

**FARMERS' KNOWLEDGE AND PRACTICE REGARDING PLANT  
NURSERY MANAGEMENT**

**MD. RAZIB HASAN ANU**



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

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**FARMERS' KNOWLEDGE AND PRACTICE REGARDING  
PLANT NURSERY MANAGEMENT**

BY

**MD. RAZIB HASAN ANU**

**REGISTRATION NO. 10-03955**

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**SEMESTER: JULY- DECEMBER, 2016**

**Approved by**

.....  
**(Prof. Dr. Md. Sekender Ali)**

Supervisor

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

.....  
**(Md. Javed Azad)**

Co-Supervisor and  
Assistant Professor

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

.....  
**(Md. Mahbubul Alam, PhD)**

Chairman & Assoc. Prof.

Department of Agricultural Extension & Information System  
Sher-e-Bangla Agricultural University, Dhaka



Department of Agricultural Extension and  
Information System  
Sher-Bangla Agricultural University

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

Memo No.: SAU/AEIS

Date:

## CERTIFICATE

This is to certify that the thesis entitled, “**FARMERS’ KNOWLEDGE AND PRACTICE REGARDING PLANT NURSERY MANAGEMENT**” submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **Master of Science (MS) in Agricultural Extension**, embodies the result of a piece of bonafide research work carried out by **Md. Razib Hasan Anu**, Registration No. **10-03955**, under my supervision and guidance. No part of this thesis has been submitted for any other degree or diploma.

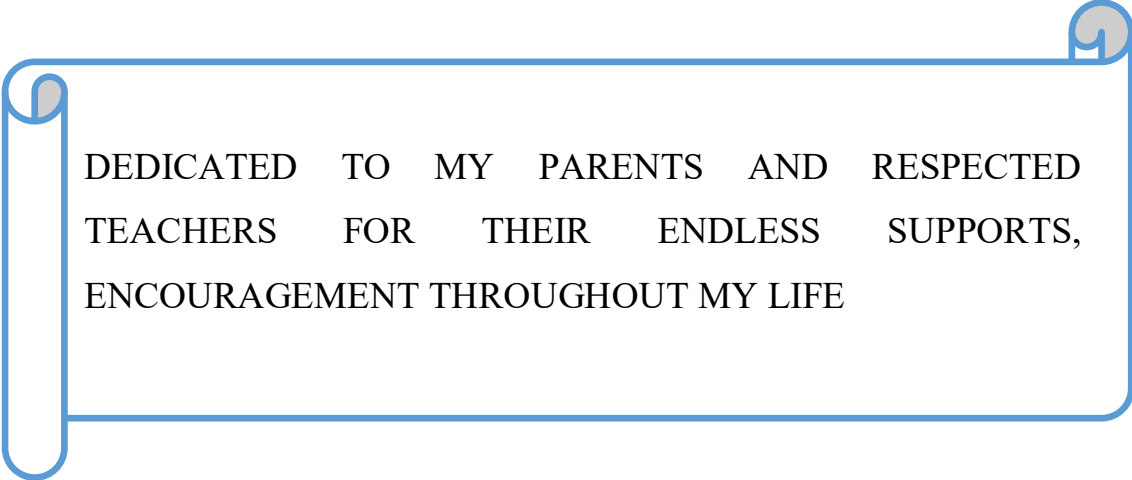
I further certify that any help or sources of information, as has been availed of during the course of investigation have been duly acknowledged.

Dated: December, 2016  
Dhaka, Bangladesh

.....  
**(Prof. Dr. Md. Sekender Ali)**  
Supervisor

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

# DEDICATION



DEDICATED TO MY PARENTS AND RESPECTED  
TEACHERS FOR THEIR ENDLESS SUPPORTS,  
ENCOURAGEMENT THROUGHOUT MY LIFE

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## LIST OF ABBREVIATIONS

<b>Aabbreviation</b>	<b>Full word</b>
Ag. Ext. and Info. Sys.	Agricultural Extension and Information System
AIS	Agriculture Information Service
BAU	Bangladesh Agricultural University
BBS	Bangladesh Bureau of Statistics
BRRI	Bangladesh Rice Research Institute
DAE	Department of Agricultural Extension
DAE	Department of Agricultural Extension
<i>et al.</i>	All Others
etc.	et cetera, and the other
FAO	Food and Agriculture Organization
MoYS	Ministry of Youth and Sports
SAAO	Sub-Assistant Agriculture Officer
SAU	Sher-e-Bangla Agricultural University



# **FARMERS' KNOWLEDGE AND PRACTICE REGARDING PLANT NURSERY MANAGEMENT**

**MD. RAZIB HASAN ANU**

## **ABSTRACT**

The purpose of this study was to determine the farmers' knowledge and practice regarding plant nursery management and explore the relationships between each of the twelve selected characteristic of the plant nursery growers with their a) knowledge and b) practices regarding plant nursery management and the relationship between knowledge and practice regarding plant nursery management. The selected characteristics were age, level of education, farm size, plant nursery area, investment in nursery, annual family income, income from plant nursery, experience in plant nursery management, plant species richness, credit received, extension contact, problems faced in plant nursery management. Data were gathered from 89 plant nursery growers of 13 villages of Swarupkathi, Jalabari and Atghar Kuriana Unions of Nesarabad upazila under Pirojpur district by using a pretested interview schedule. For harmonious representation from each village 30 percent plant nursery growers were selected as the sample by using proportionate random sampling method. Data were collected from 3 May to 27 May, 2017. Majority (59.6 percent) of the farmers had medium knowledge, while 21.3 percent high and 19.1 percent of the farmers had low knowledge on plant nursery management. Plant nursery area, investment in plant nursery, annual family income, income from plant nursery, extension contact and plant species richness of the farmers had significant positive relationship with their knowledge on plant nursery management. Majority (53.9 percent) of the plant nursery growers had medium practice, while 29.2 percent high practice and 16.9 percent of farmers had low practice regarding plant nursery management. Plant nursery area, investment in plant nursery, annual family income, income from plant nursery, extension contact and plant species richness of the farmers had significant positive relationship with their practice of plant nursery management. Age, education, farm size, nursery management experience, credit receive and problem faced in plant nursery management of the farmers had no significant relationships with their knowledge and practice of plant nursery management. Knowledge and practice regarding plant nursery management of the farmers had significant relationship. Therefore, it may be recommended that concerned authorities should arranged trainings, agricultural fairs, demonstrations, etc. for increasing knowledge as well as practice of the farmers regarding plant nursery management.

# CHAPTER 1

## INTRODUCTION

### **1.1 Background of the Study**

Bangladesh is an over populated country and its population is increasing day by day. There is only 17% forest area in Bangladesh but it should be at least 25% of total land area (BBS, 2012). Due to overpopulation the forest area become decreasing day by day. Plant nursery can play a vital role to improve this condition by supplying plant saplings as well as other horticultural plants which improve our environment, food supply as well as increase aesthetic value.

Nurseries are places where seedlings are raised for planting purposes. In the nursery, the young seedlings are tended from sowing to develop in such a way as to be able to endure the hard field conditions (Mason, 2004). Plant nursery management involves running a business that grows and sells plants for private or commercial use. This can involve selling plants wholesale or directly to customers through mail order, online or garden outlets.

According to Bhuiyan (1992) a total of 1.51 million ha of land would be available for social forestry development in Bangladesh. Scarcity of quality planting materials was reported as the most important constraint for improving the economic productivity of the traditional homestead agroforestry systems in Bangladesh (Abedin & Quddus, 1990; Millat-e-Mustafa, 1997). Over the years, increased costs of wages and benefits have driven seedlings costs close to planting costs with little or no gain productivity (Hee, 1984). Both seedlings and transplants are normally raised in a nursery (Aldhos, 1975). The soil for nursery beds or filling of containers must be readily workable, good texture and free draining such as sandy loam, clayey soils are unsuitable (Evans, 1986). Seed quality has great impact on the quality of planting stock (Tanaka, 1984).

Knowledge and practice plays important role in the production and marketing of saplings and nursery management. A successful nursery producer needs knowledge of plants, soils, fertilizers, pesticides, irrigation, machinery, pruning, harvesting methods, overwintering techniques, packing and conveyance practices etc. Ahmed (2003) reported that nursery is one of the most important income based activities in Bangladesh, which has led to poverty reduction and socio-economic improvement of the poor section of the population. The nursery business

has already cast a very positive impact on rural economy in terms of poverty alleviation and women empowerment.

Seedling production is one of the key steps in scaling up or domestication of any species. Each step has to be properly planned and implemented. The way seedlings are handled and managed in a nursery contributes to their survival rate after planting and their subsequent growth performance. Improving seedling quality correlates positively to their survival, growth and productivity. Seedling quality is governed by the genetic make-up of the parent trees and the physical growth of the seedlings. Several types of nurseries exist: individual or private, community or group, central or research, commercial and training nursery. Nursery practices must be consistent and the various techniques closely integrated. If one element in the chain is lacking there will be a negative impact on seedling quality. Good quality seedlings cannot be produced without care and tending. Nursery plants need to be protected from extremes of environmental conditions until they are strong enough to withstand them. It is important to have sufficient level of knowledge and good management practices of the farmers for the production of quality saplings as well as financial viability. Hence, assessments of knowledge and practices on plant nursery management have become an important issue which needs to be explored. Therefore, the objective of the study was conducted to assess the level of knowledge of the farmers and their practice in the production and marketing of saplings.

## **1.2 Statement of the Problem**

Now a days the demand of nursery plants is increasing. Plant nursery can become a major income generating source in rural area of Bangladesh. It can improve the quality of life of the rural poor. There are various modern technologies but not all of those are accepted by the farmers although they are intelligent and hard working. Maximum profit may be achieved only when farmers are well equipped with required technological knowledge and needed inputs and other relevant supports and most authentically if knowledge and skills are applied correctly in the field. Good practice helps the farmers making maximum profit. Because of good practices the quality and quantity of production can be increased significantly.

Analyzing the issues from plant nursery growers, the study was designed to find out the following research questions regarding farmers' knowledge and practice on plant nursery management:

1. What are the selected characteristics of the plant nursery growers?
2. What is the extent of knowledge of farmers in plant nursery management?
3. What is the extent of practice of farmers in plant nursery management?
4. Is there any relationship between farmers' selected characteristics and their knowledge and practice of plant nursery management?

The questions indicate the need for conducting a research study entitled “Farmers’ knowledge and practice regarding plant nursery management” in order to have an understanding of the knowledge and practice of plant nursery owners. Such research information will be helpful to the plant nursery owners, policy makers and government and non-government organizations dealing with nursery plant production in this country.

### **1.3 Specific Objectives**

- i. To determine and describe following selected characteristics of the plant nursery growers:
  - a) Age
  - b) Level of education
  - c) Farm size
  - d) Nursery area
  - e) Investment in nursery
  - f) Annual family income
  - g) Income from plant nursery
  - h) Experience in plant nursery management
  - i) Plant species richness
  - j) Credit receive
  - k) Extension contact and
  - l) Problem faced in plant nursery management
- ii. To determine the extent of knowledge of the nursery growers on plant nursery management
- iii. To determine the extent of farmers’ practice of plant nursery management
- iv. To explore the relationship of farmers’ each selected characteristics with their
  - a) knowledge and b) practice of plant nursery management
- v. To explore the relationship between farmers’ knowledge and practice regarding plant nursery management

#### **1.4 Justification of the study**

The major focus of the study is to assess the knowledge and practice of the plant nursery grower. Plant nursery should get adequate attention to meet the growing demand for food and wood for increased population of Bangladesh. Plant nursery supply fruit, medicinal and forest plant's saplings as well as flower plants and other ornamental plants. Different government and non-government organizations (NGOs) are currently putting effort and allocating resources for production oriented enterprises and also encouraging the rural people to establish plant nursery. Plant nursery growers' adoptions of modern management practices are necessary to improve plant nursery management. So, it is high time as well as necessary to evaluate knowledge and practice of the concerned nursery owners.

Considering the above facts, the researcher became interested to carry out the present study on **“Farmers’ Knowledge and Practice regarding Plant Nursery Management.”**

#### **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). The researcher had the following assumptions in mind while undertaking this study:

1. The selected respondents were competent enough to reply the queries made by the researcher.
2. The responses furnished by the respondents were valid and reliable.
3. Information furnished by the respondents included in the sample was the representative opinion of the whole population of the study area.
4. The researcher who acted as interviewer was well adjusted to social and environment condition of the study area. Hence, the data collected by him from the respondents were free from bias.
5. All the data concerning all the variables of the study were normally and independently distributed.

## **1.6 Limitations and Scope of the Study**

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

1. The study was confined to only Nesarabad upazila in Pirojpur district.
2. Population for the present study was kept confined within the owner of plant nursery in the study area.
3. There were many characteristics of the farmers in the study area but only 12 of them were selected for investigation.
4. For information about the study, the researcher depended on the data furnished by the selected respondents during their interview with him.
5. 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.
6. Reluctance of plant nursery growers to provide information was overcome by establishing proper rapport.

## **1.7 Definition of Terms**

A researcher needs to know the meaning and contents of every term or concept that he uses. A concept is an abstract of observed thing; events or phenomenon. It should clarify the issue as well as explain the fact to the investigator and readers.

However, for clarity of understanding, a number of key concepts/terms frequently used throughout the study are defined and interpreted as follows:

**Respondents:** Randomly selected people considered to be represented of the population are known as respondents. They are the people from whom a social research worker usually gets most data required for his research. In this study the respondents were the village level plant nursery owners.

**Plant nursery growers:** The persons who were owners of plant nurseries and involved with nursery management were treated as plant nursery growers.

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

**Level of education:** Education referred to the development of desirable change in knowledge, skill, attitude and ability in an individual through reading, writing, working, observing and other related activities. It was operationalized by the formal education of plant nursery growers by taking into account of years he/she spent in formal educational institutions.

**Farm size:** Farm size meant the total area of land on which a farmer's family carried on farming operations in terms of full benefit to the family. It was expressed in hectare.

**Nursery area:** Nursery area referred to the area of land under his/her management only for plant nursery. It was expressed in hectare.

