Exploring Market Dynamics of Flowers under Protected Cultivation: A Case Study of Mandi District (H.P.)

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Abstract

An economic analysis of flower marketing under protected cultivation was conducted in Mandi district of Himachal Pradesh. A sample of 80 flower growers was randomly selected and categorized into marginal and small farmers based on their farm size. Only one marketing channel was identified for flower marketing in the study area i.e. Producers - Wholesaler/Commission Agent - Retailer – Consumer. Producer's net price per box was found to be highest in Eustoma (Rs 18500) followed by Lilium (Rs 15000), Gypsophila (Rs 13500), Limonium (Rs 10500) and Carnation (Rs 7819). Marketing costs were highest for Lilium (Rs 969 per box) because of high price of packaging material for Lilium and lowest in Carnation (₹938 per box). Eustoma also had the highest Producer's share in consumer rupee. The growers faced significant challenges in marketing of flowers like lack of regulated markets, inadequate pricing, transportation issues and limited market information. These findings emphasize the importance of targeted interventions to tackle marketing constraints and improve the efficiency and profitability of protected flower cultivation in the region.

Keywords: Floriculture, Protected cultivation, marketing channel, marketing cost, constraints

JEL Codes: Q12, Q13, Q14

Introduction

India's floriculture industry has seen remarkable growth, transitioning from a domestic pursuit to a lucrative commercial venture (Taj *et al.,* 2013; Tiwari *et al.*, 2022). India notably stands out as a promising hub in this sector (Akintoye, 2011; Kaur *et al.*, 2020). It presents exciting opportunities for self-employment and substantial profits, particularly benefiting small-scale farmers (Vahoniya *et al.,* 2018). Recognized by the Government of India as a flourishing industry with cent per cent export-oriented status, floriculture exhibits promising growth rates, significantly contributing to the country's economy and foreign exchange reserves (Singh, 2017; Patil *et al.*, 2022). With approximately 285 thousand ha dedicated to cultivation, the sector yielded a remarkable 3097 thousand tones of flowers, encompassing both loose and cut flowers. Noteworthy contributions come from states like Kerala, Tamil Nadu and Karnataka (Anonymous, 2023). Moreover, India's floriculture exports were valued at $88.35 million in 2022-2023, underlining its burgeoning global presence, with major importing nations including the USA, Netherlands, UK and UAE (APEDA, 2023).

Himachal Pradesh, situated in the northwestern region of India, boasts a diverse range of agro-climatic conditions that are ideal for floriculture. Notably, districts such as Sirmour, Mandi and Solan of HP have seen a notable surge in flower production, particularly through protected cultivation methods. This growth can be attributed to the state's conducive environment for floriculture, aided by government initiatives like the Horticultural Technology Mission and the Pandit Deen Dayal Kisan Bagwan Samridhi Yojna. During 2021-22, the estimated area under flower production in Himachal Pradesh was 381 ha, out of which 138 ha were under protected cultivation. The largest area was under Carnation (101 ha) with an estimated production value of Rs. 46,07,500 per kg, followed by Chrysanthemum cut flowers (83 ha) with an estimated production value of Rs. 6,62,60,000 per kg (Anonymous, 2022). The Protected flower cultivation is gaining momentum in Seraj Valley, Himachal Pradesh, with varieties like Carnation, Lilium, Limonium, Eustoma and Gypsophila. Seraj Valley is becoming known as the "Greenhouse Valley" due to the proliferation of greenhouse and polyhouse structures. Protected flower cultivation not only offers economic promise but also provides sustainable opportunities for educated unemployed youth (Bhegede, 2002; Punera *et al.*, 2017; Ghangash *et al.*, 2018). Despite the notable increase in flower production, the marketing of

flowers remains a major problem in Himachal Pradesh. To address this issue, the present study focused on examining the economics of flower marketing and identifying the significant challenges faced by farmers in marketing of floral produces. By analyzing the current market dynamics, constraints, and opportunities, our objective is to provide valuable insights aimed at enhancing the marketing landscape for flower growers in the region.

