
Economics of Carnation Cut Flower Production in Kathmandu Valley, Nepal

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Abstract

Carnation is an important cut flower commercially traded in Kathmandu Valley. It has high demand in the Kathmandu Valley's floriculture market due to its physical characteristics and its suitability to be used singly or in combination with other flowers. This examines the economics of carnation cut flower production in Kathmandu Valley. The data for the study was collected from a sample of 15 carnation cut flower producers in Kathmandu Valley. Simple random sampling technique was employed to select the respondents. Information from the respondents collected through semi-structured interview schedule. Data collected through personal interview and secondary sources was analyzed by applying descriptive statistical tools. Data analysis focused mainly on the costs and returns from the carnation production, trends in production and prices, present problems in production and future prospects of carnation production in Kathmandu Valley. The findings revealed that the profits from carnation cut flower were satisfactory to the producers. However, there were ample areas of improvements in the production system. Given the high degree of demand and increasing trend of imports, concerted efforts must be made to reverse the situation and become self-reliant in fulfilling the demand for carnation cut flowers alongside exporting to other countries in the future.

Key words: Carnation, Cut-flower, Production, Costs, Returns

JEL Codes: D24

1. INTRODUCTION

Carnation (*Dianthus caryophyllus* L.) flower belongs to the family of Caryophyllaceae and is native to Mediterranean regions of Greece and Italy. It is one of the most popular commercial cut flowers grown in the world and ranks next only to Rose in the worlds' floriculture trade (Hamidimoghdam, 2014). Most carnations are half hardy herbaceous perennials; however, there are some annual varieties, too. Native species flower only in the spring due to higher day lengths (photoperiod) and temperature.

However, carnation can be cultivated as perennial cut flower in greenhouses (Asadi, Abdoosi, Mousavi, & Abadali, 2014). Carnations grow 18 to 24 inches tall and produce solitary, terminally formed flowers, the petals of which are broad with frilled margins. Carnations are grouped into two major classes "Standard" and "Spray". The standard type produces larger blooms on longer flower stalks and the spray type produces many flowers of smaller size with weaker stem (Jose et al., 2017). There are over 300 species of carnations and hundreds more of hybrid varieties. Though each hybrid comes in a different color, white, pink and red are the most common ones. Carnations can be planted in flowerbeds, borders, rock gardens and even pot like containers. Carnation is one of the important cut flowers due to its excellent keeping quality, wide range of colours and form, ability to withstand long distance transportation and remarkable ability to rehydrate after continuous shipping (FAN, 2015; Manikandan, A. & Deshmukh, R., 2018; Magar, 2019).

Carnation is an important commercial cut flower in Nepal. Its market has been emerging as the most potential floriculture enterprise in the urban areas, especially capital city Kathmandu. It is said that carnation has a huge potential to fetch increased domestic demand as well as to cater to export market. But, despite the huge market potential of carnation cut flower in the country, the competitiveness is very low (Magar, 2019). Systematic research studies in the carnation cut flower is still lacking in Nepal regarding production costs, profitability and competitiveness of this sector not just for the domestic, but also for the export market. This study was carried out with the objective to examine the economics of carnation cut flower production in Kathmandu Valley for appropriate policy formulation on the part of the government for carnation cut flower market development.