**Investment in nursery:** Amount of money invested in plant nursery. It was expressed in thousand taka.

**Annual family income:** Annual family income referred to the total earnings of a respondent and the members of his family from agricultural and non-agricultural sources (business, services, daily labor etc.) during the previous year.

**Annual income from plant nursery:** It referred to annual income of the respondent from plant nursery during the previous year. It was expressed in thousand Taka.

**Experience in plant nursery management:** Experience as a general concept comprises knowledge or skill of something or some event gained through involvement in or exposure to that thing or event. Experience refers to the nature of the events someone or something has undergone. Experience is what is happening to us all the time as long we exist. However, in this study, it was considered as the year of starting from first plant nursery cultivation till the year of data collection.

**Plant species richness:** Plant species richness is defined as the total number of plant species are grown commercially in a total nursery area.

**Credit received:** Credit received means lending money for nursery management from NGO, bank or lender. It was expressed in thousand Taka.

**Extension contact:** It referred to an individual's exposure to or contact with different communication media, source and personalities being used for dissemination of new technologies.

**Problem faced:** Problem means any difficult situation which requires some actions to minimize the gap between "what ought to be" and "what is". The term problem faced referred to different problem faced by the nursery grower in plant nursery management.

**Knowledge:** Knowledge is operationally defined for the purpose of this investigation as 'those behaviors and test situations, which emphasized the remembering either by recognition or recall of ideas, material or phenomenon'. It referred to the amount of understood information possessed by the nursery growers on various aspects of plant nursery management.

**Practice of plant nursery management:** It referred to the level of practices by the nursery growers in various aspects of plant nursery management, such as counting seedlings, proper irrigation in the field, proper insect and disease control, application of balanced fertilizer and organic manure, application of IPM shading, grading, carefully uprooting, safe transportation etc.



## **CHAPTER 2**

### **REVIEW OF LITERATURE**

This Chapter deals with the review of past research works that relates to this investigation directly or indirectly. The study was mainly concerned with nursery growers' knowledge and practice regarding plant nursery management. The reviews are conveniently presented based on the major objectives of the study. Accordingly, the researcher made an exhaustive search of the past studies that could be made from available internet, websites, books, journals and other printed materials from different sources of home and abroad. But unfortunately, a very few previous literatures were found related to the present study. This chapter is divided into following sections:

- Section 1: Concept and Past Research related to Knowledge and Practice
- Section 2: Relationships between Selected Characteristics of the Respondents and their Knowledge on Innovations
- Section 3: Relationships between Selected Characteristics of the Respondents and their Practice on Innovations
- Section 4: Conceptual Model of the Study

### **2.1 Concept and Past Research related to Knowledge and Practice**

#### **2.1.1 Concept of knowledge**

Knowledge can be defined as the 'understanding obtained through the process of experience or appropriate study'. Knowledge can also be an accumulation of facts, procedural rules or heuristics. Here-

- A fact is generally a statement representing truth about a subject matter or domain.
- A procedural rule is a rule that describes a sequence of actions.
- A heuristic is a rule of thumb based on years of experience.

Knowledge is the result of some activity such as generalization, storage, dissemination and utilization of something that entails either information or data. It is usually based on learning, thinking and proper understanding of the problem area. So when a pattern relation exists among the data and information, the pattern

has the potential to represent knowledge, however, when one able to realize and understand the patterns and their implications.

Bhuiyan (2012) said “knowledge may be defined as the scientific fact of an idea which is experimentally or empirically verified.” Boudreau (1995) indicated “human faculty resulting from interpreted information; understanding that germinates from combination of data, information, experience, and individual interpretation. Variously defined as, Things that are held to be true in a given context and that drive us to action if there were no impediments.”

Knowledge is derived from information in the same way information is derived from data when processed or patterned in human mind. It can be considered as the integration of human mind. It can be considered as the integration of human perceptive processes that helps them to draw meaningful conclusions. Therefore, when a pattern relation exists among the data and information, the pattern has the potential to represent knowledge. It only becomes knowledge, however, when one is able to realize and understand the patterns and their implications.

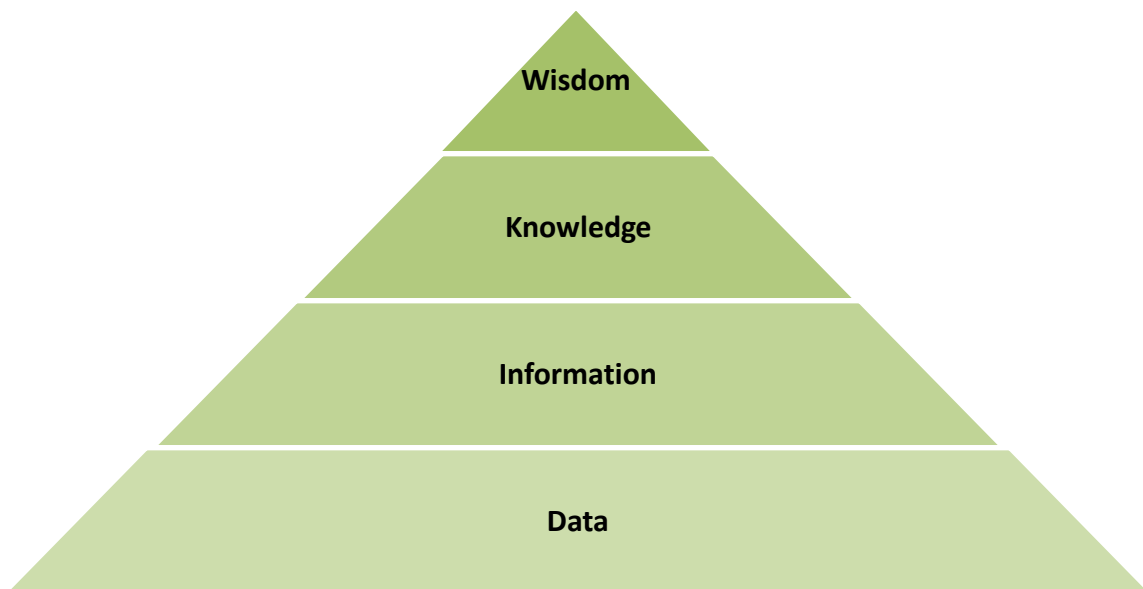


Figure 2.1 Data, information, knowledge and wisdom process

Mandal (2016) found that, majority (64.3 %) of the farmers possessed ‘medium knowledge’ while 20.7 and 15.0 percent of the farmers possessed ‘low’ to ‘high knowledge’ respectively in watermelon cultivation.

Mondal (2014) found that, Majority (54 percent) of the farmers possessed medium knowledge while 27.4 and 14.6 percent of the farmers possessed low and high knowledge respectively on strawberry cultivation.

Abdullah *et al.* (2013) found that, the majority 44.6 percent of the pond farmers possessed medium knowledge, 25.7 percent possessed high knowledge, 16.8 percent low knowledge and 12.9 percent possessed very high knowledge.

Azad *et al.* (2014) found that, 56 percent of the respondents felt in medium knowledge category followed by 35.8 percent in high knowledge category and only 8.3 percent in low knowledge category in knowledge on postharvest practices of vegetables.

### **2.1.2 Concept of practice**

“Practice may be referred as the activities of an individual that she/he performed followed by some instructions in order to fulfill some wants that she/he needed” said Alam (2004). According to Sveiby (1997) “practice may be defined as a method, procedure, process, or rule used in a particular field or profession; a set of these regarded as standard.” In another definition “Practice is the actual application or use of an idea, belief, or method as opposed to theories relating to it” according to Oxford Dictionary. From oxford dictionary it is also found that practice is the facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject.

A practice a documented approach to solving one or several commonly occurring problems. Practices are intended as “chunks” of process for adoption, enablement, and configuration. Practices are built from the basic method elements. Practices

enable a new approach to building methods. This approach offers the following benefits:

- Focused on business results
- Reusability, adaptability and scalability
- Incremental adoption
- Easy to configure and use
- Community development

A practice is a component or aspect of a process that can be adopted independently and incrementally by an organization or individual to build an organizational or own capability. Practices support easier adoption of lighter processes. Individuals and organizations only use what they really need. They can adopt one or a few practices at a time and/or adopt a practice at higher levels over time.

Practices are designed to be interchangeable; they may be mixed and matched or swapped out for alternative practices. Practice-based techniques recognize that "one-size fits all" is too limiting for processes. Practices allow alternatives. Creating a method is as simple as selecting the practices that you wish to adopt, and then publishing the results. Each practice adds itself into the framework so that content can be viewed by practice or across practices by work product, role, task and so on.

There is a proverb that “practice makes a man perfect” in the same way more practice increase knowledge and attitude (positive or negative) to a specific subject. In plant nursery management Practice includes irrigation, applying fertilizer and pesticides, application of IPM, shading of the seedlings, grading, carefully uprooting, carefully loading, safe transportation, marketing etc. Regular practice increases knowledge towards plant nursery management.

Mandal (2016) found that, Majority (71.3 %) of the watermelon farmers had 'medium practice', while 16.1 percent farmers had 'high practice' and 12.6 percent farmers had 'low practice' of watermelon cultivation.

Mondal (2014) found that, majority (69.9 percent) of the strawberry farmers had medium practice, while 17.7 percent farmers had high practice and 12.4 percent farmers had low practice on strawberry cultivation.

Abdullah (2013) found that, about 61.4 percent of the pond farmers had medium practice, while 27.7 percent farmers had low practice and only 10.9 percent farmers had high practice.

### **2.1.3 Past research related to knowledge and practice**

Khan (2005) studied on knowledge of maize cultivation and found that majority (68 percent) of the farmers had relatively low level of knowledge and 32 percent of the farmers possessed relatively high level of knowledge.

Sana (2003) studied farmers' knowledge of shrimp culture and showed that majority (61 percent) of them had medium level of knowledge, while 30 percent had low and rest 9 percent possessed high knowledge.

Hasan (2004) reported that the highest proportion of the respondents had medium knowledge on partnership extension approach (70.4 percent) followed by 16.9 percent had low knowledge and 13.3 percent had high knowledge.

Hossain, (2003) found in his study on farmers' knowledge and adoption of modern sugarcane cultivation practices found that highest proportion (84 percent) of the farmers possessed medium knowledge, 13 percent high knowledge and lowest proportion (3 percent) possessed low knowledge.

Saha (2001) conducted a study to determine farmers' knowledge in improved practices of pineapple cultivation and found that the majority (62 percent) of the farmers possessed good knowledge, 33 percent poor knowledge and only 5 percent possessed excellent knowledge.

Mandal (2016) studied on knowledge of watermelon cultivation and found that knowledge of the watermelon growers had positively significant relationship with their practice of watermelon cultivation.

Mondal (2014) studied on knowledge on strawberry cultivation and found that knowledge of the farmers had positively significant relationship with their practice of strawberry cultivation.

Abdullah (2013) studied on knowledge and practice on pond fish culture and found that knowledge of the farmers had positively significant relationship with their practice of pond fish culture.

## **2.2 Relationship between Selected Characteristics of the Farmers and their Knowledge on Innovations**

### **2.2.1 Age and knowledge**

Rahman (2006) found in his study that age of the farmers had a significant and negative relationship with their knowledge on prawn culture. Similar results were observed by Sarker (2002), Kashem (1987) in their respective studies.

Roy (2006) found in his study that age of the farmers had no significant relationship with their knowledge on boro rice cultivation. Similar results were observed by Khan (2005), Islam (2005) and Rahman (2004) in their respective studies.

Akhter (2003) found in his study that the age of the farmers had no significant relationship with their knowledge on agricultural activities.

Rahman (2015) observed in his study about “Farmers’ Knowledge and Attitude Regarding Cultivation of Salt Tolerant Variety (BRRI dhan 47) of Rice” that age of rice farmers had a positive significant relationship with knowledge on BRRI dhan 47 cultivation.

Islam (1993) in his study concluded that age of the BSs had no significant relationship with their knowledge on modern agricultural technologies. Islam (1996) conducted a study on farmers’ use of indigenous technical knowledge

(ITK) in the context of sustainable agricultural development. Buthe found that age of the farmers had significant negative relationship with their extent of use of ITK.

Mandal (2016) in his study concluded that age of the farmers had no significant relationship with their knowledge on watermelon cultivation.

Mondal (2014) in her study concluded that age of the farmers had no significant relationship with their knowledge on strawberry cultivation.

Abdullah (2013) in his study concluded that age of the farmers had significant relationship with their knowledge on pond fish culture.

Azad (2014) in his study concluded that age of the farmers had significant relationship with their knowledge on postharvest practices of vegetables.

### **2.2.2 Level of education and knowledge**

Rahman (2006) observed in his study that education level of the farmers had significant and positive relationship with their knowledge on prawn culture.

Roy (2006) in his study found that education level of the farmers had significant and positive relationship with their knowledge on boro rice cultivation.

Mondal (2014) observed in her study that level of Education of strawberry cultivation farmers had positive significant relationship with knowledge on strawberry cultivation at 5 percent level of significance.

Rahman (2015) also observed in his that level of education farmers had positive significant relationship with knowledge on BRRI dhan 47 cultivation.

Islam (1993) and Kashem (1987) found that the general education of the BSs had no significant relationship with their knowledge on modern agricultural technologies. Huda et al. (1992) found that farmers with education and without education had same level of moisture of their seed.

Akhter (2003) found in his study that level of education of the farmers had a significant and positive relationship with their knowledge on agricultural activities.

Farhad (2003) found that the education of the rural women farmer had significant and positive relationship with their knowledge in using IPM in vegetable cultivation.

Sana (2003) showed that education of the respondents had positive relationship with their knowledge in shrimp cultivation.

Sutradhar (2002) revealed that academic qualification of the respondents had a significant positive relationship with their awareness on environmental degradation.

Mandal (2016) in her study concluded that level of education of the farmers had significant relationship with their knowledge on watermelon cultivation.

Abdullah (2013) in his study concluded that level of education of the farmers had no significant relationship with their knowledge on pond fish culture.

