



STUDY ON PRODUCTION AND VALUE-CHAIN ASPECTS OF CARNATION IN KUMAUN HILLS OF UTTARAKHAND

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Abstract

Carnation is one of the important flowers grown in Kumaun hills of Uttarakhand. Present study aims at examining the profitability of Carnation flower and investigating the existing marketing system. The study revealed that the total cost of cultivation per hectare was India Rupee (INR) 8,99,210 in first year and INR 41,365 in second year. This indicates it is highly capital intensive crop. The gross return per hectare was INR 9,42,500 in the first year which increased to INR 11,78,125 in the second year. The estimated B-C ratio was 1.67 means Carnation cultivation is financially feasible. Net present value was positive and payback period was worked out to be one year. In the study area two marketing channels were functional, of which Farmer-Commission agent-Wholesaler- Retailer-Consumer was the most prevalent. It was found that retailers get higher relative share in consumer's rupee. It is suggested that liberal credit facilities need to be made operative, as Carnation is highly capital intensive enterprise. Development of wholesale markets and related infrastructure in terms of storage, packaging, transport and market information also need to be strengthened.

Keywords: Carnation, cultivation, marketing, value-chain

Introduction

There are more than 120 countries that are active floriculture production on large scale. The world floriculture trade is characterized by a high degree of concentration by product and sources. Developed countries in Europe, America, and Asia account for more than 90% of demand (Gule and Menon, 2013). International trade in floriculture, to a large extent is organized along the regional lines. Asia-Pacific countries are the main suppliers to Japan and Hong Kong. African, Middle Eastern, and other European countries are the principal suppliers to Europe's main markets, Colombia and Ecuador dominate the market in the USA. Global exports over the last few years have grown by more than 10% annually, and at this growth rate world exports are expected to reach US\$ 25 billion by 2012. Estimates of the annual consumption of commercially grown flowers worldwide vary by source and range from US\$ 40 - 60 billion. While worldwide consumption has been on the rise, consumers have also become more refined in demanding new products. To meet this growing and changing demand, production has continued to move from countries that have traditionally been consumers and growers, such as the Netherlands, to other relatively new producing countries such as Israel, Colombia, Ecuador, Kenya, and Ethiopia (Alargumani and Anugam, 1998).

World production of flowers and potted plants (in million Euros) (Country/Area 2010 share in 2010)

Country	Area 2010	Share in 2010
EU	10310	39.4%
USA	4719	18.0%
China	3306	12.6%
Japan	2606	9.9%
Columbia	1104	4.2%
Australia	763	2.9%
Canada	731	2.8%
South Korea	598	2.3%
Kenya	333	1.3%
Others	1726	6.6%
Total	26196	100.0%

Source: AIPH (International Association of Horticultural Producers)/ Union Fleurs (International Floricultural Trade Association)

The current trend of floriculture directly related to the increase in socio-economic status of the households worldwide. This has given promotion to the floriculture industry and to the development of new production centers in Asia and Africa which were earlier concentrated in Europe and USA. In Asia, India is one of leading producers and exporters of floriculture. Indian Floriculture Market Report 2018 says that the Indian Floriculture market was worth INR 130 Billion in 2017. The market is further projected to reach INR 394 Billion by 2023, at a CAGR of 20% during 2018-2023. (<https://www.researchandmarkets.com>).

Floriculture is the sunrise industry of India as it offers excellent self-employment and good remuneration for small and marginal farmers. The world annual growth rate for this industry is 8-10% per annum. In India, floriculture is emerging as an important commercial crop. A lot of importance has been given to this sector due to its multiple uses, satisfying the aesthetic needs of the people, creating more employment, ensuring higher rate of returns to rural people and facilitating earning more foreign exchange. More specifically, they are being used as raw material in the manufacture of essence, perfumes, medicines and confectioneries for direct consumption by the society. The annual domestic demand for the flower is growing at the rate of over 25% (www.vikaspedia.in). Owing to steady increase in demand of flower, floriculture has become one of the important commercial trades in agriculture. Government of India also has identified floriculture as a sunrise industry and accorded it 100% export oriented status. The liberalization of industrial and trade policies paved the way for development of export oriented production of cut flowers. The new seed policy had already made it feasible to import planting material of international varieties. Floriculture products mainly consist of cut flowers, pot plants, cut foliage, seed bulbs, tubers, rooted cuttings and dried flowers or leaves. The important floricultural crops in the international cut flower trade are rose, carnation, chrysanthemum, gerbera, gladiolus, orchids, anthurium, tulip and lilies. India is emerging as a reliable floriculture supplier to the world (Mukherjee and Shajahan, 1998)

Floriculture export for financial year 2012-13 (Apr - July)

Product	Quantity (MT)	Value (Lacs INR)
Floriculture	10,165.28	13,813.85

Source: APEDA Agri Exchange

Keeping in view the paramount importance of promotion of floriculture development in the country, and recognizing the importance of the sector's contribution to national agricultural economy, the Government of India has introduced many developmental programs mainly through the schemes of Ministry of Agriculture (National Horticulture Board, National Horticulture Mission, Horticulture Mission for North East & Himalayan States etc.) and Ministry of Commerce (APEDA).