2. METHODOLOGY

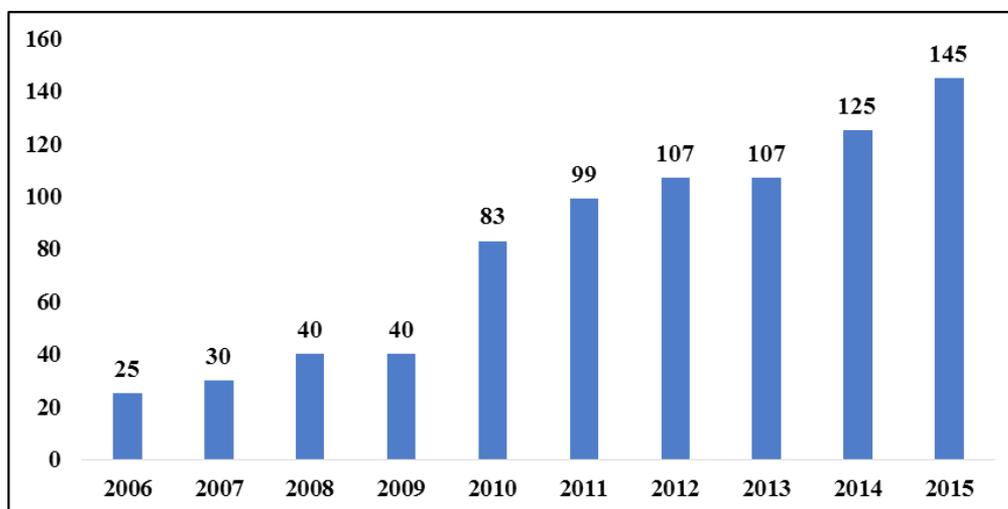
The research design set for this study is a cross-sectional study using a survey of representative samples from the commercial producers of the carnation cut flower in Kathmandu Valley using random sampling technique. The study was undertaken in February 2020. Primary data gathered from field survey through interviews with the producers of the carnation cut flower using structured interview schedule was used in the study. The primary data was complemented using secondary information obtained from the official statistics of Floriculture Association Nepal. For the collection of primary data, a sample of 15 producers of the total 24 commercial carnation producers. The sample comprised of 6, 3 and 6 producers from Kathmandu, Bhaktapur and, Lalitpur district respectively. Both quantitative and qualitative data were collected. The quantitative data comprised of the costs and quantities of various inputs used in the production and prices of outputs. The data was analyzed and presented through descriptive statistics such as ratio and percentages along with tables, and graphs.

3. RESULTS AND DISCUSSION

Area under Carnation Production in Kathmandu Valley

The data on the growth in the area under carnation cultivation in the Kathmandu Valley between 2006 and 2015 is presented in Figure 1. Data reveals that there has been gradual growth in the area of carnation cultivation in Kathmandu valley. The increasing trend of area under carnation cultivation also reveals that there is high demand of carnation cut flower in the valley.

Figure 1: Area under Carnation Cultivation in Kathmandu Valley (in Ropani)

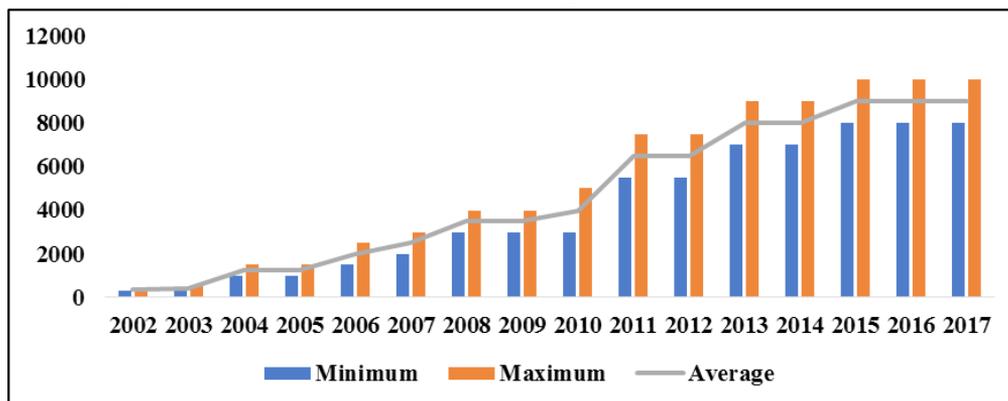


Source: Floriculture Association Nepal, 2020

This is a very interesting and encouraging figure because given the high demand and imports of carnation in the country, increase in the area under carnation cultivation is expected to help in import substitution and to fulfill the demand from the domestic production.

Demand of Carnation cut-flowers in Kathmandu Valley

The data of demand of carnation in Kathmandu Valley between the years 2002 and 2017 is presented in Figure 2. Data shows that there is constant and high rate of growth of demand owing to the increasing urbanization in the valley. The increasing trend of minimum, maximum and average demand of carnation in Kathmandu valley is a positive signal for the producers who are involved in the production of carnation to meet the growing demand.

