COMPARATIVE PROFITABILITY AND RESOURCE USE EFFICIENCY BETWEEN ROSE AND GLADIOLUS CULTIVATION IN SAVAR UPAZILA OF DHAKA DISTRICT

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BY

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CERTIFICATE

This is to certify that the thesis entitled **"COMPARATIVE PROFITABILITY AND RESOURCE USE EFFICIENCY BETWEEN ROSE AND GLADIOLUS CULTIVATION IN SAVAR UPAZILLA OF DHAKA DISTRICT "** submitted to the Department of Agricultural Economics, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE (MS) IN AGRICULTURAL ECONOMICS** embodies the result of a piece of *bona-fide* research work carried out by **SHAH AZMAIN HABIB** bearing **Registration No. 15-06851** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

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

June, 2022 **…….**

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DEDICATED
TO MY
BELOVED
PARENTS

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ABSTRACT

The floriculture sector is rapidly growing and extremely competitive. This research summarizes the current conditions and procedures for cultivation and marketing used by dealers and farmers of cut flowers. The major goals of the current study were to determine market integration of cut flowers in different market in Dhaka, as well as to analyses profitability and variables impacting the cultivation of cut flowers (rose and gladiolus growers). In Dhaka district, Savar upazila were chosen for the study due to the area's extensive cut-flower farming. Data from 77 sample farmers were gathered using a multi-stage random sampling approach and an interview schedule. Following data analysis, the per-hectare costs for roses, gross returns, gross margins, and net returns were Tk. 576861, Tk. 808492, Tk. 433775, and Tk. 231631, respectively, while the costs for gladiolus were Tk. 576703, Tk. 1005231, Tk. 640789, and Tk. 428528, respectively. Benefit cost ratios for the cultivation of roses, and gladiolus were 1:1.40 and 1:1.74, respectively, on a full cost basis. They were 1:2.15 and 1:2.75 on a cash cost basis. Despite the fact that producing roses and gladiolus was quite profitable. About to 92% of farmers who grow roses and 96% of farmers who cultivate gladiolus, respectively, inadequate cold storage and seasonality in demand were the main obstacles for farmers. The resources use efficiency, seed, urea, TSP are underutilize for both rose and gladiolus cultivation human labor and gypsum are over utilize for both this flower cultivation. Finds of suggest that, rose growers require a high yielding rose variety to increase per unit productivity. Therefore, it is essential to prioritize government assistance for ensuring farmers receive a fair price as well as technology diffusion initiatives.

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CHAPTER 1

INTRODUCTION

The cultivation of cut flowers, live plants, floral greens, dried flowers, decorative plants, and other plant products, as well as their marketing, are all included in the field of horticulture known as floristry. In contrast to other agricultural products, floriculture includes a vast array of diverse plant species and special cultivars. Throughout the beginning of time, flowers have been related to humans. In all civilized countries, including Bangladesh, flower and ornamental cultivation has long been practiced for a variety of religious and cultural festivals, including worship, religious celebrations, and social functions. The branch of horticulture known as floristry encompasses the cultivation of beautiful flowers, live plants, floral greens, dried flowers, ornamental plants, and other plant - based products, as well as their marketing. Unlike other agricultural goods, floriculture features a wide variety of unique plant species and cultivars. From the dawn of time, flowers and people have been associated. Flower and decorative horticulture has long been done for a range of religious and cultural occasions, involving worship, religious celebrations, and social occasions, in all civilized nations, including Bangladesh. Yet, flowers and leaves are today recognized for their contribution to the economy as well as their aesthetic and sociological significance.

1.1 Background Information

Bangladesh is an agricultural country, and the most of the people depends on agricultural cultivation for a portion of their income. Agriculture has a significant donation towards the Gross Domestic Product (GDP) of the country. The population's activities began to diversify in the early stages of industrialization toward various industries. Fo that reason the contribution of agriculture is decreased and is currently at 11.50%(BER, 2022). Agriculture continues to be considered the most significant part of the economy and plays a crucial part in it. The crop and horticultural sub-sector alone accounted for 55% of agricultural GDP in FY 2021-22, despite increases in tth percentages of fisheries, livestock, and forestry(BBS, 2022). (Fig 1.1). Although the contribution of crop & horticulture sub-sector in GDP marginally decreased from 9.49 percent in FY 2016-17 to 9.11

percent in FY 2017-18(BER, 2018). Inherent in the fabric of society of human existence are flowers. Flowers, a sweet creation of God, are appropriate at all events, including birth, marriage, and death. Flowers didn't have a lot of economic value in the past. One could cultivate flowers to satisfy their aesthetic needs. At times, flowers were made available for purchase in order to accommodate people's unique needs. Nowadays, flower plants are used for more than just window gardens and are a significant part of the interior design of homes and workplaces. Traditional floriculture methods have been used in Bangladesh for many years, although cultivation is limited and mostly for personal consumption. Commercial floriculture cultivation has been prioritized in recent years. Floriculture is gradually making progress in the agricultural sector.

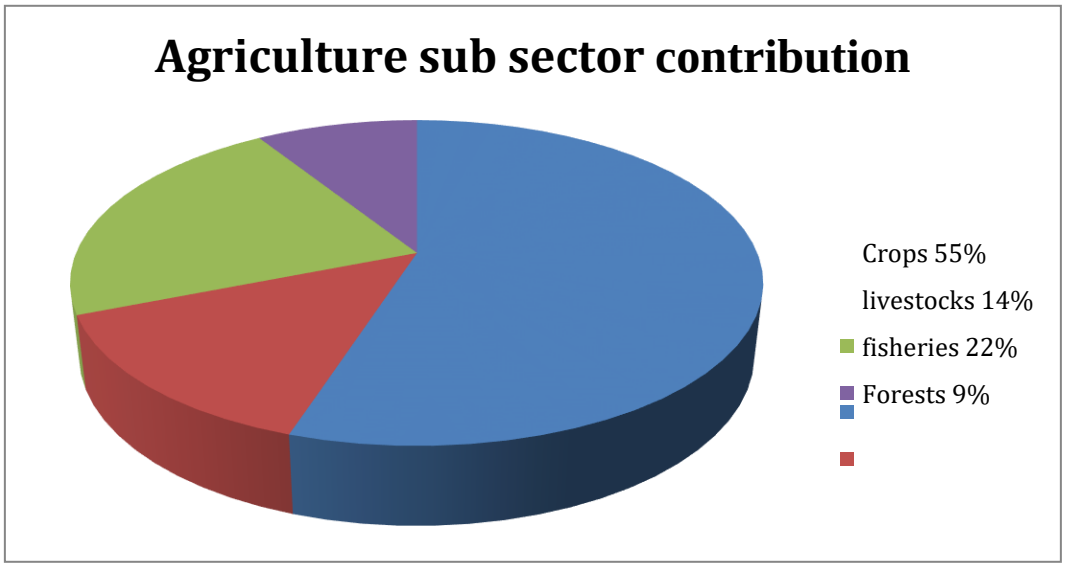

Figure 1.1: Sub-Sectorial Share of Broader Agricultural GDP in 2021-2022. Source: BBS 2022

One of the main businesses in many emerging and poor nations is the flower industry. Not an exception is Bangladesh. Some forward-thinking farmers in Bangladesh popularized floriculture in the late 1970s by growing tuberose on a modest scale. In Jhikargacha upazila in the Jessore district, large-scale commercial cultivation began in the middle of the 1980s(Sultana, 2003). Afterwards, it accelerated significantly in

Jessore, Savar, Chuandanga, Mymensingh, and Gazipur, which later emerged as Bangladesh's primary flower-producing region.Due to their high market value, gladiolus, tuberose, marigold, rose, gerbera, and orchid flower cultivation has begun by certain farmers working with some businesses. Yet, Bangladesh has relatively little socioeconomic statistics and information on rose cultivation. Yet, farmers that grow roses are deprived of better productivity.

1.2 Worldwide Floriculture

Cut flower shipments fell by -3.91% during 2019 and 2020, from $8.79 billion to $8.45 billion. Cut flower commerce makes about 0.05% of all global trade. Living trees, plants, bulbs, cut flowers, and decorative foliage all include flowers. They consist of dried flowers as well as new cut flowers and flower buds for bouquets. On the global market, six nations—Germany, the United States, the United Kingdom, France, the Netherlands, and Switzerland—account for around 80% of global consumption. The growth in global consumption has coincided with customers' more sophisticated demands for novel goods(Acharya, 2010).

Table 1.1 Top 10 flower producing countries in the world.

Country	Rank
Netherland	1st
USA	2nd
Brazil	3rd
Sweden	4th
Denmark	5th
Malaysia	6th
India	7th
Switzerland	8th
Cambodia	9th
Australia	10th

Source: Vahoniya, 2018

Over 305,105 hectares of land worldwide was used for flower cultivation, with 44,444 ha of it in Europe, 22,388 ha in North America, 215,386 ha in Asia and the Pacific, 2,282 ha in the Africa and Middle East regions, and 17,605 ha in Central and South Africa. There are 46,008 acres of flowers produced in protected greenhouses in various nations worldwide. India (88,600 ha) and China (59,527 ha), Indonesia (34,000 ha), Japan (21,218 ha), the United States (16400 ha), Brazil (10285), Taiwan (9,661 ha), The Netherlands (8,017 ha), Italy (7,654 ha), the United Kingdom (6,804 ha), Germany (6,621 ha), and Colombia (4,757 ha) are the countries with the largest ornamental crop areas, respectively(Sudhagar, 2013).

1.3 Cut flower cultivation in Bangladesh

Present era, flowers play a significant role in the economy of the nation. The need for flowers as an agricultural commodity has increased throughout time in Bangladesh, making the floriculture industry a promising one for the nation. Bangladesh's soil and climate are excellent for floriculture. Our nation's tropical environment allows for the cultivation of several exotic flowers. On a 30-acre plot of land near Jashore, a farmer by the name of Sher Ali Sardar began commercial floriculture with tuberose flowers in 1983. In 24 districts, including Jashore, Kushtia, Jhenidah, Chuadanga, Gazipur, Chattogram, Narayanganj, and Cumilla, flowers are being grown on 6,000 hectares of land. Approximately 15 to 20 lakh people rely on floriculture for their livelihood.

The Dhaka Chamber of Commerce and Industry (DCCI) recently released figures showing that the local market for cut flowers and greenery has grown to TK1,600 crore annually and is increasing by 10% annually. Over 57,000 tonnes of flowers were grown in 2014–15, bringing about TK800 crores in income. It has been encouraging to see floriculture advance and expand during the past five years. Additionally, the general expansion in many areas of floriculture expansion has been quite positive in the past couple of decades since the 2014-15.(Ara, 2017)

The Bangladeshi government included flowers to its list of exportable goods in 1991. Industry insiders in the floriculture sector claim that Bangladesh supplied floral goods and flowers to a number of nations, such as India, Italy, Portugal, Saudi Arabia,

Germany, France, and Denmark. According to EPB data, Bangladesh exported cut flowers, leaves, trees, plants, bulbs, and roots for $86,000 (or about TK72 lakh) in the 2016–17 fiscal year and for $78,000 (or approximately TK65 lakh) the year prior.

1.4 Gladiolus cultivation

Gladiolus (from Latin, family: Iridaceae, the diminutive of gladius, a sword) is a genus of perennial cormous flowering plants in the iris family. Gladiolus belongs to the most significant bulbous ornamentals produced for its durable spikes with appealing color. Around 300 species of Gladiolus have been identified. Sikkim, Nagaland, Tripura, Manipur, Meghalaya, and Assam in the north-eastern area are suited for gladiolus farming. Gladiolus needs complete sunshine exposure for healthy growth; otherwise, blasting may happen or the plant may stay blind. The number of florets, spike length, and blooming percentage all increase under the long day circumstances of a 12 to 14 h photoperiod. Warmer temperatures (between 20 and 30 °C) hasten blooming.

