FARMERS' ATTITUDE TOWARDS COMMERCIAL CULTIVATION OF CUT FLOWERS

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FARMERS' ATTITUDE TOWARDS COMMERCIAL CULTIVATION OF CUT FLOWERS

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CERTIFICATE

This is to certify that the thesis entitled **'FARMERS' ATTITUDE TOWARDS COMMERCIAL CULTIVATION OF CUT FLOWERS'** 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** in **Agricultural Extension & Information system**, embodies the result of a piece of *bonafide* research work carried out by **MOHAMMAD ASHIKUL ISLAM**, Registration No.: **10-3915** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

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

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TO

MY BELOVED

PARENTS

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ABBREVIATIONS

BBS = Bangladesh Bureau of Statistics

DAE = Department of Agriculture Extension

Et al = And others (at elli)

Ag. Ext. Ed. = Agricultural Extension Education

e.g. = Example

etc = Etcetera

UAO = Upazila Agriculture Officer

AEO = Agriculture Extension Officer

SAAO = Sub- Assistant Agriculture Officer

SPSS = Statistical Package for Social Science

GDP = Gross Domestic Product

Ha = Hectare

SD = Standard Deviation

CV = Co-Efficient of Variation

NGO = Non Government Organization

Sq. = Square

Ag. Econ. = Agricultural economic

ABSTRACT

Cut flower cultivation practice is increasing day by day in Bangladesh. The purposes of the study were to describe the socio-economic profile of the cut flower farmers in the study area; to determine the extent of attitude of farmers towards commercial cultivation of cut flowers; to explore the contributing relationship between the selected characteristics of the cut flower farmers and their attitude towards commercial cultivation of cut flowers; and to identify the problems faced by the cut flower farmers for commercial cultivation. The study was undertaken purposively in Savar upazila under Dhaka district. An authenticated and well-structured interview schedule (questionnaire) was used to collect data from 104 flower farmers during 10 November to 5 December 2016. Data analysis was done using easy and inferential statistical tools such as frequency counts, mean, standard deviation, co-efficient of variance and multiple regressions. The findings showed that majority of the farmers (41.3 percent) had positive attitude, 33.7 percent of them had more positive attitude and 25 percent had most positive attitude towards commercial cultivation of cut flowers. The results also showed that farmers' education background, agricultural extension media contact and farmers' category were significant factors for farmers' attitude towards commercial cultivation of cut flowers; and within this agricultural extension media contact and farmers' category were the most significant contributing factors.

CHAPTER 1

INTRODUCTION

1.1 General background

In Bangladesh, agriculture plays a dominant role towards ensuring food security, employment generation, human resources development, poverty alleviation, and raising standard of living and in increasing the export earnings. The major portion of its population live in the villages and about fifty percent labor forces (45.1%) are engaged in Agriculture (BBS, 2015). The average per capita income of its population is only US$1314 while the average per capital income of South Asia US$1620 (World Bank, 2015). The arable land area is being continually squeezed annually by its significant rate of non-agricultural use. Our livelihood is mainly centralized around cereal crop production, so opportunities for earning more income are increasingly getting difficult. Cereal crop growers are not getting proper price because in most of the cases production cost is higher than selling price. Besides the phenomenon of total crop failure is quite frequent in our country. An overwhelming majority of our rural people is living below the poverty line. This situation is very acute in Bangladesh. To overcome this situation, new strategies should be developed, so that people can earn more by utilizing their own resources. Cut-flower cultivation is now considered a viable diversification from traditional crops as it makes flower farmers earn higher returns per unit area which is possible because of the increasing flower consumption during all occasions.

At present, flower cultivation is more profitable than other crops cultivation. Sometimes it is 2-3 times higher than any other cereal crops or vegetable cultivation. Commercial cultivation of cut flower is an important income generating sector for many developing countries. Bangladesh has a tremendous potential for flower both for export and domestic market. Different agro climatic conditions are capable of producing variety of flowers all the year round. There is a great opportunity for Bangladesh to earn a lot of foreign currency from the international market. Approximately 8,000 farmers are involved in flower cultivation and 2000 to 3000

farmers in ornamental plants on commercial basis. About 100,000 to 120,000 people are directly or indirectly involved in floriculture industry for their livelihoods (Momin, 2006). At present, 10,000 hectares of land covers flower cultivation taking the lead by Jessore district. More than 5,000 farmers are growing flower and foliage in the country and about 1.5 lac people are directly or indirectly involved in floriculture business as their sole livelihood (Chowdhury, 2010).

Dhaka district is surrounded on the north by Gazipur and Tangail districts, on the east by Narayanganj district, on the south by Munshinganj and Faridpur districts and on the west by Manikganj district. It lies between 23º53' and 24º06' north latitudes and between 90º01' and 90º37' east longitudes. The total area of the district is 1463.60 sq. km. (565.00 sq. miles) (BBS, 2011). The district consists of 6 upazila and savar is one of those. It is located at a distance of about 24 kilometers (15 miles) to the northwest of Dhaka city. As of the 2011 Bangladesh census, Savar Upazila had a population of 1,387,426 and density of 4,951/km^2. Savar upazila has 13 Unions/Wards, 350 Mauzas/Mahallas, and 321 villages. The municipal area (Savar Town) consists of 9 wards and 55 mahallas. It has 66,956 units of household and a total area of 280.13 square kilometers (108.16 sq miles). The total cultivable land measures 16,745.71 hectares (41,379.6 acres), in addition to fallow land of 10,551.18 hectares (26,072.5 acres). The main occupations are Agriculture 24.34%, agricultural laborer 12.84%, wage laborer 4.44%, cattle breeding, forestry and fishing 1.90%, industry 1.37%, commerce 17.35%, service 20.68%, construction 1.66%, transport 3.96% and others 11.46% (Savar upazila Wikipedia, 2016).

Bangladesh, the world's mostly populated country has started commercial floriculture in Jessore district. In Bangladesh, small scale flower production initially started in late seventies by some innovative farmers with the production of tuberose, but large scale commercial production was started in mid-eighties in Jhikargacha Upazila of Jessore district (Sultana, 2003). The major production areas of cut-flowers are Dhaka, Chittagong, Cox’s Bazar, Jessore, Chuadanga, Jhenidah, Bogra, Rangpur, Kushtia and Mymensingh and the present total area under cultivation of different cut- flowers and foliages is about 3350 hectares (Miah *et al*., 2006). The area coverage under

commercial flower cultivation is approximately 10,000 hectares of land while commercial nurseries have covered approximately 2,000 to 2,500 hectares of land (Momin, 2006). At present, different categories of flower are cultivated with the area of 10,000 hectares in 5 Upazilas of Jessore district. Though it was started in Gadkhali, now-a-days it becomes popular in the whole country as a profitable farming. According to flower farmers and traders welfare association, about 3,500 hectares of land is under floriculture in 19 districts of the country. As days go, demand for flower is increasing very rapidly. At present, approximately 12000 farmers are engaged in floriculture and 4000 to 5000 farmers produce ornamental plants on commercial basis. The area coverage under commercial cultivation is approximately 5000 to 6000 hectares of land while commercial nurseries have covered approximately 2000 to 2500 hectares of land. Bangladesh has to spend roughly TK 2-3 million in importing flower and ornamental plants to meet the market demand in every year (Khandoker, 2010).

At present, marketing of flowers in Bangladesh is not much organized. Major trade for orchid in Shahbag and Gulshan market are in Dhaka. There is substantial trade also in Chittagang and other big towns. There are reportedly around 2000 retail shops of flowers in the country. About 40 percent of the retail shops of the country are located in Dhaka, while Chittagang and Sylhet having 25 percent each and the remaining 10 percent of the shops are in other district towns (Sultana 1995). As demand swells in Bangladesh, horticulturists are pressing the government for more assistance to its flower farmers; now the country imports flower from India and Thailand, but agricultural scientists reported that Bangladesh possess the natural resources to supply its own flowers and eventually build an export market. Few years ago, it was a dream to export flowers from Bangladesh. But this is a reality today and a prosperous bonanza for tomorrow. Bangladesh already exports orchids and ornamental plant.

1.2 Statement of the Problem

Commercial cultivation of cut flowers, with its ability to yield higher economic returns per unit area is slowly gaining ground in the diversification plan in agriculture. The possibility of practicing a commercial activity on a small sized farm, mainly utilizing household labor supported by growing demands for the commercial flower products in developing domestic market area under floriculture has increased substantially in the recent past. Bangladesh has achieved impressive gains in production of food grains in the last 25 years, but food security still remain as a critical concern because of the low purchasing power and thereby limited access to food especially for the rural poor. Accelerated agricultural growth through crop diversification offers considerable opportunity for expanding income and employment of rural people. Bangladesh is experiencing a flower bloom with shop opening all over the capital and some rice fields are shifting to flower production. Although commercial cultivation of cut flowers in Bangladesh is comparatively a new venture, it has now become an inseparable part of our culture. People usually use flower in all their ceremonies in social, political and historical occasions. Flower bouquets and garlands have been gaining wide popularity among almost all the people of the country. The universal usage has created a real trend of producing flower on a commercial basis to meet its increasing demand in the market.

High price of mother stock and their insufficient supply, unavailability of labor with high labor wages, high price of fertilizer and insecticides, lack of scientific knowledge and training, attack by pest and disease, lack of extension work came out as major financial and technical problems of the flower farmers while inadequate and underdeveloped transportation and communication system, low market price, lack of market information, unstructured market are among major market related problems. On the other hand marketing intermediaries specified price instability, lack of adequate market information, lacking storage facilities, unsold flower, inadequate shop-space, strikes as their problems and constraints.

In the context of the above circumstances the researcher intended to find out the answers to the following research questions:

i. What are the socio-economic profiles of the cut flower farmers?

ii. What is the extent of attitude of farmers towards commercial cultivation of cut flowers?
iii. What are the contributing relationship between the selected characteristics of the cut flower farmers and their attitude towards commercial cultivation of cut flowers?
iv. What are the problems faced by the cut flower farmers for commercial cultivation?

1.3 Specific objectives:

Specific objective(s) are pre-requisite for conducting any research work. It gives a guideline to researcher to obtain concerned goal. So, the researcher had set the following specific objectives:

i. To describe the socio-economic profile of the cut flower farmers;
ii. To determine the extent of attitude of farmers towards commercial cultivation of cut flowers;
iii. To explore the contributing relationship between the selected characteristics of the cut flower farmers and their attitude towards commercial cultivation of cut flowers; and
iv. To identify the problems faced by the cut flower farmers for commercial cultivation.

1.4 Justification of the study

Farmers are the key elements of determining their attitude towards commercial cultivation of cut flowers. At present, there is a lack of adequate understanding as to how the characteristics of the farmers influence their attitude towards commercial cultivation of cut flowers. These facts indicate the need for an investigation to ascertain the relationships of the characteristics of the farmers with their attitude towards commercial cultivation of cut flowers. The findings will be helpful to the planners and extension workers in formulation and redesigning the extension programs for increasing commercial cut flower cultivation. Considering the above

finding, the researcher became interested to undertake a study entitle, 'Farmers' attitude towards commercial cultivation of cut flowers.'

1.5 Assumption of the study

The researcher had the following assumptions consider in his mind while undertaking the present study:

i. Respondent's feedback, views and opinions were the representative views and opinions of the whole population of the area concerned.
ii. The respondents selected for the study were decent to satisfy; the observation of research and their feedback were genuine.
iii. The items, questions and scales used for measuring the variables were reasonably adequate to reflect the respondents' actual answer.
iv. The findings of the study would be useful for planning and execution of the program of extension service.
v. The data collected by the researcher were free from bias and the respondent furnished the information was reliable.

