



Marketing Efficiency of Apple in Shimla District of Himachal Pradesh, India

Sristi Sharma ^{a++}, Deval B. Patel ^{b#}
and Shaktiranjan Panigrahy ^{a#*}

^a International Agribusiness Management Institute, Anand Agricultural University, Anand, India.

^b College of Food Processing Technology and Bio-Energy, Anand Agricultural University, Anand, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Purpose: The role of apple production and marketing in hilly states such as Himachal Pradesh is very crucial. Yet the challenges it has been facing in the line of perishability and marketing inefficiencies is abominable. The study aims in identifying the marketing channels of apple in Shimla district. It also estimates the marketing efficiency, price spread among the prevailing distribution channels.

Research Methodology and Data Collection: The methodology for the study includes a multi-stage random sampling technique that focuses on the major apple growing tehsils like, Theog and Rohru. The study is based on primary data collected from 60 farmers and 5 intermediaries through personal interviews conducted from January to March 2024.

Findings: Five prominent distribution channels were identified. It was found that out of all the channels, channel-5 was most preferred by the farmer due to the harmonious relationship between

⁺⁺ Research Scholar;

[#] Assistant Professor;

^{*} Corresponding author: E-mail: panigrahy.shakti@gmail.com;

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producers and the intermediaries that led to quicker sales. Highest marketing efficiency was exhibited by Channel -3 (1.12) that included only wholesalers and retailer in the chain. Whereas the lowest marketing efficiency was exhibited by Channel-4 (0.69) that included pre-harvest contractor and multiple intermediaries.

Implications: The study concludes that the primary reason for the reduced profits is the inefficient marketing systems such as high intermediary margins and lack of infrastructure. For significant improvements in marketing efficiency, collective marketing, better logistics, infrastructure investment, and regulatory support should be provided for the intermediaries. The findings underscore the need for enhanced cold storage, transportation, and market infrastructure to support apple growers and reduce price volatility, thereby improving their economic well-being.

Keywords: Apple; marketing channel; marketing efficiency; marketing margin; price spread.

1. INTRODUCTION

Over the years, growing importance of fruits and vegetables in the consumers' diet transform the thalinomics from a carbohydrate dominated food to a nutritious one (Government of India, 2019/ Economic survey, 2019-20), pushed the producers to re-evaluate their production pattern keenly despite many hurdles in this path due to perishable nature of commodities and requisite infrastructures in the direction of support. Many times, due to seasonal aspect of production within a specific geographic boundary escalate price for the consumers with high number of intermediaries, inefficiency in the agro system, and with substantial quality loss (Acharya and Agarwal, 2019).

Apple is a dominant fruit in the temperate belt of the country, harvested largely in September; without a proper storage and logistic support could not reap a value for its stakeholders. Himachal Pradesh, Jammu & Kashmir and Uttarakhand of India¹ produce a sizeable yield (2428.15 MT) of apples for the consumers (National Horticultural Board, 2023) but with the climate change the production is stagnant, and many areas, declining which stimulates producers to think about the next cycle of production searching for the effective markets where they can deliver their harvested apples (Chand et al., 2017).

Though three states share 90 percent of the apple production, in hilly regions of Himachal Pradesh growers have greater competitive advantage over the others (Weinberger and Lumpkin, 2007). Hartta, (2023) because of the geographical and infrastructural advantages that make Himachal Pradesh a leader in apple

production. However, in these highlands, apple marketing is more intricate. Most farmers are small, marginal producers who lack organization, literacy, and dispersal. They lack resources, including time, education, and access to promote their produce. Furthermore, because of their precarious financial situation, they are unable to bargain effectively and are compelled to sell their marketable produce at a reduced price as soon as the harvest occurs. The critical role of marketing channels and infrastructural bottleneck of apple in Himachal Pradesh was highlighted in the literature (Guleria et al., 2022; Bharti and Devi, 2023). To stress the importance of apple production in Himachal Pradesh (Hartta, 2023), stated that a mainstay of Himachal Pradesh's agricultural industry, show that the apple production accounts for the 85 percent of the state's total fruit production occupying nearly half the land dedicated to fruit cultivation. He attributed this success to the state's unique geography namely the cool temperate climate and high altitude of central districts like Shimla and Kinnaur providing the perfect environment for apple growing.