Fig: Gladiolus

The gladiolus daisy is well-known among flower enthusiasts for its big, colorful blossoms. This flower comes in a very broad range of variations. The annual bloom is typically 3-4 flower sticks per plant and depends on the variety. gladiolus are in style and frequently used as cut flowers or as beautiful garden flowers. The importance of gladiolus extends beyond the decoration, design, arrangements and also includes their commercial

value. In order to create attar or other smells, it's also employed to remove natural essential oils. Despite being a foreign flower, gladiolus is very demanding flower. A tree produces 6-8 blooms. Gladiolus flowers are in high demand for various events, including weddings and New Year's. In order to supply this growing demand, floriculture grows in popularity and has recently become one of the most profitable vocations in the entire globe. Growing demand for cut flowers, live plants, high-quality seed cultivation, the trade of garden tools, pots, and other items, fragrance goods, Bonsai growth, etc. are all potential future markets for gladiolus flowers.

1.5 Rose Cultivation

A rose may be the most common flower in Bangladesh.In every occasion, rose uses most of them than other flower . There are thousands of cultivars and more than 300 species. They comprise a category of plants with stems that are frequently covered with tiny prickles, and they can be upright shrubs, climbing, or trailing. Several species, cultivars, and hybrids are produced for their attractiveness and frequently aromatic qualities. In many countries, roses have taken on cultural importance.

Fig : Rose

One of the most important and ancient raw ingredients used in fragrance is rose oil. It gives fragrances their distinctive aromatic top notes. The extracted absolute gives notes that last. The benefits of both items are combined in distilled oil and purified absolute.

Roses are used to extract vitamins C, A, B2, K, and E as well. Bulgarian rose oil is used to flavor a variety of tobacco products, most notably snuff and tobacco products as well as several fruit flavors. Otto is used in small amounts to flavor alcoholic liquors and soft beverages. From ancient times, rose water has been treasured for its use in the creation of syrups and medical preparations. Rose water is sprayed on the attendees at weddings and other social events.

Bangladesh is working toward the future, and government policy encourages and makes it easier to promote export and investment. Entrepreneurs have already begun investing in commercial flower growing in response to this legislation, and exporters are becoming more and more active in distributing the products to all conceivable market locations. For the large-scale cultivation and selling of flowers, a few non-governmental organizations (NGOs) and private business owners, have already taken the lead. While Bangladesh is a newcomer to the export market, it has a promising future in earning foreign currency through the sale of flowers and pot plants, much as the apparel industry.

1.6 Justification of the study

The growing of roses and gladiolus significantly improves our farmer's level of living by raising their revenue. The factors influencing yield variations and the value chain must be identified in order to boost rose and gladiolus cultivation as much as possible.

This study shows the real data on the socio demographic traits of farmers whogrow roses and gladiolus, the amount of input used and the cost and returns associated with it, the factors that affect the productivity of rose and gladiolus cultivation, This studycontributes some insightful knowledge to the body of knowledge already available onrose and gladiolus cultivation, particularly in relation to the study location. Mainly focus on the comparative profitability analysis between two high demanded flower in our country. This study identifies the necessity of investigating the effects of rose and gladiolus cultivation in Bangladesh.In light of these considerations, the current study is designed to examine the profitability in the savar district and market integration of rose and gladiolus. The results of this study may be useful in helping the government and NGOs develop policies that would increase cultivation and enhance flower marketing. This work may

serve as the foundation for future research on flower cultivation.

1.7 Objectives of this Study

The study's specific objectives are to:

- To examine the socio-demographic characteristics of the growers;
- To assess the financial profitability of rose and gladiolus cultivation;
- To determine resource use efficiency of rose and gladiolus.
- To determine the problems faced by rose and gladiolus growers;

1.8 Outline of the study

There are nine chapters in all, and they are arranged in the order shown below.

- Chapter 1 An introduction.
- Chapter 2 Review of the literature.
- Chapter 3 Discusses the relevant study's methodology.
- Chapter 4 The socio demographic profile of the farmers who grow roses and gladiolus.
- Chapter 5 Profitability of producing roses and gladiolus are covered.
- Chapter 6 Factors affecting yields of rose and gladiolus cultivation.
- Chapter 7 resource use efficiency of rose and gladiolus is covered.
- Chapter 8 Problems factor faced by rose and gladiolus cultivation and commercialization are discussed.
- Chapter 9 The summary, conclusion, and policy suggestions for boosting rose and gladiolus output are presented.

CHAPTER 2

REVIEW OF LITERATURE

2.1 Introduction

Every scientific study must review the available literature. It aids in determining the current knowledge gap in any study field. Moreover, it helps in formulating a competent research process and in connecting the research findings to prior knowledge. In order to construct the next research challenge and to validate the new findings, literature and research from the most significant previous studies that were related to the current study were sought. The literature evaluation was not just confined to works produced in Bangladesh but also to other nations. This Chapter presents a comprehensive assessment of pertinent literature while keeping this issue in mind.

2.2 Cut Flower (Rose and Gladiolus) related Studies

Sultana (1995) carried out a study on "Flower marketing in Dhaka city". She studied the current marketing methods with thirty firms and 30 floral users, reviewed buyer acceptance, identified issues, and made recommendations on how to make them better. She found that the gross margin for 100 flowers was Tk. 104.88, Tk. 105.71, and Tk. 122.88 for large, medium, and small dealers, respectively, and that their monthly gross margin was TX. 10910.55, Tk. 49920.96, and Tk. 22466.49. The marketing expenses of TK 49.68, TK 48.67, and TK 88.48 were incurred by big, medium, and small shops, respectively. The main issues were spoiling, not having an appropriate and proper delivery method, and not having enough flowers available to meet demand at the appropriate time. Flower dealers suggested a few methods to address the issues, including the construction of modern storage facilities and the enhancement of flower growth techniques.

Hossain and Rahman (1994) conducted a study on "The potential of flower marketing in Dhaka city". They examined the current cut flower marketing system in Dhaka from the perspectives of supply and demand. The study gathered feedback on the potentiality from non-users, sellers, and lesser cultivators as well as from users. Twenty merchants made up the study's sample. 11 non-users and 89 users.While several specific flower cultivation

trends showed encouraging development, overall cultivation of dahlia, rose, tuberose, and marigold indicated an annual rise of around 11%. The study's conclusions point to a few crucial aspects of the flower industry. The flower industry has seen a rise in capital investment, a tendency toward more shops with broader merchandising, and an increase in sales of goods created with flowers. The respondents' favorable perception of flowers. Uses of flowers for a variety of purposes, an increase in the usage of items manufactured with flowers, and an unmet demand for specific flowers are all signs of the economic boom.

Raha and Siddika (2004) completed a study on "Price spreads in cut-flower marketing some: evidence from Bangladesh". She examined the current marketing setup, calculated the cost of promotion, and calculated the margins for various flower varieties across various media. The customer gave flower producers between 30.75% and 60.42% of their taka, with marketing costs ranging from 24.71% to 58.5%. Net marketing margin ranged from 3.0% to 37.83% of total taka for customers. Of all the channels, the growers' channel had the greatest cost. Additionally, she proposed that the marketing system's efficiency be improved by adopting appropriate ways to address the present issues, therefore increasing the grower's part of the consumer's taka.

Sayla (2010) conducted a research paper on "An analysis of commercial cultivation of flower in Dhaka and Narayanganj district". The author made an effort to investigate the financial viability of three chosen crops. The net return per hectare for growing gladiolus, marigold, and roses was Tk. 631428.9, Tk. 146080.91, and Tk. 319372.01, respectively. She also noted issues and limitations related to the growing of these flowers and offered some suggestions based on those limitations, which may support and expand the flower business.

Mou (2012) carried out a studied on "Profitability of flower cultivation and marketing system of Bangladesh". She made an effort to investigate the profitability and cultivation of a few chosen flowers in relation to rival crops. She also determined Bangladesh's flower marketing networks and value chains. The gross margins per hectare for vegetables and flowers were Tk. 46362.14 and Tk. 1359824.20, respectively. She discovered that flower farming has positive effects on farmers' socioeconomic status, raises opportunities for self-employment, encourages entrepreneurship in both urban and rural areas, and

increases export trade to generate foreign exchange. As such, flower farming appears to be a promising tool for reducing poverty and fostering sustainable economic growth in Bangladesh. She also noted issues and limitations related to the growing and selling of flowers, and based on these limitations, she offered some suggestions that would advance the flower business.

Sharifuzzaman (2013) described the research title on "the potentialities of flower cultivation". Due to increased profitability, many farmers have switched from vegetable farming to floriculture, making it a lucrative venture. The flower industry has also spawned additional industries, such as nurseries and transportation service companies. As a result, it increases the possibility to export while simultaneously giving many people—especially impoverished women—new work. However, merchants suffer losses that might lessen the likelihood of flower exports owing to issues with cultivation, harvesting, packing, shipping, and a lack of government assistance. Bangladesh, however, has the potential to benefit from floriculture because of its ideal agroclimate.

Dinara Zaman (2013) conducted a study title on "Economic analysis of rose cultivation in some selected areas of Jessore district in Bangladesh". In December 2014, the study's potentials, limitations, and profitability of rose growing were determined. On a total cost and variable cost basis, the average cost of growing roses is Tk.383561 and Tk.252734 per hectare, respectively. Human labor accounts for 22% of the entire cost, followed by land use (21%), fertilizer (22%), irrigation (6%), and pesticide (12%).A hectare of roses yields 558502 blooms. Rose farming yields a net return of Tk. 454192 per hectare. On a variable cost and full cost basis, the benefit cost ratios are 3.31 and 2.18, respectively. When compared to other competing flowers like gladiolus, marigold, and others, rose cultivation yields the most return. Insect infestation, lack of HYV seedling supply, and lack of technical expertise.

Hossain *et al.* (2016) conducted a study on title on "Price variation and cost benefit ratio of different flowers produced in Bangladesh". In order to ascertain the current state of the flower industry in Bangladesh, the experiment was conducted from June 2015 to May 2016 at the Agargaon flower market, Shahbag and other retail stores in Dhaka, as well as several flower-growing regions of the country. Information was gathered from

several merchants, wholesalers, and farms. The findings showed that different regions of the nation generate the different types of flowers. Dhaka is home to a large number of flower marketplaces and stores. various flowers had various prices on different days of the week, in different months of the year, and on special occasions. Depending on the type of bloom, variable cultivation costs applied.

Khandoker S. *et al.* (2016) examined a research title on "Socioeconomic study of commercial floriculture in selected areas of Bangladesh". The socioeconomic standing and profitability of flower farming were evaluated in the Bangladeshi districts of Dhaka and Narayanganj. Three flowers—roses, gladiolus, and marigolds—were chosen for the study based on factors including area, cultivation, and market priority. The average gross cost of growing these three flowers was Tk. 528572, whereas the per hectare gross cost of growing roses, gladiolus, and marigold was Tk. 530238, Tk. 857524, and Tk. 197955, respectively. Gladiolus, marigold, and roses each had a gross return per hectare of Tk. 849609, Tk. 1488953, and Tk. 344035; the combined gross return of these flower combinations was predicted to be Tk. 894199. Gladiolus, marigold, and rose had net returns of Tk. 319372, Tk. 631429, and Tk. 146081, respectively. The net return of these flower combinations was Tk was estimated at Tk. 365627. The benefit-cost ratios for roses, gladiolus, and marigolds were 1.60, 1.73, and 1.74, respectively. The average BCR for these three flower varieties was 1.69, suggesting that flower production was lucrative in the studied region.

