mottaleb et. al., 2016; Pingali, 2007).

After the trade liberalization in 1988, cost of these machines especially power tillers and minor irrigation pumps fell by 50% resulting in increases of 400% in sales of diesel engines and more than 1000% in power tillers compared to sales three years before the liberalization (Gisselquist et. al., 2002).

However, mechanization of other agricultural field operations is still very low in Bangladesh and thus, adoption of other agricultural equipment such as bed makers, seeders, weeders, harvesters and winnowers are not common (Islam, 2009). Due to the prevailing small landholdings, many farmers who own agricultural machines for hiring out these machines in addition to operating their own land (Biggs & Justice, 2015; Kienzle et. al., 2013). This, on the one hand, optimizes the use of machines and on the other hand, increases farmers access to these machines. Through custom hiring services, even the poor can afford to mechanize farming (Alam et. al., 2004).

This has been reported across South Asia and for different implements – including 4 wt drawn zero-till seed drills (Erenstein & Farooq, 2009), laser-land leveling and wt (Mottaleb et. al., 2017). Hence the existence of rental markets can facilitate rapid adoption of lumpy technology and make technology accessible to even poor and marginal farmers who otherwise could not invest in or access it. Bangladesh agriculture is now one of the most mechanized agricultural economies in south Asia (Baudron et. al., 2015; Islam, 2009).

Bangladesh has the globe's highest per-capita level of rice consumption at 172.6 kg / person in a year (Anon, 2015). The government of Bangladesh (GoB) has tended to encourage mechanization as an avenue to increase rice production and move towards rice self-sufficiency. To facilitate this process, the GoB voluntarily reduced import restrictions and tariffs on select machineries, while

also supplying subsidy to help purchasers offset fixed costs. The GOB first introduced irrigation pumps and tractors in the 1960s (Ahmmed uddin, 2016).

Four wheel tractors were initially promoted, which are arguably scale-inappropriate in Bangladesh given the small average farm size at around 0.53 hectares, which is often divided into multiple fields (Hossain et. al., 2007), making demand aggregation for tillage services among farmers, and between-field and -farm transport of tractor equipment problematic. The GoB also first introduced centralized irrigation facilities by establishing deep tube wells (DTWs) and supplying low-lift irrigation pumps (LLPs) to farmers on a rental basis from the Bangladesh Agricultural Development Corporation (BADC). The GoB also supplied fuel at 75% subsidized rate to pump owners through BADC until the 1970s (Hossain, 2009). By 1978, BADC had rented out and managed a total of 9,000 DTWs and 35,000 LLPs (Anon, 2012). Irrigation and land preparation management under nearly complete government control however presented large logistical and financial burdens. Eight years after independence, Bangladesh undertook liberalization policies, and as a result, the government gradually opted out of state-led support of mechanization and began the privatization of irrigation, with additional efforts to open markets for land preparation equipment (Gisselquist et. al., 2002). BADC initiated sales to liquidate DTWs and LLPs to farmer' cooperatives and also to individual farmers, many of whom became service providers (Hossain, 2009).

Privatization, however, only gained full momentum when a number of tariff and non-tariff barriers on the import of irrigation and diesel engines and tractors were eliminated, actions that were linked to disaster response management by the Bangladeshi government. During this period, the GoB's Standardized Committee was responsible for controlling the quality of imported machinery, including Transplanting, weeding, harvesting and threshing operations are considered as four major labore intensive operations in rice cultivation in Bangladesh condition.



## **2.3 Relationship between selected characteristics of the respondents and their knowledge on modern agricultural machineries**

### **2.3.1 Age and knowledge of farmers on modern agricultural machineries**

(Rahman, 2018) reported in his study that age of the farmers had non-significant relationship with their knowledge on modern agricultural machineries.

Sabi *et al.* (2014) revealed that age of the farmers showed a positive and significant relationship with their knowledge on modern agricultural machineries.

### **2.3.2 Education and knowledge on modern agricultural machineries**

Rahman (2018) reported in his study that educational qualification of the farmers had significant positive relationship with knowledge of farmers on modern agricultural machineries.

Singh (1983) reported that education of the respondents was positively and significantly related with the knowledge of mechanization.

Bhatia and Singh (1991) concluded that education of the respondents showed a weak, positive but insignificant relationship with knowledge level of selected agricultural engineering technologies

### **2.3.3 Farm size and knowledge on modern agricultural machineries**

Satapathy *et al.* (1973) found that the respondents possessed 6-10 acres of land were having comparatively more knowledge of improved implements.

Singh (1983) found that size of the land holding of the farmers was positively and significantly related with adoption and knowledge of farm mechanization.

Jalak (2002) revealed that there was a significant and positive relationship between size of land holding and adoption of improved farm implements.

Joseph (2007) found that farm size and biological/chemical inputs made the greatest contribution toward the level of adoption. He also reported that the farm size had a positive and significant impact on the probability of knowledge on machineries and adoption.

Reddy *et al.* (2009) in their study on, utilization pattern of power sources on productivity of groundnut and cotton dryland production systems, reported that the farm size of the farmers had direct influence on the use of mechanical and draft animal power among different farm groups of the farmers.

Singh and Singh (2009) inferred that most important factors influencing production technology of vegetables were the size of farm and education of the farmers.

Lohan *et al.* (2015) in their study on, farm power availability and mechanization in Punjab, inferred that farm mechanization was mainly dependent and correlated upon the size of land holding.

#### **2.3.4 Quantity of modern agricultural machineries and knowledge on modern agricultural machineries**

Quantity of the modern machineries is the paternity or ownership of machineries for farming activities. If a person owned implements (like Tractor, power tiller, etc.), he / she will be able to perform framing operation easily through use it. No findings were noticed directly on this aspect to the researcher at the time of reviewing literature.

#### **2.3.5 Attitude of the farmers towards using agricultural machineries and knowledge on modern agricultural machineries**

Farouk (2015) reported that the attitude of the farmers had significant positive relationship with their knowledge of farmers on modern agricultural machineries.

Sarker (2002) found in his study that attitude of farmers in using agricultural machineries had a positive significant relationship with their knowledge.

#### **2.3.6 Experience in farming and knowledge on modern agricultural machineries**

Sanaullah (2021) revealed that, farming experience of the farmers had significant contribution to their knowledge on farm mechanization.

Hossain (2016) revealed that, farming experience of the farmers had no significant contribution to their knowledge on vegetable production.

### **2.3.7 Annual family income and knowledge on modern agricultural machineries**

Rahman (2018) reported in his study that Annual family income of the farmers had significant positive relationship with their knowledge of agricultural mechanization.

Modak (1992) concluded that as the annual income increased, there was increase in the adoption of improved implements. Salunke (1994) concluded that annual income of the farmers exhibited a non-significant and positive relationship with their knowledge on improved farm implements.

Jalak (2002) concluded that annual income of the farmers had a significant and positive relationship with annual income and knowledge of improved farm implements.

Prasad *et al.* (2009) reported that mechanization was directly dependent on the economic condition of the lac growing farmers.

Tarde *et al.* (2010) inferred that the relationship between annual income of the small farmers and their knowledge and adoption level of paddy cultivation technology was positive and significant.

### **2.3.8 Training exposure and knowledge on modern agricultural machineries**

Kamal (2017) found training exposure of the farmers had significant relationship with their knowledge in wheat cultivation.

Hossain (2016) revealed that training exposure of the farmers had significant to knowledge in vegetable production.

Mortuza (2015) revealed that training exposure on maize cultivation had significant positive relationship with their knowledge on modern agricultural machineries.

Baten (2014) revealed that training exposure had significant positive relationship with their knowledge on modern agricultural machineries.

Noman (2012) found that there was significant positive relationship with their knowledge on modern agricultural machineries.

### **2.3.9 Organizational participation and knowledge on modern agricultural machineries**

Organizational participation related to the nature of the movement of the respondents with different social organization with duration. It refers to the degree to which the farmers were involved in a formal organization as a member or as a chief executive. No findings were noticed directly on this aspect to the researcher at the time of reviewing literature.

### **2.3.10 Extension contract and knowledge of farmers on modern agricultural machineries**

Islam (2018) reported that the extension contact of the farmers had significant positive relationship with their knowledge on modern agricultural machineries.

Jalak (2002) reported that source of information used by the farmers had a positive and significant relationship with their knowledge of improved farm operation.

Dange (2012) reported that mass media used by the sugarcane growers had a negative and significant correlation with their knowledge gap of mechanization.