Data Sources and Methodology

The present study was conducted in the Mandi district of Himachal Pradesh, where the cultivation of protected flowers is rapidly emerging as a flourishing enterprise. This practice not only shields farmers from the vagaries of erratic weather but also provides promising livelihood opportunities, particularly for the educated unemployed youth of the state. Mandi district comprises 14 community development blocks, of which Gohar, Seraj, Sundernagar and Balh had a higher concentration of farmers engaged in protected flower cultivation. A list of protected flower growers in these blocks, along with details of their polyhouse areas, was obtained from the offices of the Deputy Director, Department of Horticulture. The number of protected flower growers varied across the blocks, with Gohar having 100 growers, Seraj 80, Sundernagar eight and Balh four. For this study, a mixed-method sampling approach was employed, incorporating purposive sampling and simple random

sampling without replacement. The four blocks i.e. Gohar, Seraj, Sundernagar and Balh were purposively selected due to their relatively higher numbers of farmers engaged in protected flower cultivation. From Gohar and Seraj, where the number of flower growers was significantly higher, 40 per cent of the growers were randomly selected using a proportional allocation method, resulting in a sample of 72 growers. However, due to the unavailability of some farmers, data was collected from 68 respondents in these two blocks. In Sundernagar and Balh, where the number of flower growers was small, comprising eight and four growers respectively, a complete enumeration was conducted. This resulted in a final sample of 80 respondents to conduct the study and achieve the set objectives. Data collection was conducted during 2021–22 using a structured and comprehensive questionnaire specifically designed for this study, integrating both primary and secondary data sources for a robust analysis of the farming practices and challenges.

Analytical Framework

Market analysis:

The study undertook a focused examination of the marketing dynamics surrounding flower cultivation within the Mandi district of Himachal Pradesh. Through a rigorous analysis of marketing efficiency, margins and costs incurred throughout the supply chain, particular emphasis was placed on understanding the intricacies of bringing flower produce
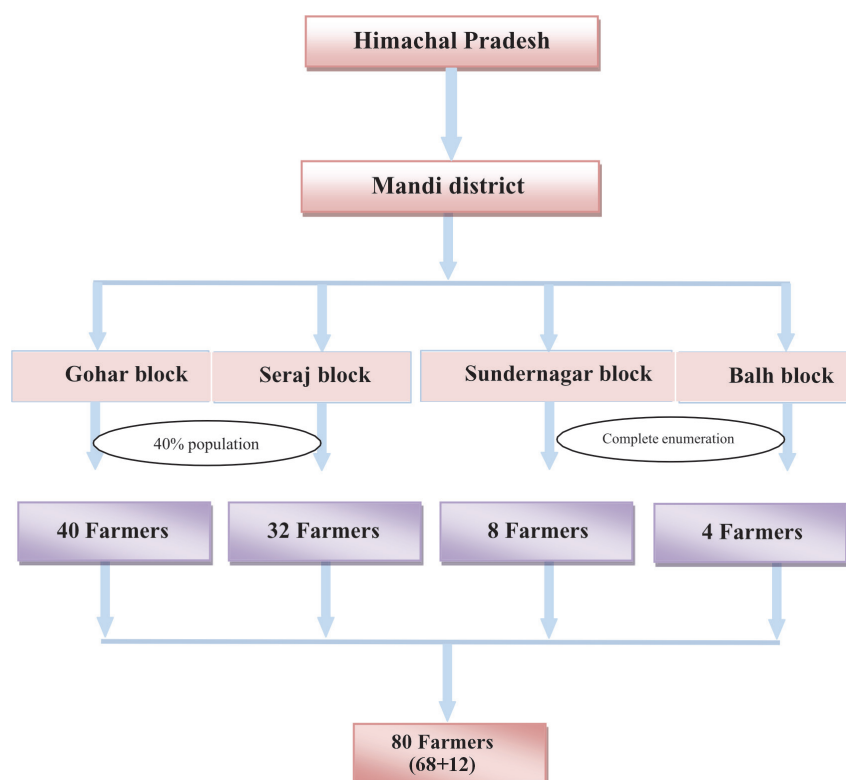

