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Synergizing traditional and digital marketing patterns of apple through FPO and eNAM in Shimla district of Himachal Pradesh

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Abstract
This paper attempts to evaluate the price spread of apples in the Shimla district of Himachal Pradesh. The study is based on primary data collected from three blocks of Shimla district i.e., Jubbal-Kotkhai, Rohru, and Narkanda. A total of 75 farmers were selected from each block. For the marketing study, 10 respondents were selected randomly from each pre-harvest contractor, post-harvest contractor, farmer producer organization, wholesaler and retailer. Primary data from apple growers was collected using an interviewing method during 2022-23. The present study examined APMC's traditional marketing system, followed by e-NAM and Farmer Producer Organization (FPO) marketing channels. i.e.; Producer -Commission Agent-Wholesaler-Retailer-Consumer, Producer- Pre-harvest Contractor-Wholesaler - Retailer-Consumer, Producer-Post-harvest Contractor-Wholesaler-Retailer-Consumer and Producer-Farmer Producer organization (FPO) - e-NAM-Consumer. Therefore, Shimla's apple business is more lucrative; revealing that 36 percent of the market share and 28.73 percent of the market margin were found in Channel I. Digital Marketing Channel IV had the highest producer share, i.e. 75.02, and the highest market efficiency, 33.

Keywords: Traditional market, eNAM, FPO, digital marketing
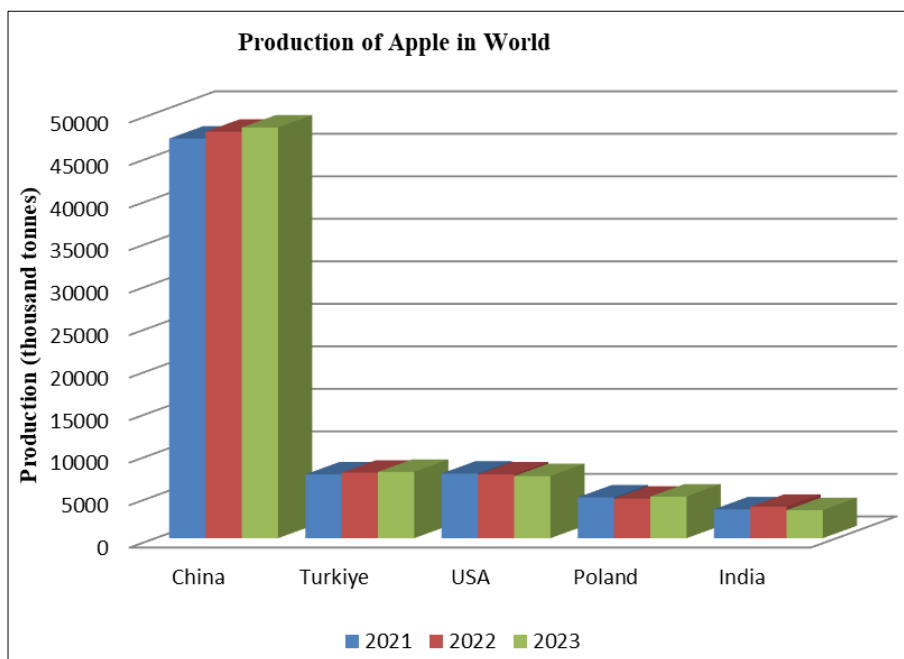
Introduction
Climate and geographical conditions in India provide ideal growing conditions for a wide range of fruits and vegetables. The hilly regions of Kashmir, Himachal Pradesh (H.P.) and Uttarakhand produce the largest quantities of temperate fruits, such as apples, pears, plums and peaches. A major portion of global apple production comes from China, accounting for approximately 49%, followed by Turkey, the United States, Poland, and India (Figure 1). In India, Jammu & Kashmir is the top apple-producing state with 77.85%, followed by Himachal Pradesh with 19.22%, Uttarakhand with 2.53%, Arunachal Pradesh with 0.32% and Nagaland with 0.09% (Figure 2). (FAOSTAT 2024). India produces an estimated 2437 thousand metric tonnes of apples annually across 320 thousand hectares (NHB, 2024). In Himachal Pradesh, 672.84 thousand metric tonnes of apples were produced from 115 thousand hectares in 2022-2023 (HPSAMB, 2024). In rural areas, the average per capita apple consumption is 0.06 kilograms per month, whereas in urban areas, it is 0.19 kilograms per month. In India, 1,77,47,254 farmers are registered to e-NAM, of which 125301 are from Himachal Pradesh (e-NAM,2024). 93 FPO registered with E-NAM (Table 1).

A high-density and high-yielding apple variety is being actively promoted by the Department of Horticulture, Government of Himachal Pradesh. Apples must be distributed in optimal condition to end consumers due to their perishable nature. It is primarily the private sector that markets apples in Himachal Pradesh, involving various entities such as pre-harvest contractors, commission agents, wholesalers and retailers. Numerous nodes and channels are involved in this process. Picking, grading, packing, and transporting apples are all steps in the apple marketing process. The efficiency of these operations largely determines Apple prices. To maximize their net returns, farmers consider the efficiency of their marketing system. In order to understand apple cultivation marketing practices, attention must be paid to them closely. This study aimed to determine the marketing aspects of apple crops in Shimla district, Himachal Pradesh. In recent decades, numerous studies have explored the production, marketing, and economics of apples and other crops.