## **2.4 Conceptual framework of the study**

In scientific research, conceptual framework is selection and measurement of variables. Properly constructed hypothesis of a research contains “dependent variable” and “independent variable”. This study is concerned with the farmer knowledge on modern agricultural machineries. So, the knowledge of the farmers on modern agricultural machineries was the dependent variables of the study. Farmers’ knowledge on modern agricultural machineries is affected through interacting forces of many independent variables. It is not possible to deal with all the variables in a single study. After consulting with the relevant experts and reviewing of past related literatures, ten selected characteristics of the farmer were considered for the study as the independent variables, which might have contribution on knowledge of the farmer on modern agricultural machineries. Based on this discussion the conceptual framework of this study has been formulated as shown in figure 2.1

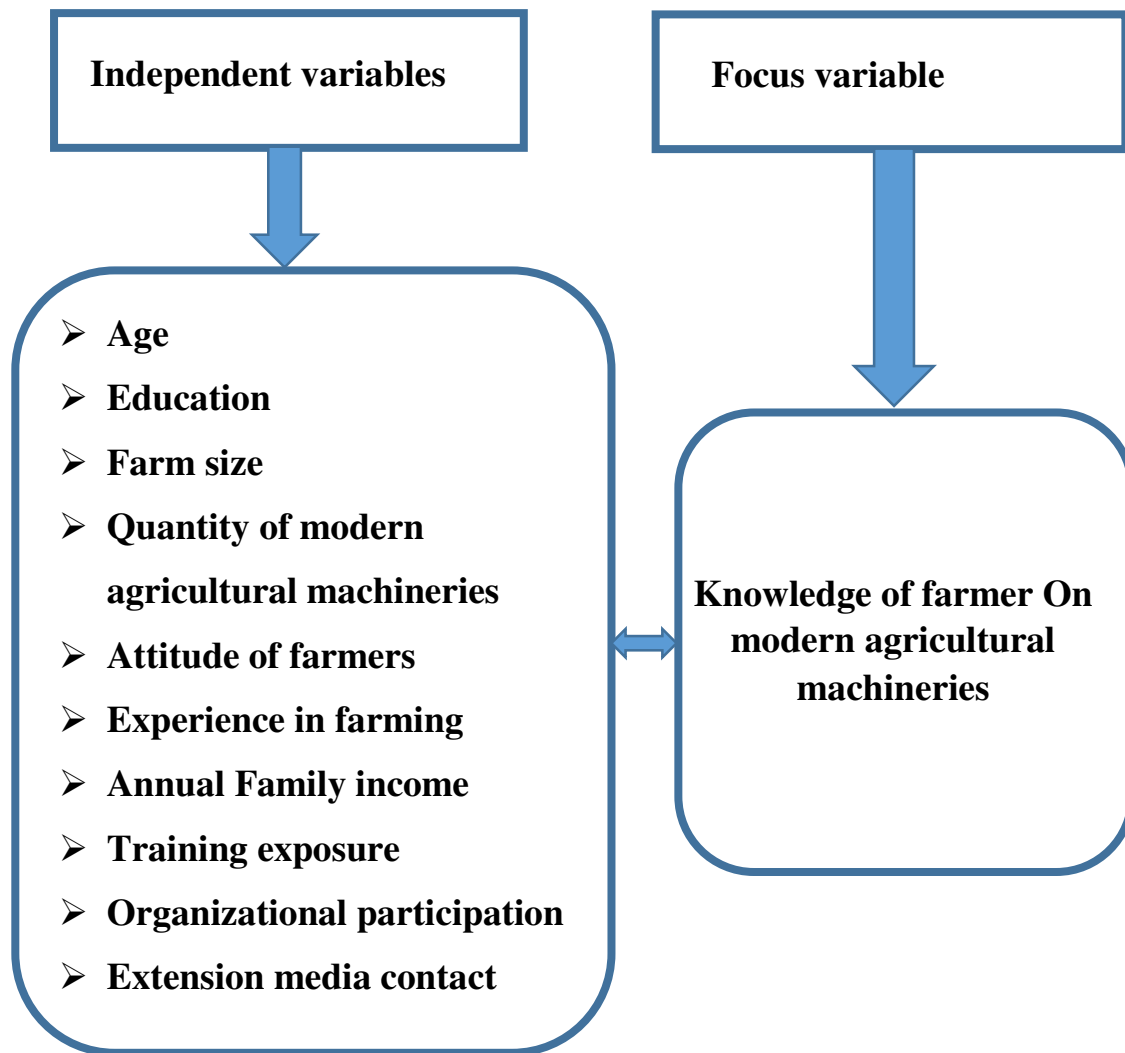


Figure 2.1 A conceptual framework of the study

## **CHAPTER III**

### **METHODOLOGY**

Methodology enables the researcher to collect valid information. It is impossible to conduct research work smoothly without proper methodology and it is very difficult to address the objectives with a scientific manner. It requires a very careful consideration on the part of the researcher to collect valid and reliable data and to analyze the same for meaningful conclusion. A sequential description of the methodologies was followed in conducting this research work has been presented in this chapter.

#### **3.1 Local of the study**

Kurigram district is selected purposively as it is potential district of Bangladesh for agricultural machineries practices. There are nine Upazilla in Kurigram district, among them Roumary Upazilla were selected purposively. The area of Roumary Upazilla 76.4 sq mil or 197.8 km<sup>2</sup>, located in between 25<sup>0</sup>33.8'N and 89<sup>0</sup>51 E. There are six Union parishad in this Upazila. They are: Bondober, Datvanga, Soilmari, Chor Soulmari, Jadurchar, Roumari. Out of six Union two union namely Soulmari and Roumari were randomly selected. Four villages two from each union were randomly selected as the local of the study. Those villages were Goytapara, Kolomerchour from Soulmari union and Sobujpara and collage para from Roumary union. A map of Kurigram district showing Roumari Upazilla and a map of Roumari Upazila showing study area have been shown in fig 3.1 and 3.2 respectively.

#### **3.2 Population and Sampling procedure**

Four villages namely Goytapara, Kolomerchar from Soulmari union and Sobujpara and Collegepara from Roumary union were selected randomly from Roumary Upazilla under Kurigram district as locale of the study. An updated list of total 1107 farmers of these four villages were collected with the help of Sub-Assistant Agriculture Officer (SAAO) which constituted the population of the study. Out of these 1107 farmers 110 farmers were selected as sample of the study by using proportionate random sampling method which is 10 % of the total population.

A reserve list of 11 farmers (10% of the total sample size) were also prepared. Farmers in the reserve list were used only when a respondent in the original list was not available.

**Table 3.1 Population and sample of the study area**

<b>Name of Upazila</b>	<b>Name of Union</b>	<b>Name of Village</b>	<b>Number of Population</b>	<b>Number of Sample Size</b>	<b>Reserve list</b>
Roumari	Soulmari	Goytapara	367	36	4
		Kolomer chour	242	24	2
	Roumari	Sobuj para	275	28	3
		College para	223	22	2
<b>Total</b>			<b>1107</b>	<b>110</b>	<b>11</b>