1.6 Limitation of the study

Researcher had some limitations considering money, time and other resources are noted below:

i. The study was confined to four villages in Savar upazila under Dhaka district.
ii. Characteristics of the farmers were many and varied. Only eleven (11) characteristics were selected as independent variables for this study.
iii. There were many farmers in the study area, but only the flower farmers were considered for this study.
iv. Farmers do not keep any records of their agricultural activities. So, possibility of interview errors during collecting information based on instant memory of the farmers could not be ruled out.
v. Money and time allocation was also limitation in this study.

1.7 Definition of related terms

Attitude: It refers to a settled way of thinking or feeling about someone, typically one that is reflected in a person's behavior.

Cut flower: Cut flowers are flowers or flower buds (often with some stem and leaf) that have been cut from the plant bearing it. It is usually removed from the plant for indoor decorative use. Typical uses are in vase displays, wreaths and garlands.

Age: Age of the respondent refers to the length of the time in actual years from his birth to the time of interview.

Education background: It was defined to the development of desirable changes in knowledge, skill and attitudes in an individual through reading, writing, working, observations and other activities.

Flower farming areas: Flower farming area refers to the total flower cultivated area either owned by a farmer or obtained from other on share cropping system or taken from others as mortgage which was used to his/her farming operation during the period of this study. The flower farming areas of the respondent was computed by using the following formula.

The measurement unit was in hectare (ha).

Flower farming areas = A+ 1/2(B+C) + D

Where;

A= Own land under cultivation

B= Land given to others as borga

C= Land taken from others as borga

D= Land taken from others as lease

Annual family income: The term annual family income referred to the total earning by the earning members from agriculture, livestock, fisheries and other accessible

sources (business, service, daily labor etc.) during a year. It was expressed in Thousand Taka.

Farmers' type: A person who owns or manages a farm is called farmer. The farmers who have land bellow 0.02 hectare are considered as landless farmer. The farmers who have land between 0.02 to 0.2 hectare are considered as marginal farmers; the farmers have the land between 0.2 to 1 hectare are considered as small farmers; the farmers who have the land between 1 to 3 hectare are considered as medium farmers and the farmers who possess the land over 3 hectare are considered as large farmers.

Training experience: It refers to the extent of participation of the farmers to any kind of training program offered by different organizations and agencies up to the time of interview.

Agricultural extension media contact: It refers to a communication about agriculture-related information among agricultural stakeholders and between agricultural and non-agricultural stakeholders.

Innovativeness: Rogers (1983), defined innovativeness as 'the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of the social system'.

Knowledge on commercial cultivation of cut flower: It referred to the knowing of various aspects of commercial cultivation of cut flower by an individual.

Variable: It is a general sign in statistical research of the characteristics that occurs in number of individuals, objects, groups etc. and that can take on various values for example the age of an individual.

CHAPTER 2

REVIEW OF LITERATURE

The main purpose of this Chapter is to review the previous studies that are related to the present research work. For relevant finding, researcher made an elaborate search of available literature. Relevant literatures have been reviewed and illustrated in different sections as stated below:

2.1 Issues of commercial flower cultivation

Bangladesh is well suited for commercial cultivation of cut flower due to its favorable climate and other conditions such as scope to expand cultivation in unutilized homestead lands, cheap labor, relatively low capital investment and good prospect for exports. Cultivation of flower is reported to give 3-5 times and 1.5-2 times more returns than rice and vegetable cultivation, respectively (Dadlani, 2003). Mou (2006) completed a study on commercial production and marketing of flower in Bangladesh, she revealed that profit from flower production is higher than profit from vegetable production. Shanmugam (2007) in a study opined that the profitability of commercial flowers not only high than other traditional crops (Rice, wheat, vegetables etc.), but also has a positive impact on socio economic condition of flower growers. Ali and Banerjee (2002) observed that homestead lands were now being put under rose at the expense of vegetables. The lucrative profit was the most important factor which led to influence the flower farmer's attitude. Hassan (1996) showed producers, marketing intermediaries and traders secure significant profit from flower production and marketing. Ghani (2007) reported that most of the farmers are now engaged in flower production have shifted from rice production where per unit return is very low, even the marigold production is profitable much higher than rice production. The return from rose and tuberose cultivation is 700 per cent higher than that of traditional crops. He also reported that a farmer can get as much as three to six times more profit than the profit come from traditional crops like wheat, rice and jute. Bangladesh earns about TK 200 crore per year by cultivating flowers on some 4,450 hectares of land. Majhi (2009) reported that floriculture in general and marigold

cultivation in particular at Katikela village in the district of jharsuguda in India has become one of the best livelihood options for the farmers, as the said profession is generating good amount of revenue for them. He also reported that Marigold cultivation for them is seen as a remunerative farming practice, because now they earn more, not only by selling the flowers but also by producing and selling the seedling. Floriculture proves to be one of the best means of livelihood for the farmers at Katikela. Ali and Banerjee (2002) reported that the cultivation of chrysanthemum is a good source of gainful employment for family labor. Farmyard manure, oilcake and chemical fertilizers are the main inputs in the cultivation of this flower. Cost of planting materials is too high, but returns are very lucrative. Out-input ratios are also noted to be remunerative, showing the feasibility of the cultivation of this flower in the study area. Miller (2001) conducted a research on floriculture industry overview: production, sales and marketing in North America. He attempted to examine the production, sales and marketing of cut flowers and cut foliage, potted flowering and foliage plants, and bedding/garden plants in the USA. He given a brief statistical history of the floriculture industry in USA and the size of the Canadian floricultural industry is also mentioned. A desk report of The Daily Prothom Alo (2010) found out the hidden outcome due to revolution of flower production and exporting of cut flower in Kenya. Kenya is gradually becoming a top level exporter of flower around the world. In the last year, Kenya earned about 40 million US dollar from exporting cut flower. An economic analysis of Gerbera by Gajanana *et al.* (2000) showed that the net return of 136.5 rupees/m^2 was recorded much more than other crops and conventional agricultural crops.

Commercial cultivation of cut flowers arises as vital issue to the Bangladeshi farmers since last two decades. As a result, a limited number of similar researches have so far been conducted by the researcher. Systematic and comprehensive study is yet to be conducted. It is therefore, the researcher has been taken into consider for further study this piece of research.

2.2 Relationship between selected characteristics of the farmers and their attitude towards commercial cultivation of cut flowers

Aus (2014) found that age of farmers had no significant relationship with their attitude towards commercial flower production. Hossain (2007) revealed that age of farmers' had no significant relationship with their attitude towards commercial flower cultivation. Aus (2014) found that education of farmers had no significant relationship with their attitude towards commercial flower production. Hossain (2007) found that education of the farmers' had no significant relationship with their attitude towards commercial flower cultivation. Wadud (2010) found that education of farmers' had positive significant relationship with their attitude towards commercial flower cultivation. Aus (2014) found that farm size of the farmers had positive significant relationship with their attitude towards commercial flower production. Wadud (2010) found that effective farm size of farmers' had no significant relationship with their attitude towards commercial flower cultivation. Hossain (2007) found that farm size of the farmers' had no significant relationship with their attitude towards commercial flower cultivation. Aus (2014) found that annual income of the farmers had positive significant relationship with their attitude towards commercial flower production. Wadud (2010) found that annual income of farmers' had positively significant. Hossain (2007) also found same result of his study. Aus (2014) found that extension media of the farmers had positive significant relationship with their attitude towards commercial flower production. Aus (2014) found that training exposure of the farmers had positive significant relationship with their attitude towards commercial flower production. Wadud (2010) found a significant positive relationship between training received by the farmers' and their attitude towards commercial flower cultivation. Hossain (2007) revealed that training experience of farmers' had no significant relationship with their attitude towards commercial flower cultivation. Aus (2014) found that organizational participation of the farmers had positive significant relationship with their attitude towards commercial flower production. Aus (2014) found that knowledge of the farmers had no significant relationship with their attitude towards commercial flower production. Wadud (2010) found that knowledge of

farmers' had positively significant. Hossain (2007) found that knowledge on commercial flower cultivation of the farmers' had positive significant relationship with their attitude towards commercial flower cultivation. Wadud (2010) found that agricultural organizational participation of farmers' had positive significant relationship with their attitude towards commercial flower cultivation. Hossain (2007) found that agricultural organizational participation of the farmers' had positive significant relationship with their attitude towards commercial flower cultivation.

2.3 Problems related to commercial cultivation of cut flowers

Mou (2006) conducted a study on commercial production and marketing of flower. She found some major problems and constraints on commercial flower production like lack of good quality seed, high price of mother stock, high price of fertilizer and insecticide, lack of storage facility, lack of transportation facility, lack of sufficient knowledge, spoilage etc. Hossain (2007) referred to problems on commercial cultivation of cut flower lack of knowledge about modern technologies of flower cultivation and preservation' were the major problem of the respondents. Yeasmin (2009) identified some problems and constraints associated with production and marketing of flowers. These were related to high price and lack of good quality plant, high price of fertilizers and insecticides, lack of scientific knowledge and training, attack by pests and diseases, low market price, environment, lack of extension work, social problems, etc. Salahuddin (2013) also found same result of his study. Kumar (2002) conducted a study of problems faced by flower farmers. The major problems perceived by the respondents were: unavailability of quality planting material, lack of market regulation, lack of hired labor during peak season, unavailability of loans, unavailability of extension services, and inadequate transport and storage facilities. Sultana (1995) identified some problems of flower marketing which are - unavailability of sufficient flowers according to demand at right time, spoilage, lack of adequate and suitable transportation system. She suggested some measures to overcome these problems such as establishment of modern storage facilities, improvement of cultivation practices of flower for the whole year and arrangement of contract marketing. Siddika (2004) carried out a study on marketing of commercial

cut flower in Bangladesh. She analyzed marketing system of some selected flowers such as tuberose, rose, gladiolus and marigold, marketing margins of different traders, export potentiality of cut-flowers, problems involved and suggestions for improving the present marketing system of cut-flowers. The growing demand of flowers in the domestic as well as export market requires a concerted effort on the part of the government as well as in the private entrepreneurs to develop floriculture industry on scientific lines. Flower preservative, cool water, hydrates, ethylene, ventilation system, and transportation system are the critical factors help to store and market flower and these types of care of cut flower are essential for maintaining high quality (Scoggins, 1998).

However, It is yet to confirm that is there have: lack of high yielding seeds, corm and seedlings, lack of improved variety, unavailability of labor with high labor wages, high cost of plant protection chemicals, high investment in establishing a poly house, fluctuation in the price, exploitation by the middleman, lack of exclusive markets for flowers by conducting a systematic research.

2.4 Research gap

There are lots of researches on commercial cultivation of cut flowers but very few researches has so far been conducted to measure farmers' attitude towards commercial cultivation of cut flowers. Moreover, very few researchers carried out their study to explore the contributing relationship between the selected characteristics of the cut flower farmers and their attitude towards commercial cultivation of cut flowers. This was a research gap of this study. The researcher carried out the study to explore the relationship between the selected characteristics of the cut flower farmers and their attitude towards commercial cultivation of cut flowers. Many research carried out problem and constraint on floriculture. But very few researchers carried out their study to identify the problems faced by the farmers in commercial cultivation of cut flowers. This was another research gap. Only a few researchers followed systematic method to determine the famers' attitude towards commercial cultivation of cut flowers. This was a research gap of the study. Hence, the researcher carried out the

present study to determine ‘Farmers’ Attitude towards Commercial Cultivation of Cut Flowers in Savar Upazila under Dhaka District.’