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Table 1: Registered Stakeholders of Himachal Pradesh with E-Nam

State	Himachal Pradesh
Traders	2310
Commission Agents (CAs)	1158
FPOs	93
Farmer	125301
Total	128862

a) Top five producers of apples in the world
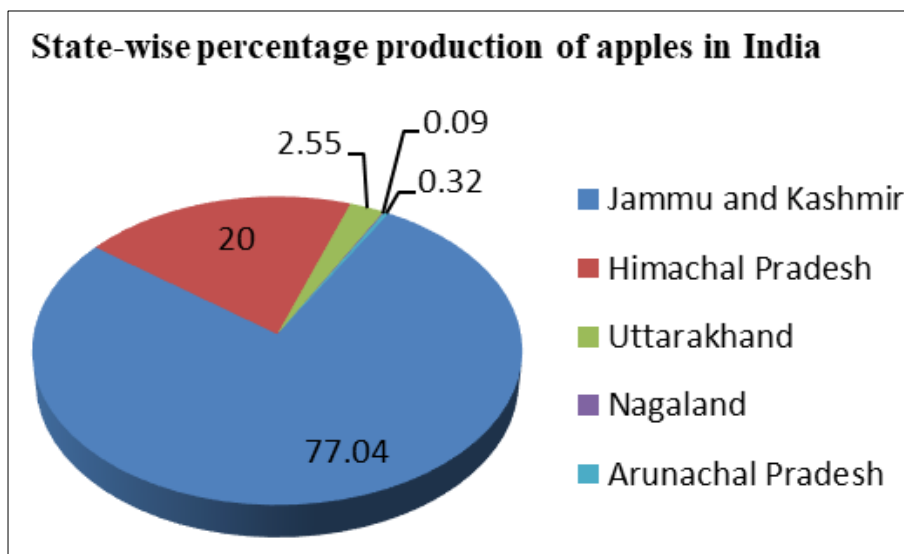
b) State-wise percentage production of apples in India
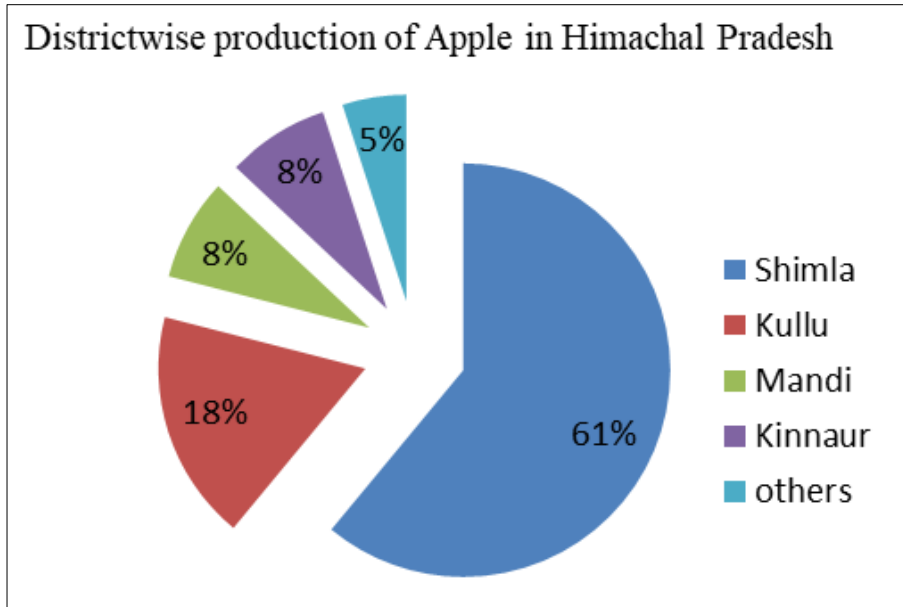
c) District-wise percentage production of apples in Himachal Pradesh

Methodology

Study area and sampling scheme

In Himachal Pradesh, Shimla district contributes 61% of total Apple Production. The block-wise area under the apple is presented in Table 2. Based on the area, three blocks, i.e. Jubbal-Kotkhai, Rohru and Narkanda of Shimla district, were selected for the study. From each block, 25 farmers were selected purposively, making the total sample size of 75 farmers. 10 respondents from each stakeholder group, i.e., pre-harvest contractors, post-harvest contractors, FPOs(Farmer Producer Organisations), wholesalers and Retailers, were selected randomly to study the marketing of apples in the study region

Table 2: The area under Apple (in Sq Km.) in Shimla district and its blocks

Table Apple area (in Sq Km.) in Shimla district and its blocks.			
S. No.	Block/District	Apple Area (Sq. Km)	Percentage Share
1	Jubbal-Kotkhai	79.42	21.1
2	Rohru	61.42	16.32
3	Narkanda	53.73	14.27
4	Theog	45.97	12.21
5	Rampur	40.66	10.8
6	Chopal	38.19	10.14
7	Chirgaon	35.52	9.44
8	Mashobra	21.36	5.67
	Shimla District	376.27	100.00

Department of Horticulture, Shimla

Analytical tools

The data was analyzed using a simple tabular approach to determine price spreads in marketing Apple fruits.

i) Marketing cost

Marketing costs are the costs incurred throughout the marketing process. The marketing cost per quintal was calculated by using the formula given by Shepherd's method, which is as follows:

$$C = C_f + C_{m_{i1}} + C_{m_{i2}} + C_{m_{i3}} + \cdots + C_{m_n}$$

Where,

C = Total marketing cost of produce (₹/box)

C_f = cost incurred by grower (₹/box)

C_{m_i} = cost incurred by i^{th} middlemen in the process of buying and selling of produce

C_{m_n} = cost incurred by n^{th} middlemen

b) Market margin of middlemen

An intermediary's profit was calculated by comparing total payments (Cost + Purchase price) with total receipts (Sale price) from the sale.

i) Average gross margin $(M_g) = \dfrac{\text{Total sale value } (S_i) - \text{Total purchase value } (P_i)}{\text{Quantity of the produce handled}}$