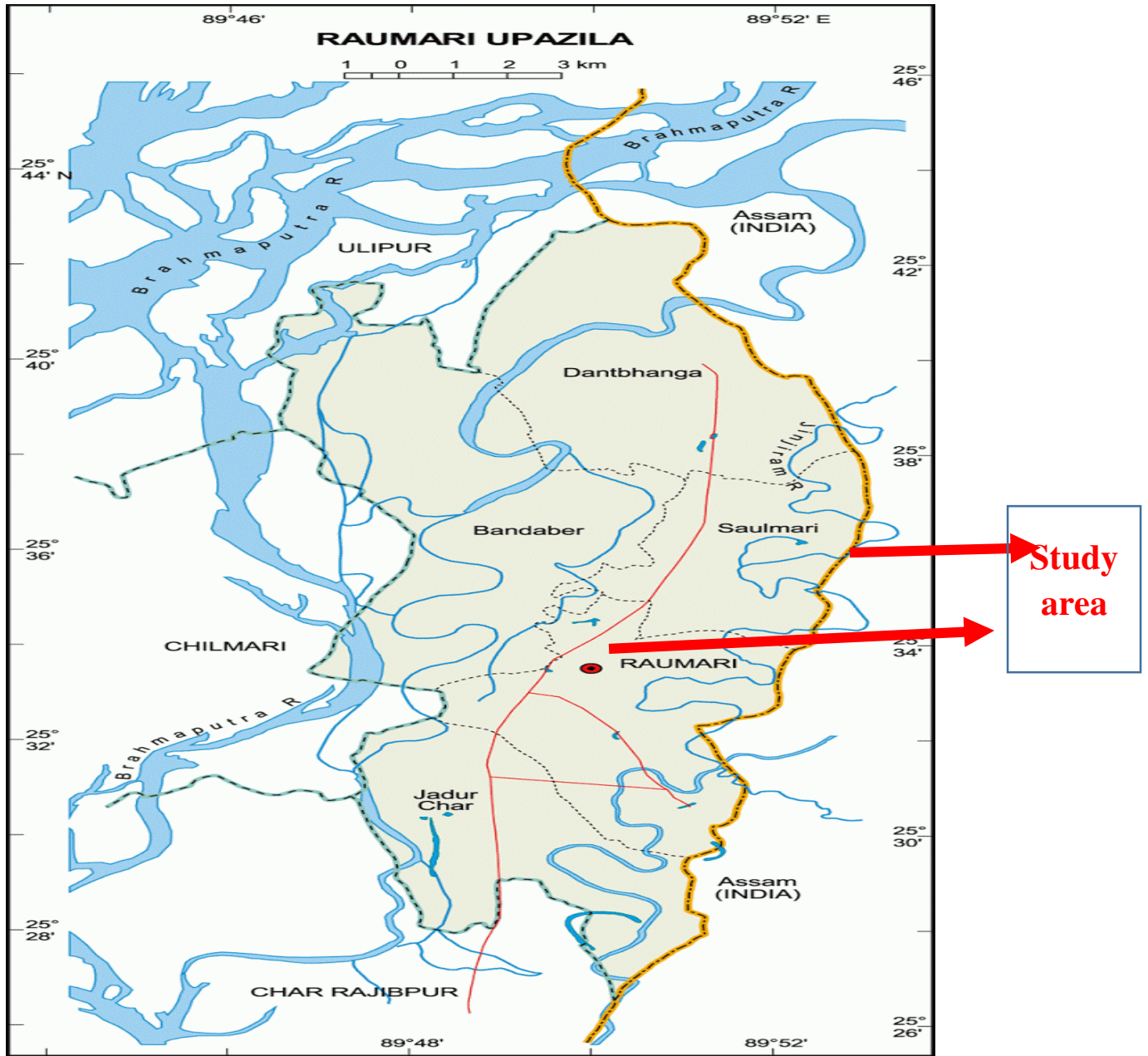


Figure 3.2: Map of Roumari upazilla showing study area



### **3.3 Research design of the study**

Research design means the plan of structure and strategy of inspection on imagined so as get answer to research question control variance (kerlinger,1973). Designing the research for the study was taken in a scientific method. At first, researcher gathered and analysis review of previous studies to choose appropriate variables and readiness of research instrument, pre-testing of the research instrument was done before ultimate data collection. The collected data was analyzed and report was written. The maps of the study place were depicted. The researcher himself with the cooperation of Upazilla Agriculture Officer (UAO), collected and update list of the all farmers of the selected villages of respective union. The total number of farmer in the area 1107 which constituted the population of the study.

### **3.4 Research Instruments**

To collect relevant data for the study, a structured interview schedule was prepared keeping the objectives in mind. The questions and statements contained in the schedule were simple, direct, and easily understandable by the respondents. The schedule contained closed form of questions. A draft interview schedule was prepared in advance before using the same for collection of data. The draft schedule was pre-tested with 10 respondents selected from the study areas. This pre-test facilitated the researcher to identify faulty questions in the draft schedule and necessary corrections, addition and adjustment was made afterwards in the schedule based on the pre-test results.

### **3.5 Collection of data**

Data were collected by researcher himself through personal contact. The interview was conducted with the respondent in their homes during their leisure time. To obtain valid and pertinent information the researcher made all possible effort explaining in purpose of the study. Report was established with the respondents before interview and objective were clearly explained by using local language to obtain possible help, so that the farmer did not feel hesitant to furnish proper data. The question was explained whenever any respondent felt difficulty in understanding them properly. Excellent co-operative was obtained from all the respondents in the study area during interview. The entire process of collecting data took 30 days from June 16 2022 to 15 July 2022.

### **3.6 Variables and their measurement technique**

The variable is a characteristic, which can assume varying, or different values in successive individual cases. A research work usually contains at least two important variables viz. independent and dependent variables. An independent variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationship to an observed phenomenon. A dependent variable is that factor which appears, disappears or varies as the researcher introduces, removes or varies the independent variable (Townsend, 1953). In the scientific research, the selection and measurement of variable constitute a significant task. Following this conception, the researcher reviewed literature to widen understanding about the natures and scopes of the variables relevant to this research. At last, ten independent variables (the selected characteristics) and one dependent variable were selected for the study. The independent variables were age, education, farm size, quantity of modern agricultural machineries, attitude of farmers towards using modern agricultural machineries, experience in farming, annual family income, training exposure, organizational participation and extension media contact. The dependent variable of this study was knowledge of farmer on modern agricultural machineries.

### **3.7 Measurement of the selected characteristic of the farmers**

The socio-economic characteristic of the farmers might have influence the knowledge of farmers on modern agricultural machineries. These characteristics were age, education, farm size, quantity of modern agricultural machineries, attitude of farmers towards using modern agricultural machineries, experience in farming, annual family income, training exposure, organizational participation, extension media contact Measurement all these characteristics and their knowledge on modern agricultural machineries are discussed in the following sub section.

#### **3.7.1. Age**

The Age of the respondent was measured in terms of years from his/her birthday to the time of interview which will be found based on response. A unit score was assigned for each year of one's age. The characteristic appears in the item no. 1 in the interview schedule.

### **3.7.2 Education**

Education was measured as the ability of an individual farmer to read and write, or formal education received up to a certain standard. Education of the respondents was measured in terms of one's year of schooling. One score was given for passing each level in an educational institution (Mondol, 2009). For example, if a respondent passed the final examination of class V his/her education score was taken as five (5). If a respondent did not know how to read and write, his education score was given as '0'. A score of 0.5 was given to that respondent who could sign his/her name only. The characteristic appears in the item no. 2 in the interview schedule.

### **3.7.3 Farm size**

Farm size was measured by the area of the raised land in which the household of the respondent had its entire dwelling unit including homestead area under cultivation (Goswami, 2016). It was expressed in hectare. The total areas of land thus obtained have been considered as farm size of the respondent. The characteristic appears in the item no. 3 in the interview schedule. It was measured using the following formula:

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

Where,

A = Homestead (including garden and fallow land)

B = Own land under own cultivation

C = Land given to others on barga

D = Land taken from others on barga

E = Land taken from others on lease/ mortgage

F = Others (pond, poultry yard etc)

### **3.7.4 Quantity of modern agricultural machineries**

The quantity of modern agricultural machineries refers the amount of machineries used by a respondent in his agricultural purpose. In interview schedule 14 modern agricultural machineries name was included.

If a respondent does not use any machineries then his assigned score was zero, if he used then one score for each machinery. Example if a respondent use 5 machine then his assigned score was 5. This characteristic included in the item no 4 in the interview schedule.

### **3.7.5 Attitude of the farmer towards using agricultural machineries**

Attitude of farmers towards using agricultural machineries refers to one's feeling towards the use of agricultural machines in various aspects of farming activities. Attitude of a respondent towards using agricultural machineries was measured by developing an attitude scale. Five-point Likert scale method of summated ratings was used to find out the respondents' attitude towards using agricultural machineries". Twelve (12) statements expressing positive and negative feelings towards using agricultural machineries were constructed. A statement was considered positive if it indicated a favorable attitude towards using agricultural machineries. If the case was reverse, it was considered as a negative statement. Out of these twelve statements six were positive and six were negative. Scoring was done by assigning 5, 4, 3, 2 and 1 scores to the five alternative responses as "strongly agreed", "agreed", "no opinion", "disagreed", and "strongly disagreed" respectively in case of a positive statement. Reverse score was assigned for a negative statement. However, attitude towards using agricultural machineries of a farmer was obtained by summing up his/her scores for all twelve (12) statements in item no. 5 of the interview schedule. Attitude score, thus, obtained for a respondent could range from 12 to 60, where 12 indicate very unfavorable attitude and 60 indicate highest level of favorable attitude.

### **3.7.6 Experience in farming**

Farming experience refers to the years of experience achieved by a farmer through years of farming activities. It was measured by the number of years of farming by the respondent. A unit score was assigned for each years of farming experience. The characteristic appears in the item no. 6 in the interview schedule.