Figure 2: Demand of Carnation (sticks per day) in Kathmandu Valley

Source: Floriculture Association Nepal, 2020

Costs and Returns from Production of Carnation Cut Flower

The cost of production and returns from the sales of carnation cut flower to the producers was calculated based on the information provided by the producers during the survey. The cost of production has been calculated in terms of per ropani area and per plant. Cost calculations are based on cultivation of carnation in the normal bamboo made plastic house with medium level of technology use in the production and for a three-year period because carnation is a perennial crop bearing flowers normally for three years from a single plantation. The average production is taken as fourteen flower stalks per plant per year.

The findings revealed that the total cost of production of carnation cut flower per ropani in the plastic house condition for a three-year period was Rs. 2.22 million of which the cost in the year 1 was Rs. 0.98 million and costs in year 2 and year 3 was Rs. 0.62 million each. The main reason for the high cost in the first year was due to the cost of planting materials which was wholly expended in the first year. Major component of the cost in carnation cut flower production was variable costs which constitute 80 percent of the total cost. The detail breakdown of the cost of production is presented in Table 1.

Table 1: Cost of production of carnation cut-flower

Rupees per Ropani*

| Particulars | Unit | Qty. | Rate (Rs.) | Year 1 | Year 2 | Year 3 | Total (Rs.) |
|--|------|-------|------------|------------------|-----------------|-----------------|------------------|
| Fixed Cost | | | | | | | |
| Green house construction | No. | 2 | 4,00,000 | 8,00,000 | - | - | 2,40,000 |
| Machinery and equipment (sprayer, stakes, ropes) | Set | 2 | 50,000 | 1,00,000 | - | - | 30,000 |
| Drip irrigation system installation (including water tank) | No. | 2 | 2,00,000 | 4,00,000 | - | - | 1,20,000 |
| Store house construction | No. | 1 | 2,00,000 | 2,00,000 | - | - | 60,000 |
| Total fixed cost | | | | 15,00,000 | | | |
| Annual fixed cost (Depreciation =TFC/10 years) | | | | 1,50,000 | 1,50,000 | 1,50,000 | 4,50,000 |
| Variable Cost | | | | | | | |
| Planting materials (tissue culture seedlings) | No. | 8,000 | 46 | 3,68,000 | - | - | 3,68,000 |
| Compost/Farm Yard Manure | Trip | 2 | 4,500 | 9,000 | 9,000 | 9,000 | 27,000 |
| Chemical fertilizer (NPK complex) | Kg | 12 | 600 | 7,200 | 7,200 | 7,200 | 21,600 |
| Micronutrients | Kg | 1 | 50,000 | 50,000 | 50,000 | 50,000 | 150,000 |
| Pesticides | LS | - | - | 10,000 | 10,000 | 10,000 | 30,000 |
| Full time labour | No. | 2 | 1,80,000 | 3,60,000 | 3,60,000 | 3,60,000 | 10,80,000 |
| Land lease | Year | 1 | 15,000 | 15,000 | 15,000 | 15,000 | 45,000 |
| Miscellaneous | LS | - | - | 15,000 | 15,000 | 15,000 | 45,000 |
| Total variable cost | | | | 8,34,200 | 4,66,200 | 4,66,200 | 17,66,600 |
| Total cost | | | | 9,84,200 | 6,16,200 | 6,16,200 | 22,16,600 |

*1 ropani is approximately 0.05 hectare

Source: Field Survey, 2020

The yield of carnation cut flower depended on various factors like varieties, season, type of plastic house, cultivation practices, among others. Some variations were found among the producers in terms of yield such as number of sticks per plant, duration of productive life, etc. Based on the information provided by the producers, the average yield and returns have been calculated which is presented in Table 2.