2.5 The conceptual framework of the study

In scientific research, selection and measurement of variables constitute a major task. Attitude towards commercial cultivation of cut flowers was the main focus of the study. A large number of factors of the flower farmers may influence the attitude of the farmers toward commercial cultivation of cut flowers. In a view of major findings of review of literature and considering the above issues, the researcher constructed a conceptual model of the study, which is self-explanatory and is presented in figure 2.1

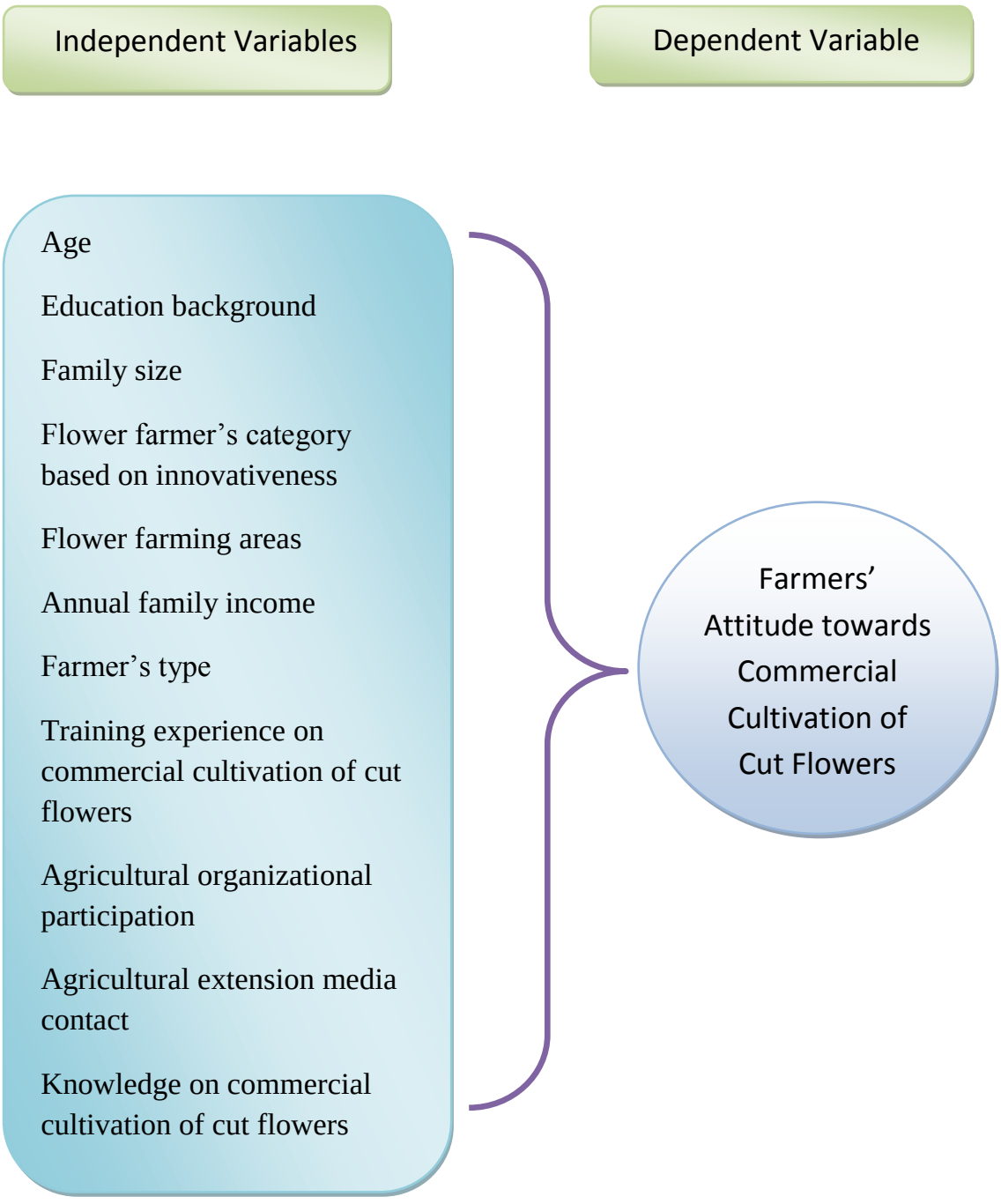

Figure 2.1 Conceptual framework of the study

CHAPTER 3

MATERIALS AND METHODS

The reliability of a scientific research depends to a greater extent on the appropriate materials and methods which made the study authentic. The researcher has great responsibilities to clearly describe as to what sorts of research design, methods and procedures he would follow in collecting valid and reliable data and to analyze and interpret those to draw reliable conclusions. A sequential description of the materials, methods, and procedures used for this research was stated below:

3.1 Locale of the study

The study was conducted purposively in selected Savar upazila under Dhaka district. There are 13 unions in this upazila and one union namely Biruliya was also purposively selected which is more cut flower cultivated area; again four villages namely Shampur, moistapara, Bagnibari and Batuliya from Biruliya union were selected randomly as the locale of the study. A map of Dhaka district showing Savar upazila is presented in Figure 3.1. A map of Savar upazila showing the study area is presented in Figure 3.2.

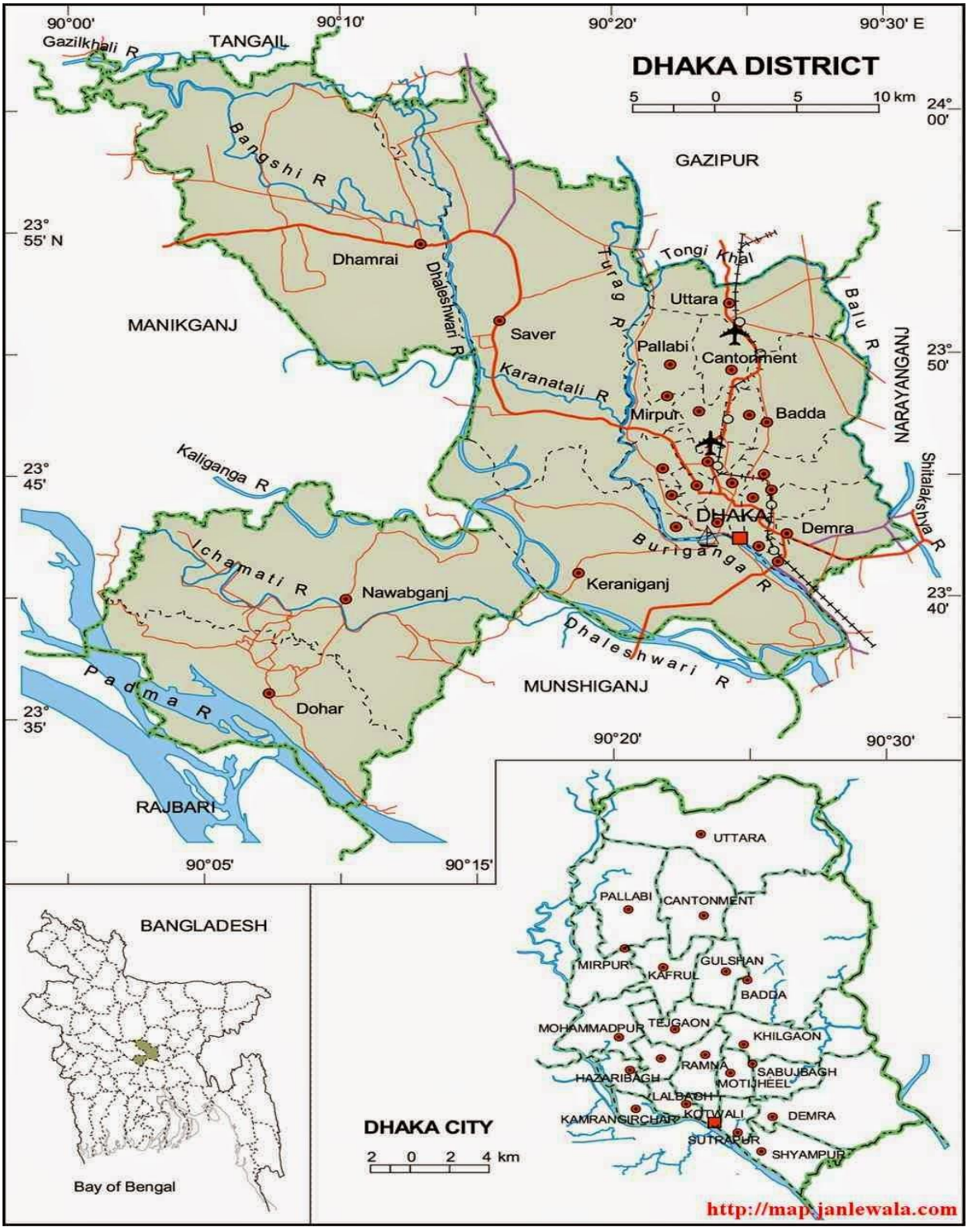

Figure 3.1 A Map of Dhaka district showing Savar upazila

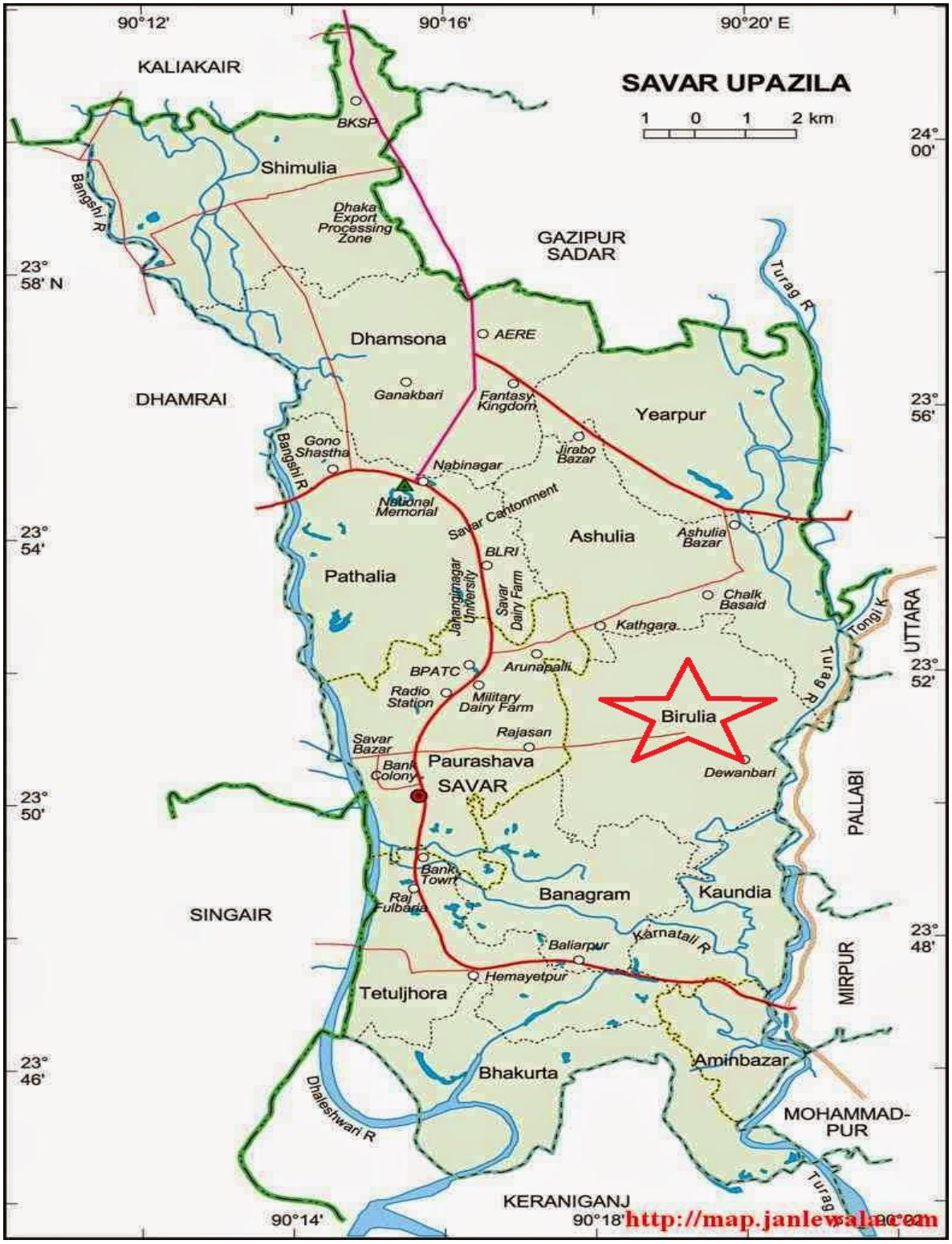

Figure 3.2 A Map of Savar upazila showing the study area

3.2 Population and Sampling

The Researcher himself with the help of Upazila Agriculture Officer, Local leaders and concerned Sub-Assistant Agriculture Officer (SAAO) was collected an updated list of farmers of the selected villages. The total numbers of farm families head in four villages were 335. According to Yamane's (1967) formula, sample size was 104 at 8% precision level, 50% degree of variability and the value of the standard normal variable (Z)= 1.96 at 95% confidence level. The given formula is stated as:

$$n = \frac{\mathbf{Z^2P(1-P)N}}{\mathbf{Z^2P(1-P)+Ne^2}}$$

Where,

n = sample size

N = population size

e = the level of precision

Z=the value of the standard normal variable given the chosen confidence level (eg. Z= 1.96 with a confident level 95%)