### **3.7.7 Annual family income**

Annual income of a respondent was measured based on total yearly earning by the respondent himself/herself and other family members. The value of all the sources encompassing farm agriculture source (rice, wheat, jute, vegetable, fruits, pulses and others) and others source (fisheries and livestock) and Of farm source (business, services, daily labor, remittance, day labor and others) etc. were taken into consideration. For calculation of income score, one (1) was assigned for each one thousand takas of income. The characteristic appears in the item no. 7 in the interview schedule.

### **3.7.8 Training experience**

Training received was determined by the total number of days of training received by the farmers from any organization during the last three years. If a respondent took three days training on agricultural machineries from GOs, NGOs or any other organization, then his training exposure score was 3 and so on. The characteristic appears in the item no. 8 in the interview schedule.

### **3.7.9 Organizational participation**

Organizational participation of respondent was measured on the basis of their nature and scoring system of participation on duration in some selected organizations. Nature of participation was classified as no participation, participation as ordinary member, participation as executive member and participation as executive officer (President, secretary, treasurer etc.) Score was computed by adding all the score of selected organization.

Organizational participation was measured by using following formula:

$$OP = \sum (NP * D)$$

Where,

OP = Organizational participation

NP= Nature of participation

D= Duration

<b>Nature of participation</b>	<b>Organizational participation</b>
No participation	0
Participation as general member	1
Participation as executive member	2
Participation as president/secretary	3

### **3.7.10 Extension media contact**

Agricultural extension media contact may be defined as one's extent of exposure to different extension media. Each respondent was asked to indicate the extent of his contact with each of the selected media with four alternative responses as regularly, occasionally, rarely, and never with their corresponding scores of 3, 2, 1 and 0 respectively (Goswami, 2016). The agricultural extension media contact score of a respondent was measured by summing up his/her scores for contact with all the 14 selected media. Thus, possible extension contact score could range from zero (0) to 56, where zero (0) indicated no extension contact and 56 indicated the highest level of extension contact. The characteristic appears in the item no. 10 in the interview schedule

### **3.8 Measurement of Focus Variable**

Knowledge on agricultural machineries referred to the extent of facts or information about agricultural machineries. It was measured with the answers of 16 selected questions related to modern agricultural machineries. Scores were assigned 2 to 5 for each question based on their weightage. If a respondent answered correctly he/she was given full marks, if could not answer given zero (0) and partial score was given for partially correct answer. Thus, possible knowledge on agricultural machineries score of a respondent could range from zero 0 to 50, where zero 0 indicated no knowledge and 50 indicated the highest level of knowledge on agricultural machineries. The characteristics appears in the item no. 11 in the interview schedule.

### **3.9 Statement of the hypotheses**

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.

### **3.10 Research hypotheses**

Based on review of literature and development of conceptual framework, the following research hypothesis was formulated: ‘There were significant relationships between the selected eleven characteristics (i.e. age, education, farm size, quantity of modern agricultural machinery, attitude of farmers towards using agricultural machineries, experience in farming, annual family income, training exposure, organizational participation, extension media contract, knowledge on agricultural machineries) of the farmers and their knowledge on agricultural machinery. However, when a researcher tries to perform statistical tests, then it becomes necessary to formulate null hypothesis.

### **3.11 Null hypotheses**

Null hypothesis: ‘There was no significant relationship between the selected eleven characteristics (i.e age, education, farm size, quantity of modern agricultural machinery, attitude of farmers towards using agricultural machineries, experience in farming, annual family income, training exposure, organigational participation, extension media contract, knowledge on agricultural machineries) of farmers and their knowledge on agricultural machinery.

## **3.12 Data Processing**

### **3.12.1 Editing**

The collected raw data were examined thoroughly to detect errors and omissions. As a matter of fact the researcher made a careful scrutiny of the completed interview schedule to make sure that necessary data were entered as complete as possible and well arranged to facilitate coding and tabulation. Very minor mistakes were detected by doing this, which were corrected promptly.

### **3.12.2 Coding and tabulation**

Having consulted with the research supervisor and co-supervisor, the investigator prepared a detailed coding plan. In case of qualitative data, suitable scoring techniques were followed by putting proper weight against each of the traits to transform the data into quantitative forms. These were then tabulated in accordance with the objective of the study.

### **3.12.3 Categorization of data**

Following coding operation, the collected raw data as well as the respondents were classified into various categories to facilitate the description of the independent and focus variables. These categories were developed for each of the variables by considering the nature of distribution of the data and extensive literature review.

### **3.12.4 Statistical Analysis**

The data collected were analyzed according to the objectives of the study. For regulating, the qualitative data were converted into quantitative data by means of suitable scoring technique. The analysis was performed using SPSS (Statistical Package for Social Sciences) computer package and the statistical measures such as range, means, standard deviation, number and percentage distribution were used to describe the variables. Pearson Product Moment coefficient of correlation ( $r$ ) was used to describe the relationships between the concerned variables. Five percent (0.05) level of probability and one percent (0.01) level of probability were used for the rejecting of null hypothesis.



## **CHAPTER IV**

### **FINDING AND DISCUSSION**

The findings of the study and interpretations of the results have been presented in this chapter. These are presented in three sub-sections according to the objectives of the study. The first sub-section deals with the selected characteristics of the farmers, while the second sub-section deals with the knowledge of farmers on modern agricultural machineries. In third section deals with the relationship between the selected characteristics of the farmers and their knowledge on modern agricultural machineries.

#### **4.1 Selected characteristic of the respondent farmers**

Ten characteristics of the farmers were selected to find out the relationships with the knowledge of farmers on modern agricultural machineries. The selected characteristics included their age, education, farm size, quantity of agricultural machineries, attitude of farmers towards using agricultural machineries, farming experience, annual family income, training exposure, organizational participation and extension media contact, Those characteristics of the respondent farmers are described in this section.

The salient features of the characteristics of the respondent farmers in order to have an overall picture of these characteristics at a glance is presented in the Table 4.1. However, for ready reference, separate tables are included while presenting categorizations, discussing and or interpreting results concerning each of the characteristics in this chapter.

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

Categories	Measuring unit	Range		Mean	S.D
		Minimum	Maximum		
Age	Years	22	67	43.30	10.693
Education of the farmer	Schooling year	0	12	5.359	4.3352
Farm size	Hectare	0.2	3.52	0.675	0.4171
Quantity of machinery	Quantity	0	9	3.118	2.0531
Attitude of farmer toward using modern agricultural machineries	Score	15	56	33.482	11.8992
Experience in farming	Years	10	35	25.459	5.0368
Annual family income	“000” BDT	110	600	289.40	131.6
Training exposure	Days	0	10	3.00	2.6161
Organizational participation	Score	0	20	5.255	5.4275
Extension media contact	Score	18	54	35.818	9.8969
Knowledge on agricultural machine	Score	15	45	24.50	9.6764

#### 4.1.1 Age

Age of the respondents varied from 22 to 67 years, the average being 43.30 years with the standard deviation of 10.69. Regarding age, the respondent farmers were classified into three categories according to Ministry of Youth and Sports, Bangladesh, 2008, such as “young aged” (up to 35), “middle aged” (36- 50) and “old aged” (above 50 years). The distribution of the farmers according to their age is shown in Table 4.2

**Table 4.2 Distribution of the farmers according to their age**

Category	No of farmer	%	Statistic		Range	
			Minimum	Maximum	Mean	S.D
Young age (up to 35)	33	30	22	67	43.30	10.69
Middle age (36 to 50 years)	49	44.55				
Old age (above 50 years)	28	25.45				
Total	110	100				

From the table 4.2 reveal that the middle-aged farmers comprised the highest percentage (44.55 percent) followed by young aged category 30 percent and the lowest percentage were made by old age farmers 25.45 percent. Data also indicated that the middle and young aged category constitute 74.55 percent of total farmers. The middle aged farmers might process more knowledge on modern agricultural machineries. Ahmmed (2016) found almost similar findings.

#### 4.1.2 Education

The level of educational scores of the farmers ranged from 0 to 12 with a mean and standard deviation is 5.35 and 4.33 respectively. Based on the educational scores, the farmers were classified into five categories. The distributions of farmers according to their level of education is presented in Table 4.3

**Table 4.3 Distribution of the farmers according to their level of education**

Category	Farmers		Statistic		Range	
	Number	Percent	Minimum	Maximum	Mean	S.D
Cannot read and sign (0)	23	20.80	0	12	5.35	4.33
Can sign only (0.5)	15	13.55				
Primary level (1-5)	22	20.2				
Secondary level (6-10)	39	35.45				
Above secondary level	11	10.0				
Total	110	100				

From the table 4.3 shows that respondent farmers under secondary level education category contain the highest proportion (35.45 percent) followed by cannot read and sign 20.80 percent and also primary level 20.2 percent. On the other hand, the lowest is 10 percent in above secondary level followed by can sign only 13.55 percent. An educated farmer is likely to have more knowledge on modern agricultural machineries and information of modern farm technologies. And they might have more knowledge in using modern agricultural machineries. The discoveries recommend that education may be one of the variables for the respondents to increase their knowledge on modern agricultural machineries. Ahmmed (2016) and Hossain (2015) found almost similar findings.