Table 2: Return from production of carnation

Rupees per Ropani

| Particulars | Unit | Quantity | Rate | First Year | Second Year | Third Year |
|-------------------------------------|------------|----------|------|------------|-------------|------------|
| Total income from flower sales | No. | 1,12,000 | 14 | 15,68,000 | 15,68,000 | 15,68,000 |
| Total cost | Rs. | | | 9,84,200 | 6,16,200 | 6,16,200 |
| Profit/Loss | Rs. | | | 5,83,800 | 9,51,800 | 9,51,800 |
| B/C ratio | | | | 0.6 | 1.5 | 1.5 |
| Cost of production per plant | Rs. | | | 8.8 | 5.5 | 5.5 |

Source: Field Survey, 2020

The total income per ropani per year from the sales of the carnation cut flower was Rs. 15,68,000. Reducing the total cost of production from the total income from the sales, the business was found profitable from the second year. The Benefit to Cost (B/C) ratio in the first year remained at 0.6 while from the second year it remains at 1.5. In the initial year, the cost of production per plant would be Rs. 8.8 while from the second year it would reduce to Rs. 5.50.

Marketing Cost of Carnation Cut Flower

Marketing cost refers to those costs which are incurred to perform various marketing activities involved in the movement of goods from producers to consumers. In the present study, marketing cost incurred by the sample producers of carnation cut flower in Kathmandu Valley was estimated. The detail breakdown of the marketing cost per unit of carnation cut flower incurred by the producers is presented in Table 3.

Table 3: Marketing Cost of Carnation Cut Flower

| Cost Items | Costs (Rs.) |
|---|-------------|
| Transportation | 0.8 |
| Labour | 0.4 |
| Transportation loss and unsold flower wastage | 0.4 |
| Packaging materials | 0.2 |
| Taxes and other expenses | 0.2 |
| Total | 2.0 |

Source: Field Survey, 2020

The findings reveal that the highest cost was incurred in the transportation followed by labour expenses (sorting, grading, packaging, loading, unloading), losses during transportation and wastage of unsold flowers, packaging material costs and finally taxes and other miscellaneous expenses.

Marketing Margin of Carnation Cut Flower

Marketing margin here denotes the difference between sales price and cost of production per unit of cut flower. The marketing margin of carnation in the study area is presented in Table 4.

Table 4: Marketing Margin of Carnation Cut Flower

| Particulars | Producers |
|---|-----------|
| Average Production Cost (A) | 6 |
| Average sales price (B) | 10 |
| Gross margin (B-A) | 4 |
| Marketing cost (C) | 2 |
| Profit per stick [(B-A)-C] (Rs.) | 2 |

Source: Field Survey, 2020

As shown in Table 4, total marketing margin and profit per unit of carnation for the producer was Rs. 4 and Rs. 2 respectively. This indicates that the returns to producers was satisfactory compared to other horticultural crops like fruits and vegetables. This clearly shows that the producers of carnation cut flower can make profit from the business.

Seasonal Pattern of Supply of Carnation Cut Flower

Like other agricultural crop production, carnation cut flower even being a perennial crop, the production generally fluctuated seasonally due to natural conditions of day length, sunshine hours, average temperature, humidity and moisture, etc. This fluctuation in the climatic condition had great bearings on the supply of the cut flower in the market. The information on seasonal fluctuation in the production of carnation cut flower was obtained from the producers and the findings are presented in Table 5.

Table 5: Seasonal Pattern of Supply of Carnation Cut Flower

(Sticks per day per ropani)

| Production Season | Months | Quantity Supplied by Individual Producer |
|-------------------|--------------------------------------|--|
| High | March, April, May, June, July | 300-400 |
| Low | January, February, December | 100-200 |
| Normal | August, September, October, November | 200-300 |

Source: Field Survey, 2020

The peak season of carnation production was in the months of March, April, May, June and July. In these months, producers produced on average 300-400 sticks per ropani per day. However, the actual level of production of individual farms depended on the variety of carnation cultivated, cultivation practices adopted, type of greenhouse structure (high tech greenhouse yielded more flowers due to controlled environment), etc. January, February and December were the months (winter season) of low production of carnation. In these months, producer's produced on average 100-200 sticks per ropani per day. Similarly, August, September, October and November were the period of normal production of carnation when producers on an average produced 200-300 sticks per ropani per day of carnation. This fluctuating supply of carnation during different months of the year calls for proper farm management practices and production scheduling to match the market demand.