Azad (2014) in his study concluded that level of education of the farmers had significant relationship with their knowledge on postharvest practices of vegetables.

### **2.2.3 Farm size and knowledge**

Rahman (2006) examined in his study that farm size of the farmers had a significant relationship with knowledge on prawn culture.

Islam (2005) in his study explored that farm size of the farmers had significant positive relationship with their knowledge on IPM in crop production.

Farhad (2003) found that farm size of rural women farmer had a positive significant relationship with their knowledge in using IPM in vegetable cultivation.

Sana (2003) reported that farm size of the shrimp cultivators had no relationship with their knowledge of shrimp culture.

Sutradhar (2002) found that farm size of the respondents had a significant positive relationship with their awareness on environmental degradation.

Hanif (2000) found that there was a negative insignificant relationship between farm size of the respondents and their awareness on environmental pollution.

Hossain (2000) found that farm size of the farmers had no relationship with their knowledge on Binadhan-6.

Mondal (2014) in his study concluded that farm size of the farmers had no significant relationship with their knowledge on strawberry cultivation.



Abdullah (2013) in his study concluded that farm size of the farmers had significant relationship with their knowledge on pond fish culture.

Azad (2014) in his study concluded that farm size of the farmers had no significant relationship with their knowledge on postharvest practices of vegetables.

#### **2.2.4 Nursery area and knowledge**

Mondal (2014) observed in her study that strawberry cultivation area of farmers had positive significant relationship with knowledge on strawberry cultivation.

Rahman (2015) also observed in his that BRRI dhan 47 cultivation area of rice farmers had positive significant relationship with knowledge on BRRI dhan 47 cultivation.

Islam (2008) found that vegetable cultivation area had a positive and substantial significant relationship with knowledge on vegetables production activities by woman members in homestead area under world vision project.

Mandal (2016) in his study concluded that watermelon cultivation area of the farmers had significant relationship with their knowledge on watermelon cultivation.

Azad (2014) in his study concluded that vegetable cultivation area of the farmers had no significant relationship with their knowledge on postharvest practices of vegetables.

#### **2.2.5 Investment in nursery and knowledge**

No literature was found related to relationship between investment in plant nursery and knowledge of farmers.

#### **2.2.6 Annual family income and knowledge**

Roy (2006) found that annual family income of the farmers had significant relation with their knowledge on boro rice cultivation. Similar results were observed by Islam (2005), Hossain (2003) and Nurruzzaman (2000) in their respective studies.

Dhali (2013) observed in his study that annual income of the farmers on semi-intensive aquaculture had significant and positive relationship. Similar results were observed by Sharif (2011), Kawser (2009), Rahman (2009) and Rahman (2006) in their respective studies.

Mandal (2016) in his study concluded that annual family income of the farmers had significant relationship with their knowledge on watermelon cultivation.

Mondal (2014) in her study concluded that annual family income of the farmers had no significant relationship with their knowledge on strawberry cultivation.

Abdullah (2013) in his study concluded that annual family income of the farmers had no significant relationship with their knowledge on pond fish culture.

Azad (2014) in his study concluded that annual family income of the farmers had no significant relationship with their knowledge on postharvest practices of vegetables.

### **2.2.7 Income from plant nursery and knowledge**

Mondal (2014) observed in her study that income from strawberry cultivation of farmers had positive significant relationship with knowledge on strawberry cultivation. Rahman (2015) also observed in his that income from BRRI dhan 47 of rice farmers had positive significant relationship with knowledge on BRRI dhan 47 cultivation.

Islam (2008) found that income from vegetable had a positive and substantial significant relationship with knowledge on vegetables production activities by woman members in homestead area under world vision project.

Mandal (2016) in his study concluded that income from watermelon cultivation of the farmers had significant relationship with their knowledge on watermelon cultivation.

Abdullah (2013) in his study concluded that income from fish farming of the farmers had no significant relationship with their knowledge on pond fish culture.

Azad (2014) in his study concluded that income from vegetable cultivation of the farmers had no significant relationship with their knowledge on postharvest practices of vegetables.

### **2.2.8 Experience and knowledge**

Islam (2008) found that vegetable cultivation experience had a positive and substantial significant relationship with knowledge on vegetables production activities by woman members in homestead area under world vision project.

Mandal (2016) in his study concluded that watermelon cultivation experience of the farmers had no significant relationship with their knowledge on watermelon cultivation.

Azad (2014) in his study concluded that vegetable cultivation experience of the farmers had significant relationship with their knowledge on postharvest practices of vegetables.

### **2.2.9 Plant species richness and knowledge**

No literature was found related to relationship between plant species richness and knowledge of farmers.

### **2.2.10 Credit received and knowledge**

Naznin (2011) found that credit received had a significantly positive relationship with fish traders' awareness. Similar findings were obtained by Islam (2009) and Sharif (2011).

Mandal (2016) in his study concluded that credit received of the farmers had no significant relationship with their knowledge on watermelon cultivation.

In contrast, Kausar (2009) found that credit availability of pond owners had a significant and negatives relationship with their knowledge on prawn culture.

Kundu (2010) in his study concluded that credit received of the farmers had no significant relationship with their knowledge gap of pulse production.

### **2.2.11 Extension contact and knowledge**

Sana (2003), Sarker (2002) and Rahman (2001) found in their study that media contact of farmers was highly positive significant relationships with their knowledge.

Mondal (2014) observed in her study that extension contact of strawberry cultivation farmers had positive significant relationship with knowledge on strawberry cultivation. Rahman (2015) also observed in his that extension contact farmers had positive significant relationship with knowledge on BRRI dhan 47 cultivation.

Mandal (2016) in his study concluded that extension contact of the farmers had significant relationship with their knowledge on watermelon cultivation.

Abdullah (2013) in his study concluded that extension contact of the farmers had no significant relationship with their knowledge on pond fish culture.

### **2.2.12 Problem faced and knowledge**

Ali (1999) concluded that problems of the farmers had a significant relationship with their knowledge.

Mondal (2014) observed in her study that Problem faced on strawberry cultivation of farmers had negative significant relationship with knowledge on strawberry cultivation. Rahman (2015) also observed in his that Problem faced on BRR1 dhan 47 cultivation of farmers had negative significant relationship with knowledge on BRR1 dhan 47 cultivation.

Mandal (2016) in his study concluded that problem faced in watermelon cultivation of the farmers had negatively significant relationship with their knowledge on watermelon cultivation.

Abdullah (2013) in his study concluded that problem faced of the farmers had negatively significant relationship with their knowledge on pond fish culture.

Azad (2014) in his study concluded that problem faced in vegetable cultivation of the farmers had negatively significant relationship with their knowledge on postharvest practices of vegetables.

## **2.3 Relationship between Selected Characteristics of the Farmers and their Practice on Innovations**

### **2.3.1 Age and practice**

Abdullah (2013), found that practice on agricultural activities has no significant relationship with their age. Saha (2003) found that practice on poultry production has no relationship with their age. Mondal (2014) observed in her study age of farmers in strawberry cultivation had no significant relationship with their practice of strawberry cultivation.

Rahman (2004) found that practice on Boro rice cultivation has no relationship with their age. In shrimp culture, Sana (2003) found that practice on has negative relationship with their age.

Mandal (2016) in his study concluded that age of the farmers had no significant relationship with their practice of watermelon cultivation.

### **2.3.2 Level of education and practice**

Rahman (2006) in practice of prawn culture and Roy (2006) in practice of coping with flood condition found that has significant and positive relationship with their level of education.

Mondal (2014) observed in her study level of education of farmers had no significant relationship with their practice of strawberry cultivation.

Akhter (2003) and Hossain (2003) found that practice of agricultural activities has Significant and negative relationship with their level of education.

Islam (2005) also found that practice of IPM in crop production has significant and negative relationship with their level of education. Saha (2003) in practice of rice cultivation and Rahman (2004) in practice of poultry production also found that has no relationship with their level of education.

Mandal (2016) in his study concluded that level of education of the farmers had no significant relationship with their practice of watermelon cultivation.

Abdullah (2013) in his study concluded that level of education of the farmers had no significant relationship with their practice on pond fish culture.

### **2.3.3 Farm size and Practice**

Abdullah (2013) in his study concluded that farm size of the farmers had no significant relationship with their practice on pond fish culture.

### **2.3.4 Nursery area and practice**

Mondal (2014) observed in her study area of farmers in strawberry cultivation had no significant relationship with their practice of strawberry cultivation.

Mandal (2016) in his study observed that watermelon cultivation area of the farmers had significant relationship with their practice of watermelon cultivation.

Abdullah (2013) in his study concluded that pond size of the farmers had significant relationship with their practice on pond fish culture.

### **2.3.5 Investment in nursery and practice**

No literature was found related to relationship between investment in plant nursery and knowledge of farmers.

### **2.3.6 Annual family income and practice**

Rahman (2006) in practice of prawn culture, Roy (2006) in practice of boro rice cultivation and Islam (2005) in IPM crop production found that there was significant and positive relationship with annual family income.

Rahman (2004) found that there was no relationship with annual family income and practice of vegetable cultivation.

Mandal (2016) in his study observed that annual family income of the farmers had significant relationship with their practice of watermelon cultivation.

Abdullah (2013) in his study concluded that annual family income of the farmers had no significant relationship with their practice on pond fish culture.

### **2.3.7 Income from plant nursery and practice**

Mondal (2014) observed in her study annual income from strawberry cultivation of farmers had positive significant relationship with their practice of strawberry cultivation.

Mandal (2016) in his study observed that income from watermelon cultivation of the farmers had significant relationship with their practice of watermelon cultivation.

Abdullah (2013) in his study concluded that income from fish farming of the farmers had no significant relationship with their practice on pond fish culture.

### **2.3.8 Experience and practice**

Mondal (2014) observed in her study experience of farmers in strawberry cultivation had no significant relationship with their practice of strawberry cultivation.

Mandal (2016) in his study observed that experience of the farmers had no significant relationship with their practice of watermelon cultivation.

Abdullah (2013) in his study concluded that extension contact of the farmers had no significant relationship with their practice on pond fish culture.

### **2.3.9 Plant species richness and practice**

No literature was found related to relationship between plant species richness and practice of farmers.

### **2.3.10 Credit received and practice**

Mandal (2016) in his study observed that credit received of the farmers had significant relationship with their practice of watermelon cultivation.

### **2.3.11 Extension contact and practice**

Mondal (2014) observed in her study extension contact of farmers had positive significant relationship with their practice of strawberry cultivation. In practice of Boro rice cultivation Roy (2006) found significant and positive relationship with extension contact. Hossain (2001) found significant and positive relationship with extension contact and cultivation practices. Sana (2003) also found significant and positive relationship with extension contact and practice on shrimp culture.

Mandal (2016) in his study observed that extension contact of the farmers had significant relationship with their practice of watermelon cultivation.

### **2.2.12 Problem faced and practice**

Mondal (2014) observed in her study problem faced by farmers in strawberry cultivation had negative significant relationship with their practice of strawberry cultivation. Rahman (2001) and Islam (2005) found on relationship between farmers practice on Alok 6201 hybrid rice and farmers practice of IPM in crop production with problem faced respectfully.

Saha (2001) found significant and positive relationship with practice of pineapple cultivation and problem faced in pineapple cultivation.

Mandal (2016) in his study observed that problem faced in watermelon cultivation of the farmers had negatively significant relationship with their practice of watermelon cultivation.

## **2.3 Conceptual Framework of the Study**

Both conceptual ideas and available empirical studies stated above were taken into consideration in developing a framework for this study. At a higher level (especially at the Masters and PhD levels) study, conceptual framework comes in form of a diagram or a figure showing how various variables interplay in the

achievement of the research objectives or constructed ideas to solve an identified research problem.

Knowledge and practice regarding plant nursery management were the main focuses of the study. Each of which may influence by many factors of the nursery growers. Considering these issues, a simple conceptual framework for the study is shown in Figure 2.2.



**Selected characteristics of the  
Nursery growers**

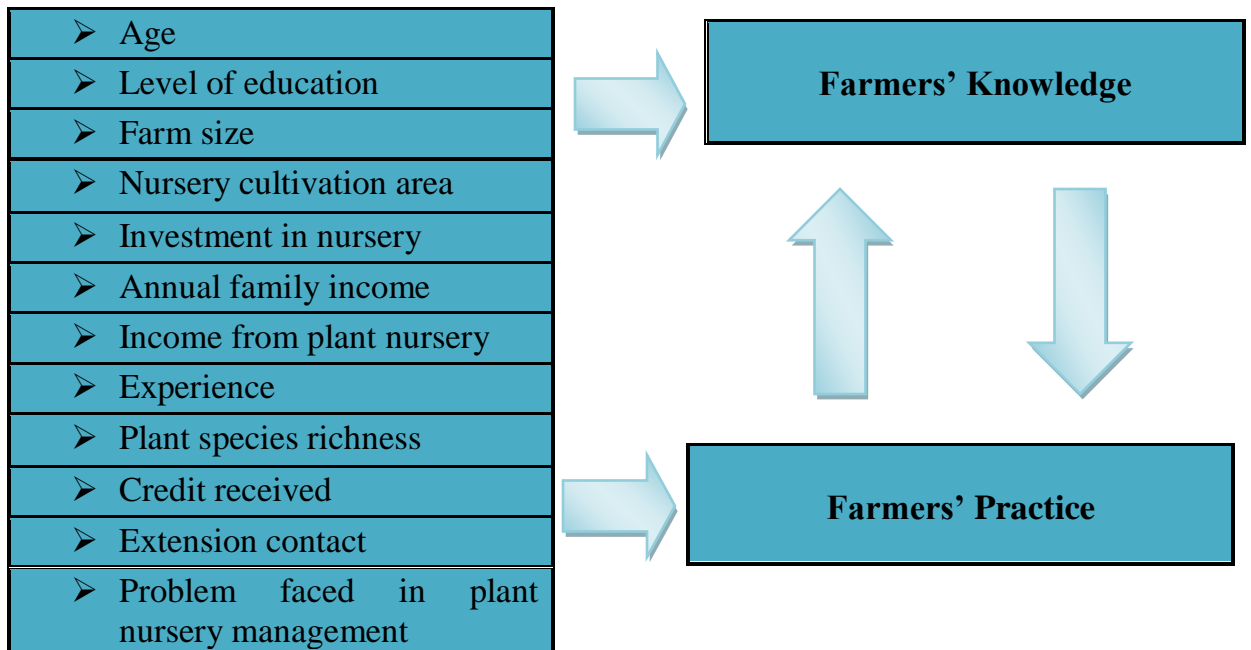


Figure 2.2 The conceptual framework of the study

## CHAPTER 3

### MATERIALS AND MEHODS

Methods and procedures used for collection and analysis of data are very important in any scientific research. It requires a careful consideration before conducting a study. Appropriate methodology enables the researcher to collect valid and reliable information and to analyze the information properly in order to arrive at correct conclusions.