Where,

M_g = Gross margin of produce

S_i = Sale value of produce

P_i = Purchase value of produce

ii) Net margin $(N_m) = Pr_i - (Pp_i + Cm_i)$

iii) Percentage margin $= \dfrac{Pr_i - (Pp_i + Cm_i)}{Pr_i} \times 100$

Where,

Pr_i = Per 20 kg box price received from produce by i^{th} middlemen

Pp_i = Per 20 kg box purchase price by i^{th} middlemen

Cm_i = Per 20 kg box marketing cost incurred by i^{th} middlemen

c) Price spreading

There exists a difference between the price that the consumer pays and the price that farmer receives for their produce.

i) Producer's Price

$$(P_f) = P_a - C_f$$

Where,

P_f = Producers price

P_a = price of a product at wholesale in the primary assembling market

C_f = cost incurred by the grower in Marketing Channel

ii) Producer's share in consumer's rupee

The producer's share is a measure of how much the producer actually receives for the product.

$$\text{Producer's share } (P_s) = \frac{P_f}{P_r} \times 100$$

Where,

P_s = producer's share in consumer's rupee (%)

P_r = price paid by the consumer's (₹)

P_f = Net price received by grower (₹)

Result and discussion

The marketing of a commodity involves the transfer of goods both physically and economically. Farmers' economic condition is adversely impacted when the marketing system fails, even though they are engaged in high-paying enterprises. Post-harvest losses in high-risk crops are always critically influenced by marketing. In order to estimate the share of different stakeholders within the Apple marketing system, an investigation has been conducted into the existing marketing system of these products. To obtain information about apple marketing, 3 blocks were chosen, namely Narkanda, Rohru, and Jubbal-Kotkhai. From Each block, 25 farmers were selected randomly, accounting for 75 samples. In order to prepare apples for marketing, various processes are involved, including picking, grading, packing, transporting, loading, and unloading. Typically, fruit is harvested by hand and sorted to eliminate diseased and rotten fruit. A subsequent grading process is carried out according to the size and colour of the fruits. Various marketing channels are used to reach end consumers, including farmers, pre-harvest contractors, wholesalers, FPO(Farmer Producer Organization) digital platform E-NAM and retailers.

Marketing channels

A commodity travels through the marketing channel from a producer to an ultimate consumer. As shown in Table 3, producers dispose of their produce through various marketing channels. Our analysis began with APMC's conventional marketing system, and then we examined the marketing channels used by e-NAM and Farmer Producer Organizations (FPOs). It is self-evident that traditional marketing systems are derived from the profit-making motives of intermediaries, although these intermediaries provide valuable services. Channel I shares 36 percent of the total quantity marketed with channel II, where producers sell pre-harvest to wholesalers. It was estimated that 25.33 percent of the products had been disposed of through this channel. In channel III, 24 percent of the total quantity was sold, while in channel IV, marketing differed from traditional methods. Either way, e-NAM recruited produce through wholesalers or FPO(Farmer Producer Organization). Only 14.67 percent of people were using these channels, which may be due to a lack of awareness, but their marketing efficiency was quite impressive. In Figure 3, Marketing channels are represented by bar graphs.

Table 3: Percentage of commodities marketed through different channels

Column1	Percent Share in total quantity marketed				
Marketing Channels	Marketing intermediaries	Jubbal-Kotkhai	Rohru	Narkanda	Overall
Channel I	Producer -commission agent-Wholesaler-Retailer-Consumer	32	40	36	36
Channel II	Producer-Pre-harvest Contractor-Wholesaler-Retailer-Consumer	28	24	24	25.33
Channel III	Producer-Post-harvest Contractor-Wholesaler-Retailer-Consumer	24	20	28	24
Channel IV	Producer-Farmer Producer organization(FPO)- E-Nam-Consumer	16	16	12	14.67
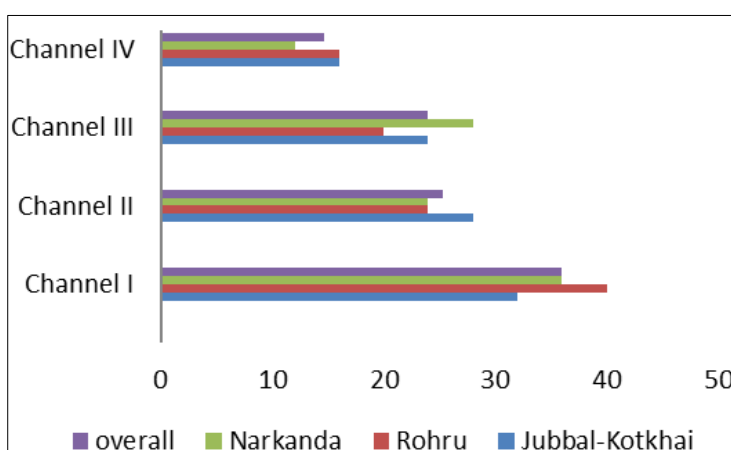
Fig 3: Percent share in total quantity marketed

Studies conducted before e-NAM implementation were reviewed, and it was observed that in Jammu and Kashmir (Chaudhary, R. *et al*., 2016) [6], the share of Apple sold through traditional chains was greater than 90 percent. In contrast, in Himachal Pradesh it was 85 percent (Sharma, I., & Guleria, A., 2020) [16]. Similarly, in the present study, the share of traditional marketing can be seen as occupied by e-NAM. The share was between 80 and 90 percent in the past, but now it is 60 to 70 percent. As a result, e-NAM has demonstrated positive performance over the years. The trade diversion due to e-NAM indicates that digital marketing will soon become a significant supply chain in India.

Marketing Cost of Apple in Rupee per box
Table 4 revealed that the estimated total cost incurred by Apple for the various stages of marketing was Rs 157.32 per box. Various marketing stages and the expenditures incurred are discussed under four sub-categories, i.e., pre-packing, packing, transportation, and miscellaneous charges.