P = the proportion or degree of variability

The sample was then selected from the four villages by considering proportionate random sampling procedure. A reserve list of 16 farm families head (about 15% of the sample) was kept purposively if any respondent was unavailable at the time of data collection. The distribution of population and sample was shown in Table 3.1

Table 3.1 Distribution of study area's population and sample

District	Upazila	Union	Village	No. of farm family head (N)	Sample size (n)	Reserve farm family head
Dhaka	Savar	Biruliya	Shampur	158	49	7
			Moistapara	82	25	4
			Bagnibari	35	11	2
			Batuliya	60	19	3
Total				**335**	**104**	**16**

3.3 Data collecting instrument

In order to collect valid and reliable information an interview schedule was prepared. Interview schedule was used as the research instrument. It was carefully designed keeping the objectives of the study in mind. Both open and closed form of questions used to collect information. Simple, direct questions and scales were included in the interview schedule for collecting information regarding the focus of farmers' attitude towards commercial cultivation of cut flower in Savar upazila. Interview schedules were pre-tested in actual field situations before using it for final data collection among 15 respondents of the study area. Necessary corrections, modifications and additions were made in the interview schedule on the basis of results of pre-test. The interview schedule was then printed in its final forms. Necessary photocopies were then made. A copy of the interview schedule in English version has been furnished in Appendix-A.

3.4 Collection of data

Data were collected personally by the researcher himself through face to face interview. To familiarize with the study area and for getting local support, the researcher took help from the local leaders and the field staffs of Upazila Agriculture Office. The researcher made all possible efforts to explain the purpose of the study to

the farmers. Rapport was established with the farmers prior to interview and the objectives were clearly explained by using local language as far as possible. Data were collected during the period of 10 November to 5 December 2016.

3.5 Variables of the study

In a social research, the selection and measurement of variables constitute an important task. In this connection, the researcher looked into the literature to widen his understanding about the nature and scope of the variables involved in research studies. Ezekiel and fox (1959) defined a variable as any measurable characteristics which can assume varying of different successive individual cases. The hypothesis of a research, while constructed properly, contains at least two important elements, independent variables and dependent variables.

Independent variables are that factors which are manipulated by the researcher in his attempt to ascertain its relationship to an observed phenomenon (Townsend, 1953). A dependent variable is that factor which appears, disappears or varies as the experimenter introduces, removes or varies in the independent variables. The dependent variables is often called the criterion or predicted variable, whereas the independent variable is called the treatment, experimental and antecedent variables (Dalen, 1977).

3.5.1 Selection of dependent and independent variables

Success of a research to a considerable extent depends on the successful selection of the variables. Irrational, inappropriate and inconsistent selection of variables may lead to misleading and unfruitful results. The researcher keeping all these in mind took adequate care in selecting the variables of the study. Before the onset of the study the researcher visited the study area several times and talked to the flower farmers intimately. Moreover, by staying in the study area for some time, he was able to observe the personal, socio-economic, socio-cultural and psychological factors of the flower farming community which the researcher assumed might have influenced on the behavior pattern of the farmers. Characteristics of the farmers like age, education background, family size, farmer's categories based on innovativeness, flower farming

areas, annual family income, farmer's type, training experience on commercial cultivation of cut flowers, agricultural organizational participation, agricultural extension media contact, knowledge on commercial cultivation of cut flowers were selected as the independent variables and farmer's attitude towards commercial cultivation of cut flower was the dependent variable. Based on this practical knowledge, side by side an extensive literature review and discussions with supervisory committee, relevant experts and academicians, the researcher selected twelve characteristics of the farmers for this study while attitude of farmers towards commercial cultivation of cut flowers was the main focus of the study.

3.5.2 Measurement of independent variables

Measurements of the independent variables are discussed in the following subsection:

3.5.2.1 Age

Age of the respondent farmers was measured by the length of time from her/his birth to the time of conducting interview. It was measured in term of actual year(s) on the basis of their response. A score of one (1) was assigned for each year of age. It was measured in complete years as reported by a respondent. For example, if a farmer age was 40 years then her/his age score was assigned as 40.

3.5.2.2 Education background

Education was measured on the basis of ability of the respondents to read and write or formal education from school/college or university. It was expressed in terms of years of schooling. A score of one (1) was given for passing each year in the educational institution, for example, if the respondent passed the final examination of class "X", his/her educational score was given as 10. If the respondent did not know how to read and write, his/her education score was given as '0' (zero). A score of 0.5 was given to that respondent who could sign his/her name only. If a flower farmer did not go to school but took non-formal education, his educational status was determined as the equivalent to a formal school student.

3.5.2.3 Family size

Family size was measured in terms of actual number of members in the family of a respondent. The family size included the respondent himself, his wife, sons, daughters and other dependents. For example, if a respondent have five members, his family score will be 5.

3.5.2.4 Flower farmer's category based on their innovativeness

Rogers (1983) defined innovativeness as 'the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of the social system'. It was measured on the basis of some criteria of a farmer and categorized as follows:

Innovator (has interest to take risk, have the highest social status, have financial liquidity, adopt an innovation within 1 year of hearing);

Early adopter (highest degree of opinion leadership, higher social status, financial liquidity, advanced education, adopt an innovation within >1 to 2 years of hearing);

Early majority (adopt an innovation after innovator and early adopter, have above average social status, seldom hold position of opinion leadership, adopt an innovation within > 2 to 3 years of hearing);

Late majority (adopt an innovation after the average participant, have below average social status, little financial liquidity, little opinion leadership, adopt an innovation within >3 to 4 years of hearing);

Laggard (show little to no opinion leadership, tend to be focused on tradition, lowest social status, illiteracy, lowest financial liquidity, adopt an innovation >4 years of hearing).

3.5.2.5 Flower farming areas

Flower farming area refers to the total flower cultivated area either owned by a farmer or obtained from other on share cropping system or taken from others as mortgage which was used to his/her farming operation during the period of this study. The flower farming areas of the respondent was computed by using the following formula.

The measurement unit was in hectare (ha).

Flower farming areas = A+ 1/2(B+C) + D

Where;

A= Own land under cultivation

B= Land given to others as borga

C= Land taken from others as borga

D= Land taken from others as lease

3.5.2.6 Annual family income

Annual family income was measured considering last year total earnings in taka of all the family members of a respondent from agriculture, services, business, labor and other sources as contained in the Question no. 6 of the interview schedule (Appendix A). The total earnings were measured in thousand taka and a score of 1 was assigned for each one thousand taka.

3.5.2.7 Farmers' type

A person who owns or manages a farm is called farmer. According to DAE (1999) given classification, the farmers who have land bellow 0.02 hectare are considered as landless farmer. The farmers who have land between 0.02 to 0.2 hectare are considered as marginal farmers; the farmers have the land between 0.2 to 1 hectare are considered as small farmers; the farmers who have the land between 1 to 3 hectare are considered as medium farmers and the farmers who possess the land over 3 hectare are considered as large farmers.

3.5.2.8 Agricultural organizational participation

Agricultural organizational participation of the respondent was measured on the basis of the nature of his/her participation in selected six organizations. Nature of participation score was computed in the following manner for each organization

Participation nature	**Score**
No participation	0
Participation as ordinary member	1
Participation as executive member	2
Participation as president/secretary	3

Thus, the organizational participation scores of a respondent could range from 0 to 18, where '0' indicated no agricultural organizational participation and 18 indicated very high agricultural organizational participation.

3.5.2.9 Training experience on commercial cultivation of cut flowers

Training experience on commercial flower farmers was measured by the total number of days she/he participated in commercial cultivation of cut flowers training program. A score of one (1) was assigned for each day of training received.

3.5.2.10 Agricultural extension media contact

The communication media exposure of the respondent was measured by the total score of media contact on the basis of his/her extent of contact with 10 selected media.

Following scores were assigned for each of 10 media:

Extent of contact	Score
Not at all	0
Rarely	1
Occasionally	2
Very often	3
Frequently	4

Thus, the communication media exposure scores of a respondent could range from 0 to 40 where '0' indicated no agricultural extension media contact and '40' indicated very high agricultural extension media contact.

3.5.2.11 Knowledge on commercial cultivation of cut flowers

Knowledge on commercial cultivation of cut flowers was measured on twelve basic open ended questions. Each question contains 2 marks. The respondents were asked to answer 12 questions. A score of '2' was given for each correct reply and '0' for incorrect reply for each item. Partial score was assigned for partially correct answer. Knowledge on commercial cultivation of cut flowers was determined by summing up the weights for their responses to all the twelve questions. Thus knowledge of the farmers towards commercial cultivation of cut flowers score of the respondents could range from 0 to 24, where zero (0) indicating very low knowledge and 24 indicated very high knowledge on commercial cultivation of cut flowers.

3.5.3 Problem faced by the cut flower farmers for commercial cultivation

Fourteen problems were selected to measure the extent of problem faced by the respondents on commercial cultivation of cut flowers. Five point rating scale was used for each problem. Five alternative responses were very low, low, moderate, high and very high problem. The weights were assigned to these responses as 0, 1, 2, 3 and 4 respectively.

Extent of problem faced score of a respondent was measured by the summing of all the responses to all the problems. Thus extent of problem faced score range from 0 to 56 while (0) indicate very low problem and 56 indicate very high problem.

3.5.4 Measurement of dependent variable

3.5.4.1 Farmer's attitude towards commercial cultivation of cut flowers

An attitude may be defined as predisposition to act towards an object in a certain manner. Attitude of a farmer towards commercial cultivation of cut flowers was used to refer to his belief, feelings and action towards the various aspects commercial cultivation of cut flower. It was measured by constituting 12 statements (six positive and six negative). A statement was considered positive if it possessed an idea favorable towards the commercial cultivation of cut flower. On the other hand, a statement was considered negative if it was unfavorable towards commercial cultivation of cut flowers. The respondents were asked to express their opinion in the form of "strongly agree" or "agree" or "undecided" or "disagree" or "strongly disagree". A score of +2 was given to "strongly agreed", +1 to "agreed", 0 to "undecided", -1 to "disagreed" and -2 to "strongly disagreed". Attitude score of a respondent was determined by summing the scores obtained by him for all the items in the scale. The index scores of respondents could range from -24 to +24 where "-24" indicating highest unfavorable and "+24" for highest favorable/positive attitude towards commercial cultivation of cut flowers.

3.6 Data processing

3.6.1 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 mistake were detected by doing this, which were corrected promptly.