#### **4.1.3 Farm size**

Farm size of the respondents ranged from 0.2 hectares to 3.52 hectares with the mean of 0.67 and standard deviation of 0.41. On the basis of their farm working area, the respondent farmers were classified into five categories as shown in Table 4.4

**Table 4.4 Distribution of the farmers according to their farm size**

Category (hectare)	Farmers		Range		Statistic	
	Number	Percentage	Minimum	Maximum	Mean	S.D
Land less ( $\leq 0.20$ )	6	5.45	0.2	3.52	0.675	0.4171
Marginal (0.21-0.50)	12	10.90				
Small farm (0.51-1.00)	42	38.18				
Medium (Above 1.00-3.00)	40	36.38				
Large ( $\geq 3.01$ )	10	9.09				
Total	110	100				

Data presented in Table 4.4 shows that majority (38.18 percent) of the farmers were under small farm size category followed by 36.38 percent, 10.90 percent, 5.45 percent and only 9.09 percent under medium, marginal, land less and large farm size category respectively. To have a sensible way of life these farmers should have the option to have high return of harvests per hectare and increment their cultivation intensity. The findings indicated that overwhelming majority (74.56 percent) of the farmers had small to medium farm size. Jalak (2002) found almost similar findings.

#### **4.1.4 Quantity of modern agricultural machineries**

Quantity of modern agricultural machinery of farmers ranged from 0 to 9 with mean and standard deviation of 3.11 and 2.05 respectively. On the basis of quantity of modern agricultural machineries, the farmers were classified into three categories namely low, medium, high. The distribution of the farmers according to their quantity of modern agricultural machineries are presented in table 4.5

#### 4.5 Distribution of the farmers according to their Quantity of modern agricultural machineries

Category	Farmers		Range		Statistic	
	Number	Percent	Minimum	Maximum	Mean	S.D
Low quantity (up to 3)	64	58.19	0	9	3.118	2.0531
Medium quantity (4 to 5)	29	26.37				
High quantity (above 6)	17	15.44				
Total	110	100				

From the table 4.5 it is revealed that majority proportion (58.19 percent) of the farmers had low quantity of modern agricultural machineries compared to medium quantity with 26.37 percent and the high quantity of modern machineries owned only 15.44 percent.

From this table, it might be said that majority of the farmers owned low quantity of modern agricultural machineries. The main reason is less knowledge on modern machineries, farmer financial problem, fragmented land problem etc. For better crop production it is needed to increase knowledge on modern agricultural machineries. Low quantity of modern agricultural machineries owned farmers supposed to have had low knowledge on modern agricultural machineries.

#### 4.1.5 Attitude of the farmers towards using modern agricultural machineries

The attitude of the farmers towards using modern agricultural machineries ranged from 12 to 60 and the minimum and maximum score from the respondent farmers was 15 to 56. The average score of the farmers was 33.48 with the standard deviation of 11.89. On the basis of the Attitude of the farmers towards using modern agricultural machineries the farmers were categorized into three categories namely 'low', 'medium' and 'high'. Presented in table 4.6

**Table 4.6 Distribution of the farmers according to their Attitude towards using modern agricultural machineries**

Category	Farmers		Range		Statistic	
	Number	Percent	Minimum	Maximum	Mean	S.D
Unfavorable attitude (up to 35)	28	25.5	15	56	33.482	11.8992
Neutral (36)	16	14.5				
Favorable attitude(37-48)	46	41.8				
High favorable attitude (above 48)	20	18.2				
Total	110	100				

From this table 4.6, majority is (41.8 percent) of the farmers had favorable attitude towards using agricultural machineries compared to 1.5 percent to the neutral favorable attitude towards using agricultural machineries. On the other hands high favorable attitude towards using agricultural machineries is 18.2 percent. On this result most of farmers had favorable attitude toward using machineries because of they had not sufficient knowledge, quantity, awareness, benefit about using modern agricultural machineries. Farouk (2015) found almost similar findings.

#### 4.1.6 Experience in farming

Experience in farming ranged from 10 to 35. The average score of the farmers was 25.45 with the standard deviation of 5.03. The farmers were classified into three categories on the basis of their Experience in farming of the three categories namely 'low', 'medium' and 'high'. Presented in table 4.7

**Table 4.7 Distribution of the farmers according to their experience in farming:**

Category	Farmers		Range		Statistic	
	Number	percent	Minimum	Maximum	Mean	S.D
Low experience ( $\leq 15$ )	7	6.36	10	35	25.45	5.030
Medium experience (16 -25)	56	50.91				
High experience (above 29)	47	42.73				
Total	110	100				

Table 4.7 indicates that more than half of the (50.91%) farmers had medium experience in farming compared to 42.73 percent had high farming experience. On the other hands the low farming experience is 6.36 percent. The result indicted that most of the farmers (93.64%) had medium to high farming experience which helps acquiring more knowledge on modern agricultural machineries. Sanauallah (2021) found almost similar findings.



#### 4.1.7 Annual family income

The score of annual family income of the farmers ranged from 110 to 600 with a mean and standard deviation of 289.40 and 131.6 respectively. On the basis of annual family income, the farmers were classified into three categories namely low, medium, high annual family income. The distribution of the farmers according to their annual family income is presented table 4.8

**Table 4.8 Distribution of the farmers according to their annual family income**

Category(“000BDT”)	Farmers		Range		Statistic	
	Number	Percentage	Minimum	Maximum	Mean	S.D
Low income (<150)	20	18.18	110	600	289.40	131.6
Medium income (151-300)	48	43.64				
High income (above 300)	42	38.18				
Total	110	100				

The table 4.8, indicate that the majority (43.64 percent) of the farmers had medium income compared to 38.18 percent had high family income and 18.18 percent had low family income. It was found that annual income of the study area was higher than the national average of \$1909 USD. Its indicating that knowledge on modern agricultural machineries is usually practiced by the farmers having comparatively medium and higher economic condition. Rahman (2018) found almost similar findings.

#### 4.1.8 Training exposure

The training exposure of the farmers ranged from 0 to 10. The average score of the farmers was 3.00 with the standard deviation of 2.61. The farmers were classified into three categories on the basis of their training exposure of three categories namely 'low', 'medium' and 'high'. Presented in table 4.9

**Table 4.9 Distribution of the farmers according to their training exposure:**

Category	Farmers		Range		Statistic	
	Numbers	Percentage	Minimum	Maximum	Mean	S.D
No training exposure (0)	27	24.54				
Low exposure (1 to 3)	43	39.09	0	10	3.000	2.6161
Medium exposure (4 to 6)	26	23.65				
High exposure (above 6)	14	12.72				
Total	110	100				

The data in the Table 4.9 revealed that more than one-third of respondent framers (39.09 percent) had low training exposure and 24.54 percent had no training exposure while 23.65 percent had medium training experience, and only 12.72 percent of the farmers had high experience. No training and low training experience create a gap to knowledge of farmers on modern agricultural machineries. Hossain (2016) found almost similar findings.

#### 4.1.9 Organizational participation

The organizational participation of the farmers ranged from 0 to 20. The average score of the farmers was 5.25 with the standard deviation of 5.42. The farmers were classified into three categories on the basis of their organizational participation namely ‘low’, ‘medium’ and ‘high’ presented in table 4.10

**Table 4.10 Distribution of the farmers according to their organizational participation:**

Category	Farmer		Range		Statistic	
	Number	Percentage	Minimum	Maximum	Mean	S.D
No participation (0)	38	34.54	0	20	5.255	5.4275
Low participation(1-4)	27	24.56				
Medium participation (5-14)	34	30.90				
High participation (15-20)	11	10				
Total	110	100				

The data in the Table 4.10 revealed that more than one third of the respondent framers (34.54 percent) had no organizational participation while 24.56 percent had low organizational participation, and 10 percent of the farmers had high organizational participation. The findings again revealed that most 59.1 percent of the respondents had no to low organizational participation. For no and low organizational participation farmers can not discuss about the effect and benefit about use of modern agricultural machineries and that’s why they had low knowledge on modern agricultural machineries. Bhuiyan (2008) found almost similar findings. Organizational participation is a very effective and powerful source of receiving information about various new and modern technologies.