Marketing cost and margin of different Market functionaries of Apple
The price spread and marketing margin between producers and consumers are common indicators of marketing efficiency. Farmer's returns have been primarily regulated by price. The government often aims to ensure farmers are paid remunerative prices, and consumers can afford them. It will adversely affect production in the following year if the farmers receive a low price or consumers pay a high price. Therefore, prices are crucial to the regulation of the economy. The cost incurred is presented and discussed as follows:

Table 4: Marketing Cost of Apple in Rupee per box(20 kg)

S.N.	Cost Components	Amount	Per cent of the total
	Marketing Cost of Apple in Rupee per box(20 kg)		
	Pre-packing cost:		
1	Charges of picking	10.83	6.88
	Charges of assembling	5.2	3.3
	Charges of grading	6.19	3.93
	Total	22.22	14.11
	Packing cost:		
2	Cost of packing box	50	31.78
	Cost of wrapping paper	9.5	6.03
	Cost of paddy straw	3.5	2.22
	Charges of packing	4	2.54
	Charges of assembling of boxes	2	1.27
	Charges of labeling & stenciling	3	1.9
	Total	72	45.74
	Transport charges:		
3	Charges of Orchard to road head	15	9.53
	Charges of Loading at road head	3.5	2.22
	Forwarding charges	18	11.44
	Charges of Unloading at destination	3.5	2.22
	Communication etc. Charges	1.1	0.69
	Total	41.1	26.1
4	Miscellaneous charges:	22	13.98
	Grand Total	157.32	100

(Standard box contains 20 kg of Apple)

Table 5 revealed that the producer sold his product directly to wholesalers, spent all marketing costs until the produce reached the wholesalers, and earned Rs 1646.87/-, Rs 1546.87/-, Rs 1596.87/- and Rs 1646.87/- for Red Delicious, Golden Delicious, Red Velvox and Red Chief varieties respectively, it was observed during the transaction that the producer received more than 50.00 percent of the consumer's price in all varieties, with a 58.92 percent share overall. The wholesaler received the apple produce from the producer directly, which accounts for a return of Rs 47.72/- (1.83 per cent), Rs 98.5/- (3.86 per cent), Rs 194/- (7.18 per cent) and Rs 192.5/- (7.26 per cent) share of consumer's price for Red Delicious, Golden Delicious, Red Velvox and Red Chief varieties respectively. Among the retail price retained by the retailer in lieu of his expenses, a proportion of Rs 252.07/- (9.69 percent), Rs 247/- (9.68 percent), Rs 262/- (9.70 percent) and Rs 267/- (10.08 percent) of the consumer's price is Rs 247.18/- (9.50 percent), Rs 253/- (9.92 percent), Rs 238.24/- (8.81 percent) and Rs 133/- (5.01 percent) of consumer's price for Red Delicious, Golden Delicious, Red Velvox and Red Chief varieties.
The producer incurs relatively low expenses for every marketing component, but the sum of his expenses is significant. For a 20 kg box, the packaging, picking turns, and wrapping paper expenses come out to be very high, amounting to Rs 50.00/-, Rs 10.83/- and Rs 9.5/-, respectively, for all varieties of apples, namely Red Delicious, Golden Delicious, Red Velvox and Red Chief. As seen in the following table, Red Delicious, Golden Delicious, Red Velvox and Red Chief were priced at Rs 2600/-, Rs 2550/-, Rs 2700/-, and Rs 2650/-, respectively, in the first marketing channel. Similar results were found by Kulshreshtha & Sharma, 2021 [13] which revealed that the price of 15 kg box was Rs 790.96/-, Rs 686.84/-, Rs 655.96/- and Rs 621.77/- per box of Delicious, Chanmura, American and Maharaji varieties respectively.
The price spread for channel II involving a producer, pre-harvest contractor, wholesaler, retailer, and consumer is shown in Table 6. The producer sold its standing crop to a pre-harvest contractor in this channel without incurring marketing expenses. For Red Delicious, Golden Delicious, Red Velvox and Red Chief varieties, the producer received Rs 1210/-, Rs 1150/-, Rs 1300/-, and Rs 1450/-, which represented 43.84 percent, 44.06 percent, 49.05 percent, and 52.15 percent of consumer's price, respectively. Until the producer reached the wholesaler, the Pre-harvest contractor covered all expenses. As part of the pre-harvest contract, the pre-harvest contractor spent 5.54 percent, 5.86 percent, 5.77 percent, and 5.50 percent of the consumer's price on marketing. For Red Delicious, Golden Delicious, Red Velvox and Red Chief varieties, the margin of contractors was 316.87/-, 266.54/-, 186.75/- and 116.67/-, corresponding to 11.48 percent, 10.22 percent, 7.05 percent and 4.2 percent.

Moreover, Table 6 shows that the retailer spent 9,13 percent, 9.46 percent, 9.88 percent and 9.6 percent of the consumer's price on transportation and to cover loss of produce during transit for Red Delicious, Golden Delicious, Red Velvox and Red Chief varieties, respectively. Retailers retained 14.75 percent of the consumer's price for the different varieties of apple in the same sequence, followed by Rs 313/- (11.9percent), Rs 188/- (7.09percent), and Rs 263/- (9.46percent). For Red Delicious, consumers paid Rs 2760/-

per box, for Golden Delicious, Rs 2610/- per box, for Red Velvox, and for Red Chief, they paid Rs 2780/- per box. Similar finding were found in the study conducted by Wani, 2019 [21] and revealed that Approximately 35 percent of the sample apple growers marketed their products through channel II. Nevertheless, 25 percent sold their produce through channel IV pre-harvest contractors, 20 percent through channel III forwarding agents, and 15 and 5 were failed channels I and V.