However, the methods and procedures followed in conducting this study has been described in the subsequent sections of this Chapter.

#### **3.1 The Locale of the Study**

The study was conducted among the plant nursery growers of purposively selected three unions (Swarupkathi, Jalabari and Atghar Kuriana) of Nesarabad upazila under Pirojpur district because plant nurseries are grown plenty in these unions. From these unions 13 villages (Swarupkathi, Sarsina, Kuniari, Alankarkathi, Akalom, Jagonnathkathi, Aramkathi, Jalabari, Bhrammankathi, Kamarkathi, Sangeetkathi, Atghra, Mahmudkathi) were selected randomly from 32 villages of these unions. The map of Bangladesh showing Pirojpur districts appears in the Figure 3.1. A map of Pirojpur district showing Nesarabad upazila and a map of Nesarabad upazila showing the study area have been shown in Figure 3.2 and 3.3 respectively.



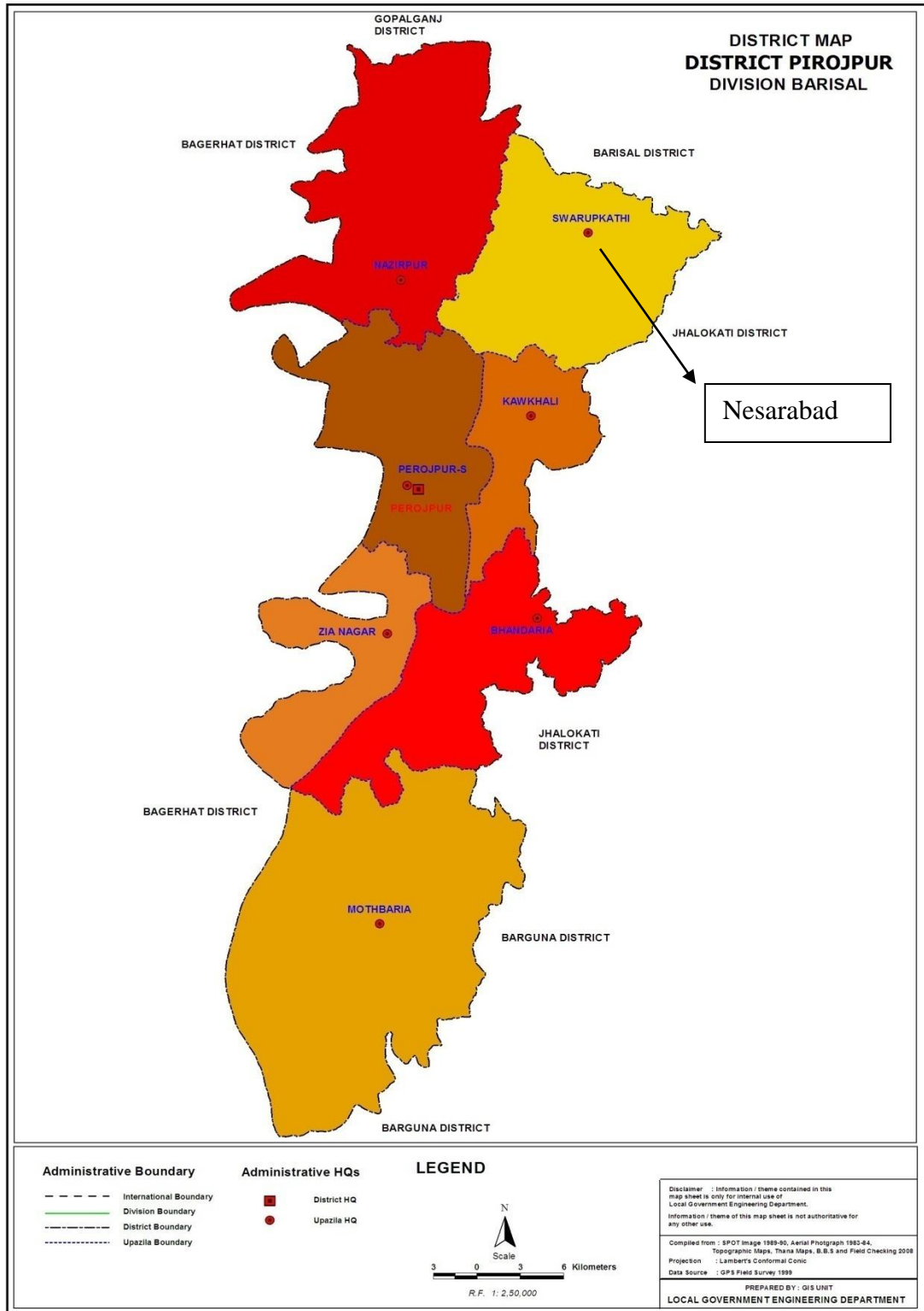


Figure 3.2. A map of Pirojpur district showing Nesarabad upazila



Figure 3.3 A map of Nesarabad upazila showing the study area (Swarupkathi, Jalabari and Atghar Kuriana Union)

### 3.2 Population and Sample of the Study

Thirteen (13) separate lists of plant nursery growers from each of the selected villages of the study area was prepared by the researchers himself with the help of the Sub Assistant Agriculture Officers (SAAO) of Nesarabad upazila Agricultural Office. These lists comprised a total 296 plant nursery growers in the study area. These farmers constituted the population of this study. To make a representative sample 30 percent of the population was selected proportionately by random sampling technique. Thus, eighty nine (89) plant nursery growers were selected as the sample of the study. The village-wise distribution of the population and sample of nursery growers are shown in Table 3.1. Besides this 5 percent of the samples were selected randomly as reserves who were supposed to be interviewed only when a respondent in the original sample list was unavailable during data collection.

**Table 3.1 Distribution of the population, sample and reserve list of plant nursery growers**

<b>Name of village</b>	<b>Population (No. of total plant nursery growers)</b>	<b>Sample size (30%)</b>	<b>Reserve list (5%)</b>
Swarupkathi	18	6	1
Sarsina	17	5	1
Kuniari	23	7	1
Alankarkathi	24	7	1
Akalam	14	4	1
Jagonnathkathi	21	6	1
Aramkathi	26	8	1
Jalabari	27	8	1
Bhrammankathi	29	9	2
Kamarkathi	31	9	2
Sangeetkathi	19	6	1
Atghar	22	7	1
Mahmudkathi	25	7	1
<b>Total</b>	<b>296</b>	<b>89</b>	<b>15</b>

### **3.3 Data Collecting Instrument**

In a social research, preparation of an interview schedule for collection of information with very careful consideration is necessary. Keeping this fact in mind the researcher prepared an interview schedule carefully for collecting data from the respondents. Objectives of the study were kept in view while preparing the interview schedule.

The initially prepared interview schedule was pre-tested among 12 respondents of the study area. The pretest was helpful to find out gaps and to locate faulty questions and statements. Alterations and adjustments were made in the schedule on the basis of experience of the pretest. English version of the interview schedule is shown in appendix-A.

### **3.4 Collection of Data**

Data were collected through personal interviewing by the researcher himself through face to face interview. The study was purposively conducted in the Nesarabad upazila of Pirojpur district of Bangladesh. To familiarize with the study area and for getting local support and establishing rapport during conducting the interview with the plant nursery growers the researcher met with the Sub-Assistant Agriculture Officers of the respective blocks in order to explain the objectives of the study and requested them to provide necessary help and co-operation in collection of data. The local leaders of the area were also approached to render essential help. As a result, there was no problem to collect data. Before going to the respondent plant nursery growers for interview, they were informed verbally to ensure their availability at the proper places as per schedule date and time. However, if any respondents failed to understand any questions, the researcher took great care to explain the issue. Excellent cooperation and coordination were obtained from all respondents. The interview was conducted confidentially. Collection of data took 25 days from 3 May to 27 May, 2017.

### **3.5 Variables of the Study**

In a descriptive social research, selection and measurement of the variables is an important task. In this connection, the researcher reviewed literature as far as possible to widen his understanding about the nature and scope of the variables relevant to this research. Variables can be defined as any aspect of a theory that can vary or change as part of the interaction within the theory (Heffner, 2014).

Ezkiel and Fox (1959) defined a variable as any measurable characteristics which can assume varying or different values in successive individual cases. Farmers' a) Knowledge and b) Practice on plant nursery management were the main focuses of the study, i.e. the predicted variables. Farmers' selected characteristics like age, education, farm size, nursery cultivation area, investment in nursery, annual family income, income from plant nursery, plant nursery cultivation experience, plant species richness, credit received, extension contact and problem faced may influence on the predicted variables which were considered as the experimental variables of the study.

### **3.6 Measurement of Variables**

This section contains procedures for measurement of both experimental as well as predicted variables of the study. The procedures followed in measuring the variables are presented below:

#### **3.6.1 Age**

Age of a respondent was measured in terms of years from birth to the time of interview which was found on the basis of response (Azad, 2003). A score of one (1) was assigned for each year of age. Question regarding this variable appears in item no. 1 in the interview schedule (Appendix-A).

#### **3.6.2 Level of education**

The education of a plant nursery grower was measured by the number of years of schooling completed in an educational institution. A score of one (1) was assigned for each year of formal schooling completed by a respondent (Sharmin, 2005). If a grower didn't know how to read and write, his education score was zero (0), while a score of 0.5 was given to a nursery grower who could sign his/her name only. (Azad *et al.*, 2014).

#### **3.6.3 Farm size**

Farm size of the farmer was measured by the land area possessed by him. Data obtained in response to questions under item No. 4 of the interview schedule



(Appendix A) formed the basis for determining the farm size of the respondent.

Farm size was computed by using the following formula:

$$\text{Farm size} = A_1 + A_2 + A_3 + 1/2 (A_4 + A_5) + A_6 + A_7$$

$A_1$  = Homestead Area

$A_2$  = Own land under own cultivation

$A_3$  = Land taken on lease from others

$A_4$  = Land taken on barga from others

$A_5$  = Land given to others as barga

$A_6$  = Pond

$A_7$  = Fallow land

The respondent farmers indicated their farm size in local unit. Finally, it was converted into hectare and was considered as the farm size of the respondents.

### **3.6.4 Nursery area**

Nursery area was measured by the area of land under his/her management only for plant nursery cultivation. The unit of measurement was hectare.

### **3.6.5 Investment in nursery**

Investment in nursery refers to the amount of taka which was invested in the plant nursery initially. It was measured in Thousand Taka ('000' Taka).

### **3.6.6 Annual family income**

Annual family income of plant nursery growers was measured on the basis of total yearly earnings from agricultural and other sources (service, business, daily labor etc.) by the respondent himself and other family members during last year. The value of all the agricultural products encompassing crops, livestock, fisheries, fruits, vegetables etc. were taken into consideration. Thus, yearly earning from agricultural and non-agricultural sources were added together to obtain annual family income of a plant nursery grower. For calculation a score of 1 was given

for each Tk. 1,000 income to compute the annual income scores of the respondents.

### **3.6.7 Annual income from plant nursery**

Income from plant nursery of the respondents was measured in thousand taka on the basis of total annual income from the value of the products of plant nursery during last year. It was expressed in '000' taka.

### **3.6.8 Experience in plant nursery management**

Plant nursery management experience of the respondent was measured by total number of years a respondent engaged in plant nursery management. The measurement included from the year of first plant nursery cultivation till the year of data collection. For calculation a score of one (1) was assigned for each year of experience.

### **3.6.9 Plant species richness**

Plant species richness of a respondent was measured by the total number of plant species (grown commercially) in his or her nursery.

### **3.6.10 Credit received**

Credit received of a respondent was measured in terms of the amount of money received from different sources by him as loan. It was expressed by thousand taka ('000'). This variable appears in question no.10 of the interview schedule as presented in Appendix-A.

### **3.6.11 Extension contact**

The term extension media contact refers to one's becoming accessible to the influence of extension education through different extension media. This variable was measured by computing an extension contact score on the basis of a plant nursery grower's extent of contact with 7 selected media as obtained in response to item no.11 of the interview schedule (Appendix A). Each farmer was asked to indicate the frequency of his contact with each of the selected media as five alternative responses as 'frequently', 'often' 'occasionally', 'rarely' and 'not at all' basis and weights were assigned as 4, 3, 2, 1 and 0 respectively. Logical

frequencies were considered for each alternative response. The extension contact score of a respondent was determined by summing up his/her scores for contact with all the selected media. Thus, possible extension contact score could range from zero (0) to 28, where zero (0) indicated no extension contact and 28 indicated the highest level of extension contact.

### **3.6.12 Problem faced in plant nursery management**

Like other crops, farmers face many problems in plant nursery management but sixteen major problems were selected for the research after consultation with nursery growers and relevant experts. Each respondent was asked to respond to four alternative responses as ‘sever problem’, ‘moderate problem’, low problem’, ‘not at all problem’ for each of 16 selected problems. Scores were assigned to those alternative responses as 3, 2, 1 and 0 respectively.

The problem faced score of a respondent was determined by summing up his/her scores for all the problems. Thus, possible faced score could vary from zero (0) to 48, where Zero (0) indicated no problem and 48 indicated the highest level of problem.