Government has always been supporting the growth of this sunshine industry by offering incentives like:

- Setting up of floriculture units for producing and exporting flowers with technical support from Israeli and Dutch consultants,

- Tax benefits are offered in form of tax holidays and exemption from certain duties,
- Financial support is offered for setting pre-cooling and cold storage units, using improved packing material
- Setting up agricultural export zones in association with the state government to provide remunerative returns to farming community engaged in floriculture

Floriculture is fast picking up in Uttarakhand as farmers find it a lucrative option as against the traditional farming (www.eksparsh.wordpress.com). Uttarakhand is endowed with various agro-climatic conditions suitable for growing a large number of flowers. In the state, the area under floricultural crops has increased gradually. Uttarakhand provides an ideal condition for growing variety of flowers and quality cut flowers can be grown under naturally ventilated greenhouses (Singh *et al.*, 2013). Carnation is one of the major cut flower being grown in the Kumaun region of Uttarakhand. However till now only specialized cultivators have adopted growing of floricultural crops and that too on small scale. This is mainly because of the fact that there is a lack of information on economic aspect of its cultivation and marketing. Success of commercial floriculture depends largely on well-developed marketing system. Marketing of floricultural crops poses more problems as compared to other agricultural commodities because flowers are highly perishable and have to be carefully handled for transportation. Carnation (*Dianthus caryophyllus*) is an excellent and attractive commercial flower. It is important due to its excellent keeping quality, different colours, wide range of flowers and ability to with stand to long distance transportation. Keeping the view the above fact, present study was under taken with following objective:

- To examine the economics of production of Carnation
- To study the exiting marketing support system

Material and Methods

The study was undertaken in Kumaun hills of Uttarakhand. In Kumaun hills, the major flower production was concentrated in three districts namely Almora, Nainital and Bageshwar, out of which Almora and Nainital districts were selected for the study. The selection of districts was based on the larger area under flower crops. For the selection of the farmers, a list of farmers growing carnation was obtained from District Horticulture Offices (DHO) of Nainital and Almora. For the study of marketing aspects, Haldwani and Delhi markets were selected. The study was based on primary

as well as secondary data. The primary data was collected from flower growers and market functionaries' viz., commission agent, wholesaler-cum-commission agent, and retailers. The collected data related to demographics, land and other farm assets, flowers grown, cultivated area, cost of production, sale of flowers and different markets. Information was also collected on different constraints faced by farmers and market functionaries.

The secondary data were collected from various sources like National Horticulture Board (NHB); Directorate of Horticulture, Chaubatia, Uttarakhand; District Horticulture Office, Almora and Nainital.

Result and Discussion

The total cost of production (cost C3) worked out to be INR 8,99,210 in first year and INR 41,365 in second year, indicates it is high capital intensive crop. The cost of production of carnation is given in table 1. Cost A₁, B₁, B₂, C₁ & C₂ are INR 8,03,611, INR 8,04,346, INR 8,09,346, INR 8,12,464 and INR 8,17,464, respectively, in the first year. In second year,

the cost are INR 27,634, INR 28,369, INR 33,369, INR 32,605 and INR 37,605, respectively. The operational cost during first year was INR 21,449. Out of this total cost, hoeing /weeding was the most important item of cost in production, accounting for 24.98 per cent of the total operational cost followed by harvesting (18.81 per cent), pinching and disbudding (14.48 per cent), plantation (14.47 per cent) manures and fertilizers (7.94 per cent) and irrigation (6.84 per cent). During the second year, operational cost decreased to INR 11,376.94.

Material cost amounted to INR 7,76,607 during first year and INR 10,703 in second year. Cuttings was the main component of material cost accounting for 93.35 per cent of the total material cost, with the value of INR 7,25,000 per hectare. Miscellaneous cost comprised of 3.73 per cent of the total material cost. Total cost of marketing came out to be INR 1,62,583 in first year and INR 20,322 in second year. Total production and marketing cost amounted to INR 9,80,047 in first year and in second year it was INR 2,40,834.