#### 4.1.10 Extension media contact

The observed score of extension media contact of the farmers ranged from 18 to 54. The average score of the farmers was 35.81 with the standard deviation of 9.89. The farmers were classified into three categories on the basis of their extension media contact scores and distribution of the three categories namely 'low', 'medium' and 'high' extension media contact of the farmers are shown in Table 4.11

**Table 4.11 Distribution of the farmers according to their extension media contact**

Category	Farmers		Range		Statistic	
	Number	Percentage	Minimum	Maximum	Mean	S.D
Low extension media contact (18-34)	56	50.90	18	54	35.818	9.8969
Medium extension media contract ( 35-45)	30	27.28				
High extension media contract (46-54)	24	21.82				
Total	110	100				

Data presented in table 4.11 showed that majority (50.90 percent) of the farmers had low extension media contact compared to 27.28 percent of them had medium extension media contact. And the high media contract was 21.82 percent. From this table, it is found that majority of the farmers had low extension media contact. The finding was interesting but logical because in general the farmers in the rural areas of Bangladesh are less composite in nature and less exposed to different information sources. Extension media contact pertains to ones contact with multifarious sources of farming knowledge and information. For low extension media contract farmers had low knowledge on modern agricultural machineries. Islam (2018) found almost similar findings.

#### 4.1.11 Knowledge of farmers on modern agricultural machineries

The Knowledge on agricultural machineries of the farmers ranged from 15 to 45. The average score of the farmers was 24.50 with the standard deviation of 9.67. The farmers were classified into three categories on the basis of their knowledge on modern agricultural machineries namely ‘low’, ‘medium’ and ‘high’. Presented in table 4.12.

**Table 4.12 Distribution of the farmers according to their knowledge on agricultural machineries:**

Category	Farmers		Range		Statistic	
	Number	Percentage	Minimum	maximum	Mean	S.D
Low knowledge (up to 17)	47	47.72	15	45	24.50	9.6764
Medium knowledge (18-34)	39	35.45				
High knowledge (above 34)	24	21.81				
Total	110	100				

The data presented in table 4.12 indicate that the majority (47.72) percent of the farmers had low knowledge on agricultural machineries compared to 35.45 percent had medium knowledge on agricultural machineries. On the other hands 21.81 percent had the high knowledge on modern agricultural machineries. The result indicted that most of the farmers had low knowledge on modern agricultural machineries. It assumes that they did not know the benefit and usefulness and important of using modern agricultural machineries. That why they did not adapt modern agricultural machineries. In order to get maximum production and crop yield, farmers must have adequate knowledge and skills in various aspects of using machinery in farming. Khan (2020) found almost similar findings.

## 4.2 Relationship between Selected Characteristics of the respondents and Their Knowledge on modern agricultural machineries

To explore the relationships between the selected characteristics of farmers with their Knowledge on modern agricultural machineries, Pearson Product Moment correlation was run. From this correlation test, it was found that education, quantity of modern agricultural machineries, attitude of farmers toward using agricultural machineries, annual family income, training exposure, and extension media contract had significant positive relationship with their knowledge on modern agricultural machineries. Beside these six characteristics, rest four characteristics of the farmers (age, farm size, experience in farming and organizational participation) had no significant relationship with their knowledge on modern agricultural machineries. Shown in table 4.13

**Table 4.13 Co-efficient of correlation showing relationship between selected characteristics of the farmers and their Knowledge on modern agricultural machineries**

Focus	Independent variables	Correlation co-efficient values (r)	Correlation value of 'r' with 109 df	
			0.05	0.01
Knowledge of farmers on agricultural machineries	Age	0.107	0.194	0.254
	Education	0.242*		
	Farm size	-0.063		
	Quantity of machineries	0.556**		
	Attitude of farmers using modern machineries	0.931**		
	Experience in farming	-0.182		
	Annual family income	0.789**		
	Training exposure	0.779**		
	Organizational participation	-0.068		
	Extension media contract	0.905**		

“\*\*\*” indicates correlation is significant at the 0.01 level (2-tailed) and

“\*\*” indicates correlation is significant at the 0.05 level (2-tailed)

#### **4.2.1 Age and Knowledge of farmers on modern agricultural machineries**

The relationship between age of the farmers and their knowledge on modern agricultural machineries was examined by testing the following null hypothesis.

“There is no relationship between age of the farmers and their knowledge on modern agricultural machineries

Co-efficient of correlation between the concerned variables was found to be ‘r’ = 0.107 value was less than that of tabulated value ( $r = 0.194$ ) with 109 df degree at 0.05 level of probability as shown in table 4.13. it leads to the following observation.

- i. The relationship showed a positive trend.
- ii. The concerned null hypothesis could not be rejected.
- iii. It could be said that Knowledge of farmers on modern agricultural machineries not influenced by the age of farmer.
- iv. Sabi et.al (2014) revealed that age of the farmers showed a positive and significant relationship with their knowledge on modern agricultural machineries.

Thus, the age of the farmers had non-significant relationship with their Knowledge of farmers on modern agricultural machineries.

#### **4.2.2 Level of education and Knowledge of farmers on modern agricultural machineries**

The relationship between education level of the farmers and Knowledge of farmers on modern agricultural machineries was examined by testing the following null hypothesis:

The computed “r” (0.242) value was lowest than the tabulated value ( $r = 0.254$ ) with 109 degree of freedom at 0.01 level of probability as shown in Table 4.13 and it directed to the following observations:

- i. The relationship between education of the farmers and Knowledge of farmers on modern agricultural machineries had significant and positive trend.
- ii. Hence, the concerned null hypothesis could not be rejected.
- iii. It could be said that the farmers Knowledge of farmers on modern agricultural machineries positively influenced by education.

- iv. Knowledge of farmers on modern agricultural machineries is high when education is high.
- v. Singh (1983) reported that education of the respondents was positively and significantly related with the knowledge of mechanization.

#### **4.2.3 Farm size and Knowledge of farmers on modern agricultural machineries**

The computed “r” (-0.063) value was lower than that of the tabulated value ( $r = 0.194$ ) with 109 degree of freedom at 0.05 level of probability as shown in Table 4.13. The findings showed that:

- i. There had no significant and no positive relationship between farm size of the farmer and Knowledge of farmers on modern agricultural machineries
- ii. Hence, the concerned null hypothesis could not be rejected.
- iii. It could be said that the Knowledge of farmers on modern agricultural machineries was low when the farm size was low.
- iv. Jalak (2002) revealed that there was a significant and positive relationship between size of land holding and adoption of improved farm implements.

#### **4.2.4 Quantity of machineries and Knowledge of farmers on modern agricultural machineries**

The computed “r” (0.556) value was higher than that of the tabulated value ( $r = 0.254$ ) with 109 degree of freedom at 0.01 level of probability as shown in Table 4.13. The findings showed that:

- i. There had significant and positive relationship between quantity of modern machineries and Knowledge of farmers on modern agricultural machineries.
- ii. Hence, the concerned null hypothesis could be rejected.
- iii. It could be said that when quantity of machinery was high than knowledge of farmers on modern agricultural machineries was high.



#### **4.2.5 Attitude of farmers towards using modern agricultural machineries and Knowledge of farmers on modern agricultural machineries**

The computed “r” (0.931) value was higher than that of the tabulated value ( $r = 0.254$ ) with 109 degree of freedom at 0.01 level of probability as shown in Table 4.13 The findings showed that:

- i. There had significant and positive relationship between the attitude of farmers towards using modern agricultural machineries and knowledge of farmers on modern agricultural machineries.
- ii. Hence, the concerned null hypothesis could be rejected.
- iv. It could be said that Knowledge of farmers on modern agricultural machineries was high when the Attitude of farmers towards using modern agricultural machineries was high.
- v. Farouk (2015) reported that the attitude of the farmers had significant positive relationship with their knowledge of farmers on modern agricultural machineries.