### **3.6.13 Knowledge on plant nursery management**

After thorough consultation with relevant experts and reviewing of related literature, 15 questions regarding plant nursery cultivation were selected and those were asked to the respondent plant nursery owners to determine their knowledge on plant nursery management. Two (2) score was assigned for each correct answer and zero (0) for wrong or no answer. Partial score was also assigned for partially correct answer. Thus, the knowledge on plant nursery management score of the respondent could range from 0 to 30, where zero (0) indicating very poor knowledge and 30 indicate the very high knowledge on plant nursery management. The variable appears in the item number 13 of the interview schedule (Appendix-A).

### **3.6.14 Practice of plant nursery management**

A good number of innovations are being practice now a days by the farmers for plant nursery management. Based on pre-test experience and through consultation with relevant experts 12 innovations regarding plant nursery cultivation were consider for this study. The respondents were asked to indicate their extent of practice of these 12 innovations with four alternative responses as regularly, occasionally, rarely and not at all basis. Score were assigned to the alternative responses as 3, 2, 1 and 0 respectively. Practice of plant nursery management of the respondents were computed by summing up all the scores obtained by them from all the 12 innovations. Thus, the possible range of practice of plant nursery management score was 0 to 36, while 0 indicated no practice and 36 indicated highest practice on plant nursery management. The variable appears in the item number 14 of the interview schedule (Appendix-A).

### **3.7 Statement of the Hypotheses**

As defined by Goode and Hatt (1952) a hypothesis is “a proposition which can be put to test to determine its validity. It may seem contrary to, or in accord with common sense. It may prove to be correct or incorrect. In any event, however, it leads to an empirical test”.

#### **3.7.1 Research hypotheses**

In the light of the objectives of the study and variables selected, the following research hypotheses were formulated to test them in. The research hypotheses were stated in positive form, the hypotheses were as follows:

*“Each of the selected characteristics of the farmers had relationship with their a) knowledge and b) practice regarding plant nursery management.”*

### **3.7.2 Null hypotheses**

In order to conduct statistical tests, the research hypotheses were converted to null form. Hence, the null hypotheses were as follows:

*“Each of the selected characteristics of the farmers had no relationship with their a) knowledge and b) practice regarding plant nursery management.”*

## **3.8 Data Processing**

### **3.8.1 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.

### **3.8.2 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 age against each of the traits to transform the data into quantitative forms. These were then tabulated in accordance with the objective of the study.

### **3.8.3 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 variables. These categories were developed for each of the variables by considering the nature of distribution of the data and extensive literature review. The procedures for categorization have been discussed while describing the variables under consideration in Chapter 4.

### **3.9 Statistical Analysis**

After completion of field survey, all the data were coded, compiled, tabulated and analyzed in accordance with the objectives of the study. Local units were converted into standard units. All the individual responses to questions of the interview schedule were transferred in to a master sheet to facilitate tabulation, categorization and organization. In case of qualitative data, appropriate scoring technique was followed to convert the data into quantitative form wherever necessary.

The statistical measures such as range, means, standard deviation, number and percentage distribution were used to describe the variables. Pearson's product moment correlation co-efficient ( $r$ ) was used in order to explore the relationships between the concerned variables. Five percent (0.05) level of significance was the basis for rejecting any null hypothesis throughout the study. The SPSS computer package was used to perform all these processes.

## CHAPTER 4

### RESULTS AND DISCUSSION

The findings of the study and interpretations of the results have been presented in this Chapter. Necessary explanations and appropriate interpretations have also been made showing possible and logical basis of the findings. However, for convenience of the discussions, the findings are systematically presented in the following sections.

#### 4.1 Characteristics of the Farmers

There were twelve characteristics of the farmers that might have relationship with their knowledge and practice regarding plant nursery management. These selected characteristics were age, level of education, farm size, plant nursery cultivation area, investment in nursery, annual family income, income from plant nursery, plant nursery management experience, plant species richness, credit received, extension contact, problems faced in plant nursery management. The salient features of the selected twelve characteristics of the farmers are presented in Table 4.1

**Table 4.1 Salient features of the selected characteristics of the farmers (n=89)**

Sl. No.	Characteristics (with measuring unit)	Range		Mean	Standard deviation
		Possible	Observed		
01	Age (years)	Unknown	22-70	40.28	10.45
02	Level of education (schooling years)	Unknown	0-12	7.48	3.1
03	Farm size (hectare)	Unknown	0.18-1.80	0.43	0.29
04	Nursery area (hectare)	Unknown	0.09-0.8	0.28	0.14
05	Investment in nursery ('000'Taka)	Unknown	80-700	322.8	150.24
06	Annual family income ('000'Taka)	Unknown	150-450	264.33	64.82
07	Annual income from plant nursery	Unknown	75-420	198.38	75.97

	(‘000’Taka)				
08	Experience in plant nursery management (years)	Unknown	5-35	17.35	7.81
09	Plant species richness (no.)	Unknown	8-45	26.77	7.12
10	Credit received(‘000’Taka)	Unknown	0-300	66.17	79.06
11	Extension contact (score)	0-28	4-18	11.15	2.37
12	Problem faced in plant nursery management (score)	0-48	16-25	20.05	1.87

#### 4.1.1 Age

Age of the plant nursery growers ranged from 22 to 70 years, the average being 40.28 years and the standard deviation of 10.45. On the basis of age, the farmers were classified into three categories: “young aged” (up to 35), “middle aged” (36-50) and “old aged” (above 50 years). Table 4.1 contains the distribution of the respondents according to their age.

**Table 4.2 Distribution of the plant nursery growers according to their age**

Categories	Basis of categorization (year)	Respondents		Mean	SD
		Numbers	Percent		
Young aged	Up to 35	31	34.8	40.28	10.45
Middle aged	36 to 50	44	49.4		
Old aged	Above 50	14	15.7		
<b>Total</b>		<b>89</b>	<b>100</b>		

Data presented in Table 4.2 indicated that about half (49.4 percent) of the plant nursery growers were middle aged compared to 34.8 percent young and 15.7 percent old. Findings again revealed that overwhelming majority (84.2 percent) of the respondents were young to middle aged.



#### 4.1.2 Level of education

Education level of the respondents ranged from 0-12 in accordance with year of successful schooling. The mean of education score of the respondents was 7.48 with a standard deviation of 3.1. Level of education was categorized according to the national classification of education system of Bangladesh, which are illiterate, primary level, secondary level, above secondary level. The farmers were classified into four categories as shown in Table 4.3

**Table 4.3 Distribution of the plant nursery growers according to their level of education**

Categories	Basis of Categorization (schooling years)	Respondents		Mean	SD
		Number	Percent		
Illiterate	0-0.5	7	7.9	7.48	3.1
Primary	1-5	15	16.7		
Secondary	6-10	61	68.7		
Above secondary	>10	6	6.7		
<b>Total</b>		<b>89</b>	<b>100</b>		

Data presented in Table 4.3 indicate that a large proportion (68.7 percent) of the respondents had secondary level of education, 16.7 percent had primary level of education and 6.7 percent had above secondary level of education and 7.9 percent illiterate. In the study area education of the nursery grower is satisfactory which is above the national average (63 percent) of Bangladesh (BBS, 2012).

#### 4.1.3 Farm size

Farm size of the respondents ranged from 0.18 hectare to 1.8 hectares with the mean of 0.43 and standard deviation of 0.3. On the basis of their farm size, the farmers were classified into three categories followed by Azad (2014) as shown in Table 4.4.

**Table 4.4 Distribution of plant nursery growers according to their farm size**

Categories	Basis of categorization (ha)	Respondents		Mean	SD
		Number	Percent		
Marginal farm	0.02 to <0.2	4	4.5	0.43	0.3
Small farm	0.2 to 1	79	88.8		
Medium farm	>1	6	6.7		
<b>Total</b>		<b>89</b>	<b>100</b>		

Data presented in the Table 4.4 represent that highest proportion (88.8 percent) of the farmers had small farm size compared to 6.7 percent having medium farm size and only 4.5 percent had marginal farm size. The findings indicated that overwhelming majority (95.5 percent) of the farmers had small to medium farm size.

#### 4.1.4 Plant nursery area

Plant nursery area of the respondents varied from 0.09 to 0.8 hectare, the average being 0.29 ha with the standard deviation of 0.14. The respondents were classified into three categories on the basis of their nursery cultivation area as shown in Table 4.5.

**Table 4.5 Distribution of plant nursery growers according to their plant nursery area**

Categories	Basis of categorization (ha)	Respondents		Mean	SD
		Number	Percent		
Small nursery	Up to 0.15 (<mean-1 sd)	16	18	0.29	0.14
Medium nursery	0.15-0.43 (mean±1 sd)	62	69.6		
Large nursery	Above 0.43 (>mean+1 sd)	11	12.4		
<b>Total</b>		<b>89</b>	<b>100</b>		

From the Table 4.5 it was revealed that the majority of the respondents (69.6 percent) had medium nursery, compared to 18 percent, and 12.4 percent large plant nursery. The findings again revealed that overwhelming majority (87.60 percent) of the nursery growers had small to medium nursery. During the data collection it was observed that the respondents who were involved in nursery management utilized their most of farming land for plant nursery production purpose.

#### 4.1.5 Investment in plant nursery

Investment in plant nursery of the respondents varied from Taka 80 to 700 thousand, the mean being 322.8 thousand and standard deviation of 150.3. The respondents were classified into three categories on the basis of their investment in plant nursery as shown in Table 4.6.

**Table 4.6 Distribution of plant nursery growers according to their investment in plant nursery**

Categories	Basis of categorization ('000' tk.)	Respondents		Mean	SD
		Number	Percent		
Low	Up to 172 (<mean-1sd)	15	16.9	322.8	150.5
Medium	172-472(mean±1sd)	56	62.9		
High	Above 472(>mean+1sd)	18	20.2		
<b>Total</b>		<b>89</b>	<b>100</b>		

From the data furnished in the Table 4.6, it was revealed that the majority of the respondents (62.9 percent) had medium investment, compared to 16.9 percent low investment, and 20.2 percent high investment in plant nursery. The findings again revealed that overwhelming majority (83.1 percent) of the farmers were medium to high investor. The initial investment in the plant nursery was high. The variable cost of plant nursery included the cost of human labor, seed/seedlings, organic manure, chemical fertilizer, soil, earthen pot, polythene, pesticide, irrigation and interest on operating capital. On the other hand, the fixed cost included cost of family labor, cost of land use and depreciation of tools and equipment. Moreover, for each and every plant species requires different seed bed and management. Therefore, the initial investment of plant nursery grower was high.

#### **4.1.6 Annual family income**

Annual family income of the respondents ranged from 150 to 450 thousand taka. The mean was 264.33 thousand taka and standard deviation was 64.8. On the basis of annual family income, the respondents were categorized into three groups as shown in Table 4.7.

**Table 4.7 Distribution of plant nursery growers according to their annual family income**

Categories	Basis of categorization ('000' tk.)	Respondents		Mean	SD
		Number	Number		
Low	Up to 200 (<mean-1sd)	16	18	264.33	64.8
Medium	200-328 (mean±1sd)	60	67.4		
High	Above 328 (>mean+1sd)	13	14.6		
<b>Total</b>		<b>89</b>	<b>100</b>		

The majority (67.4 percent) of the plant nursery grower had medium annual income compared to 18 percent low income and 14.6 percent high annual income. It indicated that plant nursery cultivation is usually practiced by the farmers having comparatively medium to higher economic condition.

#### **4.1.7 Annual income from plant nursery**

Annual income from plant nursery of the respondent ranged from 75 to 420 thousand taka. The mean was 198.38 thousand taka and standard deviation was 76. On the basis of annual income from plant nursery, the respondents were categorized into three groups as shown in Table 4.8.

**Table 4.8 Distribution of plant nursery growers according to their annual income from plant nursery**

Categories	Basis of categorization ('000' tk.)	Respondents		Mean	SD
		Number	Number		
Low	Up to 122 (<mean-1sd)	17	19.1	198.38	76
Medium	122-274 (mean±1sd)	62	69.7		
High	Above 274 (>mean+1sd)	10	11.2		
<b>Total</b>		<b>89</b>	<b>100</b>		

Data shown in the Table 4.8 indicated that 69.7 percent of the farmers had medium income while 19.1 percent farmers had low and 11.2 percent had high annual income from plant nursery. Thus, the overwhelming majority (88.8 percent) of the farmers had low to medium annual income from plant nursery.

#### 4.1.8 Experience in plant nursery management

Computed scores of the farmers about experience in plant nursery management ranged from 5 to 35 years with a mean of 17.35 and standard deviation of 7.8. On the basis of plant nursery management experience, the respondents were classified into three categories as follows in Table 4.9.

**Table 4.9 Distribution of nursery growers according to their experience in plant nursery management**

Categories	Basis of categorization (Years)	Respondents		Mean	SD
		Number	Number		
Low experience	Up to 10 (<mean-1sd)	21	23.6	17.35	7.8
Medium experience	10-24 (mean±1sd)	49	55.1		
High experience	Above 24 (>mean+1sd)	19	21.3		
<b>Total</b>		<b>89</b>	<b>100</b>		

Data of Table 4.9 reveals that the majority (55.1 percent) of the nursery growers had medium plant nursery management experience while 21.3 percent had high plant nursery management experience and 13.3 percent had low plant nursery management experience. Above three fourth (76.4 percent) of the plant nursery grower had medium to high plant nursery management experience. The higher experience might be increased the risk bearing ability of the farmers in plant nursery management as well as increase their knowledge on nursery management practices.

#### 4.1.9 Plant species richness

Plant species richness of the respondents range from 8 to 45. The mean was 26.8 and standard deviation was 7.1. On the basis of plant species richness, the respondents were classified into three categories as follows in Table 4.10.

**Table 4.10 Distribution of plant nursery growers according to their plant species richness**

Categories	Basis of categorization (Number)	Respondents		Mean	SD
		Number	Number		
Low richness	Up to 20 (<mean-1sd)	16	18	26.8	7.1
Medium richness	20-34 (mean±1sd)	59	66.3		
High richness	Above 34 (>mean+1sd)	14	15.7		
<b>Total</b>		<b>89</b>	<b>100</b>		

Data shown in the Table 4.10 indicated that 66.3 percent of the farmers had medium plant species richness where 18 percent farmers had low and 15.7 percent had high plant species richness in their nursery. The overwhelming majority (82.0 percent) of the farmers had medium to high plant species richness. This means that plant nursery growers deal with different species of plant like fruit, flower, medicinal, forest, ornamental etc.