Rakibuzzaman *et al.* (2018) conducted a study title on "Flower industry in Bangladesh: Exploring floriculture potential". This study outlined the current flower producers' and dealers' marketing strategies and even attempted to determine whether developmental intervention may be useful. Both the domestic and foreign markets were seeing a rise in the demand for flowers, particularly cut flowers. This article's scope, restrictions, and explicit focus on floriculture and the flower business were specified. It was proposed that action be done to investigate the possibility of starting a floriculture business in order to generate revenue.

Hasan *et al.* (2019) completed a studied on **"**Profitability analysis of cut flowers- based on rose". The purpose of the study was to determine and evaluate the relative profitability,

potential, and restrictions of roses. Three villages from Savar Upazila in the Dhaka district—Bonogram Purbopara, Bonogram moddhopara, and Sadullapur—were chosen to serve as the research area. For this study, a total of fifty rose farmers were chosen at random. In comparison to other flowers that are competitors for roses, such as gladiolus and gerbera, he discovered that rose cultivation yields the best profit. The market place, human labor, flower type, input seedling, early investment, and initial investment all had a beneficial impact on rose growers' monthly revenue. The main issues in rose cultivation were pest and disease infestation, lack of technical competence, and lack of HYV seedlings. Additionally, he recommended that the government take the required action to resolve these issues.

2.3 Research gap of the study

The review described above show that the majority of research focused on the cost, return, profitability, marketing, and productivity of roses and other cut flowers. Several studies also identify the variables influencing profitability. Maximum research looked at factors that affect productivity more than ten years ago. The manufacturing method may have changed throughout this time, and as a result, it is necessary to revaluate the factors' applicability. To conduct research in the context of Bangladesh, it is necessary to consider the effect of additional elements found by researchers in other nations side by side. Comparative profitability studies were seldom undertaken as integrated research. In the review of literature , methodological aspects were redesigned with the aid of the literature review. From the aforementioned studies, the researcher felt the need to conduct and comparative

profitability study of rose and gladiolus cultivation in Bangladesh within the context of current development. Many research on the profitability and resource use efficiency of these two flower have been carried out in various parts of Bangladesh, according to a general review of the pertinent literature. Because of this, farmers lack knowledge about how to use inputs effectively in their fields and how to sell their products. As a result, the current study aims to examine the cultivation of rose and gladiolus in a few key locations within the savar district. This will open up opportunities to provide academics and decision-makers with information so they can devote resources for improving cultivation and sustainability future development. This study will also aid policymakers in better understanding the current situation and in developing programs to increase rose and gladiolus cultivation and enhance the standard of living for rural Bangladeshi.

CHAPTER 3

METHODOLOGY AND ANALYTICAL TECHNIQUES

3.1 Introduction

The following is an outline of the topics covered in this issue. The right approach was followed in the research, which has a significant impact on how reliable the results are. Primary data from the farmers who are currently in operation are often collected for farm management studies. The key topics covered by methodology are the specific sequential procedures involved in doing research, such as choosing a study time, a study region, and data sources, as well as data processing and analytical methods. Each systematic study's methodology demands careful examination. A good research starts with proper approach. Depending on the purpose and scope of the study, the primary data will be gathered. Survey approach will select for the present investigation since it is less expensive and less time demanding.

3.2 Selection of the Study Areas

The choice of the study field is a crucial first step. Just a few places in Bangladesh are used for commercial flower cultivation. Certain areas are less suitable for the development of commercial flowers due to agroclimatic characteristics. In the Savar area, flowers are grown very fluently. The savar upazila is the most crucial region for flower cultivation out of all of them. In order to accomplish the goals of the current study, preliminary surveys were carried out in two villages (bangnibari and Shampur) of the Birulia Union of the Savar Upazila under the Dhaka District.

The reasons for selecting Savar upazila are:

- A location that generated a proportional amount of rose and gladiolus due to good physiographic conditions, which might make it easier to carry out the field survey.
- Savar upazila has good transportation options, which might make the survey less expensive and time-consuming.
- The researcher's expectation that the chosen responder would cooperate fully.

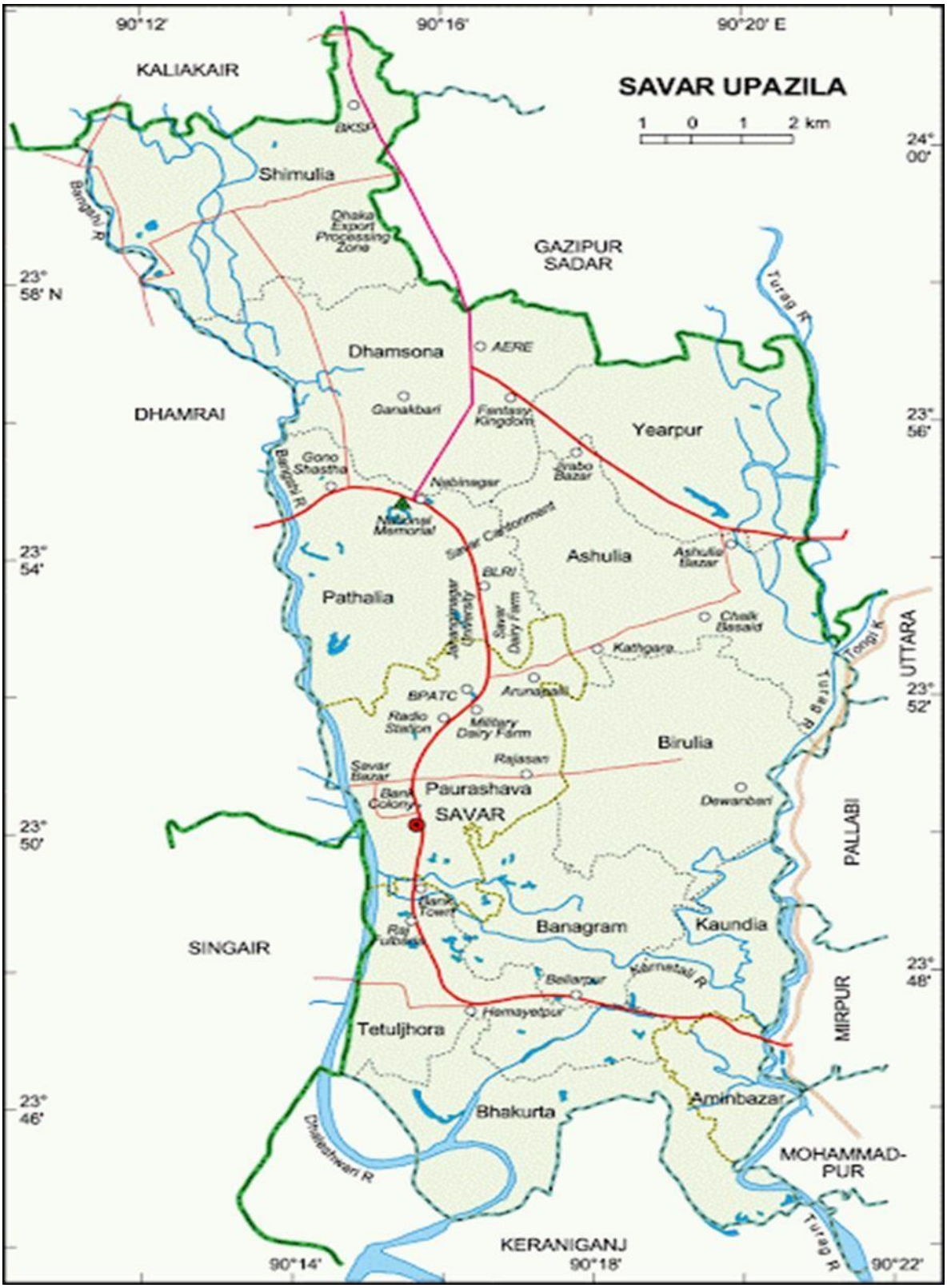

Figure 3.1: Map of Savar Upazila (study area) of Dhaka District.

3.3 Sample selection and sampling methodology

A comprehensive survey of agricultural businesses is quite challenging to create. To reduce the expense of time and resources needed for the study, sampling is used to choose representative rose and gladiolus producers. The overall sample sizes from two villages were 77 rose and gladiolus flower farmers. Shampur sent 44 flower farmers and Berulia sent 33 as a sample. For the purpose of gathering data, the farmers who grow rose and gladiolus in the research region were chosen using the multistage random sampling approach.

3.4 Preparation the survey schedule

In this study, creating survey schedules is of utmost importance. In order to get information from respondents in a format that would facilitate the prompt acquisition of all data necessary for gladiolus and rose cultivation, a comprehensive survey schedule was devised. The interview process was trialed beforehand to assess candidates' appropriateness. The timetable was set following pre-testing.

3.5 Data collecting period

During February 2023, when the farmers were typically at leisure, interviews were conducted with them at their houses in the community. The researcher initially introduced himself to the farmers and described the purpose of the study so that they could freely exchange information. At various phases, direct interviews with the chosen farmers were conducted.

3.6 Collecting data method

In Bangladesh, the majority of farmers often don't document their agricultural efforts in writing. As a result, it was incredibly challenging to get actual data, and the researcher was forced to depend only on the farmers' memories. The researcher personally conducted face-to-face interviews with respondents to gather primary data. The study's goals were made known to the respondents during the data gathering process so they could answer candidly. The material was entered on the interview schedule and the

questions were asked methodically and simply. Local units were used to collect data in order to minimize errors. Eventually, standard measures replaced these regional ones.

In order to collect secondary data in addition to primary data, publications from the Horticulture Research Center of the Bangladesh Agricultural Research Institute (BARI), the Agricultural Economics and Rural Sociology Division of the Bangladesh Agricultural Research Council, master's and doctoral dissertations, and other publications were reviewed. These publications included Books, Proceedings, Abstracts, Review papers, Journals, MS theses, and Ph.D. dissertations. The thesis work was improved by taking into consideration helpful comments from the honored major professor, the course teachers, and other resource professionals. After gathering the relevant data, it was collated and put in the proper chronological order to achieve the goals.

3.7 Data editing and tabulation

After basic data was gathered, schedules were filled out and then modified for analysis. To make sure there were no potential errors, these data were examined for correctness and consistency. All of the collected data has been thoroughly examined and condensed. The programs SPSS, STATA, and Microsoft Excel were used for entry of data and evaluation. It should be mentioned that the data was initially collected in local units and then, following verification, converted into standard ones. Eventually, a few relevant tables were made in compliance with the analytical specifications to fulfill the objectives of the investigation.

3.8 Analytical techniques

In order to fulfill the objectives of the study, data were evaluated. The data were examined usingboth statistical analysis and descriptive analysis.

3.8.1. Descriptive analysis:

Tabular and graphical analysis were often employed to determine the respondent's socio demographic profile. The cost, returns, and profitability of rose farming were calculated using a tabular method of analysis. It is extensively used, easy to comprehend, and has

straightforward calculations. Simple measurements like average, percentage, and ratio were obtained using it. Cultivation methods, input use, cost, and returns of rose and gladiolus cultivation were all tabulated.

3.8.2. Analysis of the cultivation function:

The cultivation function depicts the connection between factor inputs and output. It takes the development of its features and the definition of an actual functional form to calculate the cultivation function.