#### **4.2.6 Experience in farming and Knowledge of farmers on modern agricultural machineries**

The computed “r” (-0.182) value was higher than that of the tabulated value ( $r = 0.194$ ) with 109 degree of freedom at 0.05 level of probability as shown in Table 4.13 the value is less than the tabulation value ( $r=0.194$ ). The findings showed that:

- i. The relationship between experience in farming and Knowledge of farmer on modern agricultural machineries showed non-significant and negative trend.
- ii. Hence, the concerned null hypothesis could not be rejected
- iii. Knowledge of farmers on modern agricultural machineries was low when experience in farming was low.
- iv. Sanaullah (2021) revealed that, farming experience of the farmers had significant contribution to their knowledge on farm mechanization

#### **4.2.7 Annual family income and knowledge of farmer on modern agricultural machineries**

The computed “r” (0.789) value was higher than that of the tabulated value ( $r = 0.254$ ) with 109 degree of freedom at 0.01 level of probability as shown in Table 4.13. The findings showed that:

- i. There had significant and positive relationship between annual family income and knowledge of farmer on modern machineries
- ii. Hence, the concerned null hypothesis could be rejected.
- iii. It could be said that Knowledge of farmers on modern agricultural machineries was high when the annual family income was high.
- iv. Rahman (2018) reported in his study that Annual family income of the farmers had significant positive relationship with their knowledge of agricultural mechanization.

#### **4.2.8 Training exposure and knowledge of farmers on modern agricultural machineries**

The computed “r” (0.779) value was higher than that of the tabulated value ( $r = 0.254$ ) with 109 degree of freedom at 0.01 level of probability as shown in Table 4.13. The findings showed that

- i. There had significant and positive relationship between training exposure and knowledge of farmers on modern agricultural machineries.
- ii. Hence, the concerned null hypothesis could be rejected
- iii. It could be said that the knowledge of farmers on modern agricultural machineries was high when the training exposure was high.
- iv. Kamal (2017) found training exposure of the farmers had significant relationship with their knowledge in wheat cultivation.

#### **4.2.9 Organizational participation and knowledge of farmers on modern agricultural machineries**

The computed “r” (-0.068) value was lower than that of the tabulated value ( $r = 0.194$ ) with 109 degree of freedom at 0.05 level of probability as shown in Table 4.13 The findings showed that:

- i. The relationship between Organizational participation and knowledge of farmers on modern agricultural machineries non-significant and negative trend.
- ii. Hence, the concerned null hypothesis could not be rejected
- iii. It could be said that knowledge of farmers on modern agricultural machineries was low when organizational participation was low.

#### **4.2.10 Extension media contact and knowledge of farmers on modern agricultural machineries**

The computed “r” (0.905) value was higher than that of the tabulated value ( $r = 0.254$ ) with 109 degree of freedom at 0.01 level of probability as shown in Table 4.13. The findings showed that:

- i. There had significant and positive relationship between extension media contact and knowledge on agricultural machineries
- ii. Hence, the concerned null hypothesis could be rejected.
- iii. It could be said that use It could be said that knowledge of farmers on modern agricultural machineries was high when the extension media contact was high.
- iv. Islam (2018) reported that the extension contact of the farmers had significant positive relationship with their knowledge on modern agricultural machineries.

## CHAPTER V

### SUMMARY OF FINDINGS AND CONCLUSIONS

#### 5.1 Summary of the finding

Findings different aspect of the day are summarized below:

##### 5.1.1 Knowledge of farmer on modern agricultural machineries

Majority (42.72%) of farmers were low knowledge on modern agricultural machineries. while 21.81% of farmers were high knowledge and 35.45% of farmers were medium knowledge on modern agricultural machineries.

##### 5.1.2 Selected characteristic of farmers

**Age:** The highest proportions (44.55 percent) of the respondent were in the middle aged category compared to young aged 30% and 25.45% to the old aged farmers.

**Education:** The highest proportions (33.45 percent) of the respondent were in the secondary level category compared to primary level 20.2% and can not read and sign level 20.80% and lowest 10% in above secondary level.

**Farm size:** The highest proportion (38.18 percent) of the respondents were in the small farm owner category and 5.45% were landless farmer and 36.38% were in medium farm size category.

**Quantity of modern agricultural machineries:** More than half of the respondent (58.19%) had low quantity of modern machineries and 26.37% had medium quantity of modern machineries and 15.44% had high quantity of modern agricultural machineries.

**Attitude of farmers towards using modern agricultural machineries:** The majority (41.8 percent) of the respondent farmers had favorable attitude towards using modern agricultural machineries compared to high attitude towards using modern agricultural machineries 18.2% and 14.5% had neutral attitude towards using modern agricultural machineries.

**Experience in farming:** The majority (50.91 percent) of the respondent farmers were in medium farming experience category compared to 42.73% were in high farming experience and 6.36% were in low farming experience category.

**Annual family income:** The majority (43.64 percent) of the farmers had medium income compared to 18.18% had low income and 38.18% percent had high income.

**Training exposure:** The majority (39.09 percent) of the respondent farmers had low training experience compared to 12.72% had high training experience and 23.65% had medium training experience while 24.54% had no training exposure.

**Organizational participation:** The majority (59.1 percent) of the farmers had no to low organizational participation compared to 30.90% had medium organizational participation and 10 percent had high organizational participation.

**Extension media contact:** Half of the proportion of (50.90 percent) of the farmers had low extension media contact compared to 27.28 percent of them having medium media contact and 21.82 percent of them had high media contact.

## **5.2 Conclusion**

Following conclusions were drawn on the basis of findings, logical interpretation and other relevant facts of the study:

- i. Based on knowledge on modern agricultural machineries, the majority (51.82 percent) of the respondents belonged to low knowledge category followed by 26.37 percent in medium knowledge category and 21.81 percent in high knowledge category. Therefore, it may be concluded that there is necessity to increase the extant of knowledge of the farmers on agricultural machineries.
- ii. More than half of the farmers (54.55percent) were illiterate to only primary level educated which reflects poor educational qualification of the farmers. There exist a significant

correlation between education and knowledge of the farmers on modern agricultural machineries. Therefore, it may be concluded that, farmers with low education level had low knowledge on modern agricultural machineries compared to farmers with high education level because of education plays a vital role to increase the knowledge on modern agricultural machineries.

- ii. Among the farmers, the majority (58.19 percent) of the respondent had owned low quantity of modern machineries followed by medium quantity 26.37 percent and high quantity only 15.44 percent. It may be concluded that there is scope to increase the extant of knowledge of the farmers on modern agricultural machineries by increasing the quantity of agricultural machineries of the farmers.
- iii. More than four-fifth (87.28 percent) of the farmers possessed moderate to high favourable attitude towards using modern agricultural machineries and there existed a positive significant relationship between attitude of the farmers towards using modern agricultural machineries and their knowledge. Therefore, it may be concluded that an appreciable proportion of the farmer had positive attitude.
- iv. More than four-fifth (81.82 percent) of the respondents had medium to high family income and annual income of the farmers had positive significant relationships with their knowledge on modern agricultural machineries. So, it may be concluded that high annual income holder farmers had high knowledge on modern agricultural machineries as they have their own agricultural machineries or can afford the rent of modern agricultural machineries for their farm operations.
- v. More than four-fifth (87.28 percent) of the respondents had no to medium training exposure and it has significant positive relationship with their knowledge on modern agricultural machineries. Therefore, it may be concluded that training exposure is an important characteristics of the farmer to improve their knowledge on agricultural machineries.
- vi. Around four-fifth (78.18 percent) of the farmers had low to media extension media contact and findings expressed a significant positive relationship between extension media contact and knowledge of the farmers on modern agricultural machineries. So, it may be concluded

that if the farmer come with more contact of extension media they will acquire more knowledge on modern agricultural machineries.

### **5.3 Recommendations**

Recommendations based on the findings and conclusions of the study have been presented below:

#### **5.3.1 Recommendations for policy implications**

On the basis of observation and conclusions drawn from the findings of the study, following recommendations are made:

1. Majority (51.82 percent) of the respondents belonged to low knowledge on modern agricultural machineries. So, it may be recommended that a helpful initiative should be taken by the concerned authorities like DAE, BADC and other private agricultural machinery companies like ACI Motors, METAL and ABEDIN to improve farmer knowledge on modern agricultural mechanization through exhibition and other promotional program.
2. The findings of the study indicated that education had significant positive significant relationship with their knowledge on modern agricultural machineries. Therefore, it may be recommended that the concerned authorities should take the special mass education program for the illiterate and low literate farmers for increase their knowledge on modern agricultural machineries.
3. The findings of the study indicated that quantity of modern agricultural machinery had positive significant relationship with their knowledge on modern agricultural machineries. Therefore, it may be recommended that government, NGOs and other concerned private organizations could provide fund, sub subsidies or easy loan facilities for the farmers to buy modern agri-machineries to enhance agricultural mechanization and improve farmer's knowledge on modern agricultural machineries. The findings of the study indicated that annual income of the farmers had positive significant relationships with their knowledge on modern agricultural machineries. Therefore, it may be recommended that government

should take necessary steps like encourage bank, financial institutions and NGOs to provide soft loan with lowest interest to farmers so they can do livestock, poultry and other business besides farm activities to increase their annual income and knowledge on modern agricultural machineries

4. The findings of the study indicated that training exposure had positive significant relationship with their knowledge on modern agricultural machineries. Therefore, it may be recommended that the concerned authorities like govt agricultural organization, NGOs should take the special step on training program in mechanization to increase knowledge of farmers on modern agricultural machineries.
5. The findings showed extension media contact had a positive significant relationship with their knowledge on agricultural machineries. So, it may be recommended that the extension workers of the concerned authority should increase the contact with farmers personally and use other extension communication methods that can help them to increase their knowledge on modern agricultural machineries.