3.6.2 Coding and tabulation

After completion of field survey, all the data were coded, compiled and tabulated according to the objectives of the study. Local units were converted into standard units. All the individual response to questions of the interview schedule was transferred into a master sheet to facilitate tabulation, categorization and organization.

3.6.3 Categorization of data

The collected raw data as well as the respondents were classified into various categories to facilitate the description of the independent and dependent variables. These categories were developed for each of the variable by considering the nature of distribution of the data and extensive literature review. The procedure for categorization has been discussed while describing the variables under consideration in chapter 4.

3.7 Statistical Procedures

The data were analyzed in accordance with the objectives of the study. Qualitative data were converted into quantitative data by means of suitable scoring technique wherever necessary. The statistical measures such as range, means, standard deviation, number and percentage distribution were used to describe the variables. Multiple linear regression analysis was done for explore contributing relationship between variables. Statistical package for social sciences (SPSS) version 24 was used for analysis of data. Five percent (0.05) level of probability was considered as the basis for rejecting any null hypothesis.

3.8 Statement of hypothesis

According to Kerlinger, (1973) a hypothesis is an inferential statement of the relation between 2 or more variables. In statistical hypothesis testing, two hypotheses are compared and these are research hypothesis and the null hypothesis.

To find out relationship between variables, a researcher first formulates research hypothesis which states anticipated relationships between variables.

3.8.1 Research hypothesis

Each of the 11(eleven) selected characteristics (age, education background, family size, farmer's category based on innovativeness, flower farming areas, annual family income, farmer's type, training experience on commercial cultivation of cut flowers, agricultural organizational participation, agricultural extension media contact, knowledge on commercial cultivation of cut flowers) of the cut flower farmers have contributing relationship with their attitude towards commercial cultivation of cut flowers.

3.8.2 Null hypothesis

A null hypothesis states that there is no relationship between the concerned variables. The following null hypotheses were formulated to explore the relationship.

Each of the 11(eleven) selected characteristics (age, education background, family size, farmer's category based on innovativeness, flower farming areas, annual family income, farmer's type, training experience on commercial cultivation of cut flowers, agricultural organizational participation, agricultural extension media contact, knowledge on commercial cultivation of cut flowers) of the cut flower farmers have no contributing relationship with their attitude towards commercial cultivation of cut flowers.

CHAPTER 4
RESULTS AND DISCUSSION

The findings of the study and their interpretation have been presented in this chapter. Procedures of using these data for the measurement needed some discussion for clear understanding. Necessary explanation has also been made showing possible and logical basis of the findings whenever necessary. This chapter is presented in four sections according to the objectives of the study. This chapter is arranged in the following section:

- The first section deals with the selected characteristics for describe the socio-economic profile of the cut flower farmers;
- The second section deals with the extent of attitude towards commercial cultivation of cut flowers;
- The third section describes the contributing relationship between the selected characteristics of the cut flower farmers and their extent of attitude towards commercial cultivation of cut flowers; and
- The four section deals with the problems faced by the cut flower farmers for commercial cultivation.

4.1 Socio-economic profile of the cut flower farmers

Eleven (11) characteristics of the farmers were selected for the study which are:

- Age
- Education background
- Family size
- Flower farmer’s category based on innovativeness
- Flower farming areas
- Annual family income
- Farmer’s type
- Training experience on commercial cultivation of cut flowers
- Agricultural organizational participation
- Agricultural extension media contact
- Knowledge on commercial cultivation of cut flowers

These characteristics of the farmers are described in this section which focused study as farmer’s socio-economic profile.

The salient features of the characteristics of flower farmers were shown in Table 4.1

Table 4.1 salient features of the selected characteristics of flower farmers

SL. No.	Characteristics	Unit of measurement	Possible range	Observed range	Mean	SD
1	Age	Year	Unknown	26-56	41.99	7.83
2	Education background	year of schooling	Unknown	.5-12	5.33	3.10
3	Family size	No. of members	Unknown	3-11	7.32	2.13
4	Flower farmer's category based on innovativeness	Score	1-5	1-5	2.41	1.26
5	Flower farming areas	Hectare	Unknown	.12-1.62	.38	.25
6	Annual family income	'000'Taka	Unknown	150-1600	448.94	265.72
7	Farmer's type	Score	1-5	2-5	3.19	.88
8	Training experience on commercial cultivation of cut flowers	No. of day(s) experience	Unknown	1-7	2.42	1.50
9	Agricultural organizational participation	Score	0-18	0-3	1.44	.75
10	Agricultural extension media contact	Score	0-40	10-30	18.70	5.82
11	Knowledge on commercial cultivation of cut flowers	Score	0-24	8-22	17.39	3.42

4.1.1 Age

On the basis of their age, farmers were classified into three categories considering Ministry of Youth, People Republic of Bangladesh, (2013): "Young" (18 to 35 years), "Middle aged" (36-50 years) and "Old" (above 50 years). The observed age of the flower farmers ranged from 26 to 56 years, the average being 41.99, the standard deviation was 7.83 and co-efficient of variation was 18.65. The distribution of the flower farmers according to their age was shown in Table 4.2.

Table 4.2 Distribution of flower farmers according to their age

Categories (Years)	Number	Percent	Mean	SD	CV
Young aged (18 to 35)	29	27.9	41.99	7.83	18.65
Middle aged (36-50)	61	58.7			
Old aged (above 50)	14	13.5			
Total	**104**	**100**			

It was found that 27.9 percent of the flower farmers were young aged, 58.7 percent were middle aged and the rest 13.5 percent were old aged. Here data revealed that most of the flower farmers in the study area were middle aged. It might be due to the middle aged farmers comparatively give more preference to commercial cultivation of cut flower than the young old aged farmers as they are experienced and interested to take risk. Commercial cut flower cultivation is comparatively risky than most others farming. Aus (2014) and Hossain (2007) also found similar results in his study.

4.1.2 Education background

Education background of the farmer were classified into four categories namely can sin only (0.5), primary level (1-5), secondary level (6-10), higher level (above10) considering their year of schooling. The educational background of the farmers ranged from 0.5 to 12 with mean 5.33, the standard deviation was 3.10 and co-efficient of

variation was 58.16. The distribution of the farmers according to their educational background is shown in Table 4.3.

Table 4.3 Distribution of farmers according to their educational background

Categories	Number	Percent	Mean	SD	CV
Can sign only (0.5)	9	8.7	5.33	3.10	58.16
Primary level (1-5)	46	44.2			
Secondary level (6-10)	46	44.2			
Higher level (above 10)	3	2.9			
Total	**104**	**100**			

It was found that 8.7 percent of the farmers were under can sign only category, 44.2 percent were in primary level category, 44.2 percent farmers were in secondary level category and the rest 2.9 percent were in higher level category. Data showed that most of the farmers in the study area had primary to secondary education. Highest portion (88.4 percent) farmers in this study area did not pass high school education. It might be due to their daily hardship life and lack of awareness. It should be enhance education at higher level among the flower farmers which helps the farmers to extent their outlook and expand mental horizon by helping them to develop positive attitude. Similar findings were found in the studies of Hossain (2007) and Salahuddin (2013).

4.1.3 Family size

According to family planning ministry, family size of the farmers were classified into three categories: 'Small family' (up to 4), 'Medium family' (5-7) and 'Large family' (above 7) considering their no. of members. The family size of the farmers ranged from 3 to 11 with mean 7.32, the standard deviation was 2.13 and co-efficient of variation was 29.10. The distribution of the farmers according to their family size is shown in Table 4.4.

Table 4.4 Distribution of farmers according to their family size

Categories	Number	Percent	Mean	SD	CV
Small family (up to 4)	8	7.6	7.32	2.13	29.10
Medium family (5-7)	45	43.2			
Large family (above 7)	51	49.1			
Total	**104**	**100**			

It was found that 7.6 percent of the farmers were small family, 43.2 percent were medium family and the rest 49.1 percent were large family. Here data revealed that most of the farmers in the study area were medium to large family. It might be due to the respondents of this study area keep maintain joint family culture and lack of proper family planning. Salahuddin (2013) also found similar result.

4.1.4 Flower farmer's category based on innovativeness

On the basis of innovativeness the farmer's category were classified into five categories as suggested by Rogers (1983): a) Innovator, b) Early adopter, c) Early majority, d) Late majority, and e) Laggards.

The observed range of farmer's category was 1 to 5 with mean and standard deviation 2.41 and 1.26 respectively. Co-efficient of variation was 52.28. Distribution of the farmer's category based on innovativeness was shown on Table 4.5.

Table 4.5 Distribution of farmer's category based on their innovativeness

Categories (Score)	Number	Percent	Mean	SD	CV
Innovator (5)	7	6.7	2.41	1.26	52.28
Early adopter (4)	17	16.3			
Early majority (3)	19	18.3			
Late majority (2)	30	28.8			
Laggards (1)	31	29.8			
Total	**104**	**100**			

Data shown on Table 4.5 indicate that the majority of the respondents (29.8 percent) were Laggards while 6.7 percent farmers were 'Innovator', 16.3 percent were 'Early adopter', 18.3 percent were 'Early majority' and 28.8 percent were 'Late majority' category. It seemed to be that the highest portion farmers were laggards for their average below social status, illiteracy, little financial liquidity and they were showed poor attitude because of little to no opinion leadership. So, it should be increased by proper technical and financial support and motivation to them.

4.1.5 Flower farming areas

On the basis of the respondent's flower farming areas they were classified into three categories: 'Small flower farming area' (up to 0.131 hectare), 'Medium flower farming area' (0.131-0.623 hectare) and 'Large flower farming area' (above 0.623 hectare) (mean $\pm$1sd). The flower farming area of the farmers ranged from .12 to 1.62 hectares with an average 0.38, the standard deviation was 0.25 and co-efficient of variation was 65.79. The distribution of the farmers according to their flower farming areas was shown in Table 4.6

Table 4.6 Distribution of farmers according to their flower farming areas

Categories (hectare)	**Number**	**Percent**	**Mean**	**SD**	**CV**
Small flower farming area (up to 0.131 ha)	15	14.4	0.38	0.25	65.79
Medium flower farming area (0.131-.623 ha)	82	79.1			
Large flower farming area (above 0.623 ha)	7	6.7			
Total	**104**	**100**			

It was found that majority of the flower farmers had medium flower farming areas (79.1 percent) where 14.4 percent small flower farming areas and 6.7 percent large flower farming areas. It might be high price rate of per decimal land of this study area

due to being situated in the nearest to the Dhaka city. Aus (2014) also found similar result.

4.1.6 Annual family income

On the basis of their observed annual family income scores, farmers were classified into three categories: low income (up to Taka 183 thousands), medium income (Taka 184-713 thousands) and high income (above Taka 713 thousands) (mean $\pm$1SD). Annual family income of the farmers ranged from Taka150 thousands to 1600 thousands, the mean being 448.94, the standard deviation was 265.72 and co-efficient of variation was 59.19. Distribution of the farmers according to their annual family income was shown in Table 4.7.

Table 4.7 Distribution of farmers according to their annual family income

Categories ('000'Taka)	Number	Percent	Mean	SD	CV
Low income (up to 183)	12	11.6	448.94	265.72	59.19
Medium income (184-713)	83	79.8			
High income (Above 713)	9	8.7			
Total	**104**	**100**			

Table 4.7 shows that 11.6 percent of the farmers had low income, 79.8 percent of the respondents had medium income and 8.7 percent had high income. The majority of the respondents (79.8%) had medium income category. It might be due to the income from agriculture and non-agriculture sources are less than the income of commercial cut flower cultivation. Another reason was the flower farmers of the study area were educated. It also might be they were very willing to adopt innovations due to their risk bearing ability. Hossain (2007) and Aus (2014) also found similar results.