Table 5: Price spread of channel-I (Producer-commission agent-Wholesaler-Retailer-Consumer)

S.N.	Particulars	Varieties				
		Red Delicious	Golden Delicious	Red Velvox	Red Chief	Overall
	A) Producer					
	I) Expenses incurred by the producer over marketing :					
1	Charges of picking	10.83	10.83	10.83	10.83	10.83
2	Charges of assembling	5.2	5.2	5.2	5.2	5.2
3	Charges of grading	6.19	6.19	6.19	6.19	6.19
4	Cost of the packing box	50	50	50	50	50
5	Cost of wrapping paper	9.5	9.5	9.5	9.5	9.5
6	Cost of paddy straw	3.5	3.5	3.5	3.5	3.5
7	Charges of packing	4	4	4	4	4
8	Charges of assembling boxes	2	2	2	2	2
9	Charges to godown, loading & unloading	4.9	4.9	4.9	4.9	4.9
10	Charges of labelling and stenciling	3	3	3	3	3
	Total	99.12	99.12	99.12	99.12	99.12
		(3.81)	(3.88)	(3.67)	(3.74)	(3.75)
II)	**Expenses incurred by the producer over transport**					
1	Charges of Orchard to road head	20	20	20	20	20
2	Charges of Loading at Roadhead	4	4	4	4	4
3	Forwarding charges	30	30	30	30	30
	Total	54	54	54	54	54
		(2.07)	(2.11)	(2.00)	(2.03)	(2.05)
	Grand Total	153.12	153.12	153.12	153.12	153.12
		(5.88)	(6.00)	(5.67)	(5.77)	(5.83)
III)	Producer's sale price :	1800	1700	1750	1800	1700
IV	Producer's share in sale price:	1646.87	1546.87	1596.87	1646.87	1546.87
		(63.34)	(60.66)	(49.88)	(62.14)	(58.92)
B)	**Wholesaler:**					
1	**Expenses incurred by wholesaler :**					
I	Gross price paid by the wholesaler	1800	1700	1750	1800	1700
II	**Cost components**					
a	Transportation cost	35	35	35	35	35
b	Cost of basket/crate	25	25	25	25	25
c	Loading/unloading	10	10	10	10	10
d	Grading	120	120	120	120	120
e	Mandi fee (1 per cent)	21	20.5	22	22.5	21.5
f	Commission charges(2 per cent)	42.01	41	44	45	43.00
	Total	253.02	251.5	256	257.5	254.50
		(9.73)	(9.86)	(9.48)	(9.71)	(9.69)
	Wholesaler's margin					
	(C) Sale price :	2100.74	2050	2200	2250	2150.18
	(D) Wholesaler's margin :	47.71	98.5	193.5	192.5	195.67
		(1.83)	(3.86)	(7.44)	(7.26)	(7.34)
C)	**Retailer**					
(a):	**Expenses incurred by the retailer**					
1	Transport charges	42	42	42	42	42
2	10 per cent loss realized by the retailer	210.07	205	220	225	215.01
	Total	252.07	247	262	267	257.01
		(9.69)	(9.68)	(9.7)	(10.07)	(9.78)
(b)	Total purchase price:	2352.81	2297	2462	2517	2407.2025
(c)	Sale price:	2600	2550	2700	2650	2625
(d)	Retailer's margin:	247.18	253	238	133	217.795
		(9.5)	(9.92)	(8.81)	(5.01)	(8.31)
D)	Consumer's Purchase Price:	2600	2550	2700	2650	2625
		(100)	(100)	(100)	(100)	(100)

Table 6: Price spread of channel-II (Producer-Pre-harvest Contractor-Wholesaler-Retailer-Consumer)

S. No	Particulars	Varieties				
		Red Delicious	Golden Delicious	Red Velvox	Red Chief	Overall
	(A) Producer:					
a	Producer's Sale Price	1210	1150	1300	1450	1277.5
b	Producer's Share in Consumer's Price	1210	1150	1300	1450	1277.5
	(43.84)		(44.06)	(49.05)	(52.15)	(47.27)
	(B) Pre-harvest Contractor:					
	(I) Expenses incurred by the producer over marketing:					
1	Picking Charges	10.83	10.83	10.83	10.83	10.83
2	Assembling Charges	5.2	5.2	5.2	5.2	5.2
3	Grading Charges	6.19	6.19	6.19	6.19	6.19
4	Cost of Packing Box	50	50	50	50	50
5	Cost of Wrapping Paper	9.5	9.5	9.5	9.5	9.5
6	Cost of Paddy Straw	3.5	3.5	3.5	3.5	3.5
7	Cost of Packing	4	4	4	4	4
8	Cost of assembling boxes	2	2	2	2	2
9	Charges to godown, loading & unloading	4.9	4.9	4.9	4.9	4.9
10	Charges of labelling and stenciling	3	3	3	3	3
	II) Expenses incurred by the producer over transport:					
1	Charges of Orchard to road head	20	20	20	20	20
2	Charges of Loading at Roadhead	4	4	4	4	4
3	Forwarding charges	30	30	30	30	30
	Total	153.12	153.12	153.12	153.12	153.12
		(5.54)	(5.86)	(5.77)	(5.5)	(5.67)
	Total purchase price:	1363.12	1303.12	1453.2	1603.12	1430.62
	Sale price:	1680	1570	1640	1720	1652.5
	Contractor's margin:	316.87	266.87	186.87	116.87	221.87
		(11.48)	(10.22)	(7.05)	(4.2)	(8.24)
C)	**Wholesaler:**					
1	**Expenses incurred by wholesaler :**					
I	I Gross price paid by the wholesaler	1680	1570	1640	1720	1652.5
II	**II Cost components**					
a	Transportation cost	35	35	35	35	35
b	Cost of basket/crate	25	25	25	25	25
c	Loading/unloading	10	10	10	10	10
d	Grading	120	120	120	120	120
e	Mandi fee (1%)	21	20.5	22	22.5	21.5
f	Commission charges(2%)	42.01	41	44	45	43
	Total	253.02	251.5	256	257.5	254.5
		(9.16)	(9.63)	(9.66)	(9.26)	(9.43)
	Wholesaler's margin					
	Sale price :	2100.74	2050	2200	2250	2150.18
	Wholesaler's margin :	167.71	228.5	304	272.5	243.17
		(6.07)	(8.75)	(11.47)	(9.8)	(9.02)
	D) Retailer:					
(a):	**Expenses incurred by retailer**					
1	Transport charges	42	42	42	42	42
2	10% loss realized by retailer	210.07	205	220	225	215.01
	Total	252.07	247	262	267	257.01
		(9.13)	(9.46)	(9.88)	(9.6)	(9.52)
(b)	Total purchase price:	2352.81	2297	2462	2517	2407.2
(c)	Sale price:	2760	2610	2650	2780	2700
(d)	Retailer's margin:	407.18	313	188	263	292.79
		(14.75)	(11.99)	(7.09)	(9.46)	(10.82)
D)	Consumer's Purchase Price:	2760	2610	2650	2780	2700
		(100)	(100)	(100)	(100)	(100)