Figure 1. Sampling plan of study area

from growers to consumers.

i) Marketing efficiency: Marketing efficiency can be evaluated through different approaches, each offering distinct perspectives. The ratio of output to input approach measures efficiency as the ratio of total returns from marketing to total costs incurred, giving a broad overview of system performance. Shepherd's Formula, another common method, calculates efficiency by comparing the value of goods sold to the total marketing costs, emphasizing the relationship between final price and costs. However, these methods often do not account for the roles of intermediaries or the distribution of costs and margins across the marketing channel. Acharya's Approach (2003) is notable for its comprehensive evaluation, incorporating retailer prices, marketing costs, and margins to offer a more precise assessment. This method helps identify inefficiencies and profit distribution among intermediaries, making it a preferred choice in studies by Bishnoi *et al*. (2017), Chand *et al.* (2020), Chand *et al.* (2021), and Manohar and Balachandra (2022) for analyzing marketing efficiency.

The formula of this method is:

$$ME = \frac{RP}{MC + MM} - 1 \qquad .... (1)$$

Where,

ME = Marketing efficiency
MC = Total marketing cost
RP = Retailer's price
MM = Total marketing margins

ii) Marketing margin: The marketing margin of middlemen is a key indicator of profitability and market efficiency, calculated as the difference between their total receipts and expenses, including the purchase price and marketing costs. Studies such as Kumar (2017), Punera *et al*. (2017), and Ravindra (2020) have extensively employed this approach to analyze marketing margins in floriculture and agricultural supply chains, highlighting its relevance in understanding price spreads and cost distribution. The formula used to estimate the marketing margin is as follows:

$$A_{mi} = P_{ri} - (P_{pi} + C_{mi}) \qquad ....(2)$$

Where,

A_{mi} is the absolute marketing margin of ith middleman
P_{ri} is the total value of receipts per unit
P_{pi} is the purchase value per unit
C_{mi} is the cost incurred on marketing per unit.

iii) Marketing cost: The marketing costs incurred by different stakeholders are essential for evaluating agricultural supply chain efficiency. This approach has been widely adopted in studies by Bhegede (2002), Kumar (2017) and Chand *et al*. (2021), providing detailed insights into marketing cost distribution. The total marketing cost (MC) incurred by the producer/seller and various intermediaries

is calculated as:

$$MC = C_F + C_W + C_R \qquad ....(3)$$

Where,

MC is the marketing cost
C_F is the cost incurred by farmer
C_W is the cost incurred by wholesaler
C_R is the cost incurred by retailer.

Analysis of marketing problems:

i) **Garrett's method of ranking:** This method was utilized to evaluate the constraints encountered by the sampled flower growers. In this approach, respondents were asked to rank the problems related to marketing aspects. This method is given by following equation:

$$\text{Percent Position} = \frac{(R_{ij} - 0.5)}{N_j} \qquad .... (4)$$

Where:

R_{ij} = Rank given to i^{th} position by the jth individual
N_j = Number of problems ranked by j^{th} individual.

ii) **Chi-square test:** To assess whether there exists a significant difference in the problems faced by marginal and small flower growers. This statistical test allows for the comparison of categorical variables and helps in determining if there is an association between the farm category (marginal or small) and the specific marketing problems reported by the growers.