4.1.7 Farmer's type

Farmers' type of the respondents score ranged from 2 to 5 having an average of 3.19, the standard deviation was 0.88 and co-efficient of variation was 27.59. According to DAE (1999) given classification/type, farmers were classified into five categories: 'Landless farmer' (below .02ha land) 'Marginal farmer' (.02-.2 ha land) 'Small farmer' (.2-1 ha land), 'Medium farmer' (1-3 ha land), Large farmer (above 3 ha land) presented in Table 4.8.

Table 4.8 Distribution of farmers according to farmer's type

Categories (Score)	Number	Percent	Mean	SD	CV
Landless farmer (below .02 ha)	0	0	3.19	.88	27.59
Marginal farmer (.02-.2 ha)	23	22.1			
Small farmer (.2-1 ha)	47	45.2			
Medium farmer(1- 3 ha)	25	24			
Large farmer(above 3 ha)	9	8.7			
Total	**104**	**100**			

Data in Table 4.8 indicate that 45.2 percent had small farmer, 22.1 ha had marginal farmer, 24 percent had medium farmer and 8.7 percent had large farmer. Data revealed that the majority (69.2%) of the flower farmers had small to medium categories. It might be due to fragmentation of land and high price of land in this study area. Hossain (2007) and Wadud (2010) also found similar results.

4.1.8 Training experience on commercial cultivation of cut flowers

On the basis of their training experience scores farmers were classified into three categories: 'Low training experience' (up to 2 days experience), 'Medium training experience' (3-5days experience) and 'High training experience' (above 5 days experience). Training experience of the farmers was ranged from 1 to 7 days; the

mean being 2.42, standard deviation 1.50 and co-efficient of variation was 61.98. Distribution of the farmers on the basis of their obtained training score was shown in Table 4.9

Table 4.9 Distribution of farmers according to their training experience

Categories	Number	Percent	Mean	SD	CV
Low training experience (up to 2 days experience)	66	63.5	2.42	1.50	61.98
Medium training experience (3-5 days experience)	33	31.7			
High training experience (above 5 days experience)	5	4.8			
Total	**104**	**100**			

Data furnished that a vast portion of the respondents (63.5 percent) had low training experience while 31.7 percent had medium training experience and 2.9 percent had high training experience. It might be due to lack of training facilities, institutional co-operation, farmer's consciousness or proper motivation towards training. Training enhances farmer's knowledge, attitude and perception and enables to show skill which is important to make positive decision. So it should be increased training experience among farmers by offering them training on commercial cultivation of cut flowers.

4.1.9 Agricultural organizational participation

The computed agricultural organizational participation scores of the patient respondents ranged from 0 to 3 with an average of 1.44, standard deviation of .75 and co-efficient of variation was 52.08. On the basis of agricultural organizational participation scores, the respondents were classified into three categories which were shown in Table 4.10.

Table 4.10 Distribution of farmers according to their agricultural organizational participation

Categories	Number	Percent	Mean	SD	CV
Low participation (up to 1)	70	67.3	1.44	0.75	52.08
Medium participation (2-3)	34	32.7			
High participation (above 3)	0	0			
Total	**104**	**100**			

Data furnished that a vast portion of the respondents (67.3 percent) had low agricultural organizational participation while 32.7 percent had medium agricultural organizational participation and 0(zero) percent had high agricultural organizational participation. It might be due to lack of awareness, political biasness of agricultural organization, transportation cost is high, etc. Agricultural organizational participation is very important for rising positive attitude towards commercial cut flower cultivation. When a farmer participates in different organization, his/her innovativeness as well as attitude both are increasing rapidly towards the targeted goals. Aus(2014) and Wadud (2010) in their study found similar results.

4.1.10 Agricultural extension media contact

On the basis of respondent's agricultural extension media contact scores they were classified into three categories: 'Low agricultural extension media contact' (score up to 13), 'Medium agricultural extension media contact' (score14-23) and 'High agricultural extension media contact' (score above 23) (mean $\pm$1sd). Agricultural extension media contact score of the farmers was ranged from 10 to 30 against the possible ranged from 0 to 40 while mean being 18.70, standard deviation was 5.82 and co-efficient of variation was 31.12 respectively. Distribution of the farmers according to their agricultural extension media contact was shown in Table 4.11.

Table 4.11 Distribution of farmers according to their agricultural extension media contact

Categories (Score)	Number	Percent	Mean	SD	CV
Low agricultural extension media contact (up to 13)	29	27.9	18.70	5.82	31.12
Medium agricultural extension media contact (14-23)	50	48.1			
High agricultural extension media contact (Above 23)	25	24			
Total	**104**	**100**			

Data revealed that about 48.1 percent farmers had medium extension media contact while 27.9 percent farmers had low extension media contact and 24 percent farmers had high extension media contact. Highest portion of the respondents (76 percent) possess low to medium agricultural extension media contact. It might be due to lack of trust and co-operation on agricultural officers and NGO workers, lack of interest and proper motivation about commercial flower cultivation. However, the agricultural extension media contact was gradually increased to medium category. So, it should be raise to high category by proper policy implications by both GO and NGO in the area. Similar findings were found in the studies of Aus (2014), Hossain (2007) and Wadud (2010).

4.1.11 Knowledge on commercial cultivation of cut flowers

On the basis of their knowledge, farmers were classified into three categories: “low knowledge” (up to14), “medium knowledge” (15 to 20), “high knowledge” (above 20) (mean±1sd). The observed knowledge of the flower farmers ranged from 8 to 22, the average being 17.39, the standard deviation was 3.42 and co-efficient of variation was

19.67.The distribution of the flower farmers according to their knowledge was shown in Table 4.12.

Table 4.12 Distribution of farmers according to their knowledge on commercial cultivation of cut flowers

Categories	Number	Percent	Mean	SD	CV
Low knowledge (up to 14)	24	23.1	17.39	3.42	19.67
Medium knowledge (15-20)	66	63.4			
High knowledge (Above 20)	14	13.5			
Total	**104**	**100**			

It was found that 23.1 percent of the flower farmers had low knowledge, 63.4 percent had medium knowledge and the rest 13.5 percent had high knowledge. Here data revealed that most of the flower farmers in the study area had medium knowledge on commercial cultivation of cut flowers. It might be due to lack of higher education, low agricultural organizational participation and low training experience on commercial cut flower cultivation. So, department of agricultural extension and other GOs and NGOs should give greater emphasis to train farmers to improve their knowledge on commercial cultivation of cut flower for achieving sustainable agricultural development. Hossain (2007) also found similar result.

4.2 Farmer's attitude towards commercial cultivation of cut flowers

Attitude towards commercial cultivation of cut flower scores of the respondents ranged from 1 to 7 against the possible range of -24 to +24 with an average of 3.19, standard deviation was 1.87 and co-efficient of variation was 58.6. Based on these attitude scores, the respondents were placed under three categories: 'positive attitude' (up to 2), 'more positive attitude' (3-4) and 'most positive attitude' (above 4) (mean±1sd). The distribution of the flower farmers according to their attitude was shown in Table 4.13.

Table 4.13 Distribution of the farmers according to their attitude towards commercial cultivation of cut flowers

Categories (score)	Number	Percent	Mean	SD	CV
Positive attitude (up to 2)	43	41.3	3.19	1.87	58.6
More positive attitude (3-4)	35	33.7			
Most positive attitude (above 4)	26	25.0			
Total	**104**	**100**			

Data presented in Table 4.13 reveal that about (41.3 percent) of the respondents held positive attitude, 33.7 percent more positive attitude and 25.0 percent most positive attitude towards commercial cultivation of cut flowers. Majority (75 percent) of the respondents had positive to more positive attitude towards commercial cultivation of cut flowers due to the flower farmers of the study area were educated. It might be educated farmers were more innovative to receive the new technologies than others. Flower farmers of the study area were earning more profit by using modern technologies that was the another reason for built up positive attitude. Aus (2014) also found similar result.

Bari *et al.* (2001) reported a research on attitude of farmers towards Hybrid Rice Alok 6201 at Manda, Mohadebpur and Pantnitala upazilas of Naogaon districts. He found that the highest proportion (45.3%) of hybrid rice flower farmers had moderately favorable attitude, towards hybrid rice variety Alok 6201.

Akanda (2001) carry out in his study that 66% of the farmers had moderately favorable attitude towards Rice-Fish program of CARE. On the other hand, 22% of the farmers had slightly favorable attitude and 21% of them had highly favorable attitude towards Rice-Fish program of CARE.

Sarkar (2002) reported a research on farmers' attitude towards organic homestead gardening program of World Vision at Sariakandi upazila under Bogra district. He found that majority (64%) of the world vision farmers were found to have moderately favorable attitude while 20% having slightly favorable attitude and only 16% farmers' belonged to highly favorable attitude. He also found that majority of the World Vision farmers showed moderate to highly favorable attitude towards organic homestead gardening program of World Vision.

Asaduzzaman *et al* (2003) revealed a research on farmers' attitude towards modern T.aman technologies of two villages Haridevpur union under Sadar thana of Rangpur district. He found that about three-fifty (59.09%) of the respondents were found to have moderately favorable attitude while 14.55% having slightly favorable attitude and only 26.36% farmers belonged to highly favorable attitude.

Haque (2006) found that two thirds of the farmers in organic farming group had highly favorable attitude towards organic farming. On the other hand, more than half (56%) of the conventional farmers had shown moderately favorable attitude towards organic farming.

Hussain (2001) reported a research on technologies. He found that majority (57 percent) of farmers had favorable, 27 percent had highly favorable while only 16 percent had unfavorable attitude towards jute cultivation.

Monalesa (2014) conducted a research on farmers' knowledge and attitude towards summer tomato cultivation at Bagherpara upazila under Jessore district. She found that about half (49.5%) of the farmers had favorable attitude towards summer tomato cultivation.

Rabby (2014) conducted a study on farmers' attitude towards jute cultivation at Babuganj upazila under Barisal district. He indicated that exactly half (50 per cent) of the respondent had favorable attitude towards jute cultivation as compared to 48.2percent had negative attitude and 1.8 percent had neutral attitude towards jute cultivation.

4.3 Contributing relationship between selected characteristics of the cut flower farmers and their extent of attitude towards commercial cultivation of cut flowers

This section deals with the findings exploring the contributing relationship between the selected characteristics of the cut flower cultivators and their extent of attitude towards commercial cultivation of cut flowers. The contributing factors were age, education background, family size, flower farmer's category based on innovativeness, flower farming areas, annual family income, farmer's type, training experience on commercial cultivation of cut flowers, agricultural organizational participation, agricultural extension media contact, knowledge on commercial cultivation of cut flowers. The main focus of the study was, "farmer's attitude towards commercial cultivation of cut flowers."

Assessing contributing relationship between the selected characteristics of the cut flower cultivators and their extent of attitude towards commercial cultivation of cut flowers, a multiple linear regression analysis was done. The multiple linear regression result has been shown in the Table 4.14

Table 4.14 Multiple linear regression coefficients of contributing variables of farmers' attitude towards commercial cultivation of cut flowers

Dependent Variable	**Independent Variables**	**B**	***P***	**R^2**	**Adj. R^2**	**F**	***P***
Farmer's attitude towards commercial cultivation of cut flowers	Age	-.067	.355	.680	.642	17.76	.000**
	Education background	.208	.044*				
	Family member	.085	.216				
	Flower farmer's category based on innovativeness	.299	.002**				
	Flower farming areas	.130	.519				
	Annual family income	-.154	.436				
	Farmer's type,	.050	.592				
	Training experience on commercial cultivation of cut flowers	-.069	.577				
	Agricultural organizational participation	.082	.418				
	Agricultural extension media contact	.412	.000**				
	Knowledge on commercial cultivation of cut flowers	-.045	.609				

**Significant at $p<0.01$

*Significant at $p<0.05$

The null hypothesis was there is no contributing relationship between selected characteristics of flower farmers (age, education background, family size, flower

farmer's category based on innovativeness, flower farming areas, annual family income, farmer's type, training experience on commercial cultivation of cut flowers, agricultural organizational participation, agricultural extension media contact, knowledge on commercial cultivation of cut flowers) and farmer's attitude towards commercial cultivation of cut flowers.