A matter of concern is that the apple production in Himachal Pradesh during the period from 1973 to 2017 is showing a continuous decrease in productivity and apple production (Sharma et al., 2022) that motivate researchers to find best markets for the produce by identifying efficient marketing pattern which generate value in the system. Even, the presence of Himachal Pradesh Horticultural Produce Marketing and Processing Corporation Limited (HPMC), Himachal Pradesh State Cooperative Marketing and Consumers Federation Limited (HIMFED), National Agricultural Co-operative Marketing Federation of India Limited (NAFED) and Fruit Growers Association create a cluster approach to apple marketing in Himachal Pradesh with a sound business ecosystem. With this backdrop,

¹ The apple produced in the hilly terrains of the Himalayas are in high demand in other states because of its superior quality.

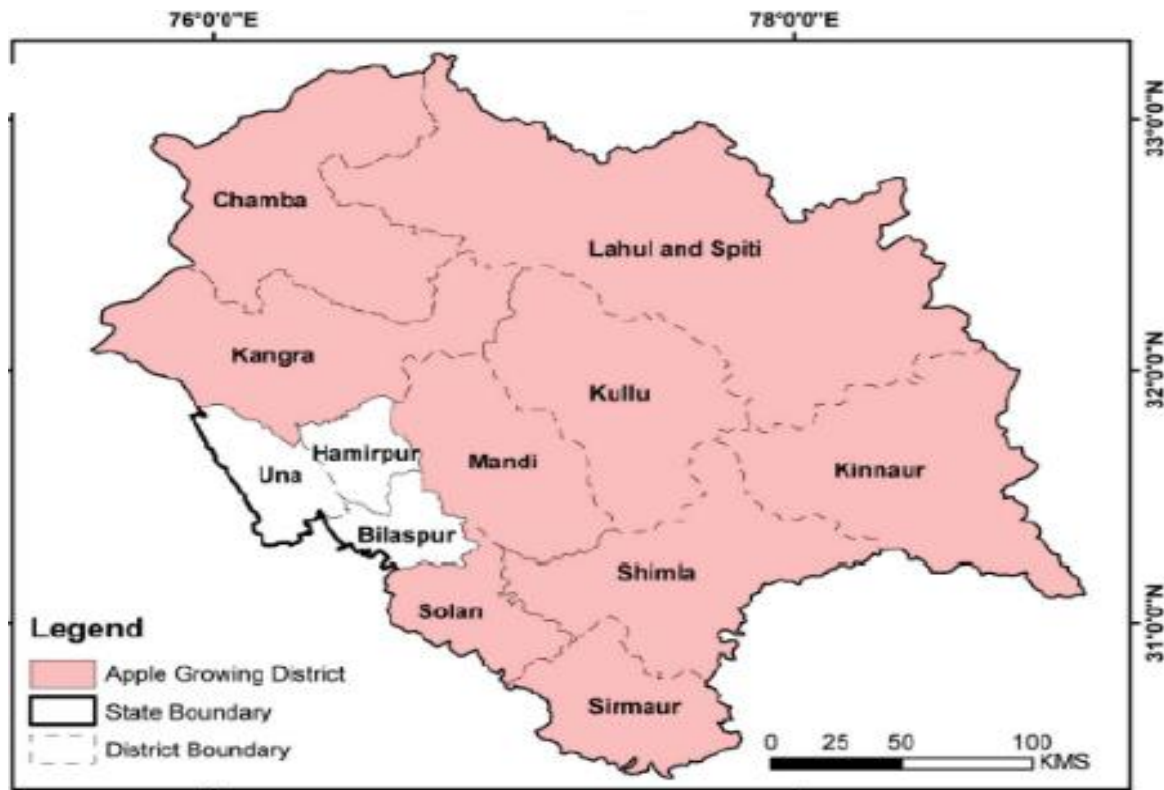


Fig. 1. Selection of study area

one of the objectives of this study is to identify different apple distribution channels in Shimla district of Himachal Pradesh as one of the leading apple-producing districts. The second objective is to estimate the marketing efficiency and price spread for the identified major channels. The market efficiency of the channel and the price spread associated with it will help the producer to sell their produce profitably and will help in identifying a better distribution channel.