The comprehensive price spread of channel-III is shown in Table 7, and it indicates that the producer's share was found to be Rs 1320.87/- for Red Delicious, Rs 1260.35/- for Golden Delicious, Rs 1380.71/- for Red Velvox, and Rs 1350.85/- for Red Chief. In other words, 46.83 per cent, 46.52 per cent, 47.61 per cent, and 45.48 per cent, respectively.

+The post-harvest contractor's margin 15.1 per cent, 15.71 per cent,20.55 per cent and 24.1 per cent per box for different varieties of apple, i.e. Red Delicious, Golden Delicious, Red Velvox and Red Chief varieties, respectively; the wholesaler earned the share of Rs 72.8/- (2.58 per cent), Rs 64.9/- (2.39 per cent), Rs 104.7/- (3.61 per cent) and Rs 63.19/- (2.12 per cent) for per box of Red Delicious, Golden Delicious, Red Velvox and Red Chief varieties. The producer covers all expenses through this channel until the fruit reaches the wholesaler.

Table 7: Price spread of channel-III (Producer-Post-harvest Contractor-Wholesaler-Retailer-Consumer)

Sl. N.	Particulars	Varieties				
		Red Delicious	golden delicious	Red Velvox	Red Chief	Overall
	Producer:					
	(A) Expenses incurred by the producer over marketing					
1	Charges of picking	10.83	10.83	10.83	10.83	10.83
2	Charges of assembling	5.2	5.2	5.2	5.2	5.2
3	Charges of grading	6.19	6.19	6.19	6.19	6.19
4	Cost of packing box	50	50	50	50	50
5	Cost of wrapping paper	9.5	9.5	9.5	9.5	9.5
6	Cost of paddy straw	3.5	3.5	3.5	3.5	3.5
7	Charges of packing	4	4	4	4	4
8	Charges of assembling of boxes	2	2	2	2	2
9	Charges to godown, loading / unloading	4.9	4.9	4.9	4.9	4.9
10	Charges of labeling and stenciling	3	3	3	3	3
	Total	99.12	99.12	99.12	99.12	99.12
		(3.51)	(3.65)	(3.41)	(3.33)	(3.48)
	(B) Producer's sale price:	1420	1360	1480	1450	1427.5
	(C) Producer's share in consumer's price:	1320.87	1260.87	1380.87	1350.87	1328.37
		(46.83)	(46.52)	(47.61)	(45.48)	(46.61)
	Post-harvest contractor:					
	(A) Expenses incurred by the Post-harvest contractor over transport					
1	Charges of Orchard to road head	20	20	20	20	20
2	Charges of Loading at Roadhead	4	4	4	4	4
3	Road head to wholesaler	40	40	40	40	40
	Total	64	64	64	64	64
		2.26	2.36	2.2	2.15	2.24
	(B) Total purchase price:	1484	1424	1544	1514	1491.5
	(C) Sale price:	1910	1850	2140	2230	2032.5
	(D) Contractor's margin:	426	426	596	716	541
		(15.1)	(15.71)	(20.55)	(24.1)	(18.87)
	Wholesaler:					
1	**Expenses incurred by wholesaler**					
	I Gross price paid by the wholesaler	1910	1850	2140	2230	2032.5
	II Cost components					
	a Transportation cost	35	35	35	35	35
	b cost of basket/crate	25	25	25	25	25
	c Loading/unloading	10	10	10	10	10
	d Grading	120	120	120	120	120
	e Mandi fee (1%)	22.4	21.7	25.1	25.6	23.7
	f Commission charges(2%)	44.8	43.4	50.2	51.2	47.4
	Total	257.2	255.1	265.3	266.8	261.1
		(9.12)	(9.41)	(9.14)	(8.98)	(9.16)
	Wholesaler's margin					
	(C) Sale price :	2240	2170	2510	2560	2370
	(D) Wholesaler's margin :	72.8	64.9	104.7	63.19	76.4
		(2.58)	(2.39)	(3.61)	(2.12)	(2.67)
	Retailer:					
	(A) Expenses incurred by retailer					
1	Transport charges	42	42	42	42	42
2	10% loss realized by retailer	224	217	251	256	237
	Total	266	259	293	298	279
		(9.43)	(9.55)	(10.1)	(10.03)	(9.78)
	(B) Total purchase price:	2506	2429	2803	2858	2649
	(C) Sale price:	2820	2710	2900	2970	2850
	(D) Retailer's margin:	314	281	97	112	201
		(11.13)	(10.36)	(3.34)	(3.77)	(7.15)
	Consumer's Purchase Price:	2820	2710	2900	2970	2850
		(100)	(100)	(100)	(100)	(100)