One of the cultivation functions that is most frequently employed for empirical estimates is the Cobb Douglas cultivation function. In the 1920s, C.W. Cobb and P.H. Douglas were the first to use this function to determine the marginal productivities of capital and labor in American manufacturing industries. Their main objective was to estimate the proportions of both capital and labor in the total product, thus they used this function with the limitation that the sum of the elasticity or regression coefficients must be equal to 1. Eventually, they relaxed this constraint. Cobb and Douglas first modified the function to fit the 1930s and 1940s time period. Subsequently, the form of this function was used in other studies of cultivation functions for agricultural basic units (crops, animals).The original form used by Cobb and Douglas was

$$Q = aL^{\beta}k^{1-\beta}u$$

This makes the total elasticity equal to one. Their subsequent alteration was

$$Q = aL^{\beta}k^{\beta}u$$

In the log transformation model, the Cobb-Douglas cultivation function may be written as

$$\ln Y = \ln a + b_i \ln X_i + U$$

3.8.3 Cobb-Douglas Cultivation Function Specification

The Cobb-Douglas cultivation function technique was used to study the input-output connections in the cultivation of rose and gladiolus flowers. The following model specification was used to ascertain the contribution of the most crucial factors in the manufacturing process of rose and gladiolus cultivation. the Cobb-Douglas cultivation function was changed into the following logarithmic form.

$$\ln Y = a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + b_8 \ln X_8 + b_9 \ln X_9 + U_i \quad (3.5)$$

Where,

For rose,

Y= yield (stick/ha)

X_1= Human labor (man-day/ha)

X_2 = Land preparation cost (tk/ha)

X_3= Seedling cost (tk/ha)

X_4=Manure (kg/ha)

X_5= Urea (kg/ha)

X_6= TSP (kg/ha)

X_7= MOP (kg/ha)

X_8= Insecticide cost (tk/ha)

X_9= Irrigation cost (tk/ha)

For Gladiolus,

Y= Yield (stick/ha)

X_1= Human labor (man-day/ha)

X_2 = Land preparation cost (tk/ha)

X_3= Seedling cost (tk/ha)

X_4=Manure (kg/ha)

X_5= Urea (kg/ha);

X_6= TSP (kg/ha);

X_7= MOP (kg/ha);

X_8= Insecticide cost (tk/ha)

X_9= Irrigation cost (tk /ha)

a = Intercept;

b_1, b_2.....b_9 = Coefficients of the respective variables to be estimated.

U_i = Error term.

3.9 Analysis of Profitability

The most popular technique for figuring out and cost and return study compares the profitability of different farm families. The current study employs the following methodology to ascertain the profitability of rose cultivation:

3.9.1 Estimation of Gross Return

The entire amount of product was multiplied by the associated per-unit pricing to determine the per-hectare gross return.

Gross Return/Total Return (GR/TR)=product's quantity * average selling price.

3.9.2 Gross margin computation

The distinction between gross return and variable expenses is known as gross margin. Farmers often aim to maximize return relative to variable cost of cultivation. Farmers' need for returns over variable costs is the justification for employing the gross margin analysis. Based on TVC, It calculated the gross margin. The gross return was subtracted from the variable expenditures to determine the gross margin per hectare. Put otherwise, gross margin is equal to gross return less variable costs.

$$GM= GR-TVC$$

3.9.3 Net Return Calculation

The whole cultivation costs are subtracted from the total return, or gross return, to get the net return or profit. Net Return/Net Income (NR/NI) = Total Return - Total Cultivation Cost.

The following profit equation was use to assess the profitability of rose and gladiolus cultivation at the farm level:

$$\Pi = P_rQ_r + P_bQ_b - \Sigma (P_{xi} - X_i) - TFC$$

Where,

Π = profit per hectare for producing flower

P_r= per unit price of output (tk/kg)

Q_r = Quantity of output (kg/ha)

P_b = per unit price of by- product (tk/kg)

Q_b = Quantity of by- product (kg/ha)

P_{xi} = per unit price of i^{th} variable input (tk/kg)

X_i = Quantity of i^{th} variable input (kg/ha)

i = 1,2,3,… .....n and

TFC = total fixed cost

3.9.4 Undiscounted Benefit Cost Ratio (BCR)

An indication of the link between the relative costs and advantages of a proposed project, represented in monetary or qualitative terms, is the benefit-cost ratio (BCR). A project is anticipated to provide a business and its investors with a positive net present value if its BCR is greater than 1.0. BCR was calculated using the following method for the flower cultivation: BCR (Full Cost Basis) = Total Return/Total Cost (TR/TC)

BCR (Cash Cost Basis) = Total Return/Total Variable Cost (TR/TVC)

Where, GR = Gross return; TC = Total Cost and the decision rules

are that, when BCR>1, economically satisfactory;

BCR<1, not economically satisfactory; and

BCR=1, there exist economic breakeven point of cultivation.

3.10 Resource use efficiency

The mathematical equation used to assess the efficiency of use of resources is:

$$\frac{\text{MVP}}{MFC} = 1$$

The value of the added product must be higher than the cost of the additional resources used in its production in order to achieve the goal of profit maximization, or the optimal deployment of resources.

Where,

MVP= Marginal value product

MFC= Marginal factor cost

When all other inputs are held constant, the marginal productivity of a given resource is the additional gross returns in value produced by an additional unit of that resource. The MVP is calculated by multiplying the value of the marginal physical product (MPP) by the unit price of the product. By utilizing the geometric means of gross return (Y) and resources (Xi), the most dependable and maybe most useful calculation for the MVP is produced.

In this study the MPP and values of MVP were obtained as follows:

MPP_{xi}*Pyi = MFC

Where, MPP_{xi}*Pyi = MVP

But, MPP = b_i*(Y/X_i)

So, MVP = b_i*(Y/Xi) P_{yi}

Where,

b_i= regression coefficient per resource

Y = mean output

Xi = mean value of input

P_{yi} = price of output

MFC = price per unit of output

Thus, when resource use efficiency (RUE) =1, resources are optimum utilized, when RUE< 1, resources are over utilized and when RUE> 1, resources are under- utilized.

3.11 Problems analysis

Tabular and percentage analysis were often employed to determine the constraints factor faced by the growers. Problem arise of rose farming were calculated using a percentage method of analysis. It is extensively used, easy to comprehend, and has straightforward calculations. Simple measurements like average, percentage, and ratio were obtained using it.

CHAPTER 4
SOCIO-ECONOMIC STATUS OF ROSE AND GLADIOLUS PRODUCING FARMERS

4.1 Introduction

The socioeconomic traits of the sample farmers are covered in this chapter. The socioeconomic makeup of the farmers has a big impact on how output is planned. In many ways, people are different from one another. An individual's qualities play a big role on how they behave. In the current study, the socioeconomic characteristics of the sample homes were looked at. They included age distribution and family size and composition, education level, women's participation, patterns of land ownership, etc.

4.2 The Sample Farmers' Age Distribution and Family Size

Farmers' ages affect their ability to produce and manage the cultivation system more effectively. Older farmers may be more skilled and resource-efficient, according to some academics. According to other study, younger farmers are more eager than older ones to accept new technologies.

Table 4.1 shows the respondents' ages, family sizes, and earning members.

	Rose Farming		**Gladiolus Farming**	
Age category	**No.**	**Percentage**	**No.**	**Percentage**
Young age (< 30 years)	4	9	9	27
Middle age (31-45 years)	13	30	16	48
Old age (>45 years)	27	61	8	25
Total	**44**	**100**	**33**	**100**
Average family size (No.)	4.04		4.04	
Average male member (No.)	2.09		2.08	
Average female member (No.)	1.97		1.99	
Average earning member (No.)	1		1	

Source: Field survey, 2023.

As shown in Table 4.1, For the purposes of this study, all different kinds of farmers in the research region were split into different age groups. The chart makes it clear

majority of the farmers in the research region were in their middle years. Farmers who grow roses and gladiolus were divided into three age groups: those under 30, those between 31 and 45, and those above 45.

In rose farming, 9 percent of the entire sample farmers were under 30 years old, while in gladiolus farming, 27 percent of the whole sample farmers were under 30 years old. 48 percent of gladiolus farmers and 30 percent of rose farmers, respectively, were between the ages of 31 and 45. In the farming of roses, 61 percent of the workers were over 45, while 33 percent of the workers in the farming of gladiolus were over 45. This result suggests that the majority of the sample farmers were in the age bracket above 45, which is the most active in rose farming, indicating that they put in greater physical effort for labor and in gladiolus, age between 31-45, are more active. Average family sizes of farmers who grow roses and gladiolus were found to be 4.04 and 4.04, respectively, which was somewhat smaller than the national average. In rose farming, the average male, average female, average earner were 2.09, 1.97, 1 respectively. Nevertheless, in gladiolus farming, averages for male, female, income, were determined to be 2.08, 1.99, and 1 respectively.

4.3 Age and Gender Distribution of the Sample Farmers

Here, the sex category was separated into male and female groupings. Figure 4.2 shows the association between age and sex in the research region. But i have not find any female farmers in our research region. So, I have shown only male farmer age distribution in figure 4.2, 3 farmers of the sample's total farmers worked in the rose industry and were under 30 years old. Currently, 13 farmers of the population was between the ages of 31 and 45 Once more, 27 farmers of the population was over 45 years old.

Likewise, in the gladiolus farming industry, 9 farmers of the overall sample of farmers were under the age of 30. Currently, 16 farmers of the population was between the ages of 31 and 45.Once more, 18 farmers of the population was above the age of 45.

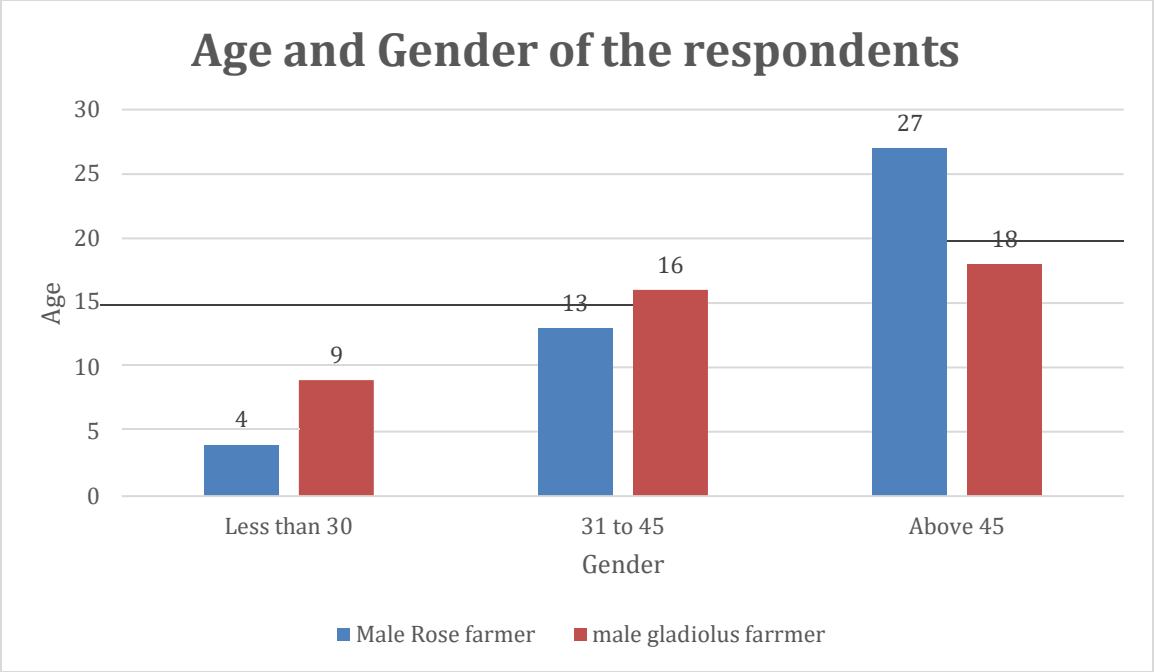

Figure 4.1: Age and Gender of Rose and Gladiolus farmer

Source: Field survey, 2023.