2. MATERIALS AND METHODS

The study was undertaken in Shimla district of Himachal Pradesh since it is one of the districts where apples are cultivated extensively². Shimla, the summer capital of Himachal Pradesh, is renowned for its significant contribution to apple production in the region. This city plays a pivotal role in state's horticultural landscape. The total production of apple in Himachal Pradesh as of 2022 is 6,11,859 MT, out of which the production share of Shimla is 3,69,720 MT (Economics &

Statistics Department, HP, 2024). The unique climatic conditions, characterized by cool temperatures and abundant rainfall, create an ideal environment for apple orchards to thrive. This district produced 49.70% of apples from 2021-2022 (Economics & Statistics Department, HP, 2024). The total producing apple acreage is 42,292 Ha of the total 1,14,807 Ha for the state in 2022 (Economics & Statistics Department, HP, 2024). This combination of favorable growing conditions and robust logistics makes Shimla an exemplary case study for understanding the dynamics of apple production and supply in Himachal Pradesh. Theog and Rohru were the two tehsils that were purposefully chosen based on the large production acreage. Multi-stage random sampling technique was used for selecting the villages and farmers under the tehsils. Six villages were chosen at random from each tehsil. The sample size of the study consisted of 60 farmers and 5 intermediaries among the major channels identified.

The wholesale and retail price of apples were collected from different regions of the district. Using a pretested schedule as a guide, personal interviews with the respondent farmers and various intermediaries yielded the core data for

² Shimla is located in mid altitudinal range of Himachal Pradesh, 1500-2500 meter above the sea level where Apple production (harvesting takes place for period of three months from August-September) every year.

the study. The farmers were contacted with the assistance of several officials, including the Department of Horticulture's Assistant Horticulture Officer and nearby traders. WE collected information pertaining to marketing cost and marketing margin. Data for the 2023-24 growing season was collected for the purpose of the study and the data collection was carried out from January to March 2024. For calculation of marketing efficiency, Acharya's Measurement of Marketing Efficiency was used to understand the channel wise significance in the disposal of apple from producers to consumers.

Acharya's Measurement of Marketing Efficiency

$$MME = PF/MC + MM$$

Where,

ME= Marketing efficiency
 PF = Price received by the farmer
 MC= Total marketing costs
 MM = Net marketing margins

3. RESULTS AND DISCUSSION

3.1 Prevailing Distribution Channels

The path taken to transfer goods or services from the producer/farmer to the final customer is known as the distribution channel. It considers the middlemen who work in the process, including commission agents, distributors and retailers. They make it easier for the produce to go along the line. For the purpose of distributing apples, five distinct channels have been discovered, which include:

Three of the five channels, namely channels-3, 4, and 5, are commonly accessible in Shimla³. The majority of farmer's favor channel-5, which consists of many middlemen such as commission agents, wholesalers, and retailers. The study also showed that the farmers in the region were satisfied with the channel-5 because, it allowed them to market their produce quickly without the requirement for storage and helped them to realize their profits earlier. Channel-4, which included producers, pre-harvest contractors, commission agents, wholesalers, and retailers, was the second-most preferred channel.

³ The importance of Channel 1 and Channel 2 were very much insignificant in their impact, time centric importance and consistent dependency of farmers to dispose their produce, so not considered here in further study purpose.

3.2 Mode of Sale Adopted by Farmer

Table 2 depicted prevalent channels that were followed by the farmers. It was observed that most of the farmers followed channel-5. This channel was mostly followed by the farmers because of the harmonious relationship between the intermediaries and farmers, and due to the timely availability of the credit to the farmers. The wholesalers may be categorized as near and distant wholesalers. Wholesalers (near) included as one of the intermediaries in the districts of Shimla, Kinnaur etc. whereas wholesaler (distant) included the intermediaries from Chandigarh, Jaipur, Delhi etc. Open auction system was mostly followed by the farmers of this area. As apple is a perishable and seasonal commodity, the apple mandis operated from July-November which is considered as the harvesting season of the commodity. Apple are traded in the unit of boxes. One box may weigh between 10 kg-25 kg.