The price spread for channel IV involves a price spread of Apple's digital marketing, i.e. Producer-Farmer Producer Organisation(FPO)- E-Nam-Consumer, as shown in Table 8. The producer sold its standing crop to the Farmer Producer Organisation(FPO) in this channel. For Red Delicious, Golden Delicious, Red Velvox and Red Chief varieties, the producer received Rs 1710/-, Rs 1670/-, Rs 1580/-, and Rs 1890/-, which represented 76.33 percent, 76.60 percent, 69.91 percent, and 77.14 percent of consumer's price for Red Delicious, Golden Delicious, Red Velvox and Red Chief varieties respectively. This channel shows the highest producer share compared to traditional marketing channels. FPO (Farmer Producer Organisation) paid Rs 129.15 and a margin of Rs 73.35 per box. FPO and e-NAM pay no Commission charges. For Red Delicious, consumers paid Rs 2240/- per box. For Golden Delicious, Rs 2180/- per box; for Red Velvox, Rs 2260; and for Red Chief, they paid Rs 2450/- per box, the lowest paid by the consumer in all traditional markets.

Table 8: Price spread of channel-IV [Producer-Farmer Producer Organisation(FPO)- E-NAM-Consumer]

S N	Particulars	Varieties				
		Red Delicious	golden delicious	Red Velvox	Red Chief	Overall
	A) Producer:					
	Farmer's selling price	1710	1670	1580	1890	1712.5
B)	Marketing costs incurred by FPOs					
I	Gross price paid by FPOs	1710	1670	1580	1890	1712.5
II	Cost components					
a	Cost of basket/crate	60	60	60	60	60
b	Loading/unloading	50	50	50	50	50
c	Mandi fee (1%)	19.1	18.4	17.8	21.3	19.15
d	Commission charges	0	0	0		0
	Total	129.1	128.4	127.8	131.3	129.15
	FPO's selling price/e-NAM purchase price	1910	1840	1780	2130	1915
	FPO's margin	70.9	41.6	72.2	108.7	73.35
C)	Marketing costs incurred by e-NAM					
I	Gross price paid by e-NAM	1910	1840	1780	2130	1915
II	Cost components					
a	Cost of basket/crate	-	-	-	-	-
b	Loading/unloading	50	50	50	50	50
c	Mandi fee (0.09%)	201.6	196.2	203.4	220.5	205.425
d	Commission charges	-	-	-	-	-
	Total	251.6	246.2	253.4	270.5	255.425
	e-NAM margin	78.4	93.8	226.6	49.5	112.075
	e-NAM selling price/consumer purchase price	2240	2180	2260	2450	2282.5
	D) Consumer's Purchase Price	2240	2180	2260	2450	2282.5

Table 9 presents the price spread among the different channels among the selected functionaries. Based on the table, it is apparent that the producer price varies between Rs 1277 and Rs 1712. The producer price was highest in Channel IV and lowest in Channel II. Contrary to this, Channel III had the highest consumer prices, and Channel IV had the lowest. It must be noted that Channel IV incurs the lowest marketing margin and costs, followed by Channel II, Channel III, and Channel I. Channel IV has the highest share of the consumer rupee (75.02 percent), followed by Channel I, Channel II, and Channel III.

Table 9: Price spread among different marketing channels in Apple Fruit

The price spread among different marketing channels in Apple crop				
Particulars	Channel I	Channel II	Channel III	Channel IV
Producer price	1609.37	1277.5	1328.37	1712.5
Consumer price	2625	2700	2850	2282.5
Gross marketing margin	1015.62	1422.5	1521.62	570
Total marketing cost	664.64	664.64	703.22	384.57
Net market margin	350.97	757.85	818.4	185.42
Total gross marketing margin (%)	38.69	52.68	53.39	24.97
Marketing cost (%)	25.31	24.61	24.67	16.84
Marketing margin (%)	13.37	28.06	28.73	8.14
Producer's share (%)	61.32	47.33	46.6	75.02

A summary of the marketing efficiency of the individual channels is provided in Table 10. Acharya's approach was used to determine marketing efficiency. The table shows that Channel IV (3) had the highest marketing efficiency, followed by Channel I (1.58), Channel II (0.89), and Channel III (0.87). Channel IV reported maximum efficiency (47 percent) shown in Fig 2, whereas the volume transacted was only 14.67 percent (Table 1) due to lack of awareness, but their marketing efficiency was quite impressive. This indicates that e-NAM will soon become a major supply chain in India due to its positive performance. Fig 4 shows an inverse relationship between the producer share and Marketing Margin. Fig 5 shows the marketing efficiency of different marketing channels of Apple Fruit.

According to Barakade, Lokhande, and Todkari (2011) [2], direct marketing is the most efficient form. The quantity shared is almost negligible, even though efficiency is higher. Whereas in the case of FPOs and e-NAM, the greater efficiency comes from a notable marketed quantity.