4.4 Level of Education of the overall Sample Farmers

The adoption of appropriate technology and output are influenced by education level. The degree of literacy in a society is typically used as a gauge of its social development. The benefits of literacy are numerous, and it promotes both social and economic advancement. It is significant to the modernization of agriculture. A person who is literate is better able to stay current on modern procedures and technical advancements in various manufacturing processes. Education makes people better competent to manage limited resources and increase profit (Miah, 1987). Education is undoubtedly an essential prerequisite for the growth of agriculture, even though it is not adequate in and of itself (Mellor, 1974). The sample farmers' educational backgrounds were divided into seven groups: illiterate (no formal education), primary (1–5 years of education), secondary (6–10 years of education), hsc level (more than 10 years of education), read only, can read and write, and last write name alone.

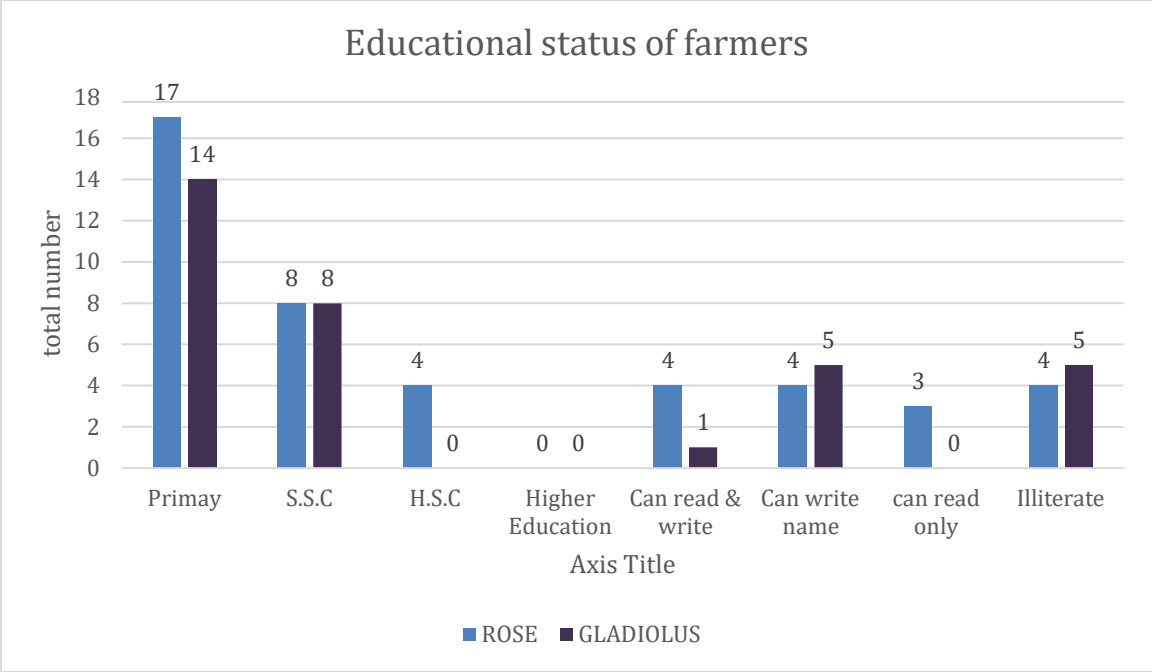

Figure 4.2: Educational Status of the sample farmers

Source: Field Survey, 2023

According to Figure 4.3, for the rose farmers, 17 farmers had only completed their primary education, just 8 farmers had completed their secondary education. Also, the figure shows that around 4 farmers had completed their higher secondary education in the study region, no farmers had higher education, 4 can write and read, 4 can write his name ,3 farmers can read only and only 4 farmers are illiterate.

For the gladiolus farmers, 14 farmers had only completed their primary education, just 8 farmers had completed their secondary education. Also, the figure shows that no farmers had completed their higher secondary education in the study region, no farmers had higher education, 1 can write and read, 5 can write his name ,no farmers can read only and only 5 farmers are illiterate.

4.6 Chapter summary

The socioeconomic characteristics of the sample farmers were examined in this chapter. The results of the research clearly show how different socioeconomic characteristics—such as age distribution, education, and ownership structure—are from one another.

CHAPTER 5

PROFITABILITY OF ROSE AND GLADIOLUS CULTIVATION

5.1 Introduction

Cost is a key factor in every cultivation process that helps farmers make the best choices. This chapter focuses on two main topics: the estimation and analysis of cultivation costs for gladiolus and roses; costs were classified into fixed and variable costs; the majority of the inputs were valued during the survey period using government rates in the research region or the prices at which farmers purchased them. Yet, certain unpaid inputs, including family labor, were really compensated in non-cash, making pricing in these situations particularly challenging. The principle of opportunity cost was applied in these situations.

In terms of rose cultivation per hectare yield, this chapter covers gross return, gross margin, net return, and undiscounted benefit-cost ratio. Thus, the anticipated financial return of cultivating gladiolus and roses was done from the farmers' point of view. Over the course of the investigation, every return was taken into consideration. This is a quick explanation of how the specific costs and rewards for the current study were estimated. The cost elements were divided into the following categories in order to account for analytical benefits.

5.2 Variable cost of rose and gladiolus

5.2.1 Cost of Human Labor

Manpower is one of the most important variable inputs in the agricultural process. Human labor is required for many farm management chores, such as weeding, sorting, grading, harvesting, etc. Human labor was divided into two categories: hired labor and family labor. Hiring labor costs are easy to calculate. The opportunity cost theory was used to determine how much family labor would cost.

The pay rate per man, or the amount that the farmers really paid the hired labor for a man-day of work, was taken into consideration in this analysis as the opportunity cost.

family labor. A man-day was defined in this study as 8 hours of work. Average rate has been considered to prevent complication. The salary rate for labor fluctuates according to the season. The range in the research region was between 450 and 550 Tk. per man-day. The average rate that was calculated was Tk. 500 per man-day is needed to cultivate roses. The use of human labor and the associated costs were displayed in table 5.2. The labor cost for rose and gladiolus was Tk per acre. 29809 tk and Tk. 28976 made up 7.96percent and 7.95 percent, respectively, of the total variable cost.

5.2.2 Preparing the land

Table 5.2 displays the costs associated with land preparation. For roses, the per hectare cost of land preparation was Tk. 2688, or 0.72 percent of the total variable cost; for gladiolus, the per hectare cost of land preparation was Tk. 1626, or 0.45 percent of the total variable cost.

Because rose plants demand well-drained soil and this type of bed's constriction was a bit more expensive than gladiolus, the cost of preparing rose land was somewhat lower than that of gladiolus.

5.2.3 Seedling cost

In the research region, seedlings constitute a crucial component of rose and gladiolus growth. The cost of a seedling per unit varied from time to time and between locations. However, the price was established by taking into account the real amount that the farmers paid. Rose and gladiolus seedlings often sell for Tk. 11 per piece and Tk. 10 per piece, respectively. The average cost of rose and gladiolus seedlings per acre was calculated to be Tk. 82920and Tk. 75650, which represented 22.13 percent and 20.76 percent of the total variable cost, respectively (Table 5.2).

5.2.4 Cost of organic manure

Manure, or cow dung, was a common organic fertilizer used for flower cultivation. Purchasing manure in the research region didn't have a predetermined pricing. Farmers used manure that they purchased. The cost of fertilizer was calculated using the going rate in the market. Per acre cost of utilizing manure was computed at Tk. 34565 and TK. 34523 were spent on cultivating roses and gladiolus, which together represented 9.22 percent and 9.47 percent of the overall variable cost (Table 5.2).

5.2.5 Cost of insecticides

Insecticide expenses were displayed in table 5.2. The per acre expenses of pesticides for rose and gladiolus were Tk. 112431 and Tk. 111170, which made up 30% and 30.50% of the total variable cost.

5.2.6 Irrigation Cost

Rose and gladiolus require water at the right time for proper growth. Roses cannot be cultivated without water. Farmers in the study area used motors to raise water levels and supply it to the canal. Consequently, the going market rate was used to determine the cost of irrigation. The average irrigation cost per hectare for gladiolus and roses was calculated to be Tk. 13841 and Tk. 14190, respectively. This represents 3.69 and 3.89 percent of the total variable cost (Table 5.2).

5.2.7 Cost of fertilizer

Fertilizer is a crucial ingredient for rose and gladiolus cultivation. Producers of gladiolus and roses used a variety of fertilizers, including gypsum, TSP, and urea. The development of flowers is enhanced by the use of these fertilizers. In order to estimate the cost of fertilizer, current market pricing—which farmers really paid—was used. These fertilizers were thought to be priced the same on all types of farms. Urea, TSP, and gypsum were all priced on average at Tk. 18 per kilogram, Tk. 22 per kilogram & Tk. 45 for each kilogram in the study region.

The estimated costs of fertilizer are shown in table 5.2. It was revealed that rose growers suffered expense of Tk. 1630 for Urea, Tk. 33148 for TSP and Tk. 7400 for gypsum. Which represent of 0.43%, 8.85%, 1.97% on total variable cost. On average, gladiolus growers paid Tk 1654 for urea, tk 33172 for TSP, tk 7483 for gypsum. which represented 0.45 percent, 9.10 percent, and 2.05 percent of the total variable cost.

5.2.8 Interest on Operating Capital

Interest on operational capital was computed using the opportunity cost concept. Because no expense was expended all at once, the operational capital truly represented the investment made throughout the course of the period in various agricultural operations. Throughout the whole cultivation period, the expense was incurred. For the sake of rose

and gladiolus cultivation, an interest rate of 9 percent per year on operating capital was computed for a period of six months. The interest rate was determined by taking into account the bank rate that was in effect in the market during the study period. The interest on working capital was calculated using the conventional calculation that follows. (Miah, 1992).

Interest on Operating Capital (IOC)= Alit

Where,

Al= Total investment /2,

t = Total time period of a cycle

i= interest rate which was 9% per year during the study period.

The interest on operating capital of rose and gladiolus was estimated at Tk. 16151 and Tk. 15694 respectively which constituted 4.31 percent and 4.31 percent share of total variable cost (Table 5.1).

Table 5.1: Per Hectare Variable Costs of Rose and Gladiolus Cultivation

Variable cost items	Units	Rose				Gladiolus			
		Quantity (unit/ha)	Price (tk/ unit)	Cost (tk)	Percent of total variable cost (%)	Quantity (unit /ha)	Price (tk/ unit)	Cost (tk)	Percent of total variable cost (%)
Human labor	Man days	70	426	29809	7.94	68	424	28976	7.93
Land preparation	Tk.			2688	0.72			1626	0.45
Seedling	No.	7718	11	82920	22.08	7565	10	75650	20.71
Organic Manure	Kg.	2880	12	34565	9.20	2877	12	34523	9.45
Urea	Kg.	91	27	2457	0.65	92	27	2484	0.68
TSP	Kg.	1507	22	33148	8.83	1508	22	33172	9.08
Gypsum	Kg.	164	45	7400	1.97	166	45	7483	2.05
Insecticides	GM	414	273	112431	29.94	404	275	111170	30.43
Irrigation	Tk.			13841	3.69			14190	3.88
Machinery				40134	10.69			40304	11.03
Intereston operating cost (OC)	-			16151	4.30			15694	4.30
Total variable cost	-			375544	100			365272	100

Source: Field survey, 2023.

5.2.9 Total Variable Cost

In the research region, the overall variable expenses changed from year to year. It was noticed that the total per hectare variable cost for rose and gladiolus cultivation was Tk. 374717 and Tk. 364442 correspondingly.