The farmers accepted Channel-4 to a lesser extent than channel 5. Channel-4 included the pre-harvest contractor. Pre-harvest contractors make their choices after a thorough analysis of the potential yield of the orchards. About 50 percent of the pre-harvest contractors paid agreed-upon price to the farmer up front (during the agreement framing process), while the remaining paid at the time of harvest. The truck is loaded at the farm gate and transported to distant cities. During the one-year contract, the orchard owner oversees all cultural operations, except for spraying against apple scab, which is handled by the contractor. According to the farmer's perception this channel is not sustainable in the long run. In avarice of getting higher produce from the field, the resources are mostly over utilized creating sustainability issues/concerns. The produce is then marketed through the commission agent. Channel-3 involves the wholesaler, retailer and consumer. About 20 per cent of the farmers follow this channel. The main issue with this distribution channel is that the distributor does not always have the adequate storage and infrastructure in place, necessary if the apples are to be sold later. Six of the sixty farmers adhere to channel-1, which involves selling the producer directly to the consumer. However, channel-1 and channel-2 were not considered in the study due to their less significance highlighted before.

Table 1. Marketing channel identified in Shimla, Himachal Pradesh

Channels	Intermediaries
Channel-1	Producer □ Consumer
Channel-2	Producer □ Retailer □ Consumer
Channel-3	Producer □ Wholesaler □ Retailer □ Consumer
Channel-4	Producer □ Pre-Harvest Contractor □ Commission Agent □ Wholesaler □ Retailer □ Consumer
Channel-5	Producer □ Commission agent □ Wholesaler □ Retailer □ Consumer

Source: Primary data collection

Table 2. Mode of sale adopted by the farmers

							n=60
No	Farm size	Channel-1	Channel-2	Channel-3	Channel-4	Channel-5	Total
1	Marginal	3(16.6%)	1(5.5%)	3(16.6%)	2(11.1%)	9(50%)	18
2	Small	1(8.3%)	1(8.3%)	1(8.3%)	2(16.6%)	7(58%)	12
3	Semi Medium	1(8.3%)	2(16.6%)	4(33.3%)	2(16.6%)	4(33.3%)	12
4	Medium	1(12.5%)	1(12.5%)	1(12.5%)	1(12.5%)	4(50%)	8
5	Large	-	2(20%)	3(30%)	1(10%)	4(40%)	10

Source: Primary data collection

3.3 Marketing Cost and Marketing Margin

The marketing cost associated with each intermediary depends on factors such as the quality of the apples offered, the distance of the market, the kind of packaging material used, and the overall cost of loading and unloading (Table 3).

For channel-3, the cost incurred by the wholesaler was ₹ 1850 per quintal and the cost incurred by the retailer was ₹1960. The slight increase in the cost incurred by the retailer is due to the additional cost for the market fee which is covered by the retailer. The total marketing margin for the channel is ₹ 3310 which is less as compared to other 2 channels due to fewer intermediaries in the channel. In case of Channel-4, the marketing cost incurred by pre-harvest contractor, commission agent, wholesaler and retailer were ₹1420, ₹930, ₹890, and ₹1340, respectively.

The final sale price was higher in Channel-4, this can be attributed by two important reasons. The first reason being, most of the produce that is marketed through this channel possess higher quality standards than others. The total number of intermediaries was highest leading to higher marketing cost and higher marketing margin, hence an increased overall cost. It was observed that the marketing margin of pre-harvest

contractor was highest followed by retailer, followed by commission agent. Channel-5 was followed mostly despite higher marketing cost and marketing margin because of the harmonious relationship between the producer and commission agent. It was easier to market all the produce through this channel. In Channel-5, total marketing cost and marketing margin was found to be ₹ 4320 and ₹ 4480 respectively.

3.4 Price spread and Marketing Efficiency

Price spread is defined as the difference in amount of what the consumer pays and what the farmer/producer receives in their respective channel per unit kg of produce. Table-4 indicates that the price spread was directly proportional to the number of intermediaries involved. The price spread was highest in Channel-4 and lowest in Channel-3. Despite higher price being received by the farmers in Channel-3 it was difficult for the farmers to market their complete produce through this channel. The farmer partially prefers Channel-4 due to the support of the pre-harvest contractors to provide them with the timely inputs such as pesticides, fungicides and capital required. The price spread of the Channel-5 is ₹ 8800 and marketing efficiency was comparatively better over in Channel 4, might be due to less channel members in the supply chain.