Table 10: Marketing efficiency of different channels in Apple Fruit

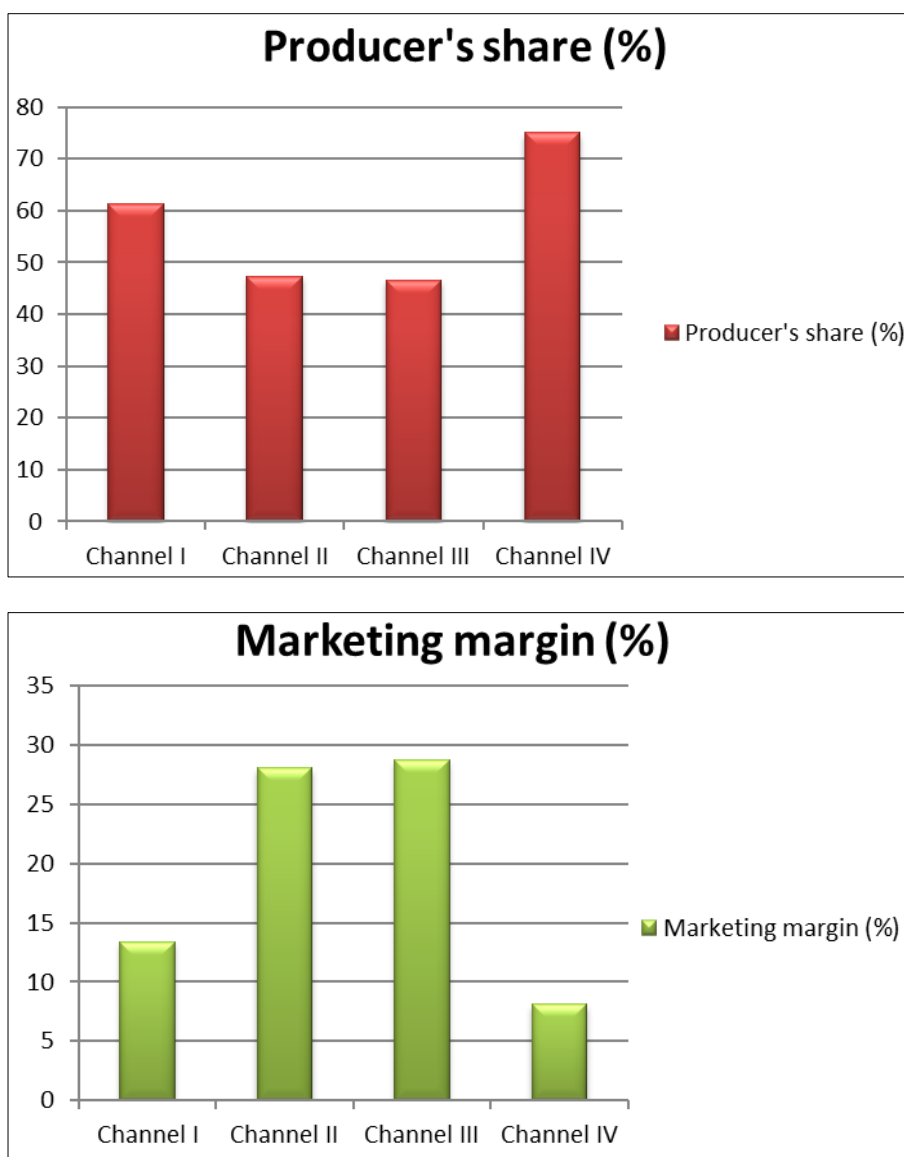| Marketing efficiency of different channels in Apple Fruit				
Particulars	Channel I	Channel II	Channel III	Channel IV
Gross marketing margin	1015.62	1423	1521.62	570
Consumer's price	2625	2700	2850	2282.5
Total net marketing margin	350.97	757.9	818.4	185.42
Marketing efficiency	1.58	0.89	0.87	3

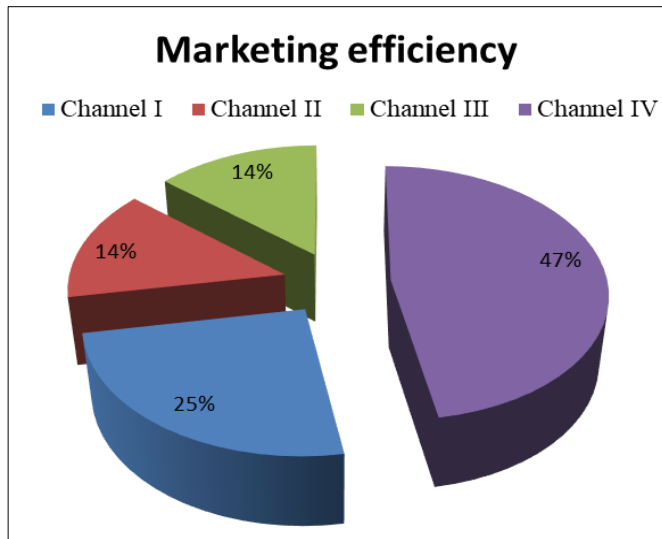**Fig 4:** Producer Share and Market Margin of Apple fruit

Fig 5: Marketing Efficiency of Apple Fruit

Conclusion
This study aimed to identify the marketing channels and trends of apple crops arriving in Shimla, Himachal Pradesh. Farmers are believed to prefer marketing channels with higher returns and lower risks for various reasons, including higher returns and lower risk. As a result, commission agents and retail channels are preferred because their prices are market-regulated, and they offer better rates. However, channel IV was the most effective method for marketing apple crops in the study area, contributing 75.02 percent. Overall, It seems that they prefer Commission agent wholesale marketing (36 percent) to avoid risks and labour issues associated with apple marketing but marketing efficiency was found to be maximum in Channel IV (47 Percent). The marketing efficiency of the present study reveals that e-NAM and FPOs efficiency is performing better than organized sector supply chains. There is a need to popularize these chains to avail more benefits. Only 14.67 percent of people were using these channels, possibly due to a lack of awareness, but their marketing efficiency was quite impressive. Farmers prefer to sell their produce. Farmers' shares in consumer rupees are reduced due to the present marketing system, which involves several intermediaries. Farmers in the study area face additional obstacles, such as a lack of good roads leading to apple orchards, labour shortages, and cold storage issues.

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