5.3 Fixed cost

5.3.1 Land Usage Cost

The farmers followed the conditions of the contract of rental when using the property. The term "lease cost" refers to the expense that rose and gladiolus growers incurred in order to get a land lease that would be utilized for their crops for a predetermined period of time.

The cost of leasing varies from area to location dependent on factors including location, soil fertility, terrain, and proximity to water supplies. In the research locations, leasing costs were by far the most expensive component. Owned land's value was determined using the opportunity cost principle. The current rental value per hectare in the research region was used to determine the cost of land usage for the cultivation of roses and gladiolus. Rose and gladiolus land was predicted to rent for Tk. 202144 and Tk. 212261 per hectare, respectively, accounting for 100% of the total fixed costs (Table 5.3).

Table 5.2: Per Hectare Fixed Costs of Rose and Gladiolus Cultivation

Fixed cost items	**Cost (tk/ha)**		**Percent of total fixed cost (%)**	
	Rose	**Gladiolus**	**Rose**	**Gladiolus**
Land use cost	202144	212261	100	100
Total fixed costs	202144	212261	100	100

Source: Field survey, 2023.

5.3.2 Total Fixed cost

According to estimates, the total fixed cost for year-round rose cultivation in the research region was Tk. 202144 per hectare, or 35.04 percent of the overall cost and on the other hand, gladiolus cultivation was tk 212261 per hectare, or 36.08 percent of total cost. (Table 5.3).

5.4 Total Cost

Whole variable cost and total fixed cost were added together to determine the overall expenses. According to the study, the per-hectare costs for growing roses and gladiolus were Tk. 576861 and Tk. 576703, respectively (Table 5.4)

Table 5.3: Per Hectare Total Cost of Rose and Gladiolus Cultivation

	Rose		Gladiolus	
Cost items	**Cost (tk/ha)**	**Percent of total cost (%)**	**Cost (tk/ha)**	**Percent of total cost (%)**
a. Total variablecost	375544	65.01	365272	63.25
b. Total fixed cost	202144	34.99	212261	36.75
Total cost (a+b)	577688	100	577533	100

Source: Field survey, 2018.

5.5 Returns of Rose and Gladiolus Cultivation

5.5.1 Gross Return

The whole product's monetary worth is referred to as the gross return. The entire amount of produce was multiplied by the corresponding market prices to determine the per-hectare gross returns. The average rose and gladiolus yields in the research region were 125426 and 139670 sticks per hectare, respectively, and their monetary values were 808492 tk and 1005231 taka.

5.5.2 Net Return

Entrepreneur's income is generally referred to as net return. Net return is a crucial factor to consider when assessing how profitable rose cultivation is. The difference between gross return and total costs is the net return. Rose and gladiolus cultivation was projected to have a per-hectare net return of Tk. 231631 and Tk. 428528, respectively, showing that it is a lucrative industry for farmers (Table 5.4). While the price of gladiolus was higher per stick than the price of rose, the net return was two times more. So, one may conclude that gladiolus is more successful than rose.

5.5.3 Gross Margin

Most farmers strive to cover their variable costs of cultivation with the greatest possible profit. The inability to accurately estimate fixed cultivation costs is the most likely cause. Thus, the comparable value has been determined using the gross margin analysis. cultivation of roses and gladiolus is profitable. It was calculated that rose and gladiolus cultivation had gross margins of Tk. 433775 and Tk. 640789, respectively (Table 5.4).

Table 5.4 Gross Margin and Benefit Cost Ratio (Undiscounted) of Rose and Gladiolus Cultivation

Sl. No.	Items			Amount (tk/ha)	
				Rose	Gladiolus
A.	Gross returns (GR) (yield* price)			808492	1005231
		Yield(stick/ha)	Price(tk/stick)		
	Rose	125426	**6**		
	Gladiolus	139670	**7**		
B.	Total variable costs (TVC)			375544	365272
C.	Total Fixed Cost (TFC)			202144	212261
D.	Total costs (TVC+TFC)			577688	577533
E.	Net return (GR-TC)			230804	427698
F.	Gross margin (GR-TVC)			432948	639959
G.	Benefit-cost ratio (BCR) = GR/TC (Full cost basis)			1.40	1.74
H.	Benefit-cost ratio (BCR) = GR/TVC (Cash cost basis)			2.15	2.75

Source: Field survey, 2023.

5.5.4 Benefit Cost Ratio, (Undiscounted)

By dividing gross return by gross cost (or total cost), the benefit cost ratio was derived. It suggests a return on investment per taka. Analyzing the farm's financial efficiency is

helpful. According to the study, the benefit cost ratio for rose and gladiolus cultivation was calculated at 1.40 and 1.74, respectively, meaning that an investment of 1.00 would yield 1.40 Tk for rose cultivation and 1.74 Tk for gladiolus cultivation. Again, the benefit cost ratio for roses and gladiolus was 2.16 and 2.76, respectively, on a cash cost basis. Hence, farmers found both rose and gladiolus cultivation to be extremely profitable, but gladiolus was slightly more profitable than rose.

5.6 Chapter summary

The results showed that the overall variable costs for growing roses and gladiolus were higher per hectare than the total fixed costs for growing roses. The growing of roses and gladiolus gives farmers larger yields. Because to its great cultivation potential and demand on the global market, rose and gladiolus gardening is progressively gaining favor in the nation. Sample farmers expressed their belief that increased yield , revenue encouraged them to continue growing roses and gladiolus, but that they would make more money growing gladiolus than rose.

CHAPTER 6

FACTORS AFFECTING YIELDS OF ROSE AND GLADIOLUS CULTIVATION

6.1 Introduction

This chapter makes an effort to pinpoint and quantify the key factors that affect the development of roses and gladiolus. To calculate the impact of important factors on the cultivation process of rose and gladiolus cultivation, the Cobb-Douglas cultivation function was used. In Table 6.1, the model's estimated values are shown.

6.2 Functional analysis to determine the cultivation-related variables

The greatest output that may be generated with the given inputs is specified by a relationship or mathematical function called the cultivation function. In keeping with the study's goals and taking into account how explanatory factors affect the yield of rose and gladiolus cultivation, To assess the quantitative impact of inputs on output, nine explanatory factors for roses and gladiolus were used.

Since a farm operator in the current study performs both labor and management duties, the management element was left out of the model due to the difficulty of defining and measuring it. Other independent factors that would have affected the productivity of agricultural enterprises, such time, soil type, water quality, etc., were removed from the model based on some initial estimation. Here is a quick rundown of the explanatory variables in the model.

Estimated Values of the Study of the Cultivation Function

i. F-value was employed to assess the goodness of fit for various input types.

ii. The coefficient of multiple determinations (R^2) shows how many independent variables were used in the model to account for all of the changes in output.

iii. Coefficients with enough degrees of freedom were evaluated for significance at the 1%, 5%, and 10% levels of significance.

Table 6.1 Estimated Values of Coefficients and Related Statistics of Cobb-Douglas Cultivation Function.

	Rose			Gladiolus		
Explanatory variables	**Coefficient**	**Standard error**	**t-value**	**Coefficient**	**Standard error**	**t- value**
Intercept	12.59	14.182	.888	7.191	24.452	.294
Human labor (X_1)	.272	.244	1.113	1.090*	.573	1.903
Land preparation (X_2)	.144	.184	.782	.088	.339	.261
Seedling (X_3)	.086	.213	.403	.038	.272	.140
Organic manure (X_4)	2.992**	1.709	1.750	1.676***	.616	2.868
Urea (X_5)	2.677***	.673	3.978	2.866**	1.353	2.118
TSP (X_6)	2.030***	1.010	2.00	3.616	2.782	1.300
Gypsum (X_7)	.840***	.287	2.92	3.127**	.914	3.421
Insecticides(X_8)	3.878***	.725	5.348	-3.651**	.944	-3.867
Irrigation(X_9)	-.259	.280	-.926	-1.322**	.459	-2.883
R^2	.706				.710	
Adjusted R^2	.767				0.775	
F-value	12.49				25.968	

Source: Field survey, 2023.

Note: * Significant at 1 percent level**

**** Significant at 5 percent level**

**** Significant at 10 percent level**

Interpretations of Results

6.3 interpretation of the result

Effect of human labor (X_1):

From the table (6.1) as can be shown, the coefficient for rose had a positive and

insignificant value. The coefficient's value of.274 suggests that there is no influence of rose cultivation.In case of gladiolus the coefficient's value, at the 10% level of significance, of 1.090 means that, while holding all other variables equal, a 1% increase in the utilization of human labor has resulted in a 1.090% increase in gladiolus yield.

Effect of land preparation (X_2):

From the table (6.1) as can be shown, rose had a positive and insignificant value for the coefficient of land preparation. The coefficient value of.144 suggests that there are no significant effects from rose cultivation. Gladiolus yield was unaffected by a 1 percent increase in land preparation while all other parameters remained constant, according to the positive and statistically significant coefficient value of.088 in the gladiolus example.

Effect of seedling (X_3):

we can see that for rose seedlings, the coefficient's value was both positive and insignificant.086 shows that a 1% increase in seedlings has no effect on rose production while other parameters remain same. On the other hand, the value of the coefficient was positive and negligible which is .038 shows that a 1% increase has no effect on gladiolus yield while other conditions remain same.

Effect of organic manure (X_4):

From the table (6.1), it was found that the value of coefficient of the use of organic manure was positive and 5% level of significant for rose. The value of the coefficient was 2.992 indicating that it has positive effect on the cultivation of rose.

In case of gladiolus the value of coefficient of the use of organic manure was positive and 1 percent level of significance which indicates that at 1 percent increase in the use of organic manure would increase the yield of gladiolus by 1.676 percent.

Effect of urea (X_5):

Regression analysis revealed that the coefficient of urea usage was positive and significant at the 1 percent significance level. This means that, with other parameters held constant, a 1 percent increase in urea use would result in a 2.667 percent increase in rose yield (table 6.1).

Regression analysis revealed that, in gladiolus, the coefficient of urea consumption was

positive and significant at the five percent significance level.

Effect of TSP (X_6):

The coefficient of the usage of TSP was found to be positive and significant at the 1% level of significance in table (6.1), which means that a 1 percent increase in the use of TSP while keeping all other parameters constant would enhance the yield of roses by 2.030 percent.

In contrast, the value of the TSP usage coefficient for gladiolus was positive and insignificant, indicating that a 1% increase in TSP use while maintaining all other parameters constant would no change of yield .

Effect of Gypsum (X_7):

Regression analysis revealed that the coefficient of gypsum usage was negative and insignificant, indicating that a 1% increase gypsum in use while holding all other parameters constant would no change result in rose yield. (table 6.1).

The coefficient of gypsum usage in the instance of gladiolus shows that it is 5% level of significant and positive which means 1% increase in gypsum use while keeping all other parameters constant enhance 3.127% gladiolus cultivation. (table 6.1).

Effect of insecticides (X_8):

According to table (6.1), the coefficient value was positive and 1% level of significant, which means that a 1 percent increase in pesticide use would result in on impact rose cultivation, assuming all other parameters remained equal.

When it comes to gladiolus, the coefficient's value shows that a 1% increase in pesticide usage while maintaining all other variables the same has no appreciable impact on gladiolus cultivation. (Table 6.1).

Effect of irrigation (X_9):

Regression analysis revealed that the irrigation coefficient was negative and, indicating that a 1% increase in irrigation application while keeping all other factors constant would no change in rose yield. (table 6.1).

the irrigation coefficient value shows that a 1 percent increase in irrigation application while holding all other variables equal has no appreciable impact ongladiolus cultivation.