#### 4.1.10 Credit received

Credit received of the respondents ranged from 0 to 300 thousand taka. The average and standard deviation were 66.17 and 79.0 respectively. Based on credit received, the respondents were classified into four categories and shown in Table 4.11.

**Table 4.11 Distribution of the plant nursery growers according to their credit received**

Categories	Basis of categorization ('000' tk.)	Respondents		Mean	SD
		Number	Number		
No credit received	0	30	33.7	66.17	79.0
Low	Up to 100	43	48.3		
Medium	>100-200	12	13.5		
High	Above 200	4	4.5		
<b>Total</b>		<b>89</b>	<b>100</b>		

The highest proportion (48.3 percent) of the farmers received low amount of credit while 33.7 percent did not receive any credit compared to 13.5 percent medium and 4.5 percent received high amount of credit. The plant nursery growers of the study area received credit mainly from local lenders, different types of NGOs and banks. Naznin (2011), Sharif (2011), Kawsar (2009), Islam (2009) and Salam (2013) found similar results. Another important thing to mention that more than one third (33.70 percent) of the respondent did not receive credit from any source.

#### 4.1.11 Extension contact

The observed extension contact scores of the plant nursery grower ranged from 4 to 18 against the possible range from 0 to 28, the mean and standard deviation were 11.16 and 2.37 respectively. According to this score, the respondents were classified into three categories as shown in Table 4.12.

**Table 4.12 Distribution of the plant nursery growers according to their extension contact**

Categories	Basis of categorization (score)	Respondents		Mean	SD
		Number	Number		
Low contact	Up to 9 (<mean-1sd)	21	23.6	11.16	2.37
Medium contact	9-13 (mean±1sd)	58	65.2		
High contact	Above 13 (>mean+1sd)	10	11.2		
<b>Total</b>		<b>89</b>	<b>100</b>		

Data of Table 4.12 reveals that the majority (66.52 percent) of the respondents had medium extension contact compared to 23.6 percent of them had low extension media contact and 11.2 percent of them had high media contact. Thus, overwhelming majority (88.8 percent) of the respondents had low to medium extension contact. Extension contact is a very effective and powerful source of receiving information about various modern technologies. Shanto (2011) found similar result.

#### 4.1.12 Problem faced in plant nursery management

Problem defined by Goode (1945) is any significant perplexing and challenging situation, real and artificial, the solution of which requires reflective “thinking”. Problem faced, therefore, refers to the extent to which individual faces difficult situations about which something needs to be done. The respondents' problems faced scores in all 16 selected items ranged from 16 to 25 against the possible range of 0 to 48 with an average of 20 and standard deviation of 1.9. Based on their overall problems faced scores, the respondents were classified into three categories as shown in Table 4.13.

**Table 4.13 Distribution of the plant nursery growers according to their problem faced in plant nursery management**

Categories	Basis of categorization (score)	Respondents		Mean	SD
		Number	Number		
Low problem	Up to 18 (<mean-1sd)	17	19.1	20	1.9
Medium problem	18-22 (mean±1sd)	66	74.2		
High problem	Above 22 (>mean+1sd)	6	6.7		
<b>Total</b>		<b>89</b>	<b>100</b>		

About 74.2 percent of the plant nursery grower faced medium problem compared to 19.1 percent of them faced low problem and 6.7 percent of them faced high problem. Findings again reveal that most of the farmers (80.9 percent) faced medium to high problems in plant nursery management. Nursery growers in the study area faced different problems regarding production and marketing.

#### 4.2 Knowledge on plant nursery management

Knowledge on plant nursery management scores of the farmers ranged from 17 to 28 against the possible range from 0 to 30. The mean and standard deviation were 22.7 and 2.4 respectively. Based on the observed scores, the farmers were classified into three categories as: “low knowledge” “medium knowledge” and



“high knowledge”. The distribution of the plant nursery growers according to their knowledge level is shown in Table 4.14.

**Table 4.14 Distribution of the plant nursery growers according to their knowledge on plant nursery management**

Categories	Basis of categorization (score)	Respondents		Mean	SD
		Number	Number		
Low knowledge	Up to 20 (<mean-1sd)	17	19.1	22.7	2.4
Medium knowledge	20-24 (mean±1sd)	53	59.6		
High knowledge	Above 24 (>mean+1sd)	19	21.3		
<b>Total</b>		<b>89</b>	<b>100</b>		

Data of Table 4.14 reveals that 59.6 percent of the respondents were felt in medium knowledge category followed by 21.3 percent in high knowledge category and 19.1 percent in low knowledge category. To perform optimum production, plant nursery growers should have adequate knowledge on different aspects of plant nursery management. Most of the nursery grower (78.7 percent) had low to medium knowledge. In the study area, the education level of nursery grower was satisfactory. Moreover, they had a good level of experience regarding plant nursery management.

### **4.3 Practice of plant nursery management**

Possible practice scores of plant nursery growers ranged from 0 to 36. But their observed practice scores ranged from 19 to 30, the mean being 25.8 and standard deviation being 2.47. Based on the practice scores, the respondents were classified into three categories namely low, medium and high. The distribution of the respondents under each of the three categories has been shown in Table 4.15.

**Table 4.15 Distribution of the nursery growers according to their practice on plant nursery management**

Categories	Basis of categorization (score)	Respondents		Mean	SD
		Number	Number		
Low	Up to 23 (<mean-1sd)	15	16.9	25.8	2.47
Medium	23-27 (mean±1sd)	48	53.9		
High	Above27 (>mean+1sd)	26	29.2		
<b>Total</b>		<b>89</b>	<b>100</b>		

Findings revealed that (53.9 percent) of the respondents had medium practice, while 29.2 percent farmers had high practice and 16.9 percent farmers had low practice on plant nursery management. It means that more than two third (70.7 percent) of the farmers had low to medium practice on plant nursery management.

#### **4.4 Relationship between each of the Selected Characteristics of the Nursery Growers and Their Knowledge on Plant Nursery Management**

Co-efficient of correlation was computed in order to explore the relationships between each of the selected characteristics of the plant nursery growers and their knowledge on plant nursery management. The relationship between each of the selected characteristics of the plant nursery grower and their knowledge on plant nursery management has been presented in Table 4.16. However, the inter co-relationships among different variables have also been computed by using Pearson's product moment correlation co-efficient and the results have been presented in APPENDIX-B.

**Table 4.16 Relationship between each of the selected characteristics of the nursery growers and their knowledge on plant nursery management (n=89)**

	<b>Selected characteristics</b>	<b>Computed 'r' values</b>
Knowledge of the plant nursery growers on plant nursery management	Age	0.060 <sup>NS</sup>
	Level of education	0.041 <sup>NS</sup>
	Farm size	0.140 <sup>NS</sup>
	Nursery area	0.441 <sup>**</sup>
	Investment in nursery	0.371 <sup>**</sup>
	Annual family income	0.340 <sup>**</sup>
	Income from plant nursery	0.217 <sup>*</sup>
	Experience in plant nursery management	0.089 <sup>NS</sup>
	Plant species richness	0.425 <sup>**</sup>
	Credit received	0.148 <sup>NS</sup>
	Extension contact	0.421 <sup>**</sup>
	Problem faced in plant nursery management	-0.034 <sup>NS</sup>

**\*\*** Significant at 0.01 level of probability (table value 0.272) with 87 df.

**\*** Significant at 0.05 level of probability (table value 0.208) with 87 df

<sup>NS</sup> Not significant

#### **4.4.1 Relationship between age of the plant nursery growers and their knowledge on plant nursery management**

Computed value of the co-efficient of correlation between age of the farmers and their knowledge on plant nursery management was found to be 0.06. The following observations were recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.06<sup>NS</sup>) was found smaller than that of the tabulated value (0.208) with 87df at 0.05 level of probability.

- The relationship between the concerned variables was insignificant.
- The null hypothesis was accepted.

The findings indicated that the age of the plant nursery growers was insignificant. So, there is no relationship between age of the nursery growers and their knowledge on plant nursery management. Roy (2006) found that age of the farmer had no significant relationship with their knowledge on boro rice cultivation. Similar results were observed by Khan (2005), Islam (2005) and Rahman (2004) in their respective studies.

#### **4.4.2 Relationship between level of education of the plant nursery growers and their knowledge on plant nursery management**

Computed value of the co-efficient of correlation between education of the farmers and their knowledge on plant nursery management was found to be 0.041. The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (0.041<sup>NS</sup>) was found smaller than that of the tabulated value (0.208) with 87 df at 0.05 level of probability.
- The relationship between the concerned variables was not significant.
- The null hypothesis was accepted.

Based on the above findings, it can be concluded that education of the plant nursery growers was not significant. So, there is no relationship between education of the plant nursery growers and their knowledge on plant nursery management.

#### **4.4.3 Relationship between farm size of the plant nursery growers and their knowledge on plant nursery management**

Computed value of the co-efficient of correlation between farm size of the farmers and their knowledge on plant nursery management was found to be 0.14. The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (0.14<sup>NS</sup>) was found smaller than that of the tabulated value (0.208) with 87 df at 0.05 level of probability.
- The relationship between the concerned variables was not significant.
- The null hypothesis was accepted.

Based on the above findings, it can be concluded that farm size of the plant nursery growers was not significant. So, there was no significant relationship between farm size of the plant nursery growers and their knowledge on plant nursery management.

#### **4.4.4 Relationship between nursery area of the plant nursery growers and their knowledge on plant nursery management**

Computed value of the co-efficient of correlation between nursery area of the farmers and their knowledge on plant nursery management was found to be 0.441. The following observation was recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.441\*\*) was found larger than that of the tabulated value (0.272) with 87 df at 0.01 level of probability.
- The relationship between the concerned variables was significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that nursery area of the plant nursery growers had significant and positive relationship with their knowledge on plant nursery management.

#### **4.4.5 Relationship between investment in nursery of the plant nursery growers and their knowledge on plant nursery management**

Computed value of the co-efficient of correlation between investment in nursery of the farmers and their knowledge on plant nursery management was found to be 0.371. The following observation was recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.371\*\*) was found larger than that of the tabulated value (0.272) with 87 df at 0.01 level of probability.

- The relationship between the concerned variables was significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that investment in nursery of the plant nursery growers had significant and positive relationship with their knowledge on plant nursery management.

#### **4.4.6 Relationship between annual family income of the plant nursery growers and their knowledge on plant nursery management**

Computed value of the co-efficient of correlation between annual family income of the farmers and their knowledge on plant nursery management was found to be 0.34. The following observation was recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.340\*\*) was found larger than that of the tabulated value (0.272) with 87 df at 0.01 level of probability.
- The relationship between the concerned variables was significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that annual family income of the plant nursery growers had significant and positive relationship with their knowledge on plant nursery management.

#### **4.4.7 Relationship between income from plant nursery of the plant nursery growers and their knowledge on plant nursery management**

Computed value of the co-efficient of correlation between income from plant nursery of the farmers and their knowledge on plant nursery management was found to be 0.217. The following observation was recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.217\*) was found larger than that of the tabulated value (0.208) with 87 df at 0.05 level of probability.
- The relationship between the concerned variables was significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that income from plant nursery of the plant nursery grower had significant and positive relationship with their knowledge on plant nursery management.

#### **4.4.8 Relationship between experience in plant nursery management of the plant nursery growers and their knowledge on plant nursery management**

Computed value of the co-efficient of correlation between plant nursery cultivation experience of the farmers and their knowledge on plant nursery management was found to be 0.089. The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (0.089<sup>NS</sup>) was found smaller than that of the tabulated value (0.208) with 87 df at 0.05 level of probability.
- The relationship between the concerned variables was not significant.
- The null hypothesis was accepted.

Based on the above findings, it can be concluded that plant nursery cultivation experience of the plant nursery grower was not significant. So, there is no relationship between experience in plant nursery management of the plant nursery growers and their knowledge on plant nursery management.

#### **4.4.9 Relationship between plant species richness of the plant nursery growers and their knowledge on plant nursery management**

Computed value of the co-efficient of correlation between plant species richness of the farmers and their knowledge on plant nursery management was found to be 0.425. The following observation was recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.425<sup>\*\*</sup>) was found larger than that of the tabulated value (0.272) with 87df at 0.01 level of probability.
- The relationship between the concerned variables was significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that plant species richness of the plant nursery growers had significant and positive relationship with their knowledge on plant nursery management.

#### **4.4.10 Relationship between credit received of the plant nursery growers and their knowledge on plant nursery management**

Computed value of the co-efficient of correlation between credit received of the farmers and their knowledge on plant nursery management was found to be 0.148. The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (0.148<sup>NS</sup>) was found smaller than that of the tabulated value (0.208) with 87 df at 0.05 level of probability.
- The relationship between the concerned variables was not significant.
- The null hypothesis was accepted.

Based on the above findings, it can be concluded that plant nursery cultivation experience of the plant nursery grower was not significant. So, there is no relationship between credit received of the farmers and their knowledge on plant nursery management.

#### **4.4.11 Relationship between extension contact of the plant nursery growers and their knowledge on plant nursery management**

Computed value of the co-efficient of correlation between extension contact of the farmers and their knowledge on plant nursery management was found to be 0.421. The following observation was recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.421\*\*) was found larger than that of the tabulated value (0.272) with 87 df at 0.01 level of probability.
- The relationship between the concerned variables was significant.
- The null hypothesis was rejected.



Based on the above findings, it can be concluded that extension contact of the plant nursery growers had significant and positive relationship with their knowledge on plant nursery management.

#### **4.4.12 Relationship between problem faced in plant nursery management of the plant nursery growers and their knowledge on plant nursery management**

Computed value of the co-efficient of correlation between problem faced in plant nursery management of the farmers and their knowledge on plant nursery management was found to be -0.034. The following observations were recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (-0.034<sup>NS</sup>) was found smaller than that of the tabulated value (0.208) with 87 df at 0.05 level of probability.
- The relationship between the concerned variables was negatively insignificant.
- The null hypothesis was accepted.