### **5.3.2 Recommendations for further study**

On the basis of scope and limitations of the present study and observation made by the researcher, the following recommendations are made for future study.

- ❖ The study was conducted in Soulmari union of Roumary Upazila and Roumary union of Roumary Upazila under Kurigram district. Findings of this study need verification by similar research in other parts of the country.
- ❖ Knowledge of farmers on modern agricultural machineries was investigated. But such study may be conducted by taking into consideration of other factors
- ❖ Relationships of ten characteristics of the farmers with their knowledge on modern agricultural machineries. Further research should be conducted to explore relationships of other characteristics of the farmers like family size, problem face, utilization on modern agricultural machineries with their Knowledge on modern agricultural machineries



## **CHAPTER VI**

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## ENGLISH VERSION OF THE INTERVIEW SCHEDULE

Department of Agricultural Extension & Information System

Sher-e-bangla Agricultural University

Dhaka-1207

### An Interview schedule for data collection on

### “Knowledge of farmers on Modern Agricultural Machineries”

(This interview schedule is entitled to a research study. Collected data will only be used for research purpose)

Name of the respondent:

Serial No:.....

Village:

Union:

Upazilla:

Contact no:

Please answer the following question

**1. Age:** How old are you?..... Years

**2. Education:** what is your education qualification?

- a) Can't read and write.....
- b) Can sign only.....
- c) Primary level (1-5).....
- d) Secondary level (6-10).....
- e) Above Secondary level(specify).....

**3. Farm Size:** Mention your farm size according to the following land use?

Sl No.	Use of Land	Measuring Unit	
		Local Unit	Hectare
1	Homestead		
2	Own land under own cultivation		
3	Land given to others on <i>borga</i>		
4	Land taken from others on <i>borga</i>		
5	Land taken from others on lease/mortgage		
6	Others (pond, poultry yard etc.)		
Total= A+B+ $\frac{1}{2}$ (C+D) +E+F			



**4. Quantity of Modern Agricultural Machineries:**

Do you use Modern Agricultural Machineries?

Yes:.....; No:.....

If yes please mention the exact numbers;

SI No	Names of modern agricultural machineries	Numbers
1	Combined Harvester	
2	Reaper	
3	Power Thrasher	
4	Power Tiller	
5	Tractor	
6	Power Sprayer	
7	Water pump	
8	Dram Seeder	
9	Japanese Rice Weeder	
10	Mechanical Dryer	
11	Trans planter	
12	Knapsack sprayer	
13	Winnower	
14	Others(please specify)	

**5. Attitude of the farmer towards using agricultural machineries:** Please mention your degree of agreement with the following statements

Sl. No.	Statements	Extent of agreement/ disagreement				
		SA	A	NO	D	SD
1(+)	The modern farming equipment and machineries are convenient for farming activities					
2(-)	Agricultural mechanization is harmful for environment					
3(+)	Use of modern farming equipment and machineries increases crop yield					
4(-)	There is a lack of spare parts and service facilities for using agri-machineries					
5(+)	Agricultural machineries makes effective to do farming activities					
6(-)	Using modern farming equipment and machineries is more risky compared to traditional machineries					
7(+)	Introduction of agricultural mechanization is a blessing					

	for farmers					
8(-)	It causes human health hazard					
9(+)	Using modern farming equipment's and machineries reduces labor cost					
10(-)	Maintenance and repairing cost of agricultural is difficult					
11(+)	Agricultural mechanization solves the problem of labor shortage					
12(-)	Use of agri-machineries is expensive					

(N. B: SA= Strongly Agreed; A= Agreed; NO= No Opinion; D= Disagreed; SD=Strongly Disagreed)

**6. Experience in farming:** How many years have you been engaged in farming?  
..... Year

**7. Annual Family Income:** Please mention your family income in taka from each of the following sources for last one year.

Income from agricultural sector (A)			
Sl No.	Sources	Monthly Income	Annual Income
1	Agriculture		
2	Livestock		
3	Fish		
Subtotal (A)			
Income from non-agricultural sector (B)			
Sl No.	Sources	Monthly Income	Annual Income
4	Service		
5	Business		
6	Day Labour		
7	Other		
Subtotal (B)			
Total (A+B)			

**8. Training exposure: Did you participated in any farm mechanization or modern agricultural practice related training program?**

Yes..... No.....

**If yes, mention the following information**

SL.	Subject of training	Duration of training (Days)
1.		
2.		
3.		

**9. Organizational participation:**

Yes..... No.....

What type of participation they provide?

SL NO	Name of the Organization	Nature of Participation			
		GM	ECM	ECO	DURATION
1	Sotota poribar organization				
2	Primary school committee				
3	Cental mosjid committee				
4	NGO (ASA)				
5	Gram protirokkha committee				
6	Khelaghor committee				
7	Others				

**10.Extension media content:**

**Please indicate your extension media contact**

Sl. No	Source of Information	Extent of use				
		Regularly (4)	Often (3)	Occasionally (2)	Rarely (1)	Never (0)
<b>Personal media</b>						
1.	UAO	7-8 times/ year	5-6 times/ year	3-4 times/ year	1-2 times/ year	0
2.	AEO	4 times/ month	3 times/ month	2 times/ month	1 times/ month	0
3.	SAAO	4 times/ month	3 times/ month	2 times/ month	1 times/ month	0
4.	NGO Worker	4 times/ month	3 times/ month	2 times/ month	1 times/ month	0
5.	Experienced farmer	7-8 times/ month	5-6 times/ month	3-4 times/ month	1-2 times/ month	0

6.	Neighbor	7-8 times/ month	5-6 times/ month	3-4 times/ month	1-2 times/ month	0
7.	Local Leader	7-8 times/ month	5-6 times/ month	3-4 times/ month	1-2 times/ month	0
<b>Group media</b>						
8.	Group discussion	7-8 times/ year	5-6 times/ year	3-4 times/ year	1-2 times/ year	0
9.	Training Center	4-5 times/ life	3 times/ life	2 times/ life	1 times/ life	0
10.	Field trip	4 times/ year	3 times/ year	2 times/ year	1 times/ year	0
<b>Mass media</b>						
11.	Watching agricultural machineries programme on Television.	Regularly	4-5 times/ week	2-3 times/ week	1 times/ week	0
12.	Listening agricultural programme on radio	Regularly	4-5 times/ week	2-3 times/ week	1 times/ week	0
13.	Reading different modern agricultural machineries based books/magazines/leaflets	7-8 times/ year	5-6 times/ year	3-4 times/ year	1-2 times/ year	0
14.	Mobile internet/ social media	Regularly	4-5 times/ week	2-3 times/ week	1 times/ week	0

**11. Knowledge of farmers on modern agricultural machineries:** Please answer the following questions

Sl. No.	Questions	Full marks	Obtained marks
1	What do you mean by agricultural mechanization?	2	
2	Mention name of five agricultural machineries	2	
3	Mention two agricultural machinery name that is used in land preparation	2	
4	Mention two types of pump that is used in irrigation	2	
5	Mention two machines that is used in sowing operation	2	
6	Mention two machines that is used in weeding operation	2	
7	Mention two sprayers name	2	
8	Mention five machines that is used in harvesting and post-harvesting operation	3	
9	State the functions of tractor and power tiller	3	
10	Describe the precautions of using spraying	3	
11	Describe the functions of rotavator	4	
12	Describe the functions of thresher	4	
13	Describe the major functions of combine harvester	4	
14	Discuss about the importance of agricultural mechanization?	5	

<b>15</b>	Discuss about the major problems in using modern agricultural machineries?	5	
<b>16</b>	How do you consider the role of government towards using and improving knowledge of farmers on modern agricultural machineries?	5	
<b>Total</b>		50	

Thank you very much for your kind cooperation and participation to the interview.

.....  
**Signature of the interviewer with date**