Where,

The detail of Chi-square test is given as under:

$$\sum_{j=1}^{L} \sum_{i=1}^{K} \frac{(O-E)^2}{E} \sim \chi^2 (L-1)(K-1) \text{ d. f.} \qquad .... (5)$$

O = Observed values
E = Expected values
K = number of problems
L = number of farm size groups

Results and Discussion

Marketing of protected flowers

Marketing of flowers requires careful handling from assembly to transportation, to ensure quality. The absence of essential infrastructural facilities such as cold storage, regulated markets and inadequate road infrastructure in Himachal Pradesh exacerbates the challenges in marketing operations. Moreover, the study area's considerable distance from the flower market in Ghaziabad further complicates the situation. To optimize returns, flowers are categorized into various grades, although grading was conducted solely for Carnation and Lilium among the selected flowers. Packaging was executed using cardboard boxes, with the number of bunches per box varying by crop: 50 bunches for Carnation, 40-50 bunches for Lilium and 60 to 80 bunches

each for Limonium and Gypsophila. Following packaging, transportation becomes paramount for an effective marketing system, alleviating burdens on farmers. However, given the study area's significant distance from the main flower market, farmers incurred large transportation costs to deliver their produce to the wholesale market. Consequently, producers had to transport their packages to the roadhead daily or weekly, depending on the yield of flowers.

Marketing channels

Marketing channels serve as pathways for agricultural produce to travel from producers to consumers, involving different entities that facilitate this movement within the marketing system. These channels play a crucial role in the sale of farmer's produce. The selection of marketing channels significantly impacts the absolute and relative share of producers in the consumer's rupee. In the study area, a single predominant marketing channel was observed: Producers - Wholesaler/Commission Agent - Retailer - Consumer. Nearly all the produce flowed through this channel for sale. The price spread through this given channel has been presented in Table 1 as given below.

The marketing costs, margins and efficiency of selected flowers are presented in Table 2 based on data collected from farmers and market functionaries. Among the flowers, Eustoma fetched the highest price for producers at Rs 18,500 per box, followed by Lilium (Rs 15,000 per box), Gypsophila (Rs 13,500 per box), Limonium (Rs 10,500 per box) and Carnation (Rs 7,819 per box). Lilium incurred the highest marketing costs (Rs 956 per box) due to the expensive packaging material, while Carnation had the lowest costs (Rs 938 per box). The marketing margin of functionaries was highest for Eustoma (Rs 3,975 per box), followed by Lilium (Rs 3,650 per box), Gypsophila (Rs 3,415 per box), Limonium (Rs 2,910 per box) and Carnation (Rs 2,729 per box). The producer's share in the consumer's rupee was the highest for Eustoma (79%), followed by Lilium (76%), Gypsophila (76%), Limonium (73%) and Carnation (68%). Eustoma also demonstrated the highest marketing efficiency (3.17) due to its substantial producer share in the consumer's price.

Table 1: Price spread of selected flowers through marketing channel

(Rs /Box)

S.N.	Particulars	Carnation	Lilium	Limonium	Gypsophila	Eustoma
		Price spread of selected flowers through marketing channel				
A	**At producers level**					
I	Producer's net price	7818.75	15000.00	10500.00	13500.00	18500.00
II	Assembling charges	12.05	10.05	10.08	10.08	10.08
III	Grading charges	10.53	10.53	0.00	0.00	0.00
IV	Packing material	180.37	201.63	220.00	210.00	210.33
V	Labour charges	17.24	15.64	10.24	10.24	10.24
VI	Transportation	320.00	320.00	320.00	320.00	320.00
VII	Sub-total (I to VI)	540.19	557.85	560.32	550.32	550.65
VIII	Wholesalers price	8358.94	15557.85	11060.32	14050.32	19050.65
B	**Wholesaler/Commission Agent price**	8358.94	15557.85	11060.32	14050.32	19050.65
I	Loading/unloading	18.03	18.03	18.03	18.03	18.03
II	Miscellaneous	11.25	11.25	11,25	11.25	11.25
III	Commission charges	300.00	300.00	300.00	300.00	300.00
IV	Sub-total (I to III)	329.28	329.28	318.03	329.28	329.28
V	Margin of Wholesaler/ Commission Agent	547.30	1050.00	610.00	915.00	1175.25
C	**Retailer's price**	**9235.52**	**16937.13**	**11988.35**	**15294.60**	**20555.18**
I	Marketing cost of retailer	68.68	68.68	68.68	68.68	68.68
II	Retailer's margin	2181.25	2600.00	2300.00	2500.00	2800.00
III	Consumer's price	11485.45	19605.81	14357.03	17863.28	23423.86