Table 1: Cost of Cultivation of Carnation (INR per hectare) Figures in parenthesis is the per cent of the total

Particulars	Years	
	I	II
Operational cost		
Land preparation	1050.25 (4.89)	–
Sowing	5250.5 (24.48)	–
M/F application	5935.5 (27.67)	3550.85 (3.12)
Irrigation	1264.75 (5.89)	1264.75 (11.11)
Inter culture	1885.2 (8.78)	1970.23 (17.32)
Plant protection chemicals	450.25 (2.09)	640.11 (5.62)
Micro nutrient	435.05 (2.03)	575.25 (5.06)
Pinching & disbudding	2252.94 (10.50)	–
Harvesting	2925.25 (13.64)	3375.75 (29.67)
Sub Total	21449.69 (100)	11376.94 (100)
Material cost		
Cuttings	725000 (93.35)	–
FYM	13500 (1.74)	–
Fertilizers	1070 (0.14)	639.96 (5.98)
Plant protection chemicals	762.5 (0.09)	1051.72 (9.82)
Irrigation charges	1875 (0.24)	1875 (17.52)
Micronutrients	5400 (0.69)	7137 (66.67)
Miscellaneous	29000 (3.73)	–
Sub total	776607.5 (100)	10703.68 (100)
Fixed cost		
Depreciation	2300 (28.08)	2300 (28.08)
Land revenue	154 (1.88)	154 (1.88)
Rental value of land	5000 (61.06)	5000 (61.06)
Interest on fixed capital	735 (8.97)	735 (8.97)
Sub Total	8189 (100)	8189 (100)
Interest on working capital	3100	3100

Cost A ₁ =A ₂	803611.2	27634.62
Cost B ₁	804346.2	28369.62
Cost B ₂	809346.2	33369.62
Cost C ₁	812464.4	32605.33
Cost C ₂ =C ₂ *	817464.4	37605.33
Cost C ₃	899210.8	41365.86
Total cost of marketing	162583.3	203229.2
Yield(number of Spikes)	377000	471250
Price (INR / spike)	2.50	2.50
Gross return	942500	1178125
Total cost of production plus marketing cost	980047.7	240834.5
Net return over total cost of production plus marketing cost	-37547.7	937290.5

Where

Cost A₁ = All actual expenses in cash and kind incurred in production.

Cost A₂ = Cost A₁+rent paid for leased in land.

Cost B₁ = Cost A₁+interest on value of owed capital asset (excluding land).

Cost B₂ = Cost B₁+ rental value of owned land (net of land revenue) and rent paid for leased in land.

Cost C₁= Cost B₁+imputed value of family labour.

Cost C₂ = Cost B₂+ imputed value of family labour.

Cost C₂* = Cost C₂ estimated by taking in to account the statutory minimum or actual wages whichever is higher.

Cost C₃= Cost C₂* +10 % of cost of C₂* on account of managerial function performed by farmer.

As it is seen from the table that the return was negative in the first year i.e. the carnation cultivators incurred a loss of INR 3,757 per hectare whereas in the second year, the return realized was INR 9,37,290. Since the benefit-cost ratio and net present value techniques are function of discount rate, these measures were obtained at 12 per cent discount rate. The estimated benefit cost ratio of carnation cultivation was 1.67. B-C ratio indicates that carnation cultivation is financially feasible. The net present value was estimated to be INR 7,13,677. The positive net present value indicates that the carnation cultivation is financially feasible as it shows the absolute profitability. The payback period was worked out to be one year. It means that would take one year to just cover the capital cost.

To appraise the economics of carnation cultivation, the appraisal techniques like B-C ratio, payback period and net present value were used and results are presented in Table2.

Table 2: Benefit-cost Ratio, Net present value and Payback period of Carnation Cultivation

Indicators	Value
Benefit-cost ratio	1.67
Net present value (INR)	7,13,677.5
Payback period (Years)	1.04

Existing marketing support system

In the study area, the two marketing channels were prevalent through which the growers of carnation sold their produce.

1. Farmer - Commission agent – Wholesaler – Retailer - Consumer
2. Farmer - Commission agent – Retailer - Consumer

The cost of marketing, market margin and price spread were worked out and shown in Table 3 to 4 for each of the channel I and II. In channel I, the producer sells his produce to wholesaler through commission agent. Average price received by farmer, in the channel was found to be INR 30 per dozen of spikes.