The findings of the study revealed that the observed F ratio was significant at 0.01 and 0.05 level of significance. 68 percent (%) (R^2=0.680) of the variation in the respondent's attitude can be attributed to their age, education background, family size, flower farmer's category based on innovativeness, flower farming areas, annual family income, farmer's type, training experience on commercial cultivation of cut flowers, agricultural organizational participation, agricultural extension media contact, knowledge on commercial cultivation of cut flowers making contribution on farmer's attitude towards commercial cultivation of cut flowers.

However, each predictor may expound some of the variance in respondents' attitude simply by chance. The adjusted R-square value penalizes the addition of extraneous predictors in the model, but values of .642 still show that the variance in respondents' attitude towards commercial cultivation of cut flowers can be attributed to the predictor variables rather than by chance and the F value indicate that the model was significant (p<0.01).

From Table 4.14 it was observed that education background, flower farmer's category based on innovativeness, agricultural extension media contact had significant contribution on farmer's attitude towards commercial cultivation of cut flowers. Data also showed that here, agricultural extension media contact, flower farmer's category based on innovativeness (innovator, early adopter, early majority, late majority and laggards) had most significant contribution at 1% (p<0.01) level of significance on attitude of farmers. It was also showed that education background had also significant contribution at (p<0.05) 5% level of significance on their attitude towards commercial cultivation of cut flowers.

In summary, the models suggest that the respective authority should consider the respondent's education background, flower farmer's category based on innovativeness and agricultural extension media contact when made policy for their attitude towards commercial cultivation of cut flowers to be improved.

Data furnished from Table 4.14 that, farmer's educational background was positively influenced on their attitude. It had significant (significant at $p<0.05$) contribution on their attitude towards commercial cultivation of cut flowers. It seemed to be the educated farmers had more knowledge, a greater ability to understand and respond to anticipated changes, were better able to forecast future scenarios and, overall, have greater access to information and opportunities than others, which might encourage attitude.

Farmer's category based on innovativeness had positive influence on farmer's attitude. It had most significant (significant at $p<0.01$) contribution on their attitude. It might be the innovators had more positive attitude due to their highest financial liquidity, highest social status, had interest to take risk and high level attitude. In the study majority of farmers was early adopter who had also greater impact on attitude. Laggards showed poor attitude due to lowest social status, illiteracy, lowest financial liquidity, tend to be concentrated on tradition and little to no opinion leadership. It seemed to be the laggards showed lengthy in decision of attitude but they took decision when the practice became older ones however they receive innovational information from peer ones but later she/he showed few attitude which had also contribution to attitude extent.

Data revealed from Table 4.14 showed that, agricultural extension contact was positively influence on their attitude. It had most significant (significant at $p<0.01$) contribution on their attitude towards commercial cultivation of cut flowers. It might be that, Agricultural extension media contact enhances farmers' knowledge, attitudes, perception to innovation which was suitable for her/his problem to be solved. Agricultural extension media contact was made her/him motivated towards attitude.

So, it could be said that, more agricultural extension media contact were enhanced flower farmers attitude.

4.4 Problem faced by the cut flower farmers for commercial cultivation

On the basis of their problem scores, farmers were classified into three categories: 'Low problem' (up to 15), 'Medium problem' (16-27), 'High problem' (above 27) (mean±1sd). The observed problem scores of the flower farmers ranged from 10 to 34, the average being 27.73, the standard deviation was 6.55 and co-efficient of variation was 30.14. The distribution of the flower farmers according to their problems faced in commercial cultivation of cut flowers was shown in Table 4.15.

Table 4.15 Distribution of flower farmers according to their problems faced in commercial cultivation of cut flowers

Categories (scores)	Number	Percent	Mean	SD	CV
Low problem (up to 15)	21	20.2	21.73	6.55	30.14
Medium problem (16-27)	57	54.7			
High problem (above 27)	26	25.1			
Total	**104**	**100**			

Data revealed that a vast portion of the respondents (54.7 percent) had medium problem faced while 20.2 percent had low problem and 25.1 percent had high problem. It also revealed that problem faced by the most of the flower farmers in the study area were medium to high problem. It might be due to their geographical location, lack of awareness and proper training facilities, less using of modern technology, communication gap between flower farmers and agricultural officer's etc. Problems should be minimized by taking proper steps with the help of GOs and NGOs.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The study was undertaken with the objectives: i) to describe the socio-economic profile of the cut flower farmers; ii) To determine the extent of attitude of farmers towards commercial cultivation of cut flowers; iii) To explore the contributing relationship between the selected characteristics of the cut flower farmers and their attitude towards commercial cultivation of cut flowers; and iv) To identify the problems faced by the cut flower farmers for commercial cultivation.

In this chapter, the first section deals with summary of the findings; the second section deals with conclusion and the third section deals with recommendations.

5.1 Summary of findings

5.1.1 Socio- economic profile of the cut flower farmers

Age of the flower farmers' ranged from 26 to 56 years, the average being 41.99, the standard deviation was 7.83 and co-efficient of variation was 18.65. It was found that 27.9 percent of the flower farmers were young aged, 58.7 percent were middle aged and the rest 13.5 percent were old aged. Here data revealed that most of the flower cultivators in the study area were middle aged.

Educational background of the farmers' ranged from 0.5 to 12 with mean 5.33, the standard deviation was 3.10 and co-efficient of variation was 58.16. It was found that 8.7 percent of the farmers were under can sign only category, 44.2 percent were in primary level category, 44.2 percent farmers were in secondary level category and the rest 2.9 percent were in higher level category. Data showed that most of the farmers in the study area had primary to secondary education. Highest portion (88.4 percent) farmers in this study area had low level education.

Family member of the farmers' ranged from 3 to 11 with mean 7.32, the standard deviation was 2.13 and co-efficient of variation was 29.10. It was found that 7.6

percent of the farmers were small family, 43.2 percent were medium family and the rest 49.1 percent were large family. Here data revealed that most of the farmers in the study area were medium to large family.

Farmer's category based on their innovativeness was ranged from 1 to 5 with mean and standard deviation 2.41 and 1.26 respectively. Co-efficient of variation was 52.28. It was that majority of the respondents (29.8 percent) were Laggards while 6.7 percent farmers were 'Innovator', 16.3 percent were 'Early adopter', 18.3 percent were 'Early majority' and 28.8 percent were 'Late majority' category.

The flower farming area of the farmers ranged from .12 to 1.62 hectares with an average 0.38, the standard deviation was 0.25 and co-efficient of variation was 65.79. It was found that majority of the farmers had medium flower farming area (79.1 percent) where 14.4 percent small flower farming areas and 6.7 percent large flower farming areas.

Annual family income of the farmers ranged from Taka 150 thousands to 1600 thousands, the mean being 448.94, the standard deviation was 265.72 and co-efficient of variation was 59.19. It was found that 11.6 percent of the farmers had low income, 79.8 percent of the farmers had medium income and 8.7 percent had high income. The majority of the respondents (79.8%) had medium income category.

Farmers' type of the respondents ranged from 2 to 5 ha having an average of 3.19, the standard deviation was 0.88 and co-efficient of variation was 27.59. It was found that 45.2 percent had small farmer, 22.1 ha had marginal farmer, 24 percent had medium farmer and 8.7 percent had large farmer. Data revealed that the majority (69.2%) of the flower farmers had small to medium categories.

Training experience of the farmers was ranged from 1 to 7 days; the mean being 2.42, standard deviation 1.50 and co-efficient of variation was 61.98. It was found that a vast portion of the respondents (63.5 percent) had low training experience while 31.7 percent had medium training experience and 2.9 percent had high training experience.

The computed agricultural organizational participation scores of the patient respondents ranged from 0 to 3 with an average of 1.44, standard deviation of .75 and co-efficient of variation was 52.08. It was found that a vast portion of the respondents (67.3 percent) had low agricultural organizational participation while 32.7 percent had medium agricultural organizational participation and 0(zero) percent had high agricultural organizational participation.

Agricultural extension media contact of the farmers' was ranged from 10 to 30 against the possible ranged from 0 to 40 while mean being 18.70, standard deviation was 5.82 and co-efficient of variation was 31.12. It was found that about 48.1 percent farmers had medium extension media contact while 27.9 percent farmers had low extension media contact and 24 percent farmers had high extension media contact. Highest portion of the respondents (76 percent) possess low to medium agricultural extension media contact.

Knowledge of the flower farmers' ranged from 8 to 22, the average being 17.39, the standard deviation was 3.42 and co-efficient of variation was 19.67. It was found that 23.1 percent of the flower farmers were low knowledge, 63.4 percent were medium knowledge and the rest 13.5 percent were high knowledge. Here data revealed that most of the flower cultivators in the study area were medium knowledge.

5.1.2 Farmer's extent of attitude towards commercial cultivation of cut flowers

Farmers' extent of attitude were categorized into three categories: 'positive attitude' (up to 2), 'more positive attitude' (3-4) and 'most positive attitude' (above 4) (mean$\pm$1sd). Attitude towards commercial cultivation of cut flowers score of the respondents ranged from 1 to 7 against the possible range of -24 to +24 with an average of 3.19, standard deviation was 1.87 and co-efficient of variation was 58.6. Data also showed that about 41.3 percent of the respondents held positive attitude, 33.7 percent more positive attitude and 25.0 percent most positive attitude towards commercial cultivation of cut flowers. Majority (75 percent) of the respondents had positive to more positive attitude towards commercial cultivation of cut flowers.

5.1.3 Significant factors on the extent of attitude of farmers

Farmers' educational background was positively influenced on their attitude and had significant (significant at $p<0.05$) contribution on their attitude towards commercial cultivation of cut flowers.

Farmer's category based on innovativeness had positive influence on farmer's attitude towards commercial cultivation of cut flowers. It had most significant (significant at $p<0.01$) contribution on their attitude.

Agricultural extension media contact was positively influence on their attitude. It had most significant (significant at $p<0.01$) contribution on their attitude towards commercial cultivation of cut flowers.

5.1.4 Problem faced by the cut flower farmers for commercial cultivation

The observed problem scores of the flower farmers ranged from 10 to 34, the average being 27.73, the standard deviation was 6.55 and co-efficient of variation was 30.14. Data revealed that a vast portion of the respondents (54.7 percent) had medium problem faced while 20.2 percent had low problem and 25.1 percent had high problem. It also revealed that problem faced by the most of the flower farmers in the study area were medium to high problem.

5.2 Conclusions

Majority (75 percent) of the respondents had positive to more positive attitude towards commercial cultivation of cut flowers. This fact leads to the conclusion that the study area is more favorable for promoting of all modern aspects of commercial cultivation of cut flowers.

Education background of the farmers had significant contribution on their attitude towards commercial cultivation of cut flowers. It could be concluded that education enhanced knowledge and positive attitude of a farmer and it could make her/him more enthusiastic to justify the quality and utility of the modern cultivation practices.

Farmer's category based on their innovativeness had most significant contribution to their attitude towards commercial cultivation of cut flowers. So, it could be concluded that farmer's category (innovator, early adopter, early majority, late majority, and laggards) could play an important role in regulating their high and/or low attitude towards commercial cultivation of cut flowers.

Agricultural extension media contact of the farmers had also most significant contribution on their attitude. It increases more outlook and inspiration. So, it could be concluded that high agricultural extension media contact of a farmer increased their attitude towards commercial cultivation of cut flowers.