Seasonal Pattern of Carnation Cut Flower Price

The seasonal pattern of carnation cut flower price experienced by the producers was inquired from the respondents and the findings are presented in Table 6.

Table 6: Seasonal Pattern of Carnation Cut Flower Price

(Rs. per stick)

| Price Trend | Months | Price |
|-------------|--|-------|
| Maximum | February, December | 18 |
| Minimum | January, March, August | 6 |
| Average | April, May, June, July, September, October, November | 10 |

Source: Field Survey, 2020

Producers received maximum price from the sales of carnation during the months of February and December. In the months of January, March and August, they reported to receive the lowest price. The months of April, May, June, July, September, October and November were considered by them as normal months where the price was neither too high nor too low.

The reasons for highest price received during the months of February and December provided by the respondents were due to high intensity of wedding ceremonies, socio-cultural occasions, Valentine's Day, etc. The reasons for lowest price received during the month of January, March and August as reported by the respondents were in these months the demand was very low and during low demand the prices tend to be low. Thus, price of carnation cut flower in Kathmandu Valley was basically determined based on season, demand and supply situation in the market.

Trend of Carnation Cut Flower Price

There was the lack of reliable time series data on trend of carnation cut flower price in the market. The information about the price was thus sought based on the experience of producers. None of the respondents reported constant and decreasing trend of the price. Majority (81 percent) of the respondents replied increasing trend of the price and the remaining 19 percent replied fluctuating trend in the price. The reasons for fluctuating trend of price of carnation cut flower in the market thought by the respondents were chiefly the mismatch between the supply and demand. No respondent replied artificial price hike or monopoly pricing or similar other malpractices for the increasing and fluctuating trend of price which is a good indication of healthy business environment.

Trend of Carnation Cut Flower Production

Alongside the seasonal trend of supply, demand and price of carnation, the long term trend of production of carnation cut flower in the Kathmandu Valley was also assessed from the producer respondents. Seventy percent producers replied that carnation production in their farms has increased within the recent ten years. Twenty percent of the producers replied that there was more or less constant production in their farms while the remaining 10 percent reported that the production has decreased. Producers replying decreasing and constant production reported that the main reason for this was high cost of production and more labour needed in the carnation cut flower production compared to other cut flowers and high profit margin in other cut flowers.

Pricing Mechanism of Carnation Cut Flower

The basis of sales price fixation of carnation by the producers was examined during the study. All producers replied that the price they received while selling to the wholesalers was fixed by the wholesaler (buyer) and they (sellers) were just the price takers. However, during peak season of demand when wholesalers demand more supply from the producers, producers usually asked the wholesalers to raise the price. The producers would actually know the price of their carnation cut flower only after they could sell it to the wholesaler.

Due to the lack of regular and reliable information about the supply of carnation from the producers, price of the carnation was determined only after it arrived at the wholesalers based on the overall demand and supply situation in the market. However, wholesalers sometimes used to pay premium price to the regular producers supplying high quality flowers during peak season of demand to retain the producers with them and gain the goodwill of the producers against competitors in the wholesale market.

Problems in the Carnation Cut Flower Production

The analysis of problems in carnation cut flower production along with the rank assigned by the respondents was carried out based on the responses of the respondents. The responses of the respondents are presented in Table 7.

Table 7: Problems in Production of Carnation Cut Flower

| S.N. | Production Related Problems | High | Moderate | Low | No | Total | Percent | Rank |
|------|--|------|----------|-----|----|-------|---------|------|
| 1 | Unavailability of planting materials | 6 | 4 | 2 | 3 | 15 | 80 | I |
| 2 | High cost of production and low profit | 5 | 2 | 2 | 6 | 15 | 60 | II |
| 3 | Low technical knowhow | 4 | 3 | - | 8 | 15 | 47 | III |
| 4 | Pest damage | 3 | 1 | 2 | 9 | 15 | 40 | IV |
| 5 | No insurance | 2 | 3 | - | 10 | 15 | 33 | V |

Source: Field Survey, 2020

Major problems identified by the producers of carnation were unavailability of adequate quantity, quality and variety of planting materials during planting season, high cost of production especially the high cost of tissue culture seedlings and high cost of human labour, low technical expertise of the producers on scientific cultivation practices and lack of trained extension personnel both at the public and private level, damage of the flower due to insect and diseases which degraded the quality of flower directly affecting the price the producers received from the wholesalers and the agriculture insurance not covering the insurance of cut flower sector.