Table 3: Marketing Cost and Margins of Carnation (per dozen) at Different Stages of Marketing Channels: Value-chain approach

Market functionaries	Price received (INR)	Purchased price (INR)	Marketing cost (INR)	Marketing cost as % of cost to consumer	Absolute margin (INR)	Price spread (INR)
Channel-I						
Producer	30	–	7.0	9.72	–	-
Wholesaler	37	30	3.25	4.51	7	42
Retailer	72	37	5.25	7.29	35	-
Channel-II						
Producer	32	–	6.5	8.66	–	-
Retailer	75	32	5.65	7.53	43	43

Table4: Market Margin of Carnation (per dozen) at Different Stages of Marketing Channels: Value-chain approach

Market functionaries	Net margin (INR)	Percentage margin (INR)	Mark up (%)	Percentage share in consumers INR (%)
Channel –I				
Producer	–	–	–	41.66
Wholesaler	3.75	18.91	23.33	9.72
Retailer	29.75	48.61	94.59	48.61
Channel –II				
Producer	–	42.66	–	42.66
Retailer	37.35	57.33	134.37	57.33

In channel II, the price of INR 32 per dozen of spikes received by farmer was higher than that in channel I (INR30 per dozen of spikes). Retailer in channel II, earned a net margin of INR 37.35 per dozen of spike and had a share of 57.33 per cent in consumer rupees. The commission agent, as middleman between farmer and retailer, receive 15 per cent of the value of produce sold.

Conclusion and Policy Implications

The total cost of production (cost C_3) of Carnation was worked out to be INR 8,99,211 in first year and INR 41,366 in second year. Cost A_1 , B_1 , B_2 , C_1 & C_2 are INR 8,03,611, INR 8,04,346, INR 8,09,346, INR 8,12,464 and INR 8,17,464, respectively in first year. In second year, the cost was INR 27,635, INR 28,370, INR 33,370, INR 32,605 and INR 37,605, respectively. The operational cost during the first year was INR 21,450. Out of this total cost hoeing /weeding was the most important item of cost, accounting for 24.98 per cent of the total operational cost followed by harvesting (18.81 per cent), pinching and disbudding (14.48 per cent), plantation (14.47 per cent) manures and fertilizers (7.94 per cent) and irrigation (6.84 per cent). During the second year, operational cost was decreased to INR 11,377. Material cost amounted to INR 7,76,608 during first year and INR 10,704 in second year. Cutting constitutes the chief component of material cost accounting for 93.35 per cent of the total material cost, with the value of INR 7,25,000 per hectare. Total cost of marketing came out to be INR1,62,583 in first year and INR 2,03,229 in second year. Total production and marketing cost amounted to INR 9,80,048 in first year and in second year it was INR 2,40,835. During first year the yield of carnation was estimated to be 3,77,000 spikes per hectare, which go up to 4,71,250 spikes per hectare in second year. The gross return per hectare was worked out to be INR 9,42,500 in the first years which increase to INR 11,78,125 in the second year, i.e., full flowering year. The returns were negative in the first year. In the second year, the return was estimated at INR 9,37,291. The benefit cost ratio was found to be

1.67, net present value to be INR 7,13,678 for entire expected life of two years and payback period of one year fourth months. Thus, the cultivation of carnation in the study area was found to be economically viable. In case of carnation two channels were prevalent. These are:

1. Farmer- Commission agent- wholesaler-retailer-consumer
2. Farmer- Commission agent-retailer-consumer

Around 90 per cent of the farmers sold their flowers to wholesaler in the flower market via commission agent. The cost of commission (15 per cent of value of sale) and transport was born by the farmers. Wholesalers then after picking up flowers from the *mandi* sell them to the consumers. Only 10 per cent of the farmers sold their flowers through channel II. The net margin received by retailer was INR 37.35 per dozen of spike in channel II and had a share of 57.33 per cent in consumer rupees.

The Kumaun hills of Uttarakhand holds a great potential for floriculture development due to rich natural resources and salubrious climate coupled with pollution free environment. This potential can be harnessed after major bottlenecks are taken care of. Thus, a few suggestions are offered based on the findings of the study. These are as follows:

- Setting up and strengthening of necessary infrastructure for providing quality planting material of improved varieties. This also necessitates prompt action of scientists working on research stations.
- Provision of cost effective low cost environment-friendly cool chambers on farm and railway stations; and timely availability of production inputs like fertilizers and plant protection chemicals.
- Strengthening of wholesale markets by providing proper regulatory frame work, provision of market information, provision of quality controls, regular and timely payments and storage facilities etc.

- Lack of market information emerged to be a severe constraint and farmers have no information about prices and demand in *mandi*. Hence market information system needs to be strengthened and made effective by making available the modern means of communication for good connectivity.

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