Table 2: Marketing Efficiency, Marketing Cost and Marketing Margin of selected flowers

(Rs/box)

S.N.	Particulars	Carnation	Lilium	Limonium	Gypsophila	Eustoma
I	Producer's price	7818.75	15000.00	10500.00	13500.00	18500.00
II	Marketing margin	2728.55	3650.00	2910.00	3415.00	3975.25
III	Marketing cost	938.15	955.81	947.03	948.28	948.61
IV	Consumer's price	11485.45	19605.81	14357.03	17863.28	23423.86
V	Producer's share in consumer rupee	68.00	76.46	73.13	75.57	78.98
VI	Marketing efficiency	1.51	2.67	2.11	2.51	3.17

Marketing constraints

The activity of protected cultivation has seen a notable increase in the study area over time. However, due to the perishable and bulky nature of the selected flowers, growers encountered several challenges in marketing of flowers as shown in Table-3. It's observed that these challenges vary significantly from one location to another and from one grower to another. A majority of farmers face multiple issues across various aspects of their operations, necessitating a comprehensive approach to address these challenges. Utilizing Chi square tests and Garret's ranking, the study identified and categorized problems among different farm sizes. The analysis reveals that responses to certain problems significantly vary between farm categories, indicating that the impact of these challenges is not uniformly distributed among the growers. In the marketing of flowers, numerous constraints were reported, including high transportation costs, inadequate pricing, absence of regulated markets, insufficient transportation facilities, costly and time-consuming transportation to markets, high commission charges, and lack of market facilities for loading, boarding, and parking vehicles. Among these challenges, lack of availability of regulated market, inadequate price and lack of transportation facilities emerged as the significant constraints. The lack of a regulated market emerged as the major concern among the challenges perceived by the farmers which has given rise to other types of constraints in efficient marketing. The absence of a structured market framework not only exacerbates the logistical difficulties associated with transportation but also leads to pricing inefficiencies, making it challenging for producers to receive fair price for their produce. The problem statement for this study was formulated based on observed data and insights from previous research on flower marketing. Studies by Dar *et al*. (2017), Kaur *et al*. (2020), Sehgal and Komal (2020), Tiwari *et al*. (2020), and Patil *et al*. (2022) highlighted several key challenges faced by flower growers, including high transportation costs, inadequate pricing mechanisms, absence of regulated markets and insufficient infrastructure.

Garret ranking technique

As presented in Table 4 it is evident from the analysis that several key problems emerged as significant challenges for flower growers in the study area. Foremost among these was the persistent issues of lack of availability of regulated market, with a high Garret mean score of 49.84 percent, indicating the severity of this challenge. Following closely behind was the inadequate price which has a score of 49.34. Additionally, Lack of market information, with a score of 48.76, and availability of the means of transportation, scoring 46.19, further compounded the challenges faced by growers. The lack of awareness among growers, with a score of 44.62, also emerged as a significant hurdle, emphasizing the crucial role of education and training in enhancing flower marketing practices. Furthermore, a range of other problems were identified in the study area, each presenting its own set of obstacles. These included challenges such as inclusion of middlemen (VI), market yard-related or structural issues (VII), high labor charges (VIII), Wastage and risks (IX) and the costly and time-consuming transportation to markets (X). Additionally, high transportation cost (XI) posed significant challenges for growers. Despite their impact, these issues received varying levels of attention, as reflected in their respective Garret scores, with scores ranging from 44.57 to 36.72. Conversely, certain problems such as the lack of proper road links, lack of market facilities in loading, boarding and parking of vehicle and high commission charges were also reported, with Garret scores of 29.19, 34.43 and 36.15, respectively. Addressing these multifaceted challenges requires a comprehensive approach that considers the diverse needs and circumstances of flower growers, ultimately fostering a more conducive environment for sustainable and profitable flower cultivation.