Lack of mother stock and improved varieties, lack of credit facilities, high price of fertilizer and insecticides, lack of scientific knowledge & training, unavailability of labor with high labor wages came out as major financial and technical problems of the flower farmers. There is no cold storage in Bangladesh to preserve or store flowers during emergency. Therefore a large amount of flowers perish in the field or market.

5.3 Recommendations

In social science research, it is not easy to draw concrete policy implications which can be applied in wide range of situations. But still, there is scope to make some recommendations based on their findings and interpretation of the results, which if addressed properly, would have contribute a lot in solving or minimizing many problems.

5.3.1 Recommendations for policy implications

i. Findings indicated that commercial cultivation of cut flower had a significant positive attitude. So, it may be recommended that commercial cultivation of cut flower may be extended to the suitable areas of the country by the GOs and NGOs.

ii. Education is the main source of all development activities. Low education status of farmer might make them unable to take necessary steps in commercial cultivation of cut flower. So, educational opportunity for all aged farmers should be increased in different ways among the flower farmers for make them enthusiastic.

iii. Innovativeness of flower farmers should be increased by proper guidance and inspiration by continuing training program, agricultural organizational participation, result and method demonstration, group discussion etc. and can be increased flower farmer innovativeness status as high innovative category.

iv. Agricultural extension media contact increases flower farmers' diversified knowledge and make them able to cope with adverse situations. So, policies should be taken engage flower farmers with different agricultural extension media to broaden their outlook and to develop most positive attitude on commercial cultivation of cut flowers.

v. There were unavailability of credit facility and input shortage like high yielding seeds, corm, seedlings, fertilizer and high cost of plant protection chemicals,

pesticides. So, it is recommended that government bank, donor agencies and other organizations should provide available credit facilities. Side by side government should take necessary steps to ensure reasonable price and enough supply of inputs for commercial cultivation of cut flower. Government should establish cool storage center in the study area for solving storage crisis. Agriculture Research Council or other agriculturist agencies could take the lead in supplying various new varieties of cut flowers for cultivation.

5.3.2 Recommendations for further research

i. The research was conducted in the four villages of Savar upazila under Dhaka district. Similar research are suggested to be conducted covering more commercial flower cultivating to have more comprehensive idea about the farmer's attitude toward commercial cultivation of cut flower. It was also suggested that the future researchers could take up a broad based study with large samples.

ii. In the present study only eleven (11) independent variables were studied. There were some other important characteristics of the flower farmers' that could not be included in this study. So, opportunity will remain to study with other important variables.

iii. Acreage response, growth and instability of the flower cultivation can also be studied with respect to Bangladesh situation as a whole.

iv. This research was conducted at 8% level of precision of the population. So, study would be conducted at below 5% level of precision for more authentic findings.

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APPENDIX-A

(English version of the interview schedule)

Department of Agricultural Extension and Information System

Sher-e- Bangla Agriculrural University

Dhaka-1207.

An interview schedule for a research study entitle:

FARMER'S ATTITUDE TOWARDS CUMMERCIAL CULTIVATION OF CUT FLOWERS

Serial No…….

Respondent Name:

Village: Union:

Upazila: District:

Mobile No:

Please answer the following questions:

A)

1. Age

What is your present Age? ---------- Years.

2. Education: What is your level of education?

i) Illiterate: ……..

ii) Can sign only: …….

iii) Have passed class: …….

iv) I took non-formal education…….. years

3. Please mention the number of your family member

i) Male……. ii) Female……

Total: ……..

4. Flower farmer's category based on their innovativeness:

(Please indicate your position under following flower farming category)

i. **Innovator** (have interest to take risk, have the highest social status, have financial liquidity, adopt an innovation within 1 year of hearing)…….

ii. **Early adopter** (highest degree of opinion leadership, higher social status, financial liquidity, advanced education, adopt an innovation within >1 to 2 years of hearing)…….

iii. **Early majority** (adopt an innovation after innovator and early adopter, have above average social status, seldom hold position of opinion leadership, adopt an innovation within > 2 to 3 years of hearing)……..

iv. **Late majority** (adopt an innovation after the average participant, have below average social status, little financial liquidity, little opinion leadership, adopt an innovation within >3 to 4 years of hearing)……..

v. **Laggard (**show little to no opinion leadership, tend to be focused on tradition, lowest social status, lowest financial liquidity, adopt an innovation >4 years of hearing)…….

5. Flower farming areas:

(Please indicate your area of lands according to use for flower cultivation)

Sl. No.	Use of land for flower cultivation	Land possession	
		Local unit	Hectare
i.	Own land under own cultivation(A)		
ii.	Land given to others as borga(B)		
iii.	Land taken from others as borga(C)		
iv.	Land taken from others as lease(D)		
	Total flower farming area=A+1/2(B+C)+D		

6. Annual family income: (Please state the income of your family during last year of cut flower farming and others source)

a) Income from cut flower cultivation……Taka

b) Income from other sources:

i) Agriculture income (other than flower) ……..Taka

ii) Livestock and fisheries……Taka

iii) Nonagricultural source(s)……..Taka

Total income from other sources (i+ii+iii)……Taka

7. Farmer's type: (According to DAE given classification/type, based on your land following which type of farmer do you hold?)

i. Landless farmer (bellow 0.02 hectare)…….

ii. Marginal farmer (0.02 to 0.2 hectare)…….

iii. Small farmer (0.2 to 1 hectare)……..

iv. Medium farmer (1 to 3 hectare)……

v. Large farmer (above 3 hectare)…….

8. Training experience on commercial cultivation of cut flowers (Have you participated any training program on commercial cultivation of cut flowers?) Yes……./No…….

If yes, furnish the following information:

Sl. No.	Name of training course	Organization	Day (s)
i.			
ii.			
iii.			
iv.			

9. Agricultural organizational participation: (Please mention the nature of your participation with the following organizations)

Sl. No.	Name of the agencies	No participation	Nature of participation		
			Ordinary member	Executive member	President/ Secretary
i.	Union Information & Service Centre(UISC)				
ii.	Mushroom Development Institution				
iii.	Village Youth Development Society				
iv.	Flower Cultivator Welfare Committee				
v.	NGO Samity				
vi.	Krishak Somobai Samity				

10. Agricultural extension media contact: (Please indicate the extent of contact in following sources)

Sl. No.	Contact media	Extent of contact				
		Frequently	Very Often	Occasionally	Rarely	Not at all
i.	Model farmers	4 or more times/month	2-3 times/month	At least 1 time/ month	1-5 times/years	
ii.	Agricultural input dealer	4 or more times/month	3 or more times/month	1-2 times/month	At least once a year	
iii.	Sub Assistant Agriculture Officer	4 or more times/month	2-3 times/month	1-2 times/month	At least once a year	
iv.	NGO worker	4 or more times/month	2-3 times/month	At least 1 time/ month	1-5 times/year	
v.	Participation in group meeting	3 or more times/month	2-3 times/month	1-2 times/month	At least once a year	
vi.	Agricultural Extension Officer (AEO)	3 or more times/month	1-2 times/month	At least 1 time/ month	1-3 times/year	
vii.	Listening agricultural program on radio	7 days/week	4-5 days/week	1-3 days/week	1-3 days/month	
viii.	Watching agricultural program on TV	4-7 days/week	3-5 days/week	1-2 days/week	1-3 days/month	
ix.	Reading printed materials like leaflet, bulletin etc.	2 piece/month	1 piece/month	3-5 pieces/year	1-2 pieces/year	
x.	Watching agricultural posters advertisements in newspaper	2 piece/month	1 piece/month	3-5 pieces/year	1-2 pieces/year	

11. Knowledge on commercial cultivation of cut flowers: (Please answer the following questions)

Sl. No.	Questions	Full Marks	Marks obtained
i.	Mention 2 insects that cause damage to your commercial cultivation of cut flowers.	2	
ii.	Mention 2 diseases that cause damage to your commercial cultivation of cut flowers.	2	
iii.	Mention one popular variety from each of your cultivated cut flowers.	2	
iv.	Name one chemicals used as growth promoter for your cut flower cultivation.	2	
v.	What kind of soil is suitable for commercial cultivation of cut flowers?	2	
vi.	What is meant by top dressing of fertilizer?	2	
vii.	What is the optimum sowing time of your cultivated cut flower(s)?	2	
viii.	Which type of irrigation do you practice in gerbera cultivation?	2	
ix.	What is the time of pruning in rose?	2	
x.	What is the spacing of rose?	2	
xi.	How many splits are needed in case of urea application in gladiolus cultivation?	2	
xii.	What is the optimum depth of cormel for gladiolus cultivation?	2	

B) Farmers' attitude towards commercial cultivation of cut flowers: (please indicate your opinion against each of the following statements)

	Statements	*SA (+2)	A (+1)	UD (0)	D (-1)	SD (-2)
+	Commercial cultivation of cut flower gives higher profit compared to other crops					
-	Easy to cultivate because it requires less capital					
-	Cut flower requires more fertilizer per ha compared to other crops					
+	The socio-economic conditions of the villagers are improving by commercial cultivation of cut flowers					
+	Difficult to follow proper techniques of cut flower cultivation					
+	Cut flower market demand is increased day by day					
-	Cut flower cultivation is suitable only for high fertile land					
+	Training on cut flower cultivation is effective					
-	Cut flower cultivation creates environmental hazards					
-	Cut flower processing for marketing is difficult					
-	Planting materials of cut flower cultivation is not available					
+	Necessary pesticide for flower cultivation is available at close vicinity					

*SA=Strongly Agree; A=Agree; UD=Undecided; D=Disagree and SD=Strongly Disagree

D) Problem faced by the farmers in commercial cultivation of cut flowers: (Please indicate the extent of your opinions regarding the following problem statements in commercial cultivation of cut flowers)

Sl. No.	Problem statements	Very High	High	Moderate	Low	Very Low
i.	Lack of institutional credit facilities					
ii.	Lack of hybrid and high yielding seed, corm and seedlings					
iii.	High price of seed and fertilizer					
iv.	Inadequate processing technology					
v.	Lack of training on commercial cut flower cultivation					
vi.	Loan interest rate is high					
vii.	Lack of marketing facilities					
viii.	Unavailability of labor with high labor wages					
ix.	Lack of co-operation from extension providers					
x.	Lack of knowledge on using balanced fertilizers					
xi.	Lack of knowledge on modern technologies					
xii.	Lack of advice in proper time					
xiii.	Scarcity of suitable selling centre in the market					
xiv.	Poor transport facility					

Thanks for your co-operation ……

Signature of the interviewer with date

Appendix-B

Correlation Matrix

Variables	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	Y
X_1	1											
X_2	-.393**	1										
X_3	.299**	-.076	1									
X_4	-.281**	.652**	.056	1								
X_5	-.071	.610**	.041	.601**	1							
X_6	-.113	.599**	.089	.627**	.946**	1						
X_7	-.175	.539**	.029	.487**	.738**	.733**	1					
X_8	-.178	.694**	.167	.673**	.594**	.583**	.467**	1				
X_9	-.112	.612**	.148	.598**	.577**	.551**	.429**	.793**	1			
X_{10}	-.196*	.650**	.131	.645**	.542**	.548**	.537**	.727**	.562**	1		
X_{11}	-.333**	.615**	-.117	.554**	.527**	.557**	.502**	.563**	.443**	.646**	1	
Y	-.270**	.680**	.118	.708**	.542**	.539**	.507**	.653**	.577**	.745**	.533**	1

X_1	Age	X_7	Farmer's type
X_2	Education background	X_8	Training experience on commercial cultivation of cut flowers
X_3	Family size	X_9	Agricultural organizational participation
X_4	Flower farmer's category based on innovativeness	X_{10}	Agricultural extension media contact
X_5	Flower farming areas	X_{11}	Knowledge on commercial cultivation of cut flowers
X_6	Annual family income	Y	Farmers' Attitude towards Commercial Cultivation of Cut Flowers