6.4 Coefficient of multiple determinations (R^2)

The value of the coefficient of multiple determination for rose cultivation was determined to be 0.706, meaning that the included explanatory variables of the model could account for around 70 percent of the overall variance in the yield (stick/ha). Therefore, since R^2 reflects the regression model's goodness of fit, we may state that it fits the data better than the previous regression model. (Table 6.1).

The coefficient of multiple determination for gladiolus was determined to be 0.710, meaning that the explanatory factors in the model that were included could account for almost 71 percent of the overall variance in the yield (stick/ha). As a result, we can also state that this regression model has a superior goodness of fit.

6.6 Adjusted R^2

"Adjusted" in this context refers to degrees of freedom. With a modified R^2 of 0.767 for rose cultivation, the model's explanatory variables were able to explain about 76% of the variations in the output. (Table 6.1).

On the other hand, the adjusted R^2 for gladiolus cultivation was found to be 0.775, indicating that the explanatory factors included in the model accounted for over 77% of the variations in the output. (Table 6.1).

6.7 F-value

The F-statistic was calculated to show the overall quality of fit of any fitted model. Rose cultivation had a computed F-value of 12.456, which was extremely significant.It indicates that the model's explanatory variables were crucial in illuminating the variance in rose cultivation's yield. (Table 6.1).

In the instance of gladiolus, the calculated F-value was 25.968, which was also highly significant. This indicates that the explanatory factors crucial to understanding the variance in gladiolus cultivation yield were present in the model. (Table 6.1)

CHAPTER 7

RESOURCES USE EFFICENCY OF ROSE AND GLADIOLUS

In order to test the resource use efficiency the mathematical formula is-

$$\frac{\text{MVP}}{\text{MFC}} = 1$$

The value of the added product must be higher than the cost of the additional resources used in its production in order to achieve the goal of profit maximization, or the optimal deployment of resources.

The ratios of MVP and MFC of seed 7.20, urea 2.28, and TSP 1.18 for rose culture were positive, as shown in Table 7.1, and more than one suggested that these inputs for rose cultivation were underused in the research region. Thus, in order to reach the desired level of efficiency, farmers need utilize these inputs more. Additionally, the research area's overuse of gypsum .20 and human labor .06 was suggested by less than one. Therefore, farmers ought to utilize fewer of these inputs to attain efficiency level.

Table 7.1 Estimated Resource Use Efficiency in rose and gladiolus cultivation

Variables	ROSE									
	GM	MVP	MFC	MVP/MFC	Comment	GM	MVP	MFC	MVP/MFC	Comment
Human labour	58.52	240.06	400.00	0.06	Over Utilized	56.25	256.24	400.00	0.64	Over Utilized
Seed	38.65	720.85	100.00	7.20	Under Utilized	36.84	645.24	100.00	6.45	Under Utilized
Urea	51.98	41.78	18.00	2.28	Under Utilized	38.22	48.24	18.00	2.68	Under Utilized
TSP	40.64	26.78	22.00	1.18	Under Utilized	37.51	39.58	22.00	1.80	Under Utilized
Gypsum	58.65	9.20	45.00	0.20	Over Utilized	41.67	40.54	45.00	0.90	Over Utilized

Source: Field Survey, 2023

Table 7.1 also shown that the ratios of urea 2.68, TSP 1.80, and MVP and MFC of seed 6.25, for rose culture were positive, and more than one suggested that these inputs for gladiolus cultivation were underutilized in the research region. Thus, farmers should utilize these inputs more in order to reach the desired level of efficiency. Additionally, the research area's overuse of gypsum .90 and human labor .64 was suggested by less than one. Thus, in order to achieve a certain degree of efficiency, farmers should utilize less of these inputs.

CHAPTER 8

PROBLEMS FACED BY CUT FLOWER FARMERS

8.1 Introduction

Despite the fact that Savar (the research region) was ideally suited for the cultivation and selling of rose and gladiolus, farmers and middlemen faced several obstacles. Here is a discussion of the issues encountered with the manufacturing and marketing of these flowers.

8.2 The Challenges Facing Farmers

Bangladesh's economy is largely reliant on agriculture. However, the agricultural industry is still very small. There are several issues with this industry. Experience has demonstrated that Bangladeshi farmers rarely receive the necessary amount of seedlings, appropriate funding, fertilizers, technical help, and ultimately a fair price for their output. These are some of the issues farmers encountered when producing flowers:

Lack of high-quality bulbs:

Due to natural obstacles and a lack of understanding, the majority of farmers in the study region were unable to harvest high-quality seedlings from their own farms. This forced them to rely on other people's seedlings. Even they were had to pay an absurdly high price. Lack of high-quality seedlings among the farmers was the major issue in the study area which is faced by 80% of rose farmer and 98% of gladiolus farmer.

Lack of sufficient capital or institutional credit:

In order to produce flowers, farmers must have enough money to purchase the essential inputs, including fertilizer, irrigation, pesticide, and specific agronomic care. Most of the farmers in the study region stated that they lacked sufficient operational capital. The majority of them were denied institutional credit. They are therefore forced to borrow money from neighbors or moneylenders at high rates of interest due to their financial

incompetence and urgent need for cash. Lack of appropriate capital was the major issue in the research region as faced by 88% cultivers of rose and 98% of gladiolus.

High labor costs:

The cost of labor is quite high in this area. The majority of farmers had to pay a significant cost for labor. High labor costs were the major issue among the sample farmers in the research area such as 18% rose farmer and 20% gladiolus far,er faced it.

Absence of sufficient storage options:

One of the major issues in the research region is a lack of storage options. Sometimes farmers' lack of storage facilities results in the destruction of many blooms. The study area's 92% of rose and 96% of gladiolus farmer faced lack of suitable storage space.

Lack of scientific expertise and training:

To manage commercial flower producing operations like cultivation, there is a dearth of skilled labor. handling after harvest, creating products, and biotechnology. 72% of rose and 80% of gladiolus farmer does not have knowledge about contemporary technologies.

Infestation by disease and insects:

It is a problem for the producers of both rose and gladiolus. It's possible that disease and insect infestation will lower cultivation. They occasionally utilized insecticides and pesticides, which raised the cost of their produce, to address this issue. Disease and insect infestation among the farmers in the research is the vital problem such as 72 % of rose cultivar and 70% of gladiolus cultivar faced.

Carrying problem:

One of the issues in the research area included carrying. Due to proper carrying, it has become very difficult to transport different inputs and outputs from the field to the market.

Table 8.1 Major Problems Faced by the Sample Farmers in Producing rose

	Rose		
Factor	**No of respondents**	**Percentage (%)**	**Rank**
Price fluctuation	42	93	1st
Lack of cold storage	46	92	2nd
Huge investment requirement	44	88	3rd
Non availability of quality indigenous planting material	40	80	4th
Lack of scientific knowledge and training	36	72	5th
Pest and diseases attack	36	72	6th
Spoilage of flower	25	50	7th
Loss of cultivation due to thief	20	40	8th
Transportation and communication	12	24	9th
High cost of labor	9	18	10h

Source: Field survey, 2023

Inadequate communication and transportation infrastructure:

Transportation was a major issue for the study's creators. There was no other mode of transportation available during the rainy season other than vans and carts due to how muddy and impassable roads had become. Also, local markets were around 8 kilometers away from the fields. Therefore, transportation costs covered more than 60% of the total marketing cost. Because to shipping costs, several respondents were forced to sell their flower at farm yards for less money. Poor communication and transportation facilities were a major issue in the research region like 24% of rose and 30% of gladiolus farmer faced it.

output price fluctuation :

In order to cover home expenses, pay labor costs, etc., the majority of farmers were compelled to sell their crops at a very low price shortly after harvest. The aware farmers saw that the price of their goods was extremely cheap when compared to the cost of cultivation. output prices fluctuation were the major issue for farmers in the research region faced by 93% of rose and 92% of gladiolus farmers.

Table 8.2 Major Problems Faced by the Sample Farmers in Producing gladiolus

	gladiolus		
Factor	**No of respondents**	**Percentage (%)**	**Rank**
Huge investment requirement	33	98	1st
Lack of cold storage	48	96	2nd
Price fluctuation	43	92	3rd
Non availability of quality indigenous planting material	32	84	4th
Lack of scientific knowledge and training	40	80	5th
Pest and diseases attack	35	70	6th
Spoilage of flower	25	50	7th
Loss of cultivation due to thief	22	44	8th
Transportation and communication	15	30	9th
Lack of electricity supply	12	24	10h

Source: Field survey, 2023

Damage of flowers:

50% of rose farmers and 44% of gladiolus farmer faced by the crop damage in some reason in the study area, which must be removed by the higher authority.

Improper use of fertilizers:

The most crucial input in the cultivation of flower is fertilizer. Urea, TSP, and MP are typically used. Farmers have applied fertilizer to their land multiple times for greater yield. Most often, they overuse fertilizer, which raises the price of produce. 40% of rose and 50% of gladiolus farmer doesn't even know how to use proper fertilizer for greater cultivation.

8.3 Measures for Solving the Problems:

In Cultivation of rose and gladiolus, The farmers who had recognized their individual issues also offered some recommendations for raising the general level of agriculture efficiency. Farmers' recommended actions:

Farmers recommended the following actions to address the issues encountered in farming. In places that produce, a sufficient quantity of fertilizer ought to be provided at a government-subsidized cost. It is important to provide farmers with access to institutional financing facilities so they can guarantee the use of sufficient inputs to enhance production. Technology and scientific knowledge must be imported by growers in order to cultivate flowers. For weeding and fertilizer application, specifically scientific as well as economical procedures should be implemented. Facilities for communication and transportation need to be enhanced. The construction of such roadways connecting communities to large thoroughfares and marketplaces should be prioritized.

8.4 Chapter summary

Naturally interconnected with one another, For the improvement of cut flower farming as a whole, an integrated program that addresses all of the aforementioned concerns must be implemented. The percentages that matched the farmers' experiences were used to rank their challenges. The majority of farmers stated that the primary reasons restricting their capacity to produce gladiolus were seasonal demand, a large investment required, and a lack of cold storage, whereas the primary factors limiting their ability to grow roses were price instability and a lack of cold storage.

CHAPTER 9

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

9.1 Summary

Bangladesh's economy has depended heavily on the flower business from the beginning of civilization. This industry has received a lot of attention since it serves many purposes, satisfies people's aesthetic demands, generates more jobs, ensures greater rates of return for rural residents, and makes it easier to earn more foreign currency.

In the fiscal year 2017–18, the broad agricultural sector, which comprises fisheries, forestry, livestock, and crops, contributed 11.50% of the GDP overall (ECONOMIC REVIEW, 2023). The ecology of the nation is suitable for the development and cultivation of flowers. With the help of contemporary technologies, flower output is rising steadily. With the help of contemporary technologies, flower output is rising steadily. Bangladesh produced 32,120 tonnes of flowers in FY2020–21, an increase of 12% over the prior fiscal year, according to the Bangladesh Bureau of Statistics (BBS). In the meantime, more and more land is being used for flower growing as demand increases output volume. Around 3,930 hectares of land were used to grow flowers in Bangladesh in FY2020-21, compared to 931 hectares in FY2009–2010. On the other hand, when new technologies are developed, the variety of flowers that are grown grows daily. More than 50 different flower species, including the rose, genda, chameli, jasmine, gladiolus, shefali, rajnigandha, gandharaja, Chandramallika, dahlia, Rangana, dolanchampa, konakchampa, jaba, cosmos, malati, and kamini, are being grown for commercial use in Bangladesh.

In light of this, the study's specific goals were developed to evaluate the comparative profitability analysis of rose and gladiolus cultivation in savar regions and also market integration of these two flower in Bangladesh.