The findings indicated that the problem faced on plant nursery management of the plant nursery grower was negatively insignificant. So there is no relationship between problem faced on plant nursery management of the plant nursery growers and their knowledge on plant nursery management.

#### **4.5 Relationship between each of the Selected Characteristics of the Farmers and their Practice of Plant Nursery Management**

Co-efficient of correlation was computed in order to explore the relationships between each of the selected characteristics of the plant nursery growers and their practice of plant nursery management. The relationship between each of the selected characteristics of the plant nursery grower and their practice of plant nursery management has been presented in Table 4.17. However, the inter co-relationships among different variables have also been computed by using Pearson’s product moment correlation co-efficient and the results have been presented in APPENDIX-B

**Table 4.17 Relationship between each of the selected characteristics of the nursery growers and their practice of plant nursery management (n=89)**

	<b>Selected characteristics</b>	<b>Computed 'r' values</b>
Practice of the plant nursery growers on plant nursery management	Age	0.010 <sup>NS</sup>
	Level of education	0.085 <sup>NS</sup>
	Farm size	0.130 <sup>NS</sup>
	Nursery area	0.319 <sup>**</sup>
	Investment in nursery	0.466 <sup>**</sup>
	Annual family income	0.405 <sup>**</sup>
	Income from plant nursery	0.270 <sup>*</sup>
	Plant nursery cultivation experience	0.069 <sup>NS</sup>
	Plant species richness	0.487 <sup>**</sup>
	Credit received	0.140 <sup>NS</sup>
	Extension contact	0.389 <sup>**</sup>
	Problem faced in plant nursery management	-0.113 <sup>NS</sup>

**\*\*** Significant at 0.01 level of probability (table value 0.275) with 85 df.

**\*** Significant at 0.05 level of probability (table value 0.211) with 85 df

<sup>NS</sup> Not significant

#### **4.5.1 Relationship between age of the plant nursery growers and their practice of plant nursery management**

Computed value of the co-efficient of correlation between age of the farmers and their practice of plant nursery management was found to be 0.01. The following observations were recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.010<sup>NS</sup>) was found smaller than that of the tabulated value (0.208) with 87 df at 0.05 level of probability.

- The relationship between the concerned variables was insignificant.
- The null hypothesis was accepted.

The findings indicated that the age of the plant nursery growers was insignificant. So, there is no relationship between age of the plant nursery growers with their practice plant nursery management. Mondal (2014) observed in her study age of farmers in strawberry cultivation had no significant relationship with their practice of strawberry cultivation. Rahman (2004) also found that practice on Boro rice cultivation has no relationship with their age.

#### **4.5.2 Relationship between level of education of the plant nursery growers and their practice of plant nursery management**

Computed value of the co-efficient of correlation between education of the farmers and their practice of plant nursery management was found to be 0.085. The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (0.085<sup>NS</sup>) was found smaller than that of the tabulated value (0.208) with 87 df at 0.05 level of probability.
- The relationship between the concerned variables was not significant.
- The null hypothesis was accepted.

Based on the above findings, it can be concluded that education of the plant nursery grower was not significant. So, there is no relationship between education of the plant nursery growers and their practice of plant nursery management.

#### **4.5.3 Relationship between farm size of the plant nursery growers and their practice of plant nursery management**

Computed value of the co-efficient of correlation between farm size of the farmers and their practice of plant nursery management was found to be 0.13. The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (0.130<sup>NS</sup>) was found smaller than that of the tabulated value (0.208) with 87 df at 0.05 level of probability.
- The relationship between the concerned variables was not significant.
- The null hypothesis was accepted.

Based on the above findings, it can be concluded that farm size of the plant nursery grower was not significant. So, there is no relationship between farm size of the plant nursery growers and their practice of plant nursery management.

#### **4.5.4 Relationship between nursery area of the plant nursery growers and their practice of plant nursery management**

Computed value of the co-efficient of correlation between nursery area of the farmers and their practice of plant nursery management was found to be 0.319. The following observation was recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.319\*\*) was found larger than that of the tabulated value (0.272) with 87 df at 0.01 level of probability.
- The relationship between the concerned variables was significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that nursery area of the plant nursery grower had significant and positive relationship with their practice of plant nursery management.

#### **4.5.5 Relationship between investment in nursery of the plant nursery growers and their practice of plant nursery management**

Computed value of the co-efficient of correlation between investment in nursery of the farmers and their practice of plant nursery management was found to be 0.466. The following observation was recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.466\*\*) was found larger than that of the tabulated value (0.272) with 87 df at 0.01 level of probability.

- The relationship between the concerned variables was significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that investment in nursery of the plant nursery grower had significant and positive relationship with their practice of plant nursery management.

#### **4.5.6 Relationship between annual family income of the plant nursery growers and their practice of plant nursery management**

Computed value of the co-efficient of correlation between annual family income of the farmers and their practice of plant nursery management was found to be 0.405. The following observation was recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.405\*\*) was found larger than that of the tabulated value (0.272) with 87 df at 0.01 level of probability.
- The relationship between the concerned variables was significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that annual family income of the plant nursery grower had significant and positive relationship with their practice of plant nursery management.

#### **4.5.7 Relationship between income from plant nursery of the plant nursery growers and their practice of plant nursery management**

Computed value of the co-efficient of correlation between income from plant nursery of the farmers and their practice of plant nursery management was found to be 0.270. The following observation was recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.270\*) was found larger than that of the tabulated value (0.208) with 87 df at 0.05 level of probability.
- The relationship between the concerned variables was significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that income from plant nursery of the plant nursery grower had significant and positive relationship with their practice of plant nursery management.

#### **4.5.8 Relationship between experience in plant nursery management of the plant nursery growers and their practice of plant nursery management**

Computed value of the co-efficient of correlation between plant nursery cultivation experience of the farmers and their practice of plant nursery management was found to be 0.069. The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (0.069<sup>NS</sup>) was found smaller than that of the tabulated value (0.208) with 87 df at 0.05 level of probability.
- The relationship between the concerned variables was not significant.
- The null hypothesis was accepted.

Based on the above findings, it can be concluded that plant nursery cultivation experience of the plant nursery grower was not significant. So, there is no relationship between experience in plant nursery management of the plant nursery growers and their practice of plant nursery management.

#### **4.5.9 Relationship between plant species richness of the plant nursery growers and their practice of plant nursery management**

Computed value of the co-efficient of correlation between plant species richness of the farmers and their practice of plant nursery management was found to be 0.487. The following observation was recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.487<sup>\*\*</sup>) was found larger than that of the tabulated value (0.272) with 87 df at 0.01 level of probability.
- The relationship between the concerned variables was significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that plant species richness of the plant nursery grower had significant and positive relationship with their practice of plant nursery management.

#### **4.5.10 Relationship between credit received of the plant nursery growers and their practice of plant nursery management**

Computed value of the co-efficient of correlation between credit received of the farmers and their practice of plant nursery management was found to be 0.140. The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (0.140<sup>NS</sup>) was found smaller than that of the tabulated value (0.208) with 87 df at 0.05 level of probability.
- The relationship between the concerned variables was not significant.
- The null hypothesis was accepted.

Based on the above findings, it can be concluded that plant nursery cultivation experience of the plant nursery grower was not significant. So, there is no relationship between credit received of the plant nursery growers and their practice of plant nursery management.

#### **4.5.11 Relationship between extension contact of the plant nursery growers and their practice of plant nursery management**

Computed value of the co-efficient of correlation between extension contact of the farmers and their practice of plant nursery management was found to be 0.389. The following observation was recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.389\*\*) was found larger than that of the tabulated value (0.272) with 87 df at 0.01 level of probability.
- The relationship between the concerned variables was significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that extension contact of the plant nursery grower had significant and positive relationship with their practice of plant nursery management.

#### **4.5.12 Relationship between problem faced in plant nursery management of the plant nursery growers and their practice of plant nursery management**

Computed value of the co-efficient of correlation between problem faced in plant nursery management of the farmers and their practice of plant nursery management was found to be  $-0.113^{NS}$ . The following observations were recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” ( $-0.113^{NS}$ ) was found smaller than that of the tabulated value (0.208) with 87 df at 0.05 level of probability.
- The relationship between the concerned variables was negatively insignificant.
- The null hypothesis was accepted.

The findings indicated that the problem faced on plant nursery management of the plant nursery grower was negatively insignificant. So, there is no relationship between problem faced on plant nursery management of the plant nursery growers and their practice of plant nursery management.

#### **4.6 Relationship between Farmers’ Knowledge and Practice regarding Plant Nursery Management**

Co-efficient of correlation was computed in order to explore the inter-correlation among the focus variables of the study. The inter-correlation among farmers’ knowledge and practice on plant nursery management has been presented in Table 4.18.



**Table 4.18 The value of correlation co-efficient (r) among farmers' knowledge and practice regarding plant nursery management**

	Knowledge on plant nursery management	Practice of plant nursery management
Knowledge on plant nursery management	-	
Practice of plant nursery management	0.405**	-

\*\* Significant at 0.01 level of probability (table value 0.275) with 85 df

\* Significant at 0.05 level of probability (table value 0.211) with 85 df

<sup>NS</sup> Not significant

The co-efficient of correlation between the concerned variables was found to be 0.405 as shown in Table 4.18. This led to the following observations regarding the relationship between the two variables under consideration:

- The computed value of “r” (0.405\*\*) was found greater than that of the tabulated value (0.272) with 87df at 0.01 level of probability.
- The relationship between the concerned variables was positively significant.
- The null hypothesis was rejected.

The findings indicated that knowledge of the plant nursery growers had positively significant relationship with their practice of plant nursery management. Mondal (2014) observed in her study that knowledge of farmers in strawberry cultivation had positive significant relationship with their practice of strawberry cultivation. Rahman (2015) also observed in his study that knowledge of farmers had positive significant relationship with practice of BRRI dhan 47 cultivation.

## CHAPTER 5

### SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

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

#### **5.1 Summary of Findings**

The major findings of the study are summarized below:

##### **5.1.1 Individual characteristics of the plant nursery growers**

**Age:** About half (49.4 percent) of the farmers was middle aged, while 34.8 percent were young aged and 15.7 percent were old aged.

**Level of Education:** The highest proportions (68.7 percent) of the farmers were in the secondary level. Primary, illiterate and above secondary level of literacy found 16.7 percent, 7.9 percent and 6.7 percent respectively.

**Farm size:** The highest proportion (88.8 percent) of the farmers had small farm size, while 6.7 percent and 4.5 percent belonged to the medium farm and marginal farm respectively.

**Plant nursery cultivation area:** Majority (69.6 percent) of the respondents had medium nursery area, while 18 percent and 12.4 percent belonged to the small nursery area and large nursery area respectively.

**Investment in Plant nursery:** The highest proportions (62.90 percent) of the farmers had medium investment, while 20.2 percent had high investment and 16.9 percent had low investment in the plant nursery.

**Annual family income:** The highest proportion (67.40 percent) had medium annual family income compared to 18 percent having low income and 14.6 percent having high annual family income.

**Annual income from plant nursery:** The highest proportion (69.7 percent) of the plant nursery growers had medium income compared to 19.1 percent and 11.2 percent having low and high income from plant nursery respectively.

**Experience in plant nursery management:** The highest proportion (55.1 percent) of the farmers had medium plant nursery management experience, while 23.6 percent and 21.3 percent belonged to the low plant nursery management experience and high plant nursery management experience respectively. It means,

more than three fourth (78.70 percent) of the plant nursery growers had low to medium plant nursery management experience.

**Plant species richness:** The highest proportion (66.30 percent) had medium plant species richness compared to 18 percent having low plant species richness and 15.7 percent having high plant species richness.

**Credit received:** The highest proportion (48.30 percent) of the plant nursery growers received low credit (Up to 100 thousand taka) compared to 33.70 percent was no credit receiver, 13.5 percent (>100-200 thousand taka) medium credit receivers and only 4.5 percent was high credit receivers.

**Extension contact:** The highest proportion (65.2 percent) of the plant nursery growers had medium extension contact compared to 23.6 percent of them having low media contact and 11.2 percent of them had high extension media contact.

**Problem faced in plant nursery management:** About 74.20 percent of the plant nursery growers had medium problem compared to 19.1 percent had low problem and 6.7 percent of them had high problem.

### **5.1.2 Knowledge and practice of the farmers regarding plant nursery management**

**Knowledge on plant nursery management:** Majority (59.6 percent) of the farmers had medium knowledge, while 21.3 percent had high and 19.1 percent of the farmers had low knowledge on plant nursery management. Data reveal that 78.7 percent of the farmers had low to medium knowledge on plant nursery management.

**Practice of plant nursery management:** Majority (53.9 percent) of the plant nursery growers had medium practice, while 29.2 percent of farmers had high practice and 16.9 percent of farmers had low practice on plant nursery management. It means that more than two third (70.8 percent) of the farmers had low to medium practice on plant nursery management.

### **5.1.3 Relationship between each of the selected characteristics of the plant nursery growers with their knowledge on plant nursery management**

Plant nursery area, investment in plant nursery, annual family income, income from plant nursery, extension contact and plant species richness of the farmers had significant positive relationship with their knowledge on plant nursery management. Problem faced by the farmers had negative insignificant relationship with their knowledge on plant nursery management. Age, education, farm size, nursery management experience and credit receive of the farmers had no significant relationships with their knowledge on plant nursery management.

### **5.1.4 Relationship between each of the selected characteristics of the plant nursery growers with their practice of plant nursery management**

Plant nursery area, investment in plant nursery, annual family income, income from plant nursery, extension contact and plant species richness of the farmers had significant positive relationship with their practice of plant nursery management. Problem faced by the farmers had negative insignificant relationship with their practice of plant nursery management. Age, education, farm size, nursery management experience and credit receive of the farmers had no significant relationships with their practice of plant nursery management.

### **5.1.5 Relationship between farmers' knowledge and practice regarding plant nursery management**

Knowledge and practice regarding plant nursery management of the farmers had significant positive inter-correlation with each other.