Prospects of Carnation Cut Flower

Besides, problems of carnation cut flower, prospects of carnation cut flower development in Kathmandu Valley were also inquired. The major prospects of carnation cut flower assumed by the respondents along with the rank they assigned to individual prospect are presented in Table 8.

Table 8: Prospects of Carnation Cut Flower Market

| S.N. | Prospects of Marketing | High | Moderate | Low | No | Total | Percent | Rank |
|------|--|------|----------|-----|----|-------|---------|------|
| 1 | Increasing demand | 8 | 2 | 3 | 2 | 15 | 87 | I |
| 2 | Year-round demand | 7 | 3 | 2 | 3 | 15 | 80 | II |
| 3 | Huge demand supply gap | 7 | 2 | 2 | 4 | 15 | 73 | III |
| 4 | Increasing government support | 5 | 2 | 3 | 5 | 15 | 67 | IV |
| 5 | Possibility of year-round production | 4 | 3 | 2 | 6 | 15 | 60 | V |
| 6 | High possibility of marketing outside Kathmandu valley | 2 | 1 | 1 | 11 | 15 | 27 | VI |

Source: Field Survey, 2020

Major prospects of carnation cut flower identified by the respondents were increasing demand within the Kathmandu Valley, year round demand of carnation even though relative size of the demand during different months of the year varied greatly, huge gap in the present supply and demand of carnation in the Kathmandu Valley because the demand of Kathmandu Valley was met from the supply from other districts of the country and also from neighboring countries, possibility of carnation production throughout the year in the high-tech plastic house under controlled environment, and high possibility of marketing of carnation produced in the Kathmandu Valley to nearby districts and to the other major cities of the country.

4. CONCLUSION

Vast majority of the Nepalese commercial farmers lack the understanding as well as the skills in systematically maintaining farm operation records. Farm record keeping involves collecting an account of the daily operations like production, sales, income and expenses in the farm. These records are very crucial in running a successful farm business because they provide information for future analysis and business decision making. Poor record keeping and lack of detail business information affects directly on the future investments. This problem is also common in floriculture business which is an emerging commercial agribusiness in Nepal. In this regard, this study has attempted to analyze the economic aspect of carnation cut flower production in Kathmandu Valley based on the primary data collection from the commercial carnation producers.

Findings of the study reveal that the market prospect of the carnation cut flower in the Kathmandu valley was also quite good and the return from the carnation cut flower production was lucrative. Analysis of the costs and returns from production reveals that there is satisfactory returns to the producer. There is distinct seasonal pattern of supply of carnation in the Kathmandu Valley. The trend of carnation price in Kathmandu Valley seems to be increasing and similar was the trend of production. Major problems hindering the production of carnation cut flower in Kathmandu Valley includes the problems related to timely unavailability and high price of production inputs and low use of scientific production technologies. These problems are more technical rather than socio-cultural and political. Alongside these problems, the development of carnation cut flower have many prospects due to the reasons like increasing trends of demand in the market, availability of the flower throughout the year, high unmet demand of the carnation in the market. This calls for the intervention in the research and development activities for agricultural technology development and extension in the areas of production and post-harvest technologies and support for private sector investments.

The findings of the research provide solid base to conclude that, carnation cut flower has huge potential to emerge as an important sector in the agriculture economy of the Kathmandu Valley. Carnation has stood itself as a profitable agrobusiness as revealed by the positive sign and magnitude of the gross margin. In Kathmandu Valley, the domestic market is small but expanding. The sector is not fully dependent on domestic production and therefore has to depend on imported carnation cut-flowers during certain periods of the year. Thus, in the coming years, meeting the demand from domestic supply requires a strong strategic planning on production and marketing and coordinated efforts of stakeholders from both public and private sectors.

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