The study's specific objectives are to:

- To examine the socio-demographic characteristics of the growers;
- To assess the financial profitability of rose and gladiolus cultivation;
- To determine resource use efficiency of rose and gladiolus.
- To determine the problems faced by rose and gladiolus growers;

Primary sources provided much of the material for the study, which was assembled by the researcher through interviews with the sample farms. Forty-four rose farmers and thirty-three gladiolus farmers were selected as the 100 year-round cut flower producers from two villages in Savar Upazila, Dhaka District: shampur and bangnibari.To gather information on cultivation, a survey approach was utilized, and multistage random sampling was used to choose the growers of roses and gladiolus.

Farmers who grow roses and gladiolus were divided into three age groups: those under 30, those between 31 and 45, and those above 45. In rose farming, 9 percent of the entire sample farmers were under 30 years old, while in gladiolus farming, 27 percent of the whole sample farmers were under 30 years old. 48 percent of gladiolus farmers and 30 percent of rose farmers, respectively, were between the ages of 31 and 45. In the farming of roses, 61 percent of the workers were over 45, while 33 percent of the workers in the farming of gladiolus were over 45. This result suggests that the majority of the sample farmers were in the age bracket above 45, which is the most active in rose farming, indicating that they put in greater physical effort for labor and in gladiolus, age between 31-45, are more active. Average family sizes of farmers who grow roses and gladiolus were found to be 4.04 and 4.04, respectively, which was somewhat smaller than the national average. In rose farming, the average male, average female, average earner were 2.09, 1.97, 1 respectively. Nevertheless, in gladiolus farming, averages for male, female, income, were determined to be 2.08, 1.99, and 1 respectively. The sample farmers' educational backgrounds were divided into seven groups: illiterate (no formal education), primary (1–5 years of education), secondary (6–10 years of education), hsc level (more than 10 years of education), read only, can read and write, and last write name alone. Just 8.24% of farmers had completed their upper secondary education, the majority (14.43%) had just completed their elementary school. Also, the figure shows that around 5.15%% of the farmers in the study region were illiterate, 5.15% can write only their own

name,1.3% can read and write and 0% farmers of hsc level and only read only. the sample farmers owned maximum percent of rose farmers used to cultivate of their own land like 33%. For that reason, their rented cost of land would be minimize in that sense. And small portion of farmers like 7% are used to cultivate rose rented in land. They had paid a big amount to the land owner. On the other hand, 28 percent of gladiolus farmer used to cultivate their owned land and under 5% or farmer cultivate flower in other.

The whole product's monetary worth is referred to as the gross return. The entire amount of produce was multiplied by the corresponding market prices to determine the per-hectare gross returns. The average rose and gladiolus yields in the research region were 125426 and 139670 sticks per hectare, respectively, and their monetary values were 808492 tk and 1005231 taka. Entrepreneur's income is generally referred to as net return. Net return is a crucial factor to consider when assessing how profitable rose cultivation is. The difference between gross return and total costs is the net return. Rose and gladiolus cultivation was projected to have a per-hectare net return of Tk. 231631 and Tk. 428528, respectively, showing that it is a lucrative industry for farmers. While the price of gladiolus was higher per stick than the price of rose, the net return was two times more. So, one may conclude that gladiolus is more successful than rose. Most farmers strive to cover their variable costs of cultivation with the greatest possible profit. The inability to accurately estimate fixed cultivation costs is the most likely cause. Thus, the comparable value has been determined using the gross margin analysis. cultivation of roses and gladiolus is profitable. It was calculated that rose and gladiolus cultivation had gross margins of Tk. 433775 and Tk. 640789, respectively.

The cultivation of roses and gladiolus were some of the other issues and limitations that this study also discovered. The cultivation issues were divided into cultivation and marketing issues. The results showed that price volatility, lack of cold storage, and seasonal demand were the key constraints for their gladiolus cultivation, whereas significant investment requirements, seasonal demand, and lack of cold storage were the main constraints for their rose cultivation.

9.2 Recommendation and Policy Suggestions

We may infer that growing roses and gladiolus is profitable. Increased yield and output

will assist farmers boost income and raise living standards if modern inputs and cultivation techniques are made quickly available to them. There is plenty of room to increase the annual yield per hectare of rose and gladiolus farming. Bangladesh must import flowers to fulfill the high demand for them during significant events like Ekushey February due to the rapid expansion of the local market. On the other side, the export market offers tremendous opportunities.

because Bangladesh has cheaper manufacturing costs than other nations that export flowers. Because to its excellent geography and environment, as well as its cheap labor costs and relatively little capital investment, Bangladesh enjoys a competitive edge that is enabling the sector to flourish. We may seize the domestic and international markets by taking advantage of the favorable atmosphere and relatively superior potential. The following suggestions are made as part of the current study, which serves as a strategy-formulating tool for enhancing rose and gladiolus cultivation and developing the cut flower industry, in order to improve the productivity, efficiency, and effectiveness of rose and gladiolus cultivation.

- The government should focus on production and selling price of the flower so that farmers receive fair pricing for their produce and price fluctuation will be reduced.
- The government should provide well-organized marketing facilities and make sure that there are adequate transportation options to lessen the risk of rose and gladiolus deterioration.
- Although the bank currently provides small credit to the farmers with low interest. It recovery high investment problem of the farmer.
- Scientific cultivation techniques should be used to boost output. Farmers should get the required facilities, knowledge, and training, as well as appropriate extension services.
- To assure the quality of the flowers and to extend their shelf life, it is crucial to build relationships with local business owners and encourage them to develop and provide low-cost, high-quality packing materials like cartons, boxes, and bamboo

cages.

- The government should increase cold storage facilities so that flower will be preserved and extend shelf life.

9.3 Limitations of the Research

It is extremely typical for studies to have certain restrictions. The research conducted is really significant. Many limitation arise of this study. The issues are:

• The information was mostly gathered through the respondents' memories, which may not always be accurate;

• The majority of the data was acquired through interviews with farmers, who occasionally did not participate properly with the interviewer.

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APPENDIX

Interview Schedule **Sample ID** T1/ T2/ T3/ T4

Sher-e-Bangla Agricultural University, Dhaka

COMPARATIVE PROFITABILITY AND RESOURCE USE EFFICIENCY BETWEEN ROSE AND GLADIOLUS CULTIVATION IN SAVAR UPAZILA OF DHAKA DISTRICT.

Dear Respondent,
All of your information will be used for the development works of our country. Your accurate information will help us to conduct our research accurately. So your accurate information will be highly appreciable. We will maintain your information with strictly confidential manner.
Thank You.

Module 1: Household Identity

Name;	
Division	
District	
Thana	
Union/Block/Mouza	
Village	

Socio dempgraphic information:

Source of income

Type	**Male**	**Female**
Only Agriculture depended		
Agriculture + business		
Agriculture + Service		
Agriculture + other		

Module 2: Detailed Information of Household Members

Sl. No.	Name of the Household member	Relation with HH (Code)	Sex (M=1, F=2)	Age in complete Years	Marital Status (10 yrs.+) (Code)	Occupation (Code)		Education (5 yrs.+) (Year of schooling)
						Main	Subsidiary	
1	2	3	4	5	6	7	8	9
1								
2								
3								
4								
5								
6								

3. Relationship		6. Marital Status	7 & 8. Occupation		9.Education	
1=HH Head	7=Brother	1=Unmarried	01=Agriculture(Self)	08=Fishing	01=Passed class I	95=Can read and write
2=Wife/Husband	8=Sister	2=Married	02=Service	09=Student	02=Passed class II	96=Can write name only
3=Son	9=Daughter in Law	3=Widowed	03=Business	10=Others	….	97=Can read only
4=Daughter	10=Maid	4=Separated	04=Day laborer(agriculture)	Specify	10=Passed S.S.C	98=Illiterate
5=Father	11=Grand Child	5=Divorced	05=Day laborer(non-agril)		12=Passed H.S.C	
6=Mother	12=Others	6=Left	06=Rural transportation		……	
			07=Domestic Work			

Module 3: Land ownership and farm category (in decimal)

Category of land	Tenure Status							Total land size	Farm category
	Own land	Rented in	Mortgaged in	Leased in	Rented Out	Mortgaged out	Leased Out		
	1	2	3	4	5	6	7	8=(1+2+3+4-5-6-7)	9
1.Crop land									
2.Orchard									
3.Homestead									
4.Ponds									
5.Others									
6.Total									

If total land size is 50 to 100 decimal=marginal farm, 101 to 250 decimal= small farm and 251 to above = medium and large farm

9. Farm category code- Marginal farm=1. Small farm= 2 and Medium and large farm= 3

Production Related Timetable

Particulars	Land Preparation	Seed Sowing	Harvesting
rose			
Gladiolus			

Module 4: Input use

Please identify land area in local units as follows: A: Decimal, B: Bigha of……. decimal, C: Katha of …….decimal, D: Pakhi of …… decimal, E: Other ……. Of …… decimal.

4A. Human labor Use

No. of plots				
Total area (in decimal)				
Activities		Gender	Man-days/ Unit area	Wage rate (Tk/day)
			1	2
1.Land Preparation	a. Family	M		
		F		
	b. Hired	M		
		F		
2. Seedling	a. Family	M		
		F		
	b. Hired	M		
		F		
3.Harvesting & Carrying	a. Family	M		
		F		
	b. Hired	M		
		F		
4.Applying fertilizer	a. Family	M		
		F		
	b. Hired	M		
		F		
5.Applying irrigation water	a. Family	M		
		F		
	b. Hired	M		
		F		
6.Applying insecticides/ Others(specify)	a. Family	M		
		F		
	b. Hired	M		
		F		

4B. Draft power Use

Variety			
Area (in decimal)			
Activities		Pairs days/ unit area	Rate
1.Land Preparation	a. Family		
	b. Hired		
2.Carrying	a. Family		
	b. Hired		
3.Others (specify)	a. Family		
	b. Hired		

4C. Machinery Inputs

Variety			
Area (in decimal)			
Purpose of machinery use		Unit	Cost/Unit
		1	2
1.Land Preparation (Power Tiller/ Tractor)	a. Owned		
	b. Hired		

2.Harvesting (Harvester)	a. Owned		
	b. Hired		
3.Carrying (Tractor / Power Tiller / Van / Shallow irrigation pump)	a. Owned		
	b. Hired		
4.Others (specify)	a. Owned		
	b. Hired		

4D. Material Inputs:

Variety			
Area (in decimal)			
Inputs		Quantity/ Unit	Cost/ Unit
		1	2
Seed/ Seedling (KG)	a.Owned		
	b. Purchased		
Manure (KG)	a.Owned		
	b. Purchased		
Urea (KG)			
T.S.P (KG)			
M.P (KG)			
DAP (KG)			
Gypsum (KG)			
Insecticide (Gram)			
Irrigation (unit=)	Cash		
	Crop share		
Others (Specify)			
Rental value of land	TK. / Unit area		

4E. Output:

Variety			
Area (in decimal)			
Output (s)		Unit	Cost/Unit
		1	2
Product (stick)			

Mudoule5: Reasons of Crop Damage (Put tik marks)

Sl. No	Constrains	Degree of Constrains			
		High	Medium	Low	Not at All
1.	Price fluctuation				
2.	Lack of cold storage				
3.	Huge investment requirement				
4.	Non availability of quality indigenous planting material				
5.	Lack of scientific knowledge and training				
6.	Pest and diseases attack				
7.	Spoilage of flower				
8.	Loss of cultivation due to thief				
9.	Transportation and communication				
10.	High cost of labor				
11.	Lack of electricity supply				
12.	Packaging material problem				
13.	market information problem				
14.	Grading problem				

THANK YOU