Table 3. Marketing cost and marketing margin (numbers are in rupees)

SI No	Particular	Channel-3	Channel-4	Channel-5
A	Net price received by Producer	8000	7030	7510
B	Cost incurred by Pre-harvest Contractor	0	1420	0
1	Picking and Grading	0	300	0
2	Container cost	0	80	0
3	Loading/Unloading	0	40	0
4	Transportation cost	0	730	0
5	Miscellaneous cost	0	270	0
6	Margin of Pre-harvest contractor	0	1660	0
7	Pre-Harvest Contractor sale price	0	10110	0
C	Cost incurred by Commission agent	0	930	1040
1	Container cost	0	310	300
2	Transportation cost	0	570	690
3	Loading/Unloading	0	50	50
4	Margin of Commission Agent	0	1330	1580
5	Sale Price of Commission Agent	0	12370	10130
D	Cost incurred by Wholesaler	1850	890	1720
1	Transportation cost	990	460	760
2	Spoilage cost	860	430	960
3	Margin of the wholesaler	1510	1110	1300
4	Sale Price of the Wholesaler	11360	14370	13150
E	Cost incurred by Retailer	1960	1340	1560
1	Transportation cost	660	380	460
2	Market fee	400	400	400
3	Spoilage cost	900	560	700
4	Margin of Retailer	1800	1440	1600
5	Sale Price of Retailer	15120	17150	16310

Source: Primary data collection

Table 4. Marketing efficiency and price spread (numbers are in rupees)

Particular	Channel-3	Channel-4	Channel-5
Consumers Purchase Price	15120	17150	16310
Total Marketing Cost	3810	4580	4320
Total Marketing Margin	3310	5540	4480
Price Spread	7120	10120	8800
Marketing Efficiency	1.12	0.69	0.85

Source: Primary data collection

4. CONCLUSION

The study helps us to identify the presence of large inefficiencies in the marketing channel of apple in India. The reason for inefficiency can be attributed to higher marketing cost and marketing margin associated with different intermediaries. Charging of higher cost by the intermediaries leaves the farmer with lower producer price. Farmers are currently facing high price volatility and need supportive market to sell apples promptly due to their perishability. The infrastructure (cold storage facilities, warehouse facilities and processing facilities) is highly required to aid against the price volatility. The study identified five major apple distribution channels and three among them are widely

adopted by farmers for marketing their produce. The marketing efficiency is highest in Channel-3 which comprised of wholesaler and retailer as the intermediaries and it stands at lowest in Channel-4 that includes pre-harvest contractor, commission agent, wholesaler and retailers. To enhance the marketing efficiency, the following suggestion and strategies could be implemented:

- Collective marketing of the produce will increase farmers' profit and will provide them with better bargaining power.
- Implementation of better logistics and inventory management systems for retailers to reduce spoilage and miscellaneous costs.

- Providing training to retailers for efficient handling and storage practices to lower marketing costs.
- Investment in better transportation and storage infrastructure to reduce spoilage and transportation costs for wholesalers. This can be achieved through public-private partnerships.
- Implementation of regulatory frameworks to ensure commission agents operate transparently and efficiently, reducing additional costs.

A variety of marketing tasks, like selecting, assembling, grading, packing, loading, unloading, storing, and such, aid in obtaining higher prices in the marketplace. Lack of qualified personnel, infrastructure, and marketing information are among the marketing issues faced by orchardists. Additionally, based on the observations during the course of study, it was found that the undulating terrain in the study area is one of the major constraints faced by the apple growers of the region.

MAJOR HIGHLIGHTS

- Significant price spread and high marketing margins are observed across different channels which included varying number of intermediaries.
- The study suggests collective marketing, improved logistics, training for efficient handling, and investment in transportation and storage infrastructure to enhance marketing efficiency.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing the manuscript.

COMPETING INTERESTS

Authors have declared that no competing interest exist.

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