## 5.2 Conclusions

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

Based on findings of the study and the researcher’s interpretations of them, the following conclusions were drawn:

1. In the study 59.6 percent of the respondents felt in medium knowledge category followed by 21.3 percent in high knowledge category and 19.1 percent in low knowledge category. More than three fourth (78.7 percent) of the farmers had low to medium knowledge regarding plant nursery management. Therefore, it is necessary to increase the farmers’ knowledge on plant nursery management.
2. In the study 53.9 percent of the respondents had medium practice, while 29.2 percent farmers had high practice and 16.9 percent farmers had low practice on plant nursery management. A majority (70.80 percent) of the farmers had low to medium practice on various aspects of plant nursery management. Therefore, it may be concluded that good nursery management would not be possible to improve a significant extent unless the concerned authorities (BARI, DAE etc.) take proper steps to improve farmers overall practices.
3. An overwhelming majority (82.0 percent) of the respondent had medium to large nursery and correlation analysis revealed that nursery cultivation area had significant positive relationship with their knowledge and practice regarding plant nursery management. Therefore, it can be concluded that farmers with medium to large plant nursery cultivation area were likely to gain more knowledge because of more options of technology practiced in their plant nurseries.

4. An overwhelming majority (83.1 percent) of the respondent had medium to high investment in plant nursery and correlation analysis revealed that investment in plant nursery had significant positive relationship with their knowledge and practice regarding plant nursery management. Therefore, it may be concluded that the high investment in plant nursery by the farmers is an influential factor to increase the knowledge and practice of plant nursery management by using more technologies and plant species.
5. In the study, the highest proportion (67.40 percent) had medium annual family income compared with 18 percent having low income and 14.6 percent having high annual family income and income from plant nursery of the farmers had positive significant relationship with their knowledge and practice regarding plant nursery management. So, it may be concluded that the high annual income and income from plant nursery of the plant nursery growers significantly contributes to increase the knowledge and practice of plant nursery management.
6. An overwhelming majority (84.3 percent) of the respondent had medium to high plant species richness and correlation analysis revealed that plant species richness of the farmers had positive significant relationship with their knowledge and practice regarding plant nursery management. Therefore, it may be concluded that the high plant species richness of the nursery growers significantly contributes to increase the knowledge and practice of plant nursery management.
7. An overwhelming majority (88.8 percent) of the respondent had low to medium extension media contact in plant nursery management and correlation analysis revealed that extension media contact of the farmers showed the significant positive relationship with their knowledge and practice regarding plant nursery management. Findings from this study highlight the prospects that could be achieved if correct extension media are

used to disseminate agricultural innovations related to nursery management.

8. Farmers' knowledge and practice regarding nursery management had significant and positive relationship. Therefore, it may be concluded that farmers should be provided by good nursery management practices and as well as training and motivational program so that they can increase their level of knowledge on various aspects of nursery management.

### **5.3 Recommendations**

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

#### **5.3.1 Recommendation for policy implication**

1. A majority (78.7 percent) of the farmers had low to medium knowledge regarding plant nursery management. Therefore, attempts should be taken by DAE and other extension providers to arrange training, motivational campaigning and provide nursery management guide for increasing knowledge of the nursery growers.
2. A majority (70.80 percent) of the farmers had low to medium practice on various aspects of plant nursery management. Therefore, there is a need for greater awareness especially, among young to middle aged nursery growers through extension programs and also training and promotional activities to use recommended practices by the DAE.
3. Plant nursery area, investment in plant nursery, annual family income, income from plant nursery, plant species richness and extension contact of the farmers had significant positive relationship with their knowledge and practice regarding plant nursery management. Therefore, it may be recommended that concerned authorities should increase more contact with the plant nursery growers so that they could increase their area under plant nursery, their

- investment, their annual income from plant nursery and plant species. So that they could ultimately increase their knowledge and skill of practice of plant nursery management.
4. Plant nursery growers faced considerable amount of problem in plant nursery management. It is therefore, recommended that concerned authorities should give attention to solve the problem of nursery growers by providing proper training, management and marketing facility etc, so that they could increase knowledge and practice on plant nursery management.
  5. Knowledge and practice regarding plant nursery management of the farmers had positive significant relationship. Therefore, it may be recommended that concerned authorities should arranged trainings, motivational campaigns, agricultural fairs, demonstrations, etc. for increasing knowledge and practice of the farmers regarding plant nursery management.

### **5.3.2 Recommendations for Further Study**

A small and limited research work cannot provide unique and universal information related to present study.

On the basis of scope and limitations of the present study and observations made by the researcher, the following recommendations are made for further study:

1. The study was conducted in limited areas of Pirojpur district. Findings of the study need verification by the similar research in other part of the country.
2. Twelve characteristics of the farmers were considered as the experimental variable of the study. Therefore, it is recommended that further studies should be conducted with other variables.
3. In the present study age, education, farm size, experience, credit received and problem had no significant relationship with their knowledge and



practice of plant nursery management. In this connection, further verification is necessary.

4. Further research is necessary to find out the effective ways and means which would contribute in developing plant nursery management.
5. The study was based on the farmers' knowledge and practice regarding plant nursery management. Further studies may be conducted in respect of knowledge and practice of other crop cultivation technologies.

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**APPENDIX-A**

**Department of Agricultural Extension and Information System**  
Sher-e-Bangla Agricultural University  
Dhaka-1207

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An Interview Schedule for the Study Entitled

**“FARMERS’ KNOWLEDGE AND PRACTICE ON PLANT NURSERY  
MANAGEMENT”**

Name of the respondent: ..... Serial No: .....

Village: .....

Union: .....

Mobile No: .....

(Please provide following information. Your information will be kept confidential and will be used for research purpose only)

**1. Age:** How old are you? \_\_\_\_\_years.

**2. Level of Educations:** Please mention your level of education.

- a) I can't read and write (    )
- b) I can sign only        (    )
- c) I have passed.....class.

**3. Farm size:** What is your total farm size according to use?

Sl. No.	Use of land	Land possession	
		Local unit	Hectare
1	Homestead area (A <sub>1</sub> )		
2	Own land own cultivation (A <sub>2</sub> )		
3	Land taken from others on barga system(A <sub>3</sub> )		
4	Land given to others on barga system (A <sub>4</sub> )		
5	Land taken from others on lease (A <sub>5</sub> )		
<b>Total</b>			



$$\text{Total farm size} = A_1 + A_2 + 1/2 (A_3 + A_4) + A_5$$

#### 4. Nursery area

Please indicate your land under nursery cultivation..... (Local unit) .....  
hectare.

**5. Investment in nursery:** I have invested ..... ('000') Tk.

#### 6. Annual family income

Mention your annual family income from the following sources

Income sources		Income in '000' Tk.
A.	Agricultural sources	
1)	Crop	
	a)	Rice
	b)	Plant Nursery
	c)	Other crops
2)	Livestock	
3)	Poultry	
4)	Fisheries	
B.	Non-Agricultural sources	
	i)	Business
	ii)	Job
	iii)	Laborer
	iv)	Others
<b>Total</b>		

### 7. Income from Plant Nursery

Products name	Production (unit)	Per unit price (Tk)	Total (Tk)
1. Fruit plant sapling			
2. Forestry plant sapling			
3. Flower plants			
4. Others			
<b>Total</b>			

### 8. Experience in plant nursery management

Mention your experience in plant nursery cultivation ..... year/years.

### 9. Plant species richness

How many types of plant species are there in your nursery? There are ..... Types of plant species in the nursery.

### 10. Credit received

Have you received any credit on Plant Nursery cultivation? Yes -----  
No -----

If yes, please give the following information:

Sl. No.	Sources of Credit	Year of credit received	Amount of credit received "000" Tk.
1	NGO		
2	Bank		
3	Village money lenders		
4	Friends/Relatives/Neighbors		
5	Others		
<b>Total</b>			

**11. Extension contact:** Please indicate the nature of your extension media contact.

(Give tick (√) mark in the right place).

Sl. No.	Name of the media	Frequently (4)	Often (3)	Occasionally (2)	Rarely (1)	Not at all (0)
01	Contact with SAAO	>3 times/month ( )	3 Times/month ( )	2 times/month ( )	1 time/month ( )	0 time/month ( )
02	Contact with model nursery owner	>3 times/month ( )	3 times/month ( )	2times/ Month ( )	1 time/month ( )	0 time/month ( )
03	Contact with input dealer(s)	>6 times/month ( )	5-6 times/month ( )	3-4 times/month ( )	1-2 times/month ( )	0 time/month ( )
04	Contact with NGO worker	>3 times/year ( )	3 times/year ( )	2 times/year ( )	1 time/year ( )	0 time/year ( )
05	Watching TV programme	>6 times/month ( )	5-6 times/month ( )	3-4 times/month ( )	1-2 time/month ( )	0 time/month ( )
06	Listening krishi radio Program	>6 times/month ( )	5-6 times/month ( )	3-4 times/month ( )	1-2 time/month ( )	0 time/month ( )
07	Reading agriculture poster, booklet and bulletin etc	>6 times/year ( )	5-6 times/year ( )	3-4 times/year ( )	1-2 time/year ( )	0 time/year ( )
<b>Total</b>						

## 12. Problem faced in plant nursery management

Please state the extent of the following problems faced in plant nursery management

Sl. No.	Problem	Extent of problems			
		Severe (3)	Moderate (2)	Low (1)	Not at all (0)
1	Lack of quality seed material				
2	High production cost				
3	Lack of technical support/ management information				
4	Lack of irrigation facilities				
5	Weed infestation				
6	Insect attack				
7	Disease attack				
8	Low market price				
9	Lack of proper marketing facilities				
10	Poor transport facilities				
11	Low quality fertilizer and manure				
12	Traditional production technology				
13	Inefficient labour				
14	High interest of loan facility				
15	Unavailability of modern technology				
16	Heat and cold problem				
<b>Total</b>					

### 13. Knowledge on plant nursery management

Please answer the following questions:

Sl. No.	Questions	Full marks	Mark obtained
1	What is the difference between seedling and sapling?	2	
2	What is rootstock and scion?	2	
3	Mention two different types of grafting?	2	
4	Which is the suitable time for mango grafting?	2	
5	Mention two suitable methods of propagation of rose.	2	
6	Mention the harmful weeds in nursery field.	2	
7	Name two harmful insects of plant seedling.	2	
8	Mention two major diseases of sapling.	2	
9	Mention the fertilizer which are used in nursery bed.	2	
10	How many days require for air layering of guava?	2	
11	What is the success percentage of grafting, layering and budding?	2	
12	Mention the manure which are used in nursery bed	2	
13	What is proportion of soil, sand and manure for nursery bed?	2	
14	Mention one of hybrid variety of fruit, vegetable and flower.	2	
15	What is the proper potting mixture?	2	
<b>Total</b>			

#### 14. Practice of plant nursery management

Mention your level of practice for the nursery plant cultivation to harvesting

Sl. No.	Statement	Extent of practice			
		Regularly (3)	Occasionally (2)	Rarely (1)	Never at all (0)
1	Counting the seedlings before planting to the field				
2	Proper Irrigation in the field				
3	Proper insect and disease control				
4	Application of organic manure (OM)				
5	Application of balanced fertilizer				
6	Application of IPM				
7	Shading of the seedlings and saplings when needed				
8	Grading of seedlings and saplings before marketing				
9	Using polybag, earthen or plastic pot for sapling				
10	Careful uprooting of plantlets				
11	Careful loading				
12	Safe transportation				
<b>Total</b>					

Thank you for your kind cooperation

-----  
Signature of the interviewer

Date:

## APPENDIX-B

**Correlations matrix (showing inter co relations among the variables)**

	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>	X <sub>6</sub>	X <sub>7</sub>	X <sub>8</sub>	X <sub>9</sub>	X <sub>10</sub>	X <sub>11</sub>	X <sub>12</sub>	Y <sub>1</sub>	Y <sub>2</sub>
X <sub>1</sub>	-													
X <sub>2</sub>	-.608**	-												
X <sub>3</sub>	-.009	-.056	-											
X <sub>4</sub>	.016	.094	.611**	-										
X <sub>5</sub>	.004	.058	.295**	.462**	-									
X <sub>6</sub>	-.065	.095	.412**	.504**	.662**	-								
X <sub>7</sub>	-.001	.078	.263**	.34**	.66**	.712**	-							
X <sub>8</sub>	.875**	-.548**	.076	.125	.118	.044	.163	-						
X <sub>9</sub>	.066	.043	.295**	.546**	.523**	.496**	.283**	.122	-					
X <sub>10</sub>	-.129	.147	.317**	.318**	.375**	.457**	.384**	-.081	.230*	-				
X <sub>11</sub>	-.469**	.409**	.182	.353**	.406**	.450**	.219*	-.318**	.360**	.138	-			
X <sub>12</sub>	.005	-.158	-.022	-.089	.083	.035	.053	.011	.104	-.03	-.137	-		
Y <sub>1</sub>	.060	.041	.140	.441**	.371**	.340**	.217*	.089	.425**	.148	.421**	-.034	-	
Y <sub>2</sub>	.010	.085	.130	.319**	.466**	.405**	.27*	.069	.487**	.140	.389**	-.113	.405**	-

\*\*Significant at 0.01 levels (2-tailed)

\* Significant at 0.05 levels (2-tailed)

<sup>NS</sup>Non-Significant

X<sub>1</sub>: Age

X<sub>2</sub>: Level of education

X<sub>3</sub>: Farm size

X<sub>4</sub>: Nursery cultivation area

X<sub>5</sub>: Investment in nursery

X<sub>6</sub>: Annual family income

X<sub>7</sub>: Income from Plant Nursery

X<sub>8</sub>: Plant nursery cultivation experience

X<sub>9</sub>: Plant species richness

X<sub>10</sub>: Credit received

X<sub>11</sub>: Extension contact

X<sub>12</sub>: Plant nursery cultivation knowledge

Y<sub>1</sub>: Plant nursery cultivation knowledge

Y<sub>2</sub>: Practice of plant nursery management