Conclusion and Policy Implications

Floriculture has shown significant growth in Himachal Pradesh, particularly in the Mandi district, where flowers production has gained notable momentum. The study showed that all selected farmers are following a common marketing channel, but there are significant variations in marketing costs

Table 3: Farm category wise problems perceived by flower growers in marketing of flowers in the study area
(Multiple response per cent)

S. N.	Problems	Farm Size			Chi Sq.
		Marginal	**Small**	**Overall**	
I	High transportation cost	0.14 (4.81)	0.27 (7.89)	0.16 (5.28)	0.75
II	Inadequate price	0.29 (9.62)	0.73 (21.05)	0.35 (11.38)	4.27*
III	Lack of availability of regulated market	0.65 (21.63)	0.64 (18.42)	0.65 (21.14)	3.40*
IV	Taking produce to market costly and time consuming	0.46 (15.38)	0.27 (7.89)	0.44 (14.23)	2.41
V	Lack of transport facilities	0.26 (8.65)	0.64 (18.42)	0.31 (10.16)	3.52*
VI	Higher commission charges	0.71 (23.56)	0.55 (15.79)	0.69 (22.36)	1.53
VIII	Lack of availability of market facilities for loading boarding and parking of vehicle	0.49 (16.35)	0.36 (10.53)	0.48 (15.45)	1.26
	Total	3.01 (100.00)	3.45 (100.00)	3.08 (100.00)	

Figure in the parentheses is percentage to total

Table 4: Farmers' perceptions and problems faced by flower growers in the study area

Sr. No.	Problems	Mean Score	Rank
I	Lack of availability of regulated market	49.84	I
II	Inadequate price	49.34	II
III	Lack of market information	48.76	III
IV	Availability of the means of transportation	46.19	IV
V	Lack of awareness	44.62	V
VI	Inclusion of middlemen	44.57	VI
VII	Market yard-related or structural issues	39.58	VII
VIII	Higher labour wages	38.79	VIII
IX	Wastage and risks	38.24	IX
X	Taking produce to market costly and time consuming	36.93	X
XI	High transportation cost	36.72	XI
XII	High commission charges	36.15	XII
XIII	Lack of market facilities loading boarding and parking of vehicle	34.43	XIII
XIV	Lack of proper road links	29.19	XIV

and efficiency across different flower varieties. The flower production in the region is still in its infancy, contributing to the reliance on a single marketing channel. Eustoma was identified as the most profitable flower, followed by Lilium, Gypsophila, Limonium and Carnation. Lilium incurred the highest marketing costs due to expensive packaging, while Carnation had the lowest. The study also highlights challenges faced by growers, including high transportation costs, inadequate pricing, and the lack of regulated markets and infrastructure. Establishing regulated markets is a primary solution to stabilize prices and reduce intermediary influence. Improvements in infrastructure and market access are crucial, including the establishment of high-quality transportation systems such as temperature-controlled vehicles, well-

ventilated containers and protective packaging to maintain flower quality during transit. Storage facilities located near regulated markets and production areas can further enhance efficiency and the freshness of flowers, ensuring that they reach consumers in optimal condition. Disseminating technical knowledge through training programs on protected flower cultivation is vital for supporting sustainable practices and improving production. Policymakers must prioritize the implementation of fair pricing mechanisms, which remain challenging due to the dominance of intermediaries and inconsistent market structures. While platforms like the International Flower Auction Bangalore (IFAB) help by promoting direct sales, transparency, and payment security, they do not fully address the broader market where intermediaries still play a significant role. To combat this, policymakers should focus on creating regulated market systems that standardize pricing, minimize intermediary influence, and enhance logistics to ensure growers receive fair and stable prices for their products. Through comprehensive policy initiatives, Himachal Pradesh can strengthen its flower marketing ecosystem while maximizing the potential of protected cultivation for